Planning and Development
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

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Agenda
Planning Board
Tuesday, June 18, 2019
City Hall Conference Room (First Floor)
5:00 PM Workshop/5:30 PM Regular Meeting

5:00 PM – Workshop:

1. Sketch Plan Review: Contract Zone Request – Flag Pond Road
2. Zoning Ordinance Revision – Discussion:
    a. Signage
    b. Private Roads (Update)

5:30 PM – Regular Meeting:

1. Call to Order
2. Review Minutes of Previous Meetings:
    a. May 7, 2019
    b. May 14, 2019
    c. May 21, 2019
3. New Business, Tabled Items & Public Hearings –
    a. Application Review & Public Hearing: Map 42 Lot 1-2: Preliminary Subdivision Plan Review – Re-subdivision to create two additional lots
        - Applicant: City of Saco
        - Zone: B-8 & I-1
    b. Application Review & Public Hearing: Map 42 Lot 1-2: Site Plan & Design Review – New Public Works Facility, accessory structures and associated site improvements
        - Applicant: City of Saco
        - Zone: B-8 & I-1
    c. Continued Application Review & Public Hearing: 193 Flag Pond Road (Map 92 Lot 19): Preliminary Subdivision Review – four-lot subdivision
        - Applicant: Great Lots of Maine, LLC
        - Zone: C-1
    d. Continued Application Review & Public Hearing: Map 88 Lot 12: Preliminary Subdivision Review – 21-lot subdivision – Sandy Brook off Chantelle Way
        - Applicant: Star Homes Inc.
        - Zone: R-1D & RP
4. Old Business
5. Updates from City Planner/Planning Department
    a. Process Updates and Next Steps
6. Other Discussion
7. Adjournment

No new business will be taken up after 9:00 PM.
No business shall be conducted by the Board after 10:00 PM.

Planning Board
Meeting Packet – June 18, 2019
Regular Meeting
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Minutes
Planning Board
Tuesday, May 7, 2019
6:00 PM Regular Meeting
City Hall Auditorium

Present for the Board: Acting Chair Don Girouard; Matt Provencal; Peter Scontras; Joyce Leary Clark; Jeff Brochu
Absent for the Board: Chair Neil Shuster; Alyssa Bouthot
Also Present: Kimberly Sawyer, Program Coordinator; Joe Laverriere, City Engineer; Denise Clavette, Planning & Development Director; Tim Murphy, City Attorney; Richard Lambert, Code Enforcement Director; member of the public

Note: Regular meeting is audio recorded. These audio records will be posted on the City's website and available for public review within one week of the meeting.

1. Call to Order: Acting Chair Don Girouard called the meeting to order at 6:02 PM.
2. Minutes of April 30, 2019 Meeting: *The minutes were not yet ready, so they will be reviewed at a future Board meeting.*
3. New Business, Tabled Items & Public Hearings:
   a. 60 Bay View Road (Map 9 Lot 1): Site Plan & Design Review – 8-unit residential condominium project (6 seasonal dwelling units and 2 year-round dwelling units) with associated site improvements
      - Applicant: Estates at Bay View LLC
      - Zone: R-1A

Steve Blake of BH2M and Tim Swenson of Estates at Bay View LLC were present to discuss the application.
Overview: Emily Cole-Prescott noted that the Department had received several pieces of correspondence for the public hearing record after meeting packet distribution, for the Board's review. She noted that the items had been sent electronically to the Board and to the applicant. She mentioned that the original documentation is in the file, and copies of all of these materials are on the table in the back of the auditorium. She noted the list of these items:

- Letter dated 05/06/19 from Robert & Kathleen Dziadzio and other property owners
- Email dated 05/06/19 from Neil Schuster
- Memo dated 05/05/19 from Neil Schuster
- Memo dated 05/06/19 from City Engineer
- Email dated 05/06/19 from WRRD Howard Carter
- Landscape Peer Review dated 05/06/19 from Regina Leonard
- Email dated 05/06/19 from Tim Murphy, City Attorney

Emily Cole-Prescott provided the following overview of the proposal and application type: "Applicant, Estates at Bay View LLC, has presented a site plan application to redevelop 60 Bay View Road into a residential condominium comprised of six seasonal and two year-round units, for a total

of eight residential dwelling units on the site. According to City records and the existing conditions plan, the property previously housed thirteen dwelling units, two of which were year-round, and the rest of which were seasonal rental cottages. The plan is to construct structures that more conform to the R-1A zone, served by sewer and water, with a paved one-way access road with a grassed underdrain filter and detention pond for stormwater management.

The Code Enforcement Department had received legal opinion from City Attorney Tim Murphy indicating that structures could be replaced on the site, following the appropriate setbacks for the R-1A zone, provided that the number of seasonal and year-round dwelling units did not change, and provided that the square footage of total habitable structure on the overall site remained the same or was reduced. Although the proposal results in more impervious coverage because of the installation of a paved, private accessway, the structures are now planned to meet setbacks for the zone and to remain under the maximum lot coverage percentage (20%) for the R-1A zone. Subsequent legal opinions for the record, from both City Attorney Tim Murphy and the applicant's attorney, David Ordway, indicate that because of the age of the seasonal cottages and the number of years the property was used for seasonal rentals, subdivision review is not applicable. However, because the site will be redeveloped and result in greater than 10,000 square feet of impervious surface, the site is subject to Site Plan Review per Section 230 of the City's ordinances. Therefore, both Site Plan and Design Review are applicable to this project.

Landscaping – The applicant has submitted a landscaping plan, and we have just received peer review on the plan from Senior Landscape Architect Regina Leonard. Although she summarizes that some of the landscaping standards are not relevant to a residential project, she indicates concerns with the proposed grade changes to the site, indicating that the existing conditions survey should be updated to indicate trees on the site. She also notes that vegetation should be replanted to re-establish the buffer.

Lighting – The applicant has submitted cut sheets of the proposed building lighting for the property. The applicant has also requested a waiver for the lighting plan. In my memo dated May 7th, I indicate that the residential character of the neighborhood should be considered with this waiver request, and the Board should ask questions to the applicant as to the reason for the waiver request.

Condominium Declarations – In my memo, I reviewed several locations within the Condominium Declarations that should be revised. Among other concerns, one of the primary concerns is the definition of seasonal in the Declaration, which is proposed from April through the end of December. A seasonal use would be more in line with May through October, with clear restrictions and enforcement mechanisms to ensure that the use is strictly retained as seasonal. Several suggestions have been made. Without this non-conforming use, the property cannot be developed in this method, and could not be considered. The applicant has presented information for the record, and the Code Enforcement Director and City Attorney have also presented information for the record on the seasonal use of the site. The applicant should be asked to review and revise the Declaration accordingly.

Additionally, on the non-conforming use of the property, there is evidence submitted for the record indicating that the use continued from 2000 to 2016. The Board can ask the applicant to prove use of the site in 2017 and 2018.

Question of a Neighborhood Meeting Requirement per Section 230-1103(I): City Attorney Tim Murphy's opinion about this requirement is attached. This requirement is applicable to new multi-unit structures. However, the applicant can voluntarily host a neighborhood meeting about the project.

Sign for Site Plan Review: Section 230-1103(D)(3) of the Site Plan Review ordinances requires that a sign be posted on the subject property of a public hearing. This was brought to my attention, so the developer has added a sign to the property. Please note that there is no date requirement for the posting of this sign, and we have not required this of other applicants undergoing site plan review/public hearings in quite some time. However, moving forward, I will be requesting it of every site under site plan review.

The abutter notice requirement and posting in the newspaper standards have all been met.

The Code Enforcement Department has issued permits for the site to complete blasting limited to under 10,000 square feet, and demolition of existing structures."

Applicant's Presentation: Steve Blake, of BH2M Engineering indicated that the lighting plan will be done by tomorrow. He noted some features of the site and design. Steve Blake noted that he and the applicant will also respond to the landscape peer reviewer's comments. Steve Blake noted that additional screening and possibility of vegetation along the road should be considered in the updated landscaping plan. Joyce Leary Clark asked about follow-up from Deputy Fire Chief Dave Pendleton's comments, and Steve Blake replied that the one-way access will be plowed year-round, and the applicant does not plan to install sprinklers in the proposed structures.

Application Completeness:

- Waiver Request: Lighting Plan – Steve Blake stated that the lighting will be a single-wall pack at each house with short lights at each driveway, and the rationale for the waiver request was that there would not be throw from the driveways. Emily Cole-Prescott indicated that the applicant has requested a waiver to the lighting plan submission requirement. The applicant has submitted cut sheets of the proposed building lighting, and the City's peer reviewer has offered feedback.

Peter Scontras moved that the application is not complete, and until the lighting plan is satisfied, the Board not move forward with this application. Joyce Leary Clark seconded the motion. Jeff Brochu asked about receiving public comment at tonight's meeting. **The motion carried.**

Acting Chair Don Girouard noted that this application review and public hearing will be continued to another date. There was discussion among Board members about whether to receive public comment.

Emily Cole-Prescott clarified that it has been Saco's normal process to receive public comment at meetings in the past whether or not there had been a completeness finding; however, if the Board closes the hearing, no additional information can be received for the record. If it is the Board's preference to receive public comment, the Board may continue the hearing to a future meeting to ensure the public may comment on any new information received for the record.

Peter Scontras moved to reconsider the above motion. Joyce Leary Clark seconded the motion, and it carried unanimously.
Peter Scontras moved to find the application incomplete, but that the public hearing be opened but not terminated at this meeting, until further information is received. Joyce Leary Clark seconded the motion, and it carried unanimously.

Matt Provencal requested that full elevations of all floor plans be submitted.

Public Hearing: **Jeff Brochu moved to open the public hearing for 60 Bay View Road. Peter Scontras seconded the motion, and it carried unanimously.**

Acting Chair Don Girouard asked that each member of the public who would like to speak about the application write their name on the public hearing sign-up sheet. The following members of the public chose to speak. *Please note: The list here indicates those who spoke in favor of and in opposition to the application. Please refer to the meeting audio recording for full details.*

- *Charles Moreno, spoke for Hector Moreno, PO Box 60, Center Stafford, NH 03815,* spoke in opposition to the proposal.
- *Bob Dziadzi, 15 Plymouth Drive,* spoke in opposition to the application.
- *PJ Lassek, 7 Christopher,* spoke in opposition to the application. She read a letter on behalf of Ron Michaud about the proposal, noting concerns about several items of the proposal.
- *Mark Eisenhaur, 13 Plymouth Drive,* spoke in opposition to the proposal.
- *Cathy Stackpole, 7 Christopher,* spoke in opposition to the application.
- *Kathleen Dziadzio, 15 Plymouth Drive,* spoke in opposition to the proposal.
- *Resident of 6 Driftwood Lane,* spoke in opposition to the application.
- *Michael A. Roy, 28 Plymouth Drive,* spoke in opposition to the application.

The applicant replied to the Board about several of the comments made:

- *Tim Swenson, Saco, ME, applicant,* replied to several of the comments made.
    - Asbestos Removal: Tim Swenson explained the work he had done to have asbestos properly remediated, with appropriate information sent to the Code Enforcement Director.
    - Density: Prior to tearing down the cottages, City Atty. Tim Murphy and Code Enforcement Director Dick Lambert calculated the habitable square footage of the existing structures. The zone allows for up to 20% lot coverage. He had reduced the number of units from his original plan for the site based on comments received from the Code Enforcement Director and City Attorney.
    - Blasting Square Footage: Tim Swenson was issued a blasting permit for no more than 10,000 square feet. He stated that the Code Enforcement Director had been out to the site and verified that the blasting was kept within the parameters of the blasting permit that was issued by the Code Enforcement Department.

Acting Chair Don Girouard asked Saco's Code Enforcement Director Richard Lambert to speak about the permits that have been issued to date for the site, and non-conforming standards of the ordinance:

- *Richard Lambert, Code Enforcement Director,* presented evidence for the record. He walked the property today, and measured the blasting area. The permits had been issued for the demolition after the applicant had submitted the information required by the state and by the local

regulations regarding asbestos abatement and removal. City Attorney Murphy's letter referencing removal of the buildings was provided to the applicant, and references the fact that non-conforming use has a time limit. Certain units were allowed to be removed only after asbestos abatement had been confirmed. A blasting permit had been issued – the first one under the City's new ordinance. The requirements for the application had been fulfilled, and the blasting permit had been issued for under 10,000 square feet because of the site plan review requirements. Tim Swenson has applied for a permit to construct two of the units, and the Code Enforcement Department has issued a permit for one of the units. One unit would most likely cover up to the 10,000 sq. ft. threshold of disturbed area for site plan approval. Richard Lambert noted that he has walked the property today, and most of the area toward the rear of the property – the triangular area – has not been disturbed. Richard Lambert noted that Tim Swenson has indicated that many of the trees on the property were hazard trees. Peter Scontras asked for the protocol for removing trees, and Richard Lambert replied that unless a property is in shoreland zoning overlay district, which this property is not, there are no regulations for removal of trees. However, stumps cannot be removed if triggering 10,000 square ft. of land area.

Applicant:
There was question about the proximity of the blasted area for the foundation of unit 8 near an existing fence and a lot line. *Tim Swenson, applicant,* indicated that the existing fence is on his property. The surveyor has noted the setback line within the blasted area to ensure the setback is met.

Board Comments:
Acting Chair Don Girouard asked the Board for their questions. Board members asked the following questions:

- Jeff Brochu asked about the habitable square footage of the structure as they existed before the demolition. Richard Lambert indicated that the square footage had been presented based on existing conditions presented by the applicant, which can be confirmed with the Assessing Department.
- Jeff Brochu asked about whether there were cabins that had been inhabitable, and whether the businesses had been inspected. Richard Lambert noted that his department does not do business licensing. Although there is a seasonal use ordinance, this site had been in existence before the City's zoning, and therefore pre-dated requirements for a Certificate of Occupancy, and is not regulated under the City's seasonal ordinance.
- Richard Lambert stated that there is information in the Code Enforcement Department's record about the seasonal nature of the use. In 2000 and 2005, there is clear indication of the seasonal nature of the cottages, that were not to be used on a year-round basis. The Code Enforcement Department had cited the previous owner in 2005 for attempting to use the property as a year-round use. Richard Lambert clarified that the cottages were used seasonally, but do not fall under the City's seasonal ordinance regulations as this site is also outside of the area designated by the seasonal ordinance. Joyce Leary Clark asked if there are any City records for information on what was occupied when. Richard Lambert stated that provided at least one of the units had been occupied, the use had continued on the site, based on information from the City's Attorney.
- Tim Swenson provided a State license of motel/hotel for the record.

Acting Chair Don Girouard asked for City Attorney Tim Murphy to respond to the question(s) of use:

- City Attorney Tim Murphy indicated that it is the Code Enforcement Director's job to collect the available facts, transmit to the City Attorney, and Tim Murphy applies those facts to the analysis of the ordinances. Square footage has been historically used as seasonal cottages, and continues the nonconformance. City Attorney Tim Murphy stated that the use is allowed because it has been there before zoning. One of the key concerns with nonconformance, and if the use ceases for twelve months, the use would be lost. He said that there is no evidence to suggest that the use did not continue. Atty. Murphy summarized that questions raised tonight have to do with the following: how many cottages were used and the length of time they were used. Atty. Murphy noted that if even two cottages were used for three months that is enough to satisfy the continuing use test. The use is lawful because it existed before zoning, and is allowed to continue because it has continued. The non-conforming use cannot be expanded, as the goal of zoning is to shrink non-conformity. Atty. Murphy clarified that the question of non-conformity is with the Code Enforcement Department, not with the Planning Board. Atty. Murphy noted that the time period that becomes most pertinent is from 2016 to 2018, and his suggestion is to ask the applicant to ask the previous owner for information on rentals, whether the site was rented, and the previous owner should be able to provide some factual evidence. It is incumbent upon the applicant to have information about the previous use. Atty. Murphy noted that it should be the applicant's burden to produce information for the record about the previous two years. Atty. Murphy noted that the analysis has been done based on the amount of living space based on the historic use of the site. There is no expansion of habitable space with the proposed plan. Jeff Brochu asked about the non-conforming use was for a temporary lodging facility, and he had questions of the proposed condominium association, asking questions about the difference of the uses. Atty. Murphy noted that the argument would be the proposed use is less intense to have eight individual owner-occupied units. Atty. Murphy noted that who holds the title is the question, and he does not view this as a change of use, but rather a change of ownership. Atty. Murphy noted that the City Planner has suggested multiple revisions to the proposed Condominium Declarations, which he supports. Atty. Murphy stated that the rental provisions have been flagged by the City Planner, and this matter is a policy consideration for the Board. Upon inquiry from Acting Chair Girouard, Atty. Murphy noted that the Board may impose reasonable conditions upon the developer.

Acting Chair Don Girouard opened the floor to receive additional public comment about the application, and the following members of the public chose to speak:

- *Christina Guimond (spelling?), 7 Royal Pine Drive, Standish, ME,* spoke about her family's history and spoke in favor of the proposal.
- *Mary Lucas, 2 Plymouth Drive,* spoke in opposition to the proposal.
- *Theresa Wellborn, no address given for the record,* spoke in opposition to the application.
- *Kevin Roche, 18 Vines Road,* spoke about process concerns and concerns about non-conforming use on the site.

Acting Chair Don Girouard asked for comments from Board members:

- Peter Scontras noted that he does not agree with the City Attorney's response to his question about non-conforming use and square footage.

- Jeff Brochu noted concerns about the proposal relative to non-conforming use and change of ownership. He noted concerns about parking, lighting, and traffic issues relative to a subdivision.

Emily Cole-Prescott cautioned the Board that there is no finding of completeness on the application and there are still outstanding materials. This should be an opportunity to provide feedback to the applicant based on items received and the public comment received thus far. She noted that she will summarize some of the comments that the applicant should address moving forward.

- Joyce Leary Clark stated that the applicant has submitted a letter from Gone Coastal LLC tonight. She said there is a question of use from 2016 to 2018, and documentation of the use of the property since 2016. She would also like to see the lighting plan, updated landscaping plan, and have some more information about the stormwater. She also noted that parking matters should be considered, the seasonal use, and revisions mentioned by the City Planner to the condominium documents.
- Matt Provencal asked about the amenities in the cottages, asking if each cottage had its own bathroom facilities, kitchens, etc.
- Acting Chair Don Girouard asked the applicant for as much information as possible as to what has been going on at the property for the last several years.

E. Cole-Prescott summarized that the applicant should return with the following, based on feedback provided tonight:
- Revise Declaration of Condominium
- Lighting Plan
- Revised Landscaping Plan, and respond to Landscaping Peer Review
- Documentation for the record from 2016 to 2018 on the use of the site and how the structures were being used during that period
- Parking on the site
- Full details on the elevation plans

Acting Chair Don Girouard asked if the Board is interested in completing a site walk. Jeff Brochu noted that the details for the application should be established before a site walk is scheduled.

Upon inquiry from Acting Chair Girouard, Tim Swenson replied that he will work with the City Planner to respond to questions.

Peter Scontras moved to table the application review and continue the public hearing to a future meeting. Joyce Leary Clark seconded the motion, and it carried unanimously.

Emily Cole-Prescott stated that the abutter notices will be mailed again, and the public hearing will be published again in the newspaper before the Planning Board meeting where the application will be heard.

b. 40 Moody Street (Map 42 Lot 1): Final Subdivision Review
   - Applicant: Sweetser
   - Zone: B-8

Jon Mistos of Sweetser was present to discuss the application.

Overview: Emily Cole-Prescott introduced the application, noting that the applicant has responded to the requested revisions on the plans from preliminary review, but nothing else relative to the proposal has changed since preliminary review.

Application Completeness: **Jeff Brochu moved to find the application complete, noting the waivers that have been grated for preliminary plan review. Joyce Leary Clark seconded the motion, and it carried unanimously.**

Public Hearing: **Peter Scontras moved to open the public hearing, and Matt Provencal seconded the motion. It carried unanimously.** No member of the public chose to speak about this matter. **Jeff Brochu moved to close the public hearing. Peter Scontras seconded the motion, and it carried unanimously.**

Action: **Jeff Brochu moved to approve the final subdivision plan per the enclosed findings of fact and conditions of approval dated May 7, 2019. Peter Scontras seconded the motion, and it carried unanimously.**

Updates & Other Discussion: E. Cole-Prescott explained some of the process updates on which she is working. The June 4th meeting is canceled. There is a Planning Board training scheduled on June 11th.

Adjournment: Without objection, the meeting ended at 10:01 PM.

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TO:	Planning Board
CC:	Saco Public Works Department
	John Kuchinski, CES Engineering
FROM:	Emily Cole-Prescott, City Planner
DATE:	June 13, 2019 (June 18, 2019 Planning Board Meeting)
RE:	Tax Map 42 Lot 1-2: Subdivision Amendment to create three additional lots

Overview: Applicant, City of Saco, requests preliminary subdivision review to divide three additional lots from map 42 lot 1-2. The existing lot was part of the previously approved Saco-Sweetser subdivision. This proposal includes a right-of-way from the existing Spring Hill Road to map 42 lot 1-2. The proposal is to construct an approximate 1,400' dead-end road built to City street standards to provide access to lot one, and proposed lots 2, 3, and 4. This preliminary plan is accompanied by a site plan review/design review application for the development of lot one (approximately 15 acres) to serve as the new Public Works facility.

Required Permits: This proposal is subject to the following reviews and permits:
- Subdivision Review
- Site Plan Review
- Site Location of Development under existing Spring Hill Site Law – The DEP is retaining jurisdictional authority of the Site law review for this proposal.
- NRPA Permit with the DEP
- Army Corps Permit: The applicant has obtained the required Army Corps permit, which has been included in the meeting packet.

Application Completeness: With the submissions received for both preliminary subdivision review and site plan review, Staff finds the application complete. If the Board agrees, a motion is: ***"I move to find the application for preliminary subdivision review for Map 42 Lot 1-2 complete."***

Departmental Reviews:
- Peer Reviewing Engineer (Gorrill Palmer): Steve Bushey, P.E. has reviewed both the subdivision and site plan application and has provided comments in his memos, included in the meeting packet for the Board's consideration.
- Code Enforcement Department: Richard Lambert responded that the revisions address his previous comments.
- Fire Department: Dave Pendleton has indicated that the Fire Department is aware of the proposal, and has no additional comment at this time.
- Police Department: No formal response has been received by the Police Department.

Public Hearing: The Board should receive public comment about this application. A motion is: ***"I move to open the public hearing."*** After comment is received, a motion is: ***"I move to close the public hearing."***

Waiver Requests: The applicant has requested several waivers in support of this project. Please review the Subdivision Waiver Request Form the applicant submitted for additional details on each of the following requests:

- Section 10.11.5.9: Dead Ends – The applicant has indicated that the road as designed will initially only serve the proposed Public Works facility, and the applicant plans to connect this property as a through-street in the future with the right-of-way the City has, that will allow the lots to connect back to Industrial Park Road. Additionally, the applicant has indicated that there is enough room in the proposed facility to turn around and future development of the additional lots will be done at a future date when access to this right-of way is better established.
- Section 10.15.2: Underground Utilities – The applicant plans to extend existing overhead utilities into the subdivision from the industrial park, and therefore, requests a waiver.
- Section 10.21: Street Trees – The applicant has requested a waiver to street tree requirement, citing the industrial nature of the development and the fact that Spring Hill and the older section of the industrial park do not have street trees.
- Section 11.9.1: Vertical Granite Curb: The applicant requests a waiver to the vertical granite curb standard, asking to substitute slipform concrete curbing where needed to support the stormwater design. The applicant also indicates that the "use of slip form curb has been used by the City on most new roadway construction projects."
- Sections 11.11 and 11.17: Sidewalks and Esplanades – The applicant has indicated that due to the industrial nature of the site, pedestrian traffic is not anticipated. The applicant also indicates that other industrial parks in the City do not have sidewalks.

The Board may ask questions and discuss any of the waiver requests with the applicant. If the Board agrees with the waivers requested, a motion is: ***"I move to approve the requested waivers per the above list."***

Discussion: There are several items for the Board's review and consideration:

Traffic: While this proposal plans to relocate many of the trips that are generated at the current Public Works Facility, the estimated weekday traffic generation is 450 trips per day. The applicant has submitted a traffic impact analysis and a copy of the Traffic Movement Permit for the site. Diane Morabito, traffic engineer peer reviewer, has provided comments that will be addressed by CES Engineering.

Environmental: Wetland delineation was completed by Normandeau and Associaes, shown on both the site plan and the preliminary subdivision plan. The applicants have been working with the DEP for site law and NRPA approvals, with total wetland impacts of 12,019 square feet. A stream buffer along Philips Spring and stream is proposed.

Zoning: The property is located in the I-1 and B-8 zoning districts. The proposed lots are in the B-8 zone, which requires the following:
Lot Area: 10,000 sq. ft. for sewered lots
Frontage: 50'
Side and Rear Yards: 15'
Maximum Lot Coverage: 50%
Maximum Height: 60'
The proposed lots meet the minimum lot area.

Stormwater: The applicant proposes a stormwater management system consisting of grassed under drained soil filters and two gravel wetlands to treat a development of 13.7 acres consisting of 8.79 acres of impervious area.

Conclusion: Staff has provided the following findings of fact and conditions of approval for the Board's consideration:

Saco Planning Board
Spring Hill Industrial Park Expansion (Map 42 Lot 1-2)
Findings of Fact
June 13, 2019

1. The Spring Hill Industrial Park Expansion has a project area of approximately 42 acres. The proposal is to create a total of four lots, one of which is designed for the new Public Works facility, and others which are proposed to be sold at a future date for development purposes. Proposed lot sizes are as follows:
   Lot 1: 15.688 acres
   Lot 2: 5.4278 acres
   Lot 3: 5.9824 acres
   Lot 4: 10.8064 acres (to be retained as remaining land, including ROW easement)
2. The record owner of the site, excluding land labeled "Proposed Conveyance: Cormier Land Co, Inc. to City of Saco" from Spring Hill Road, is the City of Saco, 300 Main Street, Saco, ME 04072.
3. The record owner of the section of plan labeled "Proposed Conveyance: Cormier Land Co, Inc. to City of Saco" is Cormier Land Co., 774 Portland Road, Saco, ME 04072. A copy of the purchase and sale agreement has been submitted, to establish right, title and interest.
4. The project manager is John Kuchinski, PE, of CES Inc., 146 Main Street, Suite 300, Saco, ME 04072.
5. The project parcel is identified as Tax Map 42, Lot 1-2, in the I-1 an B-8 zoning districts. Lot is referenced in Book ____ Page _____ on the York County Registry of Deeds.
6. The project requires the following reviews and approvals:
   - Subdivision Review
   - Site Plan Review
   - Site Location of Development under existing Spring Hill Site Law – The DEP is retaining jurisdictional authority of the Site law review for this proposal.
   - NRPA Permit with the DEP
   - Army Corps Permit: The applicant has obtained the required Army Corps permit, which has been included in the meeting packet.
7. The applicant has submitted the following plans in support of this proposal:
   - *Sheet 1 of 1 – Preliminary Plan Showing Spring Hill Industrial Park Expansion prepared by Dow & Coulombe, Inc. dated May 10, 2019*
   - *Sheet C201 – Proposed Plan and Profile prepared by CES Inc. revised through 05/09/19*
   - *Sheet C202 – Proposed Plan and Profile prepared by CES Inc. revised through 05/09/19*
   - *Sheet C501 – Details prepared by CES Inc. revised through 04/02/19*
   - *Sheet C502 – Details prepared by CES Inc. revised through 04/02/19*
   - *Sheet C503 – Details prepared by CES Inc. revised through 04/02/19*
   - *Sheet C504 – Details prepared by CES Inc. revised through 05/01/19*
   - *Sheet C505 – Details prepared by CES Inc. revised through 05/01/19*

- *Reference is also made to the following plans from the site plan review application:*
    - *i. Proposed Site Plan Set prepared by CES Inc.*

8. Anticipated traffic generated is proposed to be 450 daily trips. The applicant has submitted a traffic impact analysis and draft TMP application. Diane Morabito, traffic engineering peer reviewer, submitted comments on the traffic impact analysis that the applicant is asked to address before final plan review.
9. Sewer: The applicant proposes that the site will be served by public sewer. The applicant has provided an email from the WRRD Director that there is capacity to serve 1300 gallons per day.
10. Public Water: The applicant proposes that the lots will be served by public water, and has presented a capacity letter from Maine Water in support of this proposal.
11. Stormwater Management: A stormwater management report has been submitted by CES which identifies how stormwater from the site will be treated.
12. Wetlands: Wetlands impact are anticipated to be 12,019 square feet. The applicant is aware that this wetland disturbance will require NRPA permitting. A stream running from Philips Spring is anticipated to be buffered with 100' stream buffer shown on the site plan.
13. Erosion and sedimentation control will be accomplished via temporary and permanent measures as detailed on the site plan.
14. The submissions detailed above are sufficient to make a determination on the completeness of submissions, and compliance with City of Saco Subdivision Regulations and Zoning Ordinance, of the preliminary subdivision plan.

The Planning Board has considered the following criteria from the Subdivision Regulations, and before granting approval for the preliminary plan has determined that:

1.1.1 Pollution. The proposed subdivision will not result in undue water or air pollution. In making this determination, it has at least considered:

A. The elevation of the land above sea level and its relation to the flood plains;
B. The nature of soils and subsoils and their ability to adequately support waste disposal;
C. The slope of the land and its effect on effluents;
D. The availability of streams for disposal of effluents; and
E. The applicable state and local health and water resource rules and regulations;

1.1.2 Sufficient water. The proposed subdivision has sufficient water available for the reasonably foreseeable needs of the subdivision based on the capacity letter received from Maine Water.

1.1.3 Municipal water supply. The proposed subdivision will not cause an unreasonable burden on the existing water supply, as evidenced by the capacity letter received from Maine Water.

1.1.4 Erosion. The proposed subdivision will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy condition results, based on the erosion control and buffers that are proposed.

1.1.5 Traffic. The applicant has submitted a traffic impact analysis, as 450 daily trips are anticipated, and has submitted a traffic movement application. The applicant will address the comments presented by traffic engineer peer reviewer Diane Morabito before final plan review.

1.1.6 Sewage disposal. The proposed subdivision will provide for adequate sewage waste disposal and will not cause an unreasonable burden on municipal services: The applicant has presented an email from the WRRD Director confirming that the site can be served for 1300 gallons per day.

1.1.7 Municipal solid waste disposal. The proposed subdivision will not cause an unreasonable burden on the municipality's ability to dispose of solid waste.
1.1.8 Aesthetic, cultural and natural values. The proposed subdivision will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, significant wildlife habitat: The applicant has presented a letter from the Department of Inland Fisheries & Wildlife noting that no essential habitats were mapped that would be directly affected by the project.
1.1.9 Conformity with local ordinances and plans. The proposed subdivision conforms with a duly adopted subdivision regulation, zoning ordinance, and the 2011 Comprehensive Plan.
1.1.10 Financial and technical capacity. In this case, the City of Saco is the applicant, and has a history of developing industrial and business parks throughout the City. The Public Works Facility project obtained funding through a referendum process. Documentation of approved funding for the development and technical capacity information for CES has been submitted.
1.1.11 Surface waters; outstanding river segments. Whenever situated entirely or partially within the watershed of any pond or lake or within 250 feet of any wetland, great pond or river as defined in Title 38, chapter 3, subchapter I, article 2-B, the proposed subdivision will not adversely affect the quality of that body of water or unreasonably affect the shoreline of that body of water.

A. When lots in a subdivision have frontage on an outstanding river segment, the proposed subdivision plan must require principal structures to have a combined lot shore frontage and setback from the normal high-water mark of 500 feet.

(1) To avoid circumventing the intent of this provision, whenever a proposed subdivision adjoins a shoreland strip narrower than 250 feet which is not lotted, the proposed subdivision shall be reviewed as if lot lines extended to the shore.

(2) The frontage and set-back provisions of this paragraph do not apply either within areas zoned as general development or its equivalent under shoreland zoning, Title 38, chapter 3, subchapter I, article 2-B, or within areas designated by ordinance as densely developed. The determination of which areas are densely developed must be based on a finding that existing development met the definitional requirements of section 4401, subsection 1, on September 23, 1983;

1.1.12 Ground water. The proposed subdivision will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water.
1.1.13 Flood areas. Based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant whether the subdivision is in a flood-prone area. The project is located in area of minimal flood hazard, Zone X.
1.1.14 Freshwater wetlands. All freshwater wetlands within the proposed subdivision have been identified on any maps submitted as part of the application, regardless of the size of these wetlands: Wetland delineation has been completed by Normandeau and Associates.
1.1.15 River, stream or brook. Any river, stream or brook within or abutting the proposed subdivision has been identified on any maps submitted as part of the application. For purposes of this section, "river, stream or brook" has the same meaning as in Title38, section 480-B, subsection 9. Philips Spring has been identified, and a buffer has been proposed to protect the area around it.
1.1.16 Storm water. The proposed subdivision will provide for adequate storm water management, based on the submitted stormwater management report, pre- and post-development plans prepared by CES, Inc. Steve Bushey, engineer with Gorrill Palmer, has

completed peer review of the proposal, and has offered comments that will be addressed for final plan review.
1.1.17 Spaghetti-lots prohibited. If any lots in the proposed subdivision have shore frontage on a river, stream, brook, great pond or coastal wetland as these features are defined in Title 38, section 480-B.
1.1.18 Lake phosphorus concentration. The long-term cumulative effects of the proposed subdivision will not unreasonably increase a great pond's phosphorus concentration during the construction phase and life of the proposed subdivision.
1.1.19 Impact on adjoining municipality. The proposed subdivision will not cause unreasonable traffic congestion or unsafe conditions with respect to the use of existing public ways in an adjoining municipality.

15. Based on the foregoing, the project meets the standards of approval for the preliminary subdivision plan, as outlined in the City of Saco Subdivision Regulations.

Voted by the Planning Board on June 18, 2019. On behalf of the Saco Planning Board:

Emily Cole-Prescott
City Planner

Saco Planning Board
Spring Hill Industrial Park Expansion (Map 42 Lot 1-2)
Findings of Fact
June 13, 2019

1. All details will conform to City of Saco standards, including but not limited to the City of Saco Zoning Ordinance and Subdivision Regulations.
2. Approval of the preliminary plan is conditioned upon compliance by the applicant with any and all oral commitments regarding the project which were specifically made by the applicant to the Board in the course of its deliberations.
3. This approval is governed by the action taken by the Saco Planning Board for the preliminary subdivision plan.
4. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner for minor changes. The determination of major or minor shall be made by the City Planner.
5. No work shall commence until two mylar sets and three paper sets of the final plans have been received by the Planning Office, signed by the Planning Board and recorded at the York County Registry of Deeds. Proof of recording shall be submitted to the Planning Office.
6. Prior to any construction activities, the applicant and contractor shall meet with the City Engineer and City Planner to review plans, inspection schedules and erosion control practices.
7. All plans and specifications shall be provided on disk in an AutoCAD format. The final plan shall be submitted in digital format as a single composite electronic file. The plan may be submitted on a disc, via e-mail, or other format acceptable to the City Planner, and shall be compatible with commonly used CAD and/or GIS software. See Section 6.2.6 of the Subdivision Regulations for further detail.
8. Stumps generated on-site will be ground and either used on-site for erosion control or will be

hauled off-site. Stumps shall not be buried within areas shown as right of way on the final plan.

9. No filling or alteration of wetlands on individual lots shall be done without the appropriate state or local approvals. The applicant is required to obtain approval from the DEP for site law amendment and NRPA permit for the wetland impacts.
10. Prior to the start of construction, the stream buffer areas shall be marked in the field and copies of the recorded buffer deed restrictions shall be provided to the Planning Department.
11. As part of the project's as-built certification for roadway and utility infrastructure, the applicant shall provide a Stormwater Basin As-Built Certification. Prior to the issuance of a Certificate of Occupancy for any lot, the Applicant shall submit evidence in the form of a letter with as-built survey plan prepared and stamped by a Professional Engineer who either prepared the Post-Construction Stormwater Management Plan and its associated Facilities or supervised the Plan and Facilities construction and implementation. The letter or plan shall certify that the Stormwater Management Facilities have been installed in accordance with the approved Post-Construction Stormwater Management Plan and that they will function as intended by said Plan. The as-built survey plan shall be performed for all post-construction stormwater facilities to document general conformance with the approved plan. The design engineer shall be required to inspect the construction and stabilization of the stormwater structures on the site in accordance with the requirements contained in Chapter 7 of the MDEP's Volume III Stormwater BMP Technical Design Manual. Inspections shall be performed as detailed in the Construction Oversight requirements contained in Section 7.1.4.
12. The applicant shall be required to perform routine inspection and maintenance of the stormwater facilities as outlined in the operations and maintenance manual development specifically for the site. A copy of the annual inspection and maintenance report including inspection log(s) shall be retained by the Public Works Department.
13. The applicant shall address the comments provided by Diane Morabito, PE, per her traffic engineering review memo.
14. The applicant shall address the comments provided by Steve Bushey, PE, per his engineering review memo.
15. The applicant shall coordinate the plan set into one document for final plan review.

With these Conditions and the accompanying Findings of Fact, the Saco Planning Board hereby finds that the applicant has satisfied the requirements set forth in the City of Saco Subdivision Regulations and in the Zoning Ordinance. Approval for the preliminary subdivision plan is hereby granted, contingent on these Conditions of Approval. Voted by the Saco Planning Board on June 18, 2019.

Signed, on behalf of the Planning Board:

Emily Cole Prescott
City Planner

Planning and Development
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Emily Cole-Prescott
City Planner
Eprescott@sacomaine.org
Phone: (207) 282-3487 ext.357

TO:	Planning Board
CC:	John Kuchinski, CES Engineering
FROM:	Emily Cole-Prescott, City Planner
DATE:	June 12, 2019 (June 18, 2019 Planning Board Meeting)
RE:	Map 42 Lot 1-2: Site Plan & Design Review – Saco Public Works Facility

Overview: Applicant, City of Saco, requests the Board's review of site plan and design review for the construction of a new Public Works facility and associated site improvements on Map 42 Lot 1-2. The proposal consists of an approximate 27,000 square feet structure, 6,900 square feet of storage, 6,900 square ft. salt shed, and 1,152 square feet transportation building. The site is to be served by 89 parking spaces, and will include a fuel island with 10,000-gallon diesel and 10,000-gallon gasoline above-ground storage tanks.

Application Completeness: Staff has found the application complete. If the Board agrees, a suggested motion is: ***"I move to find the application for site plan review and design review complete."***

Public Hearing: The Board may receive public comment about this application. A motion is: ***"I move to open the public hearing."*** After comment received, a suggested motion is: ***"I move to continue the public hearing to an upcoming meeting date."***

Departmental Reviews:
- Peer Reviewing Engineer (Gorrill Palmer): Steve Bushey, P.E. has reviewed both the subdivision and site plan application and has provided comments in his memos, included in the meeting packet for the Board's consideration.
- Code Enforcement Department: Richard Lambert responded that the revisions address his previous comments.
- Fire Department: Dave Pendleton has indicated that the Fire Department is aware of the proposal, and has no additional comment at this time.
- Police Department: No formal response has been received by the Police Department.

Discussion: The Board may discuss and ask questions about the proposal. However, because this site plan contemplates the subdivision as part of its plan, the Board cannot make a decision on this application until the decision on the subdivision proposal has been made.

Design Review: The applicant has presented proposed plans of the building and the site, and has submitted a design analysis. See John Kuchinski's letter dated June 12, 2019. This is an opportunity to hear from the applicant's architect about the design of the site, and to ask any questions.

Conclusion: Staff suggests discussing items of the proposal, and continuing the application review to an upcoming meeting date. A suggested motion: ***"I move to continue the application review to an upcoming meeting date."***

CES INC Engineers ◆ Environmental Scientists ◆ Surveyors

May 14, 2019

Emily Cole-Prescott, City Planner
City of Saco
300 Main Street
Saco, Maine 04072

Re: Saco Industrial Park Subdivision Expansion | Subdivision Application

Dear Ms. Cole-Prescott:

On behalf of Saco Department of Public Works, CES, Inc. is submitting three copies of the attached application for Subdivision with supporting documents and plans. The site is located in the Saco Industrial Park. A new subdivision layout consisting of three lots is proposed. Lot one is proposed as a new Department of Public Works facility with associated parking areas and a newly constructed roadway. Stormwater for both the new facility and roadway is controlled by five underdrained grassed soil filters and two gravel wetlands to provide quantity control and quality treatment.

The following is included in this application:

- Cover Letter.
- Signed Application Form.
- Subdivision Waiver Request.
- Medium Intensity Soils Map.
- FEMA Flood Map.
- Stormwater Quality and Quantity Management Plan and Calculations.
- Maintenance of Stormwater Management System Plan.
- Erosion and Sedimentation Control Plan.

The Site Plans include site layout, grading, drainage and stormwater management, utilities, and typical construction details. A pre-development and post-development stormwater management plan is also provided.

Please contact us if you have any questions or need additional information.

Sincerely,
CES, Inc.

John D. Kuchinski, P.E.
Senior Project Engineer

JDK/dmm/gdr
Encl.

Sensible Solutions | www.cesincusa.com

146 Main Street
Suite 300
Saco, Maine 04072
T 207.283.9151
F 207.283.9136

Account Number_____

Fee_____

Received by_____

Date_____

SACO PLANNING BOARD
300 Main Street
Saco, Maine 04072

APPLICATION FORM FOR:

( ) Sketch Plan, Subdivision

(X) Preliminary Plan Subdivision

( ) Final Plan Subdivision

This application shall conform in all respects to the City of Saco Subdivision Regulations. It shall be accompanied by twelve (12) copies of the Plan and all submissions.

A. INFORMATION ON SUBDIVISION

1. Proposed name of subdivision, Spring Hill Industrial Park Expansion
2. Number of lots/units. 3
3. Does the applicant propose to dedicate to the public all streets and open space shown on the plan? Yes
4. State number of acres which applicant proposes to dedicate to public usage for recreational or open space: NA
5. Does owner intend to request any waivers of the requirements of the Subdivision Regulations of this Board upon the submission of the Final Plan for approval? Yes.
6. If any waivers of requirements are to be requested, list them and give reasons why such requirements should be waived: See attached waiver request

B. APPLICANT INFORMATION

OWNER'S NAME City of Saco

Address 50 Moody Street, Saco Maine 04072

Telephone and Fax Numbers 300 Main Street, Saco Maine 04072

E-mail Address ksutherland @ sacomaine.org

APPLICANT'S NAME City of Saco

Address 300 Main Street, Saco Maine 04072

Telephone and Fax Numbers (207) 282 4191

E-mail Address ksutherland @ sacomaine.org

ARCHITECT/ENGINEER'S NAME John D. Kuchinski, PE CES, Inc.

Address 146 Main Street, Suite 300, Saco, ME 04072

Telephone and Fax Numbers tel: (207) 283-9151 fax: (207) 283-9156

E-mail Address jkuchinski @ cesincusa.com

1. If Applicant is a Corporation, state whether the Corporation is licensed to do business in Maine_____YES_____NO and attach a copy of Secretary of State's Registration. N/A
2. What interest does the Applicant have in the parcel to be subdivided (Option, land purchase contract, record ownership, etc.)? record ownership

C. INFORMATION ON PARCEL TO BE SUBDIVIDED

I. Location of property: Book Lot
(from York County Register of Deeds) (Deed Reference)

2. Location of property: Map 42 Lot 1-2
(from Assessor's Office)

3. Street Address: Spring Hill Road

4. Present use of land: vacant

5. Current zoning of property: B8 (entrance road is in I1)

6. Acreage of parcel to be subdivided: 42.0 acres

7. Indicate the nature of any restrictive covenants to be placed on the deeds:___ _

Extension of the existing Spring Hill Industrial Park covenants and the following: "Any subsequent sale, lease, assignment, or license for use of the Premises (whether as one lot, two lots, or any future portion thereof) must be to a purchaser, tenant, assignee, licensee, or the like, who shall not use any portion of the Premises in a fashion which violates any State or Federal law in effect as of the Closing Date. Further, notwithstanding the legality of the same, no such purchaser, tenant, assignee, licensee, or the like shall use of the Premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative."

A complete statement of any easements relating to the property is attached. If none, please state. A drainage easement along Lot 2 and a 70 Ft. right of way easement to benefit Sweetser as shown on the Subdivision Plan.

8. Does applicant have an interest in abutting property? If none, please state.
none

10. Does the Preliminary Plan cover the entire contiguous holdings of the Applicant?_
Yes

NOTE: All plans submitted for review should contain all required information outlined in the City of Saco Subdivision Regulations, or a waiver request for specific items and reasons why specific items should be waived.

NOTE: Complete this form and return it with the required documents and twelve (12) drawings of the plan.

To the best of my knowledge, all information submitted on this application is true and correct.

Signed _____

APPLICANT

Date- 5/13/2019

The Planning Board normally meets the first and third Tuesdays of the month. Applicants must submit materials THREE WEEKS prior to the scheduled meeting for placement on the Board's agenda. If application and submission materials are not complete, placement on an agenda may be delayed.

Applications are placed on the Planning Board's agenda at the conclusion of staff review only.

FEE: a $25.00 non-refundable fee must be deposited with all applications. The required deposit is $1,000 plus $175.00 per lot on an existing street, or $1,500 plus $175.00 per lot on a proposed street, as determined by the City Planner. A copy of the Cost Recovery Ordinance is attached.

After recording return to:
Charles M. Katz-Leavy, Esq.
Jensen Baird Gardner and Henry
10 Free Street, P.O. Box 4510
Portland, Maine 04112

DLN: 1001940056723

---------- (Space Above This Line For Recording Data) ----------

QUITCLAIM DEED WITH COVENANT

KNOW ALL PERSONS BY THESE PRESENTS, that **SWEETSER** (f/k/a Sweetser Corporation), a Maine nonprofit corporation, with offices at 50 Moody Street, Saco, Maine FOR CONSIDERATION PAID, hereby grants to **THE CITY OF SACO**, a municipal body having offices at 300 Main Street, Saco, Maine, with Quitclaim Covenants, a certain lot or parcel of land, together with any improvements thereon and all rights appurtenant thereto, and being more particularly described as follows:

SEE EXHIBIT A ATTACHED HERETO AND
INCORPORATED HEREIN BY REFERENCE

IN WITNESS WHEREOF, Sweetser has caused this instrument to be executed by Debra Taylor, its President & CEO thereunto duly authorized as of this 9 day of May, 2019

SWEETSER

WITNESS

By: Debra Taylor
Debra Taylor, its President & CEO
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Debra Taylor, as President & CEO of Sweetser, and acknowledged the foregoing instrument to be her free act and deed duly authorized in said capacity.

Before me,

Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

IN WITNESS WHEREOF, as an express acceptance of certain restrictions and requirements in this deed, the City of Saco has caused this instrument to be executed by Kevin L. Sutherland, as City Administrator, thereunto duly authorized as of this 9th day of May, 2019.

WITNESS

THE CITY OF SACO

By: _____
Kevin L. Sutherland, City Administrator
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Kevin L. Sutherland, as City Administrator of the City of Saco, and acknowledged the foregoing instrument to be his free act and deed duly authorized in said capacity.

Before me,

_____
Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

EXHIBIT A
(26.3312 acres)

A certain lot or parcel of land located southeasterly of, but not adjacent to, Industrial Park Road, and southwesterly of, but not adjacent to, Spring Hill Road, situated in the City of Saco, County of York and State of Maine, bounded and described as follows:

Beginning at an iron rod with surveyor's cap #239 found driven into the ground on the southwesterly side of land described in the deed to Cormier Land Co., Inc. dated May 9, 1996 and recorded at the York County Registry of Deeds in Book 7824, Page 349; said iron rod with surveyor's cap #239 marking the northerly corner of Parcel VIII described in the deed to Cormier Land Co. dated May 9, 1996 and recorded at said Registry in Book 7825, Page 23; Reference is made to a "Plan Showing a Standard Boundary Survey Made for Cormier Land Co." dated December 11, 1997 by Dow & Coulombe, Inc. and recorded at said Registry in Plan Book 241, Page 44;

Thence, from said point of beginning, South 36°-00'-15" West, by said Cormier Land Co. land, a distance of 680.77 feet to an iron rod with surveyor's cap #239 found driven into the ground;

Thence, South 89°-50'-25" West, by remaining land of this grantor, a distance of 1320.96 feet;

Thence, North 54°-08'-30" West, by said remaining land of this grantor, a distance of 464.88 feet to land described in the deed to A. Duie Pyle, Inc. dated July 27, 2018 and recorded at said Registry in Book 17767, Page 634;

Thence, North 35°-51'-30" East, by said A. Duie Pyle, Inc. land, a distance of 270.99 feet to an iron pipe found driven into the ground;

Thence, North 35°-39'-50" East, by said A. Duie Pyle, Inc. land, a distance of 45.50 feet;

Thence, by land described in another deed given, or to be given, from this grantor to this grantee, by the following (6) lines:

South 54°-17'-50" East, a distance of 14.40 feet;

Thence, southeasterly, by a circular curve deflecting to the left having a radius of 395.00 feet, an arc distance of 113.99 feet (a chord between the two last described points bears South 62°-33'-50" East, a distance of 113.60 feet);

Thence, South 70°-49'-55" East, a distance of 206.81 feet;

Thence, easterly, northeasterly, and northerly, by a circular curve deflecting to the left having a radius of 555.00 feet, an arc distance of 1093.91 feet (a chord between the two last described points bears North 52°-42'-10" East, a distance of 925.24 feet);

Thence, North 03°-45'-45" West, a distance of 237.02 feet;

Thence, northerly, by a circular curve deflecting to the right having a radius of 465.00 feet, an arc distance of 4.75 feet (a chord between the two last described points bears North 03°-28'-10" West, a distance of 4.75 feet);

Thence, South 53°-29'-15" East, by the herein first named Cormier Land Co., Inc. land, a distance of 449.23 feet to a field stone found set in the ground witnessed by an iron pipe;

Thence, South 53°-59'-35" East, by said Cormier Land Co., Inc. land, a distance of 647.17 feet to the point of beginning.

Containing 26.3312 acres.

Meaning and intending to describe a portion of the second parcel of land described in the deed to this grantor dated April 28, 1958 and recorded at said Registry in Book 1378, Page 245, together with a portion of land described in the deed to this grantor dated October 26, 1959 and recorded at said Registry in Book 1418, Page 56.

The bearings used in this description refer to the Maine Coordinate Grid System, West Zone (NAD 1983) as calculated from bearings shown on a plan entitled "ALTA-NSPS Land Title Survey of 85 Industrial Park Road, Saco, Maine Prepared for A. Duie Pyle, Inc.", latest revision dated July 17, 2018 by Sebago Technics, and recorded at said Registry in Plan Book 396, Pages 23 and 24.

Together with appurtenant easements described in the following instruments: (i) granted in a deed from Linda Valentina to Sweetser, dated August 28, 1981 and recorded in said Registry of Deeds in Book 2843, Page 1, (ii) reserved in a deed from Sweetser to Kenneth D. Cormier and Andre Dallaire, dated October 15, 1984 and recorded at said Registry of Deeds in Book 3401, Page 124, and (iii) reserved in a deed from Sweetser to Maine Play Amusements, Inc., dated September 20, 1989 and recorded at said Registry of Deeds in Book 5189, Page 256.

Subject to restrictions, covenants, and conditions regarding the ten-foot right of way and easement reserved in a deed from Sweetser to Kenneth D. Cormier and Andre Dallaire dated October 15, 1984 and recorded said Registry in Book 3401, Page 124.

Subject to restrictions, covenants and conditions regarding the rights of way and easements reserved in a deed from Sweetser to Maine Play Amusements, Inc., dated September 20, 1989 and recorded in the said Registry in Book 5189, Page 256.

Subject to, and benefiting from, such state of facts as shown on plans entitled "Plan Showing a Standard Boundary Survey made for Sweetser Children's Services, Parcel located at Moody Street and Industrial Park Road" by Down & Coulombe, Inc., dated June, 7, 1999 and revised May 5, 2003, recorded in said Registry in Plan Book 281, Pages 10-11.

Subject to, and benefiting from, such state of facts as shown on an unrecorded plan entitled "Plan Showing a Standard Boundary Survey made for Sweetser Children's Services, Parcel located at Moody Street and Industrial Park Road" by Down & Coulombe, Inc., dated June 7, 1999 and revised through August 28, 2013, including but not limited to the location of the Woods Road as shown thereon.

Subject to, and benefiting from, such state of facts as shown on a plan entitled "Plan Showing A Standard Boundary Survey Made For Cormier Land Co." of Saco, Maine, prepared by Down & Coulombe, Inc., dated December 11, 1997, and recorded in said Registry in Plan Book 241, Page 44.

Subject to the express restriction that grantee, its successors and assigns, shall not use any portion of the premises in a fashion which violates any State or Federal law in effect as of the date of this Deed, including, without limitation, use of the premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative. It is the express intent of the parties to preclude use of the premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative, even if such uses cease to be illegal hereafter. This restriction shall run with the land in perpetuity.

Subject to a restriction on removing trees or brush within twenty-five (25) feet of any boundary along the remaining land of Grantor, measured perpendicularly therefrom, with the exception of any opening in said buffer for an access road between grantee's lot and grantors lot. This restriction shall run with the land in perpetuity.

Reference is made to "Exhibit 1-Plan Showing Proposed Conveyances of Land, Sweetser to The City of Saco, Maine", dated December 20, 2018, by Dow & Coulombe, Inc.

Reference is made to a "Final Plan Sowing Sweetser Saco Subdivision prepared for Sweetser, 50 Moody Street, Saco, ME 04072" by Down & Coulombe, Inc., as approved by the City of Saco Planning Board on May 7, 2019, a copy of which is to be recorded in the York County Registry of Deeds.

After recording return to:
Charles M. Katz-Leavy, Esq.
Jensen Baird Gardner and Henry
10 Free Street, P.O. Box 4510
Portland, Maine 04112

DLN: 1001940056725

---------- (Space Above This Line For Recording Data) ----------

QUITCLAIM DEED WITH COVENANT

KNOW ALL PERSONS BY THESE PRESENTS, that **SWEETSER** (f/k/a Sweetser Corporation), a Maine nonprofit corporation, with offices at 50 Moody Street, Saco, Maine FOR CONSIDERATION PAID, hereby grants to **THE CITY OF SACO**, a municipal body having offices at 300 Main Street, Saco, Maine, with Quitclaim Covenants, a certain lot or parcel of land, together with any improvements thereon and all rights appurtenant thereto, and being more particularly described as follows:

SEE EXHIBIT A ATTACHED HERETO AND
INCORPORATED HEREIN BY REFERENCE

IN WITNESS WHEREOF, Sweetser has caused this instrument to be executed by Debra Taylor, its President & CEO thereunto duly authorized as of this 9th day of May, 2019

SWEETSER

WITNESS

By: Debra Taylor
Debra Taylor, its President & CEO
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Debra Taylor, as President & CEO of Sweetser, and acknowledged the foregoing instrument to be her free act and deed duly authorized in said capacity.

Before me,

Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

IN WITNESS WHEREOF, as an express acceptance of certain restrictions and requirements in this deed, the City of Saco has caused this instrument to be executed by Kevin L. Sutherland, as City Administrator, thereunto duly authorized as of this 9th day of May, 2019.

WITNESS

THE CITY OF SACO

By: _____
Kevin L. Sutherland, City Administrator
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Kevin L. Sutherland, as City Administrator of the City of Saco, and acknowledged the foregoing instrument to be his free act and deed duly authorized in said capacity.

Before me,

_____
Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

EXHIBIT A
(15.6688 acres)

A certain lot or parcel of land located southeasterly of, but not adjacent to, Industrial Park Road, and southwesterly of, but not adjacent to, Spring Hill Road, situated in the City of Saco, County of York and State of Maine, bounded and described as follows:

Beginning at the southeasterly corner of land described in the deed to Brockway-Smith Company dated November 12, 2002 and recorded at the York County Registry of Deeds in Book 12164, Page 204 and shown on a "Plan Showing a Standard Boundary Survey and Topographic Survey Made for Linda M. Valentino" dated April 19, 2000, as revised November 4, 2002 by Dow & Coulombe, Inc., and recorded at said Registry in Plan Book 276, Page 4; said point of beginning also being a westerly or southwesterly corner of land described in the deed to Cormier Land Co., Inc. dated May 9, 1996 and recorded at said Registry in Book 7824, Page 349 and shown on a "Plan Showing a Standard Boundary Survey Made for Cormier Land Co." dated December 11, 1997 by Dow & Coulombe, Inc. and recorded at said Registry in Plan Book 241, Page 44;

Thence, from said point of beginning, South 53°-29'-15" East, by said Cormier Land Co., Inc. land, a distance of 2.32 feet;

Thence, by land described in another deed given, or to be given, from this grantor to this grantee, by the following (6) lines:

Southerly, by a circular curve deflecting to the left having a radius of 465.00 feet, an arc distance of 4.75 feet (a chord between the two last described points bears South 03°-28'-10" East, a distance of 4.75 feet);

Thence, South 03°-45'-45" East, a distance of 237.02 feet;

Thence, southerly, southwesterly and westerly, by a circular curve deflecting to the right having a radius of 555.00 feet, an arc distance of 1093.91 feet (a chord between the two last described points bears South 52°-42'-10" West, a distance of 925.24 feet);

Thence, North 70°-49'-55" West, a distance of 206.81 feet;

Thence, northwesterly, by a circular curve deflecting to the right having a radius of 395.00 feet, an arc distance of 113.99 feet (a chord between the two last described points bears North 62°-33'-50" West, a distance of 113.60 feet);

Thence, North 54°-17'-50" West, a distance of 14.40 feet to land described in the deed to A. Duie Pyle, Inc. dated July 27, 2018 and recorded at said Registry in Book 17767, Page 634;

Thence, North 35°-39'-50" East, partly by said A. Duie Pyle, Inc. land, and partly by said Brockway-Smith Company land, a distance of 758.58 feet to a field stone found set in the ground;

Thence, by said Brockway-Smith Company land, by the following (3) described lines:

North 35°-40'-00" East, a distance of 395.27 feet to a spike found set at the base of a found leaning iron pipe;

Thence, South 53°-09'-40" East, a distance of 163.37 feet to a drill hole found set in a field stone found set in the ground;

Thence, South 53°-29'-15" East, a distance of 277.10 feet to the point of beginning.

Containing 15.6688 acres.

Meaning and intending to describe a portion of the second parcel of land described in the deed to this grantor dated April 28, 1958 and recorded at said Registry in Book 1378, Page 245, together with a portion of land described in the deed to this grantor dated October 26, 1959 and recorded at said Registry in Book 1418, Page 56.

The bearings used in this description refer to the Maine Coordinate Grid System, West Zone (NAD 1983) as calculated from bearings shown on a plan entitled "ALTA-NSPS Land Title Survey of 85 Industrial Park Road, Saco, Maine Prepared for A. Duie Pyle, Inc.", latest revision dated July 17, 2018 by Sebago Technics, and recorded at said Registry in Plan Book 396, Pages 23 and 24.

Together with appurtenant easements described in the following instruments: (i) granted in a deed from Linda Valentina to Sweetser, dated August 28, 1981 and recorded in said Registry of Deeds in Book 2843, Page 1, (ii) reserved in a deed from Sweetser to Kenneth D. Cormier and Andre Dallaire, dated October 15, 1984 and recorded at said Registry of Deeds in Book 3401, Page 124, and (iii) reserved in a deed from Sweetser to Maine Play Amusements, Inc., dated September 20, 1989 and recorded at said Registry of Deeds in Book 5189, Page 256.

Subject to restrictions, covenants, and conditions regarding the ten-foot right of way and easement reserved in a deed from Sweetser to Kenneth D. Cormier and Andre Dallaire dated October 15, 1984 and recorded said Registry in Book 3401, Page 124.

Subject to restrictions, covenants and conditions regarding the rights of way and easements reserved in a deed from Sweetser to Maine Play Amusements, Inc., dated September 20, 1989 and recorded in the said Registry in Book 5189, Page 256.

Subject to, and benefiting from, such state of facts as shown on plans entitled "Plan Showing a Standard Boundary Survey made for Sweetser Children's Services, Parcel located at Moody Street and Industrial Park Road" by Down & Coulombe, Inc., dated June, 7, 1999 and revised May 5, 2003, recorded in said Registry in Plan Book 281, Pages 10-11.

Subject to, and benefiting from, such state of facts as shown on an unrecorded plan entitled "Plan Showing a Standard Boundary Survey made for Sweetser Children's Services, Parcel located at Moody Street and Industrial Park Road" by Down & Coulombe, Inc., dated June 7, 1999 and revised through August 28, 2013, including but not limited to the location of the Woods Road as shown thereon.

Subject to, and benefiting from, such state of facts as shown on a plan entitled "Plan Showing A Standard Boundary Survey Made For Cormier Land Co." of Saco, Maine, prepared by Down & Coulombe, Inc., dated December 11, 1997, and recorded in said Registry in Plan Book 241, Page 44.

Subject to the express restriction that grantee, its successors and assigns, shall not use any portion of the premises in a fashion which violates any State or Federal law in effect as of the date of this Deed, including, without limitation, use of the premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative. It is the express intent of the parties to preclude use of the premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative, even if such uses cease to be illegal hereafter. This restriction shall run with the land in perpetuity.

Subject to a restriction on removing trees or brush within twenty-five (25) feet of any boundary along the remaining land of Grantor, measured perpendicularly therefrom, with the exception of any opening in said buffer for an access road between grantee's lot and grantors lot. This restriction shall run with the land in perpetuity.

Reference is made to "Exhibit 1-Plan Showing Proposed Conveyances of Land, Sweetser to The City of Saco, Maine", dated December 20, 2018, by Dow & Coulombe, Inc.

Reference is made to a "Final Plan Sowing Sweetser Saco Subdivision prepared for Sweetser, 50 Moody Street, Saco, ME 04072" by Down & Coulombe, Inc., as approved by the City of Saco Planning Board on May 7, 2019, a copy of which is to be recorded in the York County Registry of Deeds.

After recording return to:

Jason G. Howe, Esq.
Bergen & Parkinson, LLC
62 Portland Rd., Suite 25
Kennebunk, ME 04043

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ACCESS EASEMENT DEED

KNOW ALL PERSONS BY THESE PRESENTS, that **THE CITY OF SACO**, a municipal body having offices at 300 Main Street, Saco, Maine ("Grantor"), FOR CONSIDERATION PAID, hereby Grants to **SWEETSER**, a Maine nonprofit corporation, with offices at 50 Moody Street, Saco, Maine ("Grantee"), with Quitclaim Covenants, a perpetual easement over and across a certain lot or parcel of land Grantor herein by virtue of two deeds of near or even date herewith, all situated in the City of Saco, County of York, State of Maine, said easement area being approximately shown as "Proposed 70' Wide Easement to Spring Hill Road" in Exhibit A hereto, which is incorporated herein by reference (all collectively "Easement"); provided, however, that Grantor shall have the right to make reasonable adjustments to the location of the Easement, provided such adjustments preserve safe, convenient and usable access for vehicle traffic to the land of Grantee.

Grantee's use of the Easement shall be for ingress and egress, on foot, by vehicle, or any other means whatsoever, including, without limitation, use for removal of logging and tree harvests, construction vehicles, and the like.

The above described and conveyed easement shall be nonexclusive, and Grantor may undertake such improvements or modifications as to make some or all of the Easement a public way, in which case, this Easement shall survive over any area not accepted as a public way.

The Grantor, its successors and assigns reserve the sole right to improve and develop the easement at its sole expense. There shall be no restrictions on the use of the easement by the Grantor, its successors or assigns, provided the same does not interfere with the Grantee's reasonable use thereof.

Grantee shall maintain a policy of general liability insurance in an amount reasonably acceptable to Grantor and shall indemnify and hold Grantor and its successors and assigns, harmless from any and all claims, actions, causes of action, losses, expenses (including reasonable attorney's fees), damages, and any and all other liabilities of any character whatsoever arising out of any act and/or omission of Grantee or its agents, representatives or employees occurring, arising or resulting from Grantee's activity on Grantor's Property or the Easement Area unless caused by the willful misconduct or gross negligence of Grantor. Nothing in the indemnification and liability insurance requirements of this Section shall be deemed a waiver of any claims of immunity or other defenses that may be available to Grantor under the Maine Tort Claims Act pursuant to the provisions of 14 MRSA Section 8101 et seq. or any other privileges or immunities as may be provided by law.

IN WITNESS WHEREOF, the City of Saco has caused this instrument to be executed by Kevin L. Sutherland, as City Administrator, thereunto duly authorized as of this 9th day of May, 2019

WITNESS

THE
CITY OF SACO

By: _____
Kevin L. Sutherland, City Administrator
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Kevin L. Sutherland, as City Administraor of the City of Saco, and acknowledged the foregoing instrument to be his free act and deed duly authorized in said capacity.

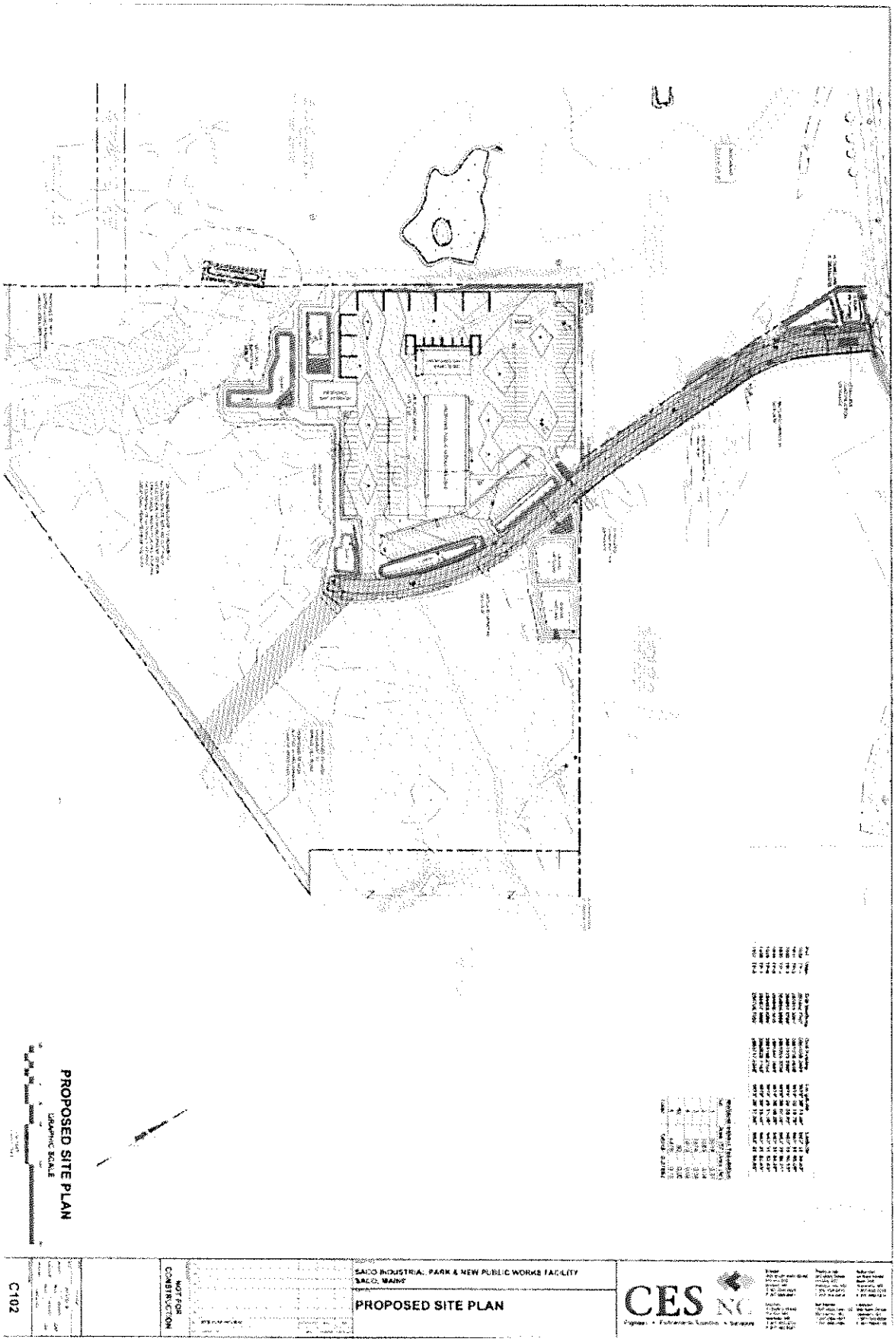
Before me,

_____
Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

(*Exhibit A Appears Below*)

EXHIBIT A


PROPOSED SITE PLAN
GRAPHIC SCALE
C102
NOT FOR CONSTRUCTION
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE
PROPOSED SITE PLAN
CES NC

After recording return to:

Jason G. Howe, Esq.
Bergen & Parkinson, LLC
62 Portland Rd., Suite 25
Kennebunk, ME 04043

---------- (Space Above This Line For Recording Data) ----------

UTILITY EASEMENT DEED

KNOW ALL PERSONS BY THESE PRESENTS, that **THE CITY OF SACO**, a municipal body having offices at 300 Main Street, Saco, Maine ("Grantor"), FOR CONSIDERATION PAID, hereby Grants to **SWEETSER**, a Maine nonprofit corporation, with offices at 50 Moody Street, Saco, Maine ("Grantee"), with Quitclaim Covenants, a perpetual utility easement (the "Easement"), subject to and benefitted by the Easement Rights set forth hereinbelow, over and across a certain lot or parcel of land of Grantor herein by virtue of two deeds of near or even date herewith, all situated in the City of Saco, County of York, State of Maine, said easement area being approximately as shown as "Proposed 70' Wide Easement to Spring Hill Road" in Exhibit A hereto, which is incorporated herein by reference (all collectively "Easement"); provided, however, that Grantor shall have the right to make reasonable adjustments to the location of the Easement, provided such adjustments preserve convenient and usable use by Grantee.

Easement Rights: The Easement is perpetual, and shall run with the land of Grantor, for the benefit of the parcels of Grantee, its successors and assigns, for purposes of erecting, burying, constructing, maintaining, repairing, rebuilding, replacing, operating, all power, telephone, sewer, water, and other such lines, pipes, and conduits, together with certain infrastructure, including by way of example and not limitation, poles, towers, pipes, duct-banks, together withal necessary fixtures, anchors, guys, cross arms, and other equipment and appurtenances, and for all and any Utility Services defined in 33 M.R.S.A § 458, and shall further include the right of Grantee to cut trees and to clear and keep clear said Easement area of all trees, timber, and bushes growing on said Easement by such means as the Grantee reasonably deems necessary, and further to enter on adjacent land of Grantor for the purpose of cutting or trimming and removing such trees or vegetation growing outside the limits of said Easement, which, in falling, would interfere with or endanger the operation and maintenance of the utilities within the Easement (all collectively the "Easement Rights").

Grantee shall maintain a policy of general liability insurance in an amount reasonably acceptable to Grantor and shall indemnify and hold Grantor and its successors and assigns, harmless from any and all claims, actions, causes of action, losses, expenses (including reasonable attorney's fees), damages, and any and all other liabilities of any character whatsoever arising out of any act and/or omission of Grantee or its agents, representatives or employees occurring, arising or resulting from Grantee's activity on Grantor's Property or the Easement Area unless caused by the willful misconduct or gross negligence of Grantor. Nothing in the indemnification and liability

insurance requirements of this Section shall be deemed a waiver of any claims of immunity or other defenses that may be available to Grantor under the Maine Tort Claims Act pursuant to the provisions of 14 MRSA Section 8101 et seq. or any other privileges or immunities as may be provided by law.

IN WITNESS WHEREOF, the City of Saco has caused this instrument to be executed by Kevin L. Sutherland, as City Administrator, thereunto duly authorized as of this 9th day of May, 2019

WITNESS

THE
CITY OF SACO

By: _____
Kevin L. Sutherland, City Administrator
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Kevin L. Sutherland, as City Administrator of the City of Saco, and acknowledged the foregoing instrument to be his free act and deed duly authorized in said capacity.

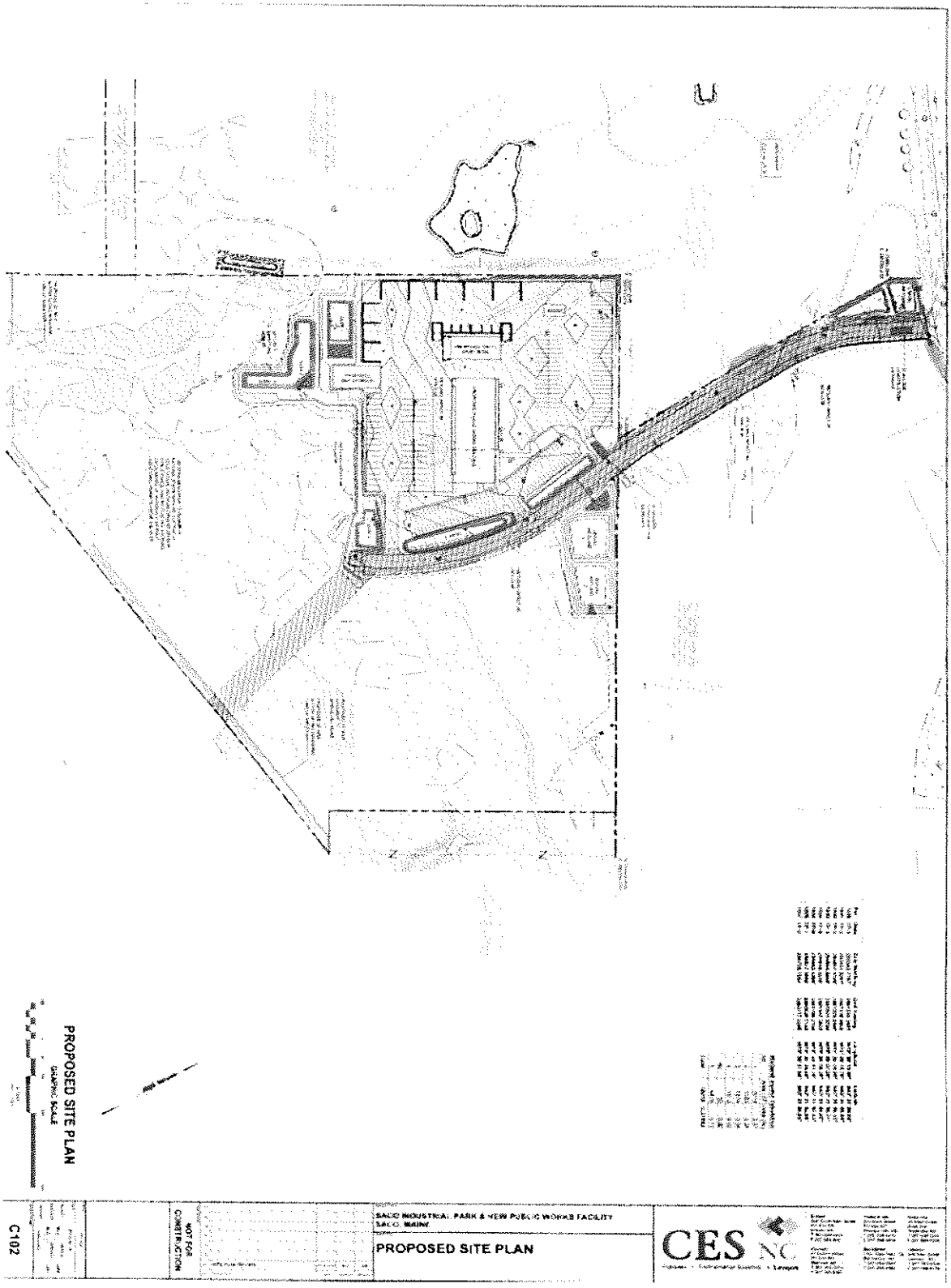
Before me,

_____
Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

(*Exhibit A Appears Below*)

EXHIBIT A


PROPOSED SITE PLAN
GRAPHIC SCALE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE
PROPOSED SITE PLAN
NOT FOR CONSTRUCTION
C102
CES NC

SUBDIVISION WAIVER REQUEST

The proposed Spring Hill Industrial Park Expansion has been designed similar to the original industrial park that was approved in 1998. The Applicant is requesting waivers from the City of Saco Subdivision Regulations that were similarly approved by the Saco Planning Board as part of the original industrial park. A summary of the requested waivers is provided below:

10.11.5.9 Dead Ends:
The Applicant is requesting a waiver from Section 10.11.5.9 for the maximum length of dead end street limit of 1,000 feet. The proposed road will initially only serve the DPW facility and two additional commercial lots. The roadway has been designed to a future extension that will connect back to Industrial Park Drive through a right-of-way granted to the City from A. Duie Pyle. We further request a waiver for the temporary cul-de-sac. The access drives at the DPW site allow sufficient turn around area for vehicles, including larger vehicles, such as semi-trailer trucks, and fire department equipment.

The Applicant discussed this issue with the Planning Board during a workshop during November of last year. During that workshop, the Board expressed no concerns with the design and permitting documents proceeding with the access road length as currently proposed.

10.15.2 Underground Utilities:
The Applicant is requesting a waiver from Section 10.15.2 for underground utilities. The proposed subdivision is extending existing overhead three phase electric, cable, and telephone utilities similar to that present throughout the existing industrial park.

10.21 Street Trees:
The Applicant is requesting a waiver for street trees along the new road. The subdivision is an industrial subdivision and is an expansion of the Spring Hill Industrial Park. Neither the existing Industrial Park Road nor Spring Hill Road contain street trees.

11.9.1 Vertical Granite Curb:
The Applicant is requesting a waiver Section 11.9.1 for vertical granite curb. Most of the road uses roadside ditches to capture and direct stormwater runoff. We request a waiver to substitute slipform concrete curbing where needed to control stormwater instead of vertical granite curb. The use if slip form curb has been used by the City on most new roadway construction projects.

11.11 and 11.17 Sidewalks and Esplanade:
The Applicant is requesting a waiver from Sections 11.11 and 11.17 for 5-foot sidewalks and 5-foot esplanades. Spring Hill Road does not have sidewalks. Due to the industrial nature of the use, pedestrian traffic is not anticipated along the proposed road.

CES INC

SACO DEPARTMENT OF PUBLIC WORKS
INDUSTRIAL PARK, SACO, MAINE

STORMWATER QUALITY AND QUANTITY MANAGEMENT

A. NARRATIVE

The Stormwater Management Plan for Saco Department of Public Works complies with the requirements of the City of Saco Code, sections 230-805 and 230-1104, and the Maine Department of Environmental Protection (MDEP) Chapter 500 regulations. This development encompasses approximately 13.7 acres of developed area for the construction of 8.79 acres of impervious area. The proposed development includes a new Public Works garage and office area, a transportation department building, a 60 foot by 115 foot salt storage shed, and a dry storage shed. The development will also consist of the construction of a 1,600 linear foot roadway with a 70 foot right of way. The stormwater will be treated by five grassed under drained soil filters and two gravel wetlands that will provide quantity control and quality treatment for both the roadway and the site.

Erosion control measures will be in place prior to the start of any construction. Temporary and permanent measures will be installed in accordance with the Erosion Control Plan included with this application. Upon completion of the construction and stabilization of all disturbed areas, the temporary erosion control measures will be removed.

B. STORMWATER QUALITY MANAGEMENT

The development will involve the installation of approximately 382,892 SF of new impervious area. Stormwater from the parking lots will be conveyed through catch basins to new grass under drained soil filters. Stormwater on the east side of the office buildings, in the parking areas, driveway, and roadway will sheet off into a stone pre-treatment strip before entering new grass under drained soil filters. As a result of these improvements, the project is required to comply with section 230-805 of the City of Saco Zoning Ordinance, chapter 500 of the MDEP's Stormwater Management Rules, and the Maine Stormwater Best Management Practices Manual. According to MDEP Chapter 500 regulations, 95% of proposed impervious surfaces and 80% of the developed area must be treated.

To treat stormwater associated with the proposed development, Saco DPW is proposing the construction of five grassed under drained soil filters (GUSF) and two gravel wetlands to meet stormwater quality standards. The locations of these BMP's are shown on the site plan.

The following table summarizes the impervious and developed area that will be treated by the grass underdrained soil filters and gravel wetlands.

STORMWATER TREATMENT SYSTEMS

PROPOSED ROAD

Subarea	New Impervious Area (SF)	New Landscape Area (SF)	Impervious Area Treated (SF)	Landscape Area Treated	Best Management Practice
1	11,378*	30,044	11,378	30,044	Gravel Wetland
2	4,280	5,220	0	0	None
3	14,375	3,920	14,375	3,920	Gravel Wetland
10	521	1,376	0	0	None
11	0	0	0	0	None
12	3,015	3,622	0	0	None
13	18,731*	42,253	18,731	42,253	Gravel Wetland
Total	**52,300**	**86,435**	**44,484**	**76,217**	

% Impervious Treated = 85.05%

% Developed Treated = 87.00%

* Impervious area includes gravel wetland

PROPOSED DPW SITE

Subarea	New Impervious Area (SF)	New Landscape Area (SF)	Impervious Area Treated (SF)	Landscape Area Treated	Best Management Practice
4	132,422	26,572	132,422	0	Gravel Wetland
5	21,562	14,561	21,562	14,561	Gravel Wetland
6	25,841	22,050	25,841	22,050	Grass Underdrained Soil Filter
7	107,911	16,246	107,664	15,912	Grass Underdrained Soil Filter
8	50,511	16,901	50,511	16,901	Grass Underdrained Soil Filter
9	7,890	14,186	7,890	14,186	Grass Underdrained Soil Filter
Total	**346,137**	**110,516**	**345,890**	**83,610**	

% Impervious Treated = 99.92%

% Developed Treated = 94.05%

SIZING CALCULATIONS			
Gravel Wetland 1:			
Impervious Area:	30,033	SF	
Landscape Area:	39,184	SF	
SF x 1" =	2,503	CF	
SF x 0.4" =	1,306	CF	
	3,809	CF of required storage	
	7,112	CF Provided (@ 1' of storage)	
Gravel Wetland 2:			
Impervious Area:	153,984	SF	
Landscape Area:	41,133	SF	
SF x 1" =	12,832	CF	
SF x 0.4" =	1,371	CF	
	14,203	CF of required storage	
	14,417	CF Provided (@ 1.5' of storage)	
GUSF 1:			
Impervious Area:	50,511	SF	
Landscape Area:	16,901	SF	
SF x 1" =	4,209	CF	
SF x 0.4" =	563	CF	
	4,773	CF of required storage	
	5,317	CF Provided (@ 1.5' of storage)	
GUSF 2/3:			
Impervious Area:	107,911	SF	
Landscape Area:	16,246	SF	
SF x 1" =	8,993	CF	
SF x 0.4" =	542	CF	
	9,534	CF of required storage	
	10,828	CF Provided (@ 1.5' of storage)	
GUSF 5:			
Impervious Area:	25,841	SF	
Landscape Area:	22,050	SF	
SF x 1" =	2,153	CF	
SF x 0.4" =	735	CF	
	2,888	CF of required storage	
	9,955	CF Provided (@ 1.5' of storage)	
GUSF 6:			
Impervious Area:	7,890	SF	
Landscape Area:	14,186	SF	
SF x 1" =	657	CF	
SF x 0.4" =	473	CF	
	1,130	CF of required storage	
	5,449	CF Provided (@ 1.5' of storage)	

C. STORMWATER QUANTITY MANAGEMENT

As previously stated, the project is required to meet the flooding standard under Chapter 500 Section 4.E(2)(a). To meet the flooding standard, HydroCAD calculations were performed to compare pre-development and post-development conditions to determine curve numbers and peak runoff flows.

The pre-development site is mostly wooded for the purpose of these calculations. There has been some recent timber harvesting on site. Soils on the site per the USDA Web Soil Survey are predominately classified as Adams and Croghan, type 'A', and Naumberg type 'A/D'. Most of the site development drains towards Innis Brook, a tributary to Goosefare Brook. A portion of the new road from Spring Hill Road to the northerly edge of the DPW site drains to Mill Brook.

Based on the results of the HydroCAD, it is expected that stormwater runoff from the site will be similar or lessened in post-development conditions as in pre-development conditions. Overall, it is expected that runoff from the site will be similar to pre-development conditions and a similar stormwater runoff will be realized. A comparison of each of the watershed areas in both Pre- and Post-Development is organized in the table below.

		2 Year (cfs)	10 Year (cfs)	25 Year (cfs)	50 Year (cfs)	50 Year Net Change
Analysis Point 1	Pre	2.50	5.86	8.97	11.76	**-5.96**
	Post	0.00	1.23	3.20	5.80	
Analysis Point 2	Pre	0.92	5.50	11.14	16.76	**-3.79**
	Post	0.27	2.27	5.68	12.97	
Analysis Point 3	Pre	4.52	11.52	18.10	24.02	**+1.14**
	Post	3.97	10.10	17.84	25.16	
Analysis Point 4	Pre	14.55	30.75	45.07	57.59	**-1.66**
	Post	14.53	26.70	41.65	55.93	

Post development flows for the 2 year, 10 year, and 25 year storms are less than the respective pre development flows. Post development flow for the 50 year storm is slightly greater than the pre development flow. The increase in Analysis Point 3 is offset by greater decreases at Analysis Points 2 and 4.

D. PRE-DEVELOPMENT HYDROCAD RESULTS

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>3.16"
Flow Length=335' Tc=39.2 min CN=84 Runoff=1.48 cfs 0.210 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>1.72"
Flow Length=460' Tc=31.3 min CN=67 Runoff=4.41 cfs 0.585 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>0.86"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=5.50 cfs 1.073 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>2.35"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=30.75 cfs 3.960 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>1.80"
Flow Length=830' Tc=25.2 min CN=68 Runoff=11.52 cfs 1.381 af

Reach AP1: Analysis Point 1 Inflow=5.86 cfs 0.795 af
Outflow=5.86 cfs 0.795 af

Reach AP2: Analysis Point 2 Inflow=5.50 cfs 1.073 af
Outflow=5.50 cfs 1.073 af

Reach AP3: Analysis Point 3 Inflow=11.52 cfs 1.381 af
Outflow=11.52 cfs 1.381 af

Reach AP4: Analysis Point 4 Inflow=30.75 cfs 3.960 af
Outflow=30.75 cfs 3.960 af

Total Runoff Area = 49.310 ac Runoff Volume = 7.210 af Average Runoff Depth = 1.75"
98.20% Pervious = 48.420 ac 1.80% Impervious = 0.890 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>4.35"
Flow Length=335' Tc=39.2 min CN=84 Runoff=2.02 cfs 0.290 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>2.66"
Flow Length=460' Tc=31.3 min CN=67 Runoff=7.00 cfs 0.905 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>1.53"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=11.14 cfs 1.916 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>3.43"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=45.07 cfs 5.776 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>2.76"
Flow Length=830' Tc=25.2 min CN=68 Runoff=18.10 cfs 2.121 af

Reach AP1: Analysis Point 1 Inflow=8.97 cfs 1.196 af
Outflow=8.97 cfs 1.196 af

Reach AP2: Analysis Point 2 Inflow=11.14 cfs 1.916 af
Outflow=11.14 cfs 1.916 af

Reach AP3: Analysis Point 3 Inflow=18.10 cfs 2.121 af
Outflow=18.10 cfs 2.121 af

Reach AP4: Analysis Point 4 Inflow=45.07 cfs 5.776 af
Outflow=45.07 cfs 5.776 af

Total Runoff Area = 49.310 ac Runoff Volume = 11.009 af Average Runoff Depth = 2.68"
98.20% Pervious = 48.420 ac 1.80% Impervious = 0.890 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>5.39"
Flow Length=335' Tc=39.2 min CN=84 Runoff=2.48 cfs 0.359 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>3.52"
Flow Length=460' Tc=31.3 min CN=67 Runoff=9.34 cfs 1.198 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>2.19"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=16.76 cfs 2.740 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>4.39"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=57.59 cfs 7.387 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>3.64"
Flow Length=830' Tc=25.2 min CN=68 Runoff=24.02 cfs 2.793 af

Reach AP1: Analysis Point 1 Inflow=11.76 cfs 1.557 af
Outflow=11.76 cfs 1.557 af

Reach AP2: Analysis Point 2 Inflow=16.76 cfs 2.740 af
Outflow=16.76 cfs 2.740 af

Reach AP3: Analysis Point 3 Inflow=24.02 cfs 2.793 af
Outflow=24.02 cfs 2.793 af

Reach AP4: Analysis Point 4 Inflow=57.59 cfs 7.387 af
Outflow=57.59 cfs 7.387 af

Total Runoff Area = 49.310 ac Runoff Volume = 14.478 af Average Runoff Depth = 3.52"
98.20% Pervious = 48.420 ac 1.80% Impervious = 0.890 ac

Summary for Subcatchment 1S: 1

Runoff = 2.48 cfs @ 12.52 hrs, Volume= 0.359 af, Depth> 5.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG D
0.250	79	Woods, Fair, HSG D
0.340	80	>75% Grass cover, Good, HSG D
0.800	84	Weighted Average
0.590		73.75% Pervious Area
0.210		26.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		**Sheet Flow, SF1-1** Woods: Light underbrush n= 0.400 P2= 3.30"
0.1	75	0.0500	9.49	94.94	**Channel Flow, CF1-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035 Earth, dense weeds
0.5	110	0.0050	3.47	2.73	**Pipe Channel, PF 1-1** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
39.2	335	Total			

Summary for Subcatchment 2S: 2

Runoff = 9.34 cfs @ 12.45 hrs, Volume= 1.198 af, Depth> 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

Area (ac)	CN	Description
2.960	79	Woods, Fair, HSG D
1.120	36	Woods, Fair, HSG A
4.080	67	Weighted Average
4.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		**Sheet Flow, SF2-1** Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	60	0.0100	1.50		**Shallow Concentrated Flow, SCF2-1** Grassed Waterway Kv= 15.0 fps
1.4	250	0.0060	2.88	28.78	**Channel Flow, CF 2-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040
31.3	460	Total			

Summary for Subcatchment 3S: 3

Runoff = 16.76 cfs @ 12.67 hrs, Volume= 2.740 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	9.000	36	Woods, Fair, HSG A
	5.620	79	Woods, Fair, HSG D
*	0.390	98	Gravel Road
	15.010	54	Weighted Average
	14.620		97.40% Pervious Area
	0.390		2.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		**Sheet Flow, SF4-1** Woods: Light underbrush n= 0.400 P2= 3.30"
12.8	545	0.0200	0.71		**Shallow Concentrated Flow, SCF4-1** Woodland Kv= 5.0 fps
2.8	870	0.0200	5.25	52.54	**Channel Flow, CF4-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
0.5	250	0.0600	9.10	91.00	**Channel Flow, CF4-2** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Mountain streams
45.3	1,815	Total			

Summary for Subcatchment 4S: 4

Runoff = 57.59 cfs @ 12.44 hrs, Volume= 7.387 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	2.020	36	Woods, Fair, HSG A
	17.920	79	Woods, Fair, HSG D
*	0.260	98	Gravel Road
	20.200	75	Weighted Average
	19.940		98.71% Pervious Area
	0.260		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	150	0.0380	0.11		**Sheet Flow, SF5-1** Woods: Light underbrush n= 0.400 P2= 3.30"
6.2	370	0.0400	1.00		**Shallow Concentrated Flow, SCF5-1** Woodland Kv= 5.0 fps
1.0	330	0.0200	5.25	52.54	**Channel Flow, CF5-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040
1.8	555	0.0140	5.02	50.24	**Channel Flow, CF 5-2** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035
31.6	1,405	Total			

Summary for Subcatchment 5S: 5

Runoff = 24.02 cfs @ 12.36 hrs, Volume= 2.793 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	2.350	36	Woods, Fair, HSG A
	6.840	79	Woods, Fair, HSG D
*	0.030	98	Gravel Road
	9.220	68	Weighted Average
	9.190		99.67% Pervious Area
	0.030		0.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2	150	0.0400	0.11		**Sheet Flow, SF6-1** Woods: Light underbrush n= 0.400 P2= 3.30"
2.7	490	0.0400	3.00		**Shallow Concentrated Flow, SCF6-1** Grassed Waterway Kv= 15.0 fps
0.3	190	0.0600	10.40	104.00	**Channel Flow, CF6-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035
25.2	830	Total			

Summary for Reach AP1: Analysis Point 1

Inflow Area = 4.880 ac, 4.30% Impervious, Inflow Depth > 3.83" for 50yr event
Inflow = 11.76 cfs @ 12.46 hrs, Volume= 1.557 af
Outflow = 11.76 cfs @ 12.46 hrs, Volume= 1.557 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP2: Analysis Point 2

Inflow Area = 15.010 ac, 2.60% Impervious, Inflow Depth > 2.19" for 50yr event
Inflow = 16.76 cfs @ 12.67 hrs, Volume= 2.740 af
Outflow = 16.76 cfs @ 12.67 hrs, Volume= 2.740 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP3: Analysis Point 3

Inflow Area = 9.220 ac, 0.33% Impervious, Inflow Depth > 3.64" for 50yr event
Inflow = 24.02 cfs @ 12.36 hrs, Volume= 2.793 af
Outflow = 24.02 cfs @ 12.36 hrs, Volume= 2.793 af, Atten= 0%, Lag= 0.0 min

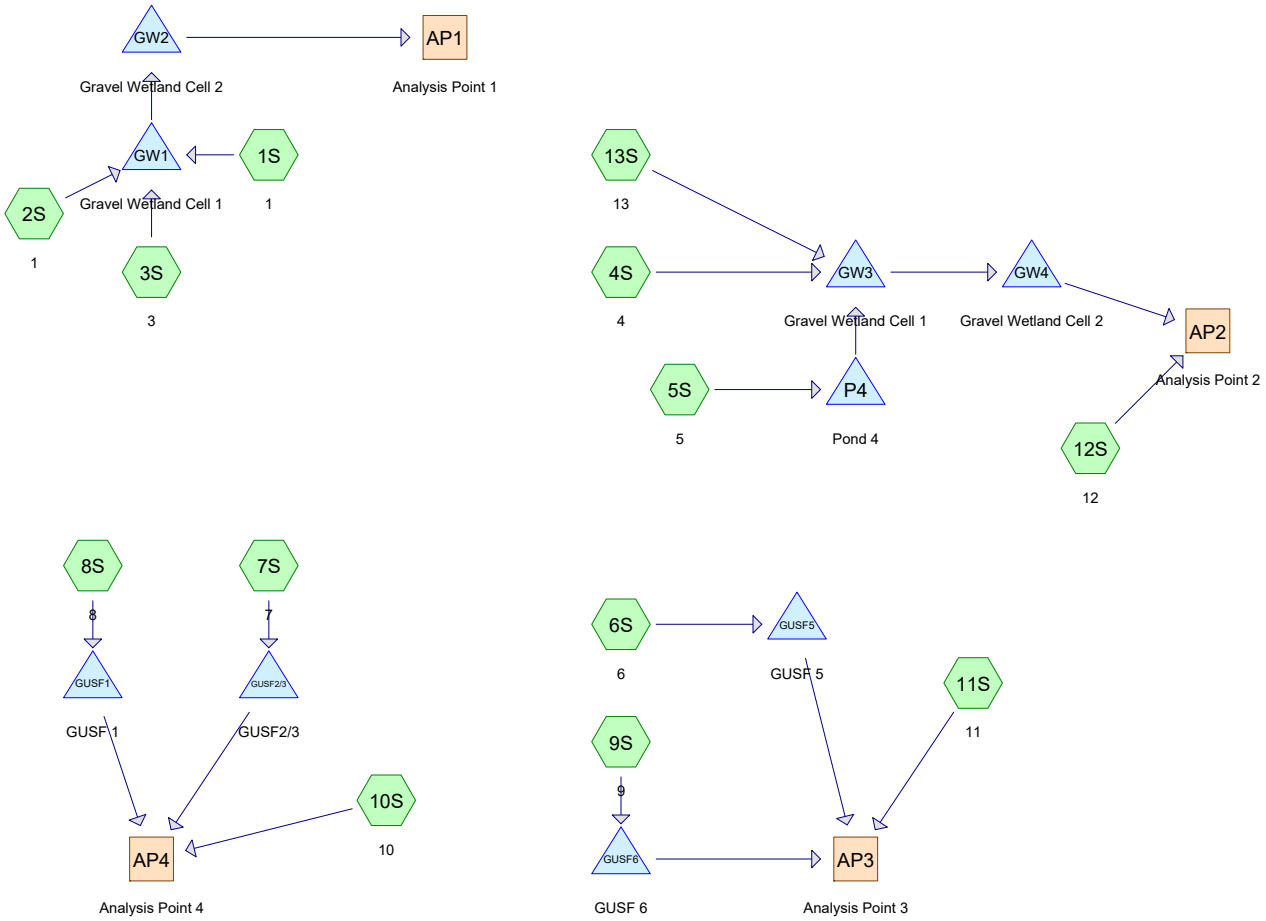
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP4: Analysis Point 4

Inflow Area = 20.200 ac, 1.29% Impervious, Inflow Depth > 4.39" for 50yr event
Inflow = 57.59 cfs @ 12.44 hrs, Volume= 7.387 af
Outflow = 57.59 cfs @ 12.44 hrs, Volume= 7.387 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

E. POST-DEVELOPMENT HYDROCAD RESULTS



Subcat Reach Pond Link

Routing Diagram for Post-Dev Hydro Updated 5-2-19
Prepared by CES, INC., Printed 5/9/2019
HydroCAD® 10.00-24 s/n 00641 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>2.17"
Tc=6.0 min CN=89 Runoff=2.35 cfs 0.172 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>1.21"
Flow Length=495' Tc=33.5 min CN=76 Runoff=1.57 cfs 0.213 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>0.41"
Flow Length=1,107' Tc=24.0 min CN=59 Runoff=0.33 cfs 0.059 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>2.09"
Tc=6.0 min CN=88 Runoff=9.02 cfs 0.657 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=80 Runoff=1.38 cfs 0.101 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>2.26"
Tc=6.0 min CN=90 Runoff=2.82 cfs 0.207 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>2.54"
Tc=6.0 min CN=93 Runoff=9.21 cfs 0.692 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>2.44"
Tc=6.0 min CN=92 Runoff=4.78 cfs 0.356 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>1.84"
Tc=6.0 min CN=85 Runoff=1.38 cfs 0.100 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>1.40"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=12.54 cfs 1.583 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>0.78"
Flow Length=760' Tc=29.5 min CN=68 Runoff=3.97 cfs 0.564 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>0.17"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=0.27 cfs 0.133 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>0.99"
Tc=6.0 min CN=72 Runoff=1.50 cfs 0.116 af

Reach AP1: Analysis Point 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach AP2: Analysis Point 2 Inflow=0.27 cfs 0.133 af
Outflow=0.27 cfs 0.133 af

Reach AP3: Analysis Point 3 Inflow=3.97 cfs 0.564 af
Outflow=3.97 cfs 0.564 af

Reach AP4: Analysis Point 4	Inflow=14.53 cfs 2.171 af Outflow=14.53 cfs 2.171 af
Pond GUSF1: GUSF 1	Peak Elev=122.01' Storage=8,812 cf Inflow=4.78 cfs 0.356 af Outflow=0.55 cfs 0.210 af
Pond GUSF2/3: GUSF2/3	Peak Elev=115.83' Storage=17,050 cf Inflow=9.21 cfs 0.692 af Outflow=1.44 cfs 0.379 af
Pond GUSF5: GUSF 5	Peak Elev=122.38' Storage=9,020 cf Inflow=2.82 cfs 0.207 af Outflow=0.00 cfs 0.000 af
Pond GUSF6: GUSF 6	Peak Elev=118.23' Storage=4,344 cf Inflow=1.38 cfs 0.100 af Outflow=0.00 cfs 0.000 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=121.86' Storage=12,157 cf Inflow=2.85 cfs 0.444 af Outflow=0.38 cfs 0.190 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=121.27' Storage=8,250 cf Inflow=0.38 cfs 0.190 af Outflow=0.00 cfs 0.000 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=120.47' Storage=21,248 cf Inflow=10.50 cfs 0.773 af Outflow=0.64 cfs 0.358 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=120.40' Storage=15,588 cf Inflow=0.64 cfs 0.358 af Outflow=0.00 cfs 0.000 af
Pond P4: Pond 4	Peak Elev=125.13' Storage=4,397 cf Inflow=1.38 cfs 0.101 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 49.310 ac Runoff Volume = 4.953 af Average Runoff Depth = 1.21"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>3.67"
Tc=6.0 min CN=89 Runoff=3.89 cfs 0.291 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>2.44"
Flow Length=495' Tc=33.5 min CN=76 Runoff=3.25 cfs 0.428 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>1.17"
Flow Length=1,107' Tc=24.0 min CN=59 Runoff=1.30 cfs 0.170 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>3.57"
Tc=6.0 min CN=88 Runoff=15.15 cfs 1.125 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>2.80"
Tc=6.0 min CN=80 Runoff=2.64 cfs 0.192 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>3.78"
Tc=6.0 min CN=90 Runoff=4.60 cfs 0.346 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>4.10"
Tc=6.0 min CN=93 Runoff=14.45 cfs 1.116 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>3.99"
Tc=6.0 min CN=92 Runoff=7.61 cfs 0.582 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>3.27"
Tc=6.0 min CN=85 Runoff=2.42 cfs 0.177 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>2.70"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=24.51 cfs 3.046 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>1.80"
Flow Length=760' Tc=29.5 min CN=68 Runoff=10.10 cfs 1.297 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>0.69"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=2.27 cfs 0.548 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>2.12"
Tc=6.0 min CN=72 Runoff=3.38 cfs 0.247 af

Reach AP1: Analysis Point 1 Inflow=1.23 cfs 0.378 af
Outflow=1.23 cfs 0.378 af

Reach AP2: Analysis Point 2 Inflow=2.27 cfs 1.013 af
Outflow=2.27 cfs 1.013 af

Reach AP3: Analysis Point 3 Inflow=10.10 cfs 1.463 af
Outflow=10.10 cfs 1.463 af

Reach AP4: Analysis Point 4	Inflow=26.70 cfs 4.281 af Outflow=26.70 cfs 4.281 af	
Pond GUSF1: GUSF 1	Peak Elev=122.94' Storage=15,210 cf	Inflow=7.61 cfs 0.582 af Outflow=0.61 cfs 0.434 af
Pond GUSF2/3: GUSF2/3	Peak Elev=116.73' Storage=28,191 cf	Inflow=14.45 cfs 1.116 af Outflow=1.61 cfs 0.800 af
Pond GUSF5: GUSF 5	Peak Elev=122.57' Storage=10,515 cf	Inflow=4.60 cfs 0.346 af Outflow=0.30 cfs 0.114 af
Pond GUSF6: GUSF 6	Peak Elev=118.54' Storage=5,620 cf	Inflow=2.42 cfs 0.177 af Outflow=0.13 cfs 0.051 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=122.65' Storage=17,044 cf	Inflow=5.69 cfs 0.889 af Outflow=2.40 cfs 0.626 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=121.85' Storage=11,386 cf	Inflow=2.40 cfs 0.626 af Outflow=1.23 cfs 0.378 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=121.21' Storage=30,314 cf	Inflow=18.52 cfs 1.420 af Outflow=4.73 cfs 0.982 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=121.51' Storage=26,482 cf	Inflow=4.73 cfs 0.982 af Outflow=0.63 cfs 0.465 af
Pond P4: Pond 4	Peak Elev=125.54' Storage=6,368 cf	Inflow=2.64 cfs 0.192 af Outflow=0.12 cfs 0.048 af

Total Runoff Area = 49.310 ac Runoff Volume = 9.565 af Average Runoff Depth = 2.33"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>4.93"
Tc=6.0 min CN=89 Runoff=5.14 cfs 0.390 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>3.53"
Flow Length=495' Tc=33.5 min CN=76 Runoff=4.72 cfs 0.621 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>1.96"
Flow Length=1,107' Tc=24.0 min CN=59 Runoff=2.35 cfs 0.284 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>4.82"
Tc=6.0 min CN=88 Runoff=20.12 cfs 1.517 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=80 Runoff=3.71 cfs 0.271 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>5.04"
Tc=6.0 min CN=90 Runoff=6.04 cfs 0.462 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>5.38"
Tc=6.0 min CN=93 Runoff=18.67 cfs 1.465 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=92 Runoff=9.87 cfs 0.767 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>4.49"
Tc=6.0 min CN=85 Runoff=3.28 cfs 0.243 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>3.84"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=34.77 cfs 4.330 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>2.76"
Flow Length=760' Tc=29.5 min CN=68 Runoff=15.86 cfs 1.992 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>1.29"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=5.07 cfs 1.028 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>3.15"
Tc=6.0 min CN=72 Runoff=5.08 cfs 0.368 af

Reach AP1: Analysis Point 1 Inflow=3.20 cfs 0.777 af
Outflow=3.20 cfs 0.777 af

Reach AP2: Analysis Point 2 Inflow=5.68 cfs 1.925 af
Outflow=5.68 cfs 1.925 af

Reach AP3: Analysis Point 3 Inflow=17.84 cfs 2.337 af
Outflow=17.84 cfs 2.337 af

Reach AP4: Analysis Point 4	Inflow=41.65 cfs 6.096 af Outflow=41.65 cfs 6.096 af
Pond GUSF1: GUSF 1	Peak Elev=123.21' Storage=17,476 cf Inflow=9.87 cfs 0.767 af Outflow=2.94 cfs 0.619 af
Pond GUSF2/3: GUSF2/3	Peak Elev=117.22' Storage=34,921 cf Inflow=18.67 cfs 1.465 af Outflow=4.20 cfs 1.147 af
Pond GUSF5: GUSF 5	Peak Elev=122.70' Storage=11,565 cf Inflow=6.04 cfs 0.462 af Outflow=1.40 cfs 0.229 af
Pond GUSF6: GUSF 6	Peak Elev=118.63' Storage=5,993 cf Inflow=3.28 cfs 0.243 af Outflow=0.70 cfs 0.117 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=123.23' Storage=21,109 cf Inflow=8.56 cfs 1.294 af Outflow=5.97 cfs 1.026 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=121.99' Storage=12,136 cf Inflow=5.97 cfs 1.026 af Outflow=3.20 cfs 0.777 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=121.51' Storage=34,313 cf Inflow=25.19 cfs 2.012 af Outflow=12.91 cfs 1.560 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=122.13' Storage=33,181 cf Inflow=12.91 cfs 1.560 af Outflow=1.85 cfs 0.897 af
Pond P4: Pond 4	Peak Elev=125.60' Storage=6,705 cf Inflow=3.71 cfs 0.271 af Outflow=0.51 cfs 0.127 af

Total Runoff Area = 49.310 ac Runoff Volume = 13.737 af Average Runoff Depth = 3.34"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>6.00"
Tc=6.0 min CN=89 Runoff=6.19 cfs 0.475 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>4.50"
Flow Length=495' Tc=33.5 min CN=76 Runoff=6.00 cfs 0.791 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>2.70"
Flow Length=1,107' Tc=24.0 min CN=59 Runoff=3.33 cfs 0.392 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>5.88"
Tc=6.0 min CN=88 Runoff=24.31 cfs 1.853 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>4.97"
Tc=6.0 min CN=80 Runoff=4.62 cfs 0.339 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>6.11"
Tc=6.0 min CN=90 Runoff=7.25 cfs 0.560 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>6.46"
Tc=6.0 min CN=93 Runoff=22.21 cfs 1.762 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>6.35"
Tc=6.0 min CN=92 Runoff=11.78 cfs 0.926 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>5.54"
Tc=6.0 min CN=85 Runoff=4.00 cfs 0.300 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>4.83"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=43.60 cfs 5.455 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>3.63"
Flow Length=760' Tc=29.5 min CN=68 Runoff=21.06 cfs 2.624 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>1.90"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=7.98 cfs 1.507 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>4.08"
Tc=6.0 min CN=72 Runoff=6.57 cfs 0.476 af

Reach AP1: Analysis Point 1 Inflow=5.80 cfs 1.135 af
Outflow=5.80 cfs 1.135 af

Reach AP2: Analysis Point 2 Inflow=12.97 cfs 2.879 af
Outflow=12.97 cfs 2.879 af

Reach AP3: Analysis Point 3 Inflow=25.16 cfs 3.124 af
Outflow=25.16 cfs 3.124 af

Reach AP4: Analysis Point 4		Inflow=55.93 cfs 7.672 af Outflow=55.93 cfs 7.672 af
Pond GUSF1: GUSF 1	Peak Elev=123.32' Storage=18,500 cf	Inflow=11.78 cfs 0.926 af Outflow=5.26 cfs 0.777 af
Pond GUSF2/3: GUSF2/3	Peak Elev=117.38' Storage=37,319 cf	Inflow=22.21 cfs 1.762 af Outflow=7.83 cfs 1.441 af
Pond GUSF5: GUSF 5	Peak Elev=122.82' Storage=12,499 cf	Inflow=7.25 cfs 0.560 af Outflow=2.74 cfs 0.327 af
Pond GUSF6: GUSF 6	Peak Elev=118.72' Storage=6,393 cf	Inflow=4.00 cfs 0.300 af Outflow=1.57 cfs 0.173 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=123.40' Storage=22,384 cf	Inflow=11.12 cfs 1.657 af Outflow=10.00 cfs 1.384 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=122.33' Storage=14,039 cf	Inflow=10.00 cfs 1.384 af Outflow=5.80 cfs 1.135 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=121.75' Storage=37,456 cf	Inflow=30.88 cfs 2.524 af Outflow=20.82 cfs 2.063 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=122.31' Storage=35,226 cf	Inflow=20.82 cfs 2.063 af Outflow=5.02 cfs 1.371 af
Pond P4: Pond 4	Peak Elev=125.71' Storage=7,281 cf	Inflow=4.62 cfs 0.339 af Outflow=1.51 cfs 0.195 af

Total Runoff Area = 49.310 ac Runoff Volume = 17.459 af Average Runoff Depth = 4.25"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Summary for Subcatchment 1S: 1

Runoff = 6.19 cfs @ 12.09 hrs, Volume= 0.475 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.260	98	Pavement
	0.260	98	Water Surface, 0% imp, HSG D
	0.430	78	Meadow, non-grazed, HSG D
	0.950	89	Weighted Average
	0.690		72.63% Pervious Area
	0.260		27.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 1**

Summary for Subcatchment 2S: 1

Runoff = 6.00 cfs @ 12.46 hrs, Volume= 0.791 af, Depth> 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.090	98	Pavement
	0.210	36	Woods, Fair, HSG A
	0.070	98	Water Surface, 0% imp, HSG D
	0.120	78	Meadow, non-grazed, HSG D
	1.620	79	Woods, Fair, HSG D
	2.110	76	Weighted Average
	2.020		95.73% Pervious Area
	0.090		4.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		**Sheet Flow, SF1-1** Woods: Light underbrush n= 0.400 P2= 3.30"
3.2	95	0.0100	0.50		**Shallow Concentrated Flow, SCF1-1** Woodland Kv= 5.0 fps
1.1	250	0.0060	3.84	38.37	**Channel Flow, CF1-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
33.5	495	Total			

Summary for Subcatchment 3S: 3

Runoff = 3.33 cfs @ 12.36 hrs, Volume= 0.392 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.330	98	Pavement
	0.020	30	Meadow, non-grazed, HSG A
	0.930	36	Woods, Fair, HSG A
	0.390	79	Woods, Fair, HSG D
	0.070	78	Meadow, non-grazed, HSG D
	1.740	59	Weighted Average
	1.410		81.03% Pervious Area
	0.330		18.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2	150	0.0400	0.11		**Sheet Flow, SF3-1** Woods: Light underbrush n= 0.400 P2= 3.30"
0.6	42	0.0300	1.21		**Shallow Concentrated Flow, SCF3-1** Short Grass Pasture Kv= 7.0 fps
0.3	175	0.0100	11.43	114.31	**Channel Flow, CF3-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.013 Asphalt, smooth
0.3	512	0.4000	33.91	26.63	**Pipe Channel, PF3-1** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
0.4	175	0.0100	6.75	67.55	**Channel Flow, CF3-2** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
0.2	53	0.0047	4.82	8.51	**Pipe Channel, PF3-2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
24.0	1,107	Total			

Summary for Subcatchment 4S: 4

Runoff = 24.31 cfs @ 12.09 hrs, Volume= 1.853 af, Depth> 5.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	3.040	98	Pavement/Building
	0.590	39	>75% Grass cover, Good, HSG A
	0.020	78	Meadow, non-grazed, HSG D
	0.130	79	Woods, Fair, HSG D
	3.780	88	Weighted Average
	0.740		19.58% Pervious Area
	3.040		80.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 4**

Summary for Subcatchment 5S: 5

Runoff = 4.62 cfs @ 12.09 hrs, Volume= 0.339 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.490	98	Pavement/Building
	0.230	39	>75% Grass cover, Good, HSG A
	0.060	78	Meadow, non-grazed, HSG D
*	0.040	98	Rip rap
	0.820	80	Weighted Average
	0.290		35.37% Pervious Area
	0.530		64.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 5**

Summary for Subcatchment 6S: 6

Runoff = 7.25 cfs @ 12.09 hrs, Volume= 0.560 af, Depth> 6.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.590	98	Pavement
	0.080	78	Meadow, non-grazed, HSG D
*	0.050	98	Rip Rap
	0.380	80	>75% Grass cover, Good, HSG D
	1.100	90	Weighted Average
	0.460		41.82% Pervious Area
	0.640		58.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6**

Summary for Subcatchment 7S: 7

Runoff = 22.21 cfs @ 12.09 hrs, Volume= 1.762 af, Depth> 6.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	2.470	98	Pavement/Building
	0.340	78	Meadow, non-grazed, HSG D
*	0.020	98	Rip rap forebay
	0.070	80	>75% Grass cover, Good, HSG D
	0.370	79	Woods, Fair, HSG D
	3.270	93	Weighted Average
	0.780		23.85% Pervious Area
	2.490		76.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 7**

Summary for Subcatchment 8S: 8

Runoff = 11.78 cfs @ 12.09 hrs, Volume= 0.926 af, Depth> 6.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	1.150	98	Pavement/Building
	0.180	78	Meadow, non-grazed, HSG D
*	0.040	98	Rip rap forebay
	0.380	80	>75% Grass cover, Good, HSG D
	1.750	92	Weighted Average
	0.560		32.00% Pervious Area
	1.190		68.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 8**

Summary for Subcatchment 9S: 9

Runoff = 4.00 cfs @ 12.09 hrs, Volume= 0.300 af, Depth> 5.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.180	98	Pavement
*	0.010	98	Rip Rap
	0.080	78	Meadow, non-grazed, HSG D
	0.230	80	>75% Grass cover, Good, HSG D
	0.150	79	Woods, Fair, HSG D
	0.650	85	Weighted Average
	0.460		70.77% Pervious Area
	0.190		29.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 9**

Summary for Subcatchment 10S: 10

Runoff = 43.60 cfs @ 12.40 hrs, Volume= 5.455 af, Depth> 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	0.050	36	Woods, Fair, HSG A
	13.450	79	Woods, Fair, HSG D
*	0.010	98	Pavement
	0.030	80	>75% Grass cover, Good, HSG D
	13.540	79	Weighted Average
	13.530		99.93% Pervious Area
	0.010		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.9	150	0.0300	0.10		**Sheet Flow, SF 10-1** Woods: Light underbrush n= 0.400 P2= 3.30"
1.2	75	0.0400	1.00		**Shallow Concentrated Flow, SCF10-1** Woodland Kv= 5.0 fps
1.8	230	0.0200	2.12		**Shallow Concentrated Flow, SCF 10-2** Grassed Waterway Kv= 15.0 fps
1.6	555	0.0140	5.86	58.61	**Channel Flow, CF 10-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
29.6	1,010	Total			

Summary for Subcatchment 11S: 11

Runoff = 21.06 cfs @ 12.42 hrs, Volume= 2.624 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

Area (ac)	CN	Description
2.300	36	Woods, Fair, HSG A
6.370	79	Woods, Fair, HSG D
8.670	68	Weighted Average
8.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2	150	0.0400	0.11		**Sheet Flow, SF11-1** Woods: Light underbrush n= 0.400 P2= 3.30"
6.9	390	0.0350	0.94		**Shallow Concentrated Flow, SCF11-1** Woodland Kv= 5.0 fps
0.4	220	0.0600	10.40	104.00	**Channel Flow, CF 11-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035 Earth, dense weeds
29.5	760	Total			

Summary for Subcatchment 12S: 12

Runoff = 7.98 cfs @ 12.83 hrs, Volume= 1.507 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	6.230	36	Woods, Fair, HSG A
	0.080	39	>75% Grass cover, Good, HSG A
*	0.060	98	Pavement
	3.160	79	Woods, Fair, HSG D
	9.530	51	Weighted Average
	9.470		99.37% Pervious Area
	0.060		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		**Sheet Flow, SF12-1** Woods: Light underbrush n= 0.400 P2= 3.30"
16.0	680	0.0200	0.71		**Shallow Concentrated Flow, SCF12-1** Woodland Kv= 5.0 fps
0.4	250	0.0600	10.40	104.00	**Channel Flow, CF12-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035 Earth, dense weeds
55.0	1,080	Total			

Summary for Subcatchment 13S: 13

Runoff = 6.57 cfs @ 12.09 hrs, Volume= 0.476 af, Depth> 4.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.090	98	Pavement
	0.340	98	Water Surface, HSG D
	0.610	78	Meadow, non-grazed, HSG D
	0.360	30	Meadow, non-grazed, HSG A
	1.400	72	Weighted Average
	0.970		69.29% Pervious Area
	0.430		30.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach AP1: Analysis Point 1

Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth > 2.84" for 50yr event
Inflow = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af
Outflow = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP2: Analysis Point 2

Inflow Area = 15.530 ac, 26.14% Impervious, Inflow Depth > 2.22" for 50yr event
Inflow = 12.97 cfs @ 12.86 hrs, Volume= 2.879 af
Outflow = 12.97 cfs @ 12.86 hrs, Volume= 2.879 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP3: Analysis Point 3

Inflow Area = 10.420 ac, 7.97% Impervious, Inflow Depth > 3.60" for 50yr event
Inflow = 25.16 cfs @ 12.40 hrs, Volume= 3.124 af
Outflow = 25.16 cfs @ 12.40 hrs, Volume= 3.124 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP4: Analysis Point 4

Inflow Area = 18.560 ac, 19.88% Impervious, Inflow Depth > 4.96" for 50yr event
Inflow = 55.93 cfs @ 12.39 hrs, Volume= 7.672 af
Outflow = 55.93 cfs @ 12.39 hrs, Volume= 7.672 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond GUSF1: GUSF 1

Inflow Area = 1.750 ac, 68.00% Impervious, Inflow Depth > 6.35" for 50yr event
Inflow = 11.78 cfs @ 12.09 hrs, Volume= 0.926 af
Outflow = 5.26 cfs @ 12.27 hrs, Volume= 0.777 af, Atten= 55%, Lag= 11.2 min
Primary = 5.26 cfs @ 12.27 hrs, Volume= 0.777 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.32' @ 12.27 hrs Surf.Area= 8,944 sf Storage= 18,500 cf

Plug-Flow detention time= 232.3 min calculated for 0.777 af (84% of inflow)
Center-of-Mass det. time= 166.3 min (937.5 - 771.1)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	24,848 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	3,545	0	0
121.00	4,370	3,958	3,958
122.00	5,270	4,820	8,778
123.00	8,530	6,900	15,678
124.00	9,810	9,170	24,848

Device	Routing	Invert	Outlet Devices
#1	Device 2	121.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	117.00'	**4.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 117.00' / 116.83' S= 0.0028 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf
#3	Primary	123.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.19 cfs @ 12.27 hrs HW=123.32' (Free Discharge)
- **2=Culvert** (Barrel Controls 0.62 cfs @ 7.16 fps)
  - **1=Orifice/Grate** (Passes 0.62 cfs of 5.10 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 4.57 cfs @ 1.43 fps)

Summary for Pond GUSF2/3: GUSF2/3

Inflow Area = 3.270 ac, 76.15% Impervious, Inflow Depth > 6.46" for 50yr event
Inflow = 22.21 cfs @ 12.09 hrs, Volume= 1.762 af
Outflow = 7.83 cfs @ 12.36 hrs, Volume= 1.441 af, Atten= 65%, Lag= 16.2 min
Primary = 7.83 cfs @ 12.36 hrs, Volume= 1.441 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 117.38' @ 12.36 hrs Surf.Area= 14,650 sf Storage= 37,319 cf

Plug-Flow detention time= 214.0 min calculated for 1.441 af (82% of inflow)
Center-of-Mass det. time= 143.1 min (910.4 - 767.3)

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	46,745 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	6,270	0	0
115.00	9,930	8,100	8,100
116.00	11,860	10,895	18,995
117.00	13,860	12,860	31,855
118.00	15,920	14,890	46,745

Device	Routing	Invert	Outlet Devices
#1	Primary	111.83'	**6.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 111.83' / 111.70' S= 0.0026 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Device 1	115.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	117.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=7.80 cfs @ 12.36 hrs HW=117.38' (Free Discharge)
- **1=Culvert** (Barrel Controls 1.72 cfs @ 8.78 fps)
  - **2=Orifice/Grate** (Passes 1.72 cfs of 11.67 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 6.07 cfs @ 1.59 fps)

Summary for Pond GUSF5: GUSF 5

Inflow Area = 1.100 ac, 58.18% Impervious, Inflow Depth > 6.11" for 50yr event
Inflow = 7.25 cfs @ 12.09 hrs, Volume= 0.560 af
Outflow = 2.74 cfs @ 12.33 hrs, Volume= 0.327 af, Atten= 62%, Lag= 14.8 min
Primary = 2.74 cfs @ 12.33 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.82' @ 12.33 hrs Surf.Area= 8,306 sf Storage= 12,499 cf

Plug-Flow detention time= 212.4 min calculated for 0.327 af (58% of inflow)
Center-of-Mass det. time= 107.7 min (885.8 - 778.2)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	18,555 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	5,510	0	0
122.00	7,000	6,255	6,255
123.00	8,600	7,800	14,055
123.50	9,400	4,500	18,555

Device	Routing	Invert	Outlet Devices
#1	Device 2	122.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	118.00'	**12.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 118.00' / 117.45' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.73 cfs @ 12.33 hrs HW=122.82' (Free Discharge)
└**2=Culvert** (Passes 2.73 cfs of 6.20 cfs potential flow)
└**1=Orifice/Grate** (Weir Controls 2.73 cfs @ 1.84 fps)

Summary for Pond GUSF6: GUSF 6

Inflow Area = 0.650 ac, 29.23% Impervious, Inflow Depth > 5.54" for 50yr event
Inflow = 4.00 cfs @ 12.09 hrs, Volume= 0.300 af
Outflow = 1.57 cfs @ 12.33 hrs, Volume= 0.173 af, Atten= 61%, Lag= 14.3 min
Primary = 1.57 cfs @ 12.33 hrs, Volume= 0.173 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 118.72' @ 12.33 hrs Surf.Area= 4,416 sf Storage= 6,393 cf

Plug-Flow detention time= 203.6 min calculated for 0.173 af (58% of inflow)
Center-of-Mass det. time= 100.2 min (893.3 - 793.1)

Volume	Invert	Avail.Storage	Storage Description
#1	117.00'	12,790 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.00	3,050	0	0
118.00	3,820	3,435	3,435
119.00	4,650	4,235	7,670
120.00	5,590	5,120	12,790

Device	Routing	Invert	Outlet Devices
#1	Primary	119.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 3	118.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	114.83'	**15.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 114.83' / 114.28' S= 0.0050 '/' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.56 cfs @ 12.33 hrs HW=118.72' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Passes 1.56 cfs of 8.43 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 1.56 cfs @ 1.52 fps)

Summary for Pond GW1: Gravel Wetland Cell 1

Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth > 4.14" for 50yr event
Inflow = 11.12 cfs @ 12.37 hrs, Volume= 1.657 af
Outflow = 10.00 cfs @ 12.52 hrs, Volume= 1.384 af, Atten= 10%, Lag= 8.9 min
Primary = 10.00 cfs @ 12.52 hrs, Volume= 1.384 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.40' @ 12.52 hrs Surf.Area= 7,596 sf Storage= 22,384 cf

Plug-Flow detention time= 130.3 min calculated for 1.384 af (84% of inflow)
Center-of-Mass det. time= 63.0 min (891.2 - 828.2)

Volume	Invert	Avail.Storage	Storage Description
#1	119.60'	23,169 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.60	4,864	0	0
122.00	5,939	12,964	12,964
123.00	7,071	6,505	19,469
123.50	7,731	3,701	23,169

Device	Routing	Invert	Outlet Devices
#1	Primary	123.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	121.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 121.50' / 121.40' S= 0.0050 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=9.93 cfs @ 12.52 hrs HW=123.40' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.40 cfs @ 1.62 fps)
└**2=Culvert** (Inlet Controls 3.53 cfs @ 4.49 fps)

Summary for Pond GW2: Gravel Wetland Cell 2

Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth > 3.46" for 50yr event
Inflow = 10.00 cfs @ 12.52 hrs, Volume= 1.384 af
Outflow = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af, Atten= 42%, Lag= 23.6 min
Primary = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.33' @ 12.91 hrs Surf.Area= 5,802 sf Storage= 14,039 cf

Plug-Flow detention time= 108.4 min calculated for 1.135 af (82% of inflow)
Center-of-Mass det. time= 38.6 min (929.8 - 891.2)

Volume	Invert	Avail.Storage	Storage Description
#1	119.60'	21,476 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.60	4,654	0	0
122.00	5,508	12,194	12,194
123.00	6,410	5,959	18,153
123.50	6,881	3,323	21,476

Device	Routing	Invert	Outlet Devices
#1	Device 2	121.70'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	119.20'	**12.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.20' / 118.80' S= 0.0050 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf
#3	Primary	123.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.80 cfs @ 12.91 hrs HW=122.32' (Free Discharge)
- **2=Culvert** (Barrel Controls 5.80 cfs @ 7.38 fps)
  - **1=Orifice/Grate** (Passes 5.80 cfs of 10.15 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW3: Gravel Wetland Cell 1

Inflow Area = 6.000 ac, 66.67% Impervious, Inflow Depth > 5.05" for 50yr event
Inflow = 30.88 cfs @ 12.09 hrs, Volume= 2.524 af
Outflow = 20.82 cfs @ 12.19 hrs, Volume= 2.063 af, Atten= 33%, Lag= 5.9 min
Primary = 20.82 cfs @ 12.19 hrs, Volume= 2.063 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 121.75' @ 12.19 hrs Surf.Area= 13,553 sf Storage= 37,456 cf

Plug-Flow detention time= 150.0 min calculated for 2.058 af (82% of inflow)

Center-of-Mass det. time= 78.0 min (879.3 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	118.40'	69,794 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
118.40	8,700	0	0
120.00	11,130	15,864	15,864
122.00	13,900	25,030	40,894
124.00	15,000	28,900	69,794

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	119.90'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 119.90' / 119.90' S= 0.0000 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=20.65 cfs @ 12.19 hrs HW=121.74' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 17.18 cfs @ 2.31 fps)
└**2=Culvert** (Inlet Controls 3.46 cfs @ 4.41 fps)

Summary for Pond GW4: Gravel Wetland Cell 2

Inflow Area = 6.000 ac, 66.67% Impervious, Inflow Depth > 4.13" for 50yr event
Inflow = 20.82 cfs @ 12.19 hrs, Volume= 2.063 af
Outflow = 5.02 cfs @ 12.89 hrs, Volume= 1.371 af, Atten= 76%, Lag= 42.2 min
Primary = 5.02 cfs @ 12.89 hrs, Volume= 1.371 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.31' @ 12.89 hrs Surf.Area= 11,643 sf Storage= 35,226 cf

Plug-Flow detention time= 209.4 min calculated for 1.371 af (66% of inflow)
Center-of-Mass det. time= 99.3 min (978.7 - 879.3)

Volume	Invert	Avail.Storage	Storage Description
#1	118.40'	57,758 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
118.40	6,500	0	0
120.00	8,610	12,088	12,088
122.00	11,030	19,640	31,728
124.00	15,000	26,030	57,758

Device	Routing	Invert	Outlet Devices
#1	Primary	122.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 3	121.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	117.75'	**4.0" Round Culvert** L= 30.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 117.60' / 117.75' S= -0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Primary OutFlow Max=5.00 cfs @ 12.89 hrs HW=122.31' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.31 cfs @ 1.40 fps)
└**3=Culvert** (Barrel Controls 0.70 cfs @ 7.99 fps)
└**2=Orifice/Grate** (Passes 0.70 cfs of 4.33 cfs potential flow)

Summary for Pond P4: Pond 4

Inflow Area = 0.820 ac, 64.63% Impervious, Inflow Depth > 4.97" for 50yr event
Inflow = 4.62 cfs @ 12.09 hrs, Volume= 0.339 af
Outflow = 1.51 cfs @ 12.40 hrs, Volume= 0.195 af, Atten= 67%, Lag= 18.8 min
Primary = 1.51 cfs @ 12.40 hrs, Volume= 0.195 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 125.71' @ 12.40 hrs Surf.Area= 5,339 sf Storage= 7,281 cf

Plug-Flow detention time= 205.7 min calculated for 0.195 af (58% of inflow)
Center-of-Mass det. time= 100.1 min (905.9 - 805.9)

Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	11,893 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
124.00	3,190	0	0
125.00	4,420	3,805	3,805
126.00	5,710	5,065	8,870
126.50	6,380	3,023	11,893

Device	Routing	Invert	Outlet Devices
#1	Device 2	125.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	121.83'	**10.0" Round Culvert** L= 130.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 121.83' / 118.83' S= 0.0231 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.55 sf

Primary OutFlow Max=1.51 cfs @ 12.40 hrs HW=125.71' (Free Discharge)
└**2=Culvert** (Passes 1.51 cfs of 3.86 cfs potential flow)
└**1=Orifice/Grate** (Weir Controls 1.51 cfs @ 1.51 fps)

EROSION AND SEDIMENTATION CONTROL

The proposed construction will require the implementation of temporary and permanent erosion control measures. These measures will be implemented in accordance with the Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual, prior to removal of any on-site vegetation or disturbance of any on-site soil. The general erosion and sediment control specifications and details, as provided within this section, are intended to describe measures to be used by contractors working on the site to maintain compliance with the standards established in the BMPs.

Implementation of proper erosion control measures will be required by site contractors to confine sediment and debris within the limit of soil disturbance. Proper use and maintenance of erosion control measures provide protection against off-site transport of sediment and discharge of sediment to undisturbed areas of the development.

EROSION AND SEDIMENTATION CONTROL PLAN

1. **Pollution Prevention:** The proposed project includes the construction of a new Public Works facility and roadway in Saco, Maine. The facility, along with associated roads and parking lots totals approximately 596,772 SF (13.7 acres) of developed area. All disturbed areas, with the exception of the building and parking areas, will be stabilized with vegetation or riprap. Proposed down-gradient wooded areas and streams will be protected with the use of silt fence or additional control devices if necessary, during construction.

2. **Sediment Barriers:** Prior to construction, sediment barriers will be installed downgradient of all disturbed areas. Sediment barriers will include silt fence, bark mulch berms, hay bales, or additional measures which may become necessary.

   Sediment barriers will also be installed adjacent to any significant natural drainage channel, not otherwise protected. All installed sediment barriers will be maintained until disturbed areas are permanently stabilized.

3. **Temporary Stabilization:** Disturbed areas, which have lost natural vegetation cover, and will not be worked for more than seven days, will be temporarily stabilized. Areas within 75 feet of a wetland or waterbody will be stabilized within 48 hours of the initial disturbance or prior to any significant storm event, whichever comes first.

   Temporary stabilization will include mulch or other non-erodible material such as erosion control mesh mats. In some instances, temporary stabilization may include temporary mulch and seeding, based on the time until the area will be worked or permanently stabilized.

4. **Removal of Temporary Sediment Control Measures:** After permanent stabilization of disturbed areas has been completed, temporary measures, such as silt fence, will be removed within 30 days. Any accumulated sediments will be removed, and any disturbed areas permanently stabilized.

5. **Permanent Stabilization:** Once proposed construction is completed all disturbed areas, not otherwise permanently stabilized, will be permanently stabilized with vegetation, seeding, or permanent mulch.

   Vegetation plantings and seeding will include species which are suitable for the light, soil, and moisture conditions of the area. Seeded areas will be protected with temporary mulch or erosion control blankets.

   Concentrated flows will not be allowed on newly seeded areas until an adequate catch of vegetation is established. It may be necessary to reseed and mulch again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. For seeded areas, permanent stabilization means a 90% cover of healthy plants with no evidence of washing or rilling of the topsoil.

Other permanent measures associated with the project include the following:

A. Permanent Mulch: Permanent mulching means total coverage of exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.

B. Permanent Riprap: Permanent riprap means that slopes and ditches stabilized with riprap have an appropriate backing of well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Properly sized angular stones will be utilized.

C. Permanent Ditches, Channels, and Swales: Permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation or with a well-graded riprap lining. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

6. **Winter Construction:** Winter construction is not anticipated at this time. If winter construction occurs, additional provisions will be made to protect disturbed areas from runoff. Winter construction includes the time between November 1 and April 15. Contractor shall follow winter construction guidelines in MDEP's erosion control manual.

7. **Stormwater Channels:** Ditches, swales, and open stormwater channels are planned as part of this project. They will be stabilized with either vegetation or rip rap depending on the situation to prevent soil erosion.

8. **Roads and Driveways:** Roads and driveways will be graded to collect water in proposed BMP's as shown on the site plans. Some sections of the driveway will be super-elevated to direct runoff to the desired stormwater BMP.

9. **Culverts:** Culverts utilized in this project will be protected on both ends and the outlet pool with rip rap to prevent scour.

10. **Parking Areas:** The proposed project includes parking areas graded to collect runoff in the various proposed BMP's.

11. **Additional Requirements:** Contractor to implement additional Erosion and Sediment Control BMPs as needed to prevent onsite erosion of site soils and maintain those BMPs until the site is stabilized.

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)		
	INSPECTION SCHEDULE	**CORRECTIVE ACTIONS**
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodged
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
CATCH BASINS	Annually in the spring	Remove sediments and debris from the bottom of the basin and inlet grates
		Remove floating debris and oils (using oil absorptive pads) from any trap
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean-out the sediment within water bars or open-top culverts
		Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
RESOURCE AND TREATEMENT BUFFERS	Annually in the spring	Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
		Clean-out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
WETPONDS AND DETENTION BASINS	Annually in fall and after heavy rains	Inspect the embankments for settlement, slope erosion, piping, and slumping
		Mow the embankment to control woody vegetation
		Inspect the outlet structure for broken seals, obstructed orifices, and plugged trash racks
		Remove and dispose of sediments and debris within the control structure
		Repair any damage to trash racks or debris guards
		Replace any dislodged stone in riprap spillways
		Remove and dispose of accumulated sediments within the impoundment and forebay
FILTRATION AND INFILTRATION BASINS	Annually in the spring and late fall	Clean the basin of debris, sediment and hydrocarbons
		Provide for the removal and disposal of accumulated sediments within the basin
		Renew the basin media if it fails to drain within 72 hours after a one inch rainfall event
		Till, seed and mulch the basin if vegetation is sparse
		Repair riprap where underlying filter fabric or gravel is showing or where stones have dislodged
PROPRIETARY DEVICES	As specified by manufacturer	Contract with a third-party for inspection and maintenance
		Follow the manufacturer's plan for cleaning of devices
OTHER PRACTICES	As specified for devices	Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

HOUSEKEEPING

1. **Spill Prevention** - During construction, controls will be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

2. **Groundwater Protection** - During construction, liquid petroleum products, and other hazardous materials with the potential to contaminate groundwater will not be stored or handled in areas of the site draining to an infiltration area. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

3. **Fugitive Sediment and Dust** - Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil will not be used for dust control. Water will be used for dust control during construction. Operations during wet months that cause mud to be tracked off the site onto public roads will provide sweeping of the road areas at least once per week and prior to significant storm events.

4. **Debris and Other Materials** - Litter, construction debris, and chemicals exposed to stormwater will be prevented from becoming a pollutant source.

5. **Trench or Foundation De-Watering** - If de-watering is necessary, the collected water will be removed from the ponded area and spread through natural wooded buffers or discharged into a construction sedimentation basin. The water will not be allowed to flow over disturbed areas to the site.

6. **Non Stormwater Discharges** – Identify and prevent contamination by non-stormwater discharges.

7. **Additional Requirements** – Additional requirements may be applied on a site-specific basis.

INSPECTION AND MAINTENANCE

The Owner and their Contractor will be responsible for maintenance during construction. The Owner will be responsible for post construction maintenance of the site and the devices that provide treatment for the stormwater from the site.

A Pre- and Post-Construction Maintenance Plan for the stormwater management system is included in this section. Any questions regarding the design and maintenance of the Stormwater Management and Erosion and Sedimentation Control Systems should be directed to:

- John Kuchinski, P.E.
  CES, Inc.
  146 Main Street, Suite 300
  Saco, ME 04072
  jkuchinski@cesincusa.com

SENSIBLE SOLUTIONS

CES INC

TRAFFIC MOVEMENT PERMIT APPLICATION
for
PROPOSED PUBLIC WORKS FACILITY
SACO, MAINE

Owner/Applicant:
City of Saco
166 Center Street
Auburn, Maine 04210



MAY 2019
JN: 10602.002

Application Prepared By:
CES, Inc.
465 South Main Street
P.O. Box 639
Brewer, ME 04412
207.989.4824

Corporate Office
465 South Main Street
PO Box 639
Brewer, Maine 04412
207.989.4824

www.cesincusa.com

Engineers ◆ Environmental Scientists ◆ Surveyors

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Location Map

Department of Transportation
Traffic Engineering Division
16 State House Station
Augusta, Maine 04333
Telephone: 207-287-3775

FOR MDOT USE
ID #

Total Fees:
Date: Received

1/2000

****

PERMIT APPLICATION - TRAFFIC
TRAFFIC MOVEMENT PERMIT, 23 M.R.S.A. § 704 - A

Please type or print:

This application is for: Traffic 100-200 PCE's X
Traffic 200+ PCE's ____

Name of Applicant: **City of Saco**

Address: **300 Main Street, Saco, ME 04072** Telephone: **(207) 282-1032**

Name of local contact or agent: **Victor J. Smith, P.E – CES, Inc.**

Address: **465 South Main Street, Brewer, ME 04412** Telephone: **(207) 612-9305**

Name and type of development: **Proposed Public Works and School Transportation Facility.**

Location of development including road, street, or nearest route number: **Spring Hill Road located**

0.6 miles westerly of the US Route 1/Spring Hill Road intersection.

City/Town/Plantation: **Saco**, County: **York**, Tax Map #**42**, Lot # **1-2**

Do you want a consolidated review with DEP pursuant to 23 M.R.S.A. § 704-A (7)? Yes **No X**

Was this development started prior to obtaining a traffic permit? **No**

Is the project located in an area designated as a growth area (as defined in M.R.S.A. title 30 - A, chapter 187)? Yes ____ **No X**

Is this project located within a compact area of an urban compact municipality? **Yes X** No _____

Is this development or any portion of the site currently subject to state or municipal enforcement action? **No**

Existing DEP or MDOT permit number (if applicable): **N/A**

Name(s) of DOT staff person(s) contacted concerning this application: **Randy Illian, MaineDOT**

Name(s) of DOT staff person(s) present at the scoping meeting for 200+ applications: _____

1/2000

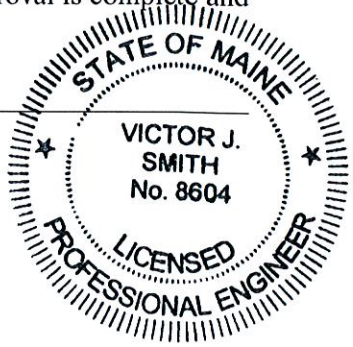
CERTIFICATION

The traffic engineer responsible for preparing this application and/or attaching pertinent site and traffic information hereto, by signing below, certifies that the application for traffic approval is complete and accurate to the best of his/her knowledge.

Signature: Victor J Smith Re/Cert/Lic No.: 8604

Name (print): Victor J. Smith

Date: 5/31/19



If the signature below is not the applicant's signature, attach letter of agent authorization signed by applicant.

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

K. L. Smith 5-21-2019

Signature of applicant Date

NOTICE OF INTENT TO FILE

Please take notice that City of Saco, 300 Main Street, Saco, ME 04072, (207) 282-1032 is intending to file a Traffic Movement Permit application with the Maine Department of Transportation pursuant to the provisions of 23 M.R.S.A. § 704 - A on or about May 29, 2019.

The application is for a combined Public Works and School Transportation Facility with an AM Peak Hour traffic generation of 103 trips in the peak hour, at the following location:

The entrance to the site will be located on Spring Hill Road, 0.6 miles westerly of the US Route 1/Spring Hill Road intersection on the south side of the road.

A request for a public hearing must be received by the Department, in writing, no later than 20 days after the application is found by the Department to be complete and is accepted for processing. Public comment on the application will be accepted throughout the processing of the application.

The application will be filed for public inspection at the Department of Transportation Region office in Scarborough during normal working hours. A copy of the application may also be seen at the municipal offices in Saco, Maine.

Written public comments may be sent to the Department of Transportation, Traffic Engineering Division, 16 State House Station, Augusta, Maine 04333.

ABUTTER'S LIST

CITY OF SACO
PUBLIC WORKS & INDUSTRIAL PARK

NAME	ADDRESS	CITY	STATE	ZIP
SWEETSER HOME	50 MOODY ST	SACO	ME	04072
CORMIER LAND CO	774 PORTLAND RD	SACO	ME	4072
BROCKWAY-SMITH COMPANY	35 UPTON DR	WILMINGTON	MA	01887-1018
DPR PROPERTIES LLC	PO BOX 32368	CHARLOTTE	NC	28232
HGH HOLDINGS LLC	52 SPRING HILL RD	SACO	ME	04072
OLP MAINE LLC	60 CUTTER MILL RD	GREAT NECK	NY	11021

CERTIFIED MAIL LIST & RECEIPTS

CITY OF SACO
PUBLIC WORKS & INDUSTRIAL PARK
Mailed: May 29, 2019

Sweetser Home
50 Moody Street
Saco, ME 04072

Cormier Land Co.
774 Portland Road
Saco, ME 04072

Brockway-Smith Company
35 Upton Drive
Wilmington, MA 01887-1018

DPR Properties LLC
P.O. Box 32368
Charlotte, NC 28232

HGH Holdings LLC
52 Spring Hill Road
Saco, ME 04072

OLP Maine, LLC
60 Cutter Mill Road
Great Neck, NY 11021

City of Saco
300 Main Street
Saco, ME 04072



Portland Press Herald
Maine Sunday Telegram
pressherald.com

Classified Advertising Proof

Saco, City Of
Attn Peter Morelli
300 Main St

Saco
ME
04072 -153
+1 (207) 282-4191
dbender@sacomaine.org

Thank you for placing your advertisement with us.

Your order information and a preview of your advertisement are attached below for your review. If there are changes or questions, please contact the classified department at (207) 791-6100

Thank you

(207) 791-6100 jjensen@mainetoday.com Monday – Friday 8:00 am – 5pm

Order Number	**0083029**	Order Price	[redacted]
Sales Rep.	**Joan Jensen**	PO No.	**Traffic Movement Permit / Torie Gorman**
Account	**6910**	Payment Type	**Invoice**

Publication	**Portland Press Herald**	Number of dates	**1**
First Run Date	**05/23/2019**	Last Run Date	**05/23/2019**

Publication	**Online Upsell PPH**	Number of dates	**1**
First Run Date	**05/23/2019**	Last Run Date	**05/23/2019**

Public Notice

NOTICE OF INTENT TO FILE

Please take notice that
City of Saco
300 Main Street
Saco, ME 04072
(207) 282-1032
is intending to file a Traffic Movement Permit application with the Maine Department of Transportation pursuant to the provisions of 23 M.R.S.A. § 704 - A on or about May 29, 2019

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Written public comments may be sent to the Department of Transportation, Traffic Engineering Division, 16 State House Station, Augusta, Maine 04333.



PROJECT TITLE: **SACO DEPARTMENT OF PUBLIC WORKS** **SACO, MAINE**	DWG: **1**	BY: WAB	CES INC Engineers • Environmental Scientists • Surveyors
		DATE: 2019-05-28	
SHEET TITLE:	JN: 10602.002	REV:	
LOCATION MAP	SCALE: 1"=2000'	REV DATE:	

SECTION 1

SITE AND TRAFFIC INFORMATION

1A – Boundary and Topographic Survey and Proposed Site Plan
1B –Trip Generation Information
1C – Trip Distribution, Composition, and Assignment

SECTION 1
SITE AND TRAFFIC INFORMATION

1.A. SITE DESCRIPTION WITH EXISTING AND PROPOSED SITE USES

The proposed site entrance is located on the southerly side of Spring Hill Road, at a location approximately 0.6 miles westerly of the Spring Hill Road/US Route 1 intersection in the City of Saco, Maine. The proposed development will be built on a 15.67-acre vacant parcel. Spring Hill Road in this vicinity is a 2-lane roadway with one 12-foot travel lane with 3-foot paved shoulder in each direction. Spring Hill Road is a low volume roadway (AADT 3480 in 2016) used to access the industrial park area off from US Route 1.

Access to the site will be via a new roadway onto Spring Hill Road. The site is approximately 15.6688 acres in area and is identified on the Saco Tax Map 42, Lot 1-2. The site survey and site plan are included in **Attachment 1A**.

The Applicant proposes to construct a new Public Works Facility as shown on the enclosed Site Plan. This facility will house the Public Works Department and the School Bussing operations for the City of Saco. This new facility will replace the existing Public Works Facility located off North Street (Route 112) just east of the Route 112 overpass over I-95.

1.B. SITE AND VICINITY BOUNDARIES

A site Location Map showing the development area is included with application materials in **Attachment 1A**. The site is bounded all around by undeveloped land. Spring Hill Road is a low volume roadway built to access the commercial and industrial properties found in this area.

Sight distance at the proposed entrance was measured in both directions. Sight distance to the left was measured to be 700-feet. Sight distance to the right was measured to be 420-feet. These sight distance measurements meet the minimum sight distance requirements for an entrance as defined by the MaineDOT entrance rules for the posted speed limit of 30 MPH.

1.C. PROPOSED USES IN THE VICINITY OF THE PROPOSED DEVELOPMENT

CES, Inc. contacted the City of Saco concerning proposed developments around the proposed Public Works Facility. According to the City Engineer, Joseph Laverriere, there are three proposed industrial developments around the proposed site that will generate additional traffic based on the *ITE Trip Generation Manual, 7th Edition*. Only one of the developments is presently under construction. The three developments total 76,600 SF of new industrial development at 66,71, and 85 Industrial Park Road which are located northerly of the I-195 interchanges onto Industrial Park Road.

We used General Light Industrial (LUC 110) to estimate the additional traffic generated by these developments. The AM Peak hour traffic generated by these facilities will be 77 PCE separated

into 69 PCE entering and 8 exiting the three developments. The PM Peak hour traffic generated by these facilities will be 83 PCE separated into 12 PCE entering and 71 exiting the three developments.

1.D. TRIP GENERATION

We performed AM and PM turning movement counts at the existing Public Works Facility located off North Street. PM counts were taken on 4/24/19 and AM counts were taken on 4/25/19. Based on our counts the AM Peak hour traffic volume exceeded the minimum of 100 PCE required for a Traffic Movement Permit. Based on our counts we have estimated the AM and PM peaks for the new facility to be as follows:

AM peak	**103 PCE**	**6:15 – 7:15**
PM peak	**88 PCE**	**15:00 – 16:00**

Since the existing facility and the traffic generated by it is largely driven by employees and entering and exiting busses, which do not change much day to day, we feel that this is a good approximation of the daily peak hour traffic at the new facility as well. Busses and larger trucks were counted as 2 PCE for determination of total traffic generated by the facility.

The trip generation documentation is included in **Attachment 1B**.

1.E. TRIP DISTRIBUTION, COMPOSITION, and ASSIGNMENT

CES, Inc. has based the ratio of entering and exiting traffic on the traffic counts taken at the existing facility: Based on our counts the entering and exiting percentages are shown below:

AM peak hour	**55% enter, 45% exit**
PM peak hour	**45% enter, 55% exit**

The traffic generated by this facility is **100% primary trips** since it is composed of employees and work vehicles (busses and work trucks) that are located at the facility. We do not expect any other traffic types at this facility.

The breakdown of the proposed new facility is given below:

AM peak hour	**103 PCE**	**57 enter**	**46 exit**
PM peak hour	**88 PCE**	**40 enter**	**48 exit**

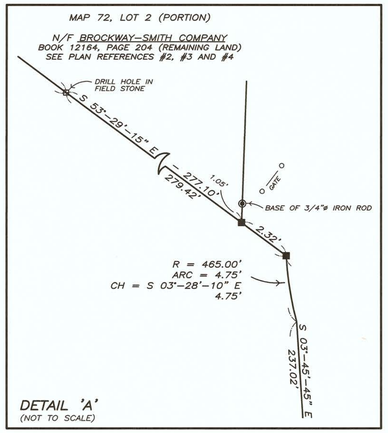
Trip assignment is based on AM and PM peak directional data collected during our counts on 4/24/19 and 4/25/19 as well as employee records and bus schedules supplied to us by the City of Saco. Trip assignment was then determined by estimating the shortest route to the new facility based on where the traffic was coming from and where it was headed.

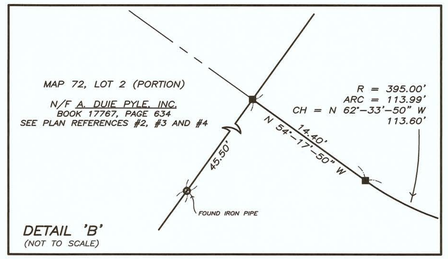
Based upon the trip assignments we have concluded that the study area for the proposed facility will extend from the intersection of Spring Hill Road and US Route 1, along Spring Hill Road onto Industrial Park Road to the intersection of North Street (Route 112) and Industrial Park Road.

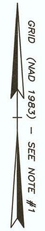
Trip assignment diagrams are included in **Attachment 1C**.

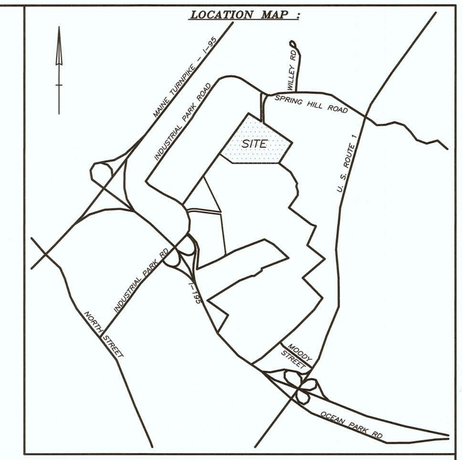
ATTACHMENT 1A

BOUNDARY AND TOPOGRAPHIC SURVEY
PROPOSED SITE PLAN









LEGEND :

- ● PROPOSED IRON ROD WITH CAP
- ■ PROPOSED GRANITE MONUMENT WITH CAP
- ø DIAMETER
- N/F NOW OR FORMERLY
- STONE WALL
- x REMAINS OF WIRE FENCE
- o CHAIN LINK FENCE

LOCUS DEED REFERENCES :

1. ALBERT E. WHITEHURST, GUARDIAN OF SARAH SILSBY TO SWEETSER APRIL 28, 1958 BOOK 1378, PAGE 245 (PARCEL 2)
2. STANLEY P. ROSS TO SWEETSER CORPORATION OCTOBER 26, 1959 BOOK 1418, PAGE 56
3. LINDA M. VALENTINO TO CORMIER LAND CO., INC. MAY 9, 1996 BOOK 7824, PAGE 349

PLAN REFERENCES :

1. "PLAN SHOWING A STANDARD BOUNDARY SURVEY MADE FOR SWEETSER", DATED JUNE 7, 1999, AS REVISED AUGUST 28, 2013 BY DOW & COULOMBE INC.
2. "PLAN SHOWING A STANDARD BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY MADE FOR LINDA M. VALENTINO", DATED APRIL 19, 2000 BY DOW & COULOMBE INC.
3. "OVERALL SITE PLAN OF SACO FREIGHT TERMINAL FOR A. DUIE PYLE, INC.", LATEST REVISION DATED JUNE 15, 2018 BY SEBEGO TECHNICS.
4. "ALTA-NSPS LAND TITLE SURVEY OF 85 INDUSTRIAL PARK ROAD, SACO, MAINE PREPARED FOR A. DUIE PYLE, INC.", LATEST REVISION DATED JULY 17, 2018 BY SEBEGO TECHNICS, RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 396, PAGES 23 AND 24.
5. "PLAN SHOWING A STANDARD BOUNDARY SURVEY MADE FOR CORMIER LAND CO.", DATED DECEMBER 11, 1997 BY DOW & COULOMBE, INC., RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 241, PAGE 44.
6. "PLAN SHOWING LAND OF THE SWEETSER CORPORATION", DATED DECEMBER 4, 1970, AS REVISED MARCH 11, 1993 BY LIBBY & DOW/DOW & COULOMBE, INC.

NOTES :

1. BOUNDARY INFORMATION (BEARINGS AND DISTANCES) COPIED FROM, AND CALCULATED FROM, PLAN REFERENCE #1. HOWEVER, THE BEARINGS HAVE BEEN ROTATED, AND THE COORDINATES TRANSLATED, TO AGREE WITH BEARINGS AND COORDINATES SHOWN ON PLAN REFERENCE #4.
2. TOTAL AREA EQUALS 42.000 ACRES EXCLUDING PROPOSED CONVEYANCE TO CORMIER LAND CO., INC.
3. OWNERS OF RECORD: SWEETSER, 50 MOODY STREET, SACO, MAINE; CORMIER LAND CO., INC., 774 PORTLAND ROAD, SACO, MAINE
4. THE SUBJECT PARCEL OF LAND IS A PORTION OF LAND SHOWN AS LOT 1 ON CITY OF SACO ASSESSOR'S MAP 42, TOGETHER WITH A PORTION OF 6 SHOWN ON CITY OF SACO ASSESSOR'S MAP 58.
5. APPLICANT: CITY OF SACO, MAINE, 300 MAIN STREET, SACO, ME 04072
6. ENGINEER: CES INC., 146 MAIN STREET, SACO, ME 04072
7. SURVEYOR: DOW & COULOMBE, INC., 13 PARK STREET, SACO, ME 04072
8. THE SUBJECT PARCEL IS LOCATED PARTLY WITHIN THE BUSINESS DISTRICT 8 (B-8) ZONE, AND PARTLY WITHIN THE INDUSTRIAL DISTRICT 1 (I-1) ZONE. ALL OF THE PROPOSED LOTS ARE LOCATED WITHIN THE B-8 ZONE. THE MINIMUM FRONT SETBACK IN THE B-8 ZONE IS 20 FEET; THE MINIMUM SIDE AND REAR SETBACKS ARE 15 FEET.
9. CONTOUR INFORMATION PLOTTED FROM INFORMATION AVAILABLE AT THE MAINE OFFICE OF GIS WEBSITE DERIVED USING LIDAR TECHNOLOGY.
10. WETLAND BOUNDARIES PLOTTED FROM SHAPE FILE PROVIDED BY THE CITY OF SACO PUBLIC WORKS DEPARTMENT AND WERE IDENTIFIED ON THE GROUND BY NORMANDEAU ASSOCIATES.
11. THE PROPOSED LOTS ARE TO BE SERVICED BY PUBLIC WATER AND SEWER.

APPROVED BY : DATE :

CHAIRPERSON

CITY OF SACO PLANNING BOARD

YORK, ss. REGISTRY OF DEEDS
Received_____
at_____h_____m_____M, and
Filed in Plan Book_____, Page_____
ATTEST:_____
Register

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

No.	Revision	Date

PRELIMINARY PLAN SHOWING
SPRING HILL INDUSTRIAL PARK EXPANSION
A SUBDIVISION PREPARED FOR THE CITY OF SACO, MAINE
(MAILING ADDRESS : C/O JOSEPH LAVERRIERE, CITY ENGINEER, 300 MAIN STREET, SACO, ME 04072)
PARCEL LOCATED SOUTHWESTERLY OF SPRING HILL ROAD
SACO MAINE

STATE OF MAINE MICHAEL J. COULOMBE No. 1253 REGISTERED PROFESSIONAL LAND SURVEYOR

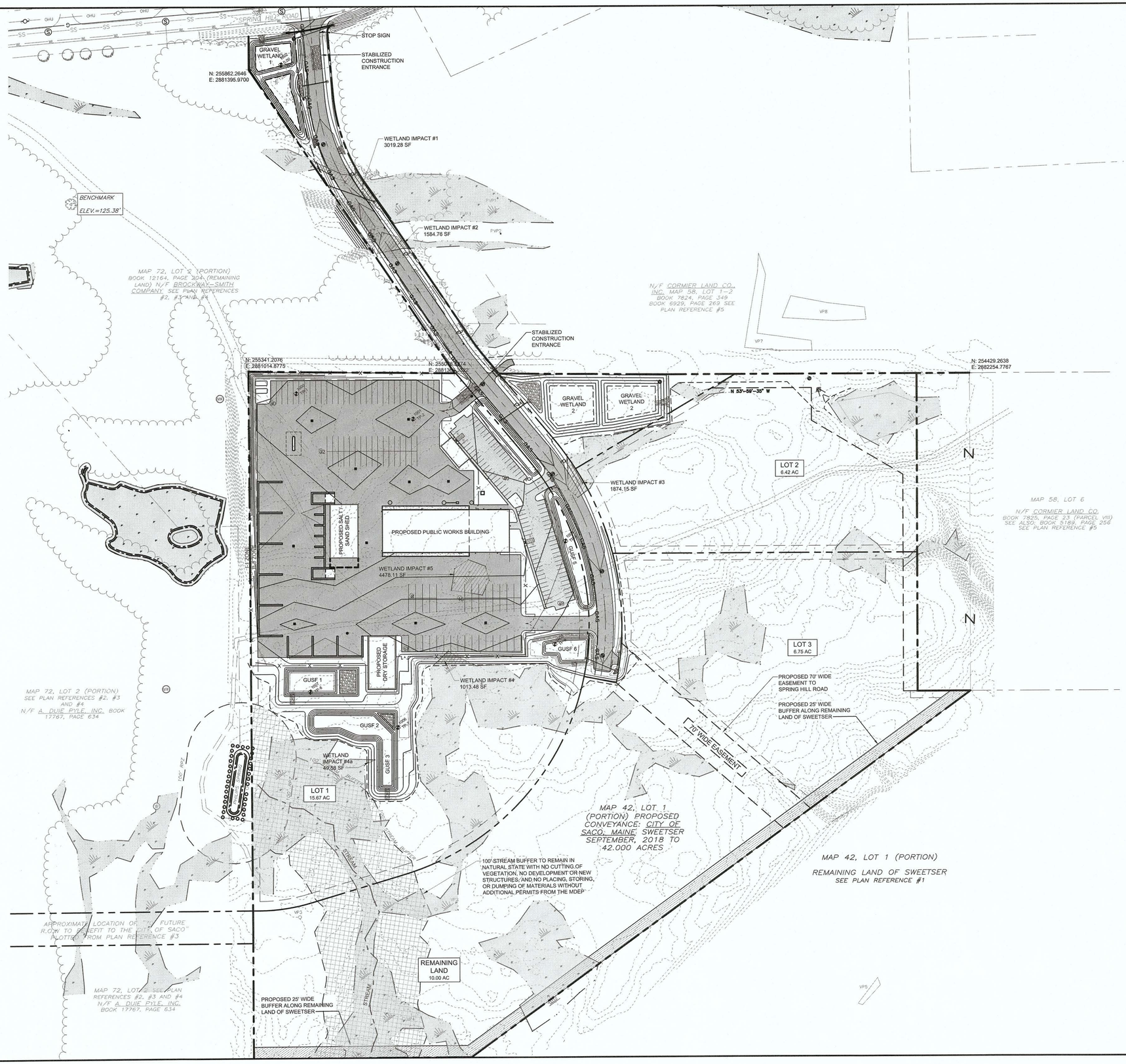
Dow & Coulombe, Inc.
Land Surveyors & Land Planners Since 1864
13 Park Street, Saco, Maine 04072
Telephone: (207)284-4521 * Fax: (207)284-4522
info@dowcoulombe.com * www.dowcoulombe.com

Celebrating 150 years

Date: MAY 10, 2019
H. Scale: 1" = 100' | Drawn by: AMS/MJC
Chk'd by: PDD | Appv'd by: MJC
SHEET 1 OF 1

ZONE-21S
Dwgs2019\SACOPRELIM21S

Z:\DrawDocuments\Dwgs2019\SACOPRELIM21S.dwg PLAN, 5/15/2019 10:48:20 AM, 1:100



TEST PIT LOCATIONS

Pnt	Desc	Grid Northing	Grid Easting Longitude	Latitude
1000	TP-1	255242.7787'	2881069.2491'	W70° 26' 13.09" N43° 31' 59.93"
1001	TP-2	255051.6281'	2881238.6880'	W70° 26' 10.78" N43° 31' 58.05"
1002	TP-3	254897.5760'	2881372.5197'	W70° 26' 08.95" N43° 31' 56.53"
1003	TP-4	254894.9068'	2881501.3724'	W70° 26' 07.20" N43° 31' 56.51"
1004	TP-5	254648.5238'	2881347.3083'	W70° 26' 09.28" N43° 31' 54.07"
1005	TP-6	254483.4396'	2881198.2164'	W70° 26' 11.30" N43° 31' 52.43"
1006	TP-7	254537.3096'	2880822.7142'	W70° 26' 16.40" N43° 31' 52.95"
1007	TP-8	254708.7850'	2880717.0246'	W70° 26' 17.84" N43° 31' 54.64"

Wetland Impact Tabulation

No.	Area (SF)	Area (Ac)
1	3019	0.07
2	1585	0.04
3	1874	0.04
4	1013	0.02
4a	50	0.00
5	4478	0.10
Total	***12019***	***0.27592***

WETLAND NOTE:
WETLAND IMPACTS SUBJECT TO MAINE DEP NRPA PERMIT.

SURVEY NOTES:

1. BOUNDARY INFORMATION PROVIDED BY DOW AND COULOMBE, INC.
2. TOPOGRAPHY SHOWN IS 2FT LIDAR CONTOUR DATA, COMPLIMENTARY OF MAINE OFFICE OF GIS, SUPPLEMENTED BY TOPOGRAPHY FROM A GROUND SURVEY PERFORMED BY DOW AND COULOMBE, INC. FOR ENTRANCE DRIVE.

SITE DATA:

TAX MAP 42 / PORTION OF LOT 1

	PROPOSED	ALLOWED
MINIMUM LOT AREA:	10,000 SF	42 ACRES
MINIMUM STREET FRONTAGE:	50 FT	181.43 FT
MINIMUM FRONT YARD:	20 FT	1039 FT
MINIMUM SIDE YARD:	15 FT	308 FT
MINIMUM REAR YARD:	15 FT	1081 FT
MAXIMUM LOT COVERAGE:	50%	18%
MAXIMUM BUILDING HEIGHT:	60 FT	35 FT

THIS IS TO CERTIFY THAT AFTER REVIEWING THE SITE PLAN SUBMISSION INFORMATION FOR THE PROJECT SHOWN ON THIS PLAN AND CONSIDERING EACH OF THE CRITERIA SET FORTH BY THE CITY OF SACO CODE, AND IN ACCORDANCE WITH THE APPLICATION REQUIREMENTS, THE UNDERSIGNED HAVE MADE FINDINGS OF FACT ESTABLISHING THAT THIS PLAN ALONG WITH ITS ADDITIONAL SUBMISSION INFORMATION HAS MET ALL THE CRITERIA SET FORTH AND THEREFORE THE SITE PLAN IS APPROVED.

APPROVED BY THE CITY OF SACO PLANNING BOARD ON: _____

CONDITIONS:

PLANNING BOARD SIGNED ON: _____

STATE OF MAINE
VICTOR J. SMITH
No. 9604
LICENSED
PROFESSIONAL ENGINEER
5/31/19
FOR TRAFFIC ONLY

PROPOSED SITE PLAN

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

CES INC
Engineers • Environmental Scientists • Surveyors

Waterville
44 Main Street
PO Box 1401
Waterville, ME
T:207-680-2202
F:207-680-2345

Lewiston
640 Main Street
Lewiston, ME
T:207-795-6112
F:207-795-6128

Presque Isle
549 Main Street
PO Box 1271
Presque Isle, ME
T:207-764-8412
F:207-764-4414

Bar Harbor
1965 State Hwy 102
Bar Harbor, ME
T:207-288-5000
F:207-288-5088

Brewer
465 South Main Street
Brewer, ME
T:207-989-4824
F:207-989-4951

Machias
6 Dublin Street
PO Box 567
Machias, ME
T:207-255-3270
F:207-255-8387

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
PROPOSED SITE PLAN

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R3	CITY REVIEW COMMENTS	2019-05-06	BLQ	JDK
R2	ADDED STOP SIGN AND NOTES	2019-04-30	BLQ	JDK
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R4				
R5				
R6				
R7				

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
5/31/2019
LICENSED
PROFESSIONAL ENGINEER

SCALE	1"=100'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDM
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002
DRAWING NUMBER	C102

P:\10602.SACO\002-IND PARK EXP-PUBLIC WORKS BLDG.SMTP\02-CAD_DRAWINGS\CIVIL D\SIGN_DWGS\10602.002-C-SP.DWG, 5/30/2019 2:25 PM

ATTACHMENT 1B

TRIP GENERATION INFORMATION



4/24/19 (2)

EXIT

Start

	① EB Route 112 Left	② WB Route 112 Right	③ DPW Entrance Left	④ DPW Entrance Right
15:00	6 / 2 / 2 / B	1 / 7 / BBB / 6	11 / 11 / 0	6 / 8 / 2 / B
15:15	0 / 10 / 10 / BBBBB	3 / 13 / 10 / BBBT(B)B	6 / 6 / 0	6 / 10 / 4 / TT
15:30	0 / 2 / 2 / B	0 / 4 / 4 / BBB	3 / 3 / 0	1 / 1 / 0
15:45	0 / 0 / 0	0 / 2 / 2 / B	6 / 6 / 0	3 / 3 / 0

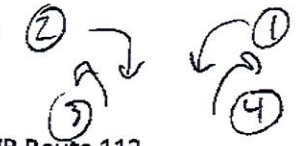
Peak Activity 2:55 – 3:05

Traffic Counts (Afternoon)

Date: 4/24/2019

Entrance to Existing Saco Public Works

PM Peak



Start	ENTER: EB Route 112 (1) Left	ENTER: WB Route 112 (2) Right	EXIT: DPW Entrance (3) Left	EXIT: DPW Entrance (4) Right
14:00	1 / 1 / 0	111 / 3 / 9 / 6 / B TT	1 / 1 / 3 / 2 / T	1111 / 4 / 4 / 0
14:15	11 / 2 / 2 / 0	~~HH~~ 1 / 6 / 6 / 2 / T	1111 / 4 / 8 / 4 / B B	0 / 0 / 0
14:30	0 / 2 / 2 / B	11 / 2 / 2 / 0	11 / 2 / 2 / 0	0 / 0 / 0
14:45	1 / 1 / 0	0 / 0 / 6	~~HH~~ / 5 / 5 / 0	11 / 2 / 2 / 0

4/24/2019 (3)

Start	ENTER: EB Route 112 Left	ENTER: WB Route 112 Right	EXIT: DPW Entrance Left	EXIT: DPW Entrance Right
16:00				
16:15				
16:30				
16:45				

All Buses are in by 16:00

No more traffic

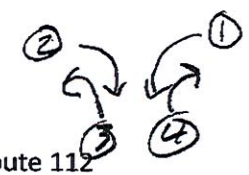
Traffic Counts (Morning)

Date: 4/25/2019

(1)

Entrance to Existing Saco Public Works

AM Peak



Start	ENTER		EXIT	
	(1) EB Route 112 Left	(2) WB Route 112 Right	(3) DPW Entrance Left	(4) DPW Entrance Right
6:00	2 / 2 / 0	2 / 2 / 0	0 / 6 / 6	0 / 0 / 0
6:15	9 / 9 / 0	9 / 9 / 0	0 / 0 / 0	1 / 3 / 2 / B
6:30	7 / 7 / 0	8 / 6 / 0	0 / 0 / 0	0 / 6 / 6 / BBB
6:45	9 / 9 / 0	9 / 9 / 0	3 / 17 / 14 / BBBBBBB	0 / 6 / 6 / BBB

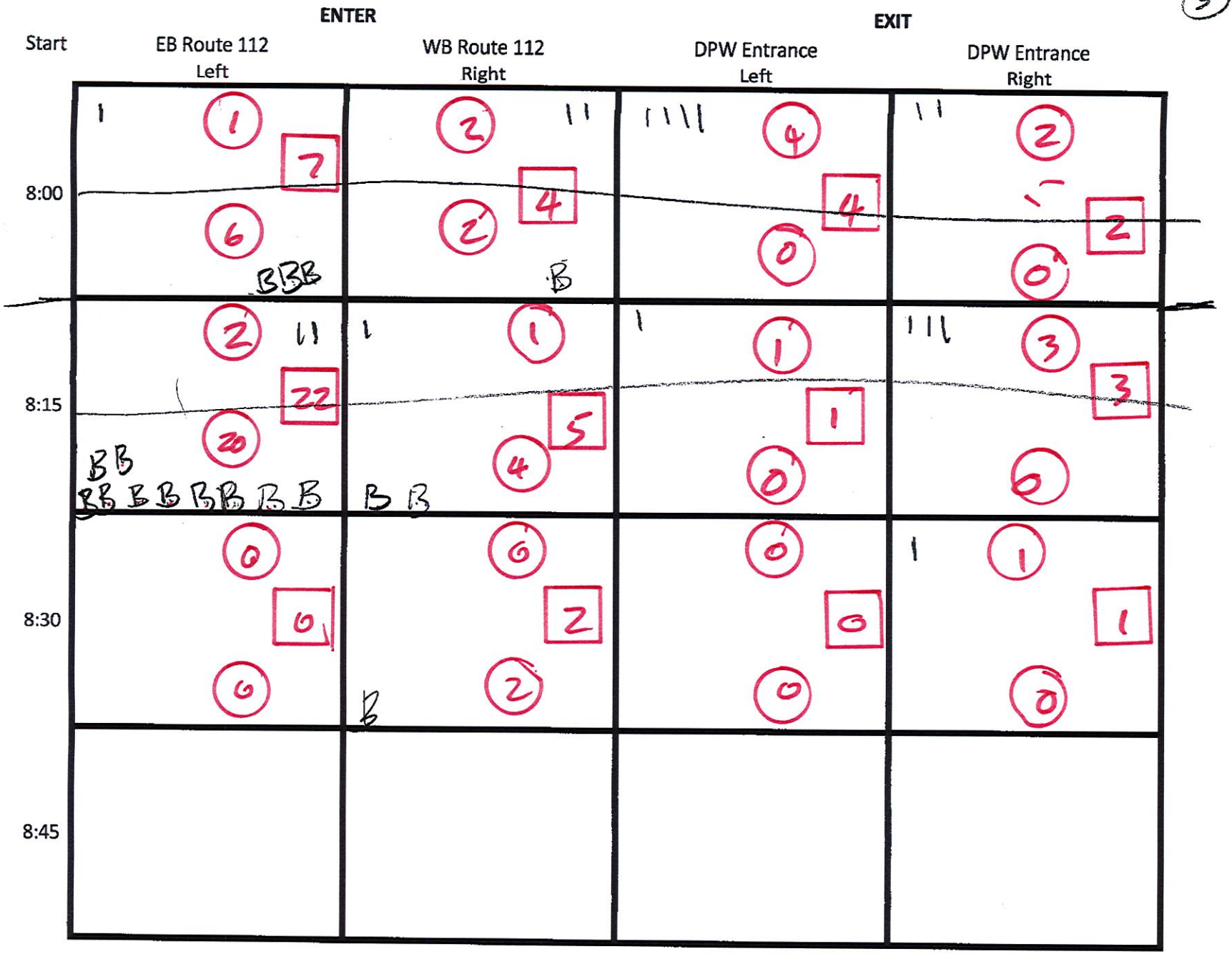
4/25/2019



Start	ENTER: EB Route 112 (1) Left	ENTER: WB Route 112 (2) Right	EXIT: DPW Entrance (3) Left	EXIT: DPW Entrance (4) Right
7:00	1 / 1 / 0	3 / 5 / 2 T	4 / 11 / 6 BBB.	1 / 3 / 2 B
7:15	0 / 0 / 0	1 / 1 / 0	3 / 7 / 4 TT	0 - 0 / 0
7:30	0 / 0 / 0	2 / 2 / 0	3 / 5 / 2 T	1 / 1 / 0
7:45	0 / 0 / 0	2 / 2 / 0	1 / 1 / 0	2 / 2 / 0

4/25/2019

(3)


ENTER
EXIT
Start
EB Route 112 Left
WB Route 112 Right
DPW Entrance Left
DPW Entrance Right
8:00
8:15
8:30
8:45

Traffic Counts (Morning) Date: 4/25/2019

Entrance to Existing Saco Public Works

AM Peak

	ENTER		EXIT		
Start	EB Route 112 Left	WB Route 112 Right	DPW Entrance Left	DPW Entrance Right	Peak Hour PCE's
6:00	2	2	0	0	87
6:15	9	9	0	3	103
6:30	7	8	0	6	90
6:45	9	9	17	6	77
7:00	1	5	11	3	41
7:15	0	1	7	0	38
7:30	0	2	5	1	61
7:45	0	2	1	2	56
8:00	7	4	4	2	
8:15	22	5	1	3	
8:30	0	2	0	1	
8:45					
Peak Hour	26	31	28	18	

PCE's (Afternoon) Date: 4/24/2019

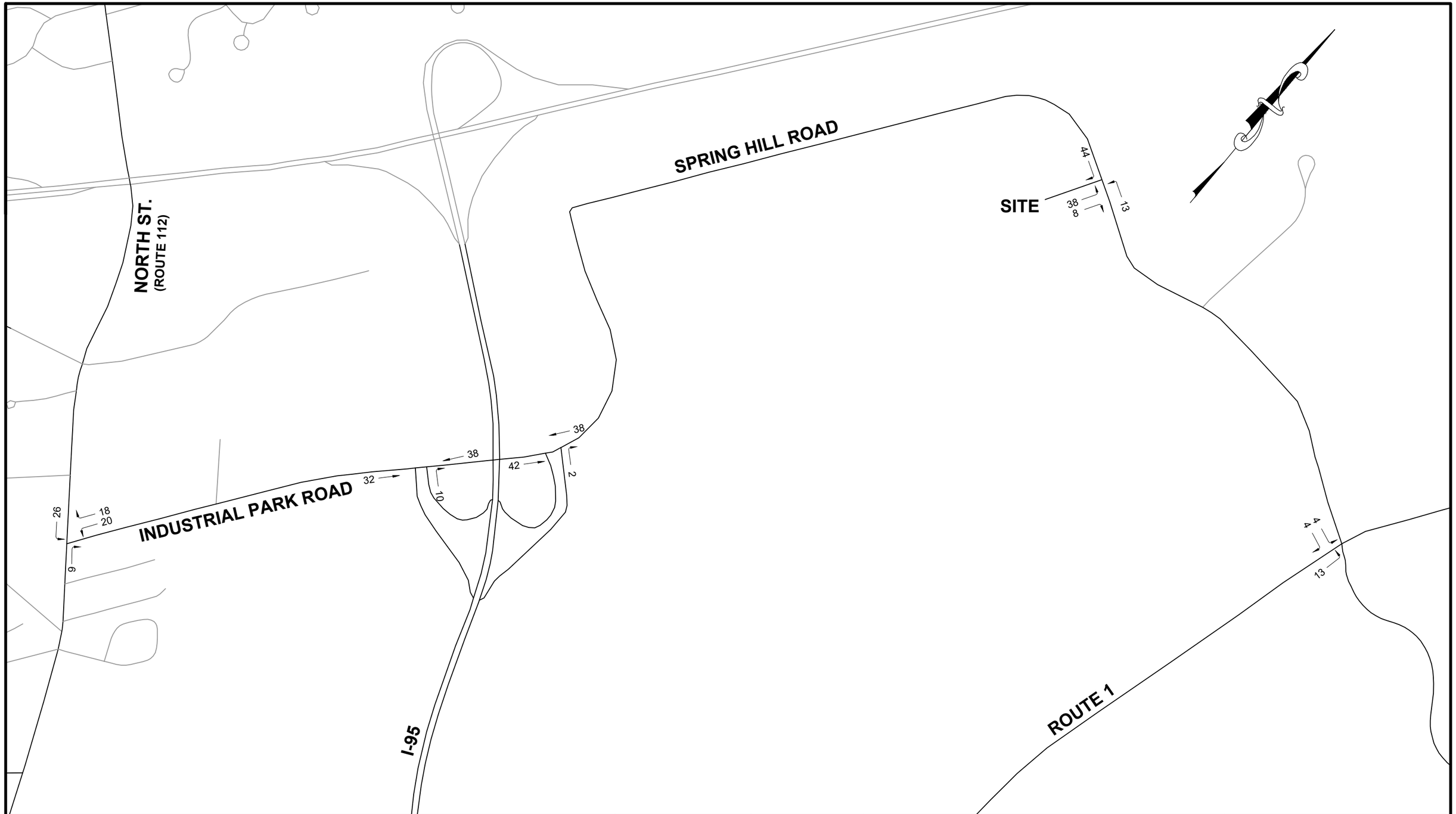
Entrance to Existing Saco Public Works

PM Peak

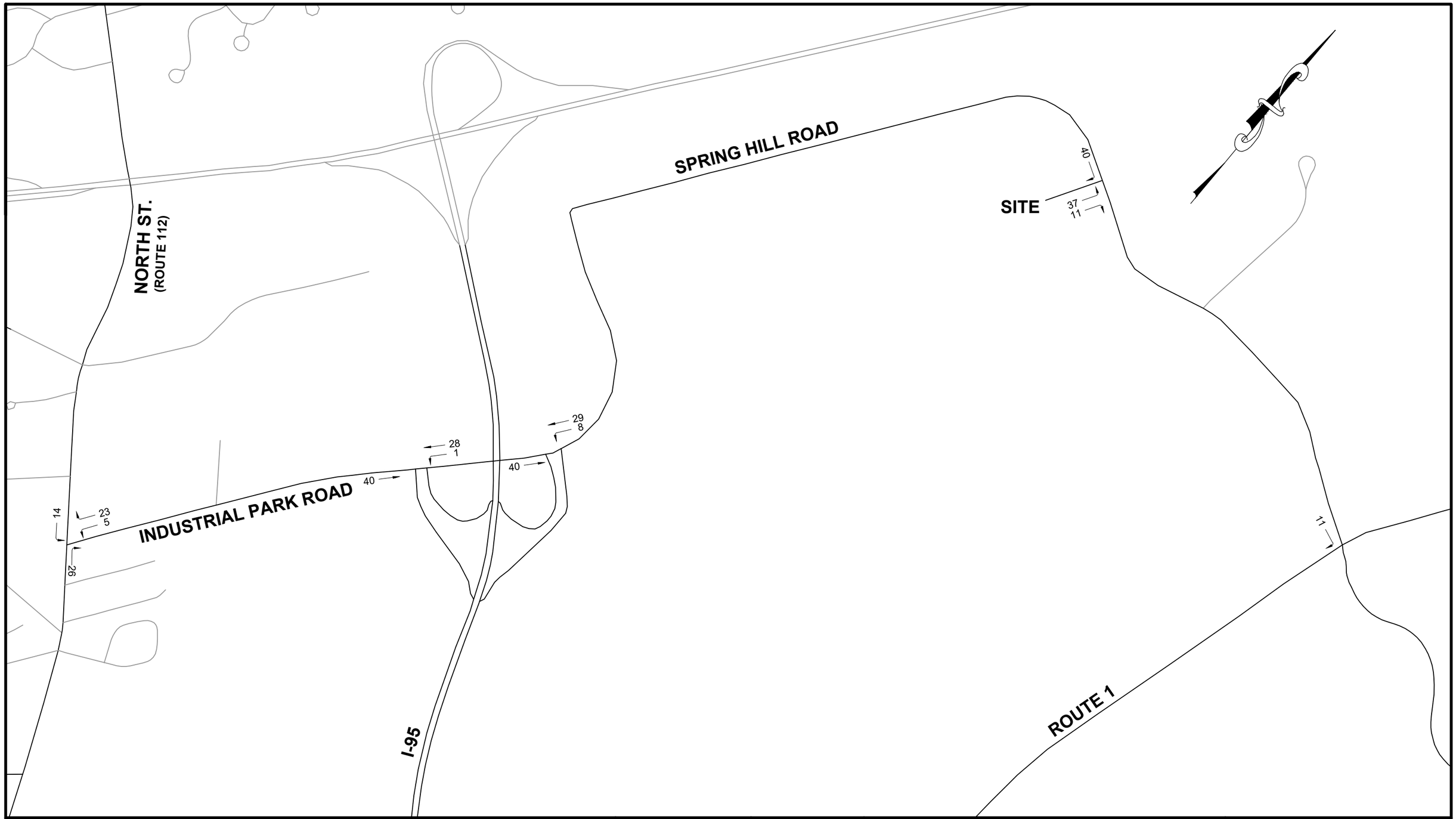
	ENTER		EXIT		
Start	EB Route 112 Left	WB Route 112 Right	DPW Entrance Left	DPW Entrance Right	Peak Hour PCE
14:00	1	9	3	4	49
14:15	2	8	8	0	60
14:30	2	2	2	0	81
14:45	1	0	5	2	85
15:00	2	7	11	8	88
15:15	10	13	6	10	
15:30	2	4	3	1	
15:45	0	2	6	3	
16:00					
16:15					
16:30					
16:45					
Peak Hour	14	26	26	22	

ATTACHMENT 1C

TRIP DISTRIBUTION, COMPOSITION, AND ASSIGNMENT



PROJECT TITLE: **SACO DEPARTMENT OF PUBLIC WORK SACO, MAINE**	DWG: **T101**	BY: BTH	REV:	DESCRIPTION: FOR REVIEW	CES INC Engineers • Environmental Scientists • Surveyors
		DATE: 2019.06.13	REV DATE:		
SHEET TITLE: **AM PEAK (0615 - 0715) PRIMARY TRIPS**	JN: 10602.002	APPROVED BY:	ISSUE:	DESCRIPTION: NOT FOR CONSTRUCTION	
	SCALE: 1"=700'	CHECKED BY:	ISSUE DATE:		



PROJECT TITLE: **SACO DEPARTMENT OF PUBLIC WORK SACO, MAINE**	DWG: **T101**	BY: BTH	REV:	DESCRIPTION: FOR REVIEW	CES INC Engineers • Environmental Scientists • Surveyors
		DATE: 2019.06.13	REV DATE:		
SHEET TITLE: **PM PEAK (1500 - 1600) PRIMARY TRIPS**	JN: 10602.002	APPROVED BY:	ISSUE:	DESCRIPTION: NOT FOR CONSTRUCTION	
	SCALE: 1"=700'	CHECKED BY:	ISSUE DATE:		

SECTION 2

TRAFFIC CRASHES

2A - Crash Map, Crash Report, Crash Diagrams

SECTION 2
TRAFFIC CRASHES

2.A. CRASH SUMMARY DATA

CES, Inc. obtained the crash data from MaineDOT for the period of January 2015 to December 2017, the most recent period available.

In order to evaluate whether a location has a crash problem, MaineDOT uses two criteria to define a High Crash Location (HCL). Both criteria must be met in order to be classified as an HCL.

1. A critical rate factor of 1.00 or more for a three-year period. (A Critical Rate Factor {CRF} compares the actual crash rate to the rate of similar intersections or roadway segments in the state. A CRF of less than 1.00 indicates a rate of less than average) and:

2. A minimum of 8 crashes over a three-year period.

The tables below summarize the HCL's provided by MaineDOT.

MaineDOT Crash Data for 2015-20017: Intersections

Node	Intersection	# of Crashes	CRF	HCL?
54829	INT of NORTH ST, INDUSTRIAL PARK ROAD	29	1.02	YES

MaineDOT Crash Data for 2015-2017: Road Elements

Nodes	Street	Element	# of Collisions	CRF	HCL?
66498-58233	INDUSTRIAL PARK ROAD	3140132	15	1.32	YES

As shown in the tables above, there are two High Crash locations within the study area of proposed development.

The intersection of North Street and Industrial Park Road (Node 54829) had 29 crashes and a Critical Rate Factor of 1.02 during the study period. A crash diagram is included. Sixteen of the 29 crashes involved rear-end collisions with most of them occurring on Industrial Park Road. Nine of the 29 crashes involved failure to yield crashes and most of these occurred with westbound North Street thru-traffic colliding with eastbound left-turning traffic. Both crash types are found at intersections that see peak hour congestion. The failure to yield crashes are also typical of permitted left-turns during peak hour movements.

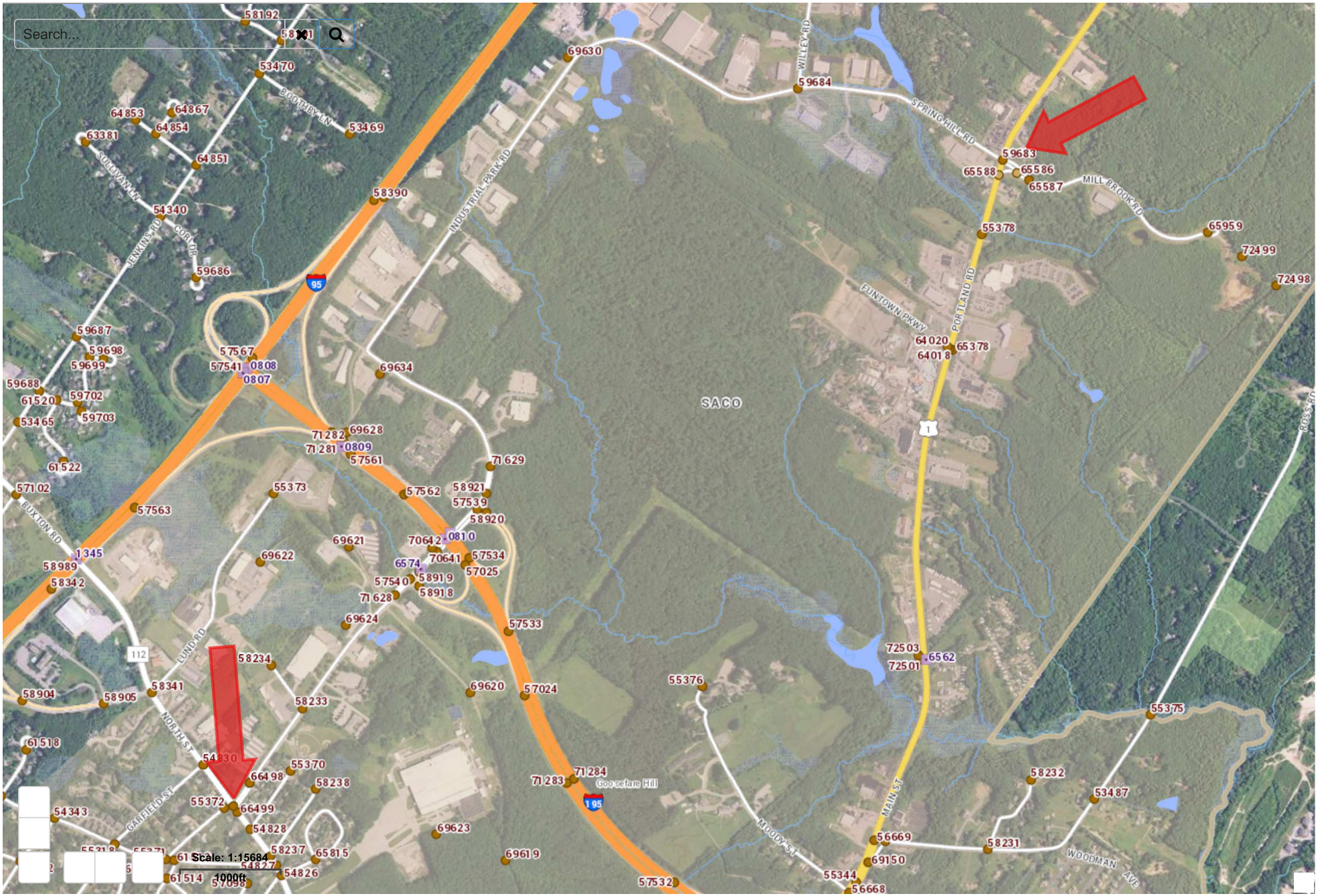
The roadway element 3140132 had 15 crashes and a Critical Rate Factor of 1.32 during the study period. A crash diagram is included. Seven of the 15 crashes appear to involve turning traffic into entrances along Industrial Park Road. Six of the 15 crashes involved rear-end collisions typical of heavily travelled roadways with multiple entrances and/or backed up traffic at an intersection. The only mitigation possible for this stretch of road would be to eliminate or combine entrances under access management protocols. This is very difficult to do considering these entrances have been in existence for a long period of time.

2.A. ATTACHMENTS

***Attachment 2A**; MaineDOT Collision Map, Summary, Collision Diagrams*

ATTACHMENT 2A

MAINEDOT
Collision Map
Crash Report
Crash Diagrams


Search...
SACO
SPRING HILL RD
PORTLAND RD
MILL BROOK RD
FUNTOWN PKWY
INDUSTRIAL PARK RD
WILLEY RD
BOOTHBY LN
SULLIVAN MAR
JENKINS RD
CURLEY DR
BUXTON RD
LUND RD
NORTH ST
GARFIELD ST
MOODY ST
MAIN ST
WOODMAN AVE
ROSS RD
Goosefare Hill
Scale: 1:15684
1000ft

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ **Crash Summary I** ☐ **Section Detail** ☑ **Crash Summary II** ☐ **1320 Public** ☐ **1320 Private** ☐ **1320 Summary**

REPORT DESCRIPTION

Saco
Industrial Park Rd./Spring Hill Rd. from Rte. 112/North St. to Rte. 1/Portland Rd.

REPORT PARAMETERS

Year 2015, Start Month 1 through Year 2017 End Month: 12

Route: **3151668**	Start Node: **54829**	Start Offset: **0**	☐ **Exclude First Node**
	End Node: **59683**	End Offset: **0**	☐ **Exclude Last Node**
Route: **3210330**	Start Node: **71629**	Start Offset: **0**	☑ **Exclude First Node**
	End Node: **57539**	End Offset: **0**	☑ **Exclude Last Node**
Route: **3210330**	Start Node: **57539**	Start Offset: **0**	☑ **Exclude First Node**
	End Node: **70641**	End Offset: **0**	☑ **Exclude Last Node**
Route: **3210330**	Start Node: **70641**	Start Offset: **0**	☑ **Exclude First Node**
	End Node: **57540**	End Offset: **0**	☑ **Exclude Last Node**
Route: **3210330**	Start Node: **57540**	Start Offset: **0**	☑ **Exclude First Node**
	End Node: **71628**	End Offset: **0**	☑ **Exclude Last Node**
Route: **3209560**	Start Node: **66499**	Start Offset: **0**	☐ **Exclude First Node**
	End Node: **66498**	End Offset: **0**	☑ **Exclude Last Node**

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
54829	3151668 - 0	Int of INDUSTRIAL PARK RD NORTH ST	9	29	0	0	0	6	23	20.7	8.146	1.19	1.17	1.02
												Statewide Crash Rate:	0.74	
66498	3151668 - 0.05	Int of INDUSTRIAL PARK RD RD INV 3209560	2	0	0	0	0	0	0	0.0	7.041	0.00	0.34	0.00
												Statewide Crash Rate:	0.15	
58233	3151668 - 0.22	Int of INDUSTRIAL PARK RD LEHNER RD	2	1	0	0	0	0	1	0.0	6.440	0.05	0.35	0.00
												Statewide Crash Rate:	0.15	
71628	3151668 - 0.49	Non Int INDUSTRIAL PARK RD	2	0	0	0	0	0	0	0.0	6.369	0.00	0.35	0.00
												Statewide Crash Rate:	0.15	
57540	3151668 - 0.53	Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL P	9	12	0	0	1	4	7	41.7	7.460	0.54	1.19	0.00
												Statewide Crash Rate:	0.74	
58919	3151668 - 0.55	Int of 195E OFF IND PK INDUSTRIAL PARK RD	2	1	0	0	0	0	1	0.0	2.195	0.15	0.37	0.00
												Statewide Crash Rate:	0.11	
70641	3151668 - 0.60	Int of ENT TO PARK RIDE INDUSTRIAL PARK RD	2	1	0	0	0	0	1	0.0	4.482	0.07	0.38	0.00
												Statewide Crash Rate:	0.15	
57539	3151668 - 0.71	Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL P	2	3	0	0	0	2	1	66.7	3.616	0.28	0.32	0.00
												Statewide Crash Rate:	0.11	
58921	3151668 - 0.74	Int of 195W OFF IND PK INDUSTRIAL PARK RD	2	0	0	0	0	0	0	0.0	0.911	0.00	0.44	0.00
												Statewide Crash Rate:	0.11	
71629	3151668 - 0.79	Non Int INDUSTRIAL PARK RD	2	0	0	0	0	0	0	0.0	1.818	0.00	0.49	0.00
												Statewide Crash Rate:	0.15	
59684	3151668 - 2.25	Int of SPRING HILL RD WILLEY RD	2	0	0	0	0	0	0	0.0	1.648	0.00	0.50	0.00
												Statewide Crash Rate:	0.15	
P59683	3151668 - 2.67	Int of MILL BROOK RD PORTLAND RD SPRING HILL RD	9	12	0	0	5	2	5	58.3	6.130	0.65	1.23	0.00
												Statewide Crash Rate:	0.74	
66499	3209560 - 0	Int of NORTH ST, RD INV 3209560	2	0	0	0	0	0	0	0.0	4.852	0.00	0.38	0.00
												Statewide Crash Rate:	0.15	
Study Years:	3.00	**NODE TOTALS:**		59	0	0	6	14	39	33.9	61.108	0.32	0.47	0.69

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
54829	66498	3140131	0 - 0.05	3151668 - 0	0.05	2	3	0	0	0	2	1	66.7	0.00259	385.74	496.72	0.00
Int of INDUSTRIAL PARK RD NORTH ST				RD INV 31 51668											Statewide Crash Rate: 174.81		
66498	58233	3140132	0 - 0.17	3151668 - 0.05	0.17	2	15	0	1	0	5	9	40.0	0.01092	458.00	347.74	1.32
Int of INDUSTRIAL PARK RD RD INV 3209560				RD INV 31 51668											Statewide Crash Rate: 174.81		
71628	58233	4210505	0 - 0.27	3151668 - 0.22	0.27	2	13	0	0	0	6	7	46.2	0.01720	251.98	315.07	0.00
Non Int INDUSTRIAL PARK RD				RD INV 31 51668											Statewide Crash Rate: 174.81		
57540	71628	4210508	0 - 0.04	3151668 - 0.49	0.04	2	0	0	0	0	0	0	0.0	0.00127	0.00	594.94	0.00
Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL PARK RAMP ON FROM INDUSTRIAL				RD INV 31 51668											Statewide Crash Rate: 174.81		
57540	58919	4210509	0 - 0.02	3151668 - 0.53	0.02	2	0	0	0	0	0	0	0.0	0.00036	0.00	748.82	0.00
Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL PARK RAMP ON FROM INDUSTRIAL				RD INV 31 51668											Statewide Crash Rate: 174.81		
70641	58919	4210510	0 - 0.05	3151668 - 0.55	0.05	2	0	0	0	0	0	0	0.0	0.00109	0.00	617.30	0.00
Int of ENT TO PARK RIDE INDUSTRIAL PARK RD				RD INV 31 51668											Statewide Crash Rate: 174.81		
57539	70641	4210511	0 - 0.11	3151668 - 0.60	0.11	2	2	0	0	0	1	1	50.0	0.00231	288.17	511.59	0.00
Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL PARK RAMP ON FROM INDUSTRIAL				RD INV 31 51668											Statewide Crash Rate: 174.81		
57539	58921	4210512	0 - 0.03	3151668 - 0.71	0.03	2	0	0	0	0	0	0	0.0	0.00024	0.00	749.64	0.00
Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL PARK RAMP ON FROM INDUSTRIAL				RD INV 31 51668											Statewide Crash Rate: 174.81		
71629	58921	4210513	0 - 0.05	3151668 - 0.74	0.05	2	0	0	0	0	0	0	0.0	0.00045	0.00	730.48	0.00
Non Int INDUSTRIAL PARK RD				RD INV 31 51668											Statewide Crash Rate: 174.81		
59684	71629	4210506	0 - 0.46	3151668 - 0.79	0.46	2	4	0	1	0	1	2	50.0	0.00836	159.49	369.94	0.00
Int of SPRING HILL RD WILLEY RD				RD INV 31 51668											Statewide Crash Rate: 174.81		
59684	71629	4210506	0.46 - 1.46	3151668 - 1.25	1	2	5	0	0	0	2	3	40.0	0.01817	91.71	311.50	0.00
Int of SPRING HILL RD WILLEY RD				RD INV 31 51668											Statewide Crash Rate: 174.81		
59684	59683	3115059	0 - 0.42	3151668 - 2.25	0.42	2	2	0	0	0	1	1	50.0	0.00539	123.72	411.76	0.00
Int of SPRING HILL RD WILLEY RD				RD INV 31 51668											Statewide Crash Rate: 174.81		
71629	57539	4210515	0 - 0.08	3210330 - 0	0.08	2	0	0	0	0	0	0	0.0	0.00073	0.00	674.83	0.00
Non Int INDUSTRIAL PARK RD				RD INV 3210330											Statewide Crash Rate: 174.81		
57539	70641	4210516	0 - 0.11	3210330 - 0.08	0.11	2	0	0	0	0	0	0	0.0	0.00231	0.00	511.59	0.00
Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL PARK RAMP ON FROM INDUSTRIAL				RD INV 3210330											Statewide Crash Rate: 174.81		
70641	57540	4210567	0 - 0.07	3210330 - 0.19	0.07	2	0	0	0	0	0	0	0.0	0.00153	0.00	568.77	0.00
Int of ENT TO PARK RIDE INDUSTRIAL PARK RD				RD INV 3210330											Statewide Crash Rate: 174.81		

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
57540	71628	4210563	0 - 0.04	3210330 - 0.26	0.04	2	0	0	0	0	0	0	0.0	0.00127	0.00	594.94	0.00
Int of INDUSTRIAL PARK RD RAMP OFF TO INDUSTRIAL PARK RAMP ON FROM INDUSTRIAL				RD INV 3210330											Statewide Crash Rate: 174.81		
66499	66498	3065837	0 - 0.06	3209560 - 0	0.06	2	1	0	0	0	0	1	0.0	0.00074	448.99	672.00	0.00
Int of NORTH ST, RD INV 3209560				RD INV 3209560											Statewide Crash Rate: 174.81		
Study Years: 3.00				**Section Totals:**	3.03		45	0	2	0	18	25	44.4	0.07494	200.16	244.42	0.82
				Grand Totals:	3.03		104	0	2	6	32	64	38.5	0.07494	462.58	379.08	1.22

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
54829	66498	3140131	0 - 0.05	3151668 - 0	3	0	0	0	2	1	2015-15953	05/26/2015	0.02	C
											2017-21596	07/17/2017	0.03	C
											2017-39896	12/13/2017	0.04	PD
66498	58233	3140132	0 - 0.17	3151668 - 0.05	15	0	1	0	5	9	2017-6602	02/16/2017	0.06	PD
											2017-16909	06/02/2017	0.07	C
											2017-13140	04/19/2017	0.07	C
											2017-33295	10/26/2017	0.07	PD
											2015-43868	09/28/2015	0.07	PD
											2016-12230	04/15/2016	0.07	PD
											2015-13154	04/22/2015	0.07	PD
											2016-4785	02/05/2016	0.08	PD
											2017-13065	04/16/2017	0.10	A
											2017-13738	04/26/2017	0.15	PD
											2015-42110	09/14/2015	0.16	C
											2016-12764	05/03/2016	0.16	PD
											2015-7467	01/15/2015	0.17	C
											2016-3261	01/05/2016	0.18	PD
											2017-16060	05/22/2017	0.19	C
71628	58233	4210505	0 - 0.27	3151668 - 0.22	13	0	0	0	6	7	2017-13880	04/26/2017	0.26	C
											2016-3429	01/26/2016	0.26	C
											2016-25397	09/08/2016	0.26	C
											2015-17142	06/09/2015	0.28	PD
											2015-19958	07/07/2015	0.31	PD
											2015-43863	09/25/2015	0.32	C
											2015-8717	03/06/2015	0.32	PD
											2015-11066	03/30/2015	0.32	PD
											2016-15401	06/06/2016	0.35	PD
											2016-12586	05/03/2016	0.41	C
											2016-8335	03/16/2016	0.41	PD
											2017-12824	04/14/2017	0.47	C
											2017-31338	10/12/2017	0.48	PD
57540	71628	4210508	0 - 0.04	3151668 - 0.49	0	0	0	0	0	0				
57540	58919	4210509	0 - 0.02	3151668 - 0.53	0	0	0	0	0	0				

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
70641	58919	4210510	0 - 0.05	3151668 - 0.55	0	0	0	0	0	0				
57539	70641	4210511	0 - 0.11	3151668 - 0.60	2	0	0	0	1	1	2015-46185	10/22/2015	0.69	PD
											2015-51340	12/06/2015	0.70	C
57539	58921	4210512	0 - 0.03	3151668 - 0.71	0	0	0	0	0	0				
71629	58921	4210513	0 - 0.05	3151668 - 0.74	0	0	0	0	0	0				
59684	71629	4210506	0.46 - 1.46	3151668 - 0.79	5	0	0	0	2	3	2015-10219	03/12/2015	0.82	PD
											2017-26579	08/31/2017	0.89	C
											2015-16421	05/17/2015	0.89	C
											2015-7498	02/11/2015	1.19	PD
											2015-45486	10/20/2015	1.63	PD
59684	71629	4210506	0 - 0.46	3151668 - 0.79	4	0	1	0	1	2	2016-37784	12/13/2016	1.82	PD
											2016-18723	06/30/2016	1.85	A
											2015-55	01/02/2015	2.16	C
											2016-38759	12/24/2016	2.18	PD
59684	59683	3115059	0 - 0.42	3151668 - 2.25	2	0	0	0	1	1	2016-29553	10/11/2016	2.34	PD
											2017-25098	08/18/2017	2.47	C
71629	57539	4210515	0 - 0.08	3210330 - 0	0	0	0	0	0	0				
57539	70641	4210516	0 - 0.11	3210330 - 0.08	0	0	0	0	0	0				
70641	57540	4210567	0 - 0.07	3210330 - 0.19	0	0	0	0	0	0				
57540	71628	4210563	0 - 0.04	3210330 - 0.26	0	0	0	0	0	0				
66499	66498	3065837	0 - 0.06	3209560 - 0	1	0	0	0	0	1	2017-28541	09/21/2017	0.03	PD
				Totals:	45	0	2	0	18	25				

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												PM												
	Hour of Day																								
Day Of Week	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**Un**	**Tot**
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	1	0	0	0	0	0	0	6
MONDAY	0	0	0	0	0	0	0	3	1	1	0	0	2	0	2	1	3	2	1	1	0	0	0	0	0	17
TUESDAY	0	0	0	0	0	1	1	5	3	0	1	0	1	1	1	0	2	6	1	0	0	0	0	0	0	23
WEDNESDAY	0	0	0	0	0	0	0	1	1	1	0	1	1	1	3	2	1	0	0	1	0	0	0	0	0	13
THURSDAY	0	0	0	0	0	1	2	2	3	0	1	2	0	0	1	0	5	1	0	2	0	1	0	0	0	21
FRIDAY	0	0	0	0	0	0	3	1	0	1	0	1	0	0	1	2	1	3	1	0	1	0	0	1	0	16
SATURDAY	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	1	1	0	0	0	0	1	0	0	0	8
Totals	0	0	0	0	0	2	6	12	8	4	2	5	4	6	9	6	15	13	4	4	1	2	0	1	0	**104**

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-Passenger Car	123	23-Bicyclist	0
2-(Sport) Utility Vehicle	36	24-Witness	17
3-Passenger Van	11	25-Other	0
4-Cargo Van (10K lbs or Less)	1	26-Construction	0
5-Pickup	26	27-Farm Vehicle	0
6-Motor Home	0	**Total**	**225**
7-School Bus	0		
8-Transit Bus	0		
9-Motor Coach	0		
10-Other Bus	0		
11-Motorcycle	4		
12-Moped	1		
13-Low Speed Vehicle	0		
14-Autocycle	0		
15-Experimental	0		
16-Other Light Trucks (10,000 lbs or Less)	0		
17-Medium/Heavy Trucks (More than 10,000 lbs)	6		
18-ATV - (4 wheel)	0		
20-ATV - (2 wheel)	0		
21-Snowmobile	0		
22-Pedestrian	0		

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	53	47	4	0	0	0	104
Ran Off Roadway	2	0	0	0	0	0	2
Failed to Yield Right-of-Way	16	14	0	0	0	0	30
Ran Red Light	0	0	0	0	0	0	0
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	1	0	0	0	0	0	1
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	4	5	0	0	0	0	9
Improper Turn	1	1	0	0	0	0	2
Improper Backing	1	2	0	0	0	0	3
Improper Passing	1	2	0	0	0	0	3
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	18	18	5	0	0	0	41
Failed to Keep in Proper Lane	2	0	0	0	0	0	2
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	3	2	0	0	0	0	5
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	2	4	0	0	0	0	6
Unknown	0	0	0	0	0	0	0
Total	**104**	**95**	**9**	**0**	**0**	**0**	**208**

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	101	94	9	0	0	0	204
Physically Impaired or Handicapped	1	0	0	0	0	0	1
Emotional(Depressed, Angry, Disturbed, etc.)	1	1	0	0	0	0	2
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	0	0	0	0	0	0	0
Under the Influence of Medications/Drugs/Alcohol	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	1
Total	**104**	**95**	**9**	**0**	**0**	**0**	**208**

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	18	0	0	0	0	18
20-24	22	0	0	0	0	22
25-29	28	0	0	0	0	28
30-39	36	0	0	0	0	36
40-49	42	0	0	0	0	42
50-59	31	0	0	0	0	31
60-69	16	0	0	0	0	16
70-79	12	0	0	0	0	12
80-Over	3	0	0	0	0	3
Unknown	0	0	0	0	0	0
Total	**208**	**0**	**0**	**0**	**0**	**208**

Crash Summary II - Characteristics

Most Harmful Event

Most Harmful Event	Total	Most Harmful Event	Total
1-Overturn / Rollover	2	38-Other Fixed Object (wall, building, tunnel, etc.)	0
2-Fire / Explosion	0	39-Unknown	0
3-Immersion	0	40-Gate or Cable	0
4-Jackknife	0	41-Pressure Ridge	0
5-Cargo / Equipment Loss Or Shift	0	**Total**	**208**
6-Fell / Jumped from Motor Vehicle	0		
7-Thrown or Falling Object	2		
8-Other Non-Collision	0		
9-Pedestrian	0		
10-Pedalcycle	0		
11-Railway Vehicle - Train, Engine	0		
12-Animal	0		
13-Motor Vehicle in Transport	202		
14-Parked Motor Vehicle	0		
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0		
16-Work Zone / Maintenance Equipment	0		
17-Other Non-Fixed Object	0		
18-Impact Attenuator / Crash Cushion	0		
19-Bridge Overhead Structure	0		
20-Bridge Pier or Support	0		
21-Bridge Rail	0		
22-Cable Barrier	0		
23-Culvert	0		
24-Curb	0		
25-Ditch	0		
26-Embankment	0		
27-Guardrail Face	0		
28-Guardrail End	0		
29-Concrete Traffic Barrier	0		
30-Other Traffic Barrier	0		
31-Tree (Standing)	0		
32-Utility Pole / Light Support	1		
33-Traffic Sign Support	0		
34-Traffic Signal Support	0		
35-Fence	1		
36-Mailbox	0		
37-Other Post Pole or Support	0		

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	2	2
B	6	6
C	32	40
PD	64	0
Total	**104**	**48**

Road Character

Road Grade	Total
1-Level	101
2-On Grade	2
3-Top of Hill	0
4-Bottom of Hill	1
5-Other	0
Total	**104**

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	61
2-Traffic Signals (Flashing)	0
3-Advisory/Warning Sign	0
4-Stop Signs - All Approaches	1
5-Stop Signs - Other	7
6-Yield Sign	1
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	2
13-None	30
14-Other	2
Total	**104**

Light

Light Condition	Total
1-Daylight	82
2-Dawn	3
3-Dusk	2
4-Dark - Lighted	15
5-Dark - Not Lighted	2
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	**104**

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2015	2016	2017	Total
JANUARY	2	3	1	6
FEBRUARY	3	1	1	5
MARCH	6	4	1	11
APRIL	2	2	8	12
MAY	6	4	3	13
JUNE	2	2	2	6
JULY	1	2	2	5
AUGUST	1	0	4	5
SEPTEMBER	4	4	1	9
OCTOBER	4	7	5	16
NOVEMBER	0	3	3	6
DECEMBER	4	4	2	10
Total	**35**	**36**	**33**	**104**

Report is limited to the last 10 years of data.

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Traffic Circle-Roundabout	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End - Sideswipe	20	0	28	6	0	2	0	0	0	0	0	0	0	0	56
Head-on - Sideswipe	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
Intersection Movement	0	0	15	6	0	13	0	0	0	0	0	0	0	0	34
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	2	4	2	0	0	1	0	0	0	0	0	0	0	0	9
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**23**	**6**	**47**	**12**	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**104**

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather / Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	6	0	0	0	0	0	0	0	0	0	0	6
Dark - Not Lighted	1	0	0	0	0	0	1	0	0	0	0	2
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	2	0	0	0	0	0	0	0	0	0	0	2
Daylight	56	2	0	0	0	0	1	0	1	0	1	61
Dusk	1	0	0	0	0	0	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	1	0	0	0	0	0	0	0	0	0	3	4
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	10	0	0	0	0	0	0	0	0	0	0	10
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

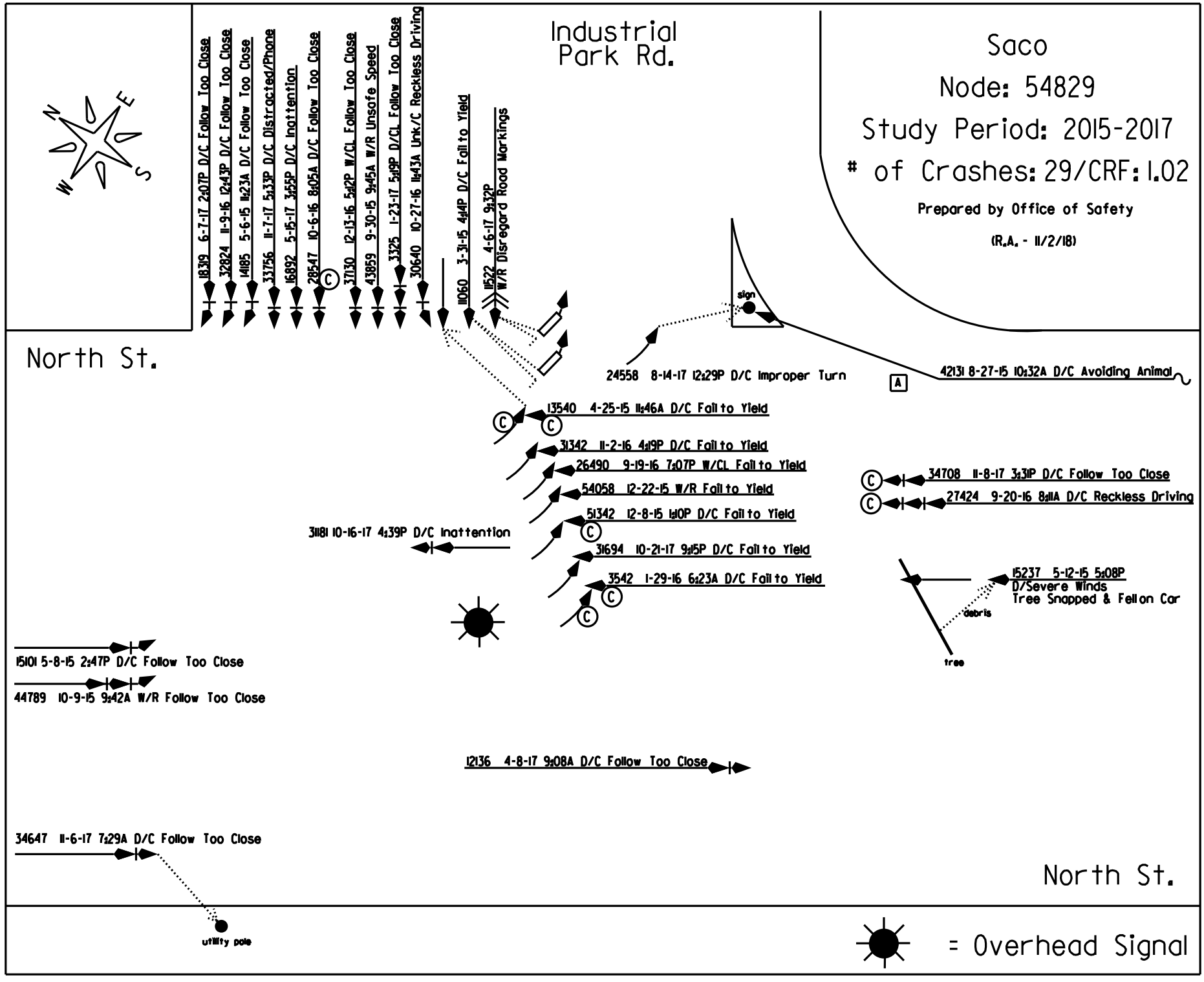
Crashes by Weather, Light Condition and Road Surface

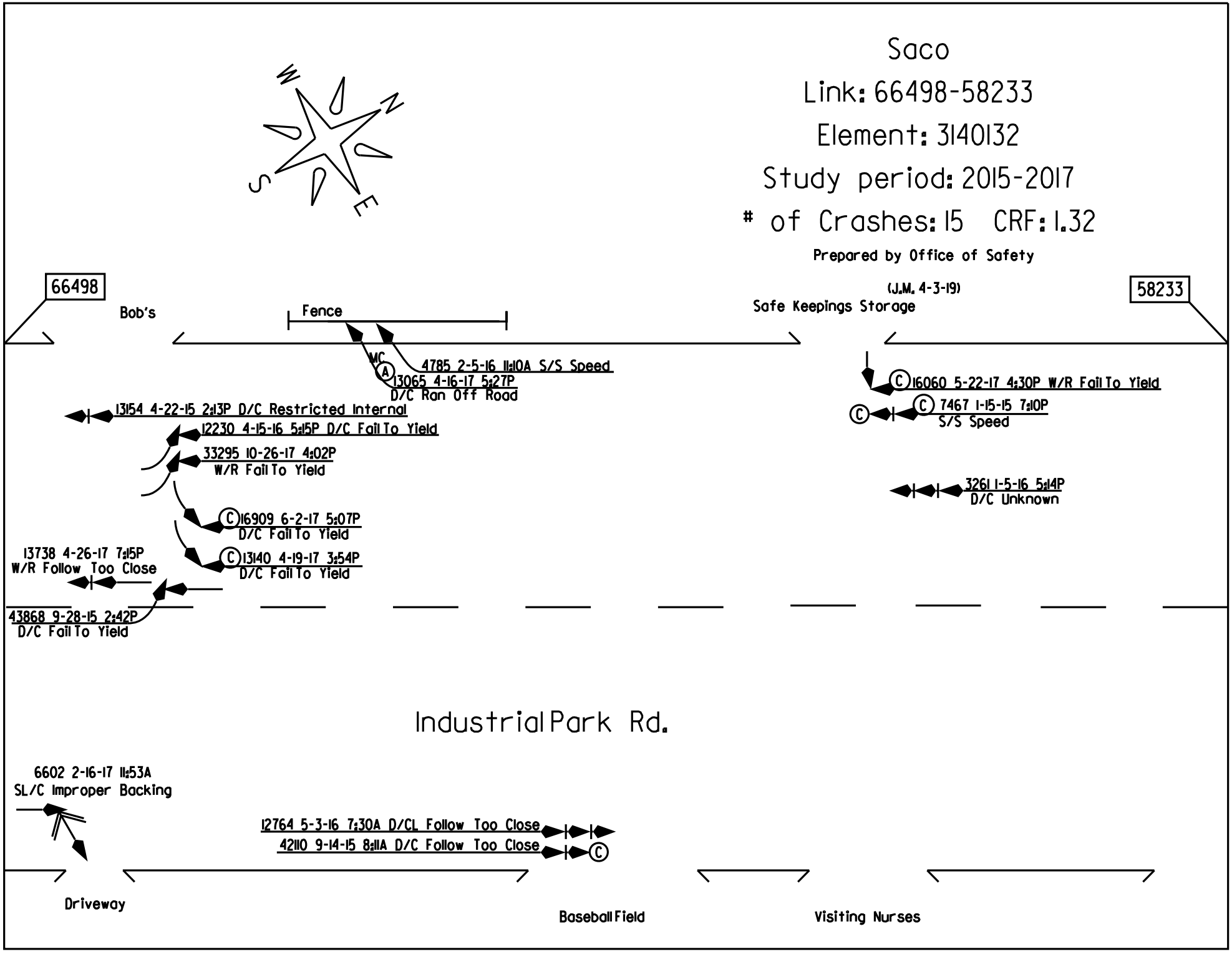
Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	4	4
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	1	0	0	0	0	0	0	0	0	6	7
Dusk	0	0	0	0	0	0	0	0	0	0	1	1
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	1	0	0	0	0	0	0	0	0	0	0	1
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	0	1	0	0	0	1
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	1	0	0	0	0	1
Daylight	0	0	0	0	0	0	0	2	0	0	1	3
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**78**	**3**	**0**	**0**	**0**	**0**	**3**	**3**	**1**	**0**	**16**	**104**


Industrial Park Rd.
Saco
Node: 54829
Study Period: 2015-2017
# of Crashes: 29/CRF: 1.02
Prepared by Office of Safety
(R.A. - 11/2/18)
N
E
S
W
1839 6-7-17 2:07P D/C Follow Too Close
32824 11-9-16 12:43P D/C Follow Too Close
14185 5-6-15 11:23A D/C Follow Too Close
331756 11-7-17 5:33P D/C Distracted/Phone
16892 5-15-17 3:55P D/C Inattention
28547 10-6-16 8:05A D/C Follow Too Close
37130 12-13-16 5:42P W/CL Follow Too Close
43859 9-30-15 9:45A W/R Unsafe Speed
3325 1-23-17 5:19P D/CL Follow Too Close
30640 10-27-16 11:43A Unk/C Reckless Driving
11060 3-31-15 4:44P D/C Fail to Yield
11522 4-6-17 9:32P W/R Disregard Road Markings
North St.
sign
24558 8-14-17 12:29P D/C Improper Turn
A
42131 8-27-15 10:32A D/C Avoiding Animal
13540 4-25-15 11:46A D/C Fail to Yield
31342 11-2-16 4:19P D/C Fail to Yield
26490 9-19-16 7:07P W/CL Fail to Yield
54058 12-22-15 W/R Fail to Yield
51342 12-8-15 1:10P D/C Fail to Yield
31181 10-16-17 4:39P D/C Inattention
31694 10-21-17 9:15P D/C Fail to Yield
3542 1-29-16 6:23A D/C Fail to Yield
34708 11-8-17 3:31P D/C Follow Too Close
27424 9-20-16 8:11A D/C Reckless Driving
15237 5-12-15 5:08P
D/Severe Winds
Tree Snapped & Fell on Car
debris
tree
15101 5-8-15 2:47P D/C Follow Too Close
44789 10-9-15 9:42A W/R Follow Too Close
12136 4-8-17 9:08A D/C Follow Too Close
34647 11-6-17 7:29A D/C Follow Too Close
utility pole
North St.
= Overhead Signal


Saco
Link: 66498-58233
Element: 3140132
Study period: 2015-2017
# of Crashes: 15 CRF: 1.32
Prepared by Office of Safety
(J.M. 4-3-19)
66498
58233
Bob's
Fence
Safe Keepings Storage
MC
A
4785 2-5-16 11:10A S/S Speed
13065 4-16-17 5:27P
D/C Ran Off Road
13154 4-22-15 2:13P D/C Restricted Internal
12230 4-15-16 5:15P D/C Fail To Yield
33295 10-26-17 4:02P
W/R Fail To Yield
C 16909 6-2-17 5:07P
D/C Fail To Yield
C 13140 4-19-17 3:54P
D/C Fail To Yield
13738 4-26-17 7:15P
W/R Follow Too Close
43868 9-28-15 2:42P
D/C Fail To Yield
C 16060 5-22-17 4:30P W/R Fail To Yield
C C 7467 1-15-15 7:10P
S/S Speed
3261 1-5-16 5:14P
D/C Unknown
Industrial Park Rd.
6602 2-16-17 11:53A
SL/C Improper Backing
12764 5-3-16 7:30A D/CL Follow Too Close
42110 9-14-15 8:11A D/C Follow Too Close
C
Driveway
Baseball Field
Visiting Nurses

SECTION 3

DEVELOPMENT OF ENTRANCES AND EXITS

SECTION 3
DEVELOPMENT ENTRANCES AND EXITS

3.A. ENTRANCE AND EXIT LOCATIONS

The proposed site will utilize one full-service entrance road to access the site from Spring Hill Road.

The location of the proposed entrance can be seen on the plan included in **Section 1, Attachment 1A**.

SECTION 4

TITLE, RIGHT, OR INTEREST

After recording return to:
Charles M. Katz-Leavy, Esq.
Jensen Baird Gardner and Henry
10 Free Street, P.O. Box 4510
Portland, Maine 04112

5 p

NANCY E HAMMOND, REGISTER OF DEEDS
Bk 17946 PG 860
Instr # 2019016552
05/10/2019 02:09:16 PM
Pages 5 YORK CO

DLN: 1001940056725

---------- (Space Above This Line For Recording Data) ----------

QUITCLAIM DEED WITH COVENANT

KNOW ALL PERSONS BY THESE PRESENTS, that **SWEETSER** (f/k/a Sweetser Corporation), a Maine nonprofit corporation, with offices at 50 Moody Street, Saco, Maine FOR CONSIDERATION PAID, hereby grants to **THE CITY OF SACO**, a municipal body having offices at 300 Main Street, Saco, Maine, with Quitclaim Covenants, a certain lot or parcel of land, together with any improvements thereon and all rights appurtenant thereto, and being more particularly described as follows:

SEE EXHIBIT A ATTACHED HERETO AND
INCORPORATED HEREIN BY REFERENCE

IN WITNESS WHEREOF, Sweetser has caused this instrument to be executed by Debra Taylor, its President & CEO thereunto duly authorized as of this 9th day of May, 2019

SWEETSER

WITNESS

By: Debra Taylor
Debra Taylor, its President & CEO
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Debra Taylor, as President & CEO of Sweetser, and acknowledged the foregoing instrument to be her free act and deed duly authorized in said capacity.

Before me,

Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

Maine R.E. Transfer Tax Paid

IN WITNESS WHEREOF, as an express acceptance of certain restrictions and requirements in this deed, the City of Saco has caused this instrument to be executed by Kevin L. Sutherland, as City Administrator, thereunto duly authorized as of this 9th day of May, 2019.

WITNESS

THE CITY OF SACO

By: _____
Kevin L. Sutherland, City Administrator
Thereunto Duly Authorized

STATE OF MAINE
Cumberland County, ss.

Date: May 9, 2019

Personally appeared the above-named Kevin L. Sutherland, as City Administrator of the City of Saco, and acknowledged the foregoing instrument to be his free act and deed duly authorized in said capacity.

Before me,

_____
Attorney at Law/Notary Public
Print: _____
[SEAL]

STEPHANIE L. BERRY
NOTARY PUBLIC
State of Maine
My Commission Expires
July 1, 2023

EXHIBIT A
(15.6688 acres)

A certain lot or parcel of land located southeasterly of, but not adjacent to, Industrial Park Road, and southwesterly of, but not adjacent to, Spring Hill Road, situated in the City of Saco, County of York and State of Maine, bounded and described as follows:

Beginning at the southeasterly corner of land described in the deed to Brockway-Smith Company dated November 12, 2002 and recorded at the York County Registry of Deeds in Book 12164, Page 204 and shown on a "Plan Showing a Standard Boundary Survey and Topographic Survey Made for Linda M. Valentino" dated April 19, 2000, as revised November 4, 2002 by Dow & Coulombe, Inc., and recorded at said Registry in Plan Book 276, Page 4; said point of beginning also being a westerly or southwesterly corner of land described in the deed to Cormier Land Co., Inc. dated May 9, 1996 and recorded at said Registry in Book 7824, Page 349 and shown on a "Plan Showing a Standard Boundary Survey Made for Cormier Land Co." dated December 11, 1997 by Dow & Coulombe, Inc. and recorded at said Registry in Plan Book 241, Page 44;

Thence, from said point of beginning, South 53°-29'-15" East, by said Cormier Land Co., Inc. land, a distance of 2.32 feet;

Thence, by land described in another deed given, or to be given, from this grantor to this grantee, by the following (6) lines:

Southerly, by a circular curve deflecting to the left having a radius of 465.00 feet, an arc distance of 4.75 feet (a chord between the two last described points bears South 03°-28'-10" East, a distance of 4.75 feet);

Thence, South 03°-45'-45" East, a distance of 237.02 feet;

Thence, southerly, southwesterly and westerly, by a circular curve deflecting to the right having a radius of 555.00 feet, an arc distance of 1093.91 feet (a chord between the two last described points bears South 52°-42'-10" West, a distance of 925.24 feet);

Thence, North 70°-49'-55" West, a distance of 206.81 feet;

Thence, northwesterly, by a circular curve deflecting to the right having a radius of 395.00 feet, an arc distance of 113.99 feet (a chord between the two last described points bears North 62°-33'-50" West, a distance of 113.60 feet);

Thence, North 54°-17'-50" West, a distance of 14.40 feet to land described in the deed to A. Duie Pyle, Inc. dated July 27, 2018 and recorded at said Registry in Book 17767, Page 634;

Thence, North 35°-39'-50" East, partly by said A. Duie Pyle, Inc. land, and partly by said Brockway-Smith Company land, a distance of 758.58 feet to a field stone found set in the ground;

Thence, by said Brockway-Smith Company land, by the following (3) described lines:

North 35°-40'-00" East, a distance of 395.27 feet to a spike found set at the base of a found leaning iron pipe;

Thence, South 53°-09'-40" East, a distance of 163.37 feet to a drill hole found set in a field stone found set in the ground;

Thence, South 53°-29'-15" East, a distance of 277.10 feet to the point of beginning.

Containing 15.6688 acres.

Meaning and intending to describe a portion of the second parcel of land described in the deed to this grantor dated April 28, 1958 and recorded at said Registry in Book 1378, Page 245, together with a portion of land described in the deed to this grantor dated October 26, 1959 and recorded at said Registry in Book 1418, Page 56.

The bearings used in this description refer to the Maine Coordinate Grid System, West Zone (NAD 1983) as calculated from bearings shown on a plan entitled "ALTA-NSPS Land Title Survey of 85 Industrial Park Road, Saco, Maine Prepared for A. Duie Pyle, Inc.", latest revision dated July 17, 2018 by Sebago Technics, and recorded at said Registry in Plan Book 396, Pages 23 and 24.

Together with appurtenant easements described in the following instruments: (i) granted in a deed from Linda Valentina to Sweetser, dated August 28, 1981 and recorded in said Registry of Deeds in Book 2843, Page 1, (ii) reserved in a deed from Sweetser to Kenneth D. Cormier and Andre Dallaire, dated October 15, 1984 and recorded at said Registry of Deeds in Book 3401, Page 124, and (iii) reserved in a deed from Sweetser to Maine Play Amusements, Inc., dated September 20, 1989 and recorded at said Registry of Deeds in Book 5189, Page 256.

Subject to restrictions, covenants, and conditions regarding the ten-foot right of way and easement reserved in a deed from Sweetser to Kenneth D. Cormier and Andre Dallaire dated October 15, 1984 and recorded said Registry in Book 3401, Page 124.

Subject to restrictions, covenants and conditions regarding the rights of way and easements reserved in a deed from Sweetser to Maine Play Amusements, Inc., dated September 20, 1989 and recorded in the said Registry in Book 5189, Page 256.

Subject to, and benefiting from, such state of facts as shown on plans entitled "Plan Showing a Standard Boundary Survey made for Sweetser Children's Services, Parcel located at Moody Street and Industrial Park Road" by Down & Coulombe, Inc., dated June, 7, 1999 and revised May 5, 2003, recorded in said Registry in Plan Book 281, Pages 10-11.

Subject to, and benefiting from, such state of facts as shown on an unrecorded plan entitled "Plan Showing a Standard Boundary Survey made for Sweetser Children's Services, Parcel located at Moody Street and Industrial Park Road" by Down & Coulombe, Inc., dated June 7, 1999 and revised through August 28, 2013, including but not limited to the location of the Woods Road as shown thereon.

Subject to, and benefiting from, such state of facts as shown on a plan entitled "Plan Showing A Standard Boundary Survey Made For Cormier Land Co." of Saco, Maine, prepared by Down & Coulombe, Inc., dated December 11, 1997, and recorded in said Registry in Plan Book 241, Page 44.

Subject to the express restriction that grantee, its successors and assigns, shall not use any portion of the premises in a fashion which violates any State or Federal law in effect as of the date of this Deed, including, without limitation, use of the premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative. It is the express intent of the parties to preclude use of the premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative, even if such uses cease to be illegal hereafter. This restriction shall run with the land in perpetuity.

Subject to a restriction on removing trees or brush within twenty-five (25) feet of any boundary along the remaining land of Grantor, measured perpendicularly therefrom, with the exception of any opening in said buffer for an access road between grantee's lot and grantors lot. This restriction shall run with the land in perpetuity.

Reference is made to "Exhibit 1-Plan Showing Proposed Conveyances of Land, Sweetser to The City of Saco, Maine", dated December 20, 2018, by Dow & Coulombe, Inc.

Reference is made to a "Final Plan Sowing Sweetser Saco Subdivision prepared for Sweetser, 50 Moody Street, Saco, ME 04072" by Down & Coulombe, Inc., as approved by the City of Saco Planning Board on May 7, 2019, a copy of which is to be recorded in the York County Registry of Deeds.

SECTION 5

PUBLIC OR PRIVATE RIGHT-OF-WAY

SECTION 5
PUBLIC OR PRIVATE RIGHT-OF-WAY

5.A. PUBLIC OR PRIVATE RIGHT-OF-WAY

Access to the site will be from Spring Hill Road. The location of the entrance can be seen on the Site Plan included in **Section 1, Attachment 1A**. There are no additional Rights-of-Way proposed for this site.

SECTION 6

SCHEDULE

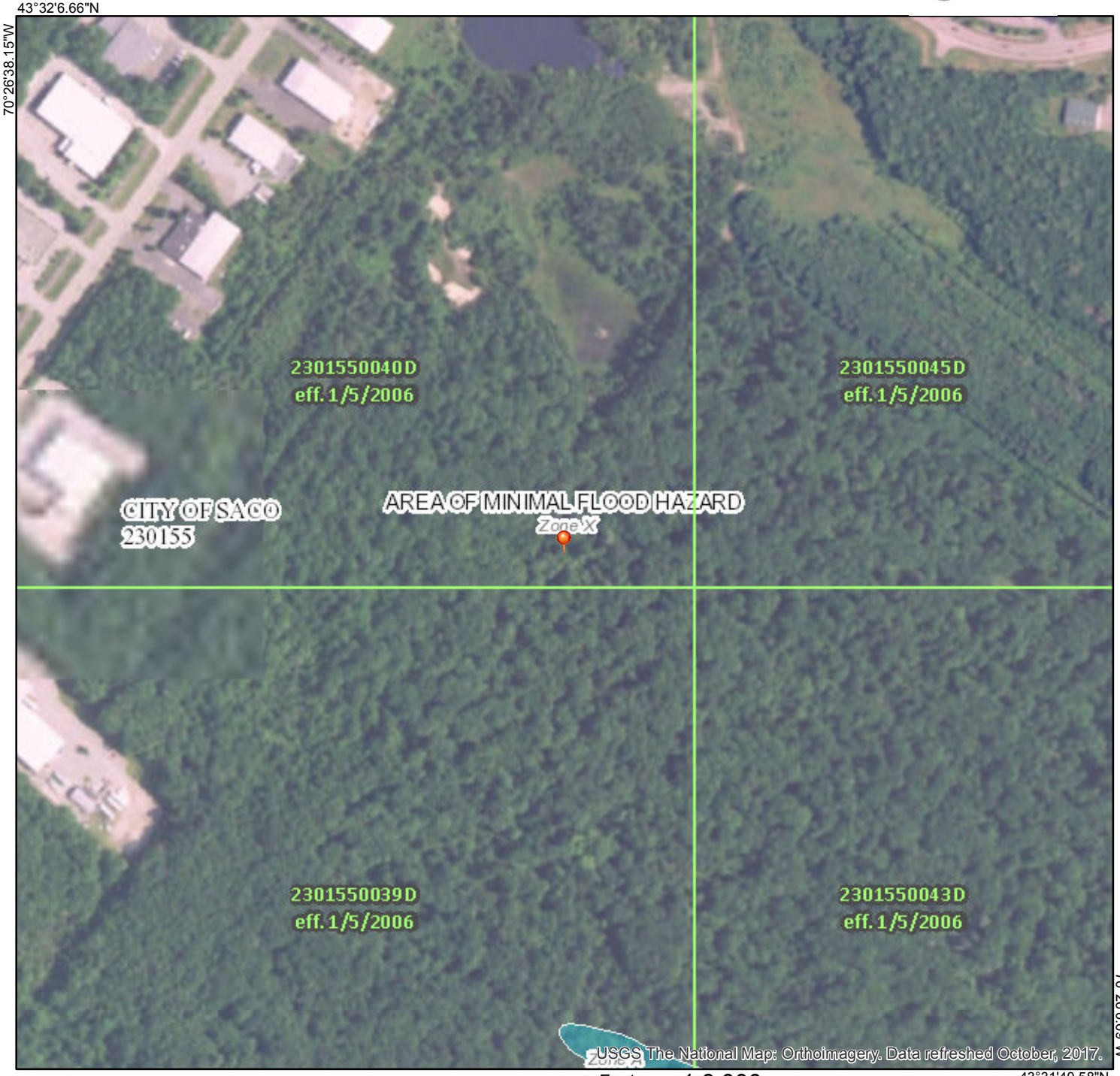
SECTION 6
SCHEDULE

6.A. SCHEDULE

The Applicant expects to begin construction during Summer 2019 with completion anticipated by Fall 2020.

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/19/2019 at 1:28:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.


70° 27' 14" W
70° 25' 18" W
43° 32' 22" N
43° 31' 28" N
382600
382800
383000
383200
383400
383600
383800
384000
384200
384400
384600
384800
385000
4821700
4821500
4821300
4821100
4820900
4820700
4820500
4820300
4820100
CoB
CrB
Na
Sc
EmB
W
BuD
Pg
AdB
AdC
Sa
95
Goosefare Brook
Exit 36
Industrial Park
Mill Brook
Inni's Brook
SeC
Ur
SeB
AdB
195
Map Scale: 1:11,900 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 150 300 600 900
Feet
0 500 1000 2000 3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: York County, Maine
Survey Area Data: Version 17, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

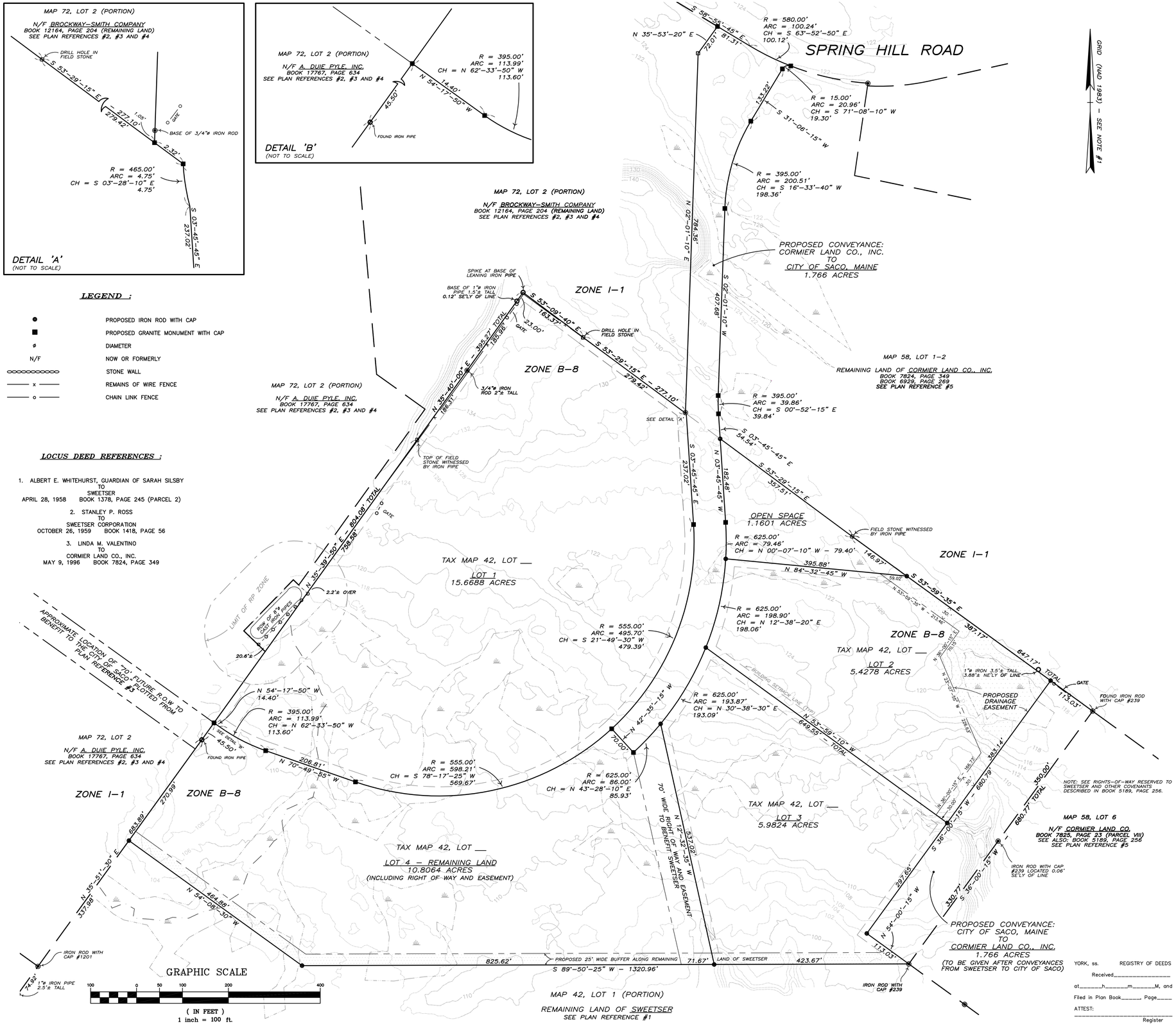
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AdB	Adams loamy sand, 0 to 8 percent slopes	19.5	3.4%
AdC	Adams loamy sand, 8 to 15 percent slopes	6.2	1.1%
BuD	Buxton silt loam, 15 to 25 percent slopes	28.1	4.9%
CoB	Colton gravelly loamy coarse sand, 0 to 8 percent slopes	0.5	0.1%
CrB	Croghan loamy sand, 0 to 8 percent slopes	203.2	35.3%
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	3.2	0.5%
Na	Naumburg sand	244.9	42.6%
Pg	Pits, gravel	8.0	1.4%
Sa	Saco mucky silt loam	3.8	0.7%
Sc	Scantic silt loam, 0 to 3 percent slopes	47.8	8.3%
SeB	Scio silt loam, 3 to 8 percent slopes	2.1	0.4%
SeC	Scio silt loam, 8 to 15 percent slopes	2.4	0.4%
Ur	Urban land	2.6	0.5%
W	Water bodies	2.9	0.5%
Totals for Area of Interest		**575.1**	**100.0%**

LEGEND :

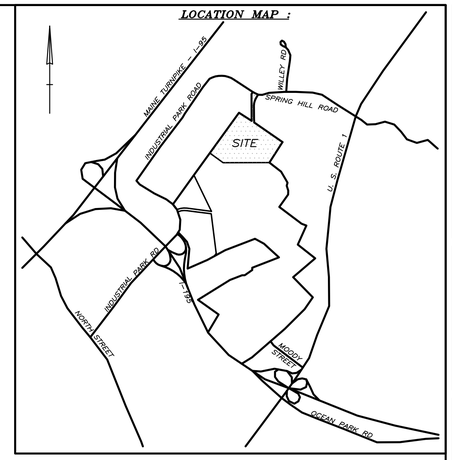
●	PROPOSED IRON ROD WITH CAP
■	PROPOSED GRANITE MONUMENT WITH CAP
ø	DIAMETER
N/F	NOW OR FORMERLY
oooooooooo	STONE WALL
——— x ———	REMAINS OF WIRE FENCE
——— o ———	CHAIN LINK FENCE

LOCUS DEED REFERENCES :

1. ALBERT E. WHITEHURST, GUARDIAN OF SARAH SILSBY TO SWEETSER APRIL 28, 1958 BOOK 1378, PAGE 245 (PARCEL 2)
2. STANLEY P. ROSS TO SWEETSER CORPORATION OCTOBER 26, 1959 BOOK 1418, PAGE 56
3. LINDA M. VALENTINO TO CORMIER LAND CO., INC. MAY 9, 1996 BOOK 7824, PAGE 349



LOCATION MAP :



PLAN REFERENCES :

1. "PLAN SHOWING A STANDARD BOUNDARY SURVEY MADE FOR SWEETSER", DATED JUNE 7, 1999, AS REVISED AUGUST 28, 2013 BY DOW & COULOMBE INC.
2. "PLAN SHOWING A STANDARD BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY MADE FOR LINDA M. VALENTINO", DATED APRIL 19, 2000 BY DOW & COULOMBE INC.
3. "OVERALL SITE PLAN OF SACO FREIGHT TERMINAL FOR A. DUIE PYLE, INC.", LATEST REVISION DATED JUNE 15, 2018 BY SEBEGO TECHNICS.
4. "ALTA–NSPS LAND TITLE SURVEY OF 85 INDUSTRIAL PARK ROAD, SACO, MAINE PREPARED FOR A. DUIE PYLE, INC.", LATEST REVISION DATED JULY 17, 2018 BY SEBEGO TECHNICS, RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 396, PAGES 23 AND 24.
5. "PLAN SHOWING A STANDARD BOUNDARY SURVEY MADE FOR CORMIER LAND CO.", DATED DECEMBER 11, 1997, BY DOW & COULOMBE, INC., RECORDED AT THE YORK COUNTY REGISTRY OF DEEDS IN PLAN BOOK 241, PAGE 44.
6. "PLAN SHOWING LAND OF THE SWEETSER CORPORATION", DATED DECEMBER 4, 1970, AS REVISED MARCH 11, 1993 BY LIBBY & DOW/DOW & COULOMBE, INC.

NOTES :

1. BOUNDARY INFORMATION (BEARINGS AND DISTANCES) COPIED FROM, AND CALCULATED FROM, PLAN REFERENCE #1. HOWEVER, THE BEARINGS HAVE BEEN ROTATED, AND THE COORDINATES TRANSLATED, TO AGREE WITH BEARINGS AND COORDINATES SHOWN ON PLAN REFERENCE #4.
2. TOTAL AREA EQUALS 42.000 ACRES EXCLUDING PROPOSED CONVEYANCE TO CORMIER LAND CO., INC.
3. OWNERS OF RECORD: SWEETSER 50 MOODY STREET SACO, MAINE; CORMIER LAND CO., INC. 774 PORTLAND ROAD SACO, MAINE
4. THE SUBJECT PARCEL OF LAND IS A PORTION OF LAND SHOWN AS LOT 1 ON CITY OF SACO ASSESSOR'S MAP 42, TOGETHER WITH A PORTION OF 6 SHOWN ON CITY OF SACO ASSESSOR'S MAP 58.
5. APPLICANT: CITY OF SACO, MAINE 300 MAIN STREET SACO, ME 04072
6. ENGINEER: CES INC. 146 MAIN STREET SACO, ME 04072
7. SURVEYOR: DOW & COULOMBE, INC. 13 PARK STREET SACO, ME 04072
8. THE SUBJECT PARCEL IS LOCATED PARTLY WITHIN THE BUSINESS DISTRICT 8 (B–8) ZONE, AND PARTLY WITHIN THE INDUSTRIAL DISTRICT 1 (I–1) ZONE. ALL OF THE PROPOSED LOTS ARE LOCATED WITHIN THE B–8 ZONE. THE MINIMUM FRONT SETBACK IN THE B–8 ZONE IS 20 FEET; THE MINIMUM SIDE AND REAR SETBACKS ARE 15 FEET.
9. CONTOUR INFORMATION PLOTTED FROM INFORMATION AVAILABLE AT THE MAINE OFFICE OF GIS WEBSITE DERIVED USING LIDAR TECHNOLOGY.
10. WETLAND BOUNDARIES PLOTTED FROM SHAPE FILE PROVIDED BY THE CITY OF SACO PUBLIC WORKS DEPARTMENT AND WERE IDENTIFIED ON THE GROUND BY NORMANDEAU ASSOCIATES.
11. THE PROPOSED LOTS ARE TO BE SERVICED BY PUBLIC WATER AND SEWER.

APPROVED BY : **DATE :**

_____ CHAIRPERSON _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

CITY OF SACO PLANNING BOARD

YORK, ss. REGISTRY OF DEEDS
Received_____
at_____h_____m_____M, and
Filed in Plan Book_____ Page_____
ATTEST:
_____
Register

No.	Revision	Date

STATE OF MAINE — MICHAEL J. COULOMBE No. 1293 — REGISTERED PROFESSIONAL LAND SURVEYOR

PRELIMINARY PLAN SHOWING
SPRING HILL INDUSTRIAL PARK EXPANSION
A SUBDIVISION PREPARED FOR THE CITY OF SACO, MAINE
(MAILING ADDRESS : C/O JOSEPH LAVERRIERE, CITY ENGINEER 300 MAIN STREET, SACO, ME 04072)
PARCEL LOCATED SOUTHWESTERLY OF SPRING HILL ROAD
SACO MAINE

Dow & Coulombe, Inc.
Land Surveyors & Land Planners Since 1864
13 Park Street, Saco, Maine 04072
Telephone: (207)284-4521 FAX: (207)284-4522
info@dowcoulombe.com * www.dowcoulombe.com

Celebrating 150 years

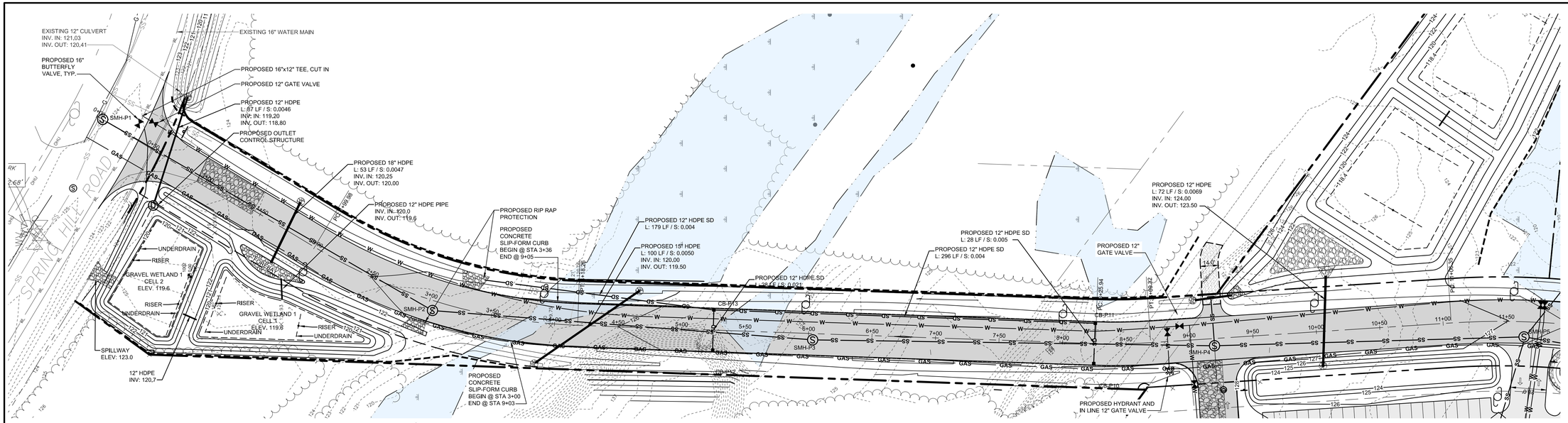
Date: MAY 10, 2019

H. Scale:	Drawn by:
1" = 100'	AMS/MJC
Chk'd by:	Appv'd by:
PDD	MJC

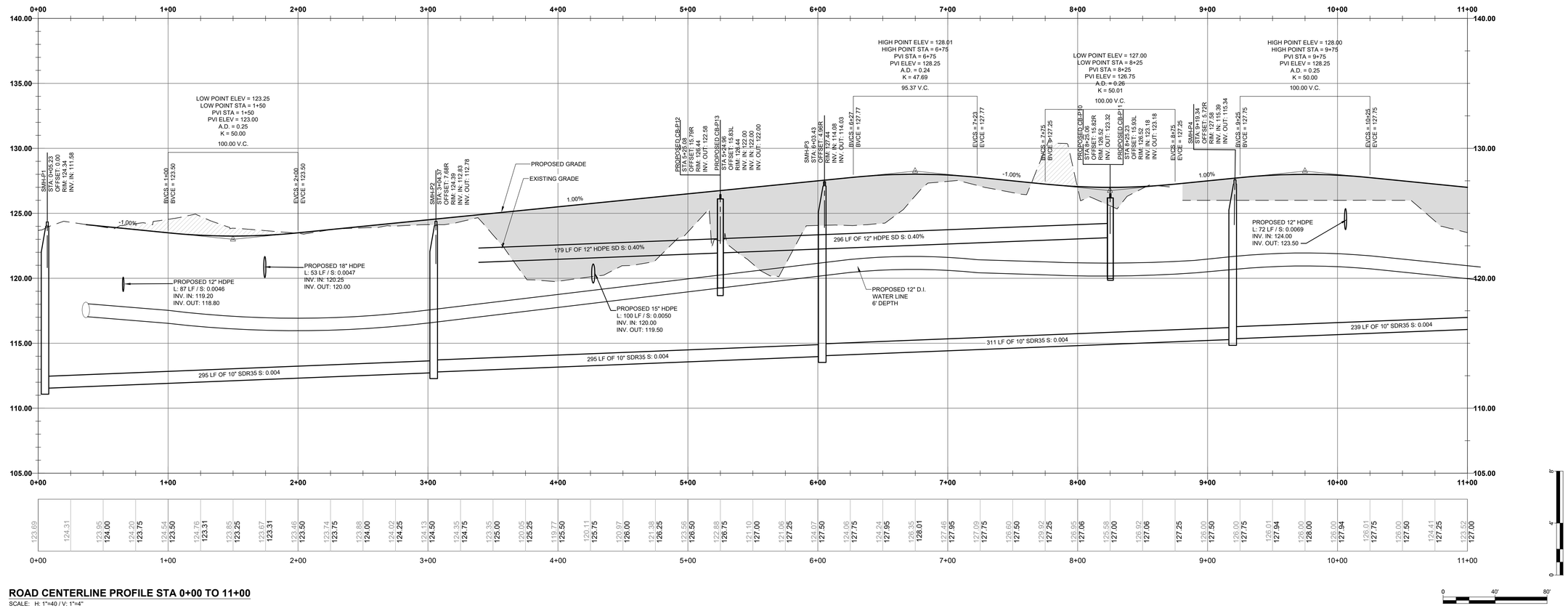
SHEET 1 OF 1

ZONE-21S
Dwgs2019\SACOPRELIM21S

Z:\dwk\Documents\Dwgs2019\SACOPRELIM21S.dwg PLAN, 5/11/2019 11:47:42 AM, 1:100



ROAD PLAN VIEW STA 0+00 TO 11+00
SCALE: 1"=40



ROAD CENTERLINE PROFILE STA 0+00 TO 11+00
SCALE: H: 1"=40 / V: 1"=4"

Portland
85 Exchange Street
PO Box 619
Portland, ME
T 207-989-4824
F 207-989-4881

Presque Isle
489 North Main Street
PO Box 627
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Machias
25 Center Street
PO Box 787
Machias, ME
T 207-255-0370
F 207-255-8367

Bar Harbor
36 Mount Desert Street
Bar Harbor, ME
T 207-288-0587
F 207-288-0688

Lewiston
415 Lisbon Street
Lewiston, ME
T 207-795-6099
F 207-795-6166

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
PROPOSED PLAN AND PROFILE

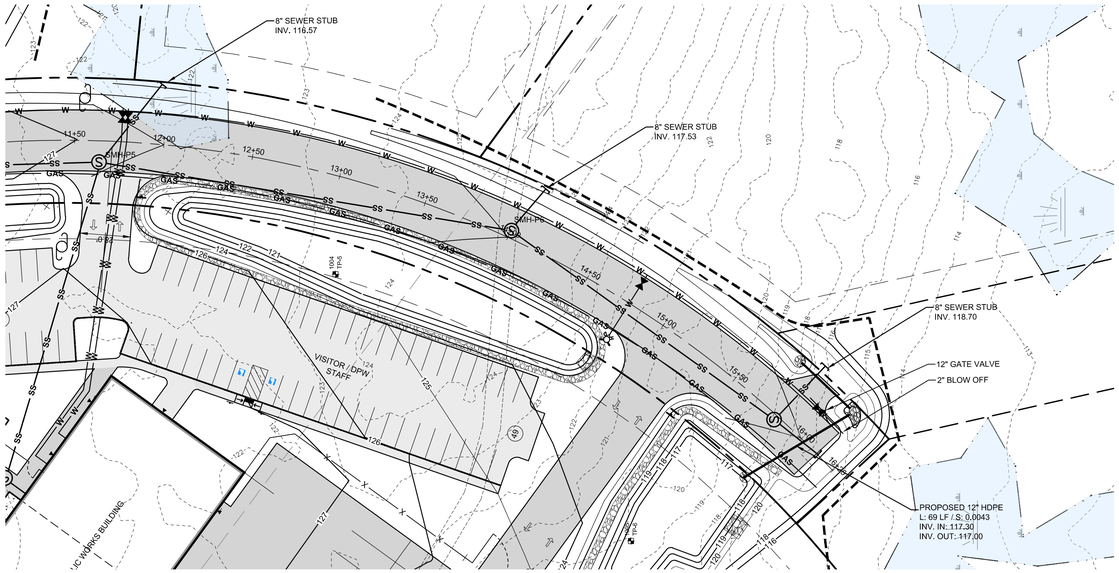
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	R1	CITY REVIEW COMMENTS	2019-04-09	BLQ	JDK
	R2	CULVERT IN PROFILE AT 10+05	2019-04-30	BLQ	JDK
	R3	SITE PLAN REVIEW	2019-04-02	BLQ	JDK

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
REGISTERED
PROFESSIONAL ENGINEER
5/09/2019

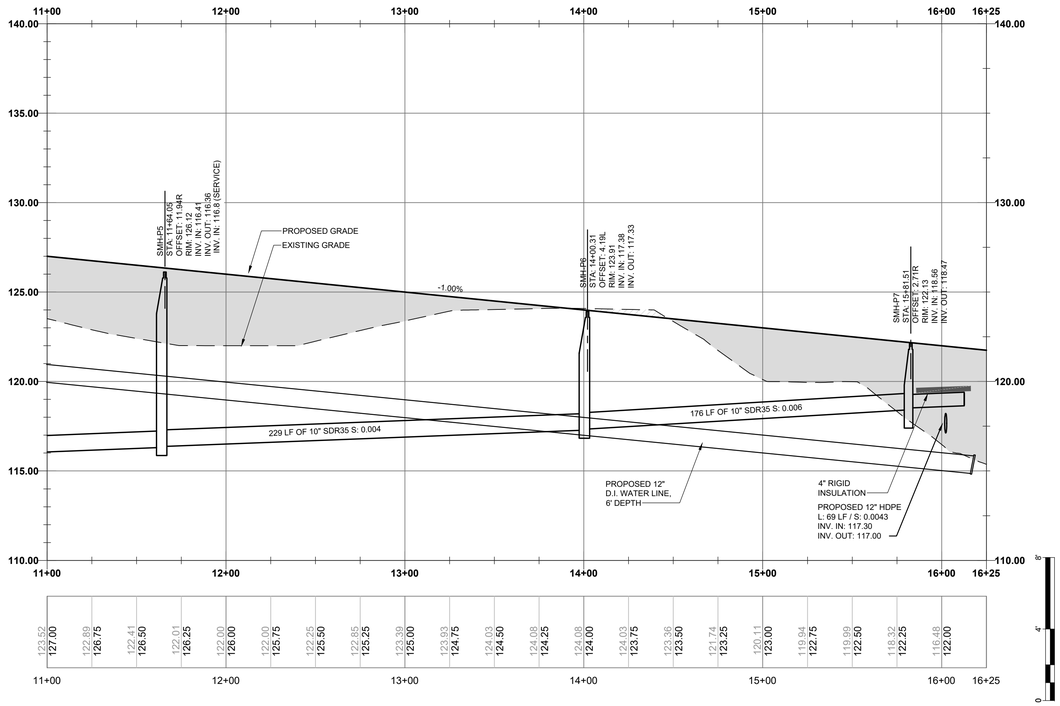
SCALE	1"=40'
DATE	2019-02-11
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	JDK
APPROVED BY	JDK
JOB NUMBER	10602.002
DRAWING NUMBER	C201

P:\10600-34\CIVIL\D IND PARK EXP-PUBLIC WORKS BLDG-SMITH\2-CAD DRAWINGS\CIVIL DESIGN_DWGS\10602.002-C3P-ITWG, 5/9/2019 2:43 PM



ROAD PLAN VIEW STA 11+00 TO 16+25
SCALE: 1"=40

0 40' 80'



ROAD CENTERLINE PROFILE STA 11+00 TO 16+25
SCALE: H: 1"=40 / V: 1"=4"

0 40' 80'

0 4' 8'

Brunswick
85 Union Street
PO Box 919
Brunswick, ME
T 207-725-1303
F 207-725-1424

Rumford
145 Congress Street
PO Box 179
Rumford, ME
T 207-369-4824
F 207-369-4881

Portland
Suite 1B
443 Congress Street
Portland, ME
T 207-756-6070
F 207-221-8810

Presque Isle
88 Main Street
PO Box 627
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Machias
Suite 2
4 Court Street
PO Box 887
Machias, ME
T 207-255-3070
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

CES INC
Engineers • Environmental Scientists • Surveyors

Bar Harbor
Suite 102
1610 State Hwy
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
PROPOSED PLAN AND PROFILE

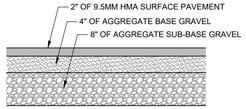
REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R2	RIGID INSULATION OVER SEWER	2019-05-03	BLQ	JDK
R3	CITY REVIEW COMMENTS	2019-05-09	BLQ	JDK
R4				
R5				
R6				
R7				

ISSUE STATUS
NOT FOR CONSTRUCTION

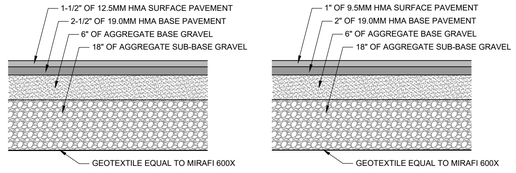
STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
05/09/2019
LICENSED PROFESSIONAL ENGINEER

SCALE	1"=40'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002
DRAWING NUMBER	C202

P:\10602-SACO\02 IND PARK EXP\PUBLIC WORKS BLDG\SMITCH\CAD_DRAWINGS\CIVIL DESIGN_DWGS\10602.002-C-SP.DWG, 5/9/2019 2:45 PM



SIDEWALK

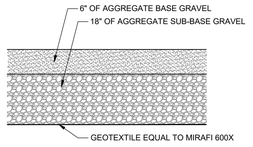


HEAVY DUTY TRAVEL SURFACE (LOTS TO THE NORTH, SOUTH, AND WEST OF DPW BUILDING, AND ADJOINING ACCESS ROADS)

AUTOMOBILE PARKING AREAS (DPW & TRANSPORTATION OFFICE PARKING LOTS AND COMMON ACCESS DRIVE)

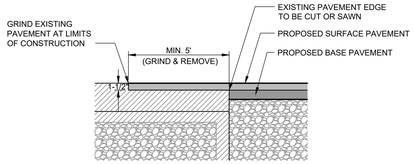
PAVEMENT BUILDUP DETAIL

N.T.S.



TYPICAL GRAVEL BUILDUP DETAIL

N.T.S.

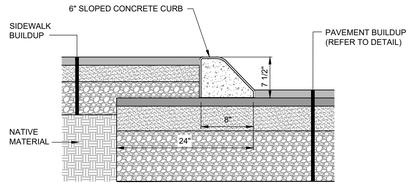


NOTES:

1. EXTEND NEW SURFACE PAVEMENT ACROSS BUTT JOINT IN BASE COURSE.
2. PROVIDE TACK COAT ON ALL SURFACES OF EXISTING PAVEMENT TO BE COVERED.

TYPICAL ASPHALT PAVEMENT GRINDING DETAIL

N.T.S.

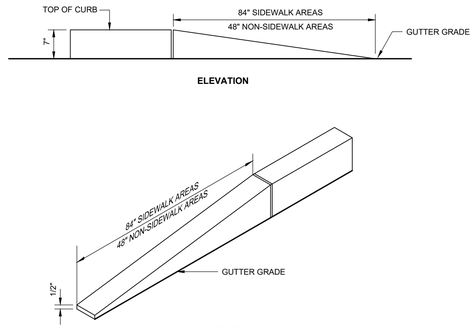


NOTES:

1. ALL CURBING AND TERMINATION IN CONJUNCTION WITH SIDEWALKS MUST MEET ADA REQUIREMENTS.

SLIP FORM CONCRETE CURB DETAIL

N.T.S.

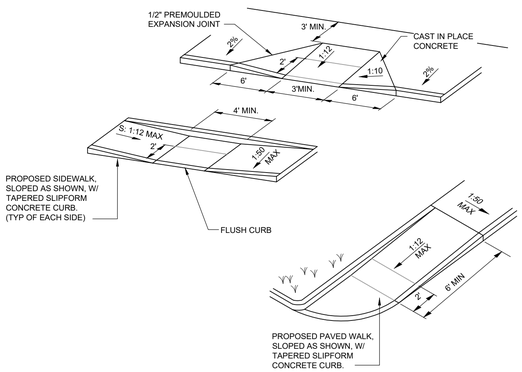


NOTE:

ALL CURBING AND TERMINATION IN CONJUNCTION WITH SIDEWALKS MUST MEET ADA REQUIREMENTS

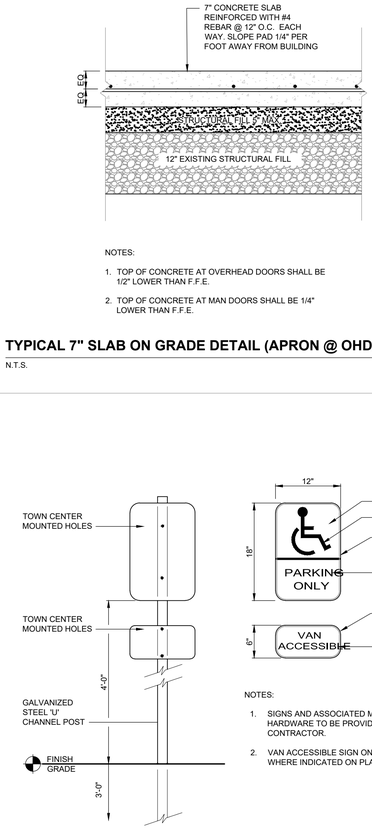
TYPICAL CURB TERMINATION DETAIL

N.T.S.



TYPICAL HANDICAP CURB RAMP DETAILS

N.T.S.

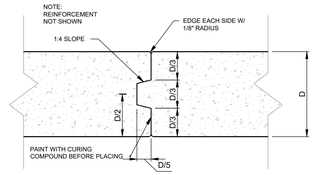


NOTES:

1. TOP OF CONCRETE AT OVERHEAD DOORS SHALL BE 1/2" LOWER THAN F.F.E.
2. TOP OF CONCRETE AT MAN DOORS SHALL BE 1/4" LOWER THAN F.F.E.

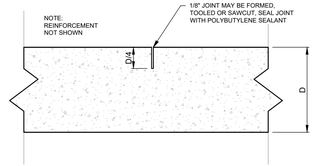
TYPICAL 7" SLAB ON GRADE DETAIL (APRON @ OHD)

N.T.S.



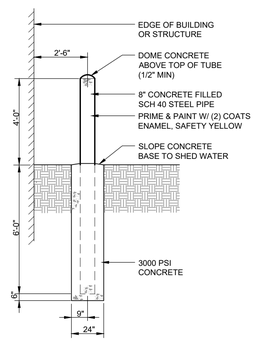
TYPICAL SLAB CONSTRUCTION JOINT

N.T.S.



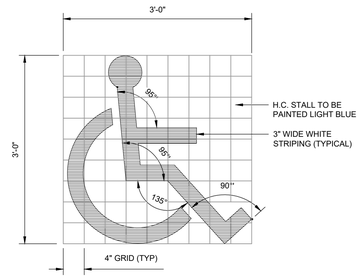
TYPICAL SLAB CONTROL JOINT

N.T.S.



STEEL BOLLARD DETAIL

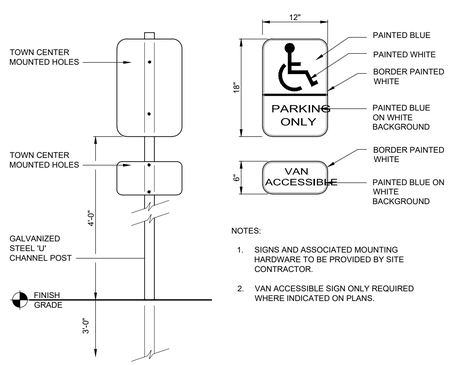
N.T.S.



NOTE: CENTER SYMBOL WITHIN PARKING STALL

TYPICAL HANDICAP PARKING STALL SYMBOL

N.T.S.

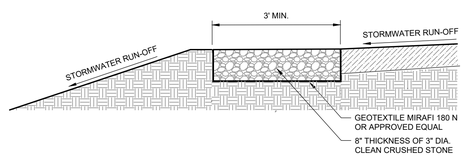


NOTES:

1. SIGNS AND ASSOCIATED MOUNTING HARDWARE TO BE PROVIDED BY SITE CONTRACTOR.
2. VAN ACCESSIBLE SIGN ONLY REQUIRED WHERE INDICATED ON PLANS.

TYPICAL HANDICAP PARKING SIGN DETAIL

N.T.S.



STONE FILTER STRIP PRETREATMENT DETAIL

N.T.S.

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Pittsfield Site
Pittsfield Main Street
PO Box 627
Pittsfield, ME
T 207-784-8412
F 207-784-8414

Bar Harbor
350 Eagle Lake Way 102
Bar Harbor, ME
T 207-288-0587
F 207-288-8588

Bremen
Bremen South Main Street
PO Box 619
Bremen, ME
T 207-989-4824
F 207-989-4881

Machias
Machias Main Street
PO Box 587
Machias, ME
T 207-255-3370
F 207-255-8367

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R7				
R6				
R5				
R4				
R3				
R2		2019-04-02	BLQ	JDK
R1	SITE PLAN REVIEW			

ISSUE STATUS

NOT FOR CONSTRUCTION

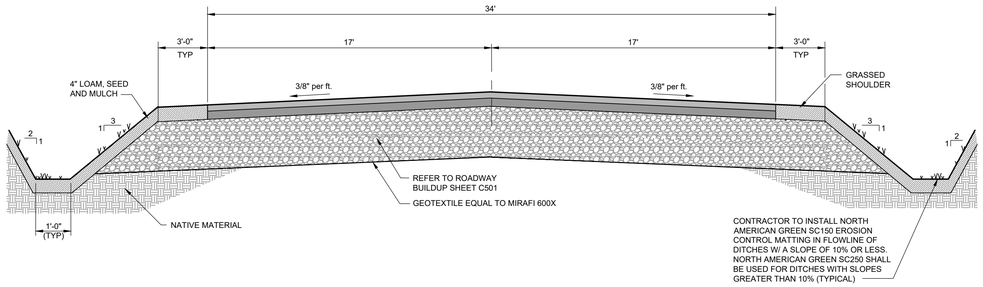
STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
LICENSED PROFESSIONAL ENGINEER
4/09/2019

SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002

DRAWING NUMBER

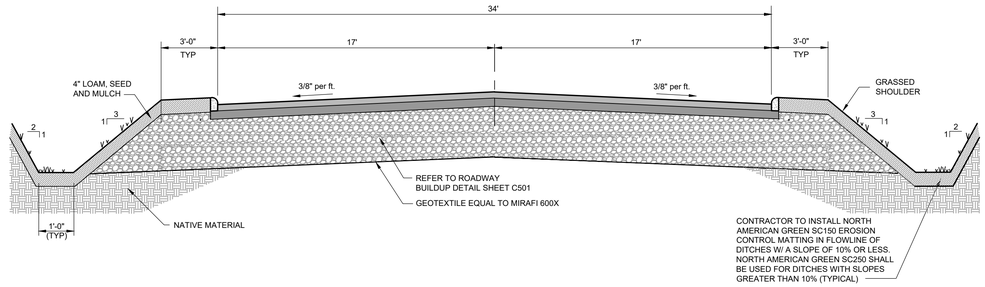
C501

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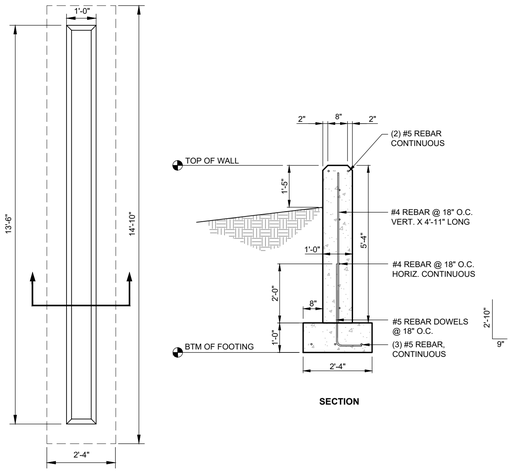
TYPICAL ROADWAY CROSS SECTION

N.T.S.



TYPICAL ROADWAY CROSS SECTION WITH CURB

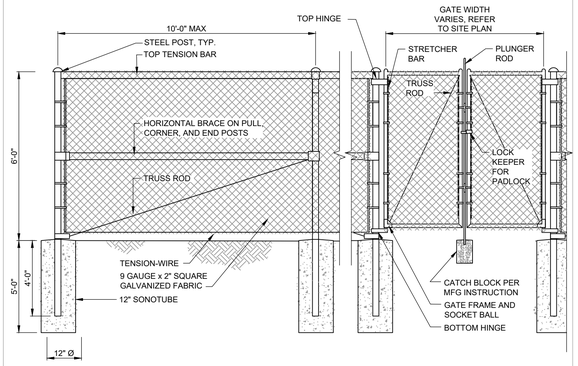
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SECTION

TYPICAL SIGN FOUNDATION DETAIL

N.T.S.

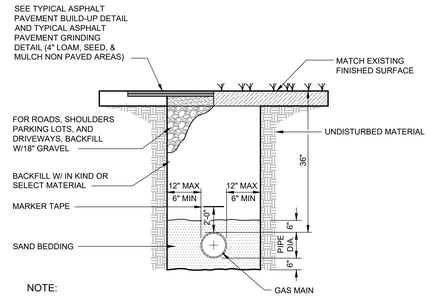


NOTE:

1. SECURE POSTS IN CONCRETE AS SHOWN AT ALL PULL, CORNER AND END POSTS (INCLUDING GATE POSTS).
2. FOR SINGLE LEAF GATES, LOCK KEEPER / PADLOCK HARDWARE SHALL BE INSTALLED ON ADJACENT POST.
3. REFER TO SITE PLAN FOR GATE DIMENSIONS AND LAYOUT.

CHAIN LINK FENCE DETAIL

N.T.S.

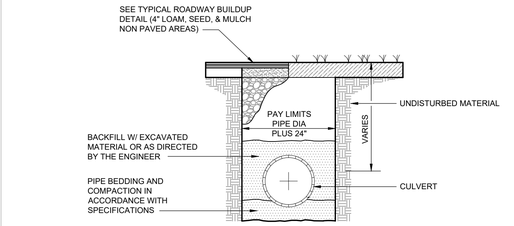


NOTE:

1. COMPACT ALL GRANULAR MATERIAL AND BACKFILL TO 95%.
2. SIDE CLEARANCE APPLICABLE TO BACKHOE OPERATIONS.

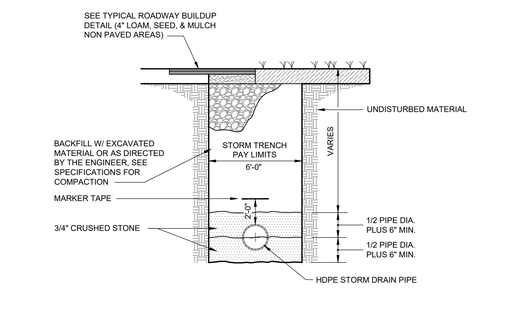
TYPICAL GAS TRENCH DETAIL

N.T.S.



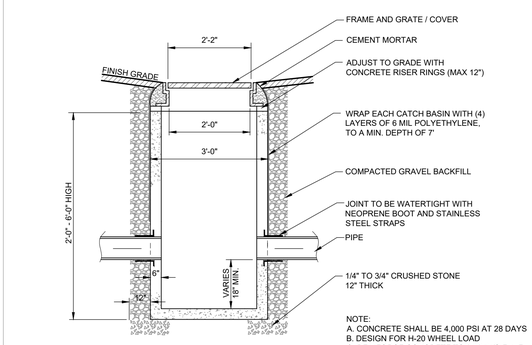
TYPICAL CULVERT TRENCH DETAIL

NTS



TYPICAL STORM DRAIN TRENCH DETAIL

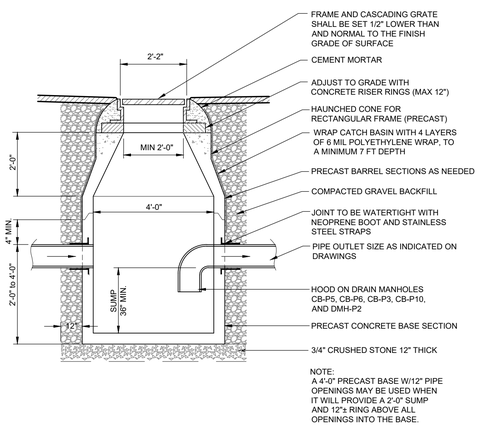
N.T.S.



NOTE:
A. CONCRETE SHALL BE 4,000 PSI AT 28 DAYS
B. DESIGN FOR H-20 WHEEL LOAD
C. REINFORCE CONCRETE TO 0.12 IN/S.F. L.F.

TYPICAL TYPE 'F' CATCH BASIN DETAIL

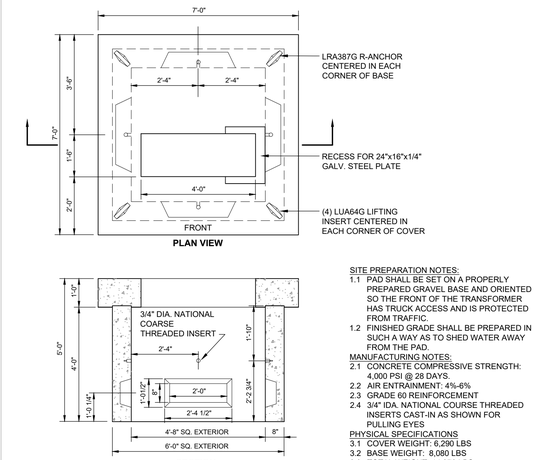
N.T.S.



NOTE:
A 4'-0" PRECAST BASE W/12" PIPE OPENINGS MAY BE USED WHEN IT WILL PROVIDE A 2'-0" SUMP AND 12"± RING ABOVE ALL OPENINGS INTO THE BASE.

TYPICAL CATCH BASIN / DRAINAGE MANHOLE DETAIL

N.T.S.



PLAN VIEW

SECTION

3 PHASE TRANSFORMER PAD DETAIL

N.T.S.

SITE PREPARATION NOTES:
1.1 PAD SHALL BE SET ON A PROPERLY PREPARED GRAVEL BASE AND ORIENTED SO THE FRONT OF THE TRANSFORMER HAS TRUCK ACCESS AND IS PROTECTED FROM TRAFFIC.
1.2 FINISHED GRADE SHALL BE PREPARED IN SUCH A WAY AS TO SHED WATER AWAY FROM THE PAD.

MANUFACTURING NOTES:
2.1 CONCRETE COMPRESSIVE STRENGTH: 4,000 PSI @ 28 DAYS.
2.2 AIR ENTRAINMENT: 4%-6%
2.3 GRADE 60 REINFORCEMENT
2.4 3/4" IDA. NATIONAL COURSE THREADED INSERTS CAST-IN AS SHOWN FOR PULLING EYES

PHYSICAL SPECIFICATIONS
3.1 COVER WEIGHT: 6,290 LBS
3.2 BASE WEIGHT: 8,080 LBS
3.3 TOTAL WEIGHT: 14,370 LBS

*FRONT DENOTES THE SIDE ON WHICH THE ACCESS DOORS ARE LOCATED

Portland
Bishop South Main Street
PO Box 619
Bishop, ME
T 207-989-4824
F 207-989-4881

Presque Isle
163 Main Street
PO Box 627
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Bar Harbor
1455 State Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Machias
4 Main Street
PO Box 587
Machias, ME
T 207-255-3270
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6166

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
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R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R0				
R3				
R4				
R5				
R6				

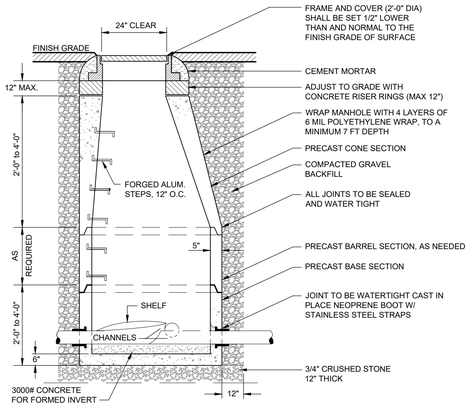
ISSUE STATUS

NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
4/09/2019
PROFESSIONAL ENGINEER
LICENSED

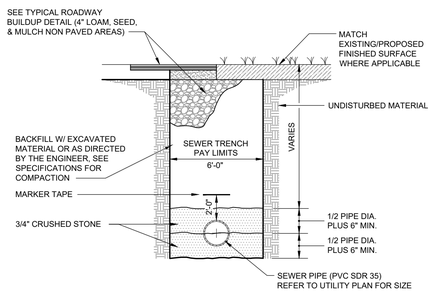
SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002
DRAWING NUMBER	C502

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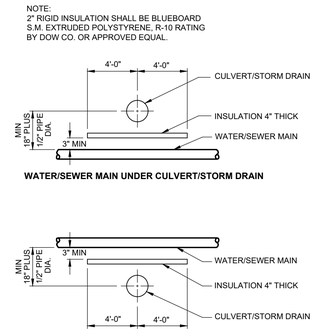
TYPICAL MANHOLE DETAIL

N.T.S.



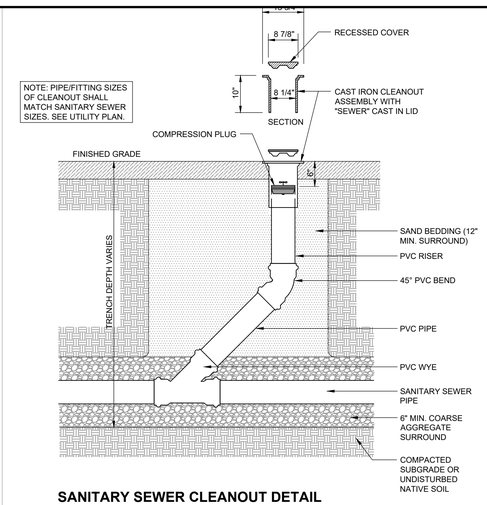
TYPICAL SEWER TRENCH DETAIL

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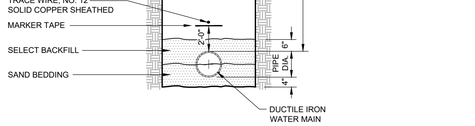
TYPICAL PIPE CROSSING INSULATION DETAIL

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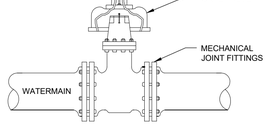
SANITARY SEWER CLEANOUT DETAIL

N.T.S.



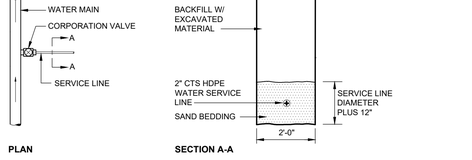
TYPICAL TRENCH DETAIL - DUCTILE IRON WATER MAIN

N.T.S.



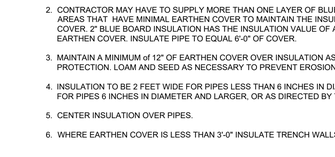
TYPICAL GATE VALVE DETAIL

N.T.S.



TYPICAL WATER SERVICE DETAIL

N.T.S.

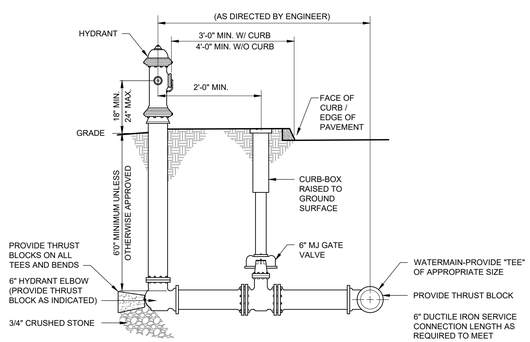


NOTES:

1. WATER AND SEWER PIPING SHALL BE INSULATED WITH 2" RIGID INSULATION BLUE BOARD BY DOW CO. SM. EXTRUDED POLYSTYRENE, (OR APPROVED EQUAL) TO BE USED IF EARTHEN COVER IS LESS THAN 6'-0".
2. CONTRACTOR MAY HAVE TO SUPPLY MORE THAN ONE LAYER OF BLUE BOARD INSULATION, IN AREAS THAT HAVE MINIMAL EARTHEN COVER TO MAINTAIN THE INSULATION VALUE OF 6'-0" COVER. 2" BLUE BOARD INSULATION HAS THE INSULATION VALUE OF APPROXIMATELY 1'-6" OF EARTHEN COVER. INSULATE PIPE TO EQUAL 6'-0" OF COVER.
3. MAINTAIN A MINIMUM of 12" OF EARTHEN COVER OVER INSULATION AS A MECHANICAL PROTECTION. LOAM AND SEED AS NECESSARY TO PREVENT EROSION.
4. INSULATION TO BE 2 FEET WIDE FOR PIPES LESS THAN 6 INCHES IN DIAMETER AND 4 FEET WIDE FOR PIPES 6 INCHES IN DIAMETER AND LARGER, OR AS DIRECTED BY THE ENGINEER.
5. CENTER INSULATION OVER PIPES.
6. WHERE EARTHEN COVER IS LESS THAN 3'-0" INSULATE TRENCH WALLS TO BOTTOM OF TRENCH.

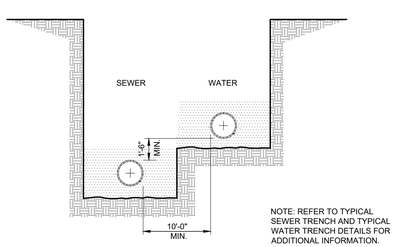
TYPICAL TRENCH PIPE INSULATION DETAIL

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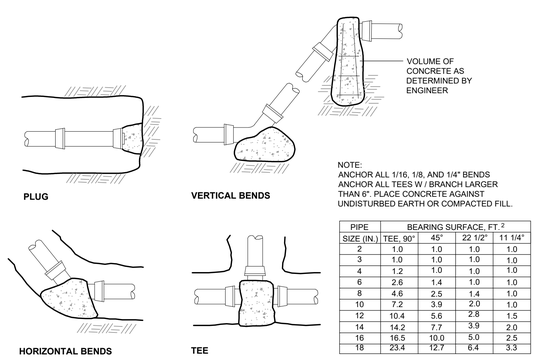
TYPICAL HYDRANT ASSEMBLY DETAIL

N.T.S.



TYPICAL SEWER / WATER SEPARATION DETAIL

N.T.S.



PIPE	BEARING SURFACE, FT.^{2}			
SIZE (IN.)	TEE, 90°	45°	22 1/2°	11 1/4°
2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0
4	1.2	1.0	1.0	1.0
6	2.6	1.4	1.0	1.0
8	4.6	2.5	1.4	1.0
10	7.2	3.9	2.0	1.0
12	10.4	5.6	2.8	1.5
14	14.2	7.7	3.9	2.0
16	16.5	10.0	5.0	2.5
18	23.4	12.7	6.4	3.3

ANCHORAGE DETAILS

N.T.S.

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Presque Isle
Skyline Mall
PO Box 627
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Bar Harbor
163 Main Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Bangor
85 Exchange Street
PO Box 619
Bangor, ME
T 207-989-4824
F 207-989-4881

Machias
PO Box 887
Machias, ME
T 207-255-2370
F 207-255-8367

CESINC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

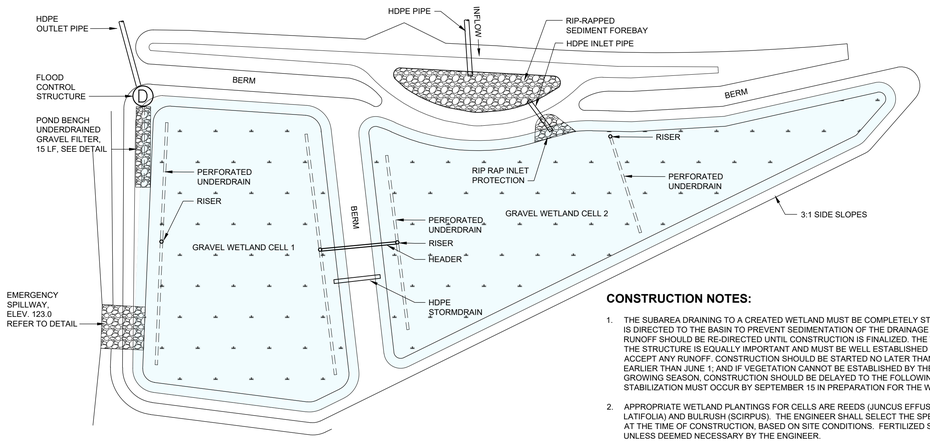
REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R7				
R6				
R5				
R4				
R3				
R2		2019-04-02	BLQ	JDK
R1	SITE PLAN REVIEW			

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
4/19/2019
LICENSED PROFESSIONAL ENGINEER

SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002
DRAWING NUMBER	C503

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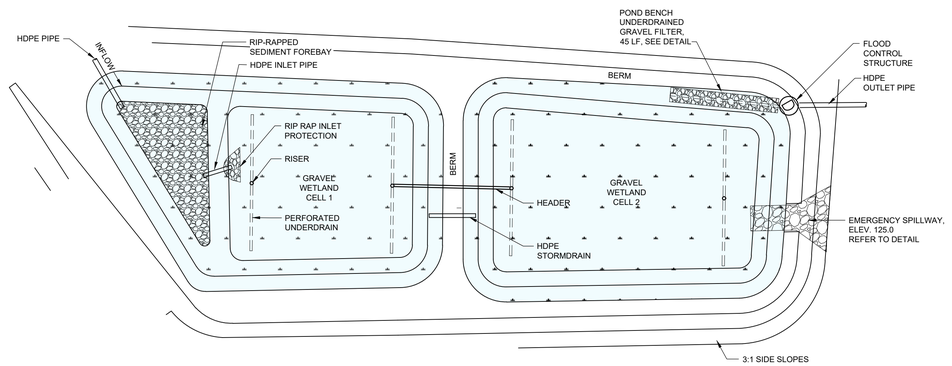


GRAVEL WETLAND 1 PLAN VIEW

CONSTRUCTION NOTES:

1. THE SUBAREA DRAINING TO A CREATED WETLAND MUST BE COMPLETELY STABLE BEFORE RUNOFF IS DIRECTED TO THE BASIN TO PREVENT SEDIMENTATION OF THE DRAINAGE LAYER; OR ALL RUNOFF SHOULD BE RE-DIRECTED UNTIL CONSTRUCTION IS FINALIZED. THE VEGETATION WITHIN THE STRUCTURE IS EQUALLY IMPORTANT AND MUST BE WELL ESTABLISHED BEFORE IT CAN ACCEPT ANY RUNOFF. CONSTRUCTION SHOULD BE STARTED NO LATER THAN SEPTEMBER 1 OR EARLIER THAN JUNE 1; AND IF VEGETATION CANNOT BE ESTABLISHED BY THE END OF THE GROWING SEASON, CONSTRUCTION SHOULD BE DELAYED TO THE FOLLOWING YEAR. SEEDING OR STABILIZATION MUST OCCUR BY SEPTEMBER 15 IN PREPARATION FOR THE WINTER SEASON.

2. APPROPRIATE WETLAND PLANTINGS FOR CELLS ARE REEDS (JUNCUS EFFUSUS), CATTAILS (TYPHA LATIFOLIA) AND BULRUSH (SCIRPUS). THE ENGINEER SHALL SELECT THE SPECIES TO BE PLANTED AT THE TIME OF CONSTRUCTION, BASED ON SITE CONDITIONS. FERTILIZED SHALL NOT BE USED UNLESS DEEMED NECESSARY BY THE ENGINEER.



GRAVEL WETLAND 2 PLAN VIEW

GRAVEL WETLAND SPECIFICATIONS:

WETLAND SOIL: THE WETLAND SOIL SHOULD HAVE A THICKNESS OF 8 INCHES MINIMUM AND SHOULD HAVE A LOW HYDRAULIC CONDUCTIVITY (0.1-0.01 FT/DAY). THIS SOIL CAN BE MANUFACTURED, USING COMPOST, SAND AND FINE SOILS, INTO A BLEND WITH MORE THAN 15% ORGANIC MATTER. IT SHOULD CONTAIN MORE THAN 15% SILT (PASSING THE #200 SIEVE); BUT WITH A CLAY SIZE PORTION THAT IS LESS THAN 2%.

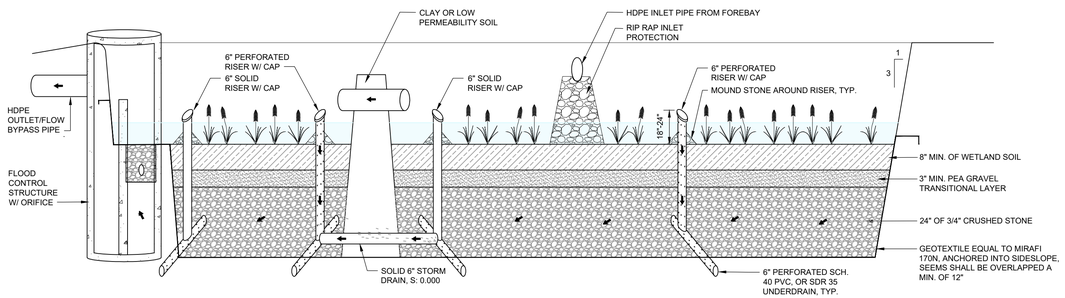
INTERMEDIATE LAYER: AN INTERMEDIATE LAYER (6 INCHES THICK) OF AGGREGATE FILTER (PEA GRAVEL) IS NEEDED TO PREVENT THE WETLAND SOIL FROM MIGRATING INTO THE CRUSHED-STONE (GRAVEL) SATURATED DRAINAGE LAYER. DO NOT USE A GEOTEXTILE FABRIC AS IT WILL RESTRICT ROOT GROWTH.
SATURATED DRAINAGE LAYER: BELOW THE WETLAND SOIL AND INTERMEDIATE LAYER IS A CRUSHED STONE (OR VERY COARSE GRAVEL) DRAINAGE LAYER WITH A 24-INCH MINIMUM THICKNESS. ANGULAR ¾" CRUSHED STONE, IS RECOMMENDED AS LARGE ANGULAR PARTICLES ARE NEEDED TO MAINTAIN THE PERMEABILITY OF THE SYSTEM. THE PIPE UNDERDRAINS SHOULD HAVE AT LEAST 2 FEET OF GRAVEL COVER AND SIX INCHES BELOW THE PIPE.

MAINTENANCE NOTES:

OPERATION AND MAINTENANCE REQUIREMENTS SIMILAR TO THOSE FOR UNDERDRAINED FILTER BASINS SHOULD BE EXPECTED. THE PLANT BIOMASS SHOULD BE HARVESTED ANNUALLY, AND ACCUMULATED SEDIMENT REMOVED AT INTERVALS OF 5-10 YEARS. THESE ACTIVITIES MAY DISRUPT THE WETLANDS SYSTEM AND MAY REQUIRE SOME VEGETATION RE-ESTABLISHMENT. THE RISER PIPES MAY CLOG AND WILL REQUIRE ANNUAL CLEAN-OUT (IT SHOULD BE DONE IN THE WINTER TIME WHEN ONE CAN WALK ON THE WETLAND).

1. FIRST YEAR POST CONSTRUCTION: INSPECTION FREQUENCY SHOULD OCCUR AFTER EVERY MAJOR STORM IN THE FIRST YEAR FOLLOWING CONSTRUCTION.
   - INSPECT THAT THE SYSTEM DRAINS WITHIN 24-48 HOURS
   - THE PLANTS MAY NEED WATERING IF NECESSARY DURING THE FIRST GROWING SEASON. RE-VEGETATE IF THE VEGETATION IS POORLY ESTABLISHING.
   - IDENTIFY AREAS OF EROSION AND MAKE TIMELY REPAIRS.
   - CHECK ALL INLETS, OUTLETS, AND SUBDRAINS FOR PROPER FUNCTIONING. RISERS MAY NEED TO BE CLEANED.

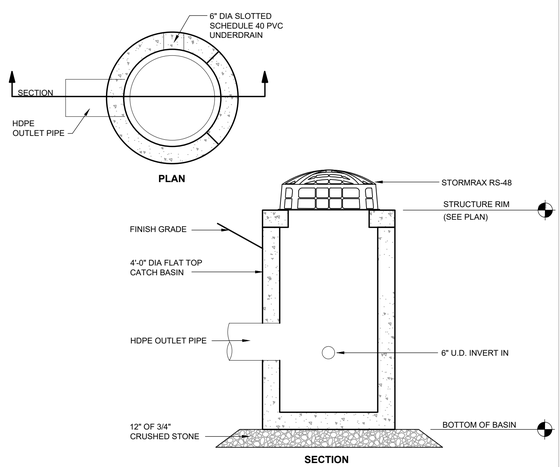
2. POST CONSTRUCTION: INSPECTION FREQUENCY SHOULD OCCUR AT LEAST EVERY 6 MONTHS AND AFTER EVERY MAJOR STORM. ACTIVITIES ARE EXPECTED TO INCLUDE:
   - CHECK THE BASIN FOR A DENSE ROOT MAT ESTABLISHMENT OF WETLAND VEGETATION.
   - CHECK AND CLEAN THE RISERS IF THERE IS EVIDENCE OF STANDING WATER, DISCOLORED WATER, OR ACCUMULATED SEDIMENTS IN THE CELLS.
   - CHECK AND CLEAN THE FOREBAY FOR SEDIMENTS, TRASH, AND DEBRIS. WHEN SEDIMENTS HAVE ACCUMULATED TO A DEPTH OF 12 INCHES, STANDING WATER IS PERSISTENT OR WETLAND VEGETATION BECOME ESTABLISHED, THE FOREBAY WILL NEED TO BE EXCAVATED AND REFORMED.
   - VERIFY THAT THE CELLS DRAIN WITHIN 24-48 HOURS. SEDIMENT WILL NEED TO BE REMOVED WHEN AN ACCUMULATION OF 4 INCHES IS EVIDENT OVER THE WETLAND SURFACE.
   - CHECK AND CLEAN ALL OUTLETS AND OVERFLOW SPILLWAY IF BLOCKED OR THERE IS EVIDENCE OF STRUCTURAL DAMAGE OR EROSION.
   - REMOVE DECAYING VEGETATION, LITTER, AND DEBRIS.
   - CHECK FOR FOREIGN SPECIES. PARTICULAR CARE MUST BE USED TO AVOID THE UNINTENDED INTRODUCTION OF INVASIVE SPECIES SUCH AS PURPLE LOOSESTRIFE (LYTHRUM SALICARIA) AND COMMON REED (PHRAGMITES AUSTRALIS). IT IS RECOMMENDED THAT A QUALIFIED WETLAND BIOLOGIST BE CONSULTED WHEN THESE ARE FOUND IN THE AREA OF THE GRAVEL WETLAND.



TYPICAL PROFILE

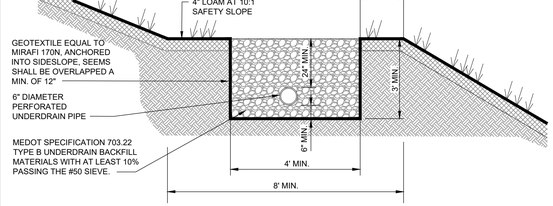
GRAVEL WETLAND DETAILS

N.T.S.



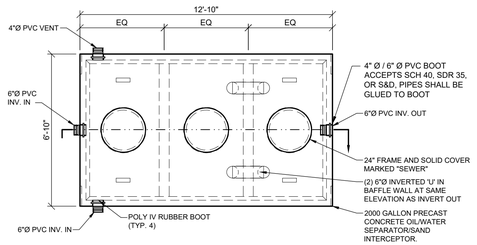
POND OUTLET STRUCTURE DETAIL

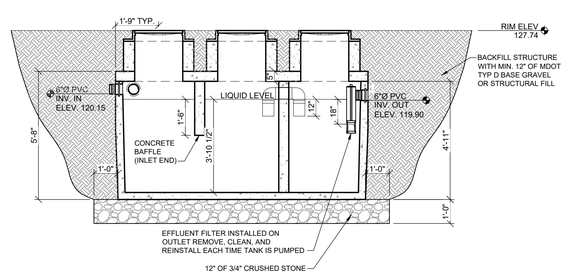
N.T.S.



POND BENCH UNDERDRAINED GRAVEL FILTER DETAIL

N.T.S.





NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5000PSI @ 28 DAYS
2. GRADE 60 REINFORCEMENT
3. DESIGNED FOR H20 LOAD RATING
4. REQUIRES GRADE RINGS AT FINISH GRADE & H20 FRAMES & COVERS
5. ALL TANK PENETRATIONS ARE INTEGRALLY CAST
6. ALL JOINTS SEALED W/ BUTYL RUBBER JOINT SEALANT
7. CARE AND MAINTENANCE SHALL BE PER MANUFACTURER'S WRITTEN INSTRUCTION
8. TANK SHALL BE COVERED WITH 4" OF BOARD INSULATION, OR AS INDICATED ON PLAN.

OIL/WATER SEPARATOR DETAIL

N.T.S.

Portland Site
249 Western Avenue
PO Box 827
Portland, ME
T 207-756-8412
F 207-756-8414

Bar Harbor
36 Kennebec Way, 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Brewer
187 South Main Street
PO Box 639
Brewer, ME
T 207-989-4824
F 207-989-4881

Machias
4 Court Street
PO Box 587
Machias, ME
T 207-255-8370
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

NO	BY	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	BLQ	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R2	BLQ	GRAVEL WETLAND SPECIFICATIONS	2019-05-01	BLQ	JDK

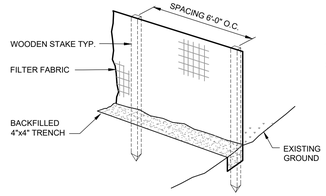
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
05/09/2019
LICENSED PROFESSIONAL ENGINEER

SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002

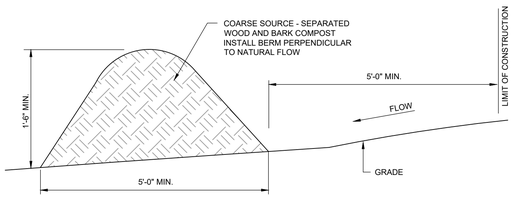
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C504

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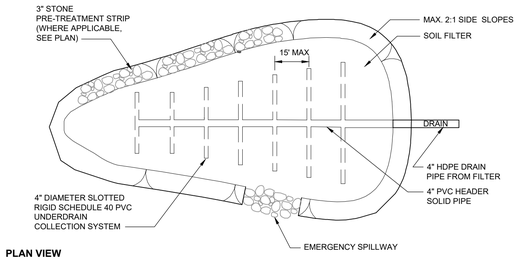


NOTES:
1. KEY FABRIC IN A 4"x4" TRENCH W/BACKFILL.
2. SILT FENCE SHALL BE A 3' FENCE WITH A MINIMUM GRAB STRENGTH OF 120 LBS.

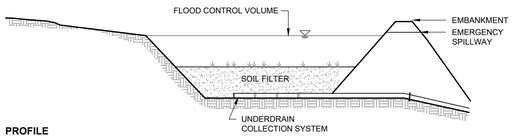
SILT FENCE DETAIL
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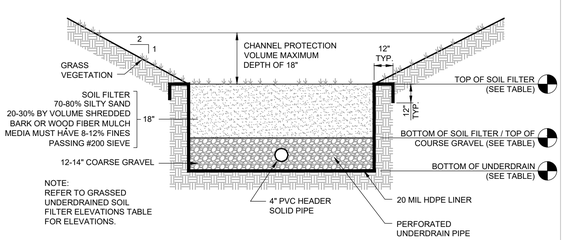
EROSION CONTROL BERM DETAIL
N.T.S. (MAY BE USED AS AN ALTERNATE TO SILT FENCE)



PLAN VIEW



PROFILE



SECTION

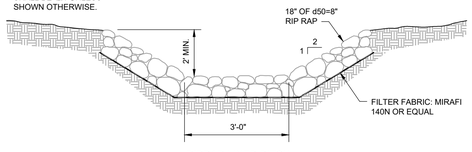
GRASSED UNDERDRAINED SOIL FILTER ELEVATIONS

USF NO.	EXISTING ELEVATION (+/-) (FT)	EMERGENCY SPILLWAY ELEVATION (FT)	PROPOSED TOP OF SOIL FILTER (FT)	PROPOSED BOTTOM OF SOIL FILTER / TOP OF COARSE GRAVEL (FT)	PROPOSED ELEVATION OF PIPE BED (FT)	PROPOSED BOTTOM OF COARSE GRAVEL (FT)	OVERFLOW OUTLET STRUCTURE RIM ELEVATION (FT)	TOP OF BERM (FT)	TREATMENT AREA REQ'D/PROVIDED (SF)	TOTAL STORAGE VOLUME (CF)
1	120.0	123.0	120.0	118.5	117.83	117.5	121.5	123.0	2863/3544	5,317
2	116.0	117.0	114.0	112.5	111.83	111.5	115.5	118.0	5720/4930	10,828
3	114.0	117.0	114.0	112.5	111.83	111.5	115.5	118.0	2130	
5	124.0	-	121.0	119.5	118.83	118.5	122.5	123.5	1723/5510	9,555
6	119.0	119.5	117.0	115.5	114.83	114.5	118.5	120.0	678/3018	5,449

* NOTE: ALL PONDS ARE LINED

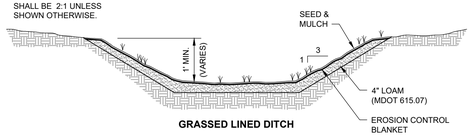
GRASSED UNDERDRAIN SOIL FILTER FIELD DETAIL
N.T.S.

NOTE:
MINIMUM SIDESLOPE
SHALL BE 2:1 UNLESS
SHOWN OTHERWISE.



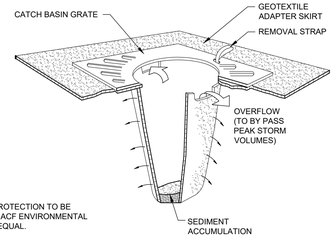
RIPRAP LINED DITCH

NOTE:
MINIMUM SIDESLOPE
SHALL BE 2:1 UNLESS
SHOWN OTHERWISE.



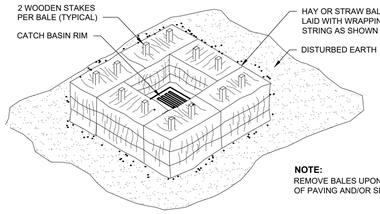
GRASSED LINED DITCH

TYPICAL DITCH DETAILS
N.T.S.



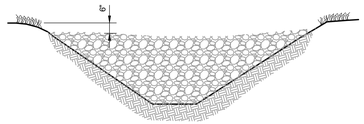
NOTES:
1. CATCH BASIN PROTECTION TO BE "SILTSTACK" BY ACF ENVIRONMENTAL OR APPROVED EQUAL.
2. INSPECT INSERT AFTER EACH RAINFALL EVENT. MAINTAIN AS REQUIRED.
3. SEDIMENT WITHIN INSERT SHALL BE EMPTIED WHEN 1/2 FULL.

SEDIMENT SACK INLET PROTECTION DETAIL
N.T.S. (MAY BE USED AS AN ALTERNATE TO HAY BALES)

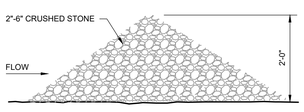


NOTE:
REMOVE BALES UPON COMPLETION OF PAVING AND/OR SEEDING

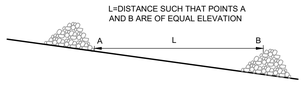
LOW POINT SEDIMENTATION CONTROL BARRIER DETAIL
N.T.S.



ELEVATION

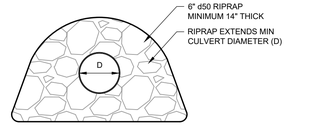


CROSS SECTION

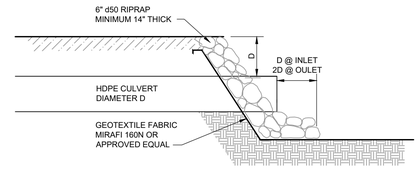


SPACING

STONE CHECK DAM DETAIL
N.T.S.

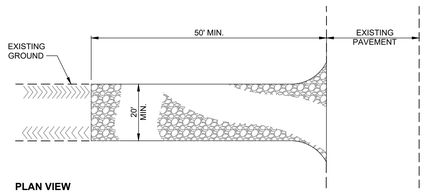


ELEVATION



PROFILE VIEW

TYPICAL CULVERT INLET/OUTLET PROTECTION DETAIL
N.T.S.



PLAN VIEW

NOTE: CONTRACTOR SHALL ADD
STONE TO ENTRANCE AS MUD/SILT
MATERIAL ACCUMULATES

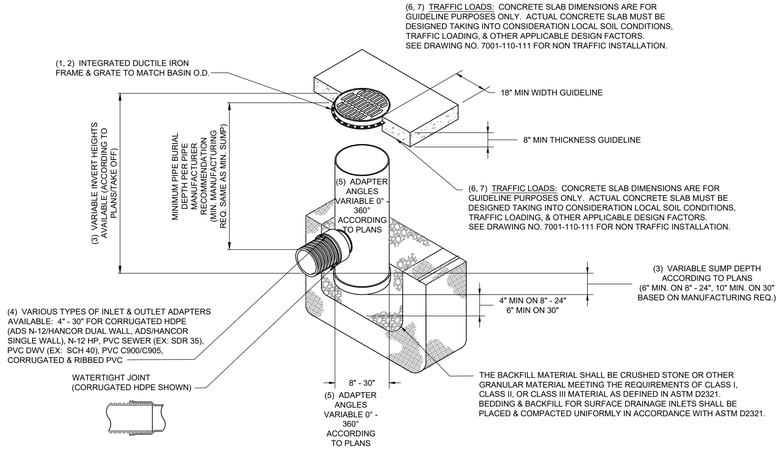


SECTION

STABILIZED CONSTRUCTION ENTRANCE DETAIL
N.T.S.



EMERGENCY SPILLWAY DETAIL
N.T.S.



(6, 7) TRAFFIC LOADS: CONCRETE SLAB DIMENSIONS ARE FOR GUIDELINE PURPOSES ONLY. ACTUAL CONCRETE SLAB MUST BE DESIGNED TAKING INTO CONSIDERATION LOCAL SOIL CONDITIONS, TRAFFIC LOADING, & OTHER APPLICABLE DESIGN FACTORS. SEE DRAWING NO. 7001-110-111 FOR NON TRAFFIC INSTALLATION.

(6, 7) TRAFFIC LOADS: CONCRETE SLAB DIMENSIONS ARE FOR GUIDELINE PURPOSES ONLY. ACTUAL CONCRETE SLAB MUST BE DESIGNED TAKING INTO CONSIDERATION LOCAL SOIL CONDITIONS, TRAFFIC LOADING, & OTHER APPLICABLE DESIGN FACTORS. SEE DRAWING NO. 7001-110-111 FOR NON TRAFFIC INSTALLATION.

NOTES:
1 - 8" - 30" STANDARD GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 12" - 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05. 8" & 10" STANDARD GRATES FIT DIRECTLY ONTO DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 - 12" - 30" STANDARD GRATES SHALL MEET H-20 LOAD RATING.
7 - 8" & 10" STANDARD GRATES ARE RATED FOR LIGHT DUTY APPLICATIONS ONLY; NO CONCRETE COLLAR NEEDED FOR LIGHT DUTY RATING.

NYLOPLAST DRAIN BASIN WITH STANDARD GRATE DETAIL
N.T.S.

Brewer
89 South Main Street
PO Box 619
Brewer, ME
T 207-989-4824
F 207-989-4881

Pinkham Isle
45 Main Street
PO Box 827
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Bar Harbor
36 Cottage Way, Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-8688

Machias
33 Center Street
PO Box 887
Machias, ME
T 207-255-2370
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

NO	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R2	U.D. SPACING, NYOPLAST DETAIL	2019-06-01	BLQ	JDK
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9789
6/09/2019
REGISTERED PROFESSIONAL ENGINEER

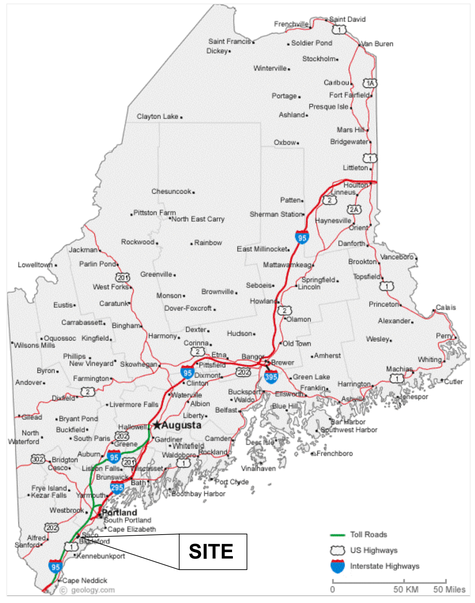
SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002

DRAWING NUMBER
C505

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SACO INDUSTRIAL PARK &
NEW PUBLIC WORKS FACILITY

SPRING HILL ROAD
SACO, MAINE



STATE OF MAINE

INDEX OF DRAWINGS

G101	GENERAL NOTES AND LEGEND
C101	EXISTING SITE PLAN
C102	PROPOSED SITE PLAN
C103	ENLARGED SITE PLAN
C104	PROPOSED UTILITY PLAN
C501	DETAILS
C502	DETAILS
C503	DETAILS
C504	DETAILS
C505	DETAILS
C701	PRE DEVELOPMENT HYDROLOGY PLAN
C702	POST DEVELOPMENT HYDROLOGY PLAN



PROJECT LOCATION

0 1500' 3000'

ISSUED FOR REVIEW

2019-02-19

REVISED

2019-05-09

CES INC

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JOHN D. KUCHINSKI
No. 9759
05/09/2019
REGISTERED PROFESSIONAL ENGINEER

JOHN KUCHINSKI, P.E.

CES PROJECT NO: 10602.002

GENERAL NOTES

1. THE UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION BY THE CONTRACTOR.
2. TEMPORARY BENCH MARKS (TBM'S) ARE GENERALLY HYDRANT VALVE NUTS OR SPIKES DRIVEN INTO THE BASE OF POWER POLES .
3. PROPERLY PROTECT AND DO NOT DISTURB PROPERTY IRONS AND MONUMENTS. IF DISTURBED, THE PROPERTY MONUMENT WILL BE RESET AT THE CONTRACTOR'S EXPENSE, BY A REGISTERED LAND SURVEYOR APPROVED BY THE ENGINEER.
4. CONTRACTOR SHALL PERFORM ALL CONSTRUCTION ACTIVITIES WITHIN THE CONFINES OF SUBJECT PROPERTY. ANY CONSTRUCTION ACTIVITY, MATERIAL STORAGE ETC., TAKING PLACE ON PRIVATE PROPERTY SHALL BE WITH THE EXPRESS WRITTEN PERMISSION OF THE OWNER.
5. IF UNEXPECTED HAZARDOUS WASTE OR MATERIALS CONTAINING HAZARDOUS WASTE ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY CEASE WORK AND CONTACT THE OWNER, ENGINEER, CONTRACTING OFFICER, AND DEP. WHEN A DEP APPROVED ACTION PLAN IS DETERMINED, WORK SHALL CONTINUE, AND ALL HAZARDOUS WASTE AND MATERIALS CONTAINING HAZARDOUS WASTE SHALL BE DISPOSED OF IN COMPLIANCE WITH THE APPROVED ACTION PLAN AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS.
6. THE CONTRACTOR SHALL PROVIDE ALL LABOR, EQUIPMENT, AND MATERIALS AS REQUIRED TO PERFORM THE WORK AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE APPLICABLE FEDERAL, STATE AND LOCAL CODES.
7. THE WORK SHALL INCORPORATE EROSION CONTROL MEASURES WHICH ARE COMPLIANT WITH THE LATEST VERSION OF "MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES".
8. THE LOCATION, TYPE AND SIZE OF EXISTING PIPES, DUCTS, CONDUITS AND OTHER UNDERGROUND STRUCTURES SHOWN ON THE DRAWINGS ARE NOT WARRANTED TO BE EXACT NOR IS IT WARRANTED THAT ALL UNDERGROUND STRUCTURES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY ALL UTILITY LOCATIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
9. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH THE CITY, UTILITY COMPANIES, DIG SAFE, EMERGENCY SERVICES AND MAINE DEPARTMENT OF TRANSPORTATION (MDOT) WHERE APPLICABLE. CONTRACTOR SHALL NOTIFY ALL UTILITIES PRIOR TO COMMENCING WORK TO ALLOW SUFFICIENT TIME TO LOCATE AND MARK THE LOCATION OF ALL BURIED UTILITIES. CONTRACTOR SHALL ALSO CONTACT "DIG SAFE", TELEPHONE NO 800-225-4977. REPAIR OF ANY DAMAGED UTILITY WILL BE INCIDENTAL TO THIS PROJECT.
10. WHEN APPLICABLE, CONTRACTOR SHALL MAINTAIN TRAFFIC IN A SAFE MANNER, IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION, AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO MAINTAIN CONTINUOUS TRAFFIC FLOW DURING CONSTRUCTION.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT EQUIPMENT FLUIDS FROM REACHING ANY WATER COURSE. ANY INADVERTENT FLUID DISCHARGES SHALL BE IMMEDIATELY CLEANED FROM THE WATERS USING WHATEVER MEANS NECESSARY, AS DETERMINED BY THE ENGINEER.
12. RESTORE ALL AREA DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL CONDITION (GRAVEL, PAVEMENT, GRASS, ETC.) UNLESS NOTED OTHERWISE ON PLANS. RESTORATION OF GRAVEL ROAD AND DRIVEWAY SURFACES AND LAWNS DAMAGED BY CONTRACTOR SHALL BE INCIDENTAL TO THE PROJECT.
13. RESTRICT ACCESS TO SITE THROUGH THE USE OF APPROPRIATE SIGNAGE, GATES, BARRIERS, FENCES, ETC. SITE SHALL BE LEFT WITH APPROPRIATE SAFETY MEASURES IN PLACE DURING NON-WORKING HOURS. NO TRENCH SHALL BE LEFT OPEN DURING NON-WORKING HOURS. SITE SAFETY IS THE RESPONSIBILITY OF CONTRACTOR, DURING BOTH WORKING AND NON-WORKING HOURS.
14. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY CONSTRUCTION PERMITS. PERMIT APPLICATIONS SHALL BE SUBMITTED WITH ADEQUATE TIME SO AS NOT TO DELAY CONSTRUCTION.
15. ALL FINISH SURFACES SHALL BE INSTALLED TO PROMOTE POSITIVE DRAINAGE. IN NO WAY SHALL THE NEW FINISH SURFACES AND CATCH BASINS CREATE DRAINAGE PROBLEMS THAT DID NOT EXIST PRIOR TO CONSTRUCTION.
16. STATIONS AND OFFSETS FOR MANHOLES, CATCH BASINS, AND OTHER STRUCTURES ARE SHOWN TO THE CENTER OF EACH.
17. HOURS FOR THE PROJECT WILL BE MONDAY THROUGH FRIDAY, FROM 7:00 AM TO 7:00 PM, UNLESS OTHERWISE AUTHORIZED BY THE OWNER.
18. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING OF ANY CONDITION OR OCCURRENCE THAT REPRESENTS A CHANGE IN PROJECT SCOPE. VERBAL NOTIFICATION IS REQUIRED PRIOR TO PROCEEDING WITH THE WORK OF THE PROJECT AND WRITTEN NOTIFICATION MUST BE PROVIDED. REQUESTS FOR FEE ADJUSTMENTS WILL NOT BE CONSIDERED UNLESS PROPER NOTICE IS GIVEN.
19. THE CONTRACTOR SHALL SUPERVISE AND INSPECT THE WORK OF THIS PROJECT IN AN EFFICIENT AND COMPETENT MANNER. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO COMPLETE THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE WORK IS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. A REPRESENTATIVE OF THE GENERAL CONTRACTOR SHALL BE PRESENT DURING ALL PHASES OF THE WORK.
20. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING TOPOGRAPHY AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
21. LAYOUT OF THE PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE APPROVED BY THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL GRADE AND LAYOUT CONTROL. LAYOUT SHOULD BE PERFORMED WITH SURVEY EQUIPMENT AND OVERSEEN BY A LICENSED SURVEYOR. A CAD FILE WILL BE AVAILABLE TO THE CONTRACTOR.
22. CONTRACTOR SHALL BE REQUIRED TO PROVIDE DUST CONTROL FOR PROJECT WHICH CAN INCLUDE, BUT IS NOT LIMITED TO, WATER AND CALCIUM CHLORIDE. COST IS INCIDENTAL TO THE PROJECT.
23. ALL MATERIALS SCHEDULED FOR REMOVAL SHALL BE DISPOSED OF IN A LEGAL MANNER BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THE OWNER HAS THE FIRST RIGHT AND REFUSAL FOR ANY DEMOLITION MATERIALS.
24. DISPOSAL OF SURPLUS SOIL MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SURPLUS MATERIAL SHALL NOT BE DISPOSED OF ON THE PROJECT SITE. DISPOSAL SHALL BE MADE ONLY AT WASTE AREAS WHICH ARE LICENSED TO ACCEPT SUCH MATERIALS, UNLESS THE MATERIAL IS ACCEPTABLE FOR USE AS FILL IN OTHER AREAS OF THE PROJECT. THE OWNER HAS THE FIRST RIGHT AND REFUSAL FOR ANY SURPLUS SOIL MATERIALS.

EROSION CONTROL NOTES

1. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENTATION CONTROL BEST MANAGEMENT PRACTICES (BMPS), PUBLISHED BY THE BUREAU OF LAND AND WATER QUALITY, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST EDITION.
2. SILT FENCE WILL BE INSPECTED, REPLACED AND/OR REPAIRED IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR LOSS OF SERVICEABILITY DUE TO SEDIMENT ACCUMULATION. AT A MINIMUM, ALL EROSION CONTROL DEVICES WILL BE OBSERVED WEEKLY.
3. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO CONSTRUCTION SITE.
4. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY A SUITABLE GROWTH OF GRASS. ONCE A SUITABLE GROWTH OF GRASS HAS BEEN OBTAINED, ALL TEMPORARY EROSION CONTROL ITEMS SHALL BE REMOVED BY THE CONTRACTOR. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THEY ARE REMOVED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED, SEEDED, AND MULCHED IMMEDIATELY.
5. ALL DISTURBED AREAS WILL BE SEEDED WITH 2.5 LBS. RED FESCUE AND 0.5 LBS. RYE GRASS PER 1,000 SQUARE FEET AND MULCHED AT A RATE OF 90 LBS. PER 1,000 SQUARE FEET OR EQUIVALENT APPLICATION OF SEED AND MULCH.
6. A SUITABLE BINDER SUCH AS CURASOL OR TERRTACK WILL BE USED ON THE HAY MULCH FOR WIND CONTROL.
7. IF FINAL SEEDING OF DISTURBED AREAS IS NOT COMPLETED BY SEPTEMBER 15th OF THE YEAR OF CONSTRUCTION, THEN ON THAT DATE THESE AREAS WILL BE GRADED AND SEEDED WITH WINTER RYE AT THE RATE OF 112 POUNDS PER ACRE OR 3 POUNDS PER 1000 SQUARE FEET. THE RYE SEEDING WILL BE PRECEDED BY AN APPLICATION OF 3 TONS OF LIME AND 800 LBS. OF 10-20-20 FERTILIZER OR ITS EQUIVALENT. MULCH WILL BE APPLIED AT A RATE OF 90 POUNDS PER 1000 SQUARE FEET.
8. IF THE RYE SEEDING CANNOT BE COMPLETED BY OCTOBER 1st OR IF THE RYE DOES NOT MAKE ADEQUATE GROWTH BY DECEMBER 1st, THEN ON THOSE DATES, HAY MULCH WILL BE APPLIED AT 150 POUNDS PER 1000 SQUARE FEET.
9. ALL CATCH BASINS ARE TO BE PROTECTED BY STRAW BALE OR SILTFENCE IN ACCORDANCE WITH SECTION B-3 STORM DRAIN INLET PROTECTION OF THE MAINE BMP HANDBOOK. SURROUNDING AREAS CAN BE EXCAVATED OR LEFT LOW AS A SEDIMENT TRAP. CURB INLETS SHALL BE PROTECTED BY GUTTERGATORS, OR APPROVED EQUIVALENT.
10. INTERIOR SILT FENCES ALONG CONTOUR DIVIDING FLAT AND STEEP SLOPES, AREAS WITH DIFFERENT DISTURBANCE SCHEDULES, AROUND TEMPORARY STOCKPILES OR IN OTHER UNSPECIFIED POSSIBLE CIRCUMSTANCES SHOULD BE CONSIDERED BY THE CONTRACTOR. THE INTENT OF SUCH INTERIOR SILT FENCES IS TO LIMIT SEDIMENT TRANSPORT WITHIN THE SITE TOWARD THE PROTECTED CATCH BASIN INLETS TO MINIMIZE SEDIMENT REMOVAL REQUIRED BY THE EROSION CONTROL NOTE 9 PROTECTIONS AND EXTEND LIFE OF SUCH DEVICES.
11. CONTRACTOR TO PROVIDE SEDIMENT SACKS IN ALL EXISTING BASINS PRIOR TO CONSTRUCTION.
12. MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE

    CONTRACTOR WILL BE RESPONSIBLE FOR FOLLOWING PROCEDURES FOUND IN THE "MAINE EROSION AND SEDIMENT CONTROL PRACTICES FIELD GUIDE FOR CONTRACTORS" (PUBLISHED MARCH 2015). THE PUBLICATION CAN BE FOUND AT: HTTP://WWW.MAINE.GOV/DEP/LAND/EROSION/ESCBMPS/INDEX.HTML

SURVEY NOTES:

1. THE DIRECTION OF LINES AND UNDERLYING COORDINATE SYSTEM IS BASED UPON THE MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE, US FOOT, NAD 83 DATUM.
2. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

REFERENCES:

1. "A PLAN SHOWING A TOPOGRAPHIC SURVEY MADE FOR THE CITY OF SACO, MAINE" DATED JANUARY 8, 2019, BY DOW & COULOMBE, INC.
2. "PLAN OF LAND MADE FOR THE CITY OF SACO, MAINE" DATED SEPTEMBER 4, 2018, BY DOW & COULOMBE, INC.
3. "PHASE ONE INDUSTRIAL PARK EXPANSION, ROADWAY UTILITIES, CITY OF SACO" DATED MARCH 1999, BY DELUCA-HOFFMAN ASSOCIATES, INC.

LEGEND:

DESCRIPTION	EXISTING	PROPOSED
BENCHMARK		NA
MANHOLE	D	D
MANHOLE	S	S
UTILITY POLE		
SIGN		
CATCH BASIN		
HYDRANT		
WATER VALVE	WV	WV
PROPERTY LINE		NA
EDGE OF GRAVEL		
EDGE OF PAVEMENT		
CENTERLINE		
MAJOR FOOT CONTOUR	100	100
MINOR FOOT CONTOUR	98	98
WATERLINE	W	W
STORM DRAIN	SD	SD
SANITARY SEWER	SS	SS
GAS LINE	GAS	GAS
OVERHEAD UTILITIES	OHU	OHU
UNDERGROUND UTILITIES	UGE	UGU
SILT FENCE	NA	SF
PAVED SURFACE		
RIP RAP	NA	
WETLAND		N/A
APPROXIMATE WETLAND BOUNDARY		N/A
TREE LINE		
STREAM		N/A

ABBREVIATIONS

@	AT		
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MAX.	MAXIMUM
APPROX.±	APPROXIMATELY	MDOT	MAINE DEPT. OF TRANSPORTATION
		MH	MANHOLE
BLDG	BUILDING	MIN	MINIMUM
		N	NORTHING
		NE	NORTHEAST
CL	CENTERLINE	N.T.S.	NOT TO SCALE
CB	CATCH BASIN	NWT	NON WOVEN GEOTEXTILE
CLR	CLEAR	OD	OUTSIDE DIAMETER
CMP	CORRUGATED METAL PIPE	O.C.	ON CENTER
CO	CLEANOUT	OH	OVERHEAD
CPE	CORRUGATED POLYETHYLENE	OZ	OUNCES
		PERF	PERFORATED
DI	DUCTILE IRON		
DIA.	DIAMETER	PSF	POUNDS PER SQUARE FOOT
		PSI	POUNDS PER SQUARE INCH
		PVC	POLYVINYL CHLORIDE
E	EASTING	PL	PROPERTY LINE
EL	ELEVATION	POH	PROPOSED OVERHEAD ELECTRIC
EFM	EXISTING FORCE MAIN	PUGE	PROPOSED UNDERGROUND ELECTRIC
EPS	EXTRUDED POLYSTYRENE		
		R	RADIUS
FM	FORCEMAIN		
GAL	GALLON	S	SLOPE
GALV	GALVANIZED	SCL	STORMWATER COLLECTION LINE
		SCS	STORMWATER COLLECTION SYSTEM
GPH	GALLONS PER HOUR	SDR	STANDARD DIMENSION RATIO
GPM	GALLONS PER MINUTE	SE	SOUTHEAST
		SHT	SHEET
HDPE	HIGH DENSITY POLYETHYLENE	SQ	SQUARE
HP	HORSEPOWER	SS	STAINLESS STEEL
		SY	SQUARE YARD
ID	INSIDE DIAMETER		
IN.	INCHES	TBM	TEMPORARY BENCH MARK
INT.	INTERSECTION	TOC	TOP OF CONCRETE
INV.	INVERT	TYP	TYPICAL

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CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
GENERAL NOTES AND LEGEND

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R7				
R6				
R5				
R4				
R3				
R2				
R1	SITE PLAN REVIEW	2019-03-05	BLQ	JDK

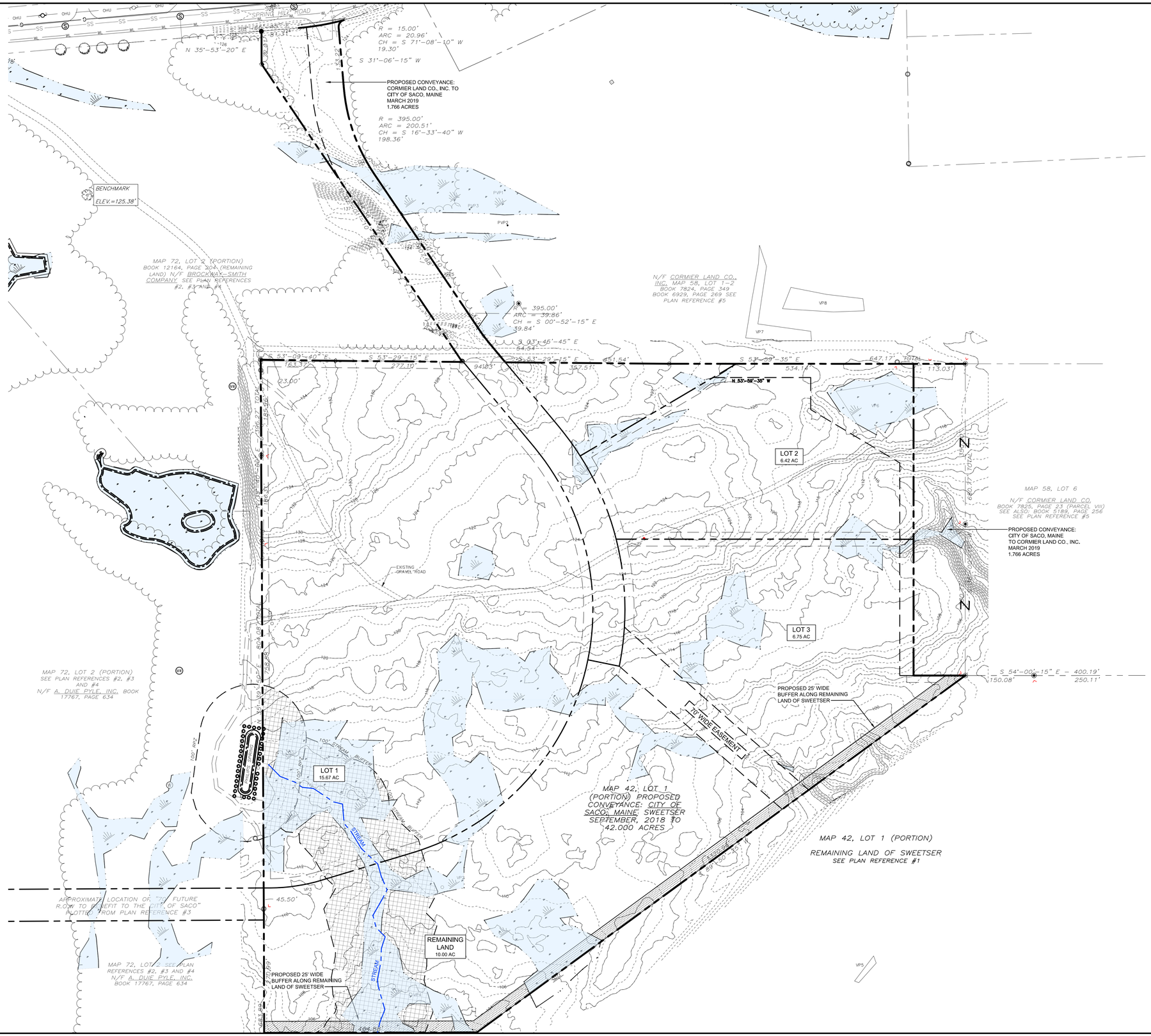
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
3/19/2019
REGISTERED PROFESSIONAL ENGINEER

SCALE	N.T.S.
DATE	2019-02-19
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002

DRAWING NUMBER
G101

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NOTES:

1. BOUNDARY INFORMATION PROVIDED BY DOW AND COULOMBE, INC.
2. TOPOGRAPHY SHOWN IS 2FT LIDAR CONTOUR DATA, COMPLIMENTARY OF MAINE OFFICE OF GIS, SUPPLEMENTED BY TOPOGRAPHY FROM A GROUND SURVEY PERFORMED BY DOW AND COULOMBE, INC. FOR ENTRANCE DRIVE.

SITE DATA:

TAX MAP 42 / PORTION OF LOT 1

	PROPOSED	ALLOWED
MINIMUM LOT AREA:	10,000 SF	42 ACRES
MINIMUM STREET FRONTAGE:	50 FT	181.43 FT
MINIMUM FRONT YARD:	20 FT	1039 FT
MINIMUM SIDE YARD:	15 FT	308 FT
MINIMUM REAR YARD:	15 FT	1081 FT
MAXIMUM LOT COVERAGE:	50%	18%
MAXIMUM BUILDING HEIGHT:	60 FT	35 FT

EXISTING SITE PLAN

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

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CESINC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
EXISTING SITE PLAN

REV.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
#1	2019-04-02	SITE PLAN REVIEW	BLQ	JDK
#2	2019-04-30	ADDED NOTES AND SITE DATA	BLQ	JDK
#3	2019-05-10	CITY REVIEW COMMENTS	BLQ	JDK
#4				
#5				
#6				
#7				

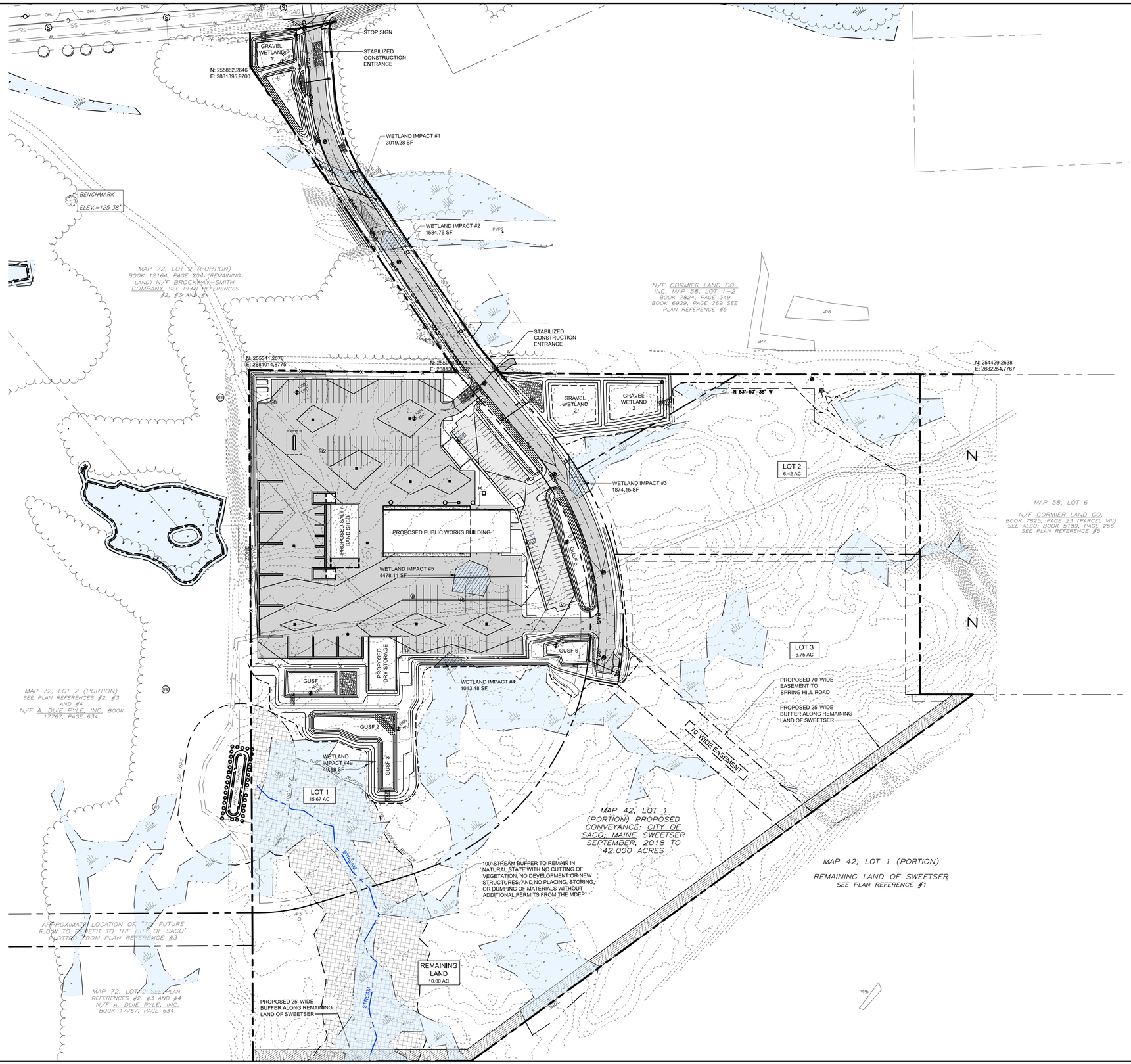
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
5/09/2019
LICENSED
PROFESSIONAL ENGINEER

SCALE	1"=100'
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DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002

DRAWING NUMBER
C101

P:\10600\SACO\00_NO PARK EXIP\PUBLIC WORKS BLDG SWP\00-DAD_DRAWINGS\CIVIL\EXISTING CONDITIONS\10602.002-EXISTING SITE PLAN.DWG 5/10/2019 8:18 AM



TEST PIT LOCATIONS

Pnt	Desc	Grid Northing	Grid Easting Longitude	Latitude
1000	TP-1	255242.7787'	2881069.2491'	W70° 26' 13.09" N43° 31' 59.93"
1001	TP-2	255051.6281'	2881238.6880'	W70° 26' 10.78" N43° 31' 58.05"
1002	TP-3	254897.5760'	2881372.5197"	W70° 26' 08.95" N43° 31' 56.53"
1003	TP-4	254894.9068'	2881501.3724'	W70° 26' 07.20" N43° 31' 56.51"
1004	TP-5	254648.5238'	2881347.3083'	W70° 26' 09.28" N43° 31' 54.07"
1005	TP-6	254483.4396'	2881198.2164'	W70° 26' 11.30" N43° 31' 52.43"
1006	TP-7	254537.3096'	2880822.7142'	W70° 26' 16.40" N43° 31' 52.95"
1007	TP-8	254708.7850'	2880717.0246'	W70° 26' 17.84" N43° 31' 54.64"

Wetland Impact Tabulation

No.	Area (SF)	Area (Ac)
1	3019	0.07
2	1585	0.04
3	1874	0.04
4	1013	0.02
4a	50	0.00
5	4478	0.10
Total	***12019***	***0.27592***

WETLAND NOTE:
WETLAND IMPACTS SUBJECT TO MAINE DEP NRPA PERMIT.

SURVEY NOTES:

1. BOUNDARY INFORMATION PROVIDED BY DOW AND COULOMBE, INC.
2. TOPOGRAPHY SHOWN IS 2FT LIDAR CONTOUR DATA, COMPLIMENTARY OF MAINE OFFICE OF GIS, SUPPLEMENTED BY TOPOGRAPHY FROM A GROUND SURVEY PERFORMED BY DOW AND COULOMBE, INC. FOR ENTRANCE DRIVE.

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MAXIMUM LOT COVERAGE:	50%	18%
MAXIMUM BUILDING HEIGHT:	60 FT	35 FT

THIS IS TO CERTIFY THAT AFTER REVIEWING THE SITE PLAN SUBMISSION INFORMATION FOR THE PROJECT SHOWN ON THIS PLAN AND CONSIDERING EACH OF THE CRITERIA SET FORTH BY THE CITY OF SACO CODE, AND IN ACCORDANCE WITH THE APPLICATION REQUIREMENTS, THE UNDERSIGNED HAVE MADE FINDINGS OF FACT ESTABLISHING THAT THIS PLAN ALONG WITH ITS ADDITIONAL SUBMISSION INFORMATION HAS MET ALL THE CRITERIA SET FORTH AND THEREFORE THE SITE PLAN IS APPROVED.

APPROVED BY THE CITY OF SACO PLANNING BOARD ON: _____

CONDITIONS:

PLANNING BOARD SIGNED ON: _____

PROPOSED SITE PLAN

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Brunswick
45 Columbia Street
PO Box 919
Brunswick, ME
T 207-798-4824
F 207-989-4881

Pittsfield Site
45 South Main Street
PO Box 627
Pittsfield, ME
T 207-754-8412
F 207-754-8414

Machias
33 Main Street
PO Box 787
Machias, ME
T 207-255-3070
F 207-255-8367

Bar Harbor
McKay Farm, Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-6588

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6165

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
PROPOSED SITE PLAN

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R2	ADDED STOP SIGN AND NOTES	2019-04-30	BLQ	JDK
R3	CITY REVIEW COMMENTS	2019-06-05	BLQ	JDK
R4				
R5				
R6				
R7				

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9789
LICENSED PROFESSIONAL ENGINEER
6/20/2019

SCALE	1"=100'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDM
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002
DRAWING NUMBER	**C102**

P:\10602.SACO\00 IND PARK EXP\PUBLIC WORKS BLDG.SMT\02.CAD\DRAWINGS\CIVIL\DWGS\10602.002-C-SP.DWG, 6/6/2019 2:25 PM

N/F CORMIER LAND CO., INC. MAP 58, LOT 1-2 BOOK 7824, PAGE 349 BOOK 6929, PAGE 269 SEE PLAN REFERENCE #5

RAY SMITH REFERENCES #4

CULVERT INLET/OUTLET PROTECTION, TYP.

6' CHAIN LINK FENCE

30 SPACES @ 12' = 360.0'

N: 255341.2076
E: 2881014.8775

RIP RAP BANK STABILIZATION

N: 255078.3874
E: 2881368.3322

FUEL TANKS

STOP SIGN

GATE, REFER TO PLANS BY OTHERS

FUEL ISLAND, REFER TO DRAWINGS BY OTHERS

BUS PARKING

ADA PARKING SIGN

TRANS OFFICE

TRANSPORTATION STAFF

TC: 127.50
BC: 127.00

BOLLARD, TYP. OF 2

RIP RAP BANK STABILIZATION

CONCRETE APRON, SLOPE 2% AWAY FROM BUILDING

RAMP

5' SIDEWALK AND CURB

7' WIDE CHAIN LINK GATE

CURBED ISLAND

GUSF 5

ADA PARKING SIGN

VISITOR / DPW STAFF

(50' X 63') RECLAIM

(50' X 63') SAND

(50' X 63') 3/4" STONE

(50' X 63') 4" STONE

(50' X 63') RIPRAP

MATERIALS STORAGE

SALT / SAND SHED
F.F.E. 128.0

20' FUTURE ADDITION

GARAGE
F.F.E. 128.0

OFFICE
F.F.E. 128.0

TC: 127.60
BC: 127.10

CONCRETE APRON, SLOPE 2% AWAY FROM BUILDING

WETLAND IMPACT #5
4478.11 SF

BOLLARD, TYP. OF 5

GATE, REFER TO PLANS BY OTHERS

FLEET PARKING

17 SPACES @ 15' = 255.0'

STOP SIGN

WASTE (42' X 50')

WASTE (42' X 50')

WASTE (42' X 50')

DRY STORAGE
F.F.E. 126.0

GUSF 1

GUSF 6

GUSF 2

GUSF 3

WETLAND IMPACT #4
1013.48 SF

14' WIDE CHAIN LINK GATE

EMERGENCY SPILLWAY ELEV. 119.5

PROPOSED 12" HDPE
L: 69 LF / S: 0.0043
INV. IN: 117.30
INV. OUT: 117.00

EMERGENCY SPILLWAY ELEV. 123.0

WETLAND IMPACT #6
49.58 SF

100' STREAM BUFFER

100' RPZ

PHILIPS SPRING

EMERGENCY SPILLWAY ELEV. 117.0

EROSION CONTROL BERM, TYP.

MAP 42, LOT 1

GRAVEL WETLAND 2 CELL 1
ELEV. 118.40

GRAVEL WETLAND 2 CELL 2
ELEV. 118.40

N 53°-59'-35" W

EMERGENCY SPILLWAY ELEV. 122.0

EROSION CONTROL BERM, TYP.

WETLAND IMPACT #3
1874.15 SF

PRE-TREATMENT STRIP

EROSION CONTROL BERM, TYP.

NOTE:
PAVEMENT BUILDUP FOR TRANSPORTATION STAFF AND VISITOR/DPW STAFF PARKING LOTS SHALL BE DIFFERENT THAN REMAINDER OF SITE. REFER TO SHEET C501 FOR MORE INFORMATION

EMERGENCY SPILLWAY ELEV. 124.0

PRE-TREATMENT STRIP

I-1 ZONE

B-8 ZONE

ENLARGED SITE PLAN

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Pittsfield
Piscataquis Site
PO Box 627
Pittsfield, ME
T 207-784-8412
F 207-784-8414

Wilton
Bangor
49 South Main Street
PO Box 619
Wilton, ME
T 207-645-4824
F 207-645-4827

Wiscasset
Machias
35 Water Street
PO Box 787
Wiscasset, ME
T 207-882-7163
F 207-882-7164

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Bar Harbor
Machias
35 Water Street
PO Box 787
Machias, ME
T 207-255-3270
F 207-255-8367

Lewiston
Bar Harbor
Suite 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

CESINC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
ENLARGED SITE PLAN

NO	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	CITY REVIEW COMMENTS	2019-05-06	BLQ	JDK
R2	SIGNAGE, SPILLWAYS, PAVEMENT BUILDUP	2019-05-03	BLQ	JDK
R3	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R4				
R5				
R6				
R7				

ISSUE STATUS

NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
REGISTERED PROFESSIONAL ENGINEER
5/9/2019

SCALE	1"=50'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002

DRAWING NUMBER

C103

P:\10602.SACO\00 IND PARK EXP PUBLIC WORKS BLDG SMT\02-CAD_DRAWINGS\CIVIL\DESIGN_DWGS\10602.002-C-SP.DWG, 5/9/2019 2:37 PM

PROPOSED DMH-P1
RIM: 129.05
INV. IN: 119.02
INV. OUT: 119.02

1" WATER SERVICE

PROPOSED CB-P4
RIM: 126.50
INV. IN: 120.60
INV. IN: 120.60
INV. IN: 120.60
INV. OUT: 120.03

PROPOSED 24" HDPE
L: 139 LF / S: 0.007

PROPOSED CB-P10
RIM: 126.50
INV. OUT: 122.05

PROPOSED 15" HDPE
L: 202 LF / S: 0.007

PROPOSED 15" HDPE
L: 152 LF / S: 0.010

PROPOSED CB-P3
RIM: 126.50
INV. OUT: 122.12

PROPOSED CB-P2
RIM: 126.50
INV. IN: 122.35
INV. OUT: 122.08

PROPOSED CB-P1
RIM: 126.50
INV. OUT: 122.75

PROPOSED 15" HDPE
L: 130 LF / S: 0.011

TRANS OFFICE

SMH-P10
RIM: 127.60
INV. IN: 121.9
INV. OUT: 121.8

PROPOSED 12" HDPE
L: 80 LF / S: 0.005

8" ROOF DRAIN

PROPOSED CB-P7
RIM: 127.60
INV. OUT: 120.80

SMH-P9
RIM: 127.60
INV. IN: 120.6
INV. OUT: 120.5

OIL WATER SEPARATOR

SMH-P8
RIM: 127.95
INV. IN: 119.3
INV. OUT: 119.2

PROPOSED CB-P5
RIM: 128.70
INV. OUT: 121.63

SALT / SAND SHED
F.F.E. 128.0

GARAGE
F.F.E. 128.0

OFFICE
F.F.E. 128.0

I-1 ZONE
B-4 ZONE

PROPOSED 12" HDPE
L: 197 LF / S: 0.013

PROPOSED CB-P8
RIM: 124.50
INV. IN: 118.04
INV. IN: 118.70
INV. OUT: 117.94

PROPOSED 12" HDPE
L: 163 LF / S: 0.005

PROPOSED CB-P6
RIM: 125.50
INV. IN: 121.00
INV. OUT: 120.39

PROPOSED 15" HDPE
L: 110 LF / S: 0.022

PROPOSED DMH-P2
RIM: 126.45
INV. IN: 118.02
INV. OUT: 118.02

PROPOSED 15" HDPE
L: 145 LF / S: 0.010

PROPOSED CB-P9
RIM: 124.50
INV. OUT: 120.20

PROPOSED 15" HDPE
L: 88 LF / S: 0.027

DRY STORAGE
F.F.E. 128.0

GUSF 1

FOREBAY

GUSF 2

12" DIA. NYLOPAST INLET,
W/ BEEHIVE GRATE
RIM: 121.00
INV. IN: 117.83 (4" U.D.)
INV. OUT: 117.00 (4" S.D.)

PROPOSED 18" HDPE
L: 208 LF / S: 0.010

INVERT 116.82

PROPOSED 12" HDPE
L: 28 LF / S: 0.005

SMH-P11

8" SANITARY
SEWER STUB

PROPOSED 24" HDPE
L: 75 LF / S: 0.014

SMH-P2

INV. IN: 124.0
INV. OUT: 123.5

12" HDPE
INV. 119.9

OUTLET CONTROL
STRUCTURE
INV. OUT: 118.00

GRAVEL WETLAND 2
CELL 1
ELEV. 118.40

GRAVEL WETLAND 2
CELL 2
ELEV. 118.40

12" STORM DRAIN

DMH-P3
INV. IN: 117.05
INV. OUT: 1117.0

INV. OUT: 16.97

N 53°-59'-35" W

12" STORM DRAIN

SMH-P5

8" SANITARY
SEWER STUB

8" FIRE SERVICE

4" DOMESTIC WATER SERVICE

4" UNDERDRAIN

8" SANITARY
SEWER STUB

18" DIA. NYLOPAST INLET,
W/ BEEHIVE GRATE
RIM: 122.5
INV. IN: 118.83 (4" U.D.)
INV. IN: 118.83 (10" S.D.)
INV. OUT: 118.00 (12" S.D.)

SMH-P6

12" STORMDRAIN

18" DIA. NYLOPAST INLET,
W/ BEEHIVE GRATE
RIM: 118.5
INV. IN: 114.83 (4" U.D.)
INV. IN: 114.83 (12" S.D.)
INV. OUT: 114.83 (15" S.D.)

SMH-P7

8" SANITARY
SEWER STUB

12" HDPE CULVERT
INV. IN: 117.5
INV. OUT: 117.3

12" HDPE CULVERT
INV. IN: 117.3
INV. OUT: 117.0

15" S.D.

INVERT 114.28

8" SANITARY
SEWER STUB

WATER LINE
BLOW-OFF

18" DIA. NYLOPAST INLET,
W/ BEEHIVE GRATE
RIM: 115.5
INV. IN: 111.83 (4" U.D.)
INV. OUT: 111.83 (6" S.D.)

INVERT 111.70

PHILIPS SPRING

100' STREAM BUFFER

100' RPZ

STREAM B

MAP 42, LOT 1
(PORTION) PROPOSED
CONVEYANCE: CITY OF
SACO, MAINE SWEETSER
SEPTEMBER, 2018 TO
42.000 ACRES

NOTES:

1. REFER TO SHEETS C201 AND C202 FOR STRUCTURE AND PIPE INFORMATION.
2. SITE LIGHTING BY OTHERS.

PROPOSED UTILITY PLAN

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

Portland Site
443 Main Street
Suite 204
Westbrook, ME
T 207-680-2262
F 207-680-2204

Lewiston
444 Lisbon Street
Lewiston, ME
T 207-795-6099
F 207-795-6166

Rumford
Basement Main Street
PO Box 619
Rumford, ME
T 207-989-4824
F 207-989-4881

Bar Harbor
Mount Desert Street
PO Box 827
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Machias
Main Street
PO Box 297
Machias, ME
T 207-255-8370
F 207-255-8367

CESINC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
PROPOSED UTILITY PLAN

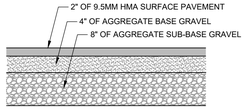
REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R2	CITY REVIEW COMMENTS	2019-05-06	BLQ	JDK
R3				
R4				
R5				
R6				

ISSUE STATUS
NOT FOR CONSTRUCTION

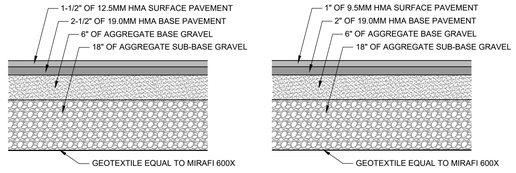
STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
LICENSED
PROFESSIONAL ENGINEER

SCALE	1"=50'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002
DRAWING NUMBER	C104

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SIDEWALK

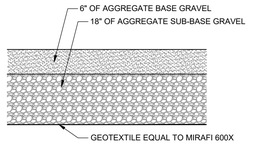


HEAVY DUTY TRAVEL SURFACE (LOTS TO THE NORTH, SOUTH, AND WEST OF DPW BUILDING, AND ADJOINING ACCESS ROADS)

AUTOMOBILE PARKING AREAS (DPW & TRANSPORTATION OFFICE PARKING LOTS AND COMMON ACCESS DRIVE)

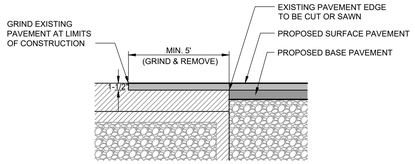
PAVEMENT BUILDUP DETAIL

N.T.S.



TYPICAL GRAVEL BUILDUP DETAIL

N.T.S.

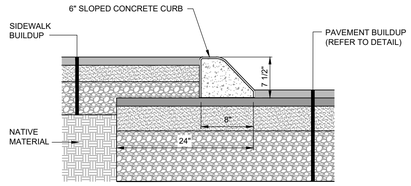


NOTES:

1. EXTEND NEW SURFACE PAVEMENT ACROSS BUTT JOINT IN BASE COURSE.
2. PROVIDE TACK COAT ON ALL SURFACES OF EXISTING PAVEMENT TO BE COVERED.

TYPICAL ASPHALT PAVEMENT GRINDING DETAIL

N.T.S.

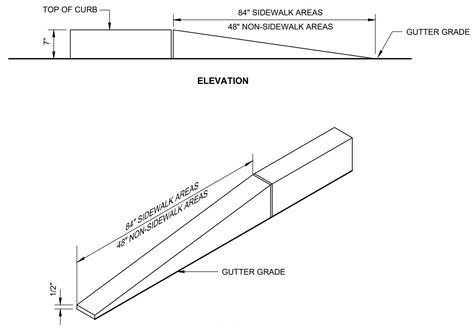


NOTES:

1. ALL CURBING AND TERMINATION IN CONJUNCTION WITH SIDEWALKS MUST MEET ADA REQUIREMENTS.

SLIP FORM CONCRETE CURB DETAIL

N.T.S.

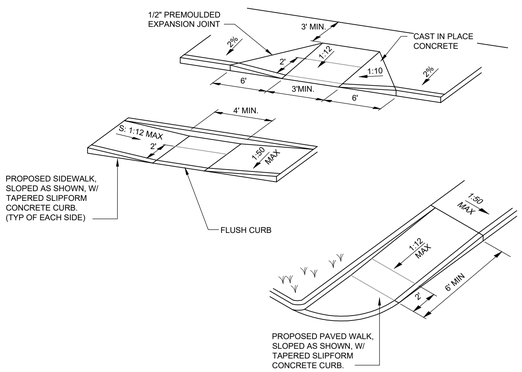


NOTE:

ALL CURBING AND TERMINATION IN CONJUNCTION WITH SIDEWALKS MUST MEET ADA REQUIREMENTS

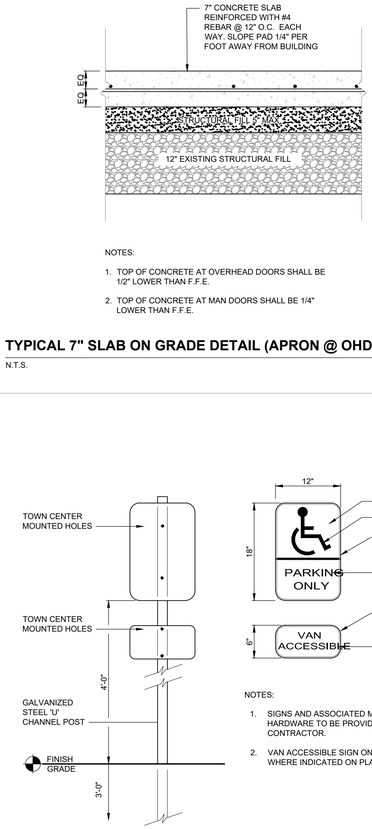
TYPICAL CURB TERMINATION DETAIL

N.T.S.



TYPICAL HANDICAP CURB RAMP DETAILS

N.T.S.

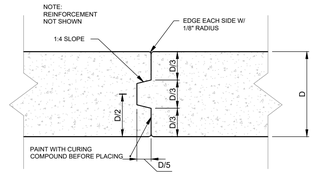


NOTES:

1. TOP OF CONCRETE AT OVERHEAD DOORS SHALL BE 1/2" LOWER THAN F.F.E.
2. TOP OF CONCRETE AT MAN DOORS SHALL BE 1/4" LOWER THAN F.F.E.

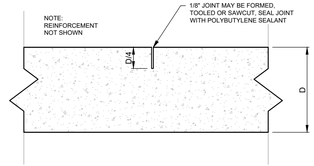
TYPICAL 7" SLAB ON GRADE DETAIL (APRON @ OHD)

N.T.S.



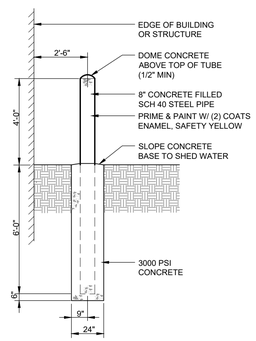
TYPICAL SLAB CONSTRUCTION JOINT

N.T.S.



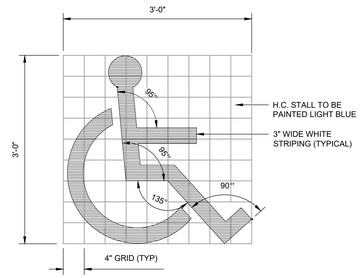
TYPICAL SLAB CONTROL JOINT

N.T.S.



STEEL BOLLARD DETAIL

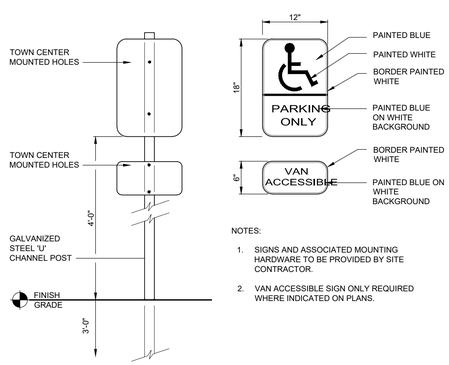
N.T.S.



NOTE: CENTER SYMBOL WITHIN PARKING STALL

TYPICAL HANDICAP PARKING STALL SYMBOL

N.T.S.

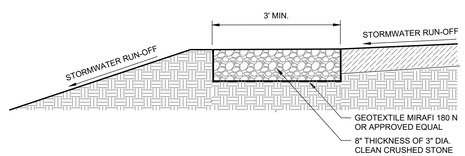


NOTES:

1. SIGNS AND ASSOCIATED MOUNTING HARDWARE TO BE PROVIDED BY SITE CONTRACTOR.
2. VAN ACCESSIBLE SIGN ONLY REQUIRED WHERE INDICATED ON PLANS.

TYPICAL HANDICAP PARKING SIGN DETAIL

N.T.S.



STONE FILTER STRIP PRETREATMENT DETAIL

N.T.S.

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Pittsfield
Pittsfield Site
149 Main Street
PO Box 627
Pittsfield, ME
T 207-784-8412
F 207-784-8414

Bar Harbor
Bar Harbor Site
350 Eagle Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-8588

Bangor
85 South Main Street
PO Box 639
Bangor, ME
T 207-989-4824
F 207-989-4881

Machias
Machias Site
PO Box 587
Machias, ME
T 207-255-3370
F 207-255-8367

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R7				
R6				
R5				
R4				
R3				
R2		2019-04-02	BLQ	JDK
R1	SITE PLAN REVIEW			

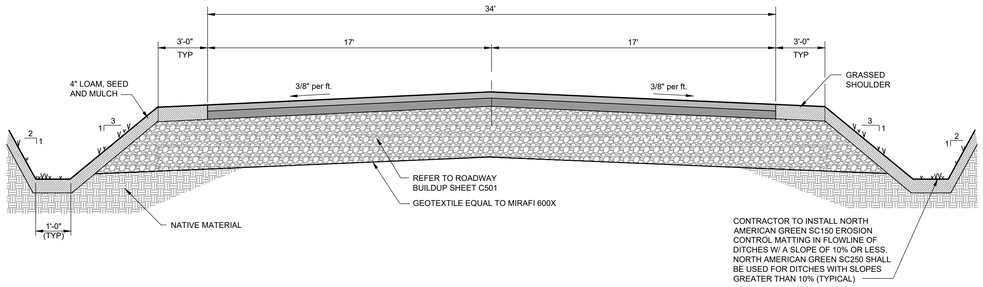
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
LICENSED PROFESSIONAL ENGINEER
4/09/2019

SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002

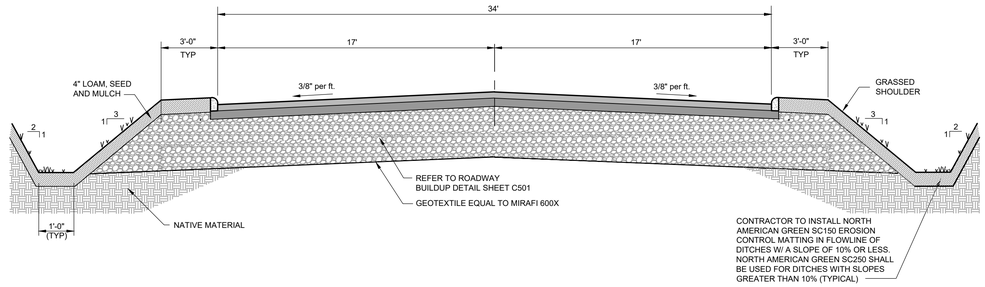
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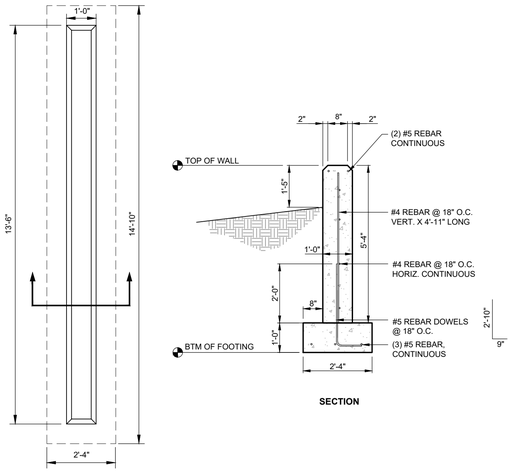
TYPICAL ROADWAY CROSS SECTION

N.T.S.



TYPICAL ROADWAY CROSS SECTION WITH CURB

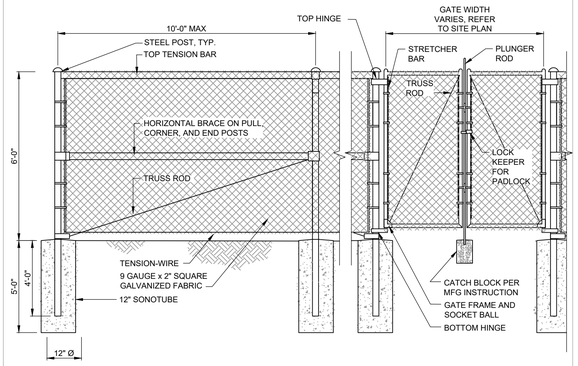
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SECTION

TYPICAL SIGN FOUNDATION DETAIL

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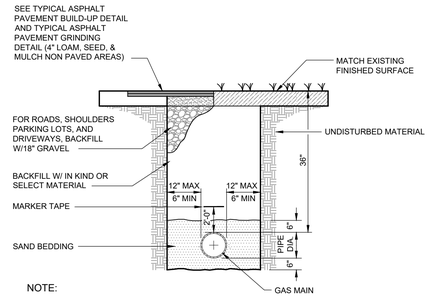


NOTE:

1. SECURE POSTS IN CONCRETE AS SHOWN AT ALL PULL, CORNER AND END POSTS (INCLUDING GATE POSTS).
2. FOR SINGLE LEAF GATES, LOCK KEEPER / PADLOCK HARDWARE SHALL BE INSTALLED ON ADJACENT POST.
3. REFER TO SITE PLAN FOR GATE DIMENSIONS AND LAYOUT.

CHAIN LINK FENCE DETAIL

N.T.S.

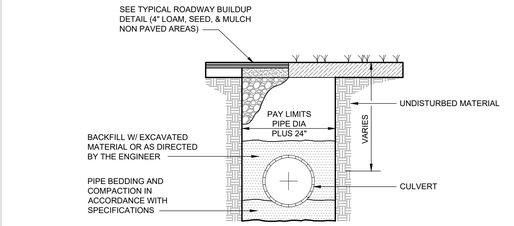


NOTE:

1. COMPACT ALL GRANULAR MATERIAL AND BACKFILL TO 95%.
2. SIDE CLEARANCE APPLICABLE TO BACKHOE OPERATIONS.

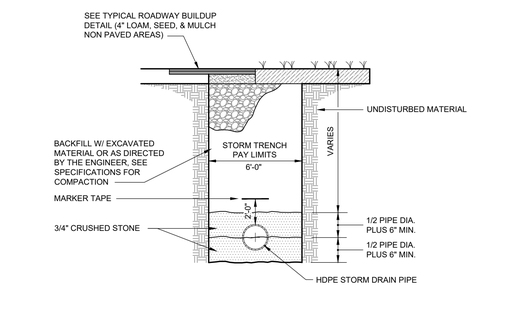
TYPICAL GAS TRENCH DETAIL

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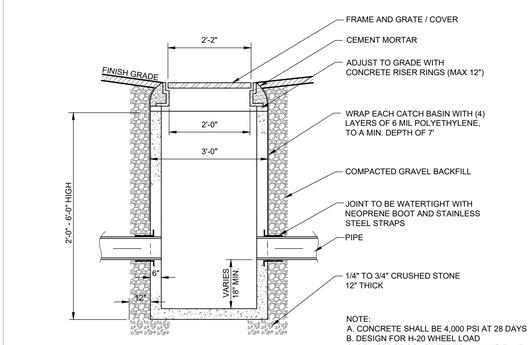
TYPICAL CULVERT TRENCH DETAIL

NTS



TYPICAL STORM DRAIN TRENCH DETAIL

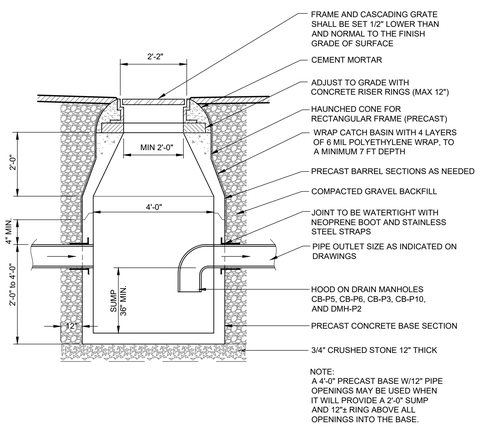
N.T.S.



NOTE:
A. CONCRETE SHALL BE 4,000 PSI AT 28 DAYS
B. DESIGN FOR H-20 WHEEL LOAD
C. REINFORCE CONCRETE TO 0.12 IN/S.F. L.F.

TYPICAL TYPE 'F' CATCH BASIN DETAIL

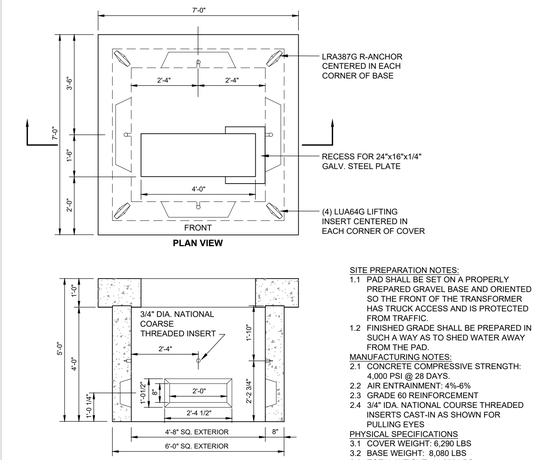
N.T.S.



NOTE:
A 4'-0" PRECAST BASE W/12" PIPE OPENINGS MAY BE USED WHEN IT WILL PROVIDE A 2'-0" SUMP AND 12"± RING ABOVE ALL OPENINGS INTO THE BASE.

TYPICAL CATCH BASIN / DRAINAGE MANHOLE DETAIL

N.T.S.



PLAN VIEW

SECTION

3 PHASE TRANSFORMER PAD DETAIL

N.T.S.

SITE PREPARATION NOTES:
1.1 PAD SHALL BE SET ON A PROPERLY PREPARED GRAVEL BASE AND ORIENTED SO THE FRONT OF THE TRANSFORMER HAS TRUCK ACCESS AND IS PROTECTED FROM TRAFFIC.
1.2 FINISHED GRADE SHALL BE PREPARED IN SUCH A WAY AS TO SHED WATER AWAY FROM THE PAD.

MANUFACTURING NOTES:
2.1 CONCRETE COMPRESSIVE STRENGTH: 4,000 PSI @ 28 DAYS.
2.2 AIR ENTRAINMENT: 4%-6%
2.3 GRADE 60 REINFORCEMENT
2.4 3/4" IDA. NATIONAL COURSE THREADED INSERTS CAST-IN AS SHOWN FOR PULLING EYES

PHYSICAL SPECIFICATIONS
3.1 COVER WEIGHT: 6,290 LBS
3.2 BASE WEIGHT: 8,080 LBS
3.3 TOTAL WEIGHT: 14,370 LBS

*FRONT DENOTES THE SIDE ON WHICH THE ACCESS DOORS ARE LOCATED

Portland
Bishop South Main Street
PO Box 619
Bishop, ME
T 207-989-4824
F 207-989-4881

Presque Isle
163 Main Street
PO Box 627
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Bar Harbor
1455 State Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Machias
4 Main Street
PO Box 587
Machias, ME
T 207-255-3270
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6166

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

REV	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
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R0				
R3				
R4				
R5				
R6				

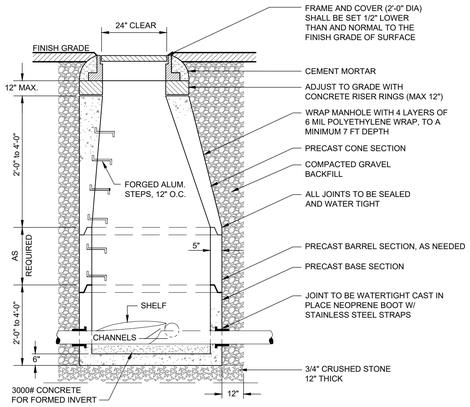
ISSUE STATUS

NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
4/09/2019
PROFESSIONAL ENGINEER
LICENSED

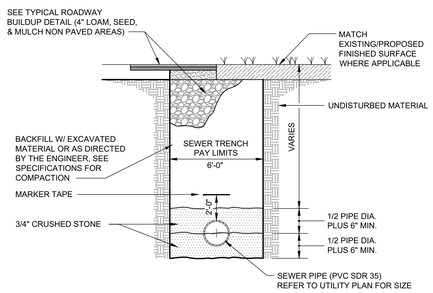
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DRAWING NUMBER	C502

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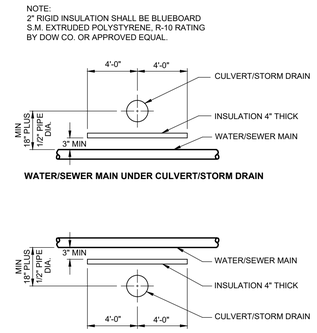
TYPICAL MANHOLE DETAIL

N.T.S.



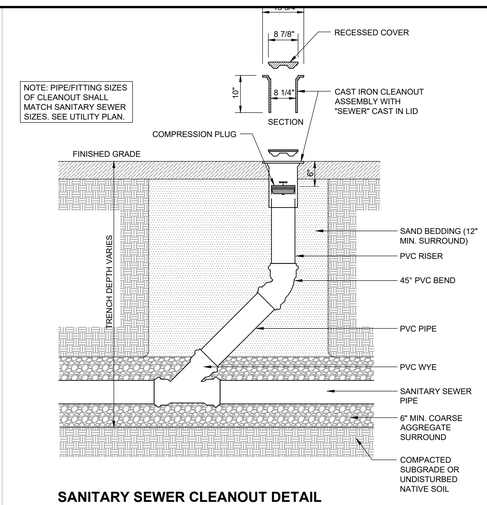
TYPICAL SEWER TRENCH DETAIL

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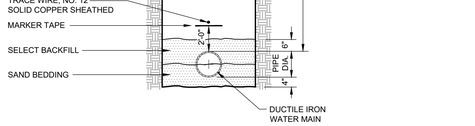
TYPICAL PIPE CROSSING INSULATION DETAIL

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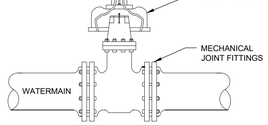
SANITARY SEWER CLEANOUT DETAIL

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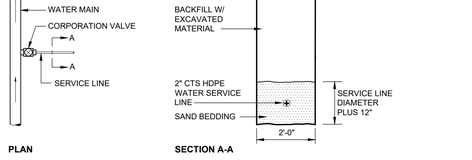
TYPICAL TRENCH DETAIL - DUCTILE IRON WATER MAIN

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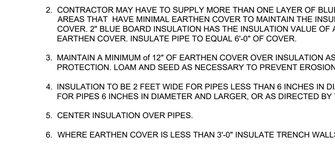
TYPICAL GATE VALVE DETAIL

N.T.S.



TYPICAL WATER SERVICE DETAIL

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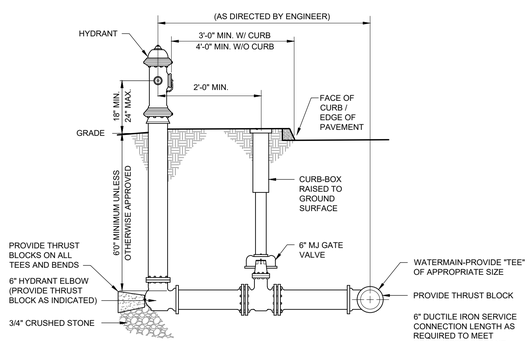


NOTES:

1. WATER AND SEWER PIPING SHALL BE INSULATED WITH 2" RIGID INSULATION BLUE BOARD BY DOW CO. SM. EXTRUDED POLYSTYRENE, (OR APPROVED EQUAL) TO BE USED IF EARTHEN COVER IS LESS THAN 6'-0".
2. CONTRACTOR MAY HAVE TO SUPPLY MORE THAN ONE LAYER OF BLUE BOARD INSULATION, IN AREAS THAT HAVE MINIMAL EARTHEN COVER TO MAINTAIN THE INSULATION VALUE OF 6'-0" COVER. 2" BLUE BOARD INSULATION HAS THE INSULATION VALUE OF APPROXIMATELY 1'-6" OF EARTHEN COVER. INSULATE PIPE TO EQUAL 6'-0" OF COVER.
3. MAINTAIN A MINIMUM of 12" OF EARTHEN COVER OVER INSULATION AS A MECHANICAL PROTECTION. LOAM AND SEED AS NECESSARY TO PREVENT EROSION.
4. INSULATION TO BE 2 FEET WIDE FOR PIPES LESS THAN 6 INCHES IN DIAMETER AND 4 FEET WIDE FOR PIPES 6 INCHES IN DIAMETER AND LARGER, OR AS DIRECTED BY THE ENGINEER.
5. CENTER INSULATION OVER PIPES.
6. WHERE EARTHEN COVER IS LESS THAN 3'-0" INSULATE TRENCH WALLS TO BOTTOM OF TRENCH.

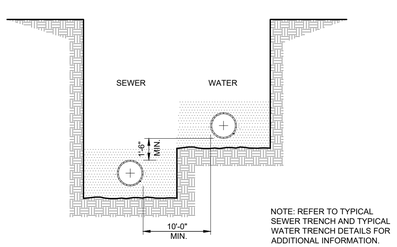
TYPICAL TRENCH PIPE INSULATION DETAIL

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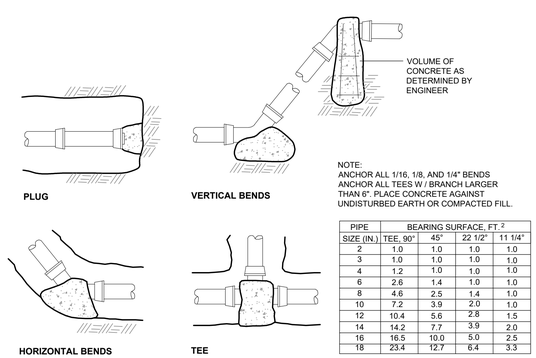
TYPICAL HYDRANT ASSEMBLY DETAIL

N.T.S.



TYPICAL SEWER / WATER SEPARATION DETAIL

N.T.S.



PIPE	BEARING SURFACE, FT.^{2}			
SIZE (IN.)	TEE, 90°	45°	22 1/2°	11 1/4°
2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0
4	1.2	1.0	1.0	1.0
6	2.6	1.4	1.0	1.0
8	4.6	2.5	1.4	1.0
10	7.2	3.9	2.0	1.0
12	10.4	5.6	2.8	1.5
14	14.2	7.7	3.9	2.0
16	16.5	10.0	5.0	2.5
18	23.4	12.7	6.4	3.3

ANCHORAGE DETAILS

N.T.S.

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Presque Isle
Skyline Mall
PO Box 627
Presque Isle, ME
T 207-764-8412
F 207-764-8414

Bar Harbor
163 Main Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Bangor
85 Exchange Street
PO Box 619
Bangor, ME
T 207-989-4824
F 207-989-4881

Machias
PO Box 887
Machias, ME
T 207-255-2370
F 207-255-8367

CESINC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

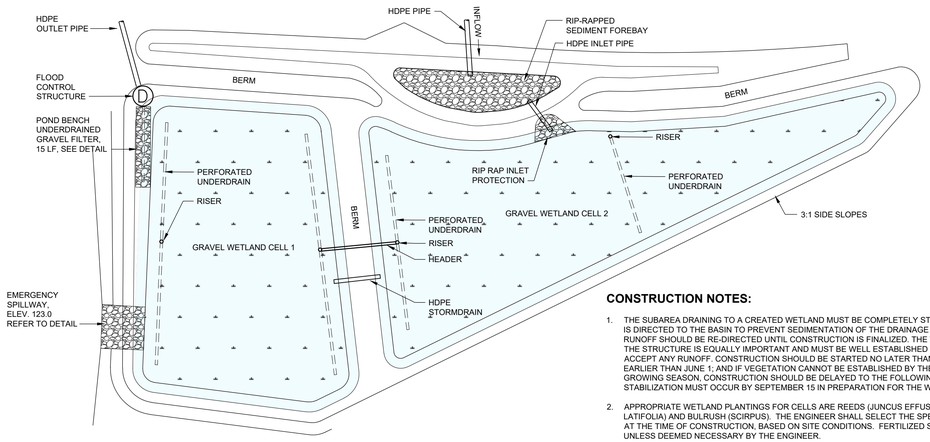
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R7				
R6				
R5				
R4				
R3				
R2		2019-04-02	BLQ	JDK
R1	SITE PLAN REVIEW			

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
4/19/2019
LICENSED PROFESSIONAL ENGINEER

SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002
DRAWING NUMBER	C503

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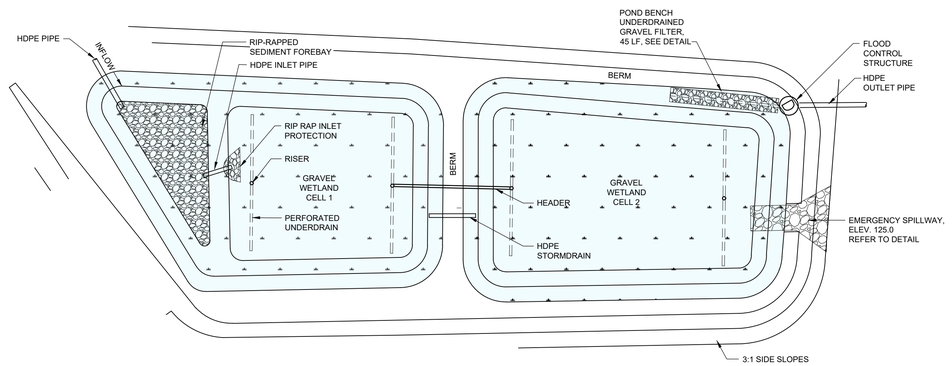


GRAVEL WETLAND 1 PLAN VIEW

CONSTRUCTION NOTES:

1. THE SUBAREA DRAINING TO A CREATED WETLAND MUST BE COMPLETELY STABLE BEFORE RUNOFF IS DIRECTED TO THE BASIN TO PREVENT SEDIMENTATION OF THE DRAINAGE LAYER; OR ALL RUNOFF SHOULD BE RE-DIRECTED UNTIL CONSTRUCTION IS FINALIZED. THE VEGETATION WITHIN THE STRUCTURE IS EQUALLY IMPORTANT AND MUST BE WELL ESTABLISHED BEFORE IT CAN ACCEPT ANY RUNOFF. CONSTRUCTION SHOULD BE STARTED NO LATER THAN SEPTEMBER 1 OR EARLIER THAN JUNE 1; AND IF VEGETATION CANNOT BE ESTABLISHED BY THE END OF THE GROWING SEASON, CONSTRUCTION SHOULD BE DELAYED TO THE FOLLOWING YEAR. SEEDING OR STABILIZATION MUST OCCUR BY SEPTEMBER 15 IN PREPARATION FOR THE WINTER SEASON.

2. APPROPRIATE WETLAND PLANTINGS FOR CELLS ARE REEDS (JUNCUS EFFUSUS), CATTAILS (TYPHA LATIFOLIA) AND BULRUSH (SCIRPUS). THE ENGINEER SHALL SELECT THE SPECIES TO BE PLANTED AT THE TIME OF CONSTRUCTION, BASED ON SITE CONDITIONS. FERTILIZED SHALL NOT BE USED UNLESS DEEMED NECESSARY BY THE ENGINEER.



GRAVEL WETLAND 2 PLAN VIEW

GRAVEL WETLAND SPECIFICATIONS:

WETLAND SOIL: THE WETLAND SOIL SHOULD HAVE A THICKNESS OF 8 INCHES MINIMUM AND SHOULD HAVE A LOW HYDRAULIC CONDUCTIVITY (0.1-0.01 FT/DAY). THIS SOIL CAN BE MANUFACTURED, USING COMPOST, SAND AND FINE SOILS, INTO A BLEND WITH MORE THAN 15% ORGANIC MATTER. IT SHOULD CONTAIN MORE THAN 15% SILT (PASSING THE #200 SIEVE); BUT WITH A CLAY SIZE PORTION THAT IS LESS THAN 2%.

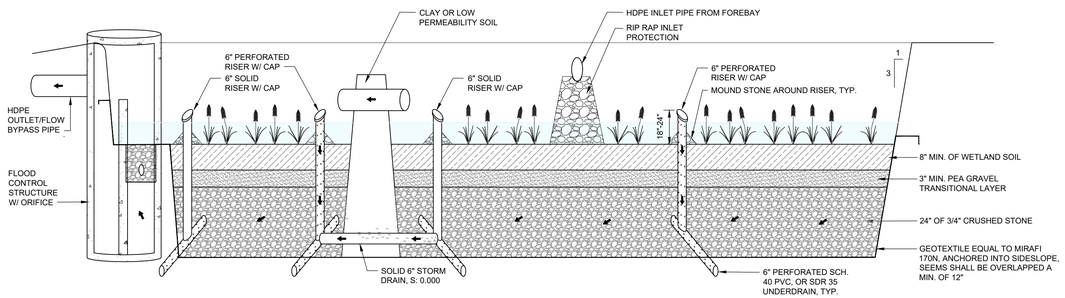
INTERMEDIATE LAYER: AN INTERMEDIATE LAYER (6 INCHES THICK) OF AGGREGATE FILTER (PEA GRAVEL) IS NEEDED TO PREVENT THE WETLAND SOIL FROM MIGRATING INTO THE CRUSHED-STONE (GRAVEL) SATURATED DRAINAGE LAYER. DO NOT USE A GEOTEXTILE FABRIC AS IT WILL RESTRICT ROOT GROWTH.
SATURATED DRAINAGE LAYER: BELOW THE WETLAND SOIL AND INTERMEDIATE LAYER IS A CRUSHED STONE (OR VERY COARSE GRAVEL) DRAINAGE LAYER WITH A 24-INCH MINIMUM THICKNESS. ANGULAR ¾" CRUSHED STONE, IS RECOMMENDED AS LARGE ANGULAR PARTICLES ARE NEEDED TO MAINTAIN THE PERMEABILITY OF THE SYSTEM. THE PIPE UNDERDRAINS SHOULD HAVE AT LEAST 2 FEET OF GRAVEL COVER AND SIX INCHES BELOW THE PIPE.

MAINTENANCE NOTES:

OPERATION AND MAINTENANCE REQUIREMENTS SIMILAR TO THOSE FOR UNDERDRAINED FILTER BASINS SHOULD BE EXPECTED. THE PLANT BIOMASS SHOULD BE HARVESTED ANNUALLY, AND ACCUMULATED SEDIMENT REMOVED AT INTERVALS OF 5-10 YEARS. THESE ACTIVITIES MAY DISRUPT THE WETLANDS SYSTEM AND MAY REQUIRE SOME VEGETATION RE-ESTABLISHMENT. THE RISER PIPES MAY CLOG AND WILL REQUIRE ANNUAL CLEAN-OUT (IT SHOULD BE DONE IN THE WINTER TIME WHEN ONE CAN WALK ON THE WETLAND).

1. FIRST YEAR POST CONSTRUCTION: INSPECTION FREQUENCY SHOULD OCCUR AFTER EVERY MAJOR STORM IN THE FIRST YEAR FOLLOWING CONSTRUCTION.
   - INSPECT THAT THE SYSTEM DRAINS WITHIN 24-48 HOURS
   - THE PLANTS MAY NEED WATERING IF NECESSARY DURING THE FIRST GROWING SEASON. RE-VEGETATE IF THE VEGETATION IS POORLY ESTABLISHING.
   - IDENTIFY AREAS OF EROSION AND MAKE TIMELY REPAIRS.
   - CHECK ALL INLETS, OUTLETS, AND SUBDRAINS FOR PROPER FUNCTIONING. RISERS MAY NEED TO BE CLEANED.

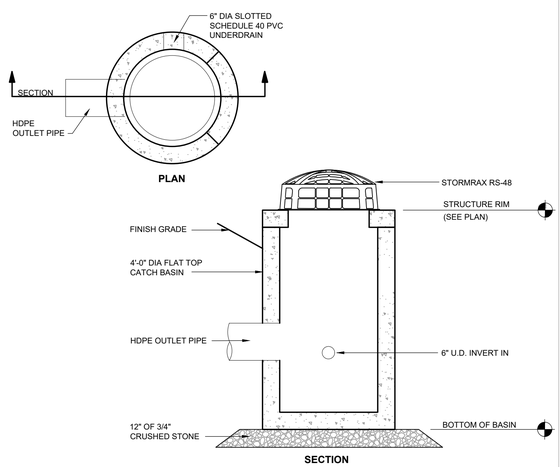
2. POST CONSTRUCTION: INSPECTION FREQUENCY SHOULD OCCUR AT LEAST EVERY 6 MONTHS AND AFTER EVERY MAJOR STORM. ACTIVITIES ARE EXPECTED TO INCLUDE:
   - CHECK THE BASIN FOR A DENSE ROOT MAT ESTABLISHMENT OF WETLAND VEGETATION.
   - CHECK AND CLEAN THE RISERS IF THERE IS EVIDENCE OF STANDING WATER, DISCOLORED WATER, OR ACCUMULATED SEDIMENTS IN THE CELLS.
   - CHECK AND CLEAN THE FOREBAY FOR SEDIMENTS, TRASH, AND DEBRIS. WHEN SEDIMENTS HAVE ACCUMULATED TO A DEPTH OF 12 INCHES, STANDING WATER IS PERSISTENT OR WETLAND VEGETATION BECOME ESTABLISHED, THE FOREBAY WILL NEED TO BE EXCAVATED AND REFORMED.
   - VERIFY THAT THE CELLS DRAIN WITHIN 24-48 HOURS. SEDIMENT WILL NEED TO BE REMOVED WHEN AN ACCUMULATION OF 4 INCHES IS EVIDENT OVER THE WETLAND SURFACE.
   - CHECK AND CLEAN ALL OUTLETS AND OVERFLOW SPILLWAY IF BLOCKED OR THERE IS EVIDENCE OF STRUCTURAL DAMAGE OR EROSION.
   - REMOVE DECAYING VEGETATION, LITTER, AND DEBRIS.
   - CHECK FOR FOREIGN SPECIES. PARTICULAR CARE MUST BE USED TO AVOID THE UNINTENDED INTRODUCTION OF INVASIVE SPECIES SUCH AS PURPLE LOOSESTRIFE (LYTHRUM SALICARIA) AND COMMON REED (PHRAGMITES AUSTRALIS). IT IS RECOMMENDED THAT A QUALIFIED WETLAND BIOLOGIST BE CONSULTED WHEN THESE ARE FOUND IN THE AREA OF THE GRAVEL WETLAND.



TYPICAL PROFILE

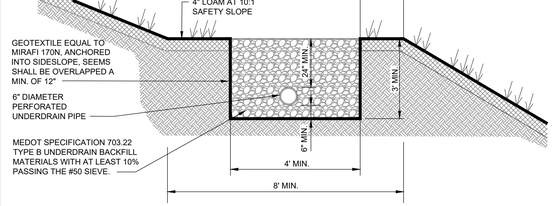
GRAVEL WETLAND DETAILS

N.T.S.



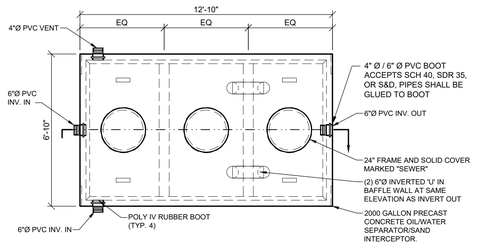
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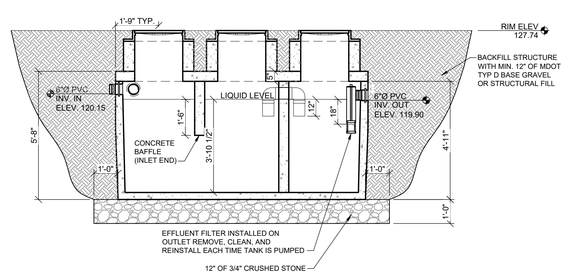
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POND BENCH UNDERDRAINED GRAVEL FILTER DETAIL

N.T.S.





NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 5000PSI @ 28 DAYS
2. GRADE 60 REINFORCEMENT
3. DESIGNED FOR H20 LOAD RATING
4. REQUIRES GRADE RINGS AT FINISH GRADE & H20 FRAMES & COVERS
5. ALL TANK PENETRATIONS ARE INTEGRALLY CAST
6. ALL JOINTS SEALED W/ BUTYL RUBBER JOINT SEALANT
7. CARE AND MAINTENANCE SHALL BE PER MANUFACTURER'S WRITTEN INSTRUCTION
8. TANK SHALL BE COVERED WITH 4" OF BOARD INSULATION, OR AS INDICATED ON PLAN.

OIL/WATER SEPARATOR DETAIL

N.T.S.

Portland Site
249 Western Avenue
PO Box 827
Portland, ME
T 207-756-8412
F 207-756-8414

Bar Harbor
36 Kennebec Way, 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Brewer
187 South Main Street
PO Box 639
Brewer, ME
T 207-989-4824
F 207-989-4881

Machias
4 Court Street
PO Box 587
Machias, ME
T 207-255-8370
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

NO	BY	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	BLQ	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R2	BLQ	GRAVEL WETLAND SPECIFICATIONS	2019-05-01	BLQ	JDK

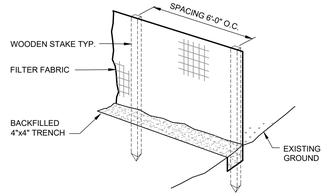
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
05/09/2019
LICENSED PROFESSIONAL ENGINEER

SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002

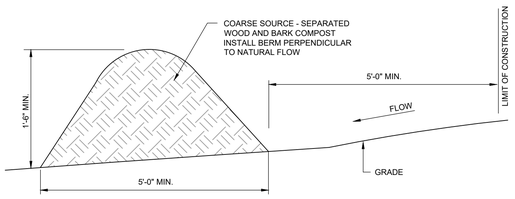
DRAWING NUMBER
C504

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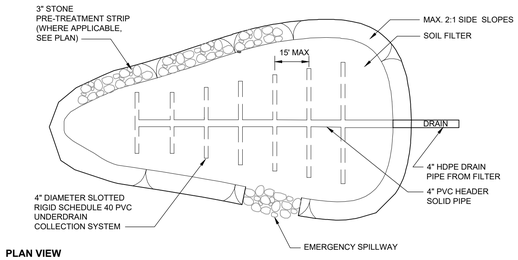


NOTES:
1. KEY FABRIC IN A 4"x4" TRENCH W/BACKFILL.
2. SILT FENCE SHALL BE A 3' FENCE WITH A MINIMUM GRAB STRENGTH OF 120 LBS.

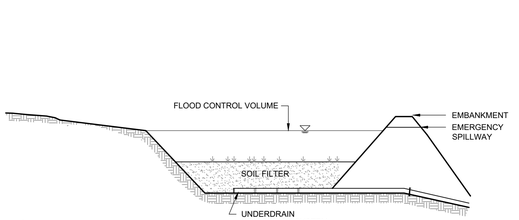
SILT FENCE DETAIL
N.T.S.



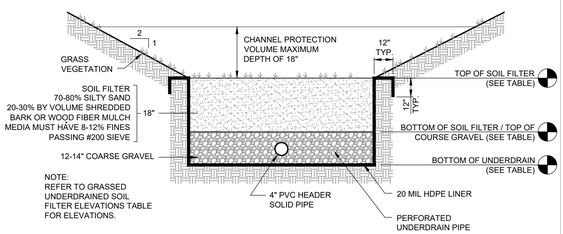
EROSION CONTROL BERM DETAIL
N.T.S. (MAY BE USED AS AN ALTERNATE TO SILT FENCE)



PLAN VIEW



PROFILE



SECTION

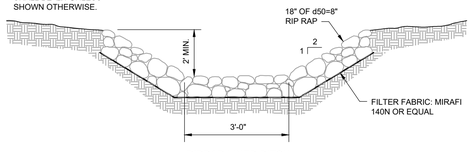
GRASSED UNDERDRAINED SOIL FILTER ELEVATIONS

USF NO.	EXISTING ELEVATION (+/-) (FT)	EMERGENCY SPILLWAY ELEVATION (FT)	PROPOSED TOP OF SOIL FILTER (FT)	PROPOSED BOTTOM OF SOIL FILTER / TOP OF COARSE GRAVEL (FT)	PROPOSED ELEVATION OF PIPE BED (FT)	PROPOSED BOTTOM OF COARSE GRAVEL (FT)	OVERFLOW OUTLET STRUCTURE RIM ELEVATION (FT)	TOP OF BERM (FT)	TREATMENT AREA REQ'D/PROVIDED (SF)	TOTAL STORAGE VOLUME (CF)
1	120.0	123.0	120.0	118.5	117.83	117.5	121.5	123.0	2863/3544	5,317
2	116.0	117.0	114.0	112.5	111.83	111.5	115.5	118.0	5720/4930	10,828
3	114.0	117.0	114.0	112.5	111.83	111.5	115.5	118.0	2130	
5	124.0	-	121.0	119.5	118.83	118.5	122.5	123.5	1723/5510	9,555
6	119.0	119.5	117.0	115.5	114.83	114.5	118.5	120.0	678/3018	5,449

* NOTE: ALL PONDS ARE LINED

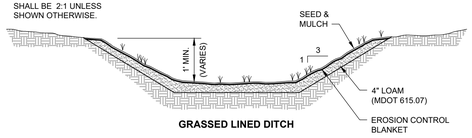
GRASSED UNDERDRAIN SOIL FILTER FIELD DETAIL
N.T.S.

NOTE:
MINIMUM SIDESLOPE
SHALL BE 2:1 UNLESS
SHOWN OTHERWISE.



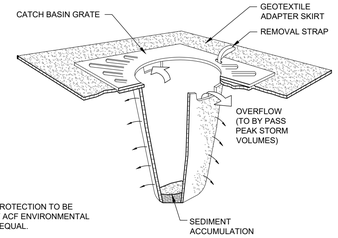
RIPRAP LINED DITCH

NOTE:
MINIMUM SIDESLOPE
SHALL BE 2:1 UNLESS
SHOWN OTHERWISE.



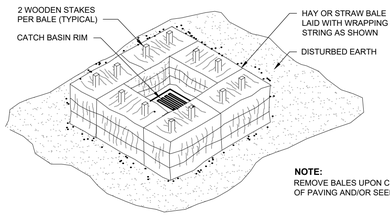
GRASSED LINED DITCH

TYPICAL DITCH DETAILS
N.T.S.



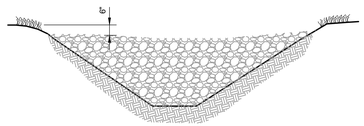
NOTES:
1. CATCH BASIN PROTECTION TO BE "SILTSTACK" BY ACF ENVIRONMENTAL OR APPROVED EQUAL.
2. INSPECT INSERT AFTER EACH RAINFALL EVENT. MAINTAIN AS REQUIRED.
3. SEDIMENT WITHIN INSERT SHALL BE EMPTIED WHEN 1/2 FULL.

SEDIMENT SACK INLET PROTECTION DETAIL
N.T.S. (MAY BE USED AS AN ALTERNATE TO HAY BALES)

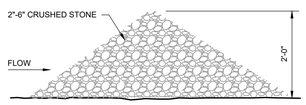


NOTE:
REMOVE BALES UPON COMPLETION OF PAVING AND/OR SEEDING

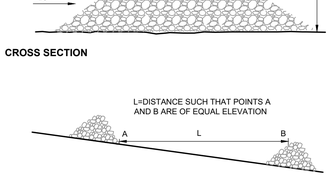
LOW POINT SEDIMENTATION CONTROL BARRIER DETAIL
N.T.S.



ELEVATION

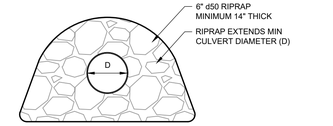


CROSS SECTION

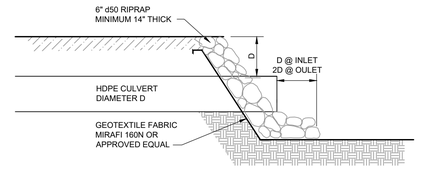


SPACING

STONE CHECK DAM DETAIL
N.T.S.

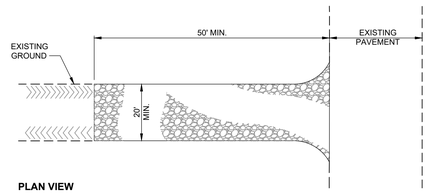


ELEVATION



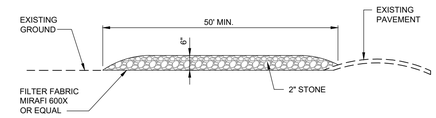
PROFILE VIEW

TYPICAL CULVERT INLET/OUTLET PROTECTION DETAIL
N.T.S.



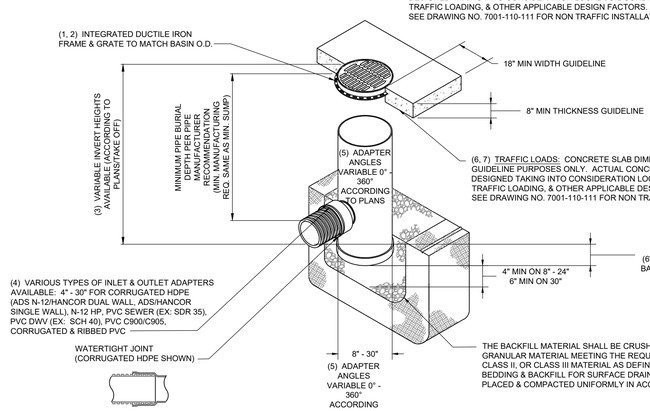
PLAN VIEW

NOTE: CONTRACTOR SHALL ADD
STONE TO ENTRANCE AS MUD/SILT
MATERIAL ACCUMULATES



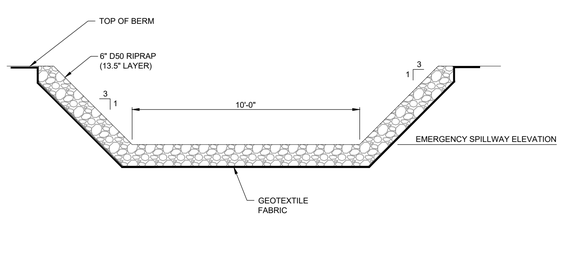
SECTION

STABILIZED CONSTRUCTION ENTRANCE DETAIL
N.T.S.



NOTES:
1 - 8" - 30" STANDARD GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 12" - 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05. 8" & 10" STANDARD GRATES FIT DIRECTLY ONTO DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 - 12" - 30" STANDARD GRATES SHALL MEET H-20 LOAD RATING.
7 - 8" & 10" STANDARD GRATES ARE RATED FOR LIGHT DUTY APPLICATIONS ONLY; NO CONCRETE COLLAR NEEDED FOR LIGHT DUTY RATING.

NYLOPLAST DRAIN BASIN WITH STANDARD GRATE DETAIL
N.T.S.



EMERGENCY SPILLWAY DETAIL
N.T.S.

Winterville
44 Main Street
Suite 204
Winterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Pittsfield Site
Pittsfield Street
PO Box 627
Pittsfield, ME
T 207-784-8412
F 207-784-8414

Bar Harbor
350 Eagle Lake Way 102
Bar Harbor, ME
T 207-288-0587
F 207-288-8688

Bangor
83 South Main Street
PO Box 619
Bangor, ME
T 207-989-4824
F 207-989-4881

Machias
25 Center Street
PO Box 887
Machias, ME
T 207-255-0370
F 207-255-8367

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
DETAILS

NO.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R2	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R1	U.D. SPACING, NYOPLAST DETAIL	2019-05-01	BLQ	JDK

ISSUE STATUS
NOT FOR CONSTRUCTION



SCALE	N.T.S.
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	
JOB NUMBER	10602.002

DRAWING NUMBER
C505

P:\10600-SACO\500-IND PARK EXP-PUBLIC WORKS BLDG-SMT\02-CAD_DRAWINGS\CIVIL\DESIGN_DWGS\10602.002-C501.DWG, 5/10/2019 8:54 AM

LEGEND:

- SOILS BOUNDARY
- PROPERTY LINE
- WATERSHED BOUNDARY LINE
- TIME OF CONCENTRATION FLOW PATH
- SCF-3-2 — FLOW PATH DESCRIPTION
- SF — SHEET FLOW
- SC — SHALLOW CONCENTRATED FLOW
- CF — CHANNEL FLOW
- WETLAND

ELEV.=122.68'
PF 2-1 110' @ 0.005
CF 1-1 75' @ 0.05
SF 1-1 150' @ 0.041
SF 2-1 150' @ 0.02
SCF 2-1 60' @ 0.01
CF 2-1 250' @ 0.006
ANALYSIS POINT 1 (SUB-AREAS 1&2)
BENCHMARK ELEV.=125.38'
MAP 72, LOT 2 (PORTION) BOOK 12164, PAGE 204 (REMAINING LAND) N/F BROCKWAY SMITH COMPANY SEE PLAN REFERENCES #2, #3 AND #4
N/F CORMIER LAND CO., INC. MAP 58, LOT 1-2 BOOK 7824, PAGE 269 SEE BOOK 6929, PAGE 349 PLAN REFERENCE #5
VP8
VP7
VP5
VP4
VP3
VP2
VP1
N 53°-59'-35" W
CF 4-1 870' @ 0.02
SCF 4-1 545' @ 0.018
SF 4-1 150' @ 0.01
SF 5-1 150' @ 0.038
SCF 5-1 370' @ 0.04
CF 3-1 310' @ 0.02
LOT 1 15.67 AC
LOT 2 6.42 AC
LOT 3 6.75 AC
REMAINING LAND 10.00 AC
CF 4-2 250' @ 0.06
ANALYSIS POINT 2 (SUB-AREA 3)
SF 6-1 150' @ 0.04
SCF 6-1 450' @ 0.04
CF 6-1 190' @ 0.06
ANALYSIS POINT 3 (SUB-AREA 5)
10' WIDE EASEMENT
PROPOSED 25' WIDE BUFFER ALONG REMAINING LAND OF SWEETSER
MAP 58, LOT 6 N/F CORMIER LAND CO. BOOK 11825, PAGE 5189, PARCEL VIII SEE BOOK 11825, PAGE 256 SEE PLAN REFERENCE #5
MAP 42, LOT 1 (PORTION) REMAINING LAND OF SWEETSER SEE PLAN REFERENCE #1
MAP 42, LOT 1 (PORTION) PROPOSED CONVEYANCE: CITY OF SACO, MAINE FROM SWEETSER SEPTEMBER 2018 42.000 ACRES
MAP 72, LOT 2 (PORTION) SEE PLAN REFERENCES #2, #3 AND #4 N/F A. DUIE PYLE, INC. BOOK 17767, PAGE 634
APPROXIMATE LOCATION OF "70' FUTURE R.O.W. TO BENEFIT TO THE CITY OF SACO" PLOTTED FROM PLAN REFERENCE #3
MAP 72, LOT 2 SEE PLAN REFERENCES #2, #3 AND #4 N/F A. DUIE PYLE, INC. BOOK 17767, PAGE 634
100' STREAM BUFFER
STREAM
EXISTING GRAVEL ROAD
CRB
ANALYSIS POINT 4 (SUB-AREA 4)

PRE DEVELOPMENT HYDROLOGY PLAN

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2252
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Pittsfield Site
45 Main Street
PO Box 627
Pittsfield, ME
T 207-784-8412
F 207-784-8414

Bar Harbor
McKay Hwy 102
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Rumford
49 South Main Street
PO Box 639
Rumford, ME
T 207-989-4824
F 207-989-4881

Machias
Main Street
PO Box 587
Machias, ME
T 207-255-3370
F 207-255-8367

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
PRE DEVELOPMENT HYDROLOGY PLAN

NO	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R2				
R3				
R4				
R5				
R6				
R7	CITY REVIEW COMMENTS	2019-04-08	BLQ	JDK
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK

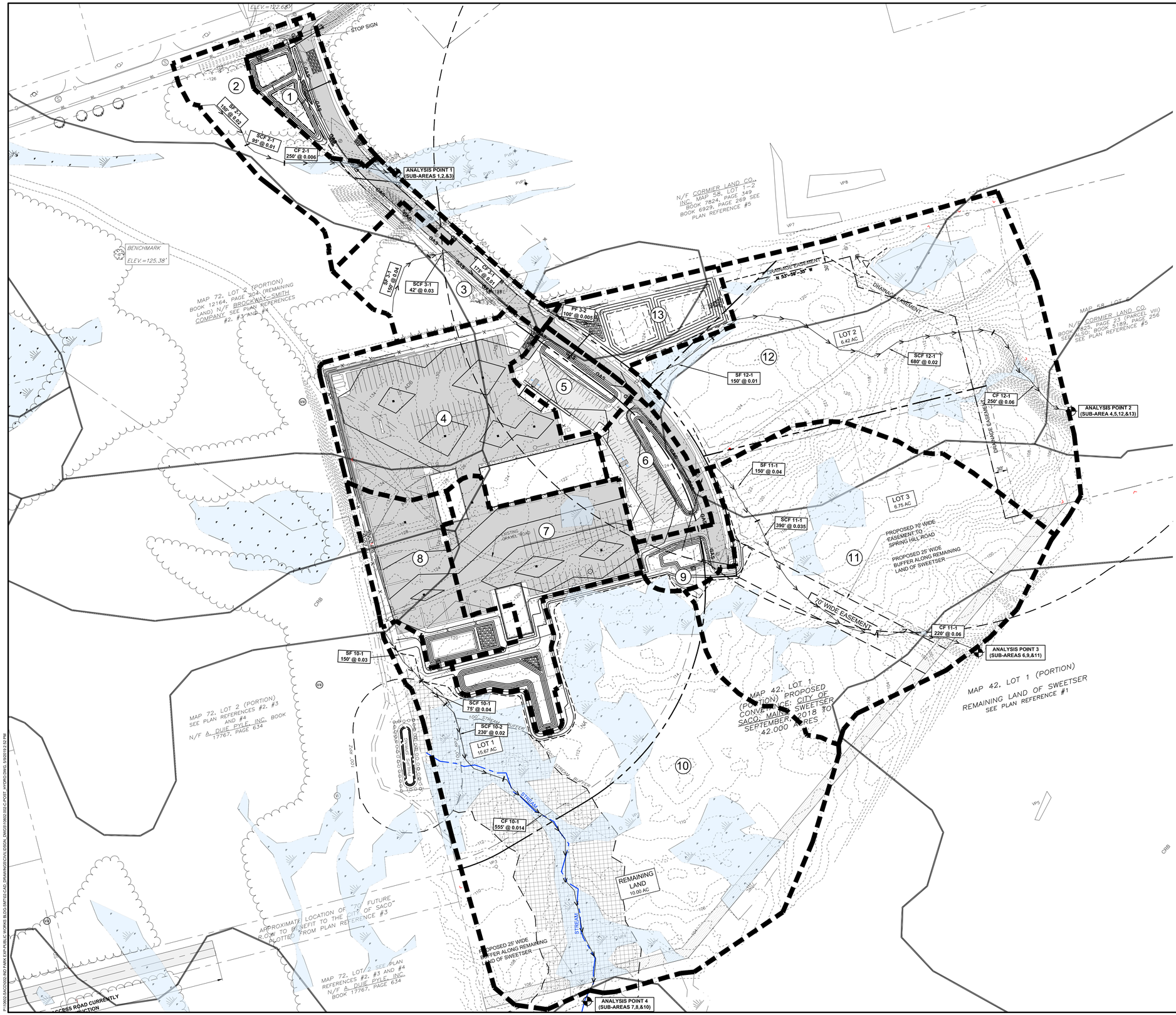
ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9739
LICENSED PROFESSIONAL ENGINEER
4/08/2019

SCALE	1"=120'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	BLQ
APPROVED BY	JDK
JOB NUMBER	10602.002

DRAWING NUMBER
C701

P:\10602-SACO\00-IND PARK EXP-PUBLIC WORKS BLDG-SMT\02-CAD (DRAWINGS\CIVIL\DESIGN_DWGS\10602-002-C-PRE_HYDRO.DWG, 3/1/2019 9:04 AM



POST DEVELOPMENT HYDROLOGY PLAN

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Portland Site
443 Main Street
PO Box 627
Biddeford, ME
T 207-756-8412
F 207-784-8414

Bar Harbor
36 Mount Desert Street
Bar Harbor, ME
T 207-288-0587
F 207-288-0588

Machias
33 Center Street
PO Box 887
Machias, ME
T 207-255-3270
F 207-255-8367

Waterville
44 Main Street
Suite 204
Waterville, ME
T 207-680-2262
F 207-680-2204

Lewiston
44 Main Street
Lewiston, ME
T 207-795-6099
F 207-795-6106

Rumford
49 South Main Street
PO Box 619
Rumford, ME
T 207-989-4824
F 207-989-4881

CES INC
Engineers • Environmental Scientists • Surveyors

PROJECT TITLE
SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

SHEET TITLE
POST DEVELOPMENT HYDROLOGY PLAN

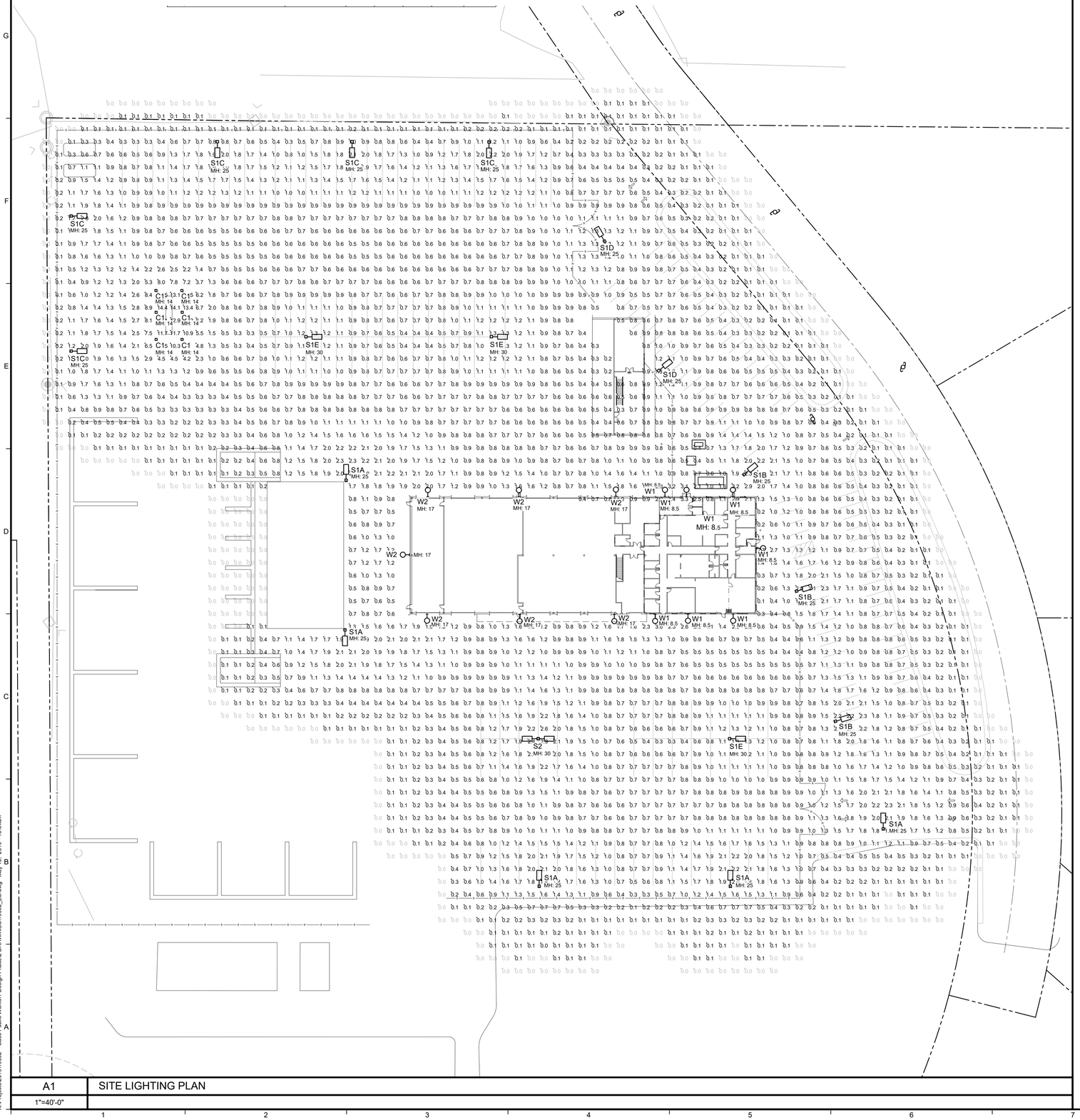
REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1	SITE PLAN REVIEW	2019-04-02	BLQ	JDK
R2	SUB-CATCHMENT 3 FLOW PATHS	2019-05-06	BLQ	JDK
R3	CITY REVIEW COMMENTS	2019-05-06	BLQ	JDK
R4				
R5				
R6				
R7				

ISSUE STATUS
NOT FOR CONSTRUCTION

STATE OF MAINE
JOHN D. KUCHINSKI
No. 9759
LICENSED PROFESSIONAL ENGINEER
5/10/2019

SCALE	1"=100'
DATE	2019-02-18
DRAWN BY	BLQ
CHECKED BY	JDK
DESIGNED BY	JDK
APPROVED BY	JDK
JOB NUMBER	10602.002
DRAWING NUMBER	C702

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Luminaire Schedule							
Symbol	Tag	Qty	LLF	Description	Lum. Watts	Lum. Lumens	Manufacturer
	S1B	3	0.900	GLEON-AF-02-LED-E1-T4FT	113	12533	McGRAW-EDISON
	S1A	5	0.900	GLEON-AF-02-LED-E1-T3	113	12461	McGRAW-EDISON
	S1D	2	0.900	GLEON-AF-02-LED-E1-5WQ	113	13123	McGRAW-EDISON
	S1E	3	0.900	GLEON-AF-03-LED-E1-5WQ	166	19580	McGRAW-EDISON
	W1	7	0.900	AEL36-15W 4000K	15	1652	Luminaire LED, Inc.
	S2	1	0.900	GLEON-AF-02-LED-E1-T4FT	113	12533	McGRAW-EDISON
	S1C	5	0.900	GLEON-AF-02-LED-E1-SL4-HSS	113	10111	McGRAW-EDISON
	W2	7	0.900	GWC-AF-01-LED-E1-T4FT-600	34	4311	McGRAW-EDISON
	C1	6	0.900	LRC-B32-7-LED-E1-MST	73	6048	McGRAW-EDISON

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
grade_Planar	Fc	0.47	14.4	0.0	N.A.	N.A.
Fuel Island	Fc	12.28	14.4	9.9	1.24	1.45
Parking and drives	Fc	1.01	3.6	0.3	3.37	12.00

160 Veranda Street
Portland, Maine 04103
T: 207.221.2260
F: 207.221.2266
Web: www.allied-eng.com

Allied Engineering
Structural Mechanical Electrical Commissioning

REVISIONS

NUMBER	DATE	BY	DESCRIPTION

Date: -
Drawn By: DLL
Checked By: SRM
Project Mgr: WPF
Project No: 19002
Cad File: 19002_ES.DWG
Graphic Scale: 0 1"

LIGHTING PHOTOMETRIC PLAN

NEW FLEET MAINTENANCE BUILDING FOR THE CITY OF SACO PUBLIC WORKS
SACO INDUSTRIAL PARK, SACO MAINE 04072

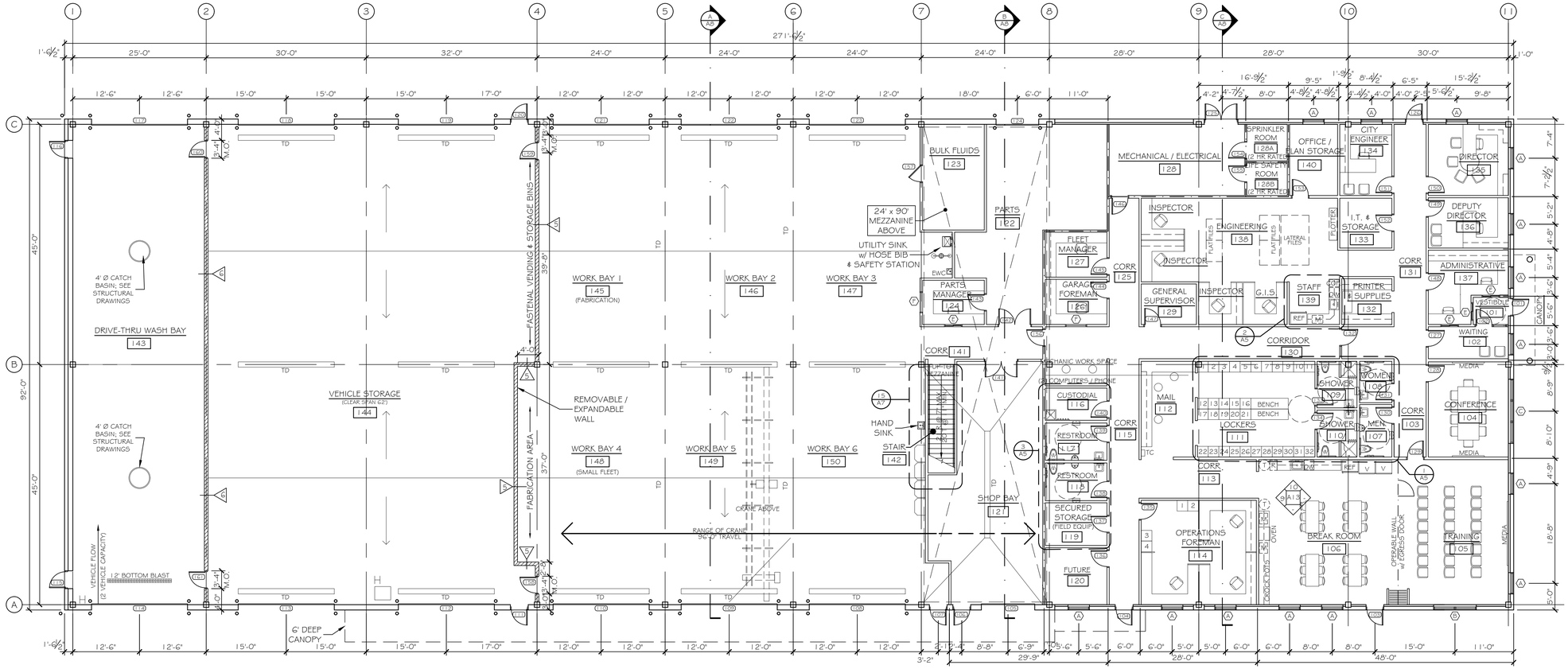
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SL-1

SITE COORDINATION PACKAGE ~ 15 MAY 2019 ~ NOT FOR CONSTRUCTION

A1
1"=40'-0"
SITE LIGHTING PLAN

N:\Projects\2019\19002 ~ Saco Public Works\1 Design Phase\2 DRAWINGS\19002_ES.dwg May 15, 2019 - 10:34am



FIRST FLOOR PLAN

SCALE: 3/32" = 1'-0"

1 HR RATED WALL

PLAN NORTH

NOTES:

1. INSTALL ½" PTD PLYWOOD TO 8'-0" A.F.F. AT ALL WALLS IN THE FOLLOWING ROOMS:
   - 121 SHOP BAY
   - 122 PARTS
   - 123 BULK FLUIDS
   - 128 MECHANICAL / ELECTRICAL
   - 128A SPRINKLER ROOM
   - 128B LIFE SAFETY ROOM
2. SEE SHEET A4 FOR ENLARGED PLAN, COLUMN LINES (7) TO (11).
3. SEE 7 - A9 FOR EPOXY PAINT SYSTEM AT WASH BAY 145.

PARTITION LEGEND	
TAG	DETAIL
1	1 / A9
2	2 / A9
3	3 / A9
4	4 / A9
5	5 / A9
6	6 / A9

GRANT HAYS ASSOCIATES
ARCHITECTURE & INTERIOR DESIGN
P.O. BOX 6179 FALMOUTH MAINE 04105
207.871.5900 www.granthays.com

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REVISIONS

PROJECT NAME

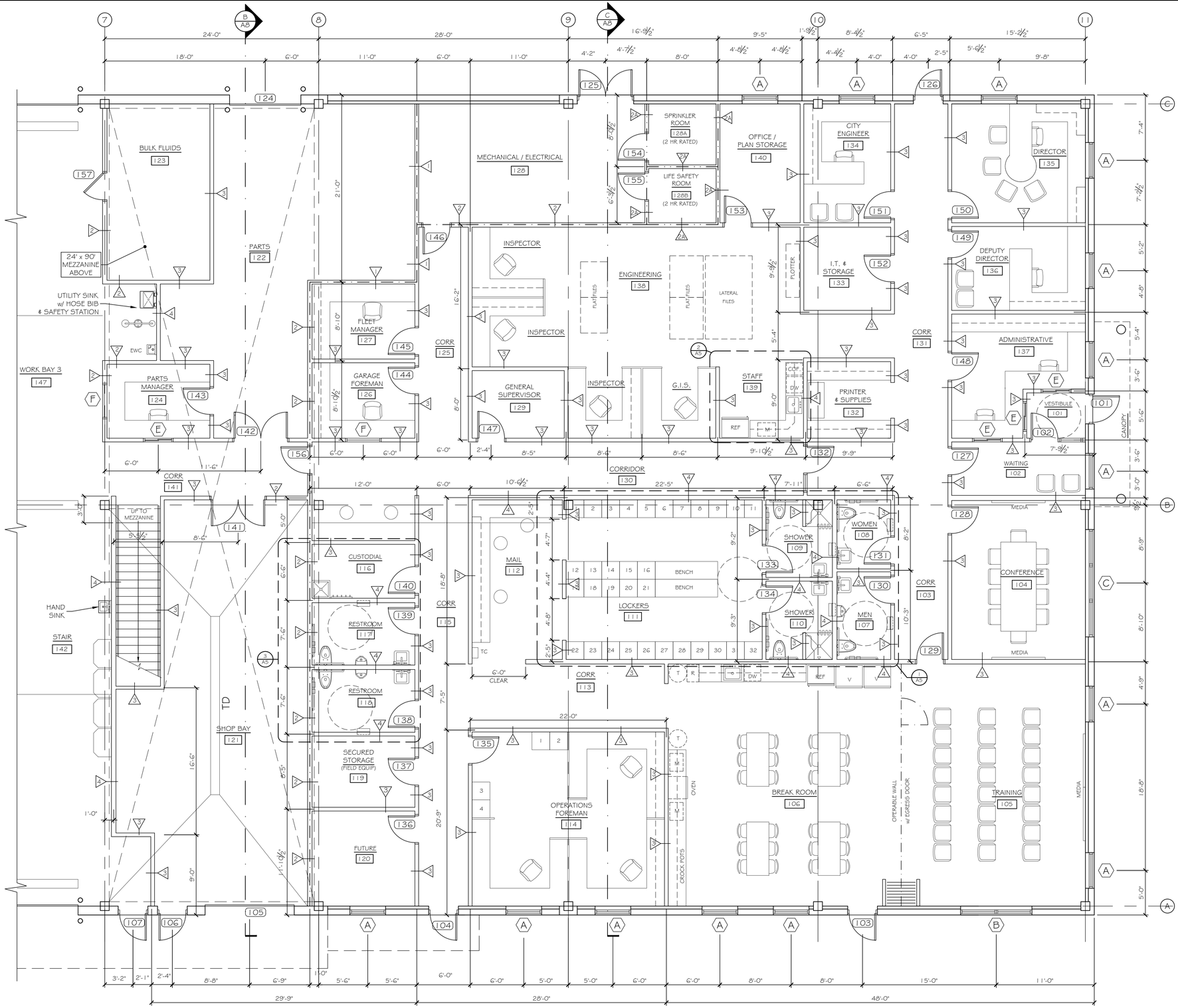
NEW FLEET MAINTENANCE BUILDING FOR THE
CITY OF SACO
PUBLIC WORKS
SACO INDUSTRIAL PARK
SACO, MAINE 04072

SHEET

FIRST FLOOR PLAN

DATE
1 APR 2019
SCALE
3/32"=1'-0"
DRAWN
MFH / mgk
JOB NO.
181202
SHEET
A-3

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ENLARGED FIRST FLOOR PLAN

SCALE: 3/16" = 1'-0"

1 HR RATED WALL

PLAN NORTH

PARTITION LEGEND	
TAG	DETAIL
1	1 / A7
2	2 / A7
3	3 / A7
4	4 / A7
5	5 / A7
6	C / A7

NOTES:

1. INSTALL ½" PTD PLYWOOD TO 8'-0" A.F.F. AT ALL WALLS IN THE FOLLOWING ROOMS:
   - 121 SHOP BAY
   - 122 PARTS
   - 123 BULK FLUIDS
   - 128 MECHANICAL / ELECTRICAL
   - 128A SPRINKLER ROOM
   - 128B LIFE SAFETY ROOM
2. SEE SHEET A4 FOR ENLARGED PLAN, COLUMN LINES (7) TO (11).
3. SEE 7 - A9 FOR EPOXY PAINT SYSTEM AT WASH BAY 145.

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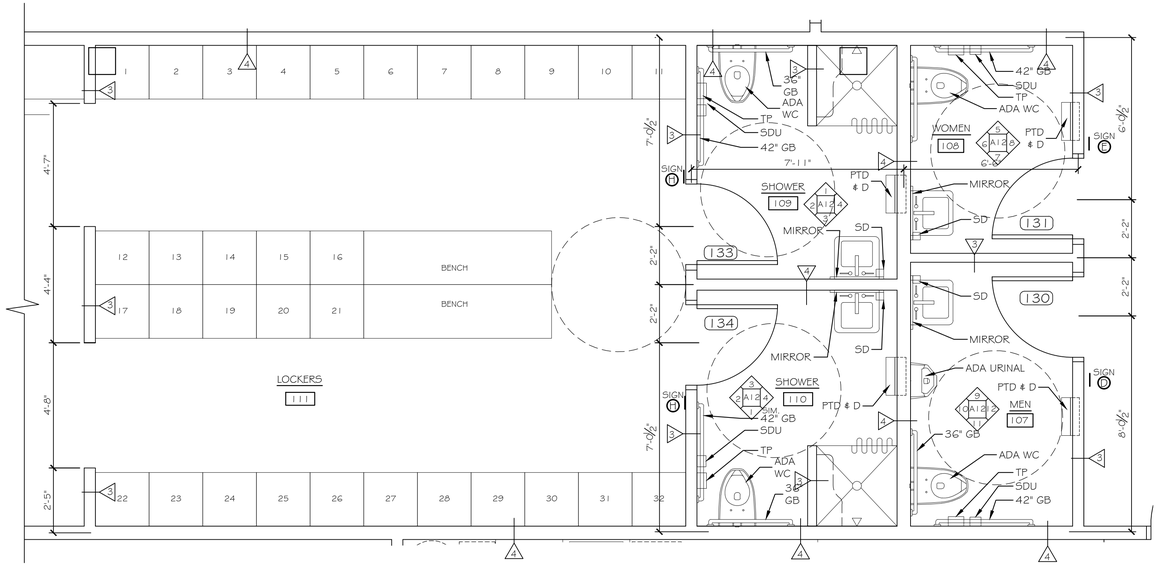
PROJECT NAME

NEW FLEET MAINTENANCE BUILDING FOR THE
CITY OF SACO
PUBLIC WORKS
SACO INDUSTRIAL PARK / SACO, MAINE 04072

SHEET
ENLARGED FIRST FLOOR PLAN

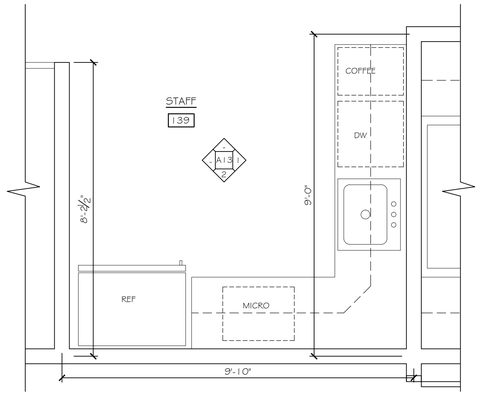
DATE 1 APR 2019
SCALE 3/16"=1'-0"
DRAWN MFH / mgk
JOB NO. 181202
SHEET A-4

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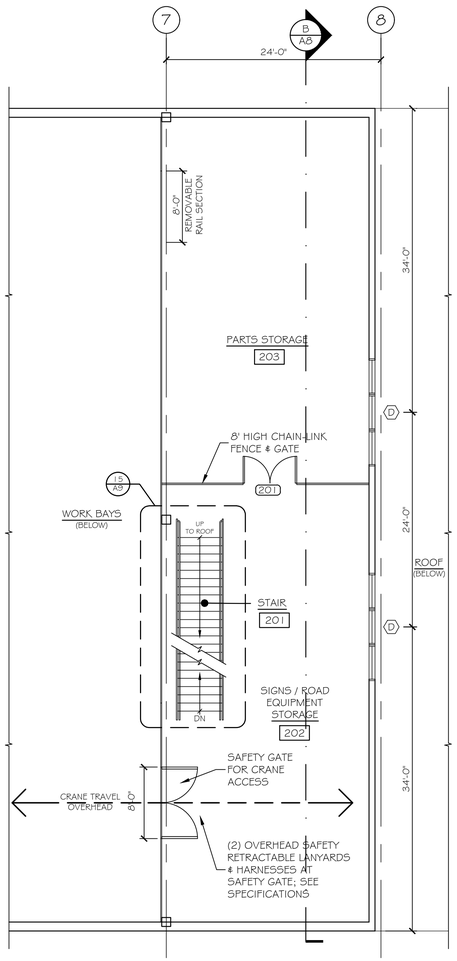


WOMEN 108 / MEN 107
LOCKERS 111 / SHOWER 110 & 109

1 SCALE: 3/8" = 1'-0"



2 STAFF 139
SCALE: 1/2" = 1'-0"

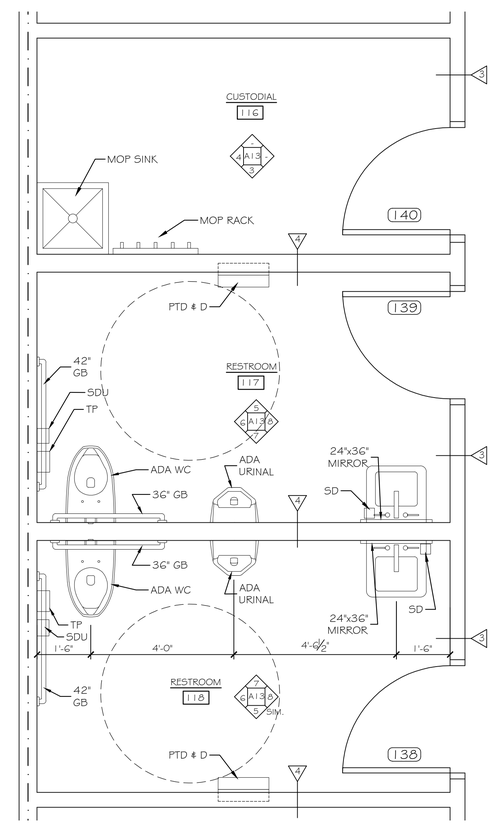


MEZZANINE FLOOR PLAN
SCALE: 1/8" = 1'-0"

1 HR RATED WALL

PLAN NORTH

PARTITION LEGEND	
TAG	DETAIL
1	1 A9
2	2 A9
3	3 A9
4	4 A9
5	5 A9
6	6 A9



3 CUSTODIAL 116 & RESTROOMS 117 & 118
SCALE: 1/2" = 1'-0"

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REVISIONS

PROJECT NAME

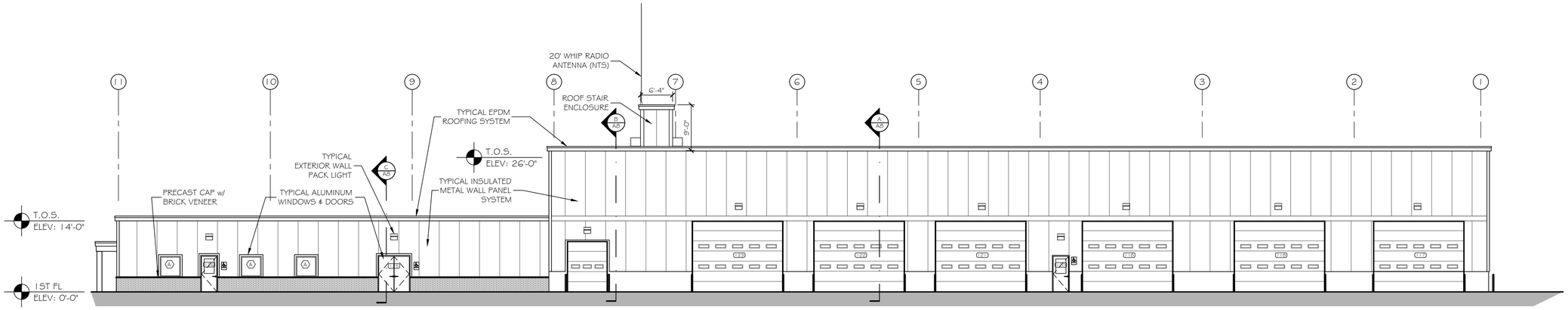
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CITY OF SACO
PUBLIC WORKS
SACO INDUSTRIAL PARK
SACO, MAINE 04072

SHEET

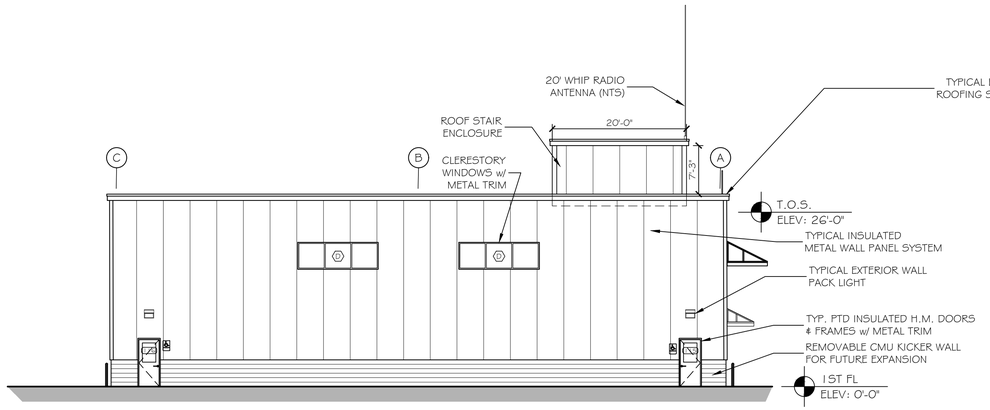
MEZZANINE &
WET CORE
FLOOR PLANS

DATE
1 APR 2019
SCALE
AS NOTED
DRAWN
MFH / mgk
JOB NO.
181202
SHEET
A-5

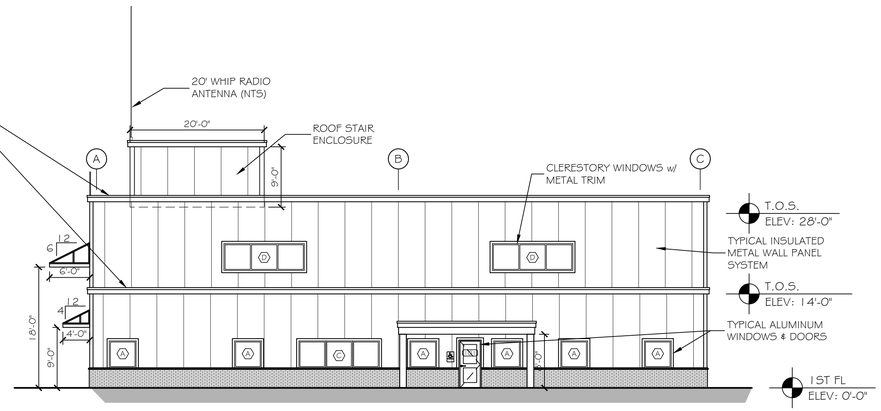
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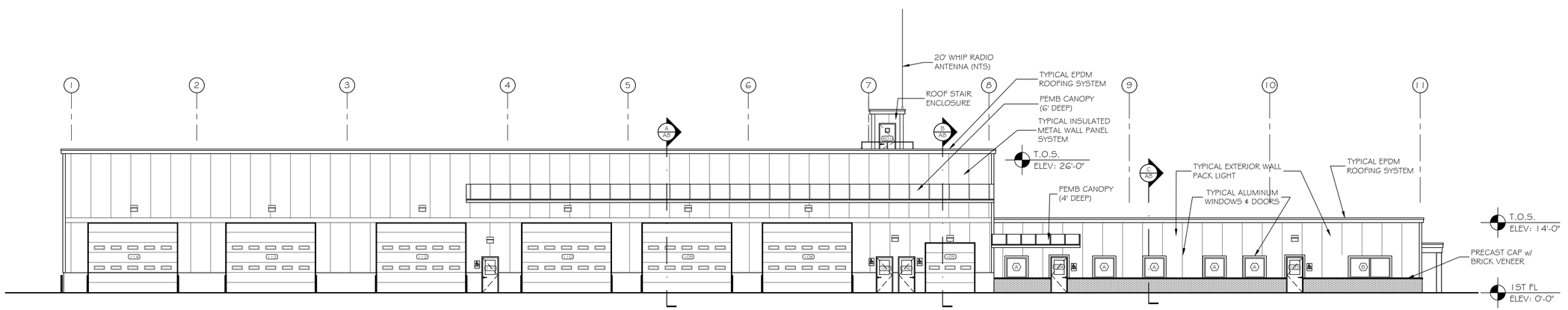
A NORTH ELEVATION
SCALE: 1/8" = 1'-0"



B WEST ELEVATION
SCALE: 1/8" = 1'-0"



D EAST ELEVATION
SCALE: 1/8" = 1'-0"



C SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

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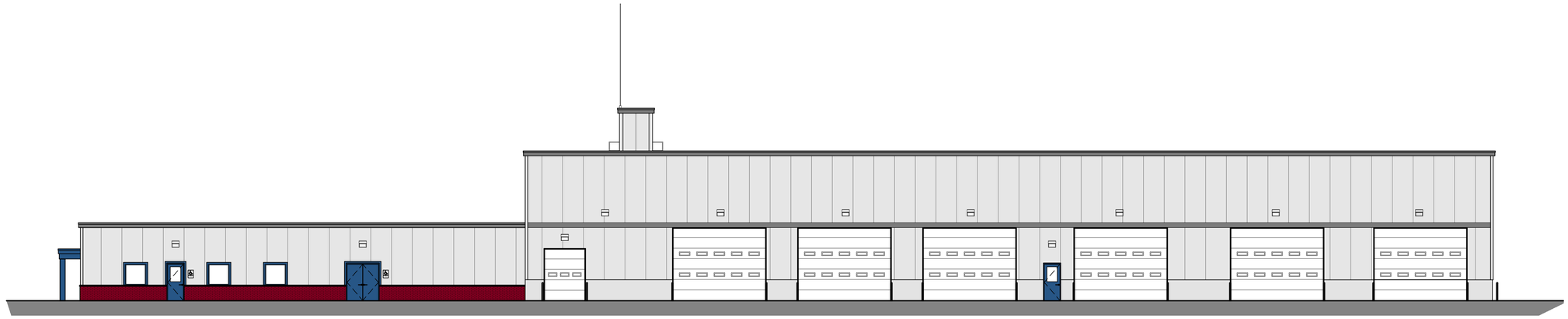
REVISIONS

PROJECT NAME
NEW FLEET MAINTENANCE BUILDING FOR THE
CITY OF SACO
PUBLIC WORKS
SACO INDUSTRIAL PARK
SACO, MAINE 04072

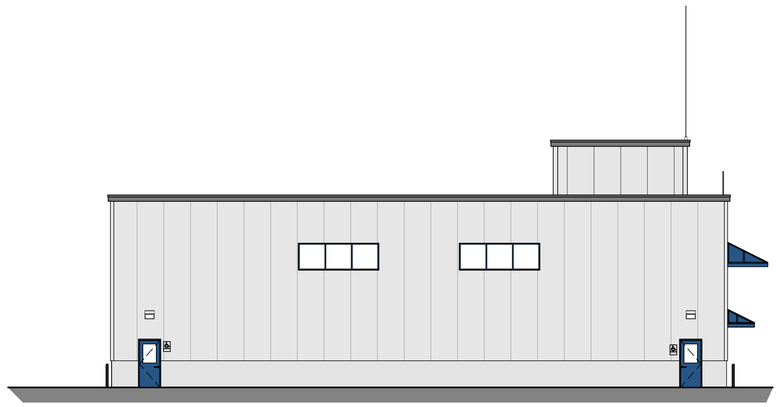
SHEET
EXTERIOR ELEVATIONS

DATE
1 APR 2019
SCALE
3/32"=1'-0"
DRAWN
MFH / mgk
JOB NO.
181202
SHEET
A-6

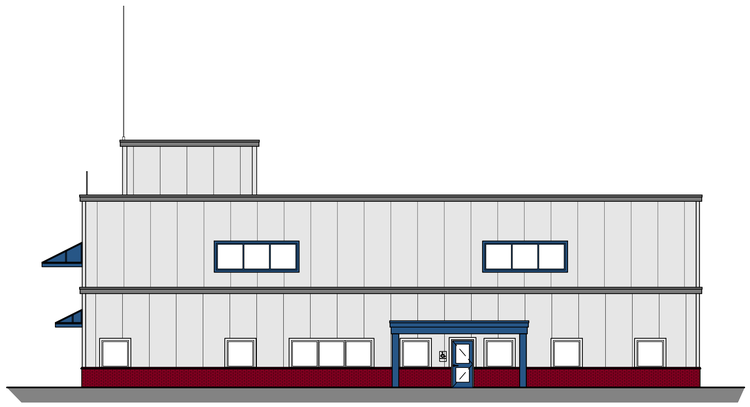
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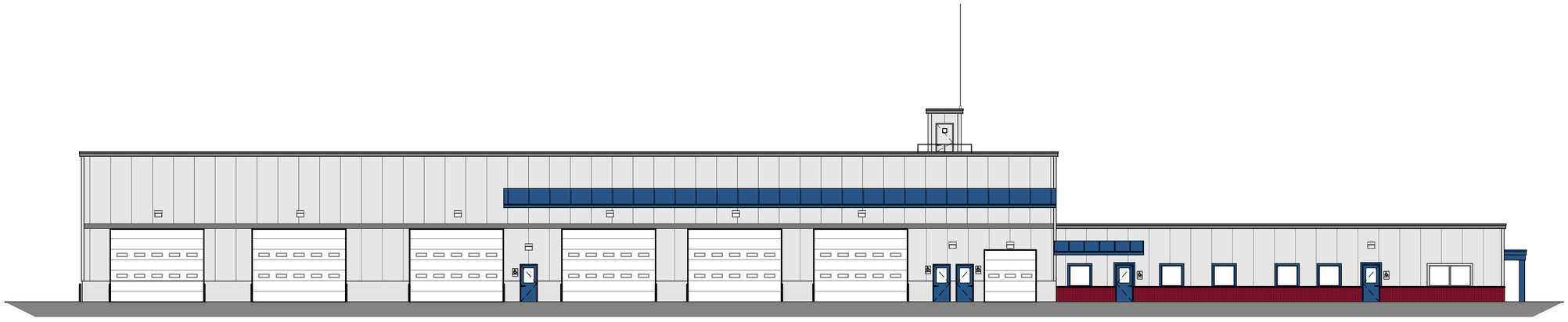
A NORTH ELEVATION
SCALE: 3/32" = 1'-0"



B WEST ELEVATION
SCALE: 3/32" = 1'-0"



D EAST ELEVATION
SCALE: 3/32" = 1'-0"



C SOUTH ELEVATION
SCALE: 3/32" = 1'-0"

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PROJECT NAME
NEW FLEET MAINTENANCE BUILDING FOR THE
CITY OF SACO
PUBLIC WORKS
SACO INDUSTRIAL PARK — SACO, MAINE 04072

SHEET
COLOR EXTERIOR ELEVATIONS

DATE
1 APR 2019
SCALE
3/32" = 1'-0"
DRAWN
MFH / mgk
JOB NO.
181202
SHEET
A-7

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McGraw-Edison

DESCRIPTION

The LRC LED Recessed Canopy Luminaire is specifically designed for recessed applications in single or double skin canopies. Three specialized optics are optimized for efficiency and uniformity, delivering high light levels on task. Typical applications include retail gas stations, convenience stores, banks and pharmacy drive thru canopies. UL/cUL listed for wet locations.

Catalog #		**Type**
Project		C1
Comments		**Date**
Prepared by		

SPECIFICATION FEATURES

Construction
Heavy-duty cast aluminum housing with aluminum mounting frame. Wet location driver enclosure is elevated to prevent water ingress. 1/2" knockouts provided for wiring connections. IP66 Rated.

Optics
Dedicated optical cavities for the array of 16 individual LEDs to maximize the efficiency and control of the distribution out of each module. To enhance visual comfort, a glare-reducing optical system is utilized to maximize delivered lumens while minimizing glare. Scalable in 1, 2 or 4 Light Square LED modules to optimize cost and lumen output. Each reflector is precision manufactured via injection molding and coated with a highly reflective optical coating via vacuum metallization. Two symmetric optics and one asymmetric optic are specifically designed for efficiency and uniformity. Offered standard in 4000K (+/- 275K) CCT and nominal 70 CRI. Optional 6000K CCT with nominal 70 CRI, and 3000K with nominal 80 CRI.

Electrical
LED driver is enclosed in a wet location box, designed to manage thermals for longevity. 120-277V 50/60Hz, 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Optional proprietary circuit module designed to withstand 10kV of transient line surge. 90% lumen maintenance expected at 60,000 hours. The LRC LED Recessed Canopy Luminaire is suitable for operation in -40°C to 40°C ambient operations.

Mounting
Designed to recess in single or double skin canopies, thickness can not exceed 4mm or 5/32". Luminaire can be installed from above or below canopy, through 14" square cutout in the canopy.

Finish
Housing and lens frame are finished in super TGIC polyester powder cost paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard housing and lens frame trim finished in true white color. Optional lens frame trim colors include white, grey, black, bronze, dark platinum, and graphite metallic. RAL and color matches available.

Warranty
Five-year warranty.

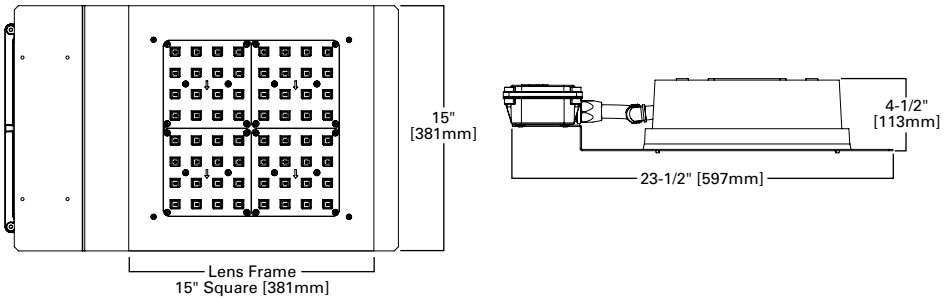


LRC
LED RECESSED CANOPY

1, 2 or 4 Light Squares
Solid State LED

CANOPY LUMINAIRE

DIMENSIONS



CERTIFICATION DATA

UL/cUL Listed
LM79 / LM80 Compliant
ISO 9001

ENERGY DATA

Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V/50 & 60Hz, 347V/60Hz, 480V/60Hz
-40°C Minimum Temperature
40°C Maximum Ambient Temperature

SHIPPING DATA

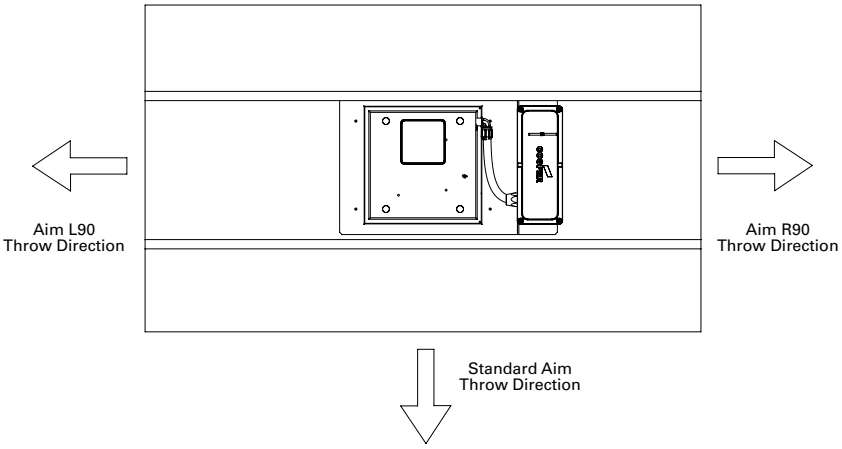
Approximate Net Weight:
20-29 lbs. (9.07-13.15 kgs.)

POWER AND LUMENS BY NUMBER OF LEDS

Number of LEDs	LED Drive Current	Input Wattage	Input Current (Amps) 120V	Input Current (Amps) 277V	Optics	MST	VAT	WST
16	700mA	37W	0.33	0.15	Lumens	3,099	2,987	3,026
					BUG Rating	2-0-0	2-0-0	1-0-0
	950mA	50W	0.41	0.19	Lumens	3,841	3,702	3,751
					BUG Rating	2-0-1	2-0-0	2-0-0
32	350mA	35W	0.30	0.14	Lumens	3,448	3,323	3,367
					BUG Rating	2-0-0	2-0-0	2-0-0
	450mA	46W	0.40	0.18	Lumens	4,285	4,130	4,184
					BUG Rating	2-0-1	2-0-0	2-0-0
	700mA	73W	0.62	0.23	Lumens	6,048	5,829	5,906
					BUG Rating	3-0-1	3-0-0	2-0-0
64	350mA	69W	0.59	0.28	Lumens	6,679	6,439	6,524
					BUG Rating	3-0-1	3-0-0	2-0-0
	450mA	88W	0.77	0.36	Lumens	8,212	8,019	8,125
					BUG Rating	3-0-1	3-0-0	3-0-0

NOTE: Lumen values tested at 4000K CCT.

VAT OPTIC ORIENTATION



LUMEN MAINTENANCE

Ambient Temperature	TM-21 Lumen Maintenance (60,000 Hours)	Theoretical L70 (Hours)
25°C	> 94%	> 350,000
40°C	> 93%	> 250,000

LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
10°C	1.04
15°C	1.03
25°C	1.00
40°C	0.96

ORDERING INFORMATION

Sample Number: LRC-B64-4-LED-E1-VAT

Product Family	Generation	Number of LEDs	Drive Current [1]	Lamp Type	Voltage	Distribution	Trim Color
LRC=LED Recessed Canopy	**B**=B	**16**=16 **32**=32 **64**=64	**1**=950mA **3**=350mA **4**=450mA **7**=700mA	**LED**=Solid State Light Emitting Diodes	**E1**=Electronic 120-277V **347**=347V **480**=480V [2]	**VAT**=Vertical Aysmmetric **WST**=Wide Symmetric **MST**=Medium Symmetric	**[Blank]**=True White **AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White

Option (Add as Suffix)	**Accessories** (Order Separately)
10K=10kV Surge Module **2L**=Two Circuits [3] **L90**=Optics Rotated 90° Left [4] **R90**=Optics Rotated 90° Right [4] **7060**=70 CRI/6000K CCT [5] **8030**=80 CRI/3000K CCT [5]	**MA1253**=10kV Circuit Module Replacement

Notes:
1. 950mA available only in 16 LEDs. 700mA available in 16 or 32 LEDs. 450mA available only in 32 or 64 LEDs. 350mA only available in 32 or 64 LEDs.
2. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
3. Not available in 347V or 480V. Not available with 16 LEDs. Not available with 32 LEDs in 350mA or 450mA.
4. Only applies with VAT distribution. MST and WST distributions are symmetrical.
5. Consult factory for lead times and lumen multiplier.

McGraw-Edison

DESCRIPTION

The Galleon™ LED luminaire delivers exceptional performance in a highly scalable, low-profile design. Patented, high-efficiency AccuLED Optics™ system provides uniform and energy conscious illumination to walkways, parking lots, roadways, building areas and security lighting applications. IP66 rated and UL/cUL Listed for wet locations.

Catalog #		**Type**
Project		S1(X), S2
Comments		**Date**
Prepared by		

SPECIFICATION FEATURES

Construction
Extruded aluminum driver enclosure thermally isolated from Light Squares for optimal thermal performance. Heavy-wall, die-cast aluminum end caps enclose housing and die-cast aluminum heat sinks. A unique, patent pending interlocking housing and heat sink provides scalability with superior structural rigidity. 3G vibration tested and rated. Optional tool-less hardware available for ease of entry into electrical chamber. Housing is IP66 rated.

Optics
Patented, high-efficiency injection-molded AccuLED Optics technology. Optics are precisely designed to shape the distribution maximizing efficiency and application spacing. AccuLED Optics create consistent distributions with the scalability to meet customized application requirements. Offered standard in 4000K (+/- 275K) CCT 70 CRI. Optional 3000K, 5000K and 6000K CCT.

Electrical
LED drivers are mounted to removable tray assembly for ease of maintenance. 120-277V 50/60Hz, 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Standard with 0-10V dimming. Shipped standard with Eaton proprietary circuit module designed to withstand 10kV of transient line surge. The Galleon LED luminaire is suitable for operation in -40°C to 40°C ambient environments. For applications with ambient temperatures exceeding 40°C, specify the HA (High Ambient) option. Light Squares are IP66 rated. Greater than 90% lumen maintenance expected at 60,000 hours. Available in standard 1A drive current and optional 600mA, 800mA and 1200mA drive currents (nominal).

Mounting
STANDARD ARM MOUNT: Extruded aluminum arm includes internal bolt guides allowing for easy positioning of fixture during mounting. When mounting two or more luminaires at 90° and 120° apart, the EA extended arm may be required. Refer to the arm mounting requirement table. Round pole adapter included. For wall mounting, specify wall mount bracket option. QUICK MOUNT ARM: Adapter is bolted directly to the pole. Quick mount arm slide into place on the adapter and is secured via two screws, facilitating quick and easy installation. The versatile, patent pending, quick mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8". Removal of the door on the quick mount arm enables wiring of the fixture without having to access the driver compartment. A knock-out enables round pole mounting.

Finish
Housing finished in super durable TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Heat sink is powder coated black. Standard housing colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available.

Warranty
Five-year warranty.



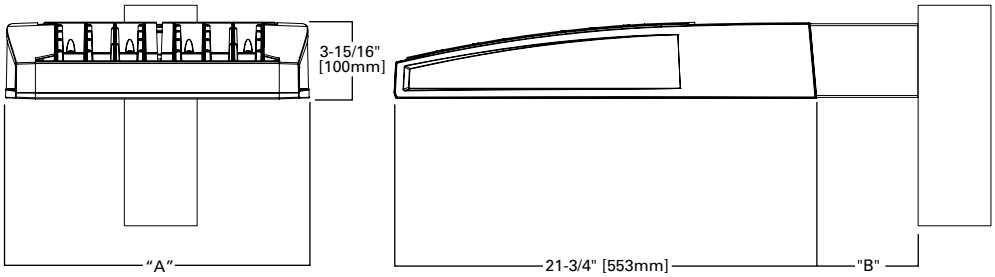
GLEON
GALLEON LED

1-10 Light Squares
Solid State LED

AREA/SITE LUMINAIRE

LumenSafe Technology
CLICK HERE

DIMENSIONS



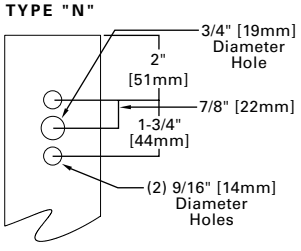
DIMENSION DATA

Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Optional Arm Length [1]	Weight with Arm (lbs.)	EPA with Arm [2] (Sq. Ft.)
1-4	15-1/2" (394mm)	7" (178mm)	10" (254mm)	33 (15.0 kgs.)	0.96
5-6	21-5/8" (549mm)	7" (178mm)	10" (254mm)	44 (20.0 kgs.)	1.00
7-8	27-5/8" (702mm)	7" (178mm)	13" (330mm)	54 (24.5 kgs.)	1.07
9-10	33-3/4" (857mm)	7" (178mm)	16" (406mm)	63 (28.6 kgs.)	1.12

NOTES: 1. Optional arm length to be used when mounting two fixtures at 90° on a single pole. **2.** EPA calculated with optional arm length.

DRILLING PATTERN

TYPE "N"



CERTIFICATION DATA
UL/cUL Wet Location Listed
ISO 9001
LM79 / LM80 Compliant
3G Vibration Rated
IP66 Rated
DesignLights Consortium® Qualified*

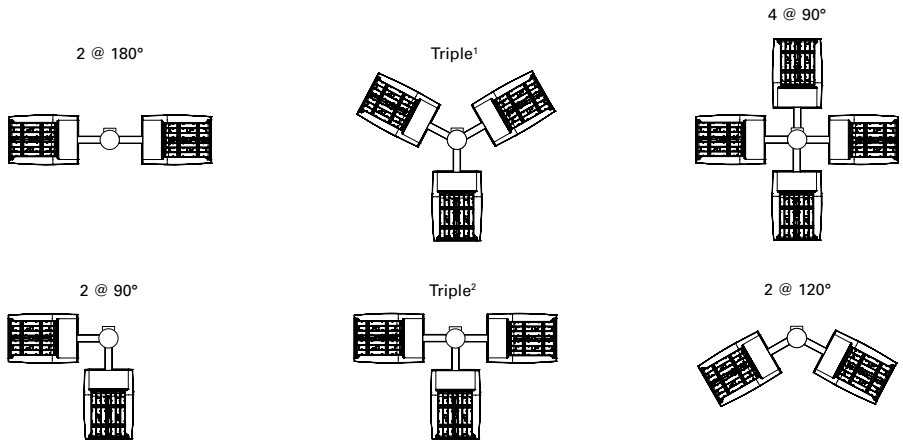
ENERGY DATA
Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120V-277V 50/60Hz
347V & 480V 60Hz
-40°C Min. Temperature
40°C Max. Temperature
50°C Max. Temperature (HA Option)

*www.designlights.org

Powering Business Worldwide

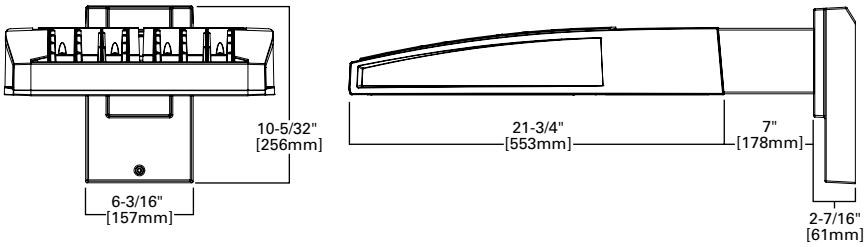
ARM MOUNTING REQUIREMENTS

Configuration	90° Apart	120° Apart
GLEON-AF-01	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-02	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-03	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-04	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-05	10" Extended Arm (Required)	7" Arm (Standard)
GLEON-AF-06	10" Extended Arm (Required)	7" Arm (Standard)
GLEON-AF-07	13" Extended Arm (Required)	13" Extended Arm (Required)
GLEON-AF-08	13" Extended Arm (Required)	13" Extended Arm (Required)
GLEON-AF-09	16" Extended Arm (Required)	16" Extended Arm (Required)
GLEON-AF-10	16" Extended Arm (Required)	16" Extended Arm (Required)

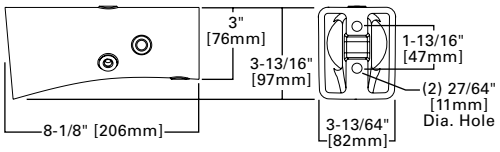


NOTES: 1 Round poles are 3 @ 120°. Square poles are 3 @ 90°. **2** Round poles are 3 @ 90°.

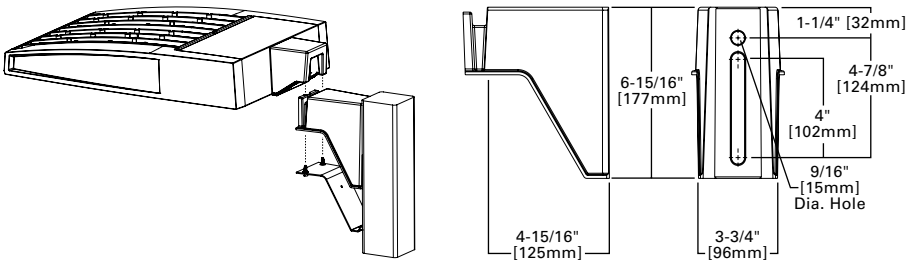
STANDARD WALL MOUNT



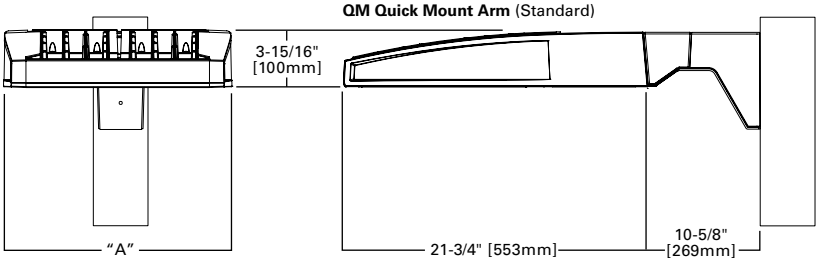
MAST ARM MOUNT



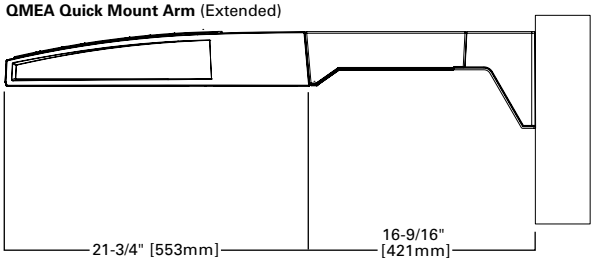
QUICK MOUNT ARM (INCLUDES FIXTURE ADAPTER)



QM Quick Mount Arm (Standard)



QMEA Quick Mount Arm (Extended)

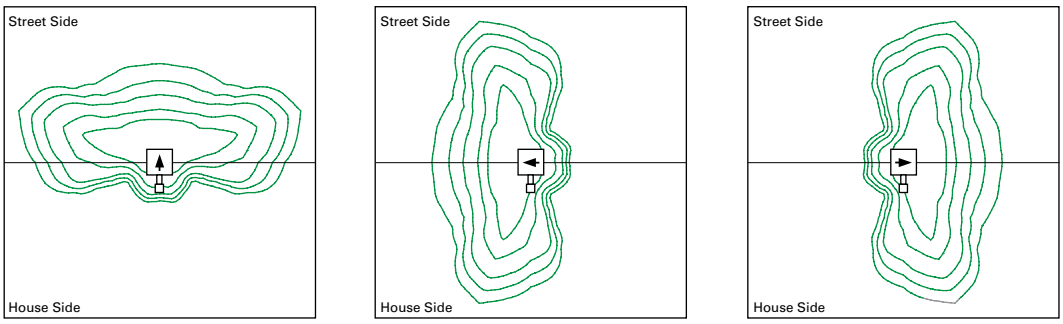


QUICK MOUNT ARM DATA

Number of Light Squares [1, 2]	"A" Width	Weight with QM Arm (lbs.)	Weight with QMEA Arm (lbs.)	EPA (Sq. Ft.)
1-4	15-1/2" (394mm)	35 (15.91 kgs.)	38 (17.27 kgs.)	1.11
5-6 [3]	21-5/8" (549mm)	46 (20.91 kgs.)	49 (22.27 kgs.)	
7-8	27-5/8" (702mm)	56 (25.45 kgs.)	59 (26.82 kgs.)	

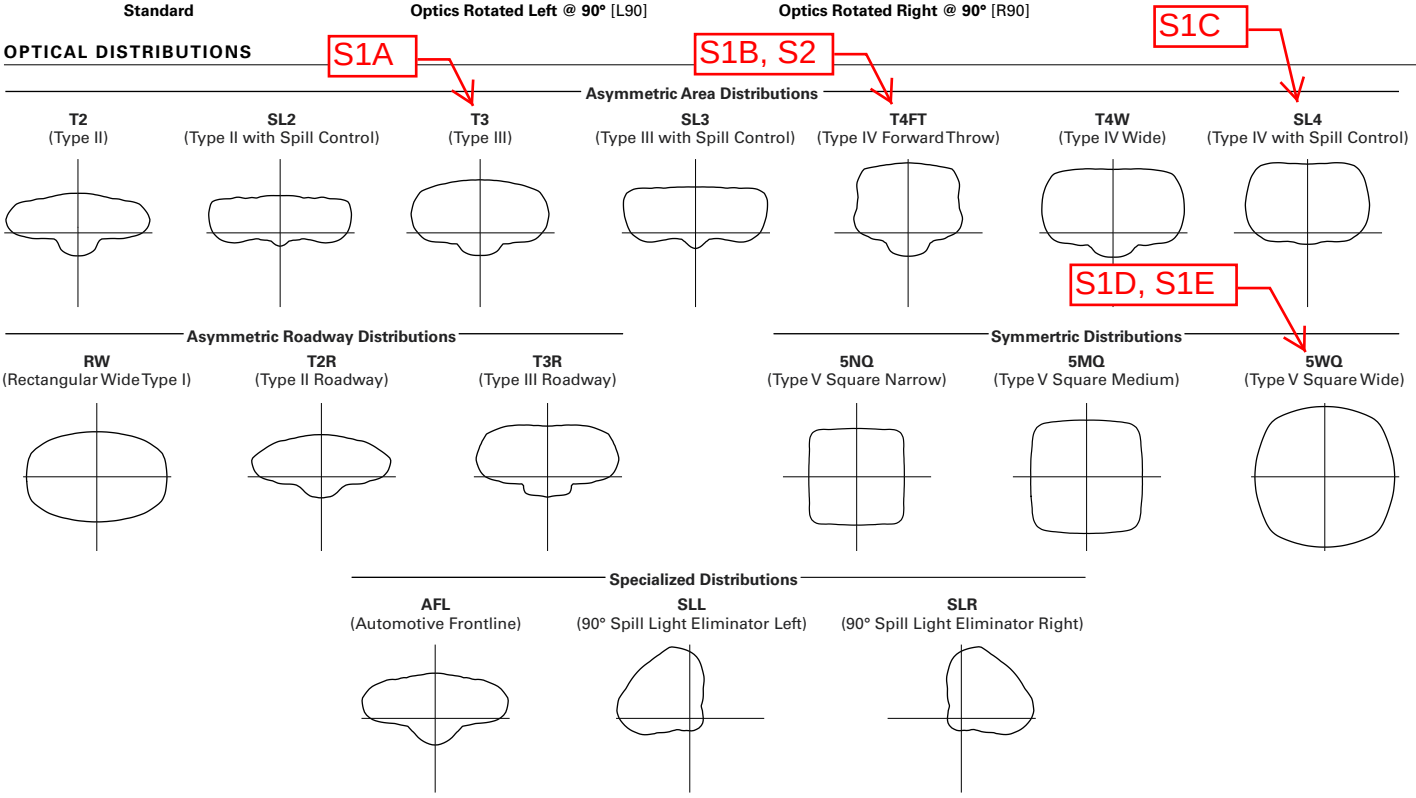
NOTES: 1 QM option available with 1-8 light square configurations. **2** QMEA option available with 1-6 light square configurations. **3** QMEA arm to be used when mounting two fixtures at 90° on a single pole.

OPTIC ORIENTATION



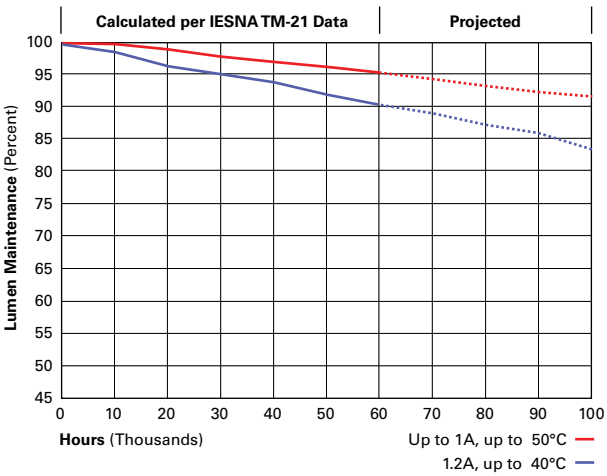
Standard | **Optics Rotated Left @ 90°** [L90] | **Optics Rotated Right @ 90°** [R90]

OPTICAL DISTRIBUTIONS



LUMEN MAINTENANCE

Drive Current	Ambient Temperature	TM-21 Lumen Maintenance (60,000 Hours)	Projected L70 (Hours)
Up to 1A	Up to 50°C	> 95%	416,000
1.2A	Up to 40°C	> 90%	205,000



LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

NOMINAL POWER LUMENS (1.2A)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		67	129	191	258	320	382	448	511	575	640
Input Current @ 120V (A)		0.58	1.16	1.78	2.31	2.94	3.56	4.09	4.71	5.34	5.87
Input Current @ 208V (A)		0.33	0.63	0.93	1.27	1.57	1.87	2.22	2.52	2.8	3.14
Input Current @ 240V (A)		0.29	0.55	0.80	1.10	1.35	1.61	1.93	2.18	2.41	2.71
Input Current @ 277V (A)		0.25	0.48	0.70	0.96	1.18	1.39	1.69	1.90	2.08	2.36
Input Current @ 347V (A)		0.20	0.39	0.57	0.78	0.96	1.15	1.36	1.54	1.72	1.92
Input Current @ 480V (A)		0.15	0.30	0.43	0.60	0.73	0.85	1.03	1.16	1.28	1.45
Optics											
T2	4000K/5000K Lumens	6,863	13,412	20,011	26,441	32,761	39,205	46,364	52,534	58,601	64,880
	3000K Lumens	6,489	12,681	18,919	25,000	30,974	37,066	43,836	49,668	55,405	61,341
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T2R	4000K/5000K Lumens	7,285	14,238	21,246	28,072	34,780	41,621	49,221	55,770	62,212	68,878
	3000K Lumens	6,888	13,462	20,087	26,541	32,884	39,351	46,537	52,729	58,819	65,122
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
T3	4000K/5000K Lumens	6,995	13,670	20,397	26,951	33,391	39,959	47,256	53,544	59,728	66,130
	3000K Lumens	6,613	12,924	19,284	25,480	31,570	37,780	44,679	50,624	56,471	62,524
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T3R	4000K/5000K Lumens	7,150	13,973	20,850	27,549	34,134	40,846	48,307	54,734	61,056	67,598
	3000K Lumens	6,761	13,212	19,713	26,046	32,272	38,619	45,673	51,750	57,726	63,911
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T4FT	4000K/5000K Lumens	7,036	13,748	20,515	27,107	33,586	40,191	47,530	53,854	60,074	66,512
	3000K Lumens	6,652	12,999	19,397	25,629	31,754	37,999	44,938	50,917	56,797	62,885
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T4W	4000K/5000K Lumens	6,945	13,571	20,249	26,756	33,152	39,671	46,917	53,160	59,298	65,653
	3000K Lumens	6,566	12,831	19,146	25,297	31,344	37,508	44,358	50,260	56,064	62,072
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL2	4000K/5000K Lumens	6,851	13,388	19,977	26,396	32,704	39,137	46,283	52,444	58,498	64,768
	3000K Lumens	6,477	12,658	18,888	24,957	30,920	37,003	43,759	49,584	55,308	61,235
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL3	4000K/5000K Lumens	6,994	13,668	20,394	26,947	33,388	39,953	47,249	53,537	59,720	66,119
	3000K Lumens	6,612	12,922	19,281	25,477	31,567	37,774	44,673	50,618	56,463	62,514
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
SL4	4000K/5000K Lumens	6,645	12,986	19,378	25,603	31,723	37,962	44,893	50,868	56,743	62,824
	3000K Lumens	6,282	12,279	18,321	24,207	29,993	35,892	42,445	48,094	53,648	59,398
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	7,214	14,097	21,036	27,795	34,437	41,210	48,734	55,220	61,597	68,199
	3000K Lumens	6,820	13,329	19,888	26,279	32,558	38,962	46,077	52,208	58,237	64,479
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
5MQ	4000K/5000K Lumens	7,347	14,356	21,423	28,306	35,071	41,969	49,632	56,237	62,730	69,454
	3000K Lumens	6,947	13,573	20,254	26,762	33,158	39,680	46,925	53,170	59,309	65,667
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
5WQ	4000K/5000K Lumens	7,366	14,396	21,480	28,381	35,164	42,080	49,765	56,386	62,898	69,639
	3000K Lumens	6,964	13,610	20,308	26,833	33,247	39,786	47,050	53,311	59,468	65,842
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
SLL/SLR	4000K/5000K Lumens	6,147	12,010	17,921	23,679	29,339	35,109	41,521	47,046	52,478	58,102
	3000K Lumens	5,811	11,355	16,944	22,388	27,739	33,194	39,256	44,479	49,617	54,933
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	7,149	13,970	20,846	27,543	34,126	40,837	48,295	54,722	61,042	67,582
	3000K Lumens	6,760	13,208	19,709	26,041	32,264	38,610	45,661	51,738	57,713	63,897
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
AFL	4000K/5000K Lumens	7,175	14,021	20,921	27,643	34,249	40,986	48,470	54,920	61,262	67,828
	3000K Lumens	6,784	13,256	19,780	26,136	32,381	38,750	45,827	51,925	57,922	64,129
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4

* Nominal data for 70 CRI.

NOMINAL POWER LUMENS (1A)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		59	113	166	225	279	333	391	445	501	558
Input Current @ 120V (A)		0.51	1.02	1.53	2.03	2.55	3.06	3.56	4.08	4.60	5.07
Input Current @ 208V (A)		0.29	0.56	0.82	1.11	1.37	1.64	1.93	2.19	2.46	2.75
Input Current @ 240V (A)		0.26	0.48	0.71	0.96	1.19	0.41	1.67	1.89	2.12	2.39
Input Current @ 277V (A)		0.23	0.42	0.61	0.83	1.03	1.23	1.45	1.65	1.84	2.09
Input Current @ 347V (A)		0.17	0.32	0.50	0.64	0.82	1.00	1.14	1.32	1.50	1.68
Input Current @ 480V (A)		0.14	0.24	0.37	0.48	0.61	0.75	0.91	0.99	1.12	1.28
Optics											
T2	4000K/5000K Lumens	6,256	12,225	18,242	24,104	29,865	35,739	42,265	47,888	53,420	59,144
	3000K Lumens	5,915	11,559	17,248	22,789	28,236	33,790	39,960	45,277	50,506	55,919
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T2R	4000K/5000K Lumens	6,642	12,979	19,366	25,589	31,705	37,941	44,870	50,840	56,711	62,789
	3000K Lumens	6,280	12,271	18,311	24,193	29,976	35,872	42,423	48,068	53,619	59,365
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
T3	4000K/5000K Lumens	6,377	12,461	18,593	24,568	30,439	36,426	43,077	48,810	54,447	60,282
	3000K Lumens	S1A	-	-	-	-	-	-	-	-	-
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T3R	4000K/5000K Lumens	6,518	12,739	19,006	25,113	31,116	37,235	44,036	49,895	55,658	61,622
	3000K Lumens	6,029	11,781	17,579	23,229	28,779	34,440	40,729	46,148	51,478	56,995
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T4FT	4000K/5000K Lumens	6,414	12,533	18,702	24,710	30,616	36,637	43,328	49,093	54,763	60,631
	3000K Lumens	S1B, S2	11,849	17,681	23,363	28,946	34,638	40,966	46,417	51,776	57,325
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T4W	4000K/5000K Lumens	6,331	12,372	18,459	24,391	30,221	36,163	42,769	48,459	54,056	59,849
	3000K Lumens	5,986	11,697	17,452	23,061	28,572	34,192	40,436	45,817	51,108	56,585
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL2	4000K/5000K Lumens	6,245	12,205	18,212	24,062	29,813	35,677	42,192	47,807	53,326	59,042
	3000K Lumens	5,904	11,539	17,218	22,750	28,187	33,732	39,891	45,199	50,418	55,822
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL3	4000K/5000K Lumens	6,376	12,460	18,591	24,564	30,436	36,421	43,072	48,803	54,439	60,273
	3000K Lumens	6,028	11,780	17,578	23,224	28,776	34,435	40,723	46,141	51,471	56,986
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
SL4	4000K/5000K Lumens	6,058	11,838	17,664	23,340	28,918	34,605	40,924	46,370	51,727	57,269
	3000K Lumens	S1C 5,727	11,193	16,701	22,067	27,341	32,718	38,692	43,841	48,906	54,146
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	6,577	12,851	19,176	25,336	31,392	37,566	44,426	50,337	56,151	62,170
	3000K Lumens	6,218	12,151	18,131	23,955	29,680	35,517	42,003	47,592	53,089	58,779
	BUG Rating	B2-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
5MQ	4000K/5000K Lumens	6,697	13,088	19,528	25,803	31,970	38,258	45,243	51,264	57,185	63,313
	3000K Lumens	6,332	12,374	18,463	24,395	30,227	36,171	42,776	48,468	54,066	59,861
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
5WQ	4000K/5000K Lumens	6,715	13,122	19,580	25,871	32,055	38,360	45,365	51,401	57,337	63,482
	3000K Lumens	S1D	12,406	18,513	24,461	30,307	36,268	42,891	48,599	54,210	60,021
	BUG Rating	B3-U0-G2	S1E	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
SLL/SLR	4000K/5000K Lumens	5,604	10,949	16,337	21,586	26,745	32,004	37,850	42,886	47,838	52,965
	3000K Lumens	5,298	10,351	15,446	20,409	25,287	30,258	35,786	40,547	45,229	50,077
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	6,517	12,735	19,002	25,107	31,109	37,227	44,025	49,883	55,644	61,607
	3000K Lumens	6,162	12,040	17,965	23,738	29,413	35,197	41,623	47,163	52,609	58,247
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
AFL	4000K/5000K Lumens	6,541	12,781	19,072	25,199	31,221	37,362	44,185	50,065	55,846	61,831
	3000K Lumens	6,184	12,084	18,032	23,825	29,519	35,325	41,775	47,334	52,801	58,459
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4

* Nominal data for 70 CRI.

NOMINAL POWER LUMENS (800MA)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		44	85	124	171	210	249	295	334	374	419
Input Current @ 120V (A)		0.39	0.77	1.13	1.54	1.90	2.26	2.67	3.03	3.39	3.80
Input Current @ 208V (A)		0.22	0.44	0.62	0.88	1.06	1.24	1.50	1.68	1.87	2.12
Input Current @ 240V (A)		0.19	0.38	0.54	0.76	0.92	1.08	1.30	1.46	1.62	1.84
Input Current @ 277V (A)		0.17	0.36	0.47	0.72	0.83	0.95	1.19	1.31	1.42	1.67
Input Current @ 347V (A)		0.15	0.24	0.38	0.49	0.63	0.77	0.87	1.01	1.15	1.52
Input Current @ 480V (A)		0.11	0.18	0.29	0.37	0.48	0.59	0.66	0.77	0.88	0.96
Optics											
T2	4000K/5000K Lumens	5,054	9,878	14,739	19,475	24,129	28,875	34,148	38,691	43,159	47,785
	3000K Lumens	4,779	9,338	13,935	18,412	22,813	27,301	32,286	36,581	40,805	45,179
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5
T2R	4000K/5000K Lumens	5,366	10,486	15,647	20,675	25,616	30,654	36,252	41,076	45,819	50,730
	3000K Lumens	5,074	9,914	14,794	19,548	24,218	28,982	34,276	38,835	43,320	47,964
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
T3	4000K/5000K Lumens	5,153	10,068	15,022	19,849	24,593	29,430	34,805	39,436	43,990	48,705
	3000K Lumens	4,872	9,519	14,203	18,766	23,251	27,825	32,907	37,285	41,591	46,048
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
T3R	4000K/5000K Lumens	5,266	10,292	15,356	20,290	25,140	30,084	35,578	40,312	44,968	49,786
	3000K Lumens	4,979	9,731	14,518	19,184	23,769	28,443	33,638	38,114	42,516	47,071
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
T4FT	4000K/5000K Lumens	5,182	10,126	15,109	19,964	24,736	29,600	35,006	39,664	44,245	48,987
	3000K Lumens	4,899	9,574	14,285	18,876	23,387	27,986	33,097	37,501	41,832	46,315
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
T4W	4000K/5000K Lumens	5,115	9,995	14,914	19,706	24,417	29,218	34,554	39,152	43,674	48,354
	3000K Lumens	4,836	9,450	14,100	18,631	23,085	27,624	32,670	37,017	41,292	45,717
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
SL2	4000K/5000K Lumens	5,046	9,860	14,713	19,441	24,087	28,825	34,089	38,625	43,085	47,702
	3000K Lumens	4,771	9,322	13,911	18,381	22,774	27,253	32,229	36,518	40,735	45,101
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
SL3	4000K/5000K Lumens	5,152	10,067	15,020	19,846	24,591	29,426	34,800	39,431	43,984	48,698
	3000K Lumens	4,871	9,518	14,200	18,764	23,249	27,822	32,902	37,280	41,585	46,042
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
SL4	4000K/5000K Lumens	4,894	9,565	14,271	18,857	23,364	27,959	33,065	37,465	41,792	46,270
	3000K Lumens	4,627	9,043	13,492	17,829	22,090	26,434	31,261	35,422	39,513	43,746
	BUG Rating	B1-U0-G2	B1-U0-G3	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	5,313	10,383	15,493	20,470	25,363	30,351	35,893	40,669	45,367	50,229
	3000K Lumens	5,024	9,817	14,647	19,354	23,980	28,696	33,936	38,452	42,893	47,490
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3
5MQ	4000K/5000K Lumens	5,411	10,574	15,778	20,848	25,830	30,911	36,554	41,418	46,202	51,154
	3000K Lumens	5,117	9,997	14,917	19,710	24,421	29,225	34,561	39,160	43,682	48,364
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
5WQ	4000K/5000K Lumens	5,426	10,603	15,820	20,903	25,899	30,992	36,652	41,529	46,325	51,290
	3000K Lumens	5,130	10,025	14,958	19,763	24,486	29,302	34,654	39,263	43,799	48,493
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
SLL/SLR	4000K/5000K Lumens	4,528	8,846	13,199	17,440	21,609	25,858	30,580	34,649	38,651	42,792
	3000K Lumens	4,281	8,364	12,480	16,489	20,430	24,448	28,912	32,759	36,543	40,459
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	5,265	10,289	15,353	20,285	25,134	30,077	35,569	40,303	44,958	49,775
	3000K Lumens	4,978	9,727	14,516	19,179	23,763	28,437	33,629	38,105	42,506	47,060
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4
AFL	4000K/5000K Lumens	5,285	10,327	15,409	20,360	25,225	30,186	35,699	40,450	45,120	49,996
	3000K Lumens	4,996	9,763	14,569	19,249	23,849	28,540	33,752	38,244	42,659	47,232
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3

* Nominal data for 70 CRI.

NOMINAL POWER LUMENS (600MA)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		34	66	96	129	162	193	226	257	290	323
Input Current @ 120V (A)		0.30	0.58	0.86	1.16	1.44	1.73	2.03	2.33	2.59	2.89
Input Current @ 208V (A)		0.17	0.34	0.49	0.65	0.84	0.99	1.14	1.30	1.48	1.63
Input Current @ 240V (A)		0.15	0.30	0.43	0.56	0.74	0.87	1.00	1.13	1.30	1.43
Input Current @ 277V (A)		0.14	0.28	0.41	0.52	0.69	0.81	0.93	1.04	1.22	1.33
Input Current @ 347V (A)		0.11	0.19	0.30	0.39	0.49	0.60	0.69	0.77	0.90	0.99
Input Current @ 480V (A)		0.08	0.15	0.24	0.30	0.38	0.48	0.53	0.59	0.71	0.77
Optics											
T2	4000K/5000K Lumens	4,121	8,055	12,019	15,881	19,676	23,547	27,847	31,552	35,196	38,967
	3000K Lumens	3,896	7,615	11,363	15,015	18,604	22,263	26,328	29,831	33,276	36,842
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
T2R	4000K/5000K Lumens	4,376	8,552	12,760	16,860	20,890	24,998	29,563	33,497	37,365	41,369
	3000K Lumens	4,138	8,085	12,064	15,941	19,751	23,635	27,951	31,670	35,328	39,113
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4
T3	4000K/5000K Lumens	4,201	8,210	12,251	16,187	20,055	23,999	28,383	32,159	35,873	39,718
	3000K Lumens	3,973	7,763	11,583	15,304	18,961	22,691	26,835	30,406	33,916	37,552
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
T3R	4000K/5000K Lumens	4,294	8,393	12,523	16,546	20,501	24,532	29,014	32,875	36,671	40,600
	3000K Lumens	4,060	7,936	11,840	15,644	19,383	23,195	27,432	31,082	34,671	38,386
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
T4FT	4000K/5000K Lumens	4,226	8,257	12,321	16,280	20,172	24,139	28,547	32,346	36,082	39,948
	3000K Lumens	3,996	7,807	11,649	15,392	19,071	22,822	26,990	30,582	34,114	37,770
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
T4W	4000K/5000K Lumens	4,171	8,151	12,162	16,071	19,912	23,827	28,178	31,928	35,615	39,432
	3000K Lumens	3,943	7,706	11,498	15,194	18,825	22,527	26,642	30,187	33,673	37,281
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
SL2	4000K/5000K Lumens	4,114	8,041	11,998	15,854	19,643	23,506	27,799	31,498	35,135	38,901
	3000K Lumens	3,890	7,603	11,344	14,989	18,572	22,224	26,282	29,780	33,219	36,779
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
SL3	4000K/5000K Lumens	4,200	8,209	12,249	16,184	20,053	23,996	28,379	32,154	35,869	39,712
	3000K Lumens	3,972	7,762	11,580	15,302	18,960	22,688	26,831	30,400	33,913	37,546
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
SL4	4000K/5000K Lumens	3,992	7,799	11,638	15,378	19,053	22,801	26,964	30,552	34,081	37,733
	3000K Lumens	3,774	7,374	11,003	14,539	18,015	21,557	25,493	28,886	32,222	35,674
	BUG Rating	B1-U0-G2	B1-U0-G2	B1-U0-G3	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G4	B2-U0-G5	B2-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	4,333	8,467	12,634	16,694	20,683	24,751	29,271	33,166	36,996	40,961
	3000K Lumens	4,097	8,005	11,945	15,784	19,555	23,401	27,674	31,357	34,978	38,727
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3
5MQ	4000K/5000K Lumens	4,413	8,622	12,867	17,000	21,064	25,207	29,810	33,777	37,677	41,715
	3000K Lumens	4,173	8,152	12,165	16,073	19,915	23,832	28,185	31,934	35,623	39,440
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
5WQ	4000K/5000K Lumens	4,424	8,646	12,900	17,046	21,120	25,274	29,890	33,866	37,778	41,826
	3000K Lumens	4,182	8,175	12,197	16,117	19,968	23,896	28,260	32,018	35,717	39,545
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
SLL/SLR	4000K/5000K Lumens	3,692	7,214	10,763	14,222	17,621	21,086	24,937	28,256	31,519	34,897
	3000K Lumens	3,491	6,820	10,176	13,447	16,660	19,937	23,577	26,715	29,800	32,994
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	4,293	8,390	12,520	16,542	20,496	24,527	29,007	32,866	36,662	40,591
	3000K Lumens	4,059	7,932	11,837	15,640	19,378	23,189	27,425	31,074	34,662	38,377
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
AFL	4000K/5000K Lumens	4,310	8,421	12,566	16,602	20,571	24,616	29,112	32,986	36,795	40,738
	3000K Lumens	4,074	7,962	11,881	15,697	19,448	23,273	27,525	31,187	34,788	38,516
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3

* Nominal data for 70 CRI.

CONTROL OPTIONS

0-10V (DIM)
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

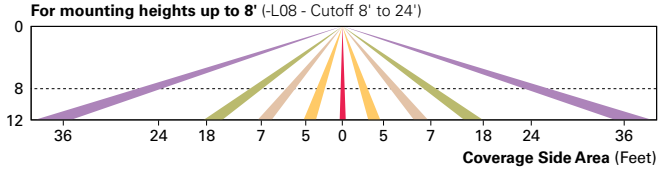
Photocontrol (P, R and PER7)
Optional button-type photocontrol (P) and photocontrol receptacles (R and PER7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

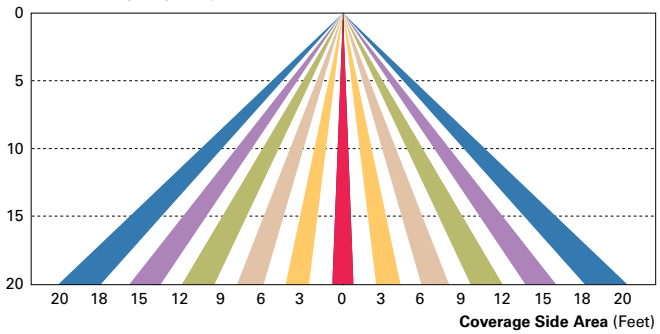
Dimming Occupancy Sensor (MS/DIM-LXX, MS/X-LXX and MS-LXX)
These sensors are factory installed in the luminaire housing. When the MS/DIM-LXX sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MS/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of five minutes. The MS-LXX sensor is factory preset to turn the luminaire off after five minutes of no activity. The MS/X-LXX is also preset for five minutes and only controls the specified number of light engines to maintain steady output from the remaining light engines.

These occupancy sensors includes an integral photocell that can be activated with the FSIR-100 accessory for "dusk-to-dawn" control or daylight harvesting - the factory preset is OFF. The FSIR-100 is a wireless tool utilized for changing the dimming level, time delay, sensitivity and other parameters. A variety of sensor lens are available to optimize the coverage. pattern for mounting heights from 8'-40'.

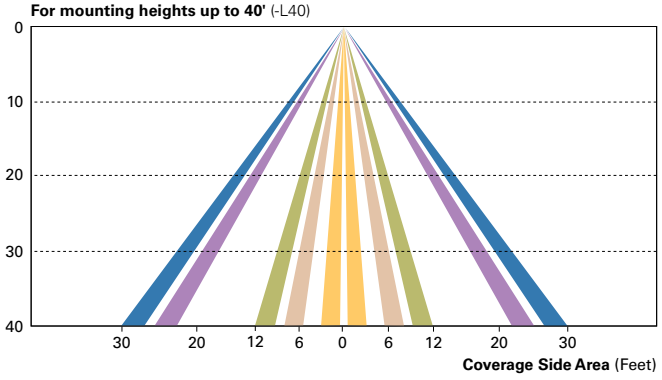
For mounting heights up to 8' (-L08 - Cutoff 8' to 24')



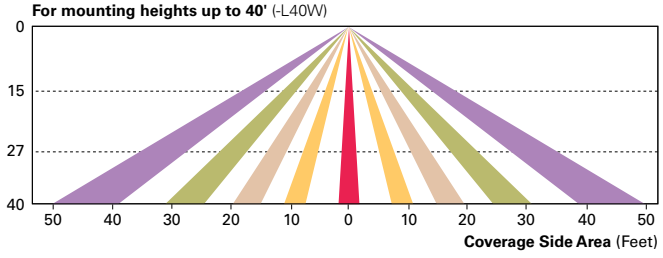
For mounting heights up to 20' (-L20)



For mounting heights up to 40' (-L40)

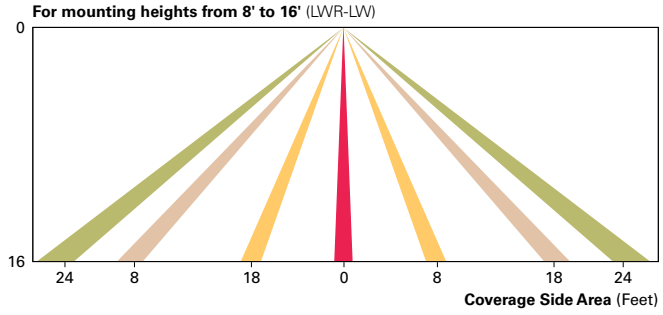


For mounting heights up to 40' (-L40W)

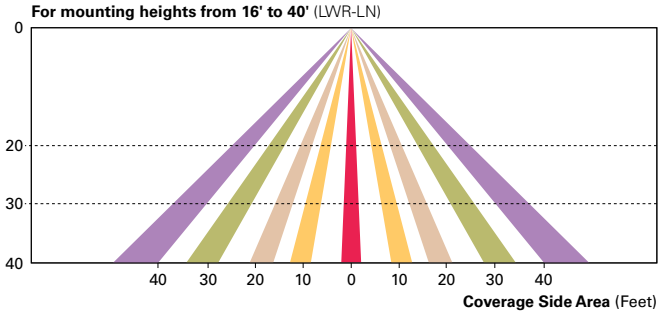


LumaWatt Pro Wireless Control and Monitoring System (LWR-LW and LWR-LN)
The Eaton's LumaWatt Pro powered by Enlighted is a connected lighting solution that combines a broad selection of energy-efficient LED luminaires with a powerful integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of building resources, beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)



For mounting heights from 16' to 40' (LWR-LN)



WaveLinx Wireless Outdoor Lighting Control Module (WOLC-7P-10A)
The 7-pin wireless outdoor lighting control module enables WaveLinx to control outdoor area, site and flood lighting. WaveLinx controls outdoor lighting using schedules to provide ON, OFF and dimming controls based on astronomic or time schedules based on a 7 day week.

LumenSafe Integrated Network Security Camera (LD)
Eaton brings ease of camera deployment to a whole new level. No additional wiring is needed beyond providing line power to the luminaire. A variety of networking options allows security integrators to design the optimal solution for active surveillance. As the ideal solution to meet the needs for active surveillance, the LumenSafe integrated network camera is a streamlined, outdoor-ready fixed dome that provides HDTV 1080p video. This IP camera is optimally designed for deployment in the video management system or security software platform of choice.

ORDERING INFORMATION

Sample Number: GLEON-AF-04-LED-E1-T3-GM-QM

Product Family [1, 2]	Light Engine	Number of Light Squares [3]	Lamp Type	Voltage	Distribution	Color	Mounting
GLEON=Galleon	**AF**=1A Drive Current	**01**=1 **02**=2 **03**=3 **04**=4 **05**=5 [4] **06**=6 **07**=7 [5] **08**=8 [5] **09**=9 [6] **10**=10 [6]	**LED**=Solid State Light Emitting Diodes	**E1**=120-277V **347**=347V [7] **480**=480V [7, 8]	**T2**=Type II **T2R**=Type II Roadway **T3**=Type III **T3R**=Type III Roadway **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **5NQ**=Type V Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **AFL**=Automotive Frontline	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White	**[Blank]**=Arm for Round or Square Pole **EA**=Extended Arm [9] **MA**=Mast Arm Adapter [10] **WM**=Wall Mount **QM**=Quick Mount Arm (Standard Length) [11] **QMEA**=Quick Mount Arm (Extended Length) [12]

S1A-S1D, S2

S1E

S1A

S1B, S2

S1D, S1E

S1C

Options (Add as Suffix)

7027=70 CRI 2700K [13]
7030=70 CRI 3000K [13]
8030=80 CRI 3000K [14]
7050=70 CRI 5000K [13]
7060=70 CRI 6000K [13]
600=Drive Current Factory Set to Nominal 600mA [15]
800=Drive Current Factory Set to Nominal 800mA [15]
1200=Drive Current Factory Set to Nominal 1200mA [15, 16]
F=Single Fuse (120, 277 or 347V. Must Specify Voltage)
FF=Double Fuse (208, 240 or 480V. Must Specify Voltage)
2L=Two Circuits [17, 18]
DIM=External 0-10V Dimming Leads [19, 20]
P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Volatage) [21]
PER7=NEMA 7-PIN Twistlock Photocontrol Receptacle [21]
R=NEMA Twistlock Photocontrol Receptacle [21]
AHD145=After Hours Dim, 5 Hours [22]
AHD245=After Hours Dim, 6 Hours [22]
AHD255=After Hours Dim, 7 Hours [22]
AHD355=After Hours Dim, 8 Hours [22]
HA=50°C High Ambient [23]
MS/DIM-L08=Motion Sensor for Dimming Operation, Maximum 8' Mounting Height [24, 25]
MS/DIM-L20=Motion Sensor for Dimming Operation, 9' - 20' Mounting Height [24, 26]
MS/DIM-L40=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height [24, 27]
MS/DIM-L40W=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height (Wide Range) [24, 28]
MS/X-L08=Bi-Level Motion Sensor, Maximum 8' Mounting Height [24, 25, 29]
MS/X-L20=Bi-Level Motion Sensor, 9' - 20' Mounting Height [24, 26, 29]
MS/X-L40=Bi-Level Motion Sensor, 21' - 40' Mounting Height [22, 27, 29]
MS/X-L40W=Bi-Level Motion Sensor, 21' - 40' Mounting Height (Wide Range) [24, 28, 29]
MS-L08=Motion Sensor for ON/OFF Operation, Maximum 8' Mounting Height [24, 25]
MS-L20=Motion Sensor for ON/OFF Operation, 9' - 20' Mounting Height [24, 26]
MS-L40=Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height [24, 27]
MS-L40W=Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height (Wide Range) [24, 28]
LWR-LW=LumaWatt Pro Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [30]
LWR-LN=LumaWatt Pro Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [30]
L90=Optics Rotated 90° Left
R90=Optics Rotated 90° Right
MT=Factory Installed Mesh Top
TH=Tool-less Door Hardware
LCF=Light Square Trim Plate Painted to Match Housing [31]
HSS=Factory Installed House Side Shield [32]
CE=CE Marking [33]

S1C

Accessories (Order Separately)

OA/RA1016=NEMA Photocontrol Multi-Tap - 105-285V
OA/RA1027=NEMA Photocontrol - 480V
OA/RA1201=NEMA Photocontrol - 347V
OA/RA1013=Photocontrol Shorting Cap
OA/RA1014=120V Photocontrol
MA1252=10kV Surge Module Replacement
MA1036-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon
MA1037-XX=2@180° Tenon Adapter for 2-3/8" O.D. Tenon
MA1197-XX=3@120° Tenon Adapter for 2-3/8" O.D. Tenon
MA1188-XX=4@90° Tenon Adapter for 2-3/8" O.D. Tenon
MA1189-XX=2@90° Tenon Adapter for 2-3/8" O.D. Tenon
MA1190-XX=3@90° Tenon Adapter for 2-3/8" O.D. Tenon
MA1191-XX=2@120° Tenon Adapter for 2-3/8" O.D. Tenon
MA1038-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon
MA1039-XX=2@180° Tenon Adapter for 3-1/2" O.D. Tenon
MA1192-XX=3@120° Tenon Adapter for 3-1/2" O.D. Tenon
MA1193-XX=4@90° Tenon Adapter for 3-1/2" O.D. Tenon
MA1194-XX=2@90° Tenon Adapter for 3-1/2" O.D. Tenon
MA1195-XX=3@90° Tenon Adapter for 3-1/2" O.D. Tenon
FSIR-100=Wireless Configuration Tool for Occupancy Sensor [24]
GLEON-MT1=Field Installed Mesh Top for 1-4 Light Squares
GLEON-MT2=Field Installed Mesh Top for 5-6 Light Squares
GLEON-MT3=Field Installed Mesh Top for 7-8 Light Squares
GLEON-MT4=Field Installed Mesh Top for 9-10 Light Squares
GLEON-QM=Quick Mount Arm Kit [10]
GLEON-QMEA=Quick Mount Extended Arm Kit [11]
LS/HSS=Field Installed House Side Shield [32, 33]
WOLC-7P-10A=WaveLinx Outdoor Control Module (7-pin) [35]

NOTES:
1 Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information. **2** DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details. **3** Standard 4000K CCT and minimum 70 CRI. **4** Not compatible with MS/4-LXX or MS/1-LXX sensors. **5** Not compatible with extended quick mount arm (QMEA). **6** Not compatible with standard quick mount arm (QM) or extended quick mount arm (QMEA). **7** Requires the use of an internal step down transformer when combined with sensor options. Not available with sensor at 1200mA. Not available in combination with the HA high ambient and sensor options at 1A. **8** Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems). **9** May be required when two or more luminaires are oriented on a 90° or 120° drilling pattern. Refer to arm mounting requirement table. **10** Factory installed. **11** Maximum 8 light squares. **12** Maximum 6 light squares. **13** Extended lead times apply. Use dedicated IES files for 2700K, 3000K, 5000K and 6000K when performing layouts. These files are published on the Galleon luminaire product page on the website. **14** Extended lead times
apply. Use dedicated IES files for 2700K, 3000K, 5000K and 6000K when performing layouts. These files are published on the Galleon luminaire product page on the website. **15** 1 Amp standard. Use dedicated IES files for 600mA, 800mA and 1200mA when performing layouts. These files are published on the Galleon luminaire product page on the website. **16** Not available with HA option. **17** 2L is not available with MS, MS/X or MS/DIM at 347V or 480V. 2L in AF-02 through AF-04 requires a larger housing, normally used for AF-05 or AF-06. Extended arm option may be required when mounting two or more fixtures per pole at 90° or 120°. Refer to arm mounting requirement table. **18** Not available with LumaWatt Pro wireless sensors. **19** Cannot be used with other control options. **20** Low voltage control lead brought out 18" outside fixture. **21** Not available if any "MS" sensor is selected. Motion sensor has an integral photocell. **22** Requires the use of P photocontrol or the PER7 or R photocontrol receptacle with photocontrol accessory. See After Hours Dim supplemental guide for additional information. **23** 50°C lumen maintenance data applies to 600mA, 800mA and 1A drive currents. **24** The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Eaton for more information. **25** Approximately 22' detection diameter at 8' mounting height. **26** Approximately 40' detection diameter at 20' mounting height. **27** Approximately 60' detection diameter at 40' mounting height. **28** Approximately 100' detection diameter at 40' mounting height. **29** Replace X with number of Light Squares operating in low output mode. **30** LumaWatt Pro wireless sensors are factory installed only requiring network components LWP-EM-1, LWP-GW-1 and LWP-PoE8 in appropriate quantities. See www.eaton.com/lighting for LumaWatt Pro application information. **31** Not available with house side shield (HSS). **32** Only for use with SL2, SL3, SL4 and AFL distributions. The Light Square trim plate is painted black when the HSS option is selected. **33** CE is not available with the LWR, MS, MS/X, MS/DIM, P, R or PER7 options. Available in 120-277V only. **34** One required for each Light Square. **35** Requires 7-pin NEMA twistlock photocontrol receptacle. The WOLC-7 cannot be used in conjunction with additional sensors or controls.

LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology* LumenSafe Technology CLICK HERE	**D**=Dome Camera	**C**=Cellular, Customer Installed SIM Card **A**=Cellular, Factory Installed AT&T SIM Card **V**=Cellular, Factory Installed Verizon SIM Card **S**=Cellular, Factory Installed Sprint SIM Card	**R**=Cellular, Factory Installed Rogers SIM Card **W**=Wi-Fi Networking w/ Omni-Directional Antenna **E**=Ethernet Networking

***Consult LumenSafe system pages for additional details and compatibility. Not available with 9-10 light square housing. Not available with 347V, 480V or high ambient options.



ARCHITECTURAL EGRESS

Vandal Resistant

AEL Full Cut-0ff LED

Fixture Type W1

Date

Job Name

Approved By

Catalog Number

SPECIFICATIONS

Description The Architectural Egress Luminaire combines a unique, patented design shaped with high performance, full cut-off optics to achieve completely unobtrusive illumination of a space or path of egress. When mounted over a doorway, the fixture is perceived as an element of the building structure and, additionally, provides water protection in the form of a drip cap over the doorway. Multiple lengths are available to match a given door opening and our unique quick mount system facilitates installation and maintenance.

Housing Marine grade heat treated extruded aluminum.
Chemically primed and finished with robotically applied polyester powder coat.

Wall Mount Marine grade heat treated extruded aluminum. Chemically primed and finished with robotically applied polyester powder coat. Designed to provide quick mounting to housing and secured with (2) captive stainless steel TORX® head screws.

Lens Frame Marine grade heat treated extruded aluminum, clear anodized. Secured to fixture via integral concealed hinge and (3) captive stainless steel TORX® head screws.

Lens UV stabilized diffused extruded polycarbonate.

End Caps Die-cast marine grade aluminum continuously welded to housing. All welds ground smooth.

Reflector Electrostatically brightened anodized aluminum PVD coated and absolutely color-free of iridescence. Shaped to provide full cutoff, LED point dispersion and maximum efficiency.

Drivers Constant current drivers at 700mA.

LED Samsung LM561B+ Series @ 2700K, 3000K, 3500K, 4000K, or 5000K and 82 CRI wired in parallel-series. L_{70} projected life of 130,000 hours at 50ºC. Tested in accordance with LM-80. Ten year warranty on LED boards against operational defects.

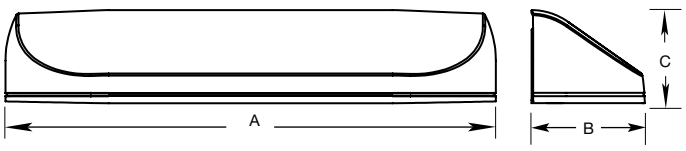
Gaskets Closed cell self-adhesive neoprene to provide watertight seal between fixture and wall and between fixture and lens frame.

Listings U.L., C.UL., Wet standard.

Lifetime Warranty Luminaire LED Incorporated will repair or replace any fixture damaged due to vandalism for the lifetime of the installation.

DIMENSIONAL DATA

	A	B	C
AEL 12	20.79	5.40	3.60
AEL 24	32.04	5.40	3.60
AEL 36	43.29	5.40	3.60
AEL 48	54.75	5.40	3.60
AEL 72	78.75	5.40	3.60



Luminaire Led
a division of the LUMINAIRES GROUP

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www.luminaireled.net
P. 732.549.0056

Luminaire LED Incorporated products are manufactured in the USA with components purchased from USA suppliers, and meet the Buy American requirements under the ARRA. Content of specification sheets is subject to change; please consult our website for current product information.

Rev: 03/19+

ARCHITECTURAL EGRESS

Vandal Resistant

Fixture Type W1

AEL Full Cut-0ff LED

ORDERING INFORMATION

SERIES	LED	CCT	VOLTS	DRIVER	LENS	COLOR	OPTIONS		TX/SD
									TX/SD
AEL 12	10W	2700K	120-277	CC	DP	BKH	DIM	EMB10ST	
AEL 24	10W	3000K	347	DIM		BZH	A/B	EMB310	
	20W	3500K		PRD		SVH	2B	EMB310ST	
AEL 36	15W	4000K				WOP	PC	EMB20R	
	30W	5000K				CUST	GLR	EMB125R	
AEL 48	20W						OCC	EMB250R	
	35W						OCC50	EMBDA	
AEL 72	30W							ST/SC	
	55W								
	PRD: Specify Watts or Lumens Above								

CC = Constant Current (Standard)
DIM = 0-10V Dimming, 10% at lowest level
PRD = Programmable driver. Specify Watts or Lumens in Ordering Information under “LED” column. N/A with AEL12.

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OPTIONS

LENS	DP = Diffused Polycarbonate.
COLORS	BKH = Black (Hammertone) · BZH = Bronze (Hammertone) · SVH = Silver (Hammertone) · WOP = White (Textured White) · CUST = Custom Color (Consult Factory)
PRD	Programmable driver. When ordering, must specify Watts or Lumens. Consult factory for availability. Not Available in AEL12.
DIM	0-10V dimming driver. 10% at lowest level. (N/A with AEL12)
A/B	Aluminum surface back box. Finished with polyester powder coat to match the fixture.
2B	(2) LED drivers for independent LED board operation. (N/A with AEL12, N/A with any OCC option, N/A with AEL24 and EMB options, N/A with AEL36 and EMB310)
PC	Photoelectric switch.
GLR	Fuse and fuse holder.
OCC	Passive infrared sensor mounted in machine hole in end cap. All LEDs sensored on/off. Maximum coverage of 10’ radius from 8’ height.
OCC50	Passive infrared sensor mounted in machine hole in end cap. 50% of LED’s constantly on and 50% sensored on/off. N/A with AEL12.
EMB10ST	1000 lumen self-testing, self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Not available in 347V. Available for AEL24, AEL36, AEL48, and AEL72 lengths only. N/A with 2B option in AEL24. Meets CA Title 20 Standards.
EMB310	1000 lumen self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Not available in 347V. Available for AEL36, AEL48, and AEL72 lengths only. N/A with 2B option. Meets CA Title 20 Standards.
EMB310ST	1000 lumen self-testing, self-contained, 90 minute emergency battery pack. 0ºC (32ºF) to 55ºC (131ºF). Not available in 347V. Available for AEL36, AEL48, and AEL72 lengths only. N/A with 2B option. Meets CA Title 20 Standards.
EMBDA	Two drivers and two emergency battery packs self-contained within fixture for independent light engine operation. Each battery pack will operate each light engine for a minimum of 90 minutes. Not available in 347V. Available in AEL72” length only.
EMB20R	Remote mounted micro inverter that will operate a 25W maximum load for 90 minutes. 0ºC (32ºF) to 45ºC (113ºF).
EMB125R	Remote inverter that will operate a 125W maximum load for 90 minutes. 20ºC (68ºF) to 30ºC (86ºF). Not available in 347V.
EMB250R	Remote inverter that will operate a 250W maximum load for 90 minutes. 20ºC(68ºF) to 30ºC (86ºF). Not available in 347V.
ST/SC	Phillips head screws instead of TORX® head.
TX/SD	TORX® head bit.

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ARCHITECTURAL EGRESS

Vandal Resistant

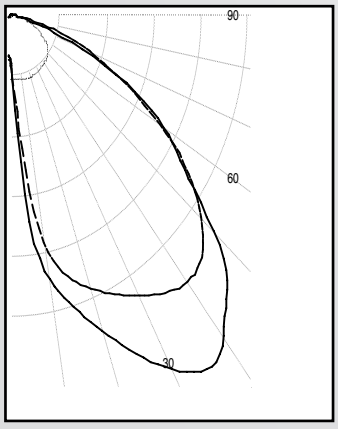
Fixture Type W1

AEL Full Cut-Off LED

PHOTOMETRIC DATA

Model	Watts	Input Watts		Delivered Lumens									
				2700K		3000K		3500K		4000K		5000K	
AEL 12	10W	10.8W		736		747		760		784		807	
AEL 24	10W	9.4W		820		832		847		873		899	
AEL 24	20W	17.6W		1535		1557		1585		1634		1682	
AEL 36	15W	14.9W		1231		1248		1271		1310		1348	
AEL 36	30W	26.3W		2954		2995		3049		3143		3237	
AEL 48	20W	18.8W		1908		1935		1969		2030		2090	
AEL 48	35W	35.2W		3568		3616		3682		3796		3909	
AEL 72	30W	27.9W		3117		3162		3217		3317		3417	
AEL 72	55W	52.2W		5830		5911		6017		6203		6389	
AEL xx	PRD			Programmable Driver. Specify Watts or Lumens in Ordering Information.									

MODEL AEL12-10W-4000K
Delivered Lumens: 726 Lumens



IES FILE: AEL12-10W-4000K
Total Power: 10.8W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B0U0G0

Zone	Lumens	% Lamps
0 - 30	153	21.1
0 - 40	287	39.5
0 - 60	585	80.6
60 - 90	726	100.0
0 - 90	439	60.5
90 -180	0	0.0
0 - 180	726	100.0

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Rev: 03/19+

ARCHITECTURAL EGRESS

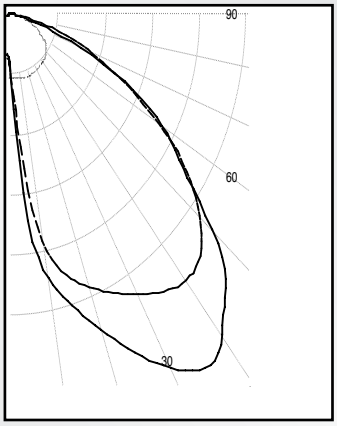
Vandal Resistant

Fixture Type W1

AEL Full Cut-0ff LED

PHOTOMETRIC DATA

MODEL AEL36-15W-4000K
Delivered Lumens: 1652 Lumens

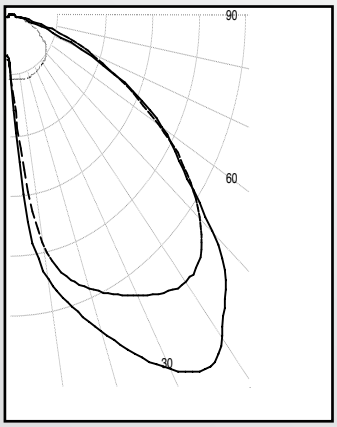


IES FILE: AEL36-15W-4000K
Total Power: 15.01W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B1U0G0

Zone	Lumens	% Lamps
0 - 30	427	25.8
0 - 40	724	43.9
0 - 60	1350	81.7
60 - 90	302	18.3
0 - 90	1652	100.0
90 -180	0	0.0
0 - 180	1652	100.0

MODEL AEL36-30W-4000K
Delivered Lumens: 3141 Lumens

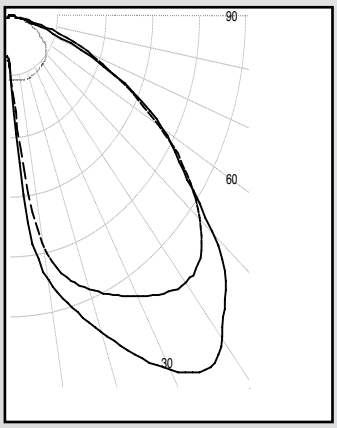


IES FILE: AEL36-30W-4000K
Total Power: 29.7W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B1U0G1

Zone	Lumens	% Lamps
0 - 30	821	26.1
0 - 40	1388	44.2
0 - 60	2575	88.0
60 - 90	566	18.0
0 - 90	3141	100.0
90 -180	0	0.0
0 - 180	3141	100.0

MODEL AEL72-30W-4000K
Delivered Lumens: 3072 Lumens



IES FILE: AEL72-30W-4000K
Total Power: 27.09W

Testing was performed in accordance with IES LM-79-08
Bug Rating: B1U0G1

Zone	Lumens	% Lamps
0 - 30	771	25.1
0 - 40	1353	44.1
0 - 60	2529	82.3
60 - 90	3072	100.0
0 - 90	1718	17.7
90 -180	542	0.0
0 - 180	3072	100.0

Luminaire Led
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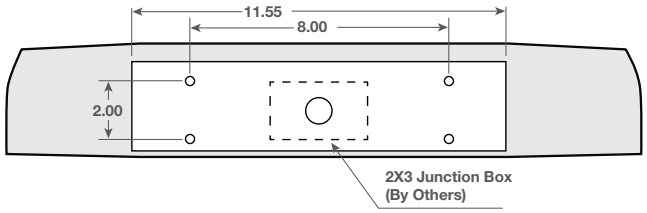
5 Sutton Place
P.O. Box 2162
Edison, NJ 08818

www.luminaireled.net
P. 732.549.0056

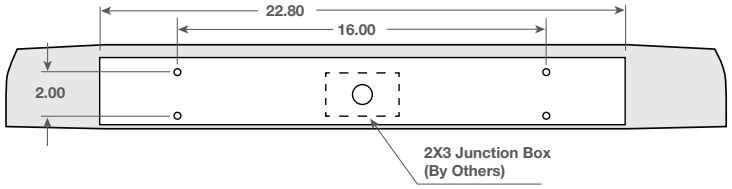
Luminaire LED Incorporated products are manufactured in the USA with components purchased from USA suppliers, and meet the Buy American requirements under the ARRA. Content of specification sheets is subject to change; please consult our website for current product information.

MOUNTING PLATE DETAILS

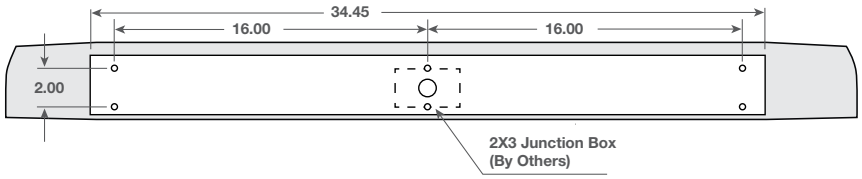
AEL 12



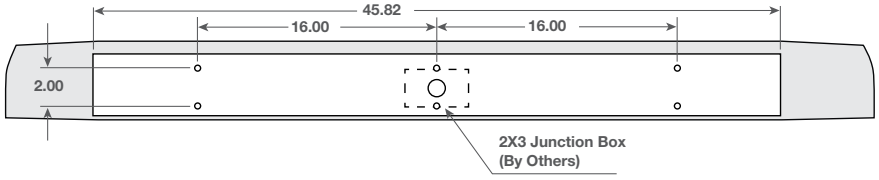
AEL 24



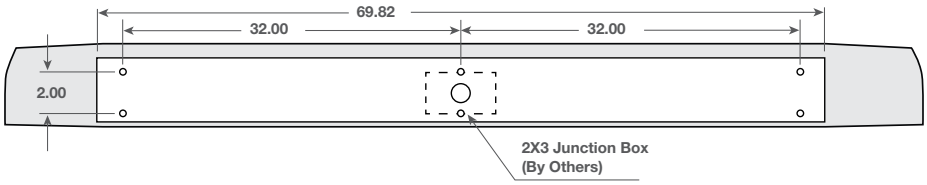
AEL 36



AEL 48



AEL 72



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Edison, NJ 08818

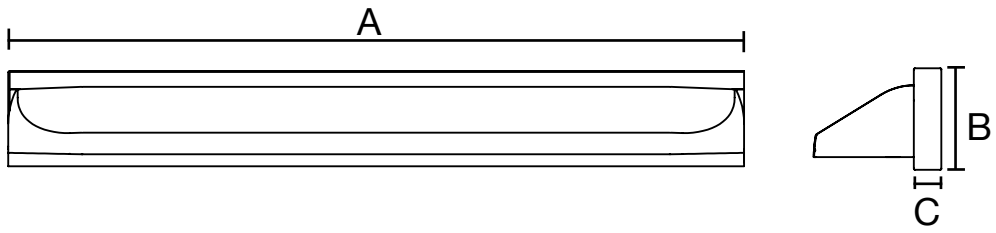
www.luminaireled.net
P. 732.549.0056

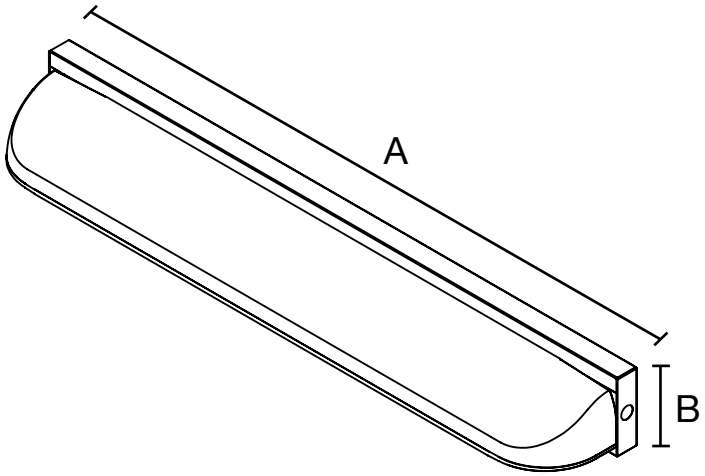
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ALUMINUM BACKBOX DETAIL

A/B Detail

	A	B	C
AEL 12 Backbox	20.80	5.20	1.50
AEL 24 Backbox	31.48	5.20	1.50
AEL 36 Backbox	43.30	5.20	1.50
AEL 48 Backbox	54.75	5.20	1.50
AEL 72 Backbox	78.75	5.20	1.50





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McGraw-Edison

DESCRIPTION

The Galleon™ Wall LED luminaire's appearance is complementary with the Galleon area and site luminaire bringing a modern architectural style to lighting applications. Flexible mounting options accommodate wall surfaces in both an upward and downward configuration. The Galleon family of LED products deliver exceptional performance with patented, high-efficiency AccuLED Optics™, providing uniform and energy conscious lighting for parking lots, building and security lighting applications.

Catalog #		Type
Project		W2
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Construction
Driver enclosure thermally isolated from optics for optimal thermal performance. Heavy wall aluminum housing die-cast with integral external heat sinks to provide superior structural rigidity and an IP66 rated housing. Overall construction passes a 1.5G vibration test to ensure mechanical integrity. UPLIGHTING: Specify with the UPL option for inverted mount uplight housing with additional protections to maintain IP rating.

Optics
Choice of thirteen patented, high-efficiency AccuLED Optics. The optics are precisely designed to shape the distribution maximizing efficiency and application spacing. AccuLED Optics create consistent distributions with the scalability to meet customized application requirements. Offered standard in 4000K (+/- 275K) CCT and minimum 70 CRI. Optional 3000K, 5000K and 6000K CCT. Greater than 90% lumen maintenance expected at 60,000 hours. Available in standard 1A drive current and optional 1200mA, 800mA, and 600mA drive currents.

Electrical
LED drivers are mounted for ease of maintenance. 120-277V 50/60Hz, 347V or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Drivers are provided standard with 0-10V dimming. An optional Eaton proprietary surge protection module is available and designed to withstand 10kV of transient line surge. The Galleon Wall LED luminaire is suitable for operation in -40°C to 40°C ambient environments. For applications with ambient temperatures exceeding 40°C, specify the HA (High Ambient) option. Emergency egress options for -20°C ambient environments and occupancy sensor available.

Mounting
Gasketed and zinc plated rigid steel mounting attachment fits directly to 4" j-box or wall with the Galleon Wall "Hook-N-Lock" mechanism for quick installation. Secured with two captive corrosion resistant black oxide coated allen head set screws which are concealed but accessible from bottom of fixture.

Finish
Housing finished in super durable TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available. Consult the McGraw-Edison Architectural Colors brochure for the complete selection.

Warranty
Five-year warranty.

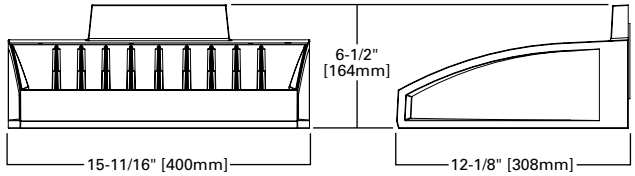


GWC GALLEON WALL

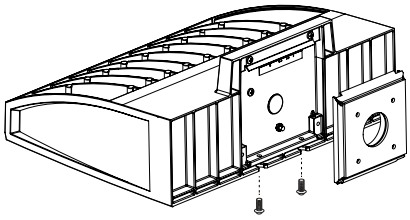
1-2 Light Squares
Solid State LED

WALL MOUNT LUMINAIRE

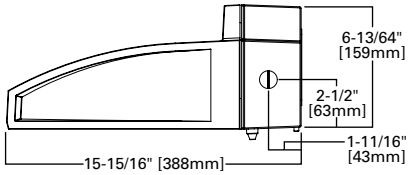
DIMENSIONS



HOOK-N-LOCK MOUNTING



BATTERY BACKUP AND THRU-BRANCH BACK BOX



CERTIFICATION DATA

UL/cUL Listed
LM79 / LM80 Compliant
IP66 Housing
ISO 9001
DesignLights Consortium® Qualified*

ENERGY DATA

Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120-277V/50 & 60Hz, 347V/60Hz, 480V/60Hz
-30°C Minimum Temperature
40°C Ambient Temperature Rating

SHIPPING DATA

Approximate Net Weight:
27 lbs. (12.2 kgs.)

Powering Business Worldwide

*www.designlights.org

POWER AND LUMENS

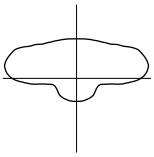
Number of Light Squares		1				2			
Drive Current		600mA	800mA	1.0A	1.2A	600mA	800mA	1.0A	1.2A
Nominal Power (Watts)		34	44	59	67	66	86	113	129
Input Current @ 120V (A)		0.30	0.39	0.51	0.58	0.58	0.77	1.02	1.16
Input Current @ 208V (A)		0.17	0.22	0.29	0.33	0.34	0.44	0.56	0.63
Input Current @ 240V (A)		0.15	0.19	0.26	0.29	0.30	0.38	0.48	0.55
Input Current @ 277V (A)		0.14	0.17	0.23	0.25	0.28	0.36	0.42	0.48
Input Current @ 347V (mA)		0.11	0.15	0.17	0.20	0.19	0.24	0.32	0.39
Input Current @ 480V (mA)		0.08	0.11	0.14	0.15	0.15	0.18	0.24	0.30
Optics									
T2	4000K/5000K Lumens	4,204	5,156	6,381	7,000	8,215	10,075	12,470	13,680
	3000K Lumens	3,975	4,874	6,033	6,618	7,767	9,525	11,790	12,934
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2
T3	4000K/5000K Lumens	4,285	5,256	6,505	7,135	8,375	10,269	12,710	13,943
	3000K Lumens	4,051	4,969	6,150	6,746	7,918	9,710	12,017	13,182
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G2
T4FT	4000K/5000K Lumens	4,311	5,286	6,542	7,177	8,422	10,329	12,784	14,024
	3000K Lumens	4,075	4,998	6,185	6,786	7,963	9,766	12,086	13,259
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G3
T4W	4000K/5000K Lumens	4,254	5,217	6,458	7,084	8,313	10,195	12,619	13,843
	3000K Lumens	4,023	4,933	6,105	6,698	7,860	9,639	11,931	13,088
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3
SL2	4000K/5000K Lumens	4,196	5,147	6,370	6,988	8,202	10,058	12,449	13,656
	3000K Lumens	3,967	4,866	6,022	6,607	7,755	9,509	11,771	12,911
	BUG Rating	B1-U0-G1	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B2-U0-G2	B2-U0-G3	B2-U0-G3
SL3	4000K/5000K Lumens	4,284	5,255	6,504	7,134	8,374	10,268	12,709	13,941
	3000K Lumens	3,849	4,720	5,842	6,408	7,520	9,224	11,415	12,523
	BUG Rating	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G3	B1-U0-G3	B1-U0-G3
SL4	4000K/5000K Lumens	4,071	4,992	6,179	6,778	7,954	9,756	12,074	13,246
	3000K Lumens	3,849	4,720	5,842	6,408	7,520	9,224	11,415	12,523
	BUG Rating	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G3	B1-U0-G3	B1-U0-G3
5NQ	4000K/5000K Lumens	4,420	5,420	6,709	7,358	8,637	10,591	13,108	14,380
	3000K Lumens	4,179	5,124	6,343	6,957	8,166	10,013	12,393	13,595
	BUG Rating	B2-U0-G1	B2-U0-G1	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2
5MQ	4000K/5000K Lumens	4,501	5,520	6,831	7,494	8,795	10,786	13,350	14,644
	3000K Lumens	4,256	5,219	6,458	7,085	8,316	10,198	12,622	13,845
	BUG Rating	B3-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B4-U0-G2	B4-U0-G2
5WQ	4000K/5000K Lumens	4,513	5,534	6,849	7,514	8,819	10,815	13,385	14,683
	3000K Lumens	4,268	5,232	6,475	7,104	8,338	10,224	12,656	13,882
	BUG Rating	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
SLL/SLR	4000K/5000K Lumens	3,765	4,619	5,716	6,270	7,358	9,023	11,167	12,251
	3000K Lumens	3,560	4,367	5,404	5,927	6,957	8,531	10,559	11,583
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G2	B1-U0-G3	B2-U0-G3
RW	4000K/5000K Lumens	4,379	5,370	6,647	7,293	8,558	10,494	12,989	14,250
	3000K Lumens	4,141	5,077	6,285	6,895	8,092	9,922	12,281	13,473
	BUG Rating	B2-U0-G1	B2-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2

* Nominal lumen data for 70 CRI. BUG rating for 4000K/5000K. Refer to IES files for 3000K BUG ratings.

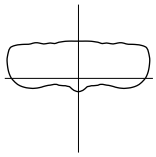
OPTICAL DISTRIBUTIONS

Asymmetric Area Distributions

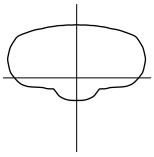
T2
(Type II)



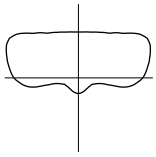
SL2
(Type II with Spill Control)



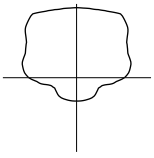
T3
(Type III)



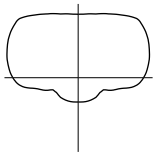
SL3
(Type III with Spill Control)



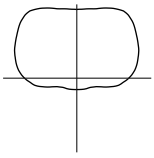
T4FT
(Type IV Forward Throw)



T4W
(Type IV Wide)

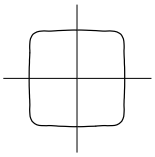


SL4
(Type IV with Spill Control)

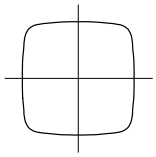


Symmertric Distributions

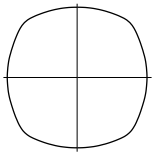
5NQ
(Type V Square Narrow)



5MQ
(Type V Square Medium)

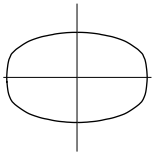


5WQ
(Type V Square Wide)

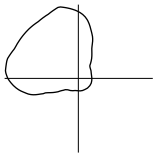


Specialized Distributions

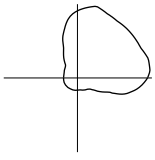
RW
(Rectangular Wide Type I)



SLL
(90° Spill Light Eliminator Left)

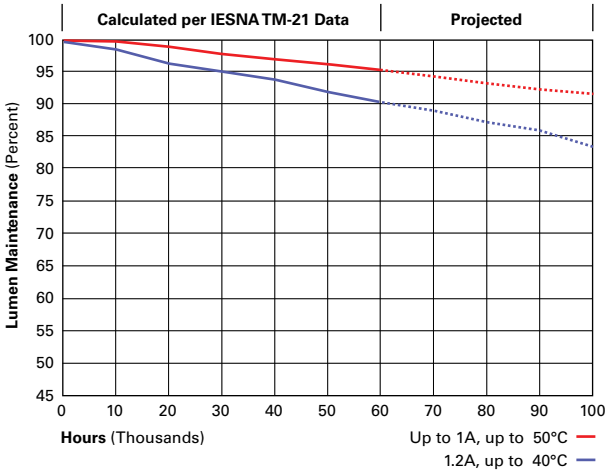


SLR
(90° Spill Light Eliminator Right)



LUMEN MAINTENANCE

Drive Current	Ambient Temperature	TM-21 Lumen Maintenance (60,000 Hours)	Projected L70 (Hours)
Up to 1A	Up to 50°C	> 95%	> 416,000
1.2A	Up to 40°C	> 90%	> 205,000



LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

CONTROL OPTIONS

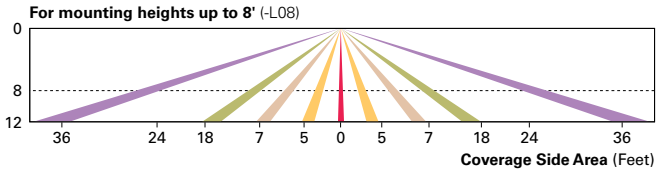
0-10V
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

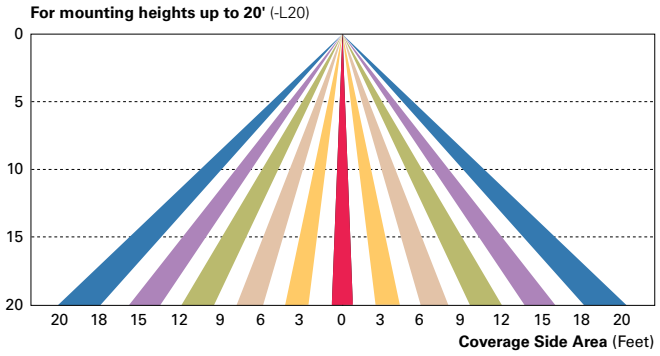
Photocontrol (P, R and PER7)
Optional button-type photocontrol (P) and photocontrol receptacles (R and PER7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

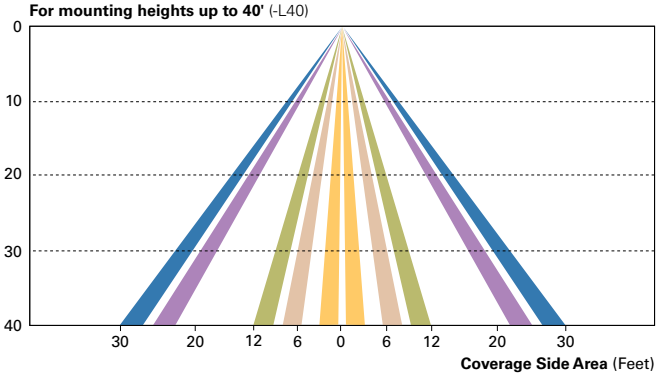
After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

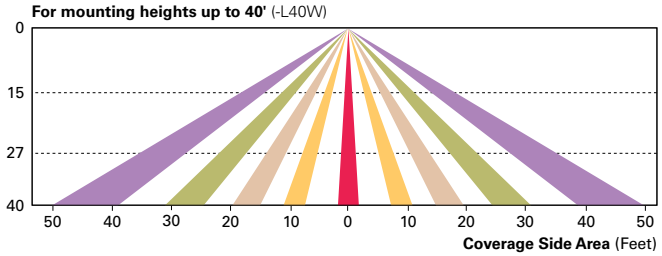
Dimming Occupancy Sensor (MS/DIM-LXX and MS-LXX)
These sensors are factory installed in the luminaire housing. When the MS/DIM-LXX sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MS/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of five minutes. The MS-LXX sensor is factory preset to turn the luminaire off after five minutes of no activity. The MS/X-LXX is also preset for five minutes and only controls the specified number of light engines to maintain steady output from the remaining light engines.

These occupancy sensors includes an integral photocell that can be activated with the FSIR-100 accessory for "dusk-to-dawn" control or daylight harvesting - the factory preset is OFF. The FSIR-100 is a wireless tool utilized for changing the dimming level, time delay, sensitivity and other parameters. A variety of sensor lens are available to optimize the coverage pattern for mounting heights from 8'-40'.

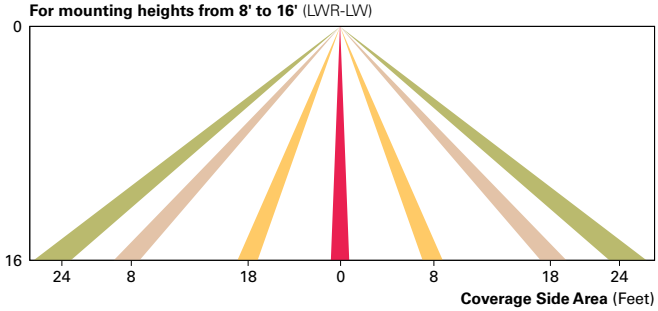


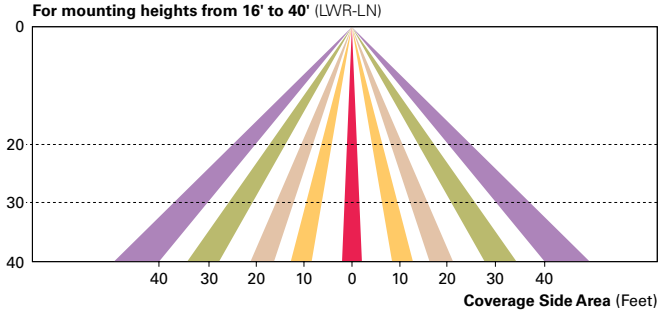






LumaWatt Pro Wireless Control and Monitoring System (LWR-LW and LWR-LN)
The Eaton's LumaWatt Pro powered by Enlighted is a connected lighting solution that combines a broad selection of energy-efficient LED luminaires with a powerful integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of building resources, beyond lighting.





WaveLinx Wireless Outdoor Lighting Control Module (WOLC-7P-10A)
The 7-pin wireless outdoor lighting control module enables WaveLinx to control outdoor area, site and flood lighting. WaveLinx controls outdoor lighting using schedules to provide ON, OFF and dimming controls based on astronomic or time schedules based on a 7 day week.

ORDERING INFORMATION

Sample Number: GWC-AF-02-LED-E1-T3-GM

Product Family [1]	Light Engine	Number of Light Squares [2]	Lamp Type	Voltage	Distribution	Color	Mounting Options
GWC=Galleon Wall	**AF**=1A Drive Current	**01**=1 **02**=2 [3]	**LED**=Solid State Light Emitting Diodes	**E1**=120-277V **347**=347V [4] **480**=480V [4, 5]	**T2**=Type II **T3**=Type III **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **5NQ**=Type V Square Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **CC**=Custom Color [6]	**[BLANK]**=Surface Mount

Options (Add as Suffix)

7027=70 CRI / 2700K [7]
7030=70 CRI / 3000K [7]
8030=80 CRI / 3000K [7]
7050=70 CRI / 5000K [7]
7060=70 CRI / 6000K [7]
600=Drive Current Factory Set to 600mA
800=Drive Current Factory Set to 800mA
1200=Drive Current Factory Set to 1200mA [8]
F=Single Fused (120, 277 or 347V. Must Specify Voltage)
FF=Double Fused (208, 240 or 480V. Must Specify Voltage)
10K=10kV Surge Module
DIM=0-10V Dimming Leads [9, 10]
DALI=DALI Driver [11]
HA=50°C High Ambient [12]
UPL=Uplight Housing [13]
BBB=Battery Pack with Back Box [3,8,14,27]
CWB=Cold Weather Battery Pack with Back Box [3,8,14,27]
P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Voltage)
R=NEMA Twistlock Photocontrol Receptacle
PER7=NEMA 7-PIN Twistlock Photocontrol Receptacle [15]
AHD145=After Hours Dim, 5 Hours [16]
AHD245=After Hours Dim, 6 Hours [16]
AHD255=After Hours Dim, 7 Hours [16]
AHD355=After Hours Dim, 8 Hours [16]
MS-LXX=Motion Sensor for On/Off Operation [17, 18, 19]
MS/DIM-LXX=Motion Sensor for Dimming Operation [17, 18, 19]
LWR-LW=LumaWatt Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [19, 20, 21]
LWR-LN=LumaWatt Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [19, 20, 21]
L90=Optics Rotated 90° Left
R90=Optics Rotated 90° Right
MT=Factory Installed Mesh Top
LCF=Light Square Trim Plate Painted to Match Housing [22]
HSS=Factory Installed House Side Shield [23]
CE=CE Marking and Small Terminal Block [24]

Accessories (Order Separately)

OA/RA1013=Photocontrol Shorting Cap
OA/RA1016=NEMA Photocontrol - Multi-Tap 105-285V
OA/RA1201=NEMA Photocontrol - 347V
OA/RA1027=NEMA Photocontrol - 480V
MA1252=10kV Circuit Module Replacement
MA1059XX=Thru-branch Back Box (Must Specify Color)
FSIR-100=Wireless Configuration Tool for Occupancy Sensor [17]
LS/HSS=Field Installed House Side Shield [23, 25]
WOLC-7P-10A=WaveLinx Outdoor Control Module (7-pin) [26]

NOTES:
1. DesignLight Consortium® Qualied. Refer to www.designlights.org Qualified Products List under Family Models for details.
2. Standard 4000K CCT and minimum 70 CRI.
3. Two light squares with BBB or CWB options limited to 25°C, 120-277V only.
4. Requires the use of a step down transformer. Not available in combination with sensor options at 1200mA.
5. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
6. Custom colors are available. Setup charges apply. Paint chip samples required. Extended Lead times apply.
7. Extended lead times apply. Use dedicated IES files when performing layouts.
8. Not available with HA option.
9. Cannot be used with other control options.
10. Low voltage control lead brought out 18" outside fixture.
11. Only availble with BBB or CWB in single light square. HA option available for single light square only. Limited to 1A and below.
12. Not available with 1200, UPL, BBB and CWB options. Available for single light square only.
13. Not available with SL2, SL3, SL4, HA, BBB, CWB, R, or PER7 options.
14. Operates a single light square only. Cold weather option operates -20°C to +40°C, standard 0°C to +40°C. Backbox is non-IP rated.
15. Compatible with standard 3-PIN photocontrols, 5-PIN or 7-PIN ANSI controls.
16. Requires the use of P photocontrol or the PER7 or R photocontrol receptacle with photocontrol accessory. See After Hours Dim supplemental guide for additional information.
17. The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Eaton for more information.
18. Replace LXX with the available mounting height options: L08, L20, L40 or L40W are the only choices.
19. Includes integral photosensor.
20. LumaWatt wireless sensors are factory installed requiring network components in appropriate quantities. See www.eaton.com/lighting for LumaWatt application information.
21. Bronze sensor is shipped with Bronze fixtures. White sensor shipped on all other housing color options.
22. Not available with HSS option.
23. Only for use with SL2, SL3 and SL4 distributions. The light square trim plate is painted black when the HSS option is selected.
24. CE is not available with the 1200, DALI, LWR, MS, MS/DIM, P, R or PER7 options. Available in 120-277V only.
25. One required for each light square.
26. Requires 7-pin NEMA twistlock photocontrol receptacle. The WOLC-7 cannot be used in conjunction with additional sensors or controls.
27. Control option limited to P=Button Type Photocontrol (must specify voltage).

June 12, 2019

Emily Cole-Prescott, Planner
City of Saco
300 Main Street
Saco, ME 04072

Re: Saco DPW Building | Response to Comments from checklists

Dear Emily:

The following is our response to your comments on the Site Plan Review checklist and Subdivision Checklist.

Site Plan Review:

- The property line of the parcel from Sweetser appears to be the zoning district line. We have shown the zoning district designations along the westerly property line on sheet C-102. We will add it to the northerly property line also.
- Please see attached Design Review Standards summary.

Subdivision:

- The subdivision plans depict the wetland areas on or adjacent to the site that were mapped by the City's consultant, Normandeau Associates.
- The subdivision does not include any park or open space. This is consistent with the approvals of both the original Industrial Park subdivision and the Spring Hill Road subdivision. Since there are no open spaces proposed, impact fees will not be required.
- We are revising the subdivision plan to include a 100-foot conservation buffer on both sides of the existing stream. Also included with the agreement between the City and Sweetser, a 25-foot buffer will remain unless modified by Sweetser.
- We are attaching proof of Financial Capacity and Technical Ability.

As always, please contact us if you have any questions or need additional information.

Sincerely,
CES, Inc.

John D. Kuchinski, P.E.
Senior Project Engineer

JDK/tmw/gdr
Encls.

Sensible Solutions | www.cesincusa.com

146 Main Street
Suite 300
Saco, Maine 04072
T 207.283.9151
F 207.283.9136

230-729 Design Standards Analysis

C. Intent

- City features a broad array of architectural styles
- Acceptable building styles compatible with nearby buildings and use of materials

D. Submissions

- DPW Maintenance and Administration Building – Building elevation line drawings have been provided for of all sides of the building that indicates exterior building materials and colors (Refer to Attachment A).
- School Department Transportation Building – Photographs of the exterior of the building have been provided (Refer to Attachment B). This building was recently constructed by the Biddeford Vocational School for the Saco School Department.
- DPW cold storage and sand-salt shed buildings – Photographs of the existing salt-shed are provided (Refer to Attachment C). The existing salt-shed building will be relocated to the new site and repurposed as the cold storage building. A new, but slightly larger, similar building will be constructed for the new salt-shed building; however, the appearance will be similar to the existing.

E. Design Standards

a. Scale
   Intent is to provide continuity with the surrounding community

b. Height
   Intent is for building heights to be visually compatible with heights on neighboring sites. The maximum building height within the B-8 Zone is 60'.
   - DPW Maintenance and Administration Building – Administration portion has a building height of 15'; maintenance garage has a building height of 29' with a small roof access component having a maximum building height of 44'. Administration portion of the building has human scale fenestration elements and canopies. This is the only area of the facility that will be accessible by the public.
   - School Department Transportation Building – Maximum building height is 16'.
   - DPW cold storage and sand-salt shed buildings – Maximum structure heights are 35'.

   Finding: The proposed building heights are consistent with other surrounding buildings and is below the maximum permissible building height within the zone. Fenestration and canopies break down the form into human scale elements at the public portion of the facility.

c. Footprint and Orientation
   Intent is to provide human scaled street wall with defined entrances. Off-street parking is to be provided to the sides and rear of the buildings.
   - DPW Maintenance and Administration Building – Administration portion consists of lower building height with defined pedestrian scale main entrance that is immediately adjacent to sidewalk along visitor/staff parking area.

- School Department Transportation Building – Defined entrance is provided immediately adjacent to sidewalk along visitor/staff parking area.
- DPW cold storage and sand-salt shed buildings – These two buildings are not considered applicable to this standard as these are not public buildings.
- Off-street parking for employees and visitors to the site occurs in front of the building. The rear and sides of the facility are for vehicle maintenance, fleet parking, fueling of the city fleet vehicles, and aggregate material storage. These areas are not intended to be public. Key access gates are provided to restrict access into the non-public regions of the site. For safety and control of access into the site, the employee staff and public parking is located outside of the gated areas.

Finding: The two new buildings that are intended for public access each provide human scaled street walls with defined entrances. The employee staff and visitor parking areas are provided in the front of the buildings for safety reasons. This is similar to the existing DPW facility, which has worked well for many years. Parking in front of the building is also similar to many other surrounding facilities within the Industrial Park.

d. Materials

Intent is to use exterior building materials and textures that are compatible with surrounding facilities.

- DPW Maintenance and Administration Building – The primary façade material is insulated metal panels. The administration portion of the building includes an accent masonry base wall component. In addition, a canopy is proposed over the main entrance as well as side canopies for personnel movement between several of the exterior doors.
- School Department Transportation Building – The exterior building materials are white vinyl cardboard siding.
- DPW cold storage and sand-salt shed buildings – These two buildings are steel frame construction with a white membrane exterior shell.

Finding: The use of vinyl siding on smaller buildings and metal siding with masonry accent on larger scale buildings are consistent exterior materials with other existing surrounding facilities within the industrial park.

e. Roof

Intent is to provide visual interest and reduce the apparent size of the building. Preference is given pitched roofs; however, flat roofs may be appropriate for larger buildings, but should be offset by the use of detailed architectural elements in the upper portion of the building façade. Provisions for screening or camouflaging rooftop protrusions should be provided outside of the industrial districts.

- DPW Maintenance and Administration Building – Due to the overall size and interior height of the building, a flat roof is proposed for this facility. This roof design was chosen for this facility for the following reasons:
    1. Provide internal roof drain system to eliminate need for gutters or dripping along garage door entries to the building;
    2. Eliminate potential for falling snow and ice;

3. Increase interior storage space within the building by placing mechanical equipment on rooftop; and
4. Provide greater flexibility in the future for alternate energy source.

Horizontal accent bands are proposed along the top of the exterior walls as well as over the top of the maintenance garage bay doors to help break-up the apparent height and size of the building. Roof top mechanical equipment is proposed that will finished is a color closely matching the exterior wall panel color so as to fade from view. The units are also located inboard to the building perimeter to minimize view from the immediate adjacent sitelines at the building. The building rooftop has also been designed for the potential future installation of solar panels, which will also aid in minimizing their view.

- School Department Transportation Building – This building has a sloped roof with asphalt shingles. There mechanical equipment is proposed to be installed on the roof.
- DPW cold storage and sand-salt shed buildings – These buildings are structural steel framed arch buildings.

Finding: The smaller building has a sloped roof, while the larger DPW facility has a flat roof. Both roof styles are permissible and consistent with surrounding facilities.

f. Walls

Intent is to create visual interest in the building by incorporating architectural features (doors windows, etc.) and avoid walls with lengths greater than 50' without an architectural feature.

- DPW Maintenance and Administration Building – The placement of exterior fenestration elements and canopies breaks up the overall building mass into roughly 25' sections, yet ties it together as a unified structure. Window and door placement provide an exterior symmetry, rhythm, and cadence while directly enhancing the interior spaces they serve. Various size canopies provide exterior cover from the weather at key locations, and serve to tie together the two distinct masses.
- School Department Transportation Building – There is no wall length greater than 50' on the building; however, there are multiple windows placed around the exterior of the building as well as exterior doors that break-up the walls.
- DPW cold storage and sand-salt shed buildings – These buildings are utility storage buildings and do not lend themselves to incorporating doors and windows or other architectural features. These buildings are located towards the rear of the site and are somewhat screened by the two other buildings located at the front of the site.

Finding: The of the buildings have been designed to create visual interest and represent the functions they populate.

g. Windows and Doors

Intent is to provide windows and doors that are visually compatible with the building and the local context.

- DPW Maintenance and Administration Building – The windows and doors are commercial grade and reflect the style consistent with both Office and Industrial occupancies. Egress doors contain glass sections for safety in high traffic applications, solid door in more utilitarian/security locations. Windows are fixed in operation to minimize fluctuations in the

internal environment and energy cost impact. Overhead doors contain vision panels for daylighting and safety purposes.

- School Department Transportation Building – Exterior windows are white vinyl clad double hung. Exterior door is steel with glass window
- DPW cold storage and sand-salt shed buildings – Not applicable. There are no windows in this structure. There is a large vehicle entrance on both ends of the buildings; however, there are no operable doors on the exterior.

Finding: The window and door elements have been designed as appropriate for the building functions and style.

h. Awnings and Canopies

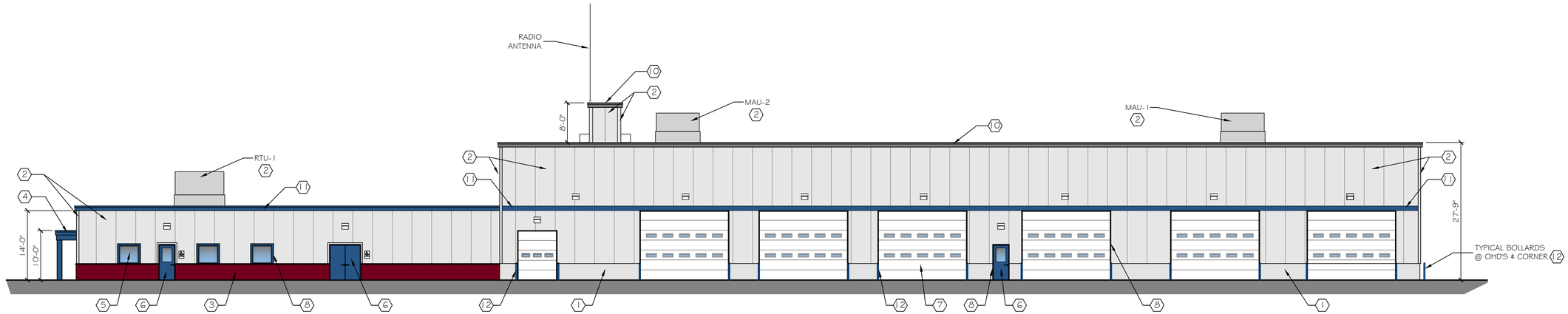
Awnings or canopies are not required; however, the intent is to integrate with the building façade to result in a consistent pattern through placement, size and shape.

- DPW Maintenance and Administration Building – The primary entrance at the front of the building is provided with a canopy to cover the entrance from inclement weather as well as draw attention to visitors. Two awnings are provided along the side of the building to provide cover for DPW staff traversing exterior of the building from the maintenance bays to the employee break room within the administration portion of the building.
- School Department Transportation Building – Not applicable. There are no awnings or canopies proposed as part of this building.
- DPW cold storage and sand-salt shed buildings – Not applicable. There are no awnings or canopies proposed as part of these buildings.

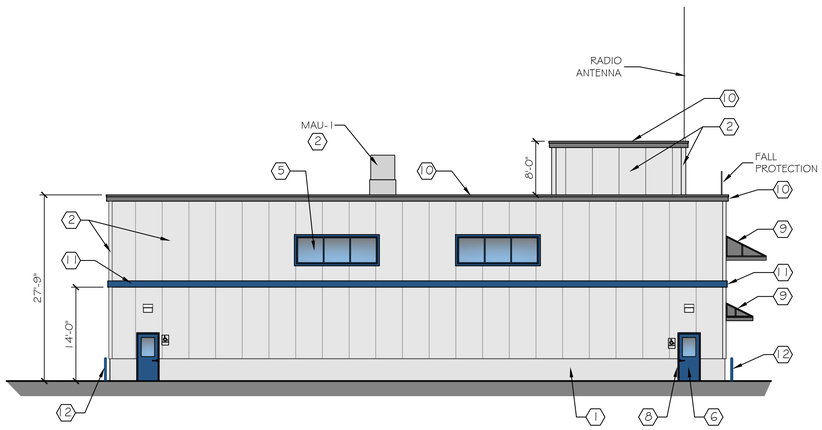
Finding: The canopies have been designed to provide both functional and aesthetic characteristics to the building. Colors have been selected to compliment the overall color scheme of the facility and draw attention to the primary (public) entrance as a clear indication for wayfinding.

ATTACHMENT A

DPW Maintenance and Administration Building



A NORTH ELEVATION
SCALE: 3/32" = 1'-0"



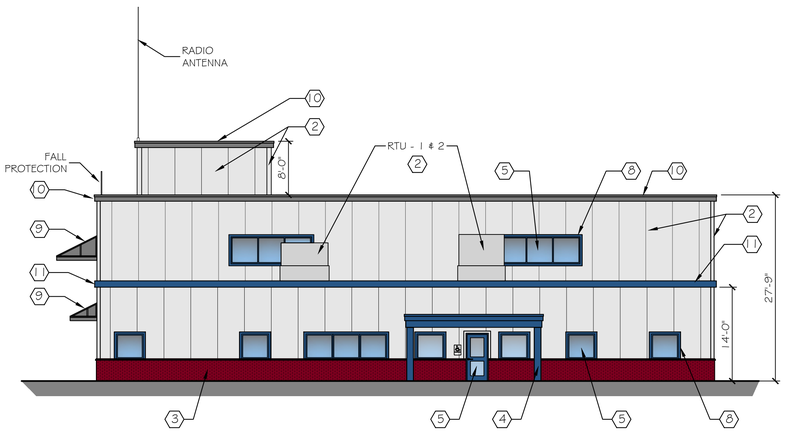
B WEST ELEVATION
SCALE: 3/32" = 1'-0"

FINISH KEY		
KEY	MATERIAL	COLOR
1	FOUNDATION (EXPOSED)	CONCRETE
2	INSULATED METAL WALL PANELS & CORNER TRIM, OHD TRIM	"BONE WHITE"
3	BRICK VENEER	BRICK RED
4	ENTRY COLUMNS & CANOPY	"HARBOR BLUE"
5	ALUMINUM WINDOWS, DOORS & FRAMES	"HARBOR BLUE"
6	PASS DOORS & FRAMES	FIELD PTD "HARBOR BLUE"
7	OVERHEAD DOORS (OHD)	WHITE
8	PASS DOOR / OHD & WINDOW TRIM	"BONE WHITE"
9	SOUTH OVERHANG ROOF CANOPY	"TUNDRA"
10	ROOF EDGE TRIM	"TUNDRA"
11	ROOF EDGE TRIM & ACCENT TRIM BAND	"HARBOR BLUE"
12	BOLLARDS	"HARBOR BLUE"

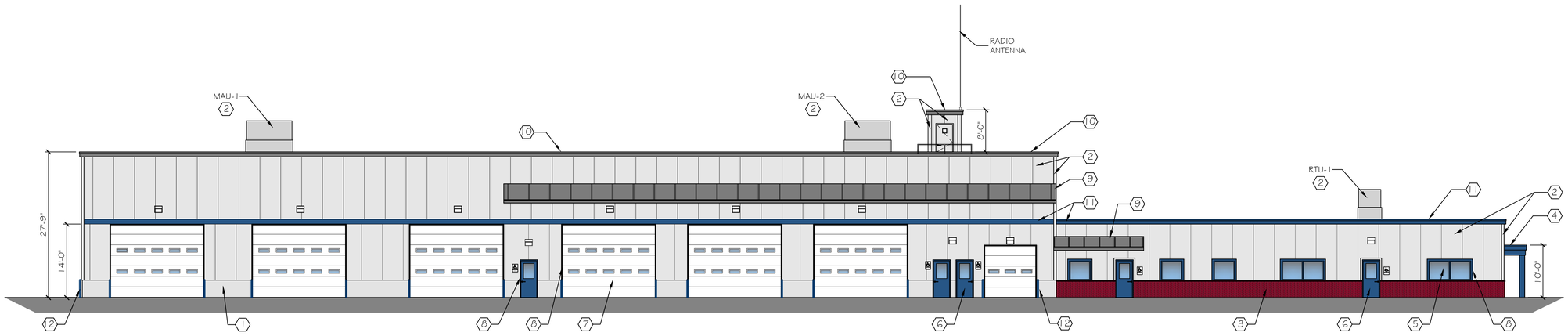
NOTES:

RTU-1 81" x 118" x 56" H
RTU-2 51" x 84" x 41" H
MAU-1 104" x 43" x 44" H
MAU-2 104" x 59" x 44" H

ALL UNITS SIT ON 36" H CURBS



D EAST ELEVATION
SCALE: 3/32" = 1'-0"



C SOUTH ELEVATION
SCALE: 3/32" = 1'-0"

GRANT HAYS ASSOCIATES
ARCHITECTURE & INTERIOR DESIGN
P.O. BOX 6179 FALMOUTH MAINE 04105
207.871.5900 www.granthays.com

SEAL

REVISIONS

PROJECT NAME
NEW FLEET MAINTENANCE BUILDING FOR THE
CITY OF SACO
PUBLIC WORKS
SACO INDUSTRIAL PARK
SACO, MAINE 04072

SHEET
COLOR EXTERIOR ELEVATIONS

DATE
4 JUNE 2019
SCALE
3/32" = 1'-0"
DRAWN
MFH / mgk
JOB NO.
181202
SHEET
A-7

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ATTACHMENT B

School Department Transportation Building



View of front and side of building exterior

ATTACHMENT C

DPW Cold Storage and Sand-Salt Shed Buildings





Views of existing salt-shed building exterior

STATE OF MAINE

COUNTY OF YORK **CITY OF SACO**

I. CALL TO ORDER – On Monday, December 11, 2017 at 8:38 p.m. a Council Meeting was held in the City Hall Auditorium.

II. RECOGNITION OF MEMBERS PRESENT – Mayor Marston Lovell recognized the members of the Council and determined that the Councilors present constituted a quorum. Councilors present: Marshall Archer, Roger Gay, William Doyle, Lynn Copeland, Alan Minthorn, Micah Smart and Nathan Johnston. City Administrator Kevin Sutherland and City Clerk Michele Hughes were also present this evening.

III. PLEDGE OF ALLEGIANCE

IV. GENERAL

V. PUBLIC COMMENT

There were no public comments this evening.

VI. CONSENT AGENDA

Councilor Gay moved, Councilor Johnston seconded to approve consent agenda items #A and B as follows:

A. CONFIRMATION OF COUNCIL LIAISON APPOINTMENTS - Be it Ordered that the City Council approve the Mayor's appointments as detailed on the document titled, "Mayor's Council Liaison Appointments, December 11, 2017". Further move to approve the order.

B. CERTIFICATION OF ELECTION RESULTS FOR NOVEMBER 7, 2017 - Be it Ordered that the City Council hereby approve the results of the November 7, 2017 General & Referendum Election as presented". Further move to approve the Order.

The motion passed with seven (7) yeas.

The item commentaries for the consent agenda are listed below.

A. CONFIRMATION OF COUNCIL LIAISON APPOINTMENTS

It is the practice of the City Council to have council members serve as a liaison with city boards and commissions. The Mayor has made appointments to these bodies and is seeking council confirmation. The Council Procedure Manual also known as the Rules and Order of Business contains a brief description of Board and Commissions.

Committee Assignments December 2017

Ward 1 Marshall Archer	Ward 5 Alan Minthorn
Saco Main Street	Transit Committee
Biddeford Joint Opns Committee	Affordable Housing
Fair Hearing Committee	Personnel Committee
Affordable Housing	Economic Development Corporation
Ward 2 Roger Gay	**Ward 6 Micah Smart**
Planning Board	Traffic Safety
Capital Planning Committee	Energy Committee
Historic Preservation Commission	Biddeford Joint Operations Committee
Zoning Board of Appeals	Insurance Committee

Ward 3 William Doyle

Economic Development Commission
Dyer Library
Goosefare Brook Restoration Committee
Cable Advisory Committee

Ward 7 Nathan Johnston

Traffic Safety
Cable Advisory Committee
Energy Committee
Parks and Recreation Advisory Committee

Ward 4 Lynn Copeland

Shoreland Commission
Coastal Waters Commission
Parks and Recreation Advisory Board
Conservation Committee

Mayor

Southern Maine Regional Planning
Insurance Committee
Age Friendly Saco Committee

B. CERTIFICATION OF ELECTION RESULTS FOR NOVEMBER 7, 2017

On November 7, 2017 a General & Referendum Election was held. The election results are being submitted to Council for Certification as required by Section 7.03 b. of the Charter of the City of Saco.

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

Note: The Write-in candidate with plurality in the Warden race for Ward 2, 3, 5, & 6 and Ward Clerk race for Ward 2, 3, 4, 5, 6, & 7 will be shown in parenthesis.

MAYOR - 2 YR TERM	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Lovell, Marston D.	471	387	273	633	415	376	319	2874
Pilon, Donald E.	288	221	301	431	289	302	190	2022
Write-In	7	8	7	9	6	4	9	50
Blank	45	80	51	65	47	65	41	394
Total	811	696	632	1138	757	747	559	5340

WARD 1 -COUNCIL - 2 YR TERM	WARD 1
Archer, Marshall F.	451
Dicianni, Matthew J.	244
Write-In	7
Blank	109
TOTAL	811

WARD 1 - WARDEN - 2 YR TERM	WARD 1
Fortier, Frederick J.	649
Write-In	4
Blank	158
TOTAL	811

WARD 1 - WARD CLERK - 2 YR TERM	WARD 1
Patterson, Carol A.	649
Write-In	4
Blank	158
TOTAL	811

WARD 2 -COUNCIL - 2 YR TERM	WARD 2
Gay, Roger B.	538
Write-In	17
Blank	141
TOTAL	696

WARD 2 - WARDEN - 2 YR TERM	WARD 2
Write-In - (Chase, George 8 votes)	23
Blank	673
TOTAL	696

WARD 2 - WARD CLERK - 2 YR TERM	WARD 2
Write-In - (Marquis, Gloria 8 votes)	29
Blank	667
TOTAL	696

WARD 2 - SCHOOL BOARD - 3 YR TERM	WARD 2
Leary, Lynn M.	572
Write-In	7
Blank	117
TOTAL	696

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

WARD 3 -COUNCIL - 2 YR TERM	WARD 3
Colman, Barbara E.	206
Doyle, William P.	362
Write-In	5
Blank	59
TOTAL	632

WARD 3 - WARDEN - 2 YR TERM	WARD 3
Write-In (By appointment)	36
Blank	596
TOTAL	632

WARD 3 - WARD CLERK - 2 YR TERM	WARD 3
Write-In (Russell, William 4 votes)	30
Blank	602
TOTAL	632

WARD 4 - COUNCIL - 2 YR TERM	WARD 4
Burman, Michael A.	416
Copeland, Lynn H.	599
Write-In	3
Blank	120
TOTAL	1138

WARD 4 - WARDEN - 2 YR TERM	WARD 4
Cook, Marianne C.	893
Write-In	4
Blank	241
TOTAL	1138

WARD 4 - WARD CLERK - 2 YR TERM	WARD 4
Write-In - (Dziadzio, Kathleen 5 votes)	53
Blank	1085
TOTAL	1138

WARD 4 - SCHOOL BOARD - 3 YR TERM	WARD 4
Shiman, Stephen	866
Write-In	7
Blank	265
TOTAL	1138

WARD 5 - COUNCIL - 2 YR TERM	WARD 5
Minthorn, Alan R.	552
Write-In	21
Blank	184
TOTAL	757

WARD 5 - WARDEN - 2 YR TERM	WARD 5
Write-In - (Villemaire, Daniel 4 votes)	46
Blank	711
TOTAL	757

WARD 5 - WARD CLERK - 2 YR TERM	WARD 5
Write-In (By appointment)	45
Blank	712
TOTAL	757

WARD 6 -COUNCIL - 2 YR TERM	WARD 6
Boucher, Jason C.	154
Sirois, Theodore L.	204
Smart, Micah A.	278
Write-In	3
Blank	108
TOTAL	747

WARD 6 - WARDEN - 2 YR TERM	WARD 6
Write-In (Messick, Jeffrey 2 Votes)	40
Blank	707
TOTAL	747

WARD 6 - WARD CLERK - 2 YR TERM	WARD 6
Write-In (Foran, Claire 5 votes)	31
Blank	716
TOTAL	747

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

WARD 6 - SCHOOL BOARD - 3 YR TERM	WARD 6
Mozden, Stanley W.	522
Write-In	11
Blank	214
TOTAL	747

WARD 7 - COUNCIL - 2 YR TERM	WARD 7
Johnston, Nathan D.	445
Write-In	14
Blank	100
TOTAL	559

WARD 7 - WARDEN - 2 YR TERM	WARD 7
Gerry, Debra A.	449
Write-In	7
Blank	103
TOTAL	559

WARD 7 - WARD CLERK - 2 YR TERM	WARD 7
Write-In (By Appointment)	32
Blanks	527
TOTAL	559

MUNICIPAL REFERENDUM QUESTIONS

QUESTION #1

Shall the Order of the City Council of the City of Saco entitled "Order Authorizing the City of Saco to borrow an amount not to exceed $2,000,000 for City facilities including the Ocean Park Rpad drainage system, the Police Station roof, the City Hall and Parks and Recreation facility HVAC systems, the Middle School baseball field, the Foss Road recreation site, Lincoln Street reconstruction and Camp Ellis erosion protection" be ratified and approved?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	514	408	411	837	535	535	428	3668
No	283	278	215	263	216	180	121	1556
Blank	14	10	6	38	6	32	10	116
TOTAL	811	696	632	1138	757	747	559	5340

QUESTION #2

Shall the Order of the City Council of the Cityof Saco entitled "Order Authorizing the City of Saco to borrow an amount not to exceed $7,250,000 for construction and equipping of a new public works facility on Industrial Park Road and to sell the existing public worksfacility on North Street and to expend such sale proceeds on such new public works facility" be ratified and approved?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	392	292	316	569	385	407	320	2681
No	407	388	303	525	356	301	227	2507
Blank	12	16	13	44	16	39	12	152
TOTAL	811	696	632	1138	757	747	559	5340

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

QUESTION #3
Shall the Order of the City Council of the City of Saco entitled "Order Authorizing the City of Saco to borrow an amount not to exceed $2,500,000 for Route One sewer extension and sidewalk, pedestrian and traffic signal improvements" be ratified and approved?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	441	332	396	682	451	482	408	3192
No	358	347	229	415	293	232	140	2014
Blank	12	17	7	41	13	33	11	134
TOTAL	811	696	632	1138	757	747	559	5340

STATE REFERENDUM QUESTIONS

1. CITIZEN INITIATIVE
Do you want to allow a certain company to operate table games and/or slot machines in York County, subject to state and local approval, with part of the profits going to the specific programs described in the initiative?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	223	173	198	225	234	199	145	1397
No	586	521	432	902	518	539	411	3909
Blank	2	2	2	6	3	10	1	26
TOTAL	811	696	632	1133	755	748	557	5332

2. CITIZEN INITIATIVE
Do you want Maine to expand Medicaid to provide healthcare coverage for qualified adults under age 65 with incomes at or below 138% of the federal poverty level, which in 2017 means $16,643 for a singleperson and $22,412 for a family of two?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	483	381	390	747	466	510	414	3391
No	322	310	239	374	282	228	143	1898
Blank	6	5	3	12	7	10	0	43
TOTAL	811	696	632	1133	755	748	557	5332

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

3. BOND ISSUE
Do you favor a $105,000,000 bond issue for construction, reconstruction and rehabilitation of highways and bridges and for facilities or equipment related to ports, harbors, marine transportation, freight and passenger railroads, aviation, transit and bicycle and pedestrian trails, to be used to match an estimated $137,000,000 in federal and other funds, and for the upgrade of municipal culverts at stream crossings?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	563	424	421	857	529	552	429	3775
No	236	265	203	256	220	176	123	1479
Blank	12	7	8	20	6	20	5	78
TOTAL	811	696	632	1133	755	748	557	5332

4. CONSTITUTIONAL AMENDMENT
Do you favor amending the Constitution of Maine to reduce volatility in state pension funding requirements caused by the financial markets by increasing the length of time over which experience losses are amortized from 10 years to 20 years, in line with pension industry standards?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	503	402	368	786	464	456	356	3335
No	274	259	235	267	260	239	172	1706
Blank	34	35	29	80	31	53	29	291
TOTAL	811	696	632	1133	755	748	557	5332

VII. AGENDA

A. ELECTION OF THE DEPUTY MAYOR

Article II, Section 2.05 – Election and Term, Subsection C of the Charter states: "The City Council shall elect from its membership a Deputy Mayor who shall exercise all powers of the Mayor during temporary absence or disability of the Mayor. In the event of a vacancy in the office of Mayor, the Deputy Mayor shall assume the office of Mayor with all the duties and obligations of that office in accordance with the provisions of Section 2.06(c)(1)."

JOHN KUCHINSKI
SENIOR PROJECT ENGINEER

CORE EXPERTISE

Site Design

Project Engineer

Commercial/ Residential Land Development

John Kuchinski comes to CES, Inc. with over 30 years' experience in the design of large scale commercial, industrial, and residential land development projects. His responsibilities included the layout of roads, parking lots, site circulation and pedestrian ways in an integrated design. John was instrumental to the design process with obtaining environmental and land use permits. His work with the design team requires effective communication skills and project management expertise. John has worked with site design and the permitting for site development on projects, including grading, stormwater drainage, spill control, utilities, and erosion control. He also has experience with construction phase services.

Professional History

2012 – 2018 | Harriman Associates, Auburn, Maine | Senior Civil Engineer
2005 – 2011 | Amec Foster Wheeler, Portland, Maine | Senior Civil Engineer/Project Manager
2001 – 2005 | BH2M Engineers, Gorham, Maine | Senior Civil Engineer
1998 – 2001 | JK Holmgren Engineering, Inc., Brockton, MA | Project Manager
1997 – 1998 | Gale Associates, Inc., Weymouth, MA | Project Engineer
1989 – 1997 | Town of Yarmouth, Yarmouth, MA | Civil Engineer

Education

BS in Civil Engineering | University of Massachusetts, Dartmouth, MA

Registrations

Professional Engineer License # ME #9759, NH #14498, MA #35862

Affiliations

American Society of Civil Engineers

Project Experience

Westbrook Saccarappa Elementary School | Westbrook, Maine
Designed site improvements for a 50,000 square foot addition to the elementary school including stormwater, grading, utilities and erosion control. Site design provide new play

fields and a new parking lot to accommodate the increase in staff. Permitting required a modification of an existing SLODA permit.

Sanford Middle School and Sanford High School | Sanford, Maine
Developed site plans for the conversion of the existing Sanford High School to be a middle school and the Conversion of the Middle School to be an elementary school.

Mildred L. Day School | Arundel, Maine
Developed plans and specifications for site improvements for reconstruction of a portion of the Mildred L. Day School. This included modification to the SLODA permit under the 2015 version of Chapter 500 redevelopment rules. Provided separate bus loop, parent drop off and parking areas.

Kennebunkport Consolidated School | Kennebunkport, Maine
Site design for expansion of the school to include improving stormwater management, site circulation and pedestrian access to the building. An improved parking lot and separate parent drop off.

Wentworth Intermediate School | Scarborough, ME
Senior Civil Engineer for the site design and permitting of a new intermediate school for the Town of Scarborough, Maine. The new school contains 164,000 square feet of floor area. Design included stormwater management, grading, and utilities. This site also included a geothermal well field to provide heating and cooling of the building. Permitting involved a modification the Site Location of Development permit of the Scarborough Municipal Complex and a Natural Resource Protection permit to impact 1.3 acres of wooded wetlands.

Broad Street School | Nashua, NH
Design and permitting of renovations to Broad Street School in Nashua, New Hampshire. This project included nearly complete reconfiguration of existing site circulation and parking. Permitting included a New Hampshire Department of Environmental Services Alteration of Terrain permit.

Sunset Heights School | Nashua, NH
(2015-2017, $14,000,000) Design and permitting of renovations to Sunset Heights Elementary School in Nashua, New Hampshire. This project redesigned site circulation, parking and bus circulation to better improve traffic flow. Permitting included a New Hampshire Department of Environmental Services Alteration of Terrain permit.

Maine Army National Guard Reserve Center | Bangor, Maine

Civil Engineer to design reconstruction of the existing parking lot paving and Drainage. Prepared detailed site plans and bid specifications. Attended pre-bid meeting. Reviewed and processed Contractor submittals and requests for information. Conducted site observations during construction to verify work is in accordance with the design documents. Developed a comprehensive punch list at the completion of construction.

Maine Army National Guard Regional Training Institute | Bangor, Maine
While working for AMEC Foster Wheeler, John designed stormwater, grading utilities and erosion control for site development for a new Regional Training Institute located on Hildreth Road North in Bangor. Other duties included the preparation of bidding plans and specifications, as well as the construction phase oversite.

Maine Army National Guard Training Facility | Auburn, ME
Senior Civil Engineer that prepared the site plan for four proposed controlled humidity buildings for storage. This facility provides long term storage of unit equipment in a controlled atmosphere to reduce degradation of the equipment. Design also included a stormwater management plan and Site Location of Development Law permitting to the Maine DEP for the entire facility.

Massachusetts Army National Guard | Camp Edwards, MA
Civil Engineer leading the design of a water recycling/reuse system for Unit Equipment Training Site (UETS) for the Massachusetts Army National Guard to reuse water from the wash rack that recycles wash water after training exercises. Prior to the project the wash water was discharged into a trench near the facility and allowed to infiltrate into the ground. This practice was in violation of the site NPDES permit and was further complicated because the base is a Superfund cleanup site. A treatment train was developed using readily available treatment equipment packages and incorporated a storage facility for both the contaminated and treated water. Construction of the facility allowed the base to continue to wash down equipment after training exercises without contributing to groundwater pollution and drastically reducing the quantity of fresh water needed.

Presque Isle Community Center | Presque Isle, Maine
Designed site improvements to an existing brownfield site for a new community recreational facility. Stormwater permit and local permitting.

Old County Road | Scarborough, Maine
Reconstruction of Old County Road in Scarborough included full depth reconstruction of the pavement and new stormwater drainage. Design reconfigured the vertical alignment of the road to facilitate runoff to drainage structures. Consideration given to revising road

to accommodate existing driveways. Meeting with the neighbors and getting their feedback.

Maritime Village | Wiscasset, ME
Senior Civil Engineer participated in the civil engineering design of phase one of Maritime Village, a project involving the redevelopment of the decommissioned Mason Station electric power generating facility. The Mason Station was decommissioned and was a Brownfield industrial site. The redevelopment of the property was envisioned to include single family homes, condominiums, shops and restaurants, a 350-slip marina, the Hinckley Boat yard and possible cultural and educational uses. Phase one consisted of 80 single family homes and a 7,120 SF addition to the Mason Station for a Hinckley Boatyard. The first phase also included 52 marina slips.

Topsham Crossing | Topsham, ME
Senior Civil Engineer designer of a 68-lot residential subdivision which included 20 units reserved for affordable housing. This development is the first "Great American Neighborhood" development in Maine that emphasized small lots and dense development while preserving a significant area of land as open space. This project incorporated stormwater Best Management Practices to control stormwater quantity and quality. The design also included sewer collection with some lots requiring low pressure sewer collection system, roadway alignment, utilities and presentation to the local planning board.

Milton CAT Wash Bay Addition | Milford, MA
Senior Civil Engineer involved in the design of an equipment wash bay for cleaning of the heavy equipment. This was needed by the client to prepare various pieces of heavy construction equipment for repair or maintenance activities. This was part of a multi-disciplinary team comprised of architects, mechanical engineers, electrical engineers and structural engineers. The purpose of the wash bay was to remove the excess soil from the equipment prior to being serviced or to clean rental equipment on return from a rental. Water recycling was an important factor to minimize water consumption.

Milton CAT Service Facility Expansion | Scarborough, ME
Civil Engineer for the master planning and permitting for this facility expansion, John developed the site layout for building expansion and outside equipment storage, grading, drainage and erosion control. This site was originally designed and permitted by OEST in 1983. A 1987 amendment to the permit greatly expanded the facility. This is yet another expansion to meet Milton CAT's growing business needs.

Mashpee Medical Center | Mashpee, MA
Project Engineer for this design/build project working in conjunction with the general contractor on the project. The civil design included developing plans for the 30,000 SF medical office building. An essential element of this project included the design of a denitrifying onsite waste water treatment and disposal system to reduce the total nitrogen concentration of the wastewater below 10 PPM because it was in a zone of contribution to a public water supply well. Stormwater design included LID techniques including infiltration and bio-retention. Design also included site grading, layout, utilities, stormwater management and design of an on-site treatment and disposal system for the sanitary sewage. Landscaping consisted of plants that did not require irrigation.

New Well Pad and Infield Pipeline Planning, Design, and Permitting Confidential | Client North Central Region, PA
Senior Civil Engineer for the planning, design, and permitting of over 30 new well pad and associated infield gathering lines. The planning process involves an initial field review of potential pad locations and pipeline routes, including an assessment of engineering and environmental limitations and restrictions, and concept level development plans are prepared for further evaluation and input from client land, geology/geophysics, and operational personnel. Once the concept plan has been refined, preliminary design plans are prepared for final client approval and subsequently developed into final design drawings, including access roads, well locations, production facilities, impoundments, as well as design narratives, and associated permit application packages, including Pennsylvania DEP's ESCGP-1. Most projects involve interagency coordination are fast-tracked such that they are completed within two weeks of confirmation of design.

Southwest Harbor Fire Station | Southwest Harbor, ME
Civil Engineer for the design site improvements for a new 10,000 SF fire station, urban stormwater management, site grading and utility connections for the building, new access road, parking, and utilities.

Town Engineering Review Services | Wells, ME
Civil Engineer responsible for multiple subdivision and site plan reviews for the Town of Wells. He was responsible for reviews of plans for compliance with zoning and subdivision regulations as well as good engineering practice.

Salt/Sand Storage Building | Town of Dayton, ME
Senior Project Engineer for the Town of Dayton on this project. His responsibilities included determining the best type of building to meet the Town's needs, providing engineering services for the site design, hiring sub-consultants for the structural and building design, completing the construction bid documents, providing construction

management services, and submitting a reimbursement request to MDOT for a portion of the building costs through the Maine Sand/Salt Storage Building Program.

Solid Waste Management Facility | Town of Yarmouth, MA

As a civil engineer for the Town, Mr. Kuchinski provided a full range of services for the design and construction of a solid waste management facility to accommodate an increased demand of residential solid waste capacity, including a facility for yard waste, composting and commercial/residential construction debris. He served as supervisor of Town staff who provided the general construction services, and prepared and supervised the bidding and awarding of specialty construction items. He also provided overall construction management and budget control for the project.

May 01, 2019

Emily Cole-Prescott, Planner
City of Saco
300 Main Street
Saco, ME 04072

Re: Saco DPW Building | Response to Comments

Dear Emily:

The following are our responses to the comments received on April 25, 2019 from Gorrill Palmer. Each comment is followed by the response in italics.

Drawing Sheet C101 – Existing Site plan

1. It would be beneficial to include a plan reference as to the source of the topographic and boundary survey information presented on the plan. Perhaps a reference to the work that Dow and Coulombe prepared for the site?
   Response: Note and a zoning table are added to the plan.
2. also suggest a Zoning summary be added to the sheet to reference the site's positioning within the B-8 Zone and a table of the dimensional standards for the DPW site as well as any future lots to be created.
   Response: A zoning table is added to the plan.

Drawing Sheet C102 – Proposed Site plan

1. I suggest the B-8 dimensional requirements be placed on the plan including zoning setbacks etc.
   Response: A zoning table is added to the plan.
2. The DPW site involves a total wetland impact of 12,019 SF which will require a Tier 1 Natural Resources Protection Act Permit from the Maine DEP. That should be noted on the plan and it should be noted to the contractor that ay additional wetland impacts would require authorization from the DEP.
   Response: A note is added to the plan.

Drawing Sheet C103 – Enlarged Site plan

1. It might be helpful to shade/hatch to better distinguish between the Standard Duty and Heavy Duty pavement areas.
   Response: We will indicate the regular duty pavement with a different weight hatch.

146 Main Street
Suite 300
Saco, Maine 04072
T 207.283.9151
F 207.283.9136

2. Will there be any directional signage placed including stop signs and other MUTCD related signs (ADA, visitor parking etc)?
   Response: There will be stop signs at the driveway exits and ADA signs at the ADA spaces.
3. What is the status of the completion of any geotechnical investigations performed for the site? This information may be worthy of placement on the plans. We note there are a few test pits identified however there appears to be nothing in the vicinity of any of the buildings and the gravel wetland cell #2 doesn't have any TP information.
   Response: The design build contractor is in the process of obtaining geotechnical information for the building.
4. The limits of curbing aren't clearly identified on the plans, either through graphic representation or by labeling.
   Response: Curbing labels have been revised on sheet C201 and added to sheet C103.
5. Multiple sewer stubs are identified on the utility plan; should driveway aprons to these future lots be identified and provided?
   Response: Inverts for the sewer stubs have been added to the plan.
6. It appears there is to be an access down to GUSF 2 & 3; what is the surface section for this access expected to be?
   Response: The access is anticipated to be compacted earth with topsoil cover for light duty vehicles to do maintenance activities.
7. The materials storage areas appear to be surrounded with a wall system; what is the wall system to consist of and will there be details provided for its construction?
   Response: The storage bins will be constructed of precast concrete blocks or similar.
8. I recommend consideration be given to the placement of reinforced concrete pads beneath the materials storage bins rather than heavy duty asphalt, if the budget allows. Perhaps a bid alternate approach might be beneficial.
   Response: We will discuss this with the DPW.
9. There is not much detail on the installation of the fuel tanks in the NW corner of the site. The specifications for all tanks, enclosures/containment, underground piping etc should be detailed and permitting for the tanks and fuel islands will be required in accordance with State and Federal regulations. Setbacks to resources, and any nearby wells or water sources must be identified. A clear delineation of work responsibility should be noted on the plan if the fuel farm construction is to be a stand alone aspect of the proposal in our opinion.
   Response: The design build contractor is providing construction designs and specification for the fuel island. The site contractor is anticipated to be a sub of the design build contractor.
10. There is limited information outlining the construction details for all the forebays, including stone sizing, depths and geotextile placement. Additional details should be provided. The design contemplates that the Forebays need to fill up with water (thus surcharging the drainage pipes) before water spills into the GUSF zones. Is this the desired objective as surcharged drainage pipes are not always desirable?
    Response: The forebays are rock forebays where the water flows through the stone to the treatment areas.
11. The GUSF's all require emergency spillways. These locations have not been identified

on the plan.
Response: Emergency spillways have been added to the plans.

12. The ADA spaces must be noted to contain a maximum 2% grade in all directions across the parking.
Response: Grading of ADA spaces is limited to 2 percent.
13. Its unclear what is proposed along the northeasterly property boundary as to grading etc. the utility plan indicates a new 12" SD to be installed. Information on the DMH including rim information is missing.
Response: There is an outlet to the gravel wetland. Revised plans show rim and invert elevations.
14. The site appears to be an earthwork fill condition; have the earthwork quantities been evaluated to best determine an economic "best fit" as it relates to overall development costs and approach? Not necessary a Site plan question but perhaps of importance to the City as it relates to development costs.
Response: Our analysis indicates it is a nearly balanced site considering the import of gravel under the pavement and the structural fill in and around the building.
15. I suggest consideration for some type of temporary barrier at the end of the road, before the steeper embankment slope to prevent a vehicle going off the end, particularly at night.
Response: We will consider this suggestion.

Drawing Sheet C104 – Proposed Utility Plan

1. The layout of underdrains within the Grassed Underdrain Soil Filters is not consistent with the details which call for 4" UD pipes to be spaces at a maximum of 8' apart. The Plan should be updated so that there is no ambiguity on the amount of underdrain pipe needed in each GUSF.
Response: We will clarify the underdrain pipe spacing in the detail.
2. Each of the GUSF has a Nyloplast structure for the overflow outlet. These should be detailed and consideration given to using precast structures as these might be more cost effective.
Response: We have added a detail to for the Nyloplast inlets.
3. There appear to be charging stations at the head of the fleet parking. Are there any details for these?
Response: The charging stations are being installed by the design build contractor. The site design indicates locations and conduit runs from the proposed building.
4. All drainage outlets should be provided with a riprap stabilized apron with appropriate sizing.
Response: We will provide appropriately sized rip rap pipe ends.
5. The Oil-water separator should be specified and sized. Will there be a wash basin in the building and if so, what volume of water etc is expected? Will there be any recycling of wash water?
Response: The plans have been revised to provide a 2,000-gallon oil/water separator to accommodate the anticipated wash rack and trench drain flows.
6. Invert elevations should be provided for all of the sanitary sewer stubs so its understood

what is to be installed.
Response: Invert elevations are provided on the sanitary sewer stubs.

7. CB-P5 and CB-P7 are relatively deep catch basins with 3' sumps; each is at the beginning of the line, thus consideration might be given to reduce their depths to save expense.
Response: The deep sump drainage structures are intentional as a pre-treatment to the stormwater treatment systems. These structures also include outlet hoods.
8. The Maine Water Company should provide a sign off on the water system design including sizing and related installation details.
Response: Design of the water infrastructure is based on meetings and guidance from Maine Water Company.
9. We understand a separate lighting plan has been prepared by others. We have not reviewed that design.
Response: none

Drawing C201 – Proposed Plan and Profile

1. Information regarding the existing conditions of the sewer line in Spring Hill Road should be provided, including depth and alignment so that the proposed SMH-P1 can be cast appropriately.
Response: As-built information of the existing sewer manholes is available.
2. Will the apparent existing sanitary sewer service entering the property be abandoned or removed?
Response: The existing sanitary sewer service will be abandoned in place.
3. The Maine Water Company should provide input as to the proposal for the connection of a new 12" water line off the existing 16" main. Will this installation require a shutdown of the existing line and what might be involved with a shutdown, as it relates to abutting properties etc. The Water company might weigh in on the use of a Tee assembly versus tapping sleeve and valve. Is a 12" water line appropriately sized for the prospective land uses in the park?
Response: Design of the water infrastructure is based on meetings and guidance from Maine Water Company.
4. The water line profile is not consistent with the apparent 6' required installation depth for the water main. Again, the Water Company should provide input on their acceptance of the design.
Response: Water line depth was varied to avoid a conflict with a proposed culvert.
5. The proposed sewer is relatively deep, thus any information on ledge depths should be identified. The Water Resources Recovery Department should provide input on the sewer sizing (10") and depths. This appears to be a relatively robust sewer size for the overall development area, although there may be specific reasons for the sizing I am unaware of. Are there any concerns on minimum flow velocities in the pipe, particularly if only DPW flows are initially discharged to the sewer?
Response: The sewer design is anticipation of future development and to allow a connection for Sweetser from their easement as agreed in the Purchase and Sale Agreement with the City.

6. All Manholes with stubs for future lot development should be clearly identified and accounted for to assure proper casting.
   Response: All manholes with stubs are identified on the plans.
7. All utility crossings should be verified and identified on the plan i.e. SD crossing at Station 10+08 +/-.
   Response: Storm drain Crossing has been added to the plan
8. A temporary grading license may be required from the property owner near Station 5+00 right.
   Response: The City is in discussions with the landowner regarding the fill.

Drawing C202 – Proposed Plan and Profile

1. The sanitary sewer stub from SMH-P7 appears as though it will be very shallow at the stub end, at little to no cover.
   Response: The stub is for future expansion. Insulation will be placed over the stub as a temporary measure until the road is extended.
2. The end of the road profile at Station 16+25 is not representative of the proposed slope. Again, consideration might be given to a barrier of some form at the end of the road, at least on a temporary basis.
   Response: We will discuss this with the DPW.

Drawing Sheet C501 – Details

1. The 7" slab on grade detail should be updated to identify/specify the structural fill material. Why is it identified as existing?
   Response: The detail has been updated.
2. The stone filter strip pretreatment detail indicates a thickness of 8" of 3" crushed stone. If 3" stone is used a more appropriate thickness might be 10" to 12" in my opinion.
   Response: The depth of the filter strip is greater than 2.5 times the stone diameter and is usually considered acceptable.

Drawing Sheet C502 – Details

1. The typical Roadway cross section identifies the road buildup information as on that sheet. I believe it is on the previous sheet.
   Response: The reference has been revised to sheet C501.
2. The DPW should verify if the polyethylene wrap for the catch basins is necessary.
   Response: The polyethene wrap is to prevent frost adhesion to the structure.
3. The transformer sizing should be verified by an electrical designer or CMP.
   Response: The design Build contractor will coordinate with CMP for the size of the transformer pad. Size depends on the electrical demand of the buildings and as required by Central Maine Power Company.

Drawing Sheet C504 – Details

1. Some specifications should be provided for the wetland soil in the Gravel Wetland detail. Will the contractor be able to salvage wetland soil from the areas of impact for reuse in the gravel wetlands an if so, might this preclude any need for additional plantings?
   Response: Wetland soil specifications have been added to the plan.
2. It is uncertain where the pond bench detail applies to the site?
   Response: The pond bench is the outlet for the gravel wetlands as indicated on the plans and in the BMP manual.
3. The Pond outlet structure may have an inadvertent elevation reference at the basin bottom?
   Response: The detail has been corrected.

Drawing Sheet C505 – Details

1. The grassed underdrain soil filter detail table appears to need some update for clarity and consistency. USF #4 is missing from table and the elevations on the rows for #5 and #6 seem inaccurate to the plans.
   Response: The GUSF table has been revised.
2. A table might be provided in the Emergency Spillway detail to provide information for each spillway at each GUSF etc.
   Response: Spill way elevations are identified on the plans.
3. Additional detail for the sizing of all culvert inlet/outlet protection should be provided.
   Response: we will provide sizing of culvert inlet/outlet protection.

Stormwater Management Report

I have performed a cursory review of the stormwater management report with the understanding that the project has been submitted to the Maine DEP as an amendment application, thus DEP staff will also be performing a more thorough review of the SWM report and designs to assure Chapter 500 compliance. I note the following general comments that should be addressed:

1. The Post Development Model indicates that Subarea 3 is part of the Point of Analysis #1 watershed. This appears inconsistent with the Post Development Plan which shows that Subarea 3 drains to the GW3/GW4 and Analysis Point 2
   Response: We will clarify the curbing along the new access drive. The grading and curbing of the access drive direct runoff from Sub Area 3 toward Analysis Point 1.
2. Similarly Subarea 1 contains GW1/GW2 and these appear to discharge to the Spring Hill Road Ditch and not to Analysis Point #1, as indicated in the HydroCAD model. This should be clarified.
   Response: The HydroCAD model is using the easterly property line as the Analysis Point as a matter of convenience.
3. Evidence including test pit information for each of the BMP's is required to verify the

depth to groundwater so that a determination can be made for the separation requirements from the bottom of the BMP's to groundwater. This may influence the need for lining any of the BMP's and whether any further groundwater relieve is needed. The design detail does call for a 20 mil liner so that may be appropriate.
Response: All treatment areas are lined.

4. The design uses multiple Grassed underdrain soil filters for water quality treatment and quantity control. The designer should provide evidence of compliance with the BMP design guidance criteria including the following:
   a. Basin sizing – The BMP Chapter 7.1 indicates a maximum basin size of 3,000 SF. The plans indicate several GUSF are larger than 3,000 SF, thus they may need to be divided up a bit to achieve the design criteria.
   Response: The GUSF areas that are just larger than the 3,000 square foot sizing recommendation in the BMP manual are generally longer and can be easily constructed and maintained. Adding a separation wall to divide up the treatment areas will only make construction and maintenance more difficult.
   b. Calculations for Drain time for each of the basins should be provided. Typically this is achieved with some form of outlet orifice control.
   Response: Calculations are being provided.
   c. Sizing calculations for the sediment pretreatment basins should be provided.
   Response: All of the forebays greatly exceed the 10% volume as an intention al design approach to provide additional pretreatment to the GUSF and to minimize maintenance.
5. The site is within the Goosefare Brook watershed which is identified by the DEP as an Urban Impaired Stream. We understand that the City has a Goosefare Brook Watershed Management Plan, thus the SWM report should address all requirements for compliance with both the DEP urban Impaired Stream standards as well as any specific objectives of the Goosefare Brook Watershed Management Plan. The SWM does not appear to provide evidence of how the development is achieving compliance with any of these standards.
   Response: The Site Location of Development permit application has included a compensation fee for the Urban Impaired Stream impacts.

As always, please let us know if you have any questions or need additional information.

Sincerely,
CES, Inc.

John D. Kuchinski, P.E.
Senior Project Engineer

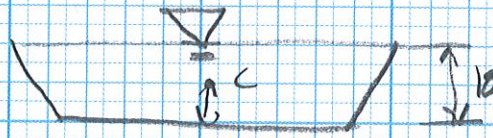
JDK/tmw
Encls.

CES INC
Engineers • Environmental Scientists • Surveyors
www.ces-maine.com

PROJECT: Saco DPW JOB # 10602.003
SUBJECT: GUSF Detention Times
COMP. BY: JDK CHK. BY: DATE: 2/20/19

Detention time using Darcy's Law:

$$Q = KA\left(\frac{dh}{dL}\right)$$



For simplicity use centroid as 9" above bottom to compute average flow through media.

$H_1 - H_2 = 9"$

$L = 18"$ of media

$i = \frac{H}{L} = \frac{9"}{18"} = 0.5$

Use $K = 1$-inch/hour

$K = \frac{1"}{hr} \times \frac{1ft}{12"} = 0.083\ ft/hr$

GUSF #1

Area = 3,345 SF Vol. @ 1.5' = 6,255 CF

$Q = (0.083)(3,345)(0.5) = 138.8\ ft^3/hr$

Time = 6,255 CF / 138.8 ft^3/hr = 45.0 hr

CES INC
Engineers • Environmental Scientists • Surveyors
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PROJECT: Saco DPW JOB # 10602.002
SUBJECT: GUSF Detention Times
COMP. BY: JDK CHK. BY: DATE: 2/20/19

GUSF # 2/3

Area = 2130 SF + 4414 SF = 6544 SF
Vol = 11,775 CF
$Q = (0.083)(5510)(0.5) = 228.7\ ft^3/hr$
Time = 11,775 CF / 228.7 ft^3/hr = 43.3 hr

GUSF #4

Area = 3180 SF Vol = 6,176 CF
$Q = (0.083)(3180)(0.5) = 132\ ft^3/hr$
Time = 6,176 CF / 132 ft^3/hr = 46.8 hr

GUSF # 5

Area = 5510 SF Vol = 9955 CF
$Q = (0.083)(5510)(0.5) = 228.7\ ft^3/hr$
Time = 9955 CF / 228.7 ft^3/hr = 43.5 hr

GUSF #6

Area = 3050 SF Vol = 5449 CF
$Q = (0.083)(3050)(0.5) = 126.6\ ft^3/hr$
Time = 5449 CF / 126.6 ft^3/hr = 43.0 hr

MEMO

To: Emily Cole Prescott, City Planner

From: John Kuchinski

Re: Saco Department of Public Works Site Plan Review

Date: May 13, 2019

The following are our responses to Code Enforcement Department comments received on May7, 2019. The comments are repeated below followed by our response in *italics*.

Project abuts a Resource Protection zone, Phillips Spring. Please address measures to be used to protect this resource.

Response: The 100-foot Resource Protection Zone around Philips Spring will remain unaltered by the proposed project.

Project depends in large part on vegetative buffer located on adjacent land to screen parking lot. No internal trees within large parking areas are shown as required by 708-C 9 (a)(2). Waiver should be requested.

Response: The Applicant requests a waiver from Zoning Section 708-C 9 (a) [2] for internal trees within the parking lots.

Will there be a sign on Spring Hill Road at the driveway entrance? May want to plan for electrical to be run out to this location.

Response: An electric sign is not anticipated at Spring Hill Road for the DPW. A wayfinding sign may be considered.

Sensible Solutions | www.cesincusa.com

146 Main Street
Suite 300
Saco, Maine 04072
T 207.283.9151
F 207.283.9136

Originally Submitted Site Plan Application & Supporting Documentation

April 2, 2019

Emily Cole-Prescott, City Planner
Town of Saco
300 Main Street
Saco, Maine 04072

Re: Saco Department of Public Works Facility | Site Plan Review

Dear Ms. Cole-Prescott:

On behalf of Saco Department of Public Works, CES, Inc. is submitting four copies of the attached application for Site Plan Review with supporting documents and site plans. The Site is located in the Saco Industrial Park. Proposed site development is for a new Department of Public Works facility with associated parking areas and a newly constructed roadway. Parking for 192 vehicles of various sizes is provided. In the front of the office buildings are 89 passenger vehicle parking spaces. Behind the office buildings, next to the garage and storage areas, are 103 large truck and trailer spaces that vary in size to accommodate a variety of vehicles. Stormwater for both the new facility and roadway is controlled by five grass under drained soil filters and two gravel wetlands to provide quantity control and quality treatment.

The following is included in this application:

- Cover Letter;
- Signed Application Form and fee;
- Site Plan Review Narrative including trip generation analysis;
- Medium Intensity Soils Map;
- FEMA Flood Map;
- Stormwater Quality and Quantity Management Plan and Calculations;
- Maintenance of Stormwater Management System Plan;
- Erosion and Sedimentation Control Plan;
- Site Lighting Plan; and
- Floor Plans and Elevations of DPW and Transportation Buildings.

Sensible Solutions | www.cesincusa.com

146 Main Street
Suite 300
Saco, Maine 04072
T 207.283.9151
F 207.283.9136

The Site Plans include site layout, grading drainage and stormwater management, utilities and typical construction details. A pre-development and post-development stormwater management plans.

Please contact us if you have any questions or need additional information.

Sincerely,
CES, Inc.

John D. Kuchinski, P.E.
Senior Project Engineer

JDK/cmc
Encl.

Account Number_____

Fee_____

Received by_____

Date_____

Saco Planning Office
300 Main Street
Saco, Maine 04072
(207)282-3487

Application Form For Site Plan Review

This application shall conform in all respects to the City of Saco Zoning Ordinance. It shall be accompanied by twelve (12) copies of all submitted materials.

STREET ADDRESS OF PROPOSED PROJECT SITE Department of Public Works

Tax Map Number 42 Lot Number 1 (portion)

York County Registry of Deeds Book Number 2837 Page 179

City of Saco Zoning District: B-8

Area of Parcel: 42 acres

Total of Proposed Developed Area of Parcel: 13.7 acres

Total Floor Area of Each Proposed Building in Square Feet: DPW: 27,142 SF, Storage: 6,900 SF, Salt Shed: 6,900 SF, Transportation Department: 1,152 SF

Footprint of Each Proposed Building in Square Feet: DPW: 24,982 SF, Storage: 6,900 SF, Salt Shed: 6,900 SF, Transportation Department:1,152 SF

Height of Proposed Building(s): 35 feet 1 stories

Total Number Proposed Parking Spaces: 89 Parking spaces

DESCRIPTION OF PROPOSAL Construction of new Department of Public Works building and Department of Transportation building, a new salt storage shed and a dry storage building with associated site work. DPW site includes storage area for materials and equipment. Parking is also available for School Department buses. A fuel island with a 10,000 gallon diesel and a 10,000 gallon gasoline above ground storage tanks.

AMENDMENT TO PREVIOUSLY APPROVED PLAN? YES _____ NO X

If so, date of previous approval: _____

OWNER'S NAME Sweetser

Address 50 Moody Street, Saco, ME

Telephone and Fax Numbers _____

E-mail Address _____ @ _____

APPLICANT'S NAME City of Saco

Address 300 Main Street, Saco, Maine 04072

Telephone and Fax Numbers 207 282-4191

E-mail Address ksutherland @ sacomaine.org

ARCHITECT/ENGINEER'S NAME John D. Kuchinski, PE CES, Inc

Address 146 Main Street, Saco ME 04072

Telephone and Fax Numbers tel: (207) 283-9151 fax: (207) 283-9156

E-mail Address jkuchinski @ cesincusa.com

SUBMISSION REQUIREMENTS: Please review and submit all items required in the attached Section 1104 of the City of Saco Zoning Ordinance. Requests for waiver of any required item shall be in writing.

FEE: A $25.00 non-refundable fee must be deposited with all applications. The required deposit is $1500.00 if engineering review required, or $350.00 if engineering review is not required, as determined by the City Planner. A copy of the Cost Recovery Ordinance is attached.

The Planning Board normally meets the first and third Tuesday of the month. Applicants must submit their materials by 4:30 P.M. THREE WEEKS prior to the scheduled meeting for placement on the Board's agenda. If application and submission materials are not complete, placement on the agenda may be delayed.

Applications are placed on the Planning Board's agenda at the conclusion of staff review only.

K. L. Sutherland 3-29-19

Signature of Applicant and/or Owner Date

LAND SWAP AGREEMENT

This LAND SWAP AGREEMENT (the "Agreement") is made as of the 25th day of January, 2019 (the "Effective Date") by and between **CITY OF SACO**, a municipal corporation existing under the laws of the State of Maine, with a mailing address of 300 Main Street, Saco, Maine 04072 (hereinafter "Saco"), and **CORMIER LAND CO., INC A/K/A CORMIER LAND CO.**, a Maine corporation with a mailing address of 774 Portland Road, Saco, Maine 04072 (hereinafter "Cormier"). For purposes of this Agreement, except as may otherwise be hereinafter provided, the terms Saco and Cormier shall include successors, heirs, and assigns.

RECITALS

WHEREAS, Saco and Cormier own or will own two adjacent lots or parcels of land located on or near Spring Hill Road, Saco, York County, Maine, as follows:

1. Certain premises, together with the improvements thereon, described in a purchase and sale agreement between Sweetser, as Seller, and Saco, as Purchaser, dated July 26, 2018, and being a portion of certain lots or parcels of land located off Moody Street, Interstate 195 (I-195), and Industrial Park Road in Saco, Maine, identified as Saco Tax Map 42, Lot 1 (the "Saco Land").

2. Certain premises, together with the improvements thereon, described in a deed from Linda M. Valentino dated February 3, 1994 and recorded in the York County Registry of Deeds in Book 6929, Page 269, as affected by a corrective deed recorded in said Registry of Deeds in Book 7824, Page 349, being further identified as City of Saco Tax Map 58, Lot 1-2 (the "Cormier Land").

WHEREAS, Saco wishes to convey a portion of the Saco Land to Cormier, and Cormier wishes to convey a portion of the Cormier Land to Saco, all in accordance with the terms and conditions herein contained and agreed.

NOW, THEREFORE, for good and valuable consideration, the parties hereby agree as follows:

1. **Conveyances:**

a. On or before August 1, 2019, or such earlier date as set forth in Section 2 below, Saco shall convey to Cormier by Quitclaim with Covenant Deed a portion of the Saco Land, containing 1.8+/- acres, and being described on Exhibit A attached hereto and incorporated herein, subject to a reserved easement for access and a deed restriction requiring that no portion of the Premises may be used in a fashion which violates any State or Federal law in effect as of the Closing Date, including, without limitation, use of the Premises for the cultivation, manufacturing, or processing of marijuana or any analogous chemical derivative.

b. On or before August 1, 2019, or such earlier date as set forth in Section 2 below, Cormier shall convey to Saco by Quitclaim with Covenant Deed a portion of the Cormier Land, containing 1.8+/- acres, and being described on Exhibit A attached hereto and incorporated herein, together with a perpetual appurtenant easement for drainage, and for access for maintenance, repair and improvement of a road, and subject to an appurtenant easement for access reserved by Cormier.

c. Each party shall each convey to the other by Quitclaim with Covenant Deed, for which title in the premises shall be good and insurable, but without a strict requirement for marketable title (it being understood that insurable title may be achieved via title insurance, including, without limitation, by way of affirmative coverage provided by national underwriter); provided, however, that any title defect that materially impairs the intended use of the premises shall not be deemed good.

2. Closing Date:

The parties shall close the transaction contemplated by this Agreement on thirty (30) days' written notice from Saco, provided, that such date shall be on or before August 1, 2019 (the "Closing Date") at the offices of Jensen, Baird, Gardner & Henry in Portland, Maine or other mutually convenient location. The parties may exchange original signed documents by courier service in lieu of a physical closing.

3. Taxes and Costs:

a. Each party will bear its own costs related to this transaction, including consultant and attorney fees, and the cost of any title insurance premium imposed in connection with any title insurance policy issued to either party, provided however that Saco agrees to reimburse Cormier for Cormier's reasonable attorney's fees not to exceed $6,000.

b. Saco shall be responsible for any recording fees and transfer taxes required to complete the transactions contemplated herein; provided, however, that Saco shall not be responsible for any discharge or release of any mortgage or other liens of Cormier.

c. For purposes of this exchange, the parties agree that each of the 1.8+/-acre parcels being conveyed shall each have a value of $2,500.00.

d. The Parties hereby agree NOT to prorate property taxes or any commercial forestry excise taxes.

e. Saco will reimburse to Cormier any increase in real property taxes assessed against the remaining portion of Tax Map 58, Lot 1-2 retained by Cormier ("Cormier's Retained Land") which result from the construction of a road by Saco and only to the extent that: (i) Cormier retains ownership of Cormier's Retained Land, (ii) the use of Cormier's

Retained Land does not change, and (iii) no material improvements are made to Cormier's Retained Land.

4. **Conditions Precedent:**

Each party may examine title to the property described on Exhibit A and shall notify the other party in writing of any exceptions to title, which would materially and adversely affect the contemplated use of said property. If either party timely notifies the other of any title exceptions, the notified party may, at its sole option, cure such exceptions on or before the date of Closing. If the notified party elects to cure a title exception raised by the notifying party, the closing will be extended to permit the notified party to cure the same. If the notified party elects not to cure a title exception, or having elected to resolve a title exception, the notified party does not cure the same within thirty (30) days after notice in writing from the notifying party, then either party may terminate this Agreement without further liability whatsoever.

Each party also agrees to the following:

1. Saco shall create not more than two (2) street openings off the road to be constructed and the installation of one (1) utility stub at or near one of the curb cuts by Saco for the benefit of Cormier; and

2. The parties shall grant to each other such additional reasonable licenses and easements as are necessary for the intended use of each parcel, such as the right to install utilities and the right to use and/or modify existing street openings a/k/a curb-cuts.

5. **Notices:**

Any notice required to be given hereunder shall be in writing and shall be served by sending the same by courier or by delivering the same by hand to the address of the party in question as set out below (or such other address as such parties shall notify the other party in accordance with this clause):

To Saco at:	Patrick Fox, Director of Public Works City of Saco 300 Main Street Saco, ME 04072
with a copy to:	Charles Katz-Leavy, Esq. Jensen Baird Gardner & Henry 10 Free Street Portland, ME 04101
To Cormier at:	Violet Y. Cormier, President Cormier Land Co, Inc.

P.O. Box 29
Saco, ME 04072

with a copy to: Scott M. Edmunds, Esq.
Bergen & Parkinson, LLC
144 Main Street
Saco, ME 04072

6. **Assignment:**

The parties may not assign this Agreement without the prior written consent of the other parties, except for an assignment to a related entity controlled by a party to this Agreement.

7. **Governing Law and Forum:**

The terms and conditions of this Agreement and the rights of the parties hereunder shall be governed by and construed in all respects in accordance with the laws of the State of Maine.

Any party who may claim a breach of this Agreement shall provide written notification of the controversy or dispute to the other party. A meeting between the parties shall be held within thirty (30) calendar days of such notice. The meeting shall be attended by representatives or agents of the parties with decision-making authority regarding the dispute, to attempt in good faith to negotiate a resolution of the dispute. Only after such a meeting may a party pursue a claim for breach of this Agreement in a court of law.

8. **Entire Agreement**

This Agreement constitutes the entire agreement between the parties hereto relating to the subject matter hereof and may be changed, modified or amended only by a writing signed by an authorized representative of each party hereto. This Agreement supersedes and replaces all prior agreements or understandings, written or oral, between the parties.

This Agreement may be executed in any number of counterparts, each of which shall constitute an original and all of which shall comprise one and the same instrument. For purposes of this Agreement, a facsimile or electronic signature shall be deemed an original.

(signatures on following page)

IN WITNESS WHEREOF, the undersigned have caused this Agreement to be executed as of this 25th day of January, 2019.

CORMIER LAND CO., INC. A/K/A CORMIER LAND CO.

Violet Y. Cormier

By Violet Y. Cormier
Its President

CITY OF SACO

Kevin L. Sutherland

By Kevin L. Sutherland
Its City Administrator

EXHIBIT A
LEGAL DESCRIPTIONS

PARCEL TO BE CONVEYED TO CORMIER

A certain parcel of land with any improvements thereon situated in the Town of Saco, County of York and State of Maine, bounded and described as follows:

PARCEL TO BE CONVEYED TO SACO

A certain parcel of land with any improvements thereon situated in the Town of Saco, County of York and State of Maine, bounded and described as follows:

STATE OF MAINE

COUNTY OF YORK **CITY OF SACO**

I. CALL TO ORDER – On Monday, December 11, 2017 at 8:38 p.m. a Council Meeting was held in the City Hall Auditorium.

II. RECOGNITION OF MEMBERS PRESENT – Mayor Marston Lovell recognized the members of the Council and determined that the Councilors present constituted a quorum. Councilors present: Marshall Archer, Roger Gay, William Doyle, Lynn Copeland, Alan Minthorn, Micah Smart and Nathan Johnston. City Administrator Kevin Sutherland and City Clerk Michele Hughes were also present this evening.

III. PLEDGE OF ALLEGIANCE

IV. GENERAL

V. PUBLIC COMMENT

There were no public comments this evening.

VI. CONSENT AGENDA

Councilor Gay moved, Councilor Johnston seconded to approve consent agenda items #A and B as follows:

A. CONFIRMATION OF COUNCIL LIAISON APPOINTMENTS - Be it Ordered that the City Council approve the Mayor's appointments as detailed on the document titled, "Mayor's Council Liaison Appointments, December 11, 2017". Further move to approve the order.

B. CERTIFICATION OF ELECTION RESULTS FOR NOVEMBER 7, 2017 - Be it Ordered that the City Council hereby approve the results of the November 7, 2017 General & Referendum Election as presented". Further move to approve the Order.

The motion passed with seven (7) yeas.

The item commentaries for the consent agenda are listed below.

A. CONFIRMATION OF COUNCIL LIAISON APPOINTMENTS

It is the practice of the City Council to have council members serve as a liaison with city boards and commissions. The Mayor has made appointments to these bodies and is seeking council confirmation. The Council Procedure Manual also known as the Rules and Order of Business contains a brief description of Board and Commissions.

Committee Assignments December 2017

Ward 1 Marshall Archer	Ward 5 Alan Minthorn
Saco Main Street	Transit Committee
Biddeford Joint Opns Committee	Affordable Housing
Fair Hearing Committee	Personnel Committee
Affordable Housing	Economic Development Corporation
Ward 2 Roger Gay	**Ward 6 Micah Smart**
Planning Board	Traffic Safety
Capital Planning Committee	Energy Committee
Historic Preservation Commission	Biddeford Joint Operations Committee
Zoning Board of Appeals	Insurance Committee

Ward 3 William Doyle

Economic Development Commission
Dyer Library
Goosefare Brook Restoration Committee
Cable Advisory Committee

Ward 7 Nathan Johnston

Traffic Safety
Cable Advisory Committee
Energy Committee
Parks and Recreation Advisory Committee

Ward 4 Lynn Copeland

Shoreland Commission
Coastal Waters Commission
Parks and Recreation Advisory Board
Conservation Committee

Mayor

Southern Maine Regional Planning
Insurance Committee
Age Friendly Saco Committee

B. CERTIFICATION OF ELECTION RESULTS FOR NOVEMBER 7, 2017

On November 7, 2017 a General & Referendum Election was held. The election results are being submitted to Council for Certification as required by Section 7.03 b. of the Charter of the City of Saco.

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

Note: The Write-in candidate with plurality in the Warden race for Ward 2, 3, 5, & 6 and Ward Clerk race for Ward 2, 3, 4, 5, 6, & 7 will be shown in parenthesis.

MAYOR - 2 YR TERM	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Lovell, Marston D.	471	387	273	633	415	376	319	2874
Pilon, Donald E.	288	221	301	431	289	302	190	2022
Write-In	7	8	7	9	6	4	9	50
Blank	45	80	51	65	47	65	41	394
Total	**811**	**696**	**632**	**1138**	**757**	**747**	**559**	**5340**

WARD 1 -COUNCIL - 2 YR TERM	WARD 1
Archer, Marshall F.	451
Dicianni, Matthew J.	244
Write-In	7
Blank	109
TOTAL	**811**

WARD 1 - WARDEN - 2 YR TERM	WARD 1
Fortier, Frederick J.	649
Write-In	4
Blank	158
TOTAL	**811**

WARD 1 - WARD CLERK - 2 YR TERM	WARD 1
Patterson, Carol A.	649
Write-In	4
Blank	158
TOTAL	**811**

WARD 2 -COUNCIL - 2 YR TERM	WARD 2
Gay, Roger B.	536
Write-In	17
Blank	141
TOTAL	**696**

WARD 2 - WARDEN - 2 YR TERM	WARD 2
Write-In - (Chase, George 8 votes)	23
Blank	673
TOTAL	**696**

WARD 2 - WARD CLERK - 2 YR TERM	WARD 2
Write-In - (Marquis, Gloria 8 votes)	29
Blank	667
TOTAL	**696**

WARD 2 - SCHOOL BOARD - 3 YR TERM	WARD 2
Leary, Lynn M.	572
Write-In	7
Blank	117
TOTAL	**696**

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

WARD 3 -COUNCIL - 2 YR TERM	WARD 3
Colman, Barbara E	206
Doyle, William P	362
Write-In	5
Blank	59
TOTAL	632

WARD 3 - WARDEN - 2 YR TERM	WARD 3
Write-In (By appointment)	36
Blank	596
TOTAL	632

WARD 3 - WARD CLERK - 2 YR TERM	WARD 3
Write-In (Russell, William 4 votes)	30
Blank	602
TOTAL	632

WARD 4 - COUNCIL - 2 YR TERM	WARD 4
Burman, Michael A	416
Copeland, Lynn H	599
Write-In	3
Blank	120
TOTAL	1138

WARD 4 - WARDEN - 2 YR TERM	WARD 4
Cook, Marianne C	893
Write-In	4
Blank	241
TOTAL	1138

WARD 4 - WARD CLERK - 2 YR TERM	WARD 4
Write-In - (Dziadzio, Kathleen 5 votes)	53
Blank	1085
TOTAL	1138

WARD 4 - SCHOOL BOARD - 3 YR TERM	WARD 4
Shiman, Stephen	866
Write-In	7
Blank	265
TOTAL	1138

WARD 5 - COUNCIL - 2 YR TERM	WARD 5
Mintheim, Alan R	552
Write-In	21
Blank	184
TOTAL	757

WARD 5 - WARDEN - 2 YR TERM	WARD 5
Write-In - (Villemaire, Daniel 4 votes)	46
Blank	711
TOTAL	757

WARD 5 - WARD CLERK - 2 YR TERM	WARD 5
Write-In (By appointment)	45
Blank	712
TOTAL	757

WARD 6 -COUNCIL - 2 YR TERM	WARD 6
Boucher, Jason C	154
Sirois, Theodore L	204
Smart, Micah A	278
Write-In	3
Blank	108
TOTAL	747

WARD 6 - WARDEN - 2 YR TERM	WARD 6
Write-In (Mossick, Jeffrey 2 Votes)	40
Blank	707
TOTAL	747

WARD 6 - WARD CLERK - 2 YR TERM	WARD 6
Write-In (Foran, Claire 5 votes)	31
Blank	716
TOTAL	747

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

WARD 6 - SCHOOL BOARD - 3 YR TERM	WARD 6
Mozden, Stanley W	522
Write-In	11
Blank	214
TOTAL	747

WARD 7 - COUNCIL - 2 YR TERM	WARD 7
Johnston, Nathan D	445
Write-In	14
Blank	100
TOTAL	559

WARD 7 - WARDEN - 2 YR TERM	WARD 7
Gerry, Debra A	449
Write-In	7
Blank	103
TOTAL	559

WARD 7 - WARD CLERK - 2 YR TERM	WARD 7
Write-In (By Appointment)	32
Blanks	527
TOTAL	559

MUNICIPAL REFERENDUM QUESTIONS

QUESTION #1

Shall the Order of the City Council of the City of Saco entitled "Order Authorizing the City of Saco to borrow an amount not to exceed $2,000,000 for City facilities including the Ocean Park Road drainage system, the Police Station roof, the City Hall and Parks and Recreation facility HVAC systems, the Middle School baseball field, the Foss Road recreation site, Lincoln Street reconstruction and Camp Ellis erosion protection" be ratified and approved?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	514	408	411	837	535	535	428	3668
No	283	278	215	263	216	180	121	1556
Blank	14	10	6	38	6	32	10	116
TOTAL	811	696	632	1138	757	747	559	5340

QUESTION #2

Shall the Order of the City Council of the Cityof Saco entitled "Order Authorizing the City of Saco to borrow an amount not to exceed $7,250,000 for construction and equipping of a new public works facility on Industrial Park Road and to sell the existing public worksfacility on North Street and to expend such sale proceeds on such new public works facility" be ratified and approved?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	392	292	318	569	385	407	320	2681
No	407	388	303	525	356	301	227	2507
Blank	12	16	13	44	16	39	12	152
TOTAL	811	696	632	1138	757	747	559	5340

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

QUESTION #3
Shall the Order of the City Council of the City of Saco entitled "Order Authorizing the City of Saco to borrow an amount not to exceed $2,500,000 for Route One sewer extension and sidewalk, pedestrian and traffic signal improvements" be ratified and approved?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	441	332	396	682	451	482	408	3192
No	358	347	229	415	293	232	140	2014
Blank	12	17	7	41	13	33	11	134
TOTAL	811	696	632	1138	757	747	559	5340

STATE REFERENDUM QUESTIONS

1. CITIZEN INITIATIVE
Do you want to allow a certain company to operate table games and/or slot machines in York County, subject to state and local approval, with part of the profits going to the specific programs described in the initiative?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	223	173	198	225	234	199	145	1397
No	586	521	432	902	518	539	411	3909
Blank	2	2	2	6	3	10	1	26
TOTAL	811	696	632	1133	755	748	557	5332

2. CITIZEN INITIATIVE
Do you want Maine to expand Medicaid to provide healthcare coverage for qualified adults under age 65 with incomes at or below 138% of the federal poverty level, which in 2017 means $16,643 for a singleperson and $22,412 for a family of two?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	483	381	390	747	466	510	414	3391
No	322	310	239	374	282	228	143	1898
Blank	6	5	3	12	7	10	0	43
TOTAL	811	696	632	1133	755	748	557	5332

State of Maine - City of Saco
State Referendum - Municipal General and Referendum Election
November 7, 2017

3. BOND ISSUE
Do you favor a $105,000,000 bond issue for construction, reconstruction and rehabilitation of highways and bridges and for facilities or equipment related to ports, harbors, marine transportation, freight and passenger railroads, aviation, transit and bicycle and pedestrian trails, to be used to match an estimated $137,000,000 in federal and other funds, and for the upgrade of municipal culverts at stream crossings?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	563	424	421	857	529	552	429	3775
No	236	265	203	256	220	176	123	1479
Blank	12	7	8	20	6	20	5	78
TOTAL	811	696	632	1133	755	748	557	5332

4. CONSTITUTIONAL AMENDMENT
Do you favor amending the Constitution of Maine to reduce volatility in state pension funding requirements caused by the financial markets by increasing the length of time over which experience losses are amortized from 10 years to 20 years, in line with pension industry standards?

	WARD 1	WARD 2	WARD 3	WARD 4	WARD 5	WARD 6	WARD 7	TOTAL
Yes	503	402	368	786	464	456	356	3335
No	274	259	235	267	260	239	172	1706
Blank	34	35	29	80	31	53	29	291
TOTAL	811	696	632	1133	755	748	557	5332

VII. AGENDA

A. ELECTION OF THE DEPUTY MAYOR

Article II, Section 2.05 – Election and Term, Subsection C of the Charter states: "The City Council shall elect from its membership a Deputy Mayor who shall exercise all powers of the Mayor during temporary absence or disability of the Mayor. In the event of a vacancy in the office of Mayor, the Deputy Mayor shall assume the office of Mayor with all the duties and obligations of that office in accordance with the provisions of Section 2.06(c)(1)."

SACO DEPARTMENT OF PUBLIC WORKS
INDUSTRIAL PARK, SACO, MAINE
SITE PLAN REVIEW NARRATIVE

DEVELOPMENT DESCRIPTION

Saco Department of Public Works is proposing to construct a new public works facility and associated parking lots and roadway in the Saco Industrial Park. The facility consists of a 27,142 square foot main office and garage, a 6,900 square foot dry storage building, a 6,900 square foot salt and sand shed, and another 1,152 square foot office building. The total impervious area of the new public works site is 332,126 square feet. The site will be used as the primary location for public works activity. The proposed development is designed in accordance with the City of Saco's Zoning Ordinance for the B-8 Zone and all other applicable standards. In the district specific regulations of the Ordinance, municipal uses are allowed as permitted uses. The following table itemizes the Ordinance layout requirements in comparison to the proposed development.

Table 1: Lot Dimensions

	Required	Provided
Minimum Lot Area	10,000 SF	42 acres
Minimum Lot Frontage	50 Feet	181.43* Feet
Minimum Front Yard	20 Feet	1039 Feet
Minimum Side Yard	15 Feet	308 Feet
Minimum Rear Yard	15 Feet	1081 Feet
Maximum Lot Coverage	50%	18 %
Maximum Building Height	60 Feet	35 Feet

* Frontage along Spring Hill Road in I1 zone.

Construction of a new driveway from Spring Hill Road to the site resulting in a total of 1,600 linear feet of newly constructed driveway conforming to the arterial road standards. Gravel wetlands and grass underdrained soil filters provide stormwater treatment for both the site and the driveway.

REVIEW CRITERIA

A. General

The proposed development will meet all requirements set fourth in section 230 of the Saco City Code and is in compliance with all applicable State and Federal laws. Stormwater Management plans and calculations will be submitted to the Maine Department of Environmental Protection (MDEP) for review and approval.

B. Compatibility with Neighboring Buildings

The proposed building is set back from both Spring Hill Road and Industrial Park Road. Proposed use is compatible to surrounding industrial buildings along Spring Hill Road and Industrial Park Road.

C. *Natural Features*

The new development and the first phase of construction for the roadway will disturb up to 12,020 square feet of wetlands. The development has been located on-site to reduce the amount of necessary grade change, reduce wetland impact, and to comply with the requirements set forth by the plan approval.

D. *Public Safety*

The new road, driveway, parking, and site layout has adequate space for emergency and non-emergency vehicles to access the various buildings on site. The layout allows for proper movement of large vehicles on site. The site circulation is designed to accommodate large public works trucks.

E. *Lighting*

The proposed development will not create glare or other hazards to motorists traveling on the adjacent road. All lighting fixtures will be cutoff type. A site lighting and photometric plan is included in the plan set.

F. *Landscaping*

Disturbed areas that are not paved or gravel will be treated with 4 inches of topsoil and will be seeded. Existing trees will be retained beyond the disturbance limits. Buffers are located along the southern property lines. Planting species, location, and quantities are shown on the site plan.

G. *Off-site Impacts*

The proposed use will not have a significant detrimental effect on the abutting properties. The lot and abutting lots are zoned as Industrial. Noise, vibrations, fumes, etc. will comply with the City of Saco Land Use Ordinance requirements.

H. *Vehicular Circulation and Pedestrian Impacts*

Parking for a total of 192 vehicles is proposed in the new parking lots, with 89 of the spaces being designed for passenger vehicles. There are 89 spaces that are 9 feet wide by 18 feet long, 24 spaces that are 15 feet wide by 30 feet long, 17 spaces that are 15 feet wide by 35 feet long, 32 spaces that are 12 feet wide by 32 feet long, and 30 spaces that are 12 feet wide by 50 feet long. The parking area is designed in such a way as to not create any hazards within the parking lot or on the adjacent roadway.

I. *Flood Hazards*

The proposed development is in FEMA Zone X, an area of minimal flooding, and will not impact flood zones.

J. *Wastewater*

The development will be served by public sewer. in Spring Hill Road. New 10-inch diameter sewer main and manholes will be constructed in the proposes access road. Water usage and wastewater generation are expected to be similar to the existing DPW facility on North Road.

A email has been received from Howard Carter stating that there is adequate capacity to serve the new facility.

K. Solid Waste

Based on past usage of the Saco Public Works Facility, the current facility generates 8 cubic yards of solid waste per week that is collected weekly and hauled off site and disposed by Pine Tree Waste, Inc. through the City's municipal solid waste collection and disposal contractor. All municipal waste is kept onsite within a covered dumpster.

The existing site is currently clear cut. Sweetser harvested the site of timber as part of its purchase and sale agreement with the City of Saco. Clearing for this site will be limited to the removal of stumps and any residual slash left from the timber harvesting operation of the development and is estimated to produce 20 tons of wood waste. This material will be ground on-site and used for erosion control and landscaping purposes.

Construction waste will be sorted for recycling at ReEnergy Lewiston LLC, where woody waste will be separated and used as a biomass fuel. Other material will be sorted and recycled where possible.

Municipal solid waste will be collected by the City of Saco waste hauling contractor and hauled to the ecomaine facility at 64 Blueberry Road in Portland.

L. Erosion Controls

Erosion and Sediment Control Best Management Practices will be used during construction in accordance with Maine Department of Environmental Protection (MDEP) rules and regulations. Refer to the Erosion Control Narrative included in this application.

M. Drainage

Grass under drained soil filters and gravel wetlands are proposed to manage stormwater runoff due to the new parking lot, buildings and roadway. Calculations are provided showing that the post-development runoff is less than the pre-development runoff. Refer to the Stormwater Quality and Quantity narratives included in this application.

N. Water Supply

The site will be served by public water available in Spring Hill Road. The water supply will meet the demands for the proposed use and for fire protection. Domestic water use will be minimal for the proposed use. A letter has been received by Maine Water Company stating adequate capacity to serve.

O. Hazardous Materials

Adequate provision will be made to properly store, transport, and dispose of hazardous substances and materials. The Department of Public Works will comply with all applicable State and Federal regulations regarding the transportation and storage of hazardous materials. The department of Public Works has developed a combined SWPPP and SPCC

document that fully describes precautions and procedures for dealing with hazardous materials.

P. Wildlife, Scenery, and Unique Critical Areas

The proposed development will not impact significant scenic vistas, significant wildlife habitats, or any other unique and critical natural areas.

Q. Traffic Conditions

The proposed use will not create unreasonably safe hazards on the adjacent roadway. Traffic generation from the proposed site will be very similar to that of the existing facility on North Street. The DPW currently has 36 employees. Their hours of operation are from 6:30 AM to 3:30 PM. These trips occur outside the peak hours of 7:00 AM to 9:00 AM for morning and 4:00 PM to 6:00 PM for the afternoon. Other trips to and from the facility occur during the day when various crews are dispatched on various maintenance tasks throughout the City. The School Transportation Department has 35 employees. Their hours of operations are from 6:30 AM to 4:30 PM.

Trips Generated from the existing facility are estimated as follows:

Description	Estimated Daily Trips
DPW	
36 Staff	72
Fleet	60
School Transportation	
34 Staff	136
Fleet	120
Other City Fleet (Maintenance and Fuel Island)	40
Visitor \ Vendors	20

Total Estimated one-way trips are approximately 448. These trips will be relocated to the Spring Hill Drive Road location. Access to the new DPW site will be via the intersection of US Route 1 and Spring Hill Road, I-195 and Industrial Park Road and North Street and Industrial Park Road. The existing trips are all on North Street and the majority at the North Street and Industrial Park Road. North Street Has a factored AADT of 12,215 and Spring Hill Road has a Factored AADT of 4979 according to MaineDOT Public Map Viewer.

The relocated DPW site will have a net reduction of trips on the North Street and Industrial Park Road intersection. The majority of the trips to the new site are anticipated to be from the Spring Hill Road and US Route 1 signalized intersection. The remainder of the daily trips at surrounding intersections beyond the adjacent access points are estimated to be similar to the current DPW and School Transportation Department trips. The relocated trips from the existing site to the new site will not result in any additional improvements on or off site.

R. Water Quality

The proposed development will not discharge any pollutants into the surrounding wetland or stream and conforms to the stormwater quality standards and MDEP chapter 500 rules and Saco Code 230-805B.

S. Utilities

The proposed development will not create unreasonable burden on public utilities.

T. Special Features of Development

A 25-foot-wide buffer is proposed along the southern property lines of the parcel in accordance with the requirements of the Purchase and Sale agreement with Sweetser.

U. Additional Standards in Shoreland Areas

The proposed development will not impact areas that are zoned as RP, SR, or SO. The development will not impact shoreland areas.

SACO DEPARTMENT OF PUBLIC WORKS
INDUSTRIAL PARK, SACO, MAINE

STORMWATER QUALITY AND QUANTITY MANAGEMENT

A. NARRATIVE

The Stormwater Management Plan for Saco Department of Public Works complies with the requirements of the City of Saco Code, sections 230-805 and 230-1104, and the Maine Department of Environmental Protection (MDEP) Chapter 500 regulations. This development encompasses approximately 13.7 acres of developed area for the construction of 8.79 acres of impervious area. The proposed development includes a new Public Works garage and office area, a transportation department building, a 60 foot by 115 foot salt storage shed, and a dry storage shed. The development will also consist of the construction of a 1,600 linear foot roadway with a 70 foot right of way. The stormwater will be treated by five grass under drained soil filters and two gravel wetlands that will provide quantity control and quality treatment for both the roadway and the site.

Erosion control measures will be in place prior to the start of any construction. Temporary and permanent measures will be installed in accordance with the Erosion Control Plan included with this application. Upon completion of the construction and stabilization of all disturbed areas, the temporary erosion control measures will be removed.

B. STORMWATER QUALITY MANAGEMENT

The development will involve the installation of approximately 382,892 SF of new impervious area. Stormwater from the parking lots will be conveyed through catch basins to new grass under drained soil filters. Stormwater on the east side of the office buildings, in the parking areas, driveway, and roadway will sheet off into a stone pre-treatment strip before entering new grass under drained soil filters. As a result of these improvements, the project is required to comply with section 230-805 of the City of Saco Zoning Ordinance, chapter 500 of the MDEP's Stormwater Management Rules, and the Maine Stormwater Best Management Practices Manual. According to MDEP Chapter 500 regulations, 95% of proposed impervious surfaces and 80% of the developed area must be treated.

To treat stormwater associated with the proposed development, Saco DPW is proposing the construction of five grassed under drained soil filters (GUSF) and two gravel wetlands to meet stormwater quality standards. The locations of these BMP's are shown on the site plan.

The following table summarizes the impervious and developed area that will be treated by the grass underdrained soil filters and gravel wetlands.

STORMWATER TREATMENT SYSTEMS

PROPOSED ROAD

Subarea	New Impervious Area (SF)	New Landscape Area (SF)	Impervious Area Treated (SF)	Landscape Area Treated	Best Management Practice
1	11,378*	30,044	11,378	30,044	Gravel Wetland
2	4,280	5,220	0	0	None
3	14,375	3,920	14,375	3,920	Gravel Wetland
10	521	1,376	0	0	None
11	0	0	0	0	None
12	3,015	3,622	0	0	None
13	18,731*	42,253	18,731	42,253	Gravel Wetland
Total	**52,300**	**86,435**	**44,484**	**76,217**	

% Impervious Treated = 85.05%

% Developed Treated = 87.00%

* Impervious area includes gravel wetland

PROPOSED DPW SITE

Subarea	New Impervious Area (SF)	New Landscape Area (SF)	Impervious Area Treated (SF)	Landscape Area Treated	Best Management Practice
4	132,422	26,572	132,422	0	Gravel Wetland
5	21,562	14,561	21,562	14,561	Gravel Wetland
6	25,841	22,050	25,841	22,050	Grass Underdrained Soil Filter
7	107,911	16,246	107,664	15,912	Grass Underdrained Soil Filter
8	50,511	16,901	50,511	16,901	Grass Underdrained Soil Filter
9	7,890	14,186	7,890	14,186	Grass Underdrained Soil Filter
Total	**346,137**	**110,516**	**345,890**	**83,610**	

% Impervious Treated = 99.92%

% Developed Treated = 94.05%

SIZING CALCULATIONS			
Gravel Wetland 1:			
Impervious Area:	30,033	SF	
Landscape Area:	39,184	SF	
SF x 1" =	2,503	CF	
SF x 0.4" =	1,306	CF	
	3,809	CF of required storage	
	7,112	CF Provided (@ 1' of storage)	
Gravel Wetland 2:			
Impervious Area:	153,984	SF	
Landscape Area:	41,133	SF	
SF x 1" =	12,832	CF	
SF x 0.4" =	1,371	CF	
	14,203	CF of required storage	
	14,417	CF Provided (@ 1.5' of storage)	
GUSF 1:			
Impervious Area:	50,511	SF	
Landscape Area:	16,901	SF	
SF x 1" =	4,209	CF	
SF x 0.4" =	563	CF	
	4,773	CF of required storage	
	5,317	CF Provided (@ 1.5' of storage)	
GUSF 2/3:			
Impervious Area:	107,911	SF	
Landscape Area:	16,246	SF	
SF x 1" =	8,993	CF	
SF x 0.4" =	542	CF	
	9,534	CF of required storage	
	10,828	CF Provided (@ 1.5' of storage)	
GUSF 5:			
Impervious Area:	25,841	SF	
Landscape Area:	22,050	SF	
SF x 1" =	2,153	CF	
SF x 0.4" =	735	CF	
	2,888	CF of required storage	
	9,955	CF Provided (@ 1.5' of storage)	
GUSF 6:			
Impervious Area:	7,890	SF	
Landscape Area:	14,186	SF	
SF x 1" =	657	CF	
SF x 0.4" =	473	CF	
	1,130	CF of required storage	
	5,449	CF Provided (@ 1.5' of storage)	

C. STORMWATER QUANTITY MANAGEMENT

As previously stated, the project is required to meet the flooding standard under Chapter 500 Section 4.E(2)(a). To meet the flooding standard, HydroCAD calculations were performed to compare pre-development and post-development conditions to determine curve numbers and peak runoff flows.

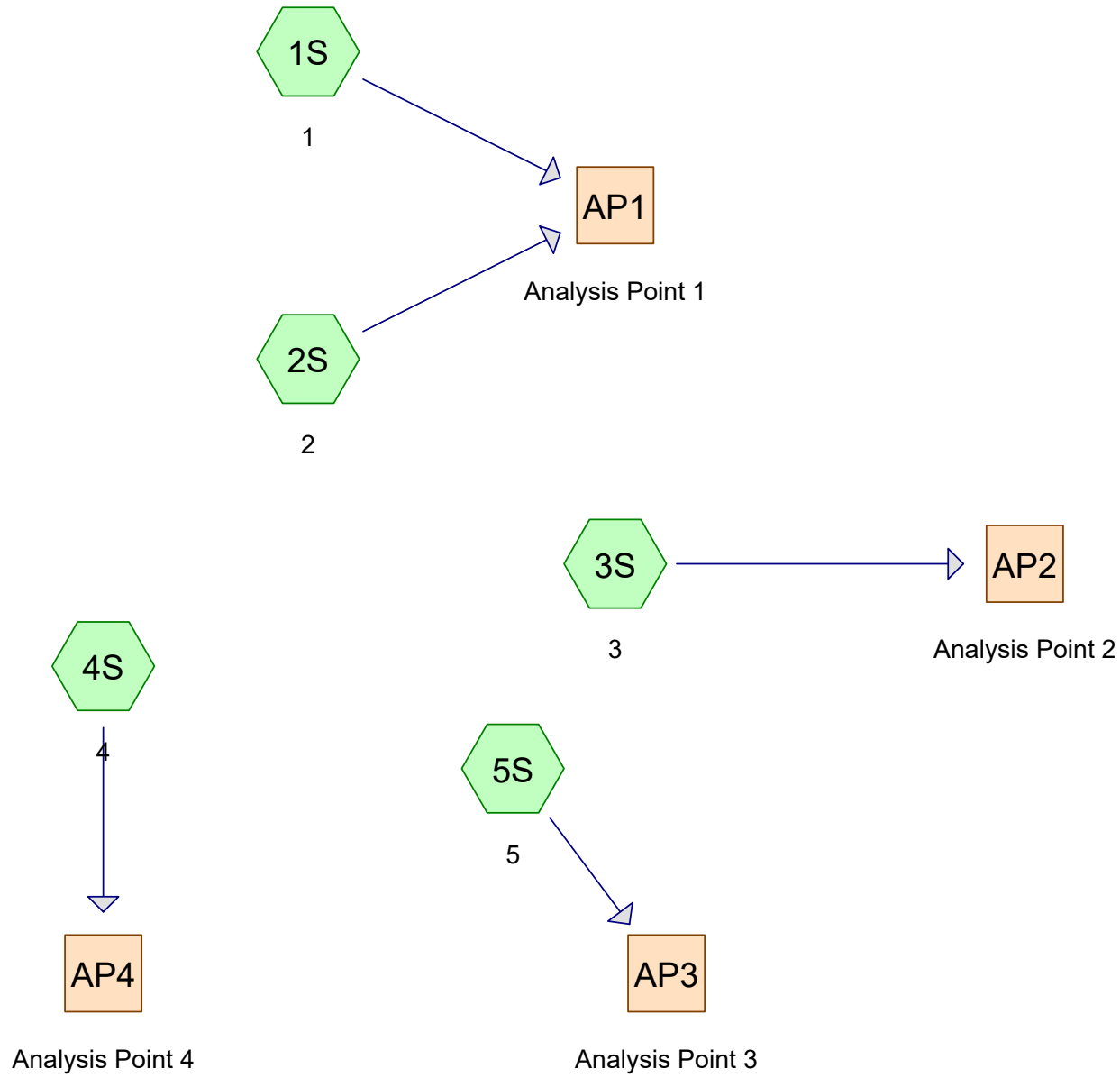
The pre-development site is mostly wooded for the purpose of these calculations. There has been some recent timber harvesting on site. Soils on the site per the USDA Web Soil Survey are predominately classified as Adams and Croghan, type 'A', and Naumberg type 'A/D'. Most of the site development drains towards Innis Brook, a tributary to Goosefare Brook. A portion of the new road from Spring Hill Road to the northerly edge of the DPW site drains to Mill Brook.

Based on the results of the HydroCAD, it is expected that stormwater runoff from the site will be similar or lessened in post-development conditions as in pre-development conditions. Overall, it is expected that runoff from the site will be similar to pre-development conditions and a similar stormwater runoff will be realized. A comparison of each of the watershed areas in both Pre- and Post-Development is organized in the table below.

		2 Year (cfs)	10 Year (cfs)	25 Year (cfs)	50 Year (cfs)	50 Year Net Change
Analysis Point 1	Pre	2.50	5.86	8.97	11.76	**-5.96**
	Post	0.00	1.23	3.20	5.80	
Analysis Point 2	Pre	0.92	5.50	11.14	16.76	**-3.79**
	Post	0.27	2.27	5.68	12.97	
Analysis Point 3	Pre	4.52	11.52	18.10	24.02	**+1.14**
	Post	3.97	10.10	17.84	25.16	
Analysis Point 4	Pre	14.55	30.75	45.07	57.59	**-1.66**
	Post	14.53	26.70	41.65	55.93	

Post development flows for the 2 year, 10 year, and 25 year storms are less than the respective pre development flows. Post development flow for the 50 year storm is slightly greater than the pre development flow. The increase in Analysis Point 3 is offset by greater decreases at Analysis Points 2 and 4.

D. PRE-DEVELOPMENT HYDROCAD RESULTS



Subcat Reach Pond Link

Routing Diagram for Pre-Dev Hydro Updated 3-22-19
Prepared by HP Inc., Printed 3/22/2019
HydroCAD® 10.00-20 s/n 00641 © 2017 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>1.75"
Flow Length=335' Tc=39.2 min CN=84 Runoff=0.82 cfs 0.117 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>0.73"
Flow Length=460' Tc=31.3 min CN=67 Runoff=1.68 cfs 0.249 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>0.25"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=0.92 cfs 0.308 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>1.15"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=14.55 cfs 1.941 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>0.78"
Flow Length=830' Tc=25.2 min CN=68 Runoff=4.52 cfs 0.601 af

Reach AP1: Analysis Point 1 Inflow=2.50 cfs 0.366 af
Outflow=2.50 cfs 0.366 af

Reach AP2: Analysis Point 2 Inflow=0.92 cfs 0.308 af
Outflow=0.92 cfs 0.308 af

Reach AP3: Analysis Point 3 Inflow=4.52 cfs 0.601 af
Outflow=4.52 cfs 0.601 af

Reach AP4: Analysis Point 4 Inflow=14.55 cfs 1.941 af
Outflow=14.55 cfs 1.941 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>3.16"
Flow Length=335' Tc=39.2 min CN=84 Runoff=1.48 cfs 0.210 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>1.72"
Flow Length=460' Tc=31.3 min CN=67 Runoff=4.41 cfs 0.585 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>0.86"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=5.50 cfs 1.073 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>2.35"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=30.75 cfs 3.960 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>1.80"
Flow Length=830' Tc=25.2 min CN=68 Runoff=11.52 cfs 1.381 af

Reach AP1: Analysis Point 1 Inflow=5.86 cfs 0.795 af
Outflow=5.86 cfs 0.795 af

Reach AP2: Analysis Point 2 Inflow=5.50 cfs 1.073 af
Outflow=5.50 cfs 1.073 af

Reach AP3: Analysis Point 3 Inflow=11.52 cfs 1.381 af
Outflow=11.52 cfs 1.381 af

Reach AP4: Analysis Point 4 Inflow=30.75 cfs 3.960 af
Outflow=30.75 cfs 3.960 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>4.35"
Flow Length=335' Tc=39.2 min CN=84 Runoff=2.02 cfs 0.290 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>2.66"
Flow Length=460' Tc=31.3 min CN=67 Runoff=7.00 cfs 0.905 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>1.53"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=11.14 cfs 1.916 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>3.43"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=45.07 cfs 5.776 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>2.76"
Flow Length=830' Tc=25.2 min CN=68 Runoff=18.10 cfs 2.121 af

Reach AP1: Analysis Point 1 Inflow=8.97 cfs 1.196 af
Outflow=8.97 cfs 1.196 af

Reach AP2: Analysis Point 2 Inflow=11.14 cfs 1.916 af
Outflow=11.14 cfs 1.916 af

Reach AP3: Analysis Point 3 Inflow=18.10 cfs 2.121 af
Outflow=18.10 cfs 2.121 af

Reach AP4: Analysis Point 4 Inflow=45.07 cfs 5.776 af
Outflow=45.07 cfs 5.776 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.800 ac 26.25% Impervious Runoff Depth>5.39"
Flow Length=335' Tc=39.2 min CN=84 Runoff=2.48 cfs 0.359 af

Subcatchment 2S: 2 Runoff Area=4.080 ac 0.00% Impervious Runoff Depth>3.52"
Flow Length=460' Tc=31.3 min CN=67 Runoff=9.34 cfs 1.198 af

Subcatchment 3S: 3 Runoff Area=15.010 ac 2.60% Impervious Runoff Depth>2.19"
Flow Length=1,815' Tc=45.3 min CN=54 Runoff=16.76 cfs 2.740 af

Subcatchment 4S: 4 Runoff Area=20.200 ac 1.29% Impervious Runoff Depth>4.39"
Flow Length=1,405' Tc=31.6 min CN=75 Runoff=57.59 cfs 7.387 af

Subcatchment 5S: 5 Runoff Area=9.220 ac 0.33% Impervious Runoff Depth>3.64"
Flow Length=830' Tc=25.2 min CN=68 Runoff=24.02 cfs 2.793 af

Reach AP1: Analysis Point 1 Inflow=11.76 cfs 1.557 af
Outflow=11.76 cfs 1.557 af

Reach AP2: Analysis Point 2 Inflow=16.76 cfs 2.740 af
Outflow=16.76 cfs 2.740 af

Reach AP3: Analysis Point 3 Inflow=24.02 cfs 2.793 af
Outflow=24.02 cfs 2.793 af

Reach AP4: Analysis Point 4 Inflow=57.59 cfs 7.387 af
Outflow=57.59 cfs 7.387 af

Summary for Subcatchment 1S: 1

Runoff = 2.48 cfs @ 12.52 hrs, Volume= 0.359 af, Depth> 5.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG D
0.250	79	Woods, Fair, HSG D
0.340	80	>75% Grass cover, Good, HSG D
0.800	84	Weighted Average
0.590		73.75% Pervious Area
0.210		26.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		**Sheet Flow, SF1-1** Woods: Light underbrush n= 0.400 P2= 3.30"
0.1	75	0.0500	9.49	94.94	**Channel Flow, CF1-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035 Earth, dense weeds
0.5	110	0.0050	3.47	2.73	**Pipe Channel, PF 1-1** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
39.2	335	Total			

Summary for Subcatchment 2S: 2

Runoff = 9.34 cfs @ 12.45 hrs, Volume= 1.198 af, Depth> 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

Area (ac)	CN	Description
2.960	79	Woods, Fair, HSG D
1.120	36	Woods, Fair, HSG A
4.080	67	Weighted Average
4.080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		**Sheet Flow, SF2-1** Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	60	0.0100	1.50		**Shallow Concentrated Flow, SCF2-1** Grassed Waterway Kv= 15.0 fps
1.4	250	0.0060	2.88	28.78	**Channel Flow, CF 2-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040
31.3	460	Total			

Summary for Subcatchment 3S: 3

Runoff = 16.76 cfs @ 12.67 hrs, Volume= 2.740 af, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	9.000	36	Woods, Fair, HSG A
	5.620	79	Woods, Fair, HSG D
*	0.390	98	Gravel Road
	15.010	54	Weighted Average
	14.620		97.40% Pervious Area
	0.390		2.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		**Sheet Flow, SF4-1** Woods: Light underbrush n= 0.400 P2= 3.30"
12.8	545	0.0200	0.71		**Shallow Concentrated Flow, SCF4-1** Woodland Kv= 5.0 fps
2.8	870	0.0200	5.25	52.54	**Channel Flow, CF4-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Winding stream, pools & shoals
0.5	250	0.0600	9.10	91.00	**Channel Flow, CF4-2** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040 Mountain streams
45.3	1,815	Total			

Summary for Subcatchment 4S: 4

Runoff = 57.59 cfs @ 12.44 hrs, Volume= 7.387 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	2.020	36	Woods, Fair, HSG A
	17.920	79	Woods, Fair, HSG D
*	0.260	98	Gravel Road
	20.200	75	Weighted Average
	19.940		98.71% Pervious Area
	0.260		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6	150	0.0380	0.11		**Sheet Flow, SF5-1** Woods: Light underbrush n= 0.400 P2= 3.30"
6.2	370	0.0400	1.00		**Shallow Concentrated Flow, SCF5-1** Woodland Kv= 5.0 fps
1.0	330	0.0200	5.25	52.54	**Channel Flow, CF5-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.040
1.8	555	0.0140	5.02	50.24	**Channel Flow, CF 5-2** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035
31.6	1,405	Total			

Summary for Subcatchment 5S: 5

Runoff = 24.02 cfs @ 12.36 hrs, Volume= 2.793 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	2.350	36	Woods, Fair, HSG A
	6.840	79	Woods, Fair, HSG D
*	0.030	98	Gravel Road
	9.220	68	Weighted Average
	9.190		99.67% Pervious Area
	0.030		0.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2	150	0.0400	0.11		**Sheet Flow, SF6-1** Woods: Light underbrush n= 0.400 P2= 3.30"
2.7	490	0.0400	3.00		**Shallow Concentrated Flow, SCF6-1** Grassed Waterway Kv= 15.0 fps
0.3	190	0.0600	10.40	104.00	**Channel Flow, CF6-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035
25.2	830	Total			

Summary for Reach AP1: Analysis Point 1

Inflow Area = 4.880 ac, 4.30% Impervious, Inflow Depth > 3.83" for 50yr event
Inflow = 11.76 cfs @ 12.46 hrs, Volume= 1.557 af
Outflow = 11.76 cfs @ 12.46 hrs, Volume= 1.557 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP2: Analysis Point 2

Inflow Area = 15.010 ac, 2.60% Impervious, Inflow Depth > 2.19" for 50yr event
Inflow = 16.76 cfs @ 12.67 hrs, Volume= 2.740 af
Outflow = 16.76 cfs @ 12.67 hrs, Volume= 2.740 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP3: Analysis Point 3

Inflow Area = 9.220 ac, 0.33% Impervious, Inflow Depth > 3.64" for 50yr event
Inflow = 24.02 cfs @ 12.36 hrs, Volume= 2.793 af
Outflow = 24.02 cfs @ 12.36 hrs, Volume= 2.793 af, Atten= 0%, Lag= 0.0 min

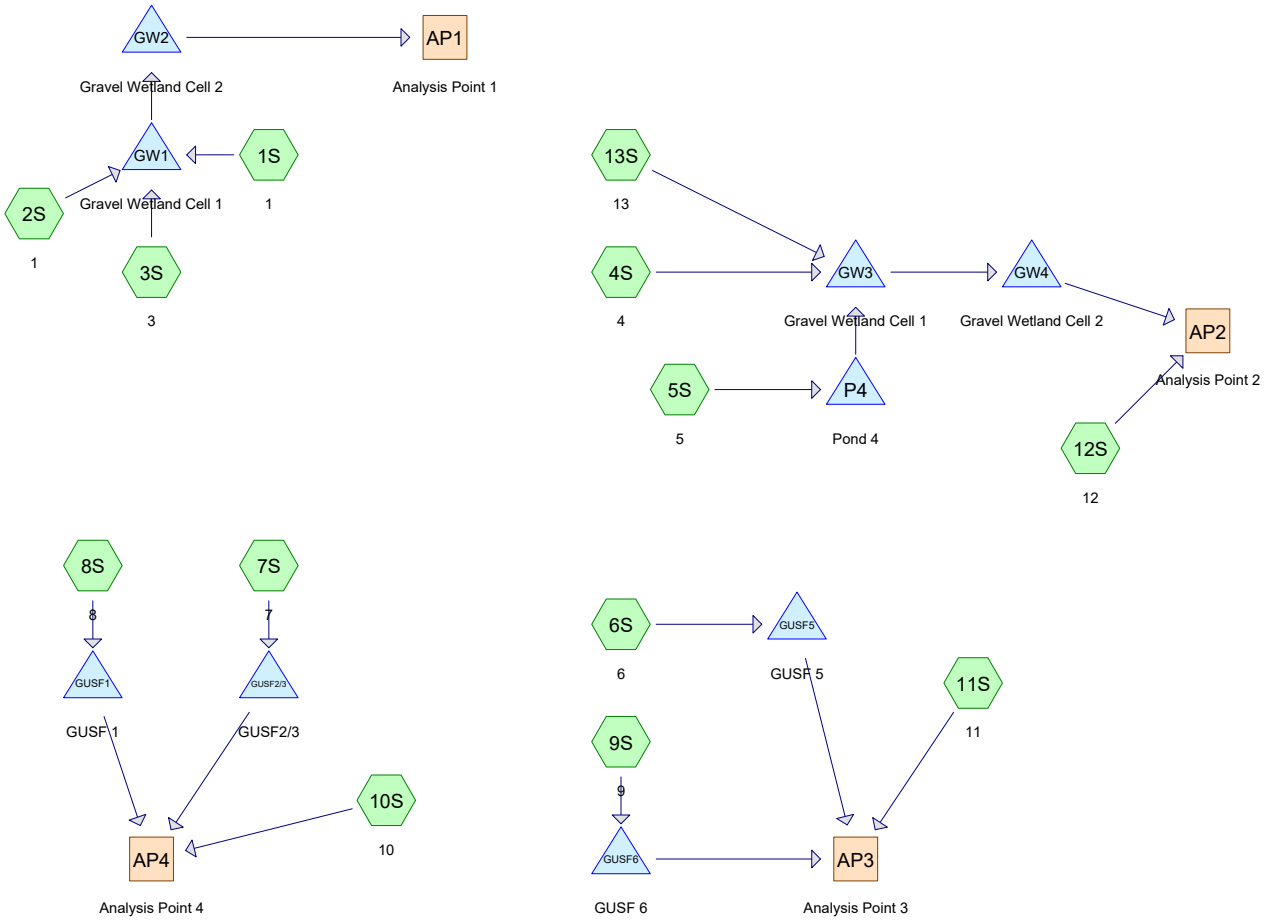
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP4: Analysis Point 4

Inflow Area = 20.200 ac, 1.29% Impervious, Inflow Depth > 4.39" for 50yr event
Inflow = 57.59 cfs @ 12.44 hrs, Volume= 7.387 af
Outflow = 57.59 cfs @ 12.44 hrs, Volume= 7.387 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

E. POST-DEVELOPMENT HYDROCAD RESULTS



Subcat Reach Pond Link

Routing Diagram for Post-Dev Hydro Updated 4-2-19
Prepared by CES, INC., Printed 4/2/2019
HydroCAD® 10.00-24 s/n 00641 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>2.17"
Tc=6.0 min CN=89 Runoff=2.35 cfs 0.172 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>1.21"
Flow Length=495' Tc=33.5 min CN=76 Runoff=1.57 cfs 0.213 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>0.41"
Flow Length=633' Tc=24.4 min CN=59 Runoff=0.33 cfs 0.059 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>2.09"
Tc=6.0 min CN=88 Runoff=9.02 cfs 0.657 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=80 Runoff=1.38 cfs 0.101 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>2.26"
Tc=6.0 min CN=90 Runoff=2.82 cfs 0.207 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>2.54"
Tc=6.0 min CN=93 Runoff=9.21 cfs 0.692 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>2.44"
Tc=6.0 min CN=92 Runoff=4.78 cfs 0.356 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>1.84"
Tc=6.0 min CN=85 Runoff=1.38 cfs 0.100 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>1.40"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=12.54 cfs 1.583 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>0.78"
Flow Length=760' Tc=29.5 min CN=68 Runoff=3.97 cfs 0.564 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>0.17"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=0.27 cfs 0.133 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>0.99"
Tc=6.0 min CN=72 Runoff=1.50 cfs 0.116 af

Reach AP1: Analysis Point 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach AP2: Analysis Point 2 Inflow=0.27 cfs 0.133 af
Outflow=0.27 cfs 0.133 af

Reach AP3: Analysis Point 3 Inflow=3.97 cfs 0.564 af
Outflow=3.97 cfs 0.564 af

Reach AP4: Analysis Point 4	Inflow=14.53 cfs 2.171 af Outflow=14.53 cfs 2.171 af
Pond GUSF1: GUSF 1	Peak Elev=122.01' Storage=8,812 cf Inflow=4.78 cfs 0.356 af Outflow=0.55 cfs 0.210 af
Pond GUSF2/3: GUSF2/3	Peak Elev=115.83' Storage=17,050 cf Inflow=9.21 cfs 0.692 af Outflow=1.44 cfs 0.379 af
Pond GUSF5: GUSF 5	Peak Elev=122.38' Storage=9,020 cf Inflow=2.82 cfs 0.207 af Outflow=0.00 cfs 0.000 af
Pond GUSF6: GUSF 6	Peak Elev=118.23' Storage=4,344 cf Inflow=1.38 cfs 0.100 af Outflow=0.00 cfs 0.000 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=121.86' Storage=12,157 cf Inflow=2.84 cfs 0.444 af Outflow=0.38 cfs 0.190 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=121.27' Storage=8,249 cf Inflow=0.38 cfs 0.190 af Outflow=0.00 cfs 0.000 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=120.47' Storage=21,248 cf Inflow=10.50 cfs 0.773 af Outflow=0.64 cfs 0.358 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=120.40' Storage=15,588 cf Inflow=0.64 cfs 0.358 af Outflow=0.00 cfs 0.000 af
Pond P4: Pond 4	Peak Elev=125.13' Storage=4,397 cf Inflow=1.38 cfs 0.101 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 49.310 ac Runoff Volume = 4.953 af Average Runoff Depth = 1.21"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>3.67"
Tc=6.0 min CN=89 Runoff=3.89 cfs 0.291 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>2.44"
Flow Length=495' Tc=33.5 min CN=76 Runoff=3.25 cfs 0.428 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>1.17"
Flow Length=633' Tc=24.4 min CN=59 Runoff=1.29 cfs 0.170 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>3.57"
Tc=6.0 min CN=88 Runoff=15.15 cfs 1.125 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>2.80"
Tc=6.0 min CN=80 Runoff=2.64 cfs 0.192 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>3.78"
Tc=6.0 min CN=90 Runoff=4.60 cfs 0.346 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>4.10"
Tc=6.0 min CN=93 Runoff=14.45 cfs 1.116 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>3.99"
Tc=6.0 min CN=92 Runoff=7.61 cfs 0.582 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>3.27"
Tc=6.0 min CN=85 Runoff=2.42 cfs 0.177 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>2.70"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=24.51 cfs 3.046 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>1.80"
Flow Length=760' Tc=29.5 min CN=68 Runoff=10.10 cfs 1.297 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>0.69"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=2.27 cfs 0.548 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>2.12"
Tc=6.0 min CN=72 Runoff=3.38 cfs 0.247 af

Reach AP1: Analysis Point 1 Inflow=1.23 cfs 0.378 af
Outflow=1.23 cfs 0.378 af

Reach AP2: Analysis Point 2 Inflow=2.27 cfs 1.013 af
Outflow=2.27 cfs 1.013 af

Reach AP3: Analysis Point 3 Inflow=10.10 cfs 1.463 af
Outflow=10.10 cfs 1.463 af

Reach AP4: Analysis Point 4	Inflow=26.70 cfs 4.281 af Outflow=26.70 cfs 4.281 af
Pond GUSF1: GUSF 1	Peak Elev=122.94' Storage=15,210 cf Inflow=7.61 cfs 0.582 af Outflow=0.61 cfs 0.434 af
Pond GUSF2/3: GUSF2/3	Peak Elev=116.73' Storage=28,191 cf Inflow=14.45 cfs 1.116 af Outflow=1.61 cfs 0.800 af
Pond GUSF5: GUSF 5	Peak Elev=122.57' Storage=10,515 cf Inflow=4.60 cfs 0.346 af Outflow=0.30 cfs 0.114 af
Pond GUSF6: GUSF 6	Peak Elev=118.54' Storage=5,620 cf Inflow=2.42 cfs 0.177 af Outflow=0.13 cfs 0.051 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=122.65' Storage=17,043 cf Inflow=5.68 cfs 0.889 af Outflow=2.40 cfs 0.626 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=121.85' Storage=11,386 cf Inflow=2.40 cfs 0.626 af Outflow=1.23 cfs 0.378 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=121.21' Storage=30,314 cf Inflow=18.52 cfs 1.420 af Outflow=4.73 cfs 0.982 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=121.51' Storage=26,482 cf Inflow=4.73 cfs 0.982 af Outflow=0.63 cfs 0.465 af
Pond P4: Pond 4	Peak Elev=125.54' Storage=6,368 cf Inflow=2.64 cfs 0.192 af Outflow=0.12 cfs 0.048 af

Total Runoff Area = 49.310 ac Runoff Volume = 9.565 af Average Runoff Depth = 2.33"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>4.93"
Tc=6.0 min CN=89 Runoff=5.14 cfs 0.390 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>3.53"
Flow Length=495' Tc=33.5 min CN=76 Runoff=4.72 cfs 0.621 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>1.96"
Flow Length=633' Tc=24.4 min CN=59 Runoff=2.33 cfs 0.284 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>4.82"
Tc=6.0 min CN=88 Runoff=20.12 cfs 1.517 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>3.96"
Tc=6.0 min CN=80 Runoff=3.71 cfs 0.271 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>5.04"
Tc=6.0 min CN=90 Runoff=6.04 cfs 0.462 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>5.38"
Tc=6.0 min CN=93 Runoff=18.67 cfs 1.465 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>5.26"
Tc=6.0 min CN=92 Runoff=9.87 cfs 0.767 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>4.49"
Tc=6.0 min CN=85 Runoff=3.28 cfs 0.243 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>3.84"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=34.77 cfs 4.330 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>2.76"
Flow Length=760' Tc=29.5 min CN=68 Runoff=15.86 cfs 1.992 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>1.29"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=5.07 cfs 1.028 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>3.15"
Tc=6.0 min CN=72 Runoff=5.08 cfs 0.368 af

Reach AP1: Analysis Point 1 Inflow=3.20 cfs 0.777 af
Outflow=3.20 cfs 0.777 af

Reach AP2: Analysis Point 2 Inflow=5.68 cfs 1.925 af
Outflow=5.68 cfs 1.925 af

Reach AP3: Analysis Point 3 Inflow=17.84 cfs 2.337 af
Outflow=17.84 cfs 2.337 af

Reach AP4: Analysis Point 4	Inflow=41.65 cfs 6.096 af Outflow=41.65 cfs 6.096 af	
Pond GUSF1: GUSF 1	Peak Elev=123.21' Storage=17,476 cf	Inflow=9.87 cfs 0.767 af Outflow=2.94 cfs 0.619 af
Pond GUSF2/3: GUSF2/3	Peak Elev=117.22' Storage=34,921 cf	Inflow=18.67 cfs 1.465 af Outflow=4.20 cfs 1.147 af
Pond GUSF5: GUSF 5	Peak Elev=122.70' Storage=11,565 cf	Inflow=6.04 cfs 0.462 af Outflow=1.40 cfs 0.229 af
Pond GUSF6: GUSF 6	Peak Elev=118.63' Storage=5,993 cf	Inflow=3.28 cfs 0.243 af Outflow=0.70 cfs 0.117 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=123.23' Storage=21,101 cf	Inflow=8.55 cfs 1.294 af Outflow=5.95 cfs 1.026 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=121.99' Storage=12,136 cf	Inflow=5.95 cfs 1.026 af Outflow=3.20 cfs 0.777 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=121.51' Storage=34,313 cf	Inflow=25.19 cfs 2.012 af Outflow=12.91 cfs 1.560 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=122.13' Storage=33,181 cf	Inflow=12.91 cfs 1.560 af Outflow=1.85 cfs 0.897 af
Pond P4: Pond 4	Peak Elev=125.60' Storage=6,705 cf	Inflow=3.71 cfs 0.271 af Outflow=0.51 cfs 0.127 af

Total Runoff Area = 49.310 ac Runoff Volume = 13.737 af Average Runoff Depth = 3.34"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 1 Runoff Area=0.950 ac 27.37% Impervious Runoff Depth>6.00"
Tc=6.0 min CN=89 Runoff=6.19 cfs 0.475 af

Subcatchment 2S: 1 Runoff Area=2.110 ac 4.27% Impervious Runoff Depth>4.50"
Flow Length=495' Tc=33.5 min CN=76 Runoff=6.00 cfs 0.791 af

Subcatchment 3S: 3 Runoff Area=1.740 ac 18.97% Impervious Runoff Depth>2.70"
Flow Length=633' Tc=24.4 min CN=59 Runoff=3.31 cfs 0.392 af

Subcatchment 4S: 4 Runoff Area=3.780 ac 80.42% Impervious Runoff Depth>5.88"
Tc=6.0 min CN=88 Runoff=24.31 cfs 1.853 af

Subcatchment 5S: 5 Runoff Area=0.820 ac 64.63% Impervious Runoff Depth>4.97"
Tc=6.0 min CN=80 Runoff=4.62 cfs 0.339 af

Subcatchment 6S: 6 Runoff Area=1.100 ac 58.18% Impervious Runoff Depth>6.11"
Tc=6.0 min CN=90 Runoff=7.25 cfs 0.560 af

Subcatchment 7S: 7 Runoff Area=3.270 ac 76.15% Impervious Runoff Depth>6.46"
Tc=6.0 min CN=93 Runoff=22.21 cfs 1.762 af

Subcatchment 8S: 8 Runoff Area=1.750 ac 68.00% Impervious Runoff Depth>6.35"
Tc=6.0 min CN=92 Runoff=11.78 cfs 0.926 af

Subcatchment 9S: 9 Runoff Area=0.650 ac 29.23% Impervious Runoff Depth>5.54"
Tc=6.0 min CN=85 Runoff=4.00 cfs 0.300 af

Subcatchment 10S: 10 Runoff Area=13.540 ac 0.07% Impervious Runoff Depth>4.83"
Flow Length=1,010' Tc=29.6 min CN=79 Runoff=43.60 cfs 5.455 af

Subcatchment 11S: 11 Runoff Area=8.670 ac 0.00% Impervious Runoff Depth>3.63"
Flow Length=760' Tc=29.5 min CN=68 Runoff=21.06 cfs 2.624 af

Subcatchment 12S: 12 Runoff Area=9.530 ac 0.63% Impervious Runoff Depth>1.90"
Flow Length=1,080' Tc=55.0 min CN=51 Runoff=7.98 cfs 1.507 af

Subcatchment 13S: 13 Runoff Area=1.400 ac 30.71% Impervious Runoff Depth>4.08"
Tc=6.0 min CN=72 Runoff=6.57 cfs 0.476 af

Reach AP1: Analysis Point 1 Inflow=5.80 cfs 1.135 af
Outflow=5.80 cfs 1.135 af

Reach AP2: Analysis Point 2 Inflow=12.97 cfs 2.879 af
Outflow=12.97 cfs 2.879 af

Reach AP3: Analysis Point 3 Inflow=25.16 cfs 3.124 af
Outflow=25.16 cfs 3.124 af

Reach AP4: Analysis Point 4		Inflow=55.93 cfs 7.672 af Outflow=55.93 cfs 7.672 af
Pond GUSF1: GUSF 1	Peak Elev=123.32' Storage=18,500 cf	Inflow=11.78 cfs 0.926 af Outflow=5.26 cfs 0.777 af
Pond GUSF2/3: GUSF2/3	Peak Elev=117.38' Storage=37,319 cf	Inflow=22.21 cfs 1.762 af Outflow=7.83 cfs 1.441 af
Pond GUSF5: GUSF 5	Peak Elev=122.82' Storage=12,499 cf	Inflow=7.25 cfs 0.560 af Outflow=2.74 cfs 0.327 af
Pond GUSF6: GUSF 6	Peak Elev=118.72' Storage=6,393 cf	Inflow=4.00 cfs 0.300 af Outflow=1.57 cfs 0.173 af
Pond GW1: Gravel Wetland Cell 1	Peak Elev=123.40' Storage=22,382 cf	Inflow=11.11 cfs 1.657 af Outflow=9.99 cfs 1.384 af
Pond GW2: Gravel Wetland Cell 2	Peak Elev=122.33' Storage=14,038 cf	Inflow=9.99 cfs 1.384 af Outflow=5.80 cfs 1.135 af
Pond GW3: Gravel Wetland Cell 1	Peak Elev=121.75' Storage=37,456 cf	Inflow=30.88 cfs 2.524 af Outflow=20.82 cfs 2.063 af
Pond GW4: Gravel Wetland Cell 2	Peak Elev=122.31' Storage=35,226 cf	Inflow=20.82 cfs 2.063 af Outflow=5.02 cfs 1.371 af
Pond P4: Pond 4	Peak Elev=125.71' Storage=7,281 cf	Inflow=4.62 cfs 0.339 af Outflow=1.51 cfs 0.195 af

Total Runoff Area = 49.310 ac Runoff Volume = 17.459 af Average Runoff Depth = 4.25"
81.22% Pervious = 40.050 ac 18.78% Impervious = 9.260 ac

Summary for Subcatchment 1S: 1

Runoff = 6.19 cfs @ 12.09 hrs, Volume= 0.475 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.260	98	Pavement
	0.260	98	Water Surface, 0% imp, HSG D
	0.430	78	Meadow, non-grazed, HSG D
	0.950	89	Weighted Average
	0.690		72.63% Pervious Area
	0.260		27.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 1**

Summary for Subcatchment 2S: 1

Runoff = 6.00 cfs @ 12.46 hrs, Volume= 0.791 af, Depth> 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.090	98	Pavement
	0.210	36	Woods, Fair, HSG A
	0.070	98	Water Surface, 0% imp, HSG D
	0.120	78	Meadow, non-grazed, HSG D
	1.620	79	Woods, Fair, HSG D
	2.110	76	Weighted Average
	2.020		95.73% Pervious Area
	0.090		4.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	150	0.0200	0.09		**Sheet Flow, SF1-1** Woods: Light underbrush n= 0.400 P2= 3.30"
3.2	95	0.0100	0.50		**Shallow Concentrated Flow, SCF1-1** Woodland Kv= 5.0 fps
1.1	250	0.0060	3.84	38.37	**Channel Flow, CF1-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
33.5	495	Total			

Summary for Subcatchment 3S: 3

Runoff = 3.31 cfs @ 12.36 hrs, Volume= 0.392 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.330	98	Pavement
	0.020	30	Meadow, non-grazed, HSG A
	0.930	36	Woods, Fair, HSG A
	0.390	79	Woods, Fair, HSG D
	0.070	78	Meadow, non-grazed, HSG D
	1.740	59	Weighted Average
	1.410		81.03% Pervious Area
	0.330		18.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2	150	0.0400	0.11		**Sheet Flow, SF3-1** Woods: Light underbrush n= 0.400 P2= 3.30"
0.8	57	0.0300	1.21		**Shallow Concentrated Flow, SCF3-1** Short Grass Pasture Kv= 7.0 fps
0.2	66	0.0050	4.97	8.78	**Pipe Channel, CMP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
0.9	260	0.0050	4.78	47.76	**Channel Flow, CF3-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.022 Earth, clean & straight
0.3	100	0.0050	4.97	8.78	**Pipe Channel, CMP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
24.4	633	Total			

Summary for Subcatchment 4S: 4

Runoff = 24.31 cfs @ 12.09 hrs, Volume= 1.853 af, Depth> 5.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	3.040	98	Pavement/Building
	0.590	39	>75% Grass cover, Good, HSG A
	0.020	78	Meadow, non-grazed, HSG D
	0.130	79	Woods, Fair, HSG D
	3.780	88	Weighted Average
	0.740		19.58% Pervious Area
	3.040		80.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 4**

Summary for Subcatchment 5S: 5

Runoff = 4.62 cfs @ 12.09 hrs, Volume= 0.339 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.490	98	Pavement/Building
	0.230	39	>75% Grass cover, Good, HSG A
	0.060	78	Meadow, non-grazed, HSG D
*	0.040	98	Rip rap
	0.820	80	Weighted Average
	0.290		35.37% Pervious Area
	0.530		64.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 5**

Summary for Subcatchment 6S: 6

Runoff = 7.25 cfs @ 12.09 hrs, Volume= 0.560 af, Depth> 6.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.590	98	Pavement
	0.080	78	Meadow, non-grazed, HSG D
*	0.050	98	Rip Rap
	0.380	80	>75% Grass cover, Good, HSG D
	1.100	90	Weighted Average
	0.460		41.82% Pervious Area
	0.640		58.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6**

Summary for Subcatchment 7S: 7

Runoff = 22.21 cfs @ 12.09 hrs, Volume= 1.762 af, Depth> 6.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	2.470	98	Pavement/Building
	0.340	78	Meadow, non-grazed, HSG D
*	0.020	98	Rip rap forebay
	0.070	80	>75% Grass cover, Good, HSG D
	0.370	79	Woods, Fair, HSG D
	3.270	93	Weighted Average
	0.780		23.85% Pervious Area
	2.490		76.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 7**

Summary for Subcatchment 8S: 8

Runoff = 11.78 cfs @ 12.09 hrs, Volume= 0.926 af, Depth> 6.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	1.150	98	Pavement/Building
	0.180	78	Meadow, non-grazed, HSG D
*	0.040	98	Rip rap forebay
	0.380	80	>75% Grass cover, Good, HSG D
	1.750	92	Weighted Average
	0.560		32.00% Pervious Area
	1.190		68.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 8**

Summary for Subcatchment 9S: 9

Runoff = 4.00 cfs @ 12.09 hrs, Volume= 0.300 af, Depth> 5.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.180	98	Pavement
*	0.010	98	Rip Rap
	0.080	78	Meadow, non-grazed, HSG D
	0.230	80	>75% Grass cover, Good, HSG D
	0.150	79	Woods, Fair, HSG D
	0.650	85	Weighted Average
	0.460		70.77% Pervious Area
	0.190		29.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 9**

Summary for Subcatchment 10S: 10

Runoff = 43.60 cfs @ 12.40 hrs, Volume= 5.455 af, Depth> 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	0.050	36	Woods, Fair, HSG A
	13.450	79	Woods, Fair, HSG D
*	0.010	98	Pavement
	0.030	80	>75% Grass cover, Good, HSG D
	13.540	79	Weighted Average
	13.530		99.93% Pervious Area
	0.010		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.9	150	0.0300	0.10		**Sheet Flow, SF 10-1** Woods: Light underbrush n= 0.400 P2= 3.30"
1.2	75	0.0400	1.00		**Shallow Concentrated Flow, SCF10-1** Woodland Kv= 5.0 fps
1.8	230	0.0200	2.12		**Shallow Concentrated Flow, SCF 10-2** Grassed Waterway Kv= 15.0 fps
1.6	555	0.0140	5.86	58.61	**Channel Flow, CF 10-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.030 Stream, clean & straight
29.6	1,010	Total			

Summary for Subcatchment 11S: 11

Runoff = 21.06 cfs @ 12.42 hrs, Volume= 2.624 af, Depth> 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

Area (ac)	CN	Description
2.300	36	Woods, Fair, HSG A
6.370	79	Woods, Fair, HSG D
8.670	68	Weighted Average
8.670		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.2	150	0.0400	0.11		**Sheet Flow, SF11-1** Woods: Light underbrush n= 0.400 P2= 3.30"
6.9	390	0.0350	0.94		**Shallow Concentrated Flow, SCF11-1** Woodland Kv= 5.0 fps
0.4	220	0.0600	10.40	104.00	**Channel Flow, CF 11-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035 Earth, dense weeds
29.5	760	Total			

Summary for Subcatchment 12S: 12

Runoff = 7.98 cfs @ 12.83 hrs, Volume= 1.507 af, Depth> 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
	6.230	36	Woods, Fair, HSG A
	0.080	39	>75% Grass cover, Good, HSG A
*	0.060	98	Pavement
	3.160	79	Woods, Fair, HSG D
	9.530	51	Weighted Average
	9.470		99.37% Pervious Area
	0.060		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.6	150	0.0100	0.06		**Sheet Flow, SF12-1** Woods: Light underbrush n= 0.400 P2= 3.30"
16.0	680	0.0200	0.71		**Shallow Concentrated Flow, SCF12-1** Woodland Kv= 5.0 fps
0.4	250	0.0600	10.40	104.00	**Channel Flow, CF12-1** Area= 10.0 sf Perim= 10.0' r= 1.00' n= 0.035 Earth, dense weeds
55.0	1,080	Total			

Summary for Subcatchment 13S: 13

Runoff = 6.57 cfs @ 12.09 hrs, Volume= 0.476 af, Depth> 4.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=7.30"

	Area (ac)	CN	Description
*	0.090	98	Pavement
	0.340	98	Water Surface, HSG D
	0.610	78	Meadow, non-grazed, HSG D
	0.360	30	Meadow, non-grazed, HSG A
	1.400	72	Weighted Average
	0.970		69.29% Pervious Area
	0.430		30.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach AP1: Analysis Point 1

Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth > 2.84" for 50yr event
Inflow = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af
Outflow = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP2: Analysis Point 2

Inflow Area = 15.530 ac, 26.14% Impervious, Inflow Depth > 2.22" for 50yr event
Inflow = 12.97 cfs @ 12.86 hrs, Volume= 2.879 af
Outflow = 12.97 cfs @ 12.86 hrs, Volume= 2.879 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP3: Analysis Point 3

Inflow Area = 10.420 ac, 7.97% Impervious, Inflow Depth > 3.60" for 50yr event
Inflow = 25.16 cfs @ 12.40 hrs, Volume= 3.124 af
Outflow = 25.16 cfs @ 12.40 hrs, Volume= 3.124 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach AP4: Analysis Point 4

Inflow Area = 18.560 ac, 19.88% Impervious, Inflow Depth > 4.96" for 50yr event
Inflow = 55.93 cfs @ 12.39 hrs, Volume= 7.672 af
Outflow = 55.93 cfs @ 12.39 hrs, Volume= 7.672 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond GUSF1: GUSF 1

Inflow Area = 1.750 ac, 68.00% Impervious, Inflow Depth > 6.35" for 50yr event
Inflow = 11.78 cfs @ 12.09 hrs, Volume= 0.926 af
Outflow = 5.26 cfs @ 12.27 hrs, Volume= 0.777 af, Atten= 55%, Lag= 11.2 min
Primary = 5.26 cfs @ 12.27 hrs, Volume= 0.777 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.32' @ 12.27 hrs Surf.Area= 8,944 sf Storage= 18,500 cf

Plug-Flow detention time= 232.3 min calculated for 0.777 af (84% of inflow)
Center-of-Mass det. time= 166.3 min (937.5 - 771.1)

Volume	Invert	Avail.Storage	Storage Description
#1	120.00'	24,848 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
120.00	3,545	0	0
121.00	4,370	3,958	3,958
122.00	5,270	4,820	8,778
123.00	8,530	6,900	15,678
124.00	9,810	9,170	24,848

Device	Routing	Invert	Outlet Devices
#1	Device 2	121.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	117.00'	**4.0" Round Culvert** L= 60.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 117.00' / 116.83' S= 0.0028 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf
#3	Primary	123.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.19 cfs @ 12.27 hrs HW=123.32' (Free Discharge)
- **2=Culvert** (Barrel Controls 0.62 cfs @ 7.16 fps)
  - **1=Orifice/Grate** (Passes 0.62 cfs of 5.10 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 4.57 cfs @ 1.43 fps)

Summary for Pond GUSF2/3: GUSF2/3

Inflow Area = 3.270 ac, 76.15% Impervious, Inflow Depth > 6.46" for 50yr event
Inflow = 22.21 cfs @ 12.09 hrs, Volume= 1.762 af
Outflow = 7.83 cfs @ 12.36 hrs, Volume= 1.441 af, Atten= 65%, Lag= 16.2 min
Primary = 7.83 cfs @ 12.36 hrs, Volume= 1.441 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 117.38' @ 12.36 hrs Surf.Area= 14,650 sf Storage= 37,319 cf

Plug-Flow detention time= 214.0 min calculated for 1.441 af (82% of inflow)
Center-of-Mass det. time= 143.1 min (910.4 - 767.3)

Volume	Invert	Avail.Storage	Storage Description
#1	114.00'	46,745 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
114.00	6,270	0	0
115.00	9,930	8,100	8,100
116.00	11,860	10,895	18,995
117.00	13,860	12,860	31,855
118.00	15,920	14,890	46,745

Device	Routing	Invert	Outlet Devices
#1	Primary	111.83'	**6.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 111.83' / 111.70' S= 0.0026 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.20 sf
#2	Device 1	115.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	117.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=7.80 cfs @ 12.36 hrs HW=117.38' (Free Discharge)
- **1=Culvert** (Barrel Controls 1.72 cfs @ 8.78 fps)
  - **2=Orifice/Grate** (Passes 1.72 cfs of 11.67 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 6.07 cfs @ 1.59 fps)

Summary for Pond GUSF5: GUSF 5

Inflow Area = 1.100 ac, 58.18% Impervious, Inflow Depth > 6.11" for 50yr event
Inflow = 7.25 cfs @ 12.09 hrs, Volume= 0.560 af
Outflow = 2.74 cfs @ 12.33 hrs, Volume= 0.327 af, Atten= 62%, Lag= 14.8 min
Primary = 2.74 cfs @ 12.33 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.82' @ 12.33 hrs Surf.Area= 8,306 sf Storage= 12,499 cf

Plug-Flow detention time= 212.4 min calculated for 0.327 af (58% of inflow)
Center-of-Mass det. time= 107.7 min (885.8 - 778.2)

Volume	Invert	Avail.Storage	Storage Description
#1	121.00'	18,555 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
121.00	5,510	0	0
122.00	7,000	6,255	6,255
123.00	8,600	7,800	14,055
123.50	9,400	4,500	18,555

Device	Routing	Invert	Outlet Devices
#1	Device 2	122.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	118.00'	**12.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 118.00' / 117.45' S= 0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=2.73 cfs @ 12.33 hrs HW=122.82' (Free Discharge)
└**2=Culvert** (Passes 2.73 cfs of 6.20 cfs potential flow)
└**1=Orifice/Grate** (Weir Controls 2.73 cfs @ 1.84 fps)

Summary for Pond GUSF6: GUSF 6

Inflow Area = 0.650 ac, 29.23% Impervious, Inflow Depth > 5.54" for 50yr event
Inflow = 4.00 cfs @ 12.09 hrs, Volume= 0.300 af
Outflow = 1.57 cfs @ 12.33 hrs, Volume= 0.173 af, Atten= 61%, Lag= 14.3 min
Primary = 1.57 cfs @ 12.33 hrs, Volume= 0.173 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 118.72' @ 12.33 hrs Surf.Area= 4,416 sf Storage= 6,393 cf

Plug-Flow detention time= 203.6 min calculated for 0.173 af (58% of inflow)
Center-of-Mass det. time= 100.2 min (893.3 - 793.1)

Volume	Invert	Avail.Storage	Storage Description
#1	117.00'	12,790 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.00	3,050	0	0
118.00	3,820	3,435	3,435
119.00	4,650	4,235	7,670
120.00	5,590	5,120	12,790

Device	Routing	Invert	Outlet Devices
#1	Primary	119.50'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 3	118.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	114.83'	**15.0" Round Culvert** L= 110.0' CMP, projecting, no headwall, Ke= 0.900

Inlet / Outlet Invert= 114.83' / 114.28' S= 0.0050 '/' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.56 cfs @ 12.33 hrs HW=118.72' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Culvert** (Passes 1.56 cfs of 8.43 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 1.56 cfs @ 1.52 fps)

Summary for Pond GW1: Gravel Wetland Cell 1

Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth > 4.14" for 50yr event
Inflow = 11.11 cfs @ 12.37 hrs, Volume= 1.657 af
Outflow = 9.99 cfs @ 12.52 hrs, Volume= 1.384 af, Atten= 10%, Lag= 8.8 min
Primary = 9.99 cfs @ 12.52 hrs, Volume= 1.384 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 123.40' @ 12.52 hrs Surf.Area= 7,595 sf Storage= 22,382 cf

Plug-Flow detention time= 130.3 min calculated for 1.384 af (84% of inflow)
Center-of-Mass det. time= 63.0 min (891.3 - 828.3)

Volume	Invert	Avail.Storage	Storage Description
#1	119.60'	23,169 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.60	4,864	0	0
122.00	5,939	12,964	12,964
123.00	7,071	6,505	19,469
123.50	7,731	3,701	23,169

Device	Routing	Invert	Outlet Devices
#1	Primary	123.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	121.50'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 121.50' / 121.40' S= 0.0050 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=9.92 cfs @ 12.52 hrs HW=123.39' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.39 cfs @ 1.62 fps)
└**2=Culvert** (Inlet Controls 3.53 cfs @ 4.49 fps)

Summary for Pond GW2: Gravel Wetland Cell 2

Inflow Area = 4.800 ac, 14.17% Impervious, Inflow Depth > 3.46" for 50yr event
Inflow = 9.99 cfs @ 12.52 hrs, Volume= 1.384 af
Outflow = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af, Atten= 42%, Lag= 23.6 min
Primary = 5.80 cfs @ 12.91 hrs, Volume= 1.135 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.33' @ 12.91 hrs Surf.Area= 5,802 sf Storage= 14,038 cf

Plug-Flow detention time= 107.8 min calculated for 1.132 af (82% of inflow)
Center-of-Mass det. time= 38.6 min (929.9 - 891.3)

Volume	Invert	Avail.Storage	Storage Description
#1	119.60'	21,476 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
119.60	4,654	0	0
122.00	5,508	12,194	12,194
123.00	6,410	5,959	18,153
123.50	6,881	3,323	21,476

Device	Routing	Invert	Outlet Devices
#1	Device 2	121.70'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	119.20'	**12.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 119.20' / 118.80' S= 0.0050 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf
#3	Primary	123.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.79 cfs @ 12.91 hrs HW=122.32' (Free Discharge)
- **2=Culvert** (Barrel Controls 5.79 cfs @ 7.38 fps)
  - **1=Orifice/Grate** (Passes 5.79 cfs of 10.14 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond GW3: Gravel Wetland Cell 1

Inflow Area = 6.000 ac, 66.67% Impervious, Inflow Depth > 5.05" for 50yr event
Inflow = 30.88 cfs @ 12.09 hrs, Volume= 2.524 af
Outflow = 20.82 cfs @ 12.19 hrs, Volume= 2.063 af, Atten= 33%, Lag= 5.9 min
Primary = 20.82 cfs @ 12.19 hrs, Volume= 2.063 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 121.75' @ 12.19 hrs Surf.Area= 13,553 sf Storage= 37,456 cf

Plug-Flow detention time= 150.0 min calculated for 2.058 af (82% of inflow)

Center-of-Mass det. time= 78.0 min (879.3 - 801.4)

Volume	Invert	Avail.Storage	Storage Description
#1	118.40'	69,794 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
118.40	8,700	0	0
120.00	11,130	15,864	15,864
122.00	13,900	25,030	40,894
124.00	15,000	28,900	69,794

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	119.90'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 119.90' / 119.90' S= 0.0000 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=20.65 cfs @ 12.19 hrs HW=121.74' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 17.18 cfs @ 2.31 fps)
└**2=Culvert** (Inlet Controls 3.46 cfs @ 4.41 fps)

Summary for Pond GW4: Gravel Wetland Cell 2

Inflow Area = 6.000 ac, 66.67% Impervious, Inflow Depth > 4.13" for 50yr event
Inflow = 20.82 cfs @ 12.19 hrs, Volume= 2.063 af
Outflow = 5.02 cfs @ 12.89 hrs, Volume= 1.371 af, Atten= 76%, Lag= 42.2 min
Primary = 5.02 cfs @ 12.89 hrs, Volume= 1.371 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 122.31' @ 12.89 hrs Surf.Area= 11,643 sf Storage= 35,226 cf

Plug-Flow detention time= 209.4 min calculated for 1.371 af (66% of inflow)
Center-of-Mass det. time= 99.3 min (978.7 - 879.3)

Volume	Invert	Avail.Storage	Storage Description
#1	118.40'	57,758 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
118.40	6,500	0	0
120.00	8,610	12,088	12,088
122.00	11,030	19,640	31,728
124.00	15,000	26,030	57,758

Device	Routing	Invert	Outlet Devices
#1	Primary	122.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Device 3	121.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	117.75'	**4.0" Round Culvert** L= 30.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 117.60' / 117.75' S= -0.0050 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.09 sf

Primary OutFlow Max=5.00 cfs @ 12.89 hrs HW=122.31' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 4.31 cfs @ 1.40 fps)
└**3=Culvert** (Barrel Controls 0.70 cfs @ 7.99 fps)
└**2=Orifice/Grate** (Passes 0.70 cfs of 4.33 cfs potential flow)

Summary for Pond P4: Pond 4

Inflow Area = 0.820 ac, 64.63% Impervious, Inflow Depth > 4.97" for 50yr event
Inflow = 4.62 cfs @ 12.09 hrs, Volume= 0.339 af
Outflow = 1.51 cfs @ 12.40 hrs, Volume= 0.195 af, Atten= 67%, Lag= 18.8 min
Primary = 1.51 cfs @ 12.40 hrs, Volume= 0.195 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 125.71' @ 12.40 hrs Surf.Area= 5,339 sf Storage= 7,281 cf

Plug-Flow detention time= 205.7 min calculated for 0.195 af (58% of inflow)
Center-of-Mass det. time= 100.1 min (905.9 - 805.9)

Volume	Invert	Avail.Storage	Storage Description
#1	124.00'	11,893 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
124.00	3,190	0	0
125.00	4,420	3,805	3,805
126.00	5,710	5,065	8,870
126.50	6,380	3,023	11,893

Device	Routing	Invert	Outlet Devices
#1	Device 2	125.50'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	121.83'	**10.0" Round Culvert** L= 130.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 121.83' / 118.83' S= 0.0231 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.55 sf

Primary OutFlow Max=1.51 cfs @ 12.40 hrs HW=125.71' (Free Discharge)
└**2=Culvert** (Passes 1.51 cfs of 3.86 cfs potential flow)
└**1=Orifice/Grate** (Weir Controls 1.51 cfs @ 1.51 fps)

MAINTENANCE PLAN OF STORMWATER MANAGEMENT SYSTEM

The Maine Department of Environmental Protection's (MDEP) Stormwater Management for Maine: Best Management Practices latest edition and the MDEP's Chapter 500: Stormwater Management were used as guidelines in the development of this Maintenance Plan. General maintenance requirements are listed below.

A. DURING CONSTRUCTION

The general contractor will be responsible for the inspection and maintenance of all stormwater management system components during construction.

Inspection: Inspection of disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site will be performed at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. Inspections shall be conducted by a person with knowledge of erosion and stormwater control, including the standards and conditions in the permit.

Maintenance: All erosion control measures will be kept in effective operating condition until areas are permanently stabilized. If BMPs need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation will be completed within 7 calendar days and prior to any rainfall event.

Documentation: A log shall be kept summarizing the inspections and any corrective action taken. A copy of the log is provided at the end of this section, and is titled, Log of Inspections During Construction.

B. POST-CONSTRUCTION

The Owner will be responsible for the inspection and maintenance of all stormwater management system components associated with the proposed project. A list of corrective actions titled Inspection and Maintenance Plan for Stormwater Management Structures (BMPs) is provided at the end of this section.

Inspection and Corrective Action

1. **Vegetated Areas:** Inspections and maintenance of vegetated areas will be performed early in the growing season or after significant rainfall to identify any erosion problems. Areas where erosion is evident will be covered with an appropriate lining, or erosive flows will be diverted to an area able to handle the flows. Any bare areas or areas with sparse growth will be replanted.

2. **Ditches, Swales, and Culverts:** Inspections and maintenance of ditches, culverts, and swales will be performed in the Spring, late Fall, and after rain events greater than 1-inch in depth to remove any obstructions to flow, remove any accumulated sediments within the structures, to repair any erosion of channel linings, check dams, inlet protection, and outlet protection. Vegetated ditches and swales must be mowed no more than twice per year and cut no less than 6-inch in height.

3. **Grassed Underdrained Soil Filter (GUSF):** Inspections and maintenance of GUSF's will be performed annually in the spring and late fall to clean the basins of debris, sediment, and hydrocarbons. Accumulated sediments within the basin shall be removed and disposed of, and basin media shall be renewed if it fails to drain within 72 hours after a one-inch rainfall event. GUSF's are to be tilled, seeded, and mulched if vegetation is sparse. Repair all riprap where underlying filter fabric or gravel is showing or where stones have dislodged.

4. **Gravel Wetlands:** Inspections and maintenance of gravel wetlands will be performed annually in the spring and late fall to clean the basins of debris, sediment and hydrocarbons. Accumulated sediments within the basin shall be removed and disposed of, and basin media shall be renewed if it fails to drain within 72 hours after a one-inch rainfall event. Gravel wetlands are to be tilled, seeded, and mulched if vegetation is sparse. Repair all riprap where underlying filter fabric or gravel is showing or where stones have dislodged.

C. DOCUMENTATION

A log shall be kept summarizing the inspections, maintenance, and any corrective action taken. A copy of the log is provided at the end of this section, and is titled, BMP Inspection Log.

SACO DPW
LOG OF INSPECTIONS DURING CONSTRUCTION

Inspection Date	Inspector (Name and Qualifications)	Major Observations	Work Performed

Notes

1) Major Observations include the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Major Observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.
2) Work Performed will include a description of the corrective action taken, the date the corrective action was taken, and the name and qualifications of the person taking the corrective actions
3) The log must be made accessible to MDEP staff and a copy must be provided upon request.
4) The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

SACO DPW
BMP INSPECTION LOG

Date	Inspector (Name and Qualifications)	ID Number	BMP Structure	Work Performed	Comments

Notes

1) If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal.
2) BMP structures shall be numbered sequentially and located on attached site map.
3) The log must be made accessible to MDEP staff and a copy must be provided upon request.
4) The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.

EROSION AND SEDIMENTATION CONTROL

The proposed construction will require the implementation of temporary and permanent erosion control measures. These measures will be implemented in accordance with the Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual, prior to removal of any on-site vegetation or disturbance of any on-site soil. The general erosion and sediment control specifications and details, as provided within this section, are intended to describe measures to be used by contractors working on the site to maintain compliance with the standards established in the BMPs.

Implementation of proper erosion control measures will be required by site contractors to confine sediment and debris within the limit of soil disturbance. Proper use and maintenance of erosion control measures provide protection against off-site transport of sediment and discharge of sediment to undisturbed areas of the development.

EROSION AND SEDIMENTATION CONTROL PLAN

1. **Pollution Prevention:** The proposed project includes the construction of a new Public Works facility and roadway in Saco, Maine. The facility, along with associated roads and parking lots totals approximately 596,772 SF (13.7 acres) of developed area. All disturbed areas, with the exception of the building and parking areas, will be stabilized with vegetation or riprap. Proposed down-gradient wooded areas and streams will be protected with the use of silt fence or additional control devices if necessary, during construction.

2. **Sediment Barriers:** Prior to construction, sediment barriers will be installed downgradient of all disturbed areas. Sediment barriers will include silt fence, bark mulch berms, hay bales or additional measures which may become necessary.

   Sediment barriers will also be installed adjacent to any significant natural drainage channel, not otherwise protected. All installed sediment barriers will be maintained until disturbed areas are permanently stabilized.

3. **Temporary Stabilization:** Disturbed areas, which have lost natural vegetation cover, and will not be worked for more than seven days, will be temporarily stabilized. Areas within 75 feet of a wetland or waterbody will be stabilized within 48 hours of the initial disturbance or prior to any significant storm event, whichever comes first.

   Temporary stabilization will include mulch or other non-erodible material such as erosion control mesh mats. In some instances, temporary stabilization may include temporary mulch and seeding, based on the time until the area will be worked or permanently stabilized.

4. **Removal of Temporary Sediment Control Measures:** After permanent stabilization of disturbed areas has been completed, temporary measures, such as silt fence, will be removed within 30 days. Any accumulated sediments will be removed, and any disturbed areas permanently stabilized.

5. **Permanent Stabilization:** Once proposed construction is completed all disturbed areas, not otherwise permanently stabilized, will be permanently stabilized with vegetation, seeding, or permanent mulch.

   Vegetation plantings and seeding will include species which are suitable for the light, soil, and moisture conditions of the area. Seeded areas will be protected with temporary mulch or erosion control blankets.

   Concentrated flows will not be allowed on newly seeded areas until an adequate catch of vegetation is established. It may be necessary to reseed and mulch again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. For seeded areas, permanent stabilization means a 90% cover of healthy plants with no evidence of washing or rilling of the topsoil.

Other permanent measures associated with the project include the following:

A. Permanent Mulch: Permanent mulching means total coverage of exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.

B. Permanent Riprap: Permanent riprap means that slopes and ditches stabilized with riprap have an appropriate backing of well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Properly sized angular stones will be utilized.

C. Permanent Ditches, Channels, and Swales: Permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation or with a well-graded riprap lining. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

6. **Winter Construction:** Winter construction is not anticipated at this time. If winter construction occurs, additional provisions will be made to protect disturbed areas from runoff. Winter construction includes the time between November 1 and April 15. Contractor shall follow winter construction guidelines in MDEP's erosion control manual.

7. **Stormwater Channels:** Ditches, swales, and open stormwater channels are planned as part of this project. They will be stabilized with either vegetation or rip rap depending on the situation to prevent soil erosion.

8. **Roads and Driveways:** Roads and driveways will be graded to collect water in proposed BMP's as shown on the site plans. Some sections of the driveway will be super-elevated to direct runoff to the desired stormwater BMP.

9. **Culverts:** Culverts utilized in this project will be protected on both ends and the outlet pool with rip rap to prevent scour.

10. **Parking Areas:** The proposed project includes parking areas graded to collect runoff in the various proposed BMP's.

11. **Additional Requirements:** Contractor to implement additional Erosion and Sediment Control BMPs as needed to prevent onsite erosion of site soils and maintain those BMPs until the site is stabilized.

INSPECTION AND MAINTENANCE PLAN FOR STORMWATER MANAGEMENT STRUCTURES (BMPS)		
	INSPECTION SCHEDULE	**CORRECTIVE ACTIONS**
VEGETATED AREAS	Annually early spring and after heavy rains	Inspect all slopes and embankments and replant areas of bare soil or with sparse growth
		Armor rill erosion areas with riprap or divert the runoff to a stable area
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Mow vegetation as specified for the area
DITCHES, SWALES AND OPEN STORMWATER CHANNELS	Annually spring and late fall and after heavy rains	Remove obstructions, sediments or debris from ditches, swales and other open channels
		Repair any erosion of the ditch lining
		Mow vegetated ditches
		Remove woody vegetation growing through riprap
		Repair any slumping side slopes
		Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodged
CULVERTS	Spring and late fall and after heavy rains	Remove accumulated sediments and debris at the inlet, outlet, or within the conduit
		Remove any obstruction to flow
		Repair any erosion damage at the culvert's inlet and outlet
CATCH BASINS	Annually in the spring	Remove sediments and debris from the bottom of the basin and inlet grates
		Remove floating debris and oils (using oil absorptive pads) from any trap
ROADWAYS AND PARKING AREAS	Annually in the spring or as needed	Clear and remove accumulated winter sand in parking lots and along roadways
		Sweep pavement to remove sediment
		Grade road shoulders and remove accumulated winter sand
		Grade gravel roads and gravel shoulders
		Clean-out the sediment within water bars or open-top culverts
		Ensure that stormwater runoff is not impeded by false ditches of sediment in the shoulder
RESOURCE AND TREATEMENT BUFFERS	Annually in the spring	Inspect buffers for evidence of erosion, concentrated flow, or encroachment by development
		Manage the buffer's vegetation with the requirements in any deed restrictions
		Repair any sign of erosion within a buffer
		Inspect and repair down-slope of all spreaders and turn-outs for erosion
		Install more level spreaders, or ditch turn-outs if needed for a better distribution of flow
		Clean-out any accumulation of sediment within the spreader bays or turnout pools
		Mow non-wooded buffers no shorter than six inches and less than three times per year
WETPONDS AND DETENTION BASINS	Annually in fall and after heavy rains	Inspect the embankments for settlement, slope erosion, piping, and slumping
		Mow the embankment to control woody vegetation
		Inspect the outlet structure for broken seals, obstructed orifices, and plugged trash racks
		Remove and dispose of sediments and debris within the control structure
		Repair any damage to trash racks or debris guards
		Replace any dislodged stone in riprap spillways
		Remove and dispose of accumulated sediments within the impoundment and forebay
FILTRATION AND INFILTRATION BASINS	Annually in the spring and late fall	Clean the basin of debris, sediment and hydrocarbons
		Provide for the removal and disposal of accumulated sediments within the basin
		Renew the basin media if it fails to drain within 72 hours after a one inch rainfall event
		Till, seed and mulch the basin if vegetation is sparse
		Repair riprap where underlying filter fabric or gravel is showing or where stones have dislodged
PROPRIETARY DEVICES	As specified by manufacturer	Contract with a third-party for inspection and maintenance
		Follow the manufacturer's plan for cleaning of devices
OTHER PRACTICES	As specified for devices	Contact the department for appropriate inspection and maintenance requirements for other drainage control and runoff treatment measures.

HOUSEKEEPING

1. **Spill Prevention** - During construction, controls will be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

2. **Groundwater Protection** - During construction, liquid petroleum products, and other hazardous materials with the potential to contaminate groundwater will not be stored or handled in areas of the site draining to an infiltration area. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

3. **Fugitive Sediment and Dust** - Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil will not be used for dust control. Water will be used for dust control during construction. Operations during wet months that cause mud to be tracked off the site onto public roads will provide sweeping of the road areas at least once per week and prior to significant storm events.

4. **Debris and Other Materials** - Litter, construction debris, and chemicals exposed to stormwater will be prevented from becoming a pollutant source.

5. **Trench or Foundation De-Watering** - If de-watering is necessary, the collected water will be removed from the ponded area and spread through natural wooded buffers or discharged into a construction sedimentation basin. The water will not be allowed to flow over disturbed areas to the site.

6. **Non Stormwater Discharges** – Identify and prevent contamination by non-stormwater discharges.

7. **Additional Requirements** – Additional requirements may be applied on a site-specific basis.

INSPECTION AND MAINTENANCE

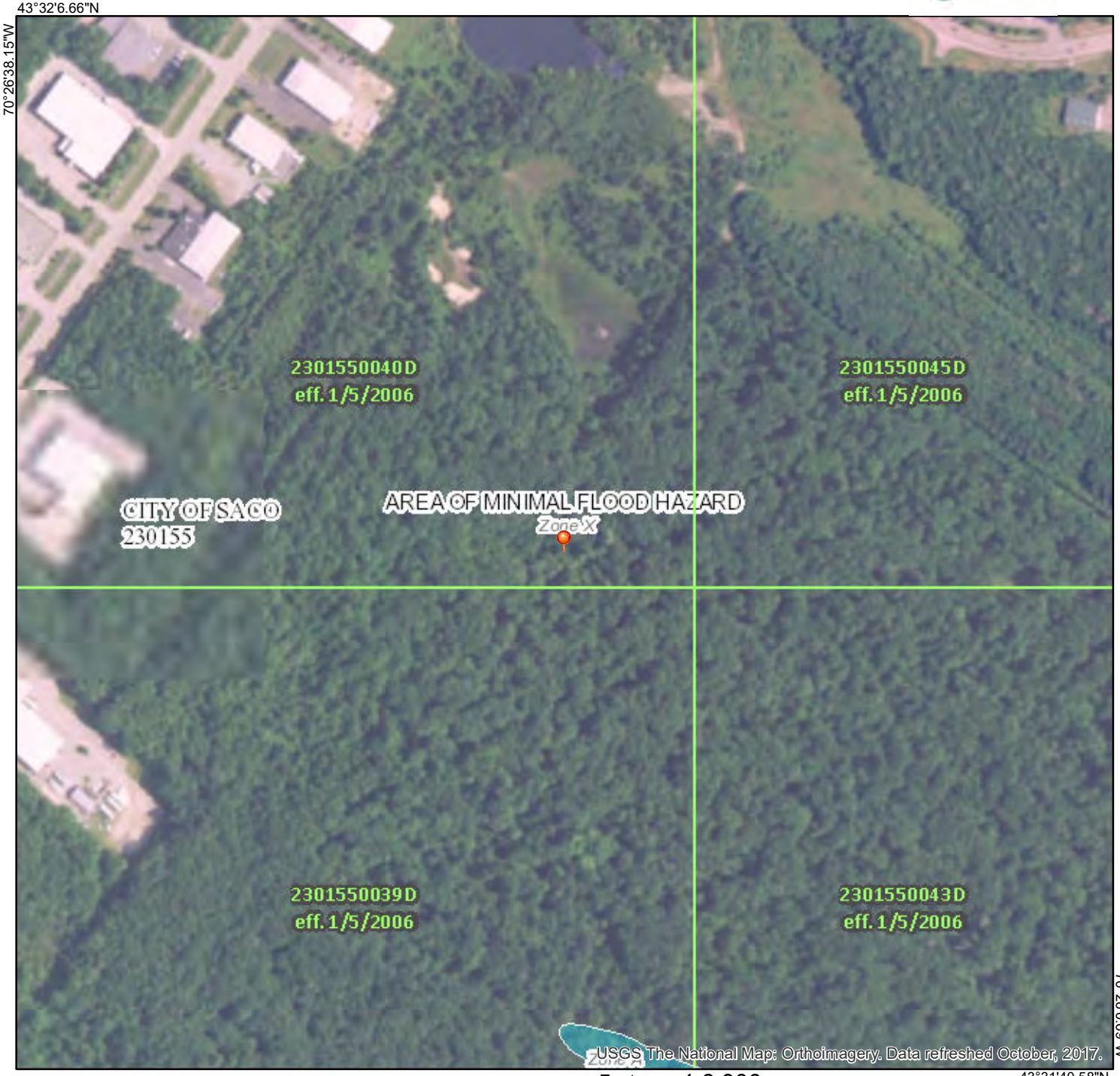
The Owner and their Contractor will be responsible for maintenance during construction. The Owner will be responsible for post construction maintenance of the site and the devices that provide treatment for the stormwater from the site.

A Pre- and Post-Construction Maintenance Plan for the stormwater management system is included in this section. Any questions regarding the design and maintenance of the Stormwater Management and Erosion and Sedimentation Control Systems should be directed to:

- John Kuchinski, P.E.
  CES, Inc.
  146 Main Street, Suite 300
  Saco, ME 04072
  jkuchinski@cesincusa.com

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- **SPECIAL FLOOD HAZARD AREAS**
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- **OTHER AREAS OF FLOOD HAZARD**
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- **OTHER AREAS**
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- **GENERAL STRUCTURES**
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- **OTHER FEATURES**
  - 20.2 Cross Sections with 1% Annual Chance
  - 17.5 Water Surface Elevation
  - Coastal Transect
  - Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
- **MAP PANELS**
  - Digital Data Available
  - No Digital Data Available
  - Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/19/2019 at 1:28:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

TYPE S1A

McGraw-Edison

DESCRIPTION

The Galleon™ LED luminaire delivers exceptional performance in a highly scalable, low-profile design. Patented, high-efficiency AccuLED Optics™ system provides uniform and energy conscious illumination to walkways, parking lots, roadways, building areas and security lighting applications. IP66 rated and UL/cUL Listed for wet locations.

Catalog #		**Type**
Project		
Comments		**Date**
Prepared by		

SPECIFICATION FEATURES

Construction
Extruded aluminum driver enclosure thermally isolated from Light Squares for optimal thermal performance. Heavy-wall, die-cast aluminum end caps enclose housing and die-cast aluminum heat sinks. A unique, patent pending interlocking housing and heat sink provides scalability with superior structural rigidity. 3G vibration tested and rated. Optional tool-less hardware available for ease of entry into electrical chamber. Housing is IP66 rated.

Optics
Patented, high-efficiency injection-molded AccuLED Optics technology. Optics are precisely designed to shape the distribution maximizing efficiency and application spacing. AccuLED Optics create consistent distributions with the scalability to meet customized application requirements. Offered standard in 4000K (+/- 275K) CCT 70 CRI. Optional 3000K, 5000K and 6000K CCT.

Electrical
LED drivers are mounted to removable tray assembly for ease of maintenance. 120-277V 50/60Hz, 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Standard with 0-10V dimming. Shipped standard with Eaton proprietary circuit module designed to withstand 10kV of transient line surge. The Galleon LED luminaire is suitable for operation in -40°C to 40°C ambient environments. For applications with ambient temperatures exceeding 40°C, specify the HA (High Ambient) option. Light Squares are IP66 rated. Greater than 90% lumen maintenance expected at 60,000 hours. Available in standard 1A drive current and optional 600mA, 800mA and 1200mA drive currents (nominal).

Mounting
STANDARD ARM MOUNT: Extruded aluminum arm includes internal bolt guides allowing for easy positioning of fixture during mounting. When mounting two or more luminaires at 90° and 120° apart, the EA extended arm may be required. Refer to the arm mounting requirement table. Round pole adapter included. For wall mounting, specify wall mount bracket option. QUICK MOUNT ARM: Adapter is bolted directly to the pole. Quick mount arm slide into place on the adapter and is secured via two screws, facilitating quick and easy installation. The versatile, patent pending, quick mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8". Removal of the door on the quick mount arm enables wiring of the fixture without having to access the driver compartment. A knock-out enables round pole mounting.

Finish
Housing finished in super durable TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Heat sink is powder coated black. Standard housing colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available.

Warranty
Five-year warranty.



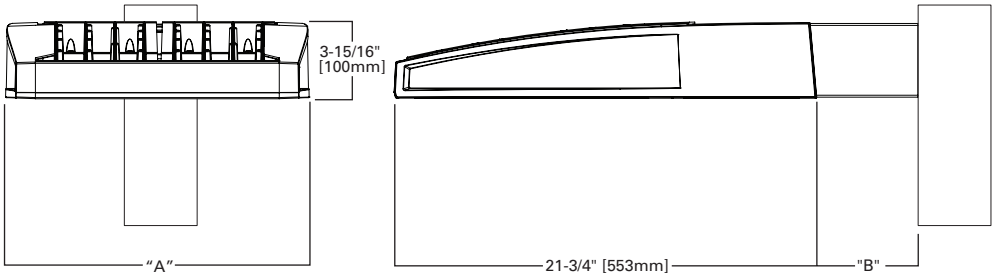
GLEON
GALLEON LED

1-10 Light Squares

Solid State LED

AREA/SITE LUMINAIRE

DIMENSIONS



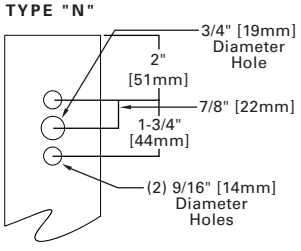
DIMENSION DATA

Number of Light Squares	"A" Width	"B" Standard Arm Length	"B" Optional Arm Length [1]	Weight with Arm (lbs.)	EPA with Arm [2] (Sq. Ft.)
1-4	15-1/2" (394mm)	7" (178mm)	10" (254mm)	33 (15.0 kgs.)	0.96
5-6	21-5/8" (549mm)	7" (178mm)	10" (254mm)	44 (20.0 kgs.)	1.00
7-8	27-5/8" (702mm)	7" (178mm)	13" (330mm)	54 (24.5 kgs.)	1.07
9-10	33-3/4" (857mm)	7" (178mm)	16" (406mm)	63 (28.6 kgs.)	1.12

NOTES: 1. Optional arm length to be used when mounting two fixtures at 90° on a single pole. **2.** EPA calculated with optional arm length.

DRILLING PATTERN

TYPE "N"



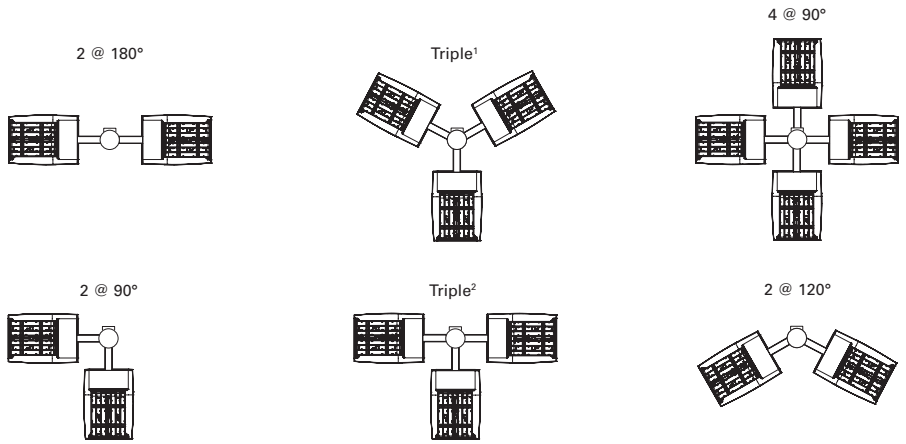
CERTIFICATION DATA
UL/cUL Wet Location Listed
ISO 9001
LM79 / LM80 Compliant
3G Vibration Rated
IP66 Rated
DesignLights Consortium™ Qualified*

ENERGY DATA
Electronic LED Driver
>0.9 Power Factor
<20% Total Harmonic Distortion
120V-277V 50/60Hz
347V & 480V 60Hz
-40°C Min. Temperature
40°C Max. Temperature
50°C Max. Temperature (HA Option)

*www.designlights.org

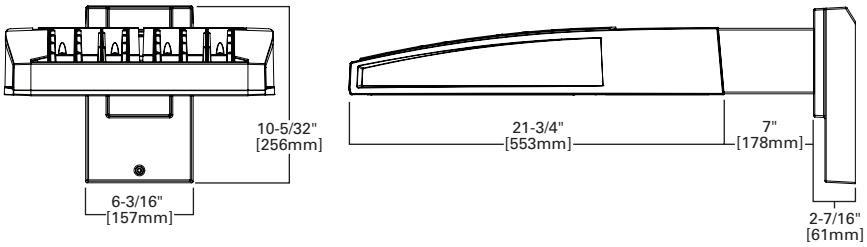
ARM MOUNTING REQUIREMENTS

Configuration	90° Apart	120° Apart
GLEON-AF-01	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-02	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-03	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-04	7" Arm (Standard)	7" Arm (Standard)
GLEON-AF-05	10" Extended Arm (Required)	7" Arm (Standard)
GLEON-AF-06	10" Extended Arm (Required)	7" Arm (Standard)
GLEON-AF-07	13" Extended Arm (Required)	13" Extended Arm (Required)
GLEON-AF-08	13" Extended Arm (Required)	13" Extended Arm (Required)
GLEON-AF-09	16" Extended Arm (Required)	16" Extended Arm (Required)
GLEON-AF-10	16" Extended Arm (Required)	16" Extended Arm (Required)

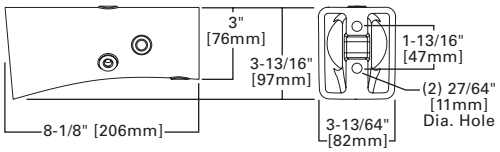


NOTES: 1 Round poles are 3 @ 120°. Square poles are 3 @ 90°. **2** Round poles are 3 @ 90°.

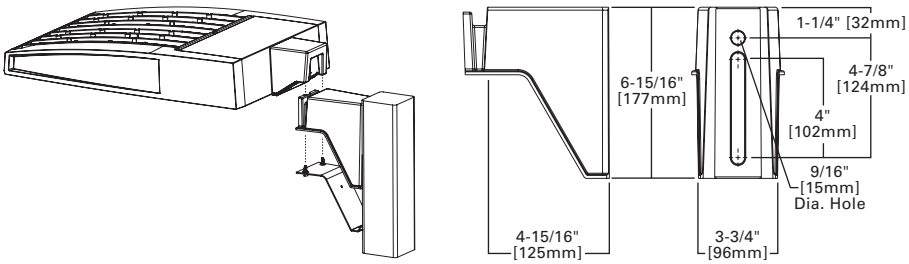
STANDARD WALL MOUNT



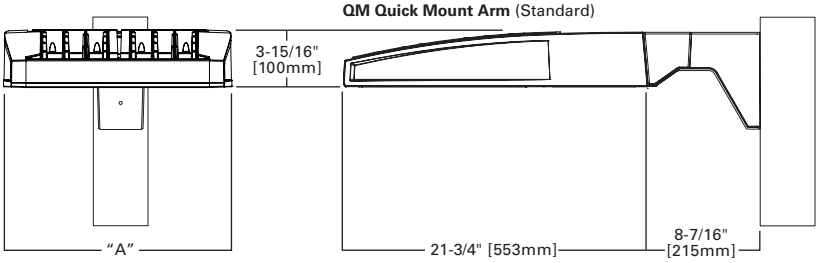
MAST ARM MOUNT



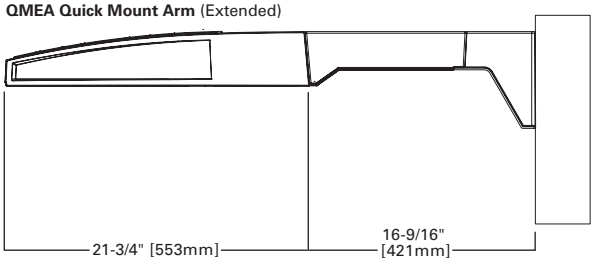
QUICK MOUNT ARM (INCLUDES FIXTURE ADAPTER)



QM Quick Mount Arm (Standard)



QMEA Quick Mount Arm (Extended)



QUICK MOUNT ARM DATA

Number of Light Squares [1,2]	"A" Width	Weight with QM Arm (lbs.)	Weight with QMEA Arm (lbs.)	EPA (Sq. Ft.)
1-4	15-1/2" (394mm)	35 (15.91 kgs.)	38 (17.27 kgs.)	1.11
5-6 [3]	21-5/8" (549mm)	46 (20.91 kgs.)	49 (22.27 kgs.)	
7-8	27-5/8" (702mm)	56 (25.45 kgs.)	59 (26.82 kgs.)	

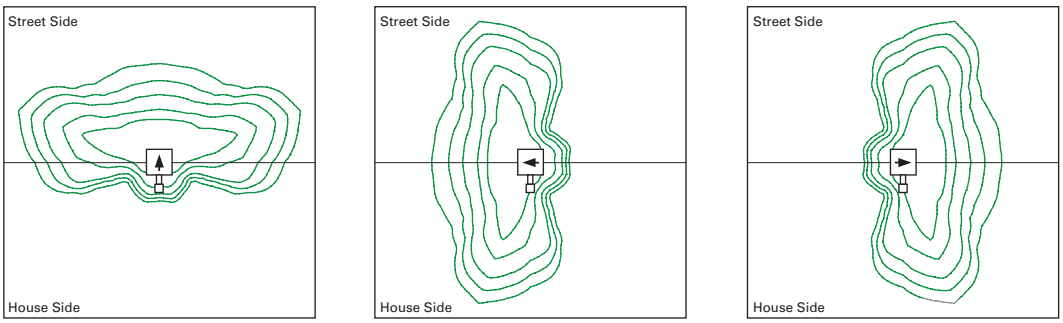
NOTES: 1 QM option available with 1-8 light square configurations. **2** QMEA option available with 1-6 light square configurations. **3** QMEA arm to be used when mounting two fixtures at 90° on a single pole.

Powering Business Worldwide

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

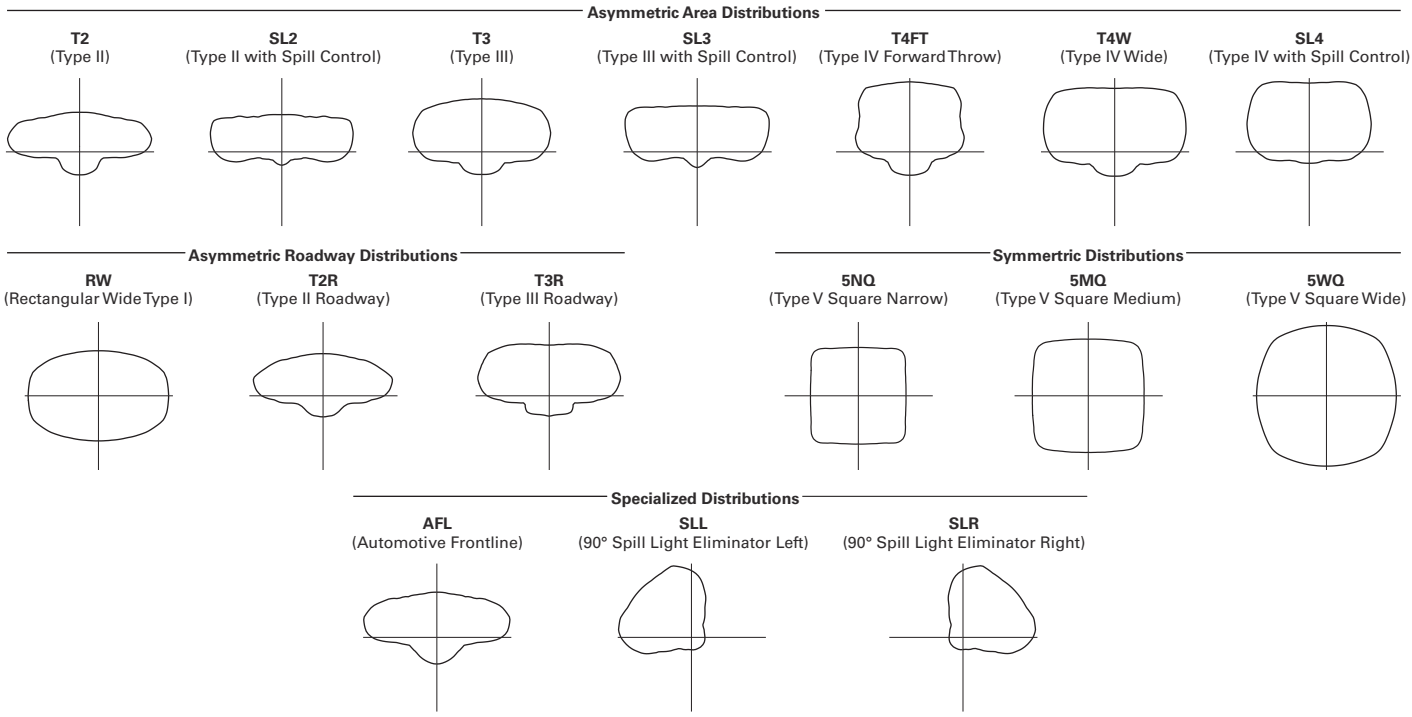
Specifications and dimensions subject to change without notice.

OPTIC ORIENTATION



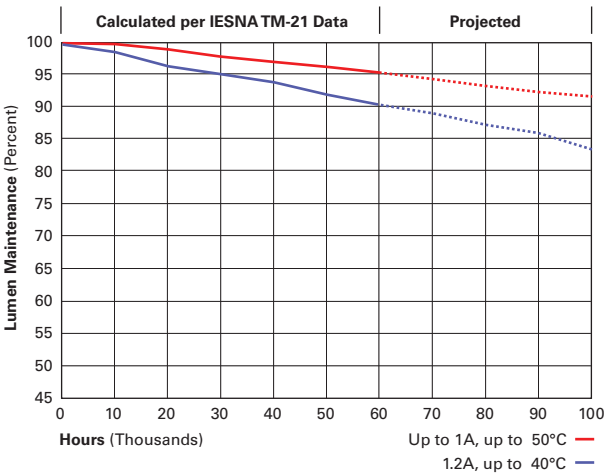
Standard | **Optics Rotated Left @ 90°** [L90] | **Optics Rotated Right @ 90°** [R90]

OPTICAL DISTRIBUTIONS



LUMEN MAINTENANCE

Drive Current	Ambient Temperature	TM-21 Lumen Maintenance (60,000 Hours)	Projected L70 (Hours)
Up to 1A	Up to 50°C	> 95%	416,000
1.2A	Up to 40°C	> 90%	205,000



LUMEN MULTIPLIER

Ambient Temperature	Lumen Multiplier
0°C	1.02
10°C	1.01
25°C	1.00
40°C	0.99
50°C	0.97

Powering Business Worldwide

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
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Specifications and dimensions subject to change without notice.

NOMINAL POWER LUMENS (1.2A)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		67	129	191	258	320	382	448	511	575	640
Input Current @ 120V (A)		0.58	1.16	1.78	2.31	2.94	3.56	4.09	4.71	5.34	5.87
Input Current @ 208V (A)		0.33	0.63	0.93	1.27	1.57	1.87	2.22	2.52	2.8	3.14
Input Current @ 240V (A)		0.29	0.55	0.80	1.10	1.35	1.61	1.93	2.18	2.41	2.71
Input Current @ 277V (A)		0.25	0.48	0.70	0.96	1.18	1.39	1.69	1.90	2.09	2.36
Input Current @ 347V (A)		0.20	0.39	0.57	0.78	0.96	1.15	1.36	1.54	1.72	1.92
Input Current @ 480V (A)		0.15	0.30	0.43	0.60	0.73	0.85	1.03	1.16	1.28	1.45
Optics											
T2	4000K/5000K Lumens	6,709	13,111	19,562	25,848	32,026	38,325	45,324	51,355	57,286	63,424
	3000K Lumens	5,939	11,606	17,316	22,881	28,349	33,925	40,121	45,459	50,710	56,143
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T2R	4000K/5000K Lumens	7,122	13,919	20,769	27,442	34,000	40,687	48,117	54,519	60,816	67,333
	3000K Lumens	5,939	11,606	17,316	22,881	28,349	33,925	40,121	45,459	50,710	56,143
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T3	4000K/5000K Lumens	6,838	13,363	19,939	26,346	32,642	39,062	46,196	52,343	58,388	64,646
	3000K Lumens	6,053	11,829	17,650	23,321	28,895	34,578	40,893	46,334	51,685	57,225
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T3R	4000K/5000K Lumens	6,990	13,660	20,382	26,931	33,368	39,930	47,223	53,506	59,686	66,081
	3000K Lumens	6,188	12,092	18,042	23,839	29,537	35,346	41,802	47,364	52,834	58,495
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T4FT	4000K/5000K Lumens	6,878	13,440	20,055	26,499	32,832	39,289	46,464	52,646	58,726	65,020
	3000K Lumens	6,088	11,897	17,753	23,457	29,063	34,779	41,130	46,602	51,984	57,556
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T4W	4000K/5000K Lumens	6,789	13,267	19,795	26,156	32,408	38,781	45,864	51,967	57,968	64,180
	3000K Lumens	6,010	11,744	17,523	23,153	28,688	34,329	40,599	46,001	51,313	56,812
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL2	4000K/5000K Lumens	6,697	13,088	19,529	25,804	31,970	38,259	45,245	51,267	57,186	63,315
	3000K Lumens	5,928	11,585	17,287	22,842	28,300	33,867	40,051	45,382	50,621	56,046
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL3	4000K/5000K Lumens	6,837	13,361	19,936	26,342	32,639	39,057	46,189	52,336	58,380	64,636
	3000K Lumens	6,052	11,827	17,647	23,318	28,892	34,573	40,887	46,328	51,678	57,216
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL4	4000K/5000K Lumens	6,496	12,695	18,943	25,029	31,011	37,110	43,886	49,727	55,470	61,414
	3000K Lumens	5,750	11,238	16,768	22,156	27,451	32,850	38,848	44,018	49,102	54,364
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	7,052	13,781	20,564	27,171	33,664	40,285	47,641	53,981	60,215	66,669
	3000K Lumens	6,242	12,199	18,203	24,052	29,799	35,660	42,172	47,784	53,302	59,015
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
5MQ	4000K/5000K Lumens	7,182	14,034	20,942	27,671	34,284	41,027	48,518	54,975	61,323	67,896
	3000K Lumens	6,358	12,423	18,538	24,494	30,348	36,317	42,948	48,664	54,283	60,102
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
5WQ	4000K/5000K Lumens	7,201	14,073	20,998	27,744	34,375	41,136	48,648	55,121	61,487	68,077
	3000K Lumens	6,374	12,457	18,587	24,559	30,429	36,414	43,063	48,793	54,428	60,262
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
SLL/SLR	4000K/5000K Lumens	6,009	11,741	17,519	23,148	28,681	34,321	40,589	45,990	51,301	56,798
	3000K Lumens	5,319	10,393	15,508	20,491	25,388	30,381	35,929	40,710	45,412	50,278
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
RW	4000K/5000K Lumens	6,989	13,657	20,378	26,925	33,360	39,921	47,211	53,494	59,672	66,066
	3000K Lumens	6,187	12,089	18,039	23,834	29,530	35,338	41,791	47,353	52,822	58,482
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
AFL	4000K/5000K Lumens	7,014	13,706	20,452	27,023	33,481	40,066	47,383	53,688	59,888	66,306
	3000K Lumens	6,209	12,133	18,104	23,921	29,637	35,466	41,943	47,525	53,013	58,694
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B4-U0-G4	B4-U0-G4

* Nominal data for 70 CRI.

NOMINAL POWER LUMENS (1A)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		59	113	166	225	279	333	391	445	501	558
Input Current @ 120V (A)		0.51	1.02	1.53	2.03	2.55	3.06	3.56	4.08	4.6	5.07
Input Current @ 208V (A)		0.29	0.56	0.82	1.11	1.37	1.64	1.93	2.19	2.46	2.75
Input Current @ 240V (A)		0.26	0.48	0.71	0.96	1.19	1.41	1.67	1.89	2.12	2.39
Input Current @ 277V (A)		0.23	0.42	0.61	0.83	1.03	1.23	1.45	1.65	1.84	2.09
Input Current @ 347V (A)		0.17	0.32	0.50	0.64	0.82	1.00	1.14	1.32	1.50	1.68
Input Current @ 480V (A)		0.14	0.24	0.37	0.48	0.61	0.75	0.91	0.99	1.12	1.28
Optics											
T2	4000K/5000K Lumens	6,116	11,951	17,833	23,563	29,195	34,937	41,317	46,814	52,221	57,817
	3000K Lumens	5,414	10,579	15,786	20,858	25,843	30,926	36,574	41,440	46,226	51,180
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T2R	4000K/5000K Lumens	6,493	12,688	18,932	25,015	30,994	37,090	43,863	49,699	55,439	61,380
	3000K Lumens	5,748	11,231	16,759	22,143	27,436	32,832	38,828	43,994	49,075	54,334
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
T3	4000K/5000K Lumens	6,234	12,181	18,176	24,017	29,756	35,609	42,111	47,715	53,225	58,930
	3000K Lumens	5,518	10,783	16,089	21,260	26,340	31,521	37,277	42,237	47,115	52,165
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
T3R	4000K/5000K Lumens	6,372	12,453	18,580	24,550	30,418	36,400	43,048	48,776	54,409	60,239
	3000K Lumens	5,640	11,023	16,447	21,732	26,926	32,221	38,106	43,177	48,163	53,324
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5
T4FT	4000K/5000K Lumens	6,270	12,252	18,282	24,156	29,929	35,815	42,356	47,992	53,534	59,271
	3000K Lumens	5,550	10,845	16,183	21,383	26,493	31,703	37,494	42,483	47,388	52,467
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
T4W	4000K/5000K Lumens	6,189	12,094	18,045	23,844	29,543	35,352	41,809	47,372	52,843	58,506
	3000K Lumens	5,479	10,706	15,973	21,107	26,151	31,294	37,009	41,934	46,777	51,790
	BUG Rating	B1-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL2	4000K/5000K Lumens	6,105	11,931	17,803	23,522	29,144	34,877	41,245	46,734	52,130	57,717
	3000K Lumens	5,404	10,561	15,759	20,822	25,798	30,873	36,510	41,369	46,145	51,091
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5	B4-U0-G5
SL3	4000K/5000K Lumens	6,233	12,180	18,174	24,013	29,753	35,604	42,106	47,708	53,218	58,921
	3000K Lumens	5,517	10,782	16,088	21,256	26,337	31,517	37,272	42,231	47,109	52,157
	BUG Rating	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
SL4	4000K/5000K Lumens	5,922	11,572	17,268	22,816	28,269	33,829	40,006	45,330	50,566	55,984
	3000K Lumens	5,242	10,244	15,286	20,197	25,024	29,945	35,413	40,126	44,761	49,557
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	6,429	12,563	18,746	24,768	30,688	36,723	43,429	49,208	54,891	60,775
	3000K Lumens	5,691	11,121	16,594	21,925	27,165	32,507	38,443	43,559	48,590	53,798
	BUG Rating	B2-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4
5MQ	4000K/5000K Lumens	6,547	12,794	19,090	25,224	31,253	37,400	44,228	50,114	55,902	61,893
	3000K Lumens	5,795	11,325	16,898	22,328	27,665	33,106	39,151	44,361	49,484	54,788
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
5WQ	4000K/5000K Lumens	6,564	12,828	19,141	25,291	31,336	37,499	44,347	50,248	56,051	62,058
	3000K Lumens	5,810	11,355	16,944	22,388	27,739	33,194	39,256	44,480	49,616	54,934
	BUG Rating	B3-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5	B5-U0-G5
SLL/SLR	4000K/5000K Lumens	5,478	10,703	15,970	21,102	26,145	31,286	37,001	41,924	46,765	51,777
	3000K Lumens	4,849	9,474	14,137	18,679	23,144	27,694	32,753	37,111	41,396	45,833
	BUG Rating	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	6,371	12,449	18,576	24,544	30,411	36,392	43,037	48,764	54,396	60,225
	3000K Lumens	5,640	11,020	16,443	21,726	26,920	32,214	38,096	43,166	48,151	53,311
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
AFL	4000K/5000K Lumens	6,394	12,494	18,644	24,634	30,521	36,524	43,194	48,942	54,593	60,444
	3000K Lumens	5,660	11,060	16,504	21,806	27,017	32,331	38,235	43,323	48,326	53,505
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4

* Nominal data for 70 CRI.

NOMINAL POWER LUMENS (800MA)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		44	85	124	171	210	249	295	334	374	419
Input Current @ 120V (A)		0.39	0.77	1.13	1.54	1.90	2.26	2.67	3.03	3.39	3.80
Input Current @ 208V (A)		0.22	0.44	0.62	0.88	1.06	1.24	1.50	1.68	1.87	2.12
Input Current @ 240V (A)		0.19	0.38	0.54	0.76	0.92	1.08	1.30	1.46	1.62	1.84
Input Current @ 277V (A)		0.17	0.36	0.47	0.72	0.83	0.95	1.19	1.31	1.42	1.67
Input Current @ 347V (A)		0.15	0.24	0.38	0.49	0.63	0.77	0.87	1.01	1.15	1.52
Input Current @ 480V (A)		0.11	0.18	0.29	0.37	0.48	0.59	0.66	0.77	0.88	0.96
Optics											
T2	4000K/5000K Lumens	4,941	9,656	14,408	19,038	23,588	28,227	33,382	37,823	42,191	46,713
	3000K Lumens	4,374	8,547	12,754	16,852	20,880	24,987	29,550	33,481	37,347	41,350
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B4-U0-G5	B4-U0-G5
T2R	4000K/5000K Lumens	5,246	10,251	15,296	20,211	25,041	29,966	35,439	40,154	44,791	49,592
	3000K Lumens	4,644	9,074	13,540	17,891	22,166	26,526	31,371	35,544	39,649	43,899
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5
T3	4000K/5000K Lumens	5,037	9,842	14,685	19,404	24,041	28,770	34,024	38,551	43,003	47,612
	3000K Lumens	4,459	8,712	12,999	17,176	21,281	25,467	30,118	34,125	38,066	42,146
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
T3R	4000K/5000K Lumens	5,148	10,061	15,011	19,835	24,576	29,409	34,780	39,408	43,959	48,669
	3000K Lumens	4,557	8,906	13,288	17,558	21,755	26,033	30,787	34,884	38,913	43,082
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
T4FT	4000K/5000K Lumens	5,066	9,899	14,770	19,516	24,181	28,936	34,221	38,774	43,252	47,888
	3000K Lumens	4,484	8,763	13,074	17,276	21,405	25,614	30,292	34,323	38,287	42,390
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
T4W	4000K/5000K Lumens	5,000	9,771	14,579	19,264	23,869	28,562	33,779	38,274	42,694	47,269
	3000K Lumens	4,426	8,649	12,905	17,052	21,129	25,283	29,901	33,880	37,793	41,843
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5	B4-U0-G5
SL2	4000K/5000K Lumens	4,933	9,639	14,383	19,005	23,547	28,178	33,324	37,758	42,118	46,632
	3000K Lumens	4,367	8,532	12,732	16,823	20,844	24,943	29,498	33,423	37,283	41,279
	BUG Rating	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B4-U0-G5	B4-U0-G5
SL3	4000K/5000K Lumens	5,036	9,841	14,683	19,401	24,039	28,766	34,019	38,546	42,997	47,605
	3000K Lumens	4,458	8,711	12,997	17,174	21,279	25,464	30,114	34,121	38,061	42,140
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
SL4	4000K/5000K Lumens	4,784	9,350	13,951	18,434	22,840	27,332	32,323	36,624	40,854	45,232
	3000K Lumens	4,235	8,277	12,349	16,318	20,218	24,194	28,612	32,420	36,164	40,039
	BUG Rating	B1-U0-G2	B1-U0-G3	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G5	B2-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	5,194	10,150	15,145	20,011	24,794	29,670	35,088	39,757	44,349	49,102
	3000K Lumens	4,598	8,985	13,406	17,714	21,948	26,264	31,060	35,193	39,258	43,465
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G3
5MQ	4000K/5000K Lumens	5,290	10,337	15,424	20,380	25,250	30,217	35,734	40,489	45,165	50,006
	3000K Lumens	4,683	9,150	13,653	18,040	22,351	26,748	31,632	35,841	39,980	44,265
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
5WQ	4000K/5000K Lumens	5,304	10,365	15,465	20,434	25,318	30,297	35,830	40,597	45,286	50,139
	3000K Lumens	4,695	9,175	13,690	18,088	22,411	26,819	31,717	35,936	40,087	44,383
	BUG Rating	B3-U0-G1	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G5	B5-U0-G5
SLL/SLR	4000K/5000K Lumens	4,426	8,648	12,903	17,049	21,124	25,278	29,894	33,872	37,784	41,832
	3000K Lumens	3,918	7,655	11,422	15,092	18,699	22,376	26,462	29,983	33,446	37,030
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	5,147	10,058	15,009	19,830	24,570	29,402	34,771	39,399	43,949	48,658
	3000K Lumens	4,556	8,903	13,286	17,554	21,749	26,027	30,779	34,876	38,904	43,072
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3	B5-U0-G4
AFL	4000K/5000K Lumens	5,166	10,095	15,063	19,903	24,659	29,509	34,898	39,542	44,108	48,835
	3000K Lumens	4,573	8,936	13,334	17,618	21,828	26,121	30,892	35,003	39,044	43,229
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3

* Nominal data for 70 CRI.

NOMINAL POWER LUMENS (600MA)

Number of Light Squares		1	2	3	4	5	6	7	8	9	10
Nominal Power (Watts)		34	66	96	129	162	193	226	257	290	323
Input Current @ 120V (A)		0.30	0.58	0.86	1.16	1.44	1.73	2.03	2.33	2.59	2.89
Input Current @ 208V (A)		0.17	0.34	0.49	0.65	0.84	0.99	1.14	1.30	1.48	1.63
Input Current @ 240V (A)		0.15	0.30	0.43	0.56	0.74	0.87	1.00	1.13	1.30	1.43
Input Current @ 277V (A)		0.14	0.28	0.41	0.52	0.69	0.81	0.93	1.04	1.22	1.33
Input Current @ 347V (A)		0.11	0.19	0.30	0.39	0.49	0.60	0.69	0.77	0.90	0.99
Input Current @ 480V (A)		0.08	0.15	0.24	0.30	0.38	0.48	0.53	0.59	0.71	0.77
Optics											
T2	4000K/5000K Lumens	4,029	7,874	11,749	15,525	19,235	23,019	27,222	30,844	34,406	38,093
	3000K Lumens	3,566	6,970	10,400	13,743	17,027	20,376	24,097	27,303	30,456	33,720
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G4
T2R	4000K/5000K Lumens	4,278	8,360	12,474	16,482	20,421	24,437	28,900	32,745	36,527	40,441
	3000K Lumens	3,787	7,400	11,042	14,590	18,077	21,632	25,582	28,986	32,334	35,798
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4
T3	4000K/5000K Lumens	4,107	8,026	11,976	15,824	19,605	23,461	27,746	31,438	35,068	38,827
	3000K Lumens	3,636	7,105	10,601	14,007	17,354	20,768	24,561	27,829	31,042	34,370
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
T3R	4000K/5000K Lumens	4,198	8,205	12,242	16,175	20,041	23,982	28,363	32,137	35,848	39,689
	3000K Lumens	3,716	7,263	10,837	14,318	17,740	21,229	25,107	28,448	31,733	35,133
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
T4FT	4000K/5000K Lumens	4,131	8,072	12,045	15,915	19,719	23,597	27,907	31,620	35,272	39,052
	3000K Lumens	3,657	7,145	10,662	14,088	17,455	20,888	24,703	27,990	31,223	34,569
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
T4W	4000K/5000K Lumens	4,077	7,968	11,889	15,710	19,465	23,292	27,546	31,212	34,816	38,547
	3000K Lumens	3,609	7,053	10,524	13,906	17,230	20,618	24,384	27,629	30,819	34,122
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5	B3-U0-G5
SL2	4000K/5000K Lumens	4,022	7,861	11,729	15,498	19,202	22,979	27,175	30,791	34,347	38,028
	3000K Lumens	3,560	6,959	10,383	13,719	16,998	20,341	24,055	27,256	30,404	33,662
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
SL3	4000K/5000K Lumens	4,106	8,025	11,974	15,821	19,603	23,458	27,742	31,433	35,064	38,821
	3000K Lumens	3,635	7,104	10,599	14,005	17,353	20,765	24,557	27,824	31,039	34,364
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G3	B2-U0-G3	B2-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
SL4	4000K/5000K Lumens	3,902	7,624	11,377	15,033	18,626	22,289	26,359	29,867	33,316	36,886
	3000K Lumens	3,454	6,749	10,071	13,307	16,488	19,730	23,333	26,438	29,491	32,651
	BUG Rating	B1-U0-G2	B1-U0-G2	B1-U0-G3	B1-U0-G3	B2-U0-G4	B2-U0-G4	B2-U0-G4	B2-U0-G5	B3-U0-G5	B3-U0-G5
5NQ	4000K/5000K Lumens	4,236	8,277	12,351	16,319	20,219	24,196	28,614	32,422	36,166	40,042
	3000K Lumens	3,750	7,327	10,933	14,446	17,898	21,418	25,329	28,700	32,014	35,445
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G2	B5-U0-G3	B5-U0-G3
5MQ	4000K/5000K Lumens	4,314	8,429	12,578	16,619	20,591	24,641	29,141	33,019	36,832	40,779
	3000K Lumens	3,819	7,461	11,134	14,711	18,227	21,812	25,796	29,228	32,604	36,098
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4
5WQ	4000K/5000K Lumens	4,325	8,452	12,611	16,664	20,646	24,707	29,219	33,106	36,930	40,888
	3000K Lumens	3,828	7,482	11,163	14,751	18,276	21,871	25,865	29,305	32,690	36,194
	BUG Rating	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G4	B5-U0-G4	B5-U0-G4	B5-U0-G4
SLL/SLR	4000K/5000K Lumens	3,609	7,052	10,522	13,903	17,226	20,613	24,378	27,622	30,812	34,114
	3000K Lumens	3,195	6,242	9,314	12,307	15,248	18,247	21,579	24,451	27,275	30,198
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4	B3-U0-G4	B3-U0-G4	B3-U0-G5	B3-U0-G5
RW	4000K/5000K Lumens	4,197	8,202	12,239	16,171	20,036	23,977	28,356	32,129	35,839	39,680
	3000K Lumens	3,715	7,260	10,834	14,315	17,736	21,224	25,101	28,441	31,725	35,125
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3	B5-U0-G3	B5-U0-G3
AFL	4000K/5000K Lumens	4,213	8,232	12,284	16,230	20,109	24,064	28,459	32,246	35,969	39,824
	3000K Lumens	3,729	7,287	10,874	14,367	17,800	21,301	25,192	28,544	31,840	35,252
	BUG Rating	B1-U0-G1	B1-U0-G1	B2-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3

* Nominal data for 70 CRI.

CONTROL OPTIONS

0-10V (DIM)
This fixture is offered standard with 0-10V dimming driver(s). The DIM option provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

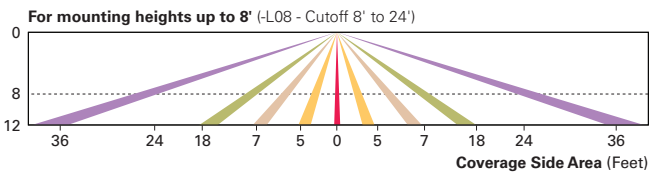
Photocontrol (P, R and PER7)
Optional button-type photocontrol (P) and photocontrol receptacles (R and PER7) provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PER7 receptacle.

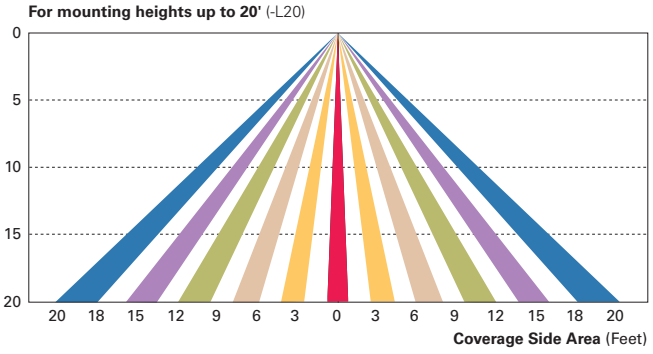
After Hours Dim (AHD)
This feature allows photocontrol-enabled luminaires to achieve additional energy savings by dimming during scheduled portions of the night. The dimming profile will automatically take effect after a "dusk-to-dawn" period has been calculated from the photocontrol input. Specify the desired dimming profile for a simple, factory-shipped dimming solution requiring no external control wiring. Reference the After Hours Dim supplemental guide for additional information.

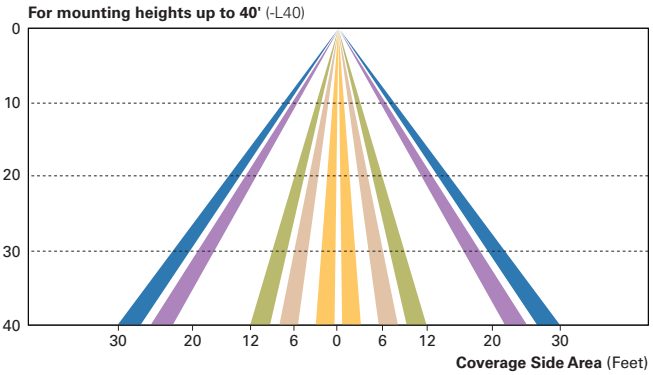
Dimming Occupancy Sensor (MS/DIM-LXX, MS/X-LXX and MS-LXX)
These sensors are factory installed in the luminaire housing. When the MS/DIM-LXX sensor option is selected, the occupancy sensor is connected to a dimming driver and the entire luminaire dims when there is no activity detected. When activity is detected, the luminaire returns to full light output. The MS/DIM sensor is factory preset to dim down to approximately 50 percent power with a time delay of five minutes. The MS-LXX sensor is factory preset to turn the luminaire off after five minutes of no activity. The MS/X-LXX is also preset for five minutes and only controls the specified number of light engines to maintain steady output from the remaining light engines.

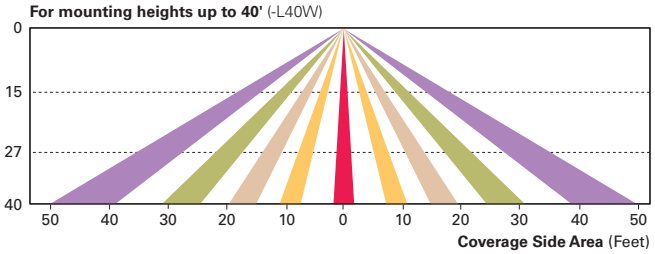
These occupancy sensors includes an integral photocell that can be activated with the FSIR-100 accessory for "dusk-to-dawn" control or daylight harvesting - the factory preset is OFF. The FSIR-100 is a wireless tool utilized for changing the dimming level, time delay, sensitivity and other parameters.

A variety of sensor lens are available to optimize the coverage pattern for mounting heights from 8'-40'.



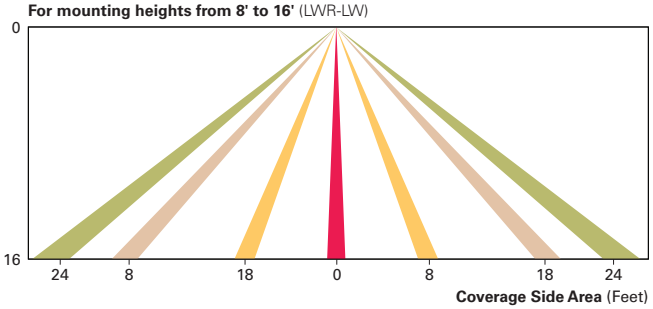


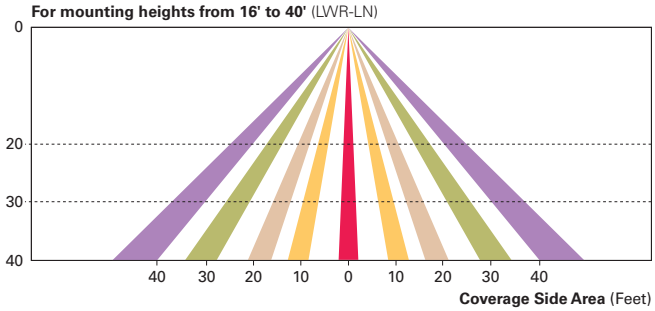




LumaWatt Wireless Control and Monitoring System (LWR-LW and LWR-LN)
The LumaWatt system is a peer-to-peer wireless network of luminaire-integral sensors for any sized project. Each sensor is capable of motion and photo sensing, metering power consumption and wireless communication. The end-user can securely create and manage sensor profiles with browser-based management software. The software will automatically broadcast to the sensors via wireless gateways for zone-based and individual luminaire control. The LumaWatt software provides smart building solutions by utilizing the sensor to provide easy-to-use dashboard and analytic capabilities such as improved energy savings, traffic flow analysis, building management software integration and more.

For additional details, refer to the LumaWatt product guides.





ORDERING INFORMATION

Sample Number: GLEON-AF-04-LED-E1-T3-GM-QM

Product Family [1, 2]	Light Engine	Number of Light Squares [3]	Lamp Type	Voltage	Distribution	Color	Mounting
GLEON=Galleon	**AF**=1A Drive Current	**01**=1 **02**=2 **03**=3 **04**=4 **05**=5 **06**=6 **07**=7 [4] **08**=8 [4] **09**=9 [5] **10**=10 [5]	**LED**=Solid State Light Emitting Diodes	**E1**=120-277V **347**=347V [6] **480**=480V [6, 7]	**T2**=Type II **T2R**=Type II Roadway **T3**=Type III **T3R**=Type III Roadway **T4FT**=Type IV Forward Throw **T4W**=Type IV Wide **5NQ**=Type V Narrow **5MQ**=Type V Square Medium **5WQ**=Type V Square Wide **SL2**=Type II w/Spill Control **SL3**=Type III w/Spill Control **SL4**=Type IV w/Spill Control **SLL**=90° Spill Light Eliminator Left **SLR**=90° Spill Light Eliminator Right **RW**=Rectangular Wide Type I **AFL**=Automotive Frontline	**AP**=Grey **BZ**=Bronze **BK**=Black **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White	**[Blank]**=Arm for Round or Square Pole **EA**=Extended Arm [8] **MA**=Mast Arm Adapter [9] **WM**=Wall Mount **QM**=Quick Mount Arm (Standard Length) [10] **QMEA**=Quick Mount Arm (Extended Length) [11]

Options (Add as Suffix)

7030=70 CRI 3000K [12]
8030=80 CRI 3000K [13]
7050=70 CRI 5000K [12]
7060=70 CRI 6000K [12]
600=Drive Current Factory Set to Nominal 600mA [14]
800=Drive Current Factory Set to Nominal 800mA [14]
1200=Drive Current Factory Set to Nominal 1200mA [14, 15]
F=Single Fuse (120, 277 or 347V. Must Specify Voltage)
FF=Double Fuse (208, 240 or 480V. Must Specify Voltage)
2L=Two Circuits [16, 17]
DIM=External 0-10V Dimming Leads
P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Volatage)
PER7=NEMA 7-PIN Twistlock Photocontrol Receptacle
R=NEMA Twistlock Photocontrol Receptacle
AHD145=After Hours Dim, 5 Hours [18]
AHD245=After Hours Dim, 6 Hours [18]
AHD255=After Hours Dim, 7 Hours [18]
AHD355=After Hours Dim, 8 Hours [18]
HA=50°C High Ambient [19]
MS/DIM-L08=Motion Sensor for Dimming Operation, Maximum 8' Mounting Height [20, 21]
MS/DIM-L20=Motion Sensor for Dimming Operation, 9' - 20' Mounting Height [20, 22]
MS/DIM-L40=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height [20, 23]
MS/DIM-L40W=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height (Wide Range) [20, 24]
MS/X-L08=Bi-Level Motion Sensor, Maximum 8' Mounting Height [20, 21, 25]
MS/X-L20=Bi-Level Motion Sensor, 9' - 20' Mounting Height [20, 22, 25]
MS/X-L40=Bi-Level Motion Sensor, 21' - 40' Mounting Height [20, 23, 25]
MS/X-L40W=Bi-Level Motion Sensor, 21' - 40' Mounting Height (Wide Range) [20, 24, 25]
MS-L08=Motion Sensor for ON/OFF Operation, Maximum 8' Mounting Height [20, 21]
MS-L20=Motion Sensor for ON/OFF Operation, 9' - 20' Mounting Height [20, 22]
MS-L40=Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height [20, 23]
MS-L40W=Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height (Wide Range) [20, 24]
LWR-LW=LumaWatt Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [26]
LWR-LN=LumaWatt Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [26]
L90=Optics Rotated 90° Left
R90=Optics Rotated 90° Right
MT=Factory Installed Mesh Top
TH=Tool-less Door Hardware
LCF=Light Square Trim Plate Painted to Match Housing [27]
HSS=Factory Installed House Side Shield [28]
CE=CE Marking [29]

Accessories (Order Separately)

OA/RA1016=NEMA Photocontrol Multi-Tap - 105-285V
OA/RA1027=NEMA Photocontrol - 480V
OA/RA1201=NEMA Photocontrol - 347V
OA/RA1013=Photocontrol Shorting Cap
OA/RA1014=120V Photocontrol
MA1252=10kV Surge Module Replacement
MA1036-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon
MA1037-XX=2@180° Tenon Adapter for 2-3/8" O.D. Tenon
MA1197-XX=3@120° Tenon Adapter for 2-3/8" O.D. Tenon
MA1188-XX=4@90° Tenon Adapter for 2-3/8" O.D. Tenon
MA1189-XX=2@90° Tenon Adapter for 2-3/8" O.D. Tenon
MA1190-XX=3@90° Tenon Adapter for 2-3/8" O.D. Tenon
MA1191-XX=2@120° Tenon Adapter for 2-3/8" O.D. Tenon
MA1038-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon
MA1039-XX=2@180° Tenon Adapter for 3-1/2" O.D. Tenon
MA1192-XX=3@120° Tenon Adapter for 3-1/2" O.D. Tenon
MA1193-XX=4@90° Tenon Adapter for 3-1/2" O.D. Tenon
MA1194-XX=2@90° Tenon Adapter for 3-1/2" O.D. Tenon
MA1195-XX=3@90° Tenon Adapter for 3-1/2" O.D. Tenon
FSIR-100=Wireless Configuration Tool for Occupancy Sensor [20]
GLEON-MT1=Field Installed Mesh Top for 1-4 Light Squares
GLEON-MT2=Field Installed Mesh Top for 5-6 Light Squares
GLEON-MT3=Field Installed Mesh Top for 7-8 Light Squares
GLEON-MT4=Field Installed Mesh Top for 9-10 Light Squares
GLEON-QM=Quick Mount Arm Kit
GLEON-QMEA=Quick Mount Extended Arm Kit
LS/HSS=Field Installed House Side Shield [28, 30]

NOTES:
1. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
2. DesignLights Consortium™ Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
3. Standard 4000K CCT and minimum 70 CRI.
4. Not compatible with extended quick mount arm (QMEA).
5. Not compatible with standard quick mount arm (QM) or extended quick mount arm (QMEA).
6. Requires the use of an internal step down transformer when combined with sensor options. Not available with sensor at 1200mA. Not available in combination with the HA high ambient and sensor options at 1A.
7. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
8. May be required when two or more luminaires are oriented on a 90° or 120° drilling pattern. Refer to arm mounting requirement table.
9. Factory installed.
10. Maximum 8 light squares.
11. Maximum 6 light squares.
12. Extended lead times apply. Use dedicated IES files for 3000K, 5000K and 6000K when performing layouts. These files are published on the Galleon luminaire product page on the website.
13. Extended lead times apply. Use dedicated IES files for 3000K, 5000K and 6000K when performing layouts. These files are published on the Galleon luminaire product page on the website.
14. 1 Amp standard. Use dedicated IES files for 600mA, 800mA and 1200mA when performing layouts. These files are published on the Galleon luminaire product page on the website.
15. Not available with HA option.
16. 2L is not available with MS, MS/X or MS/DIM at 347V or 480V. 2L in AF-02 through AF-04 requires a larger housing, normally used for AF-05 or AF-06. Extended arm option may be required when mounting two or more fixtures per pole at 90° or 120°. Refer to arm mounting requirement table.
17. Not available with LumaWatt wireless sensors.
18. Requires the use of P photocontrol or the PER7 or R photocontrol receptacle with photocontrol accessory. See After Hours Dim supplemental guide for additional information.
19. 50°C lumen maintenance data applies to 600mA, 800mA and 1A drive currents.
20. The FSIR-100 configuration tool is required to adjust parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative at Eaton for more information.
21. Approximately 22' detection diameter at 8' mounting height.
22. Approximately 40' detection diameter at 20' mounting height.
23. Approximately 60' detection diameter at 40' mounting height.
24. Approximately 100' detection diameter at 40' mounting height.
25. Replace X with number of Light Squares operating in low output mode.
26. LumaWatt wireless sensors are factory installed only requiring network components RF-EM-1, RF-GW-1 and RF-ROUT-1 in appropriate quantities. See www.eaton.com/lighting for LumaWatt application information.
27. Not available with house side shield (HSS).
28. Only for use with SL2, SL3, SL4 and AFL distributions. The Light Square trim plate is painted black when the HSS option is selected.
29. CE is not available with the LWR, MS, MS/X, MS/DIM, P, R or PER7 options. Available in 120-277V only.
30. One required for each Light Square.

PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK
COMMISSIONER

RECEIVED
DEC 0 2 2018
AND SCANNED

November 30, 2018

John Kuchinski
CES, Inc.
148 Main Street, Suite 300
Saco, ME 04072

RE: Information Request - Industrial Park project, Saco

Dear John:

Per your request received November 14, 2018, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *Industrial Park project* in Saco.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat.

While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. We recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, 207-902-1569) for further guidance, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act. Otherwise, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Significant Vernal Pools

At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs subject to protection under the Natural Resources Protection Act (NRPA) within the project area, which

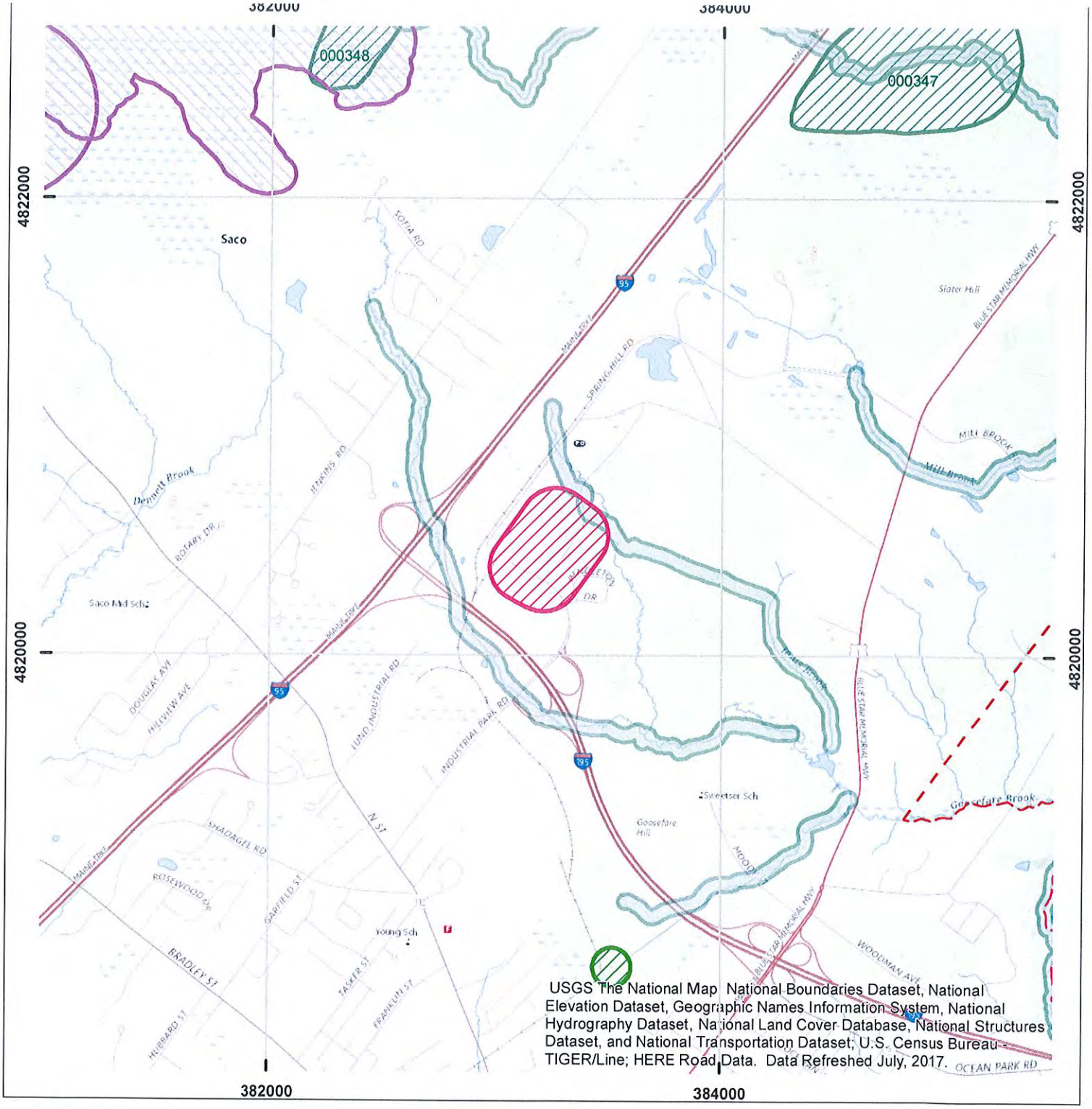
include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

John Perry
Environmental Review Coordinator



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Saco, Industrial Park project (Version 2)

Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 11/16/2018

- ProjectSearchAreas
- Deer Winter Area
- Significant Vernal Pools
- ETSc Environmental Review Polygons
- Special Concern-occupied habitats(100ft buffer)



CES INC

Engineers • Environmental Scientists • Surveyors

RECEIVED
NOV 16 2018
By 1541-18

RECEIVED
DEC 02 2018
AND SCANNED

November 14, 2018

Ms. Megan Hopkin
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, Maine 04333-0065

Re: City of Saco | New Public Works Facility and Expansion of the Saco Industrial Park, Saco, Maine

Dear Ms. Hopkin:

CES, Inc. is working with the City of Saco in preparing a Site Location of Development Permit Amendment application for the construction of a new Public Works Facility in Saco. The project site is located off Spring Hill Road and Industrial Park Road and will encompass approximately 42 acres of existing agricultural field area. The project includes a new Public Works Facility, access road and expansion of the Saco Industrial Park.

As required for permitting requirements, we are submitting this request to your office to determine if any historical sites of concern are located within the project area. Any response can be forwarded to our office located at 146 Main Street, Saco, ME 04072 or by email at jkuchinski@cesincusa.com.

Thank you for your assistance in this matter.

Sincerely,
CES, Inc.

John D. Kuchinski, PE
Senior Project Engineer

JDK/tmw
Encl.

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act. Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106 consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney, State Historic Preservation Officer
Maine Historic Preservation Commission

11/28/18
Date

Sensible Solutions | www.cesincusa.com

146 Main Street
Suite 300
Saco, Maine 04072
T 207.283.9151
F 207.283.9136

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

November 21, 2018

John Kuchinski
CES, Inc.
146 Main Street
Suite 300
Saco, ME 04072

Via email: jkuchinski@cesincusa.com

Re: Rare and exemplary botanical features in proximity to: #10602.002, Public Works, Saco, Maine

Dear Mr. Kuchinski:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received November 14, 2018 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Saco, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM

DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-8044
FAX: (207) 287-8040
WWW.MAINE.GOV/DACF/MNAP

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov

Rare and Exemplary Botanical Features within 4 miles of Project: #10602.002, Public Works, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Atlantic White Cedar						
	SC	S2	G4	1996-06-13	3	Forested wetland
Atlantic White Cedar Bog						
	<null>	S1	G3G4	1996-06-13	3	Forested wetland
Beach Plum						
	E	S1	G4	1932-09	12	Rocky coastal (non-forested, upland)
	E	S1	G4	1933-06-21	9	Rocky coastal (non-forested, upland)
	E	S1	G4	1933-05-19	10	Rocky coastal (non-forested, upland)
	E	S1	G4	1999-05-25	18	Rocky coastal (non-forested, upland)
Beach wormwood						
	SC	S1S2	G5T5	2011-10-28	6	<null>
Brackish Tidal Marsh						
	<null>	S3	GNR	2009-07-29	1	Tidal wetland (non-forested, wetland)
Butterfly Weed						
	PE	SX	G5	1986	1	Dry barrens (partly forested, upland)
Button Sedge						
	SC	S2	G5	2006-07-12	5	<null>
Clothed Sedge						
	E	S1	G5	2006-06-07	7	Dry barrens (partly forested, upland)
	E	S1	G5	2006-06-16	8	Dry barrens (partly forested, upland)
Creeping Spike-moss						
	E	S2	G5	1920-07-30	6	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	E	S2	G5	1924-08-21	8	Open wetland, not coastal nor rivershore (non-forested, wetland),Old

Rare and Exemplary Botanical Features within 4 miles of Project: #10602.002, Public Works, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
						field/roadside (non-forested, wetland or upland)
	E	S2	G5	2007-06-29	16	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	E	S2	G5	1989-08-14	2	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Dioecious Sedge						
	SC	S3	G4G5	1936-07-14	7	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
Dwarf Glasswort						
	SC	S1	G5	1981-09-16	2	Tidal wetland (non-forested, wetland)
Estuary Bur-marigold						
	SC	S3	G4	2009-07-30	35	Tidal wetland (non-forested, wetland)
Freshwater Tidal Marsh						
	<null>	S2	G4?	2009-07-30	1	Tidal wetland (non-forested, wetland)
Hollow Joe-pye Weed						
	SC	S2	G5?	1989-08-14	2	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	2013-09-01	23	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	1989-08-14	4	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	1989-08-21	1	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	1989-08-22	3	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Horned Pondweed						
	SC	S2	G5	1907-08-18	10	Tidal wetland (non-forested, wetland)
	SC	S2	G5	2000-08-28	15	Tidal wetland (non-forested, wetland)
	SC	S2	G5	2007-07-05	19	Tidal wetland (non-forested, wetland)

Rare and Exemplary Botanical Features within 4 miles of Project: #10602.002, Public Works, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	SC	S2	G5	1972-06-13	3	Tidal wetland (non-forested, wetland)
Lilaeopsis						
	SC	S2	G5	2007-07-05	11	Tidal wetland (non-forested, wetland)
	SC	S2	G5	2012-10-21	10	Tidal wetland (non-forested, wetland)
Long's Bulrush						
	T	S2	G2G3	2011-08-12	10	Open wetland, not coastal nor rivershore (non-forested, wetland)
Long-spined Sandbur						
	PE	SH	G5	1984	1	Rocky coastal (non-forested, upland)
Mudwort						
	SC	S3	G4G5	2009-07-30	35	Tidal wetland (non-forested, wetland)
Pale Green Orchis						
	SC	S2	G4?T4Q	2008-06-27	52	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
	SC	S2	G4?T4Q	2008-06-27	53	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
	SC	S2	G4?T4Q	2008-06-27	54	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
Parker's Pipewort						
	SC	S3	G3	2012-10-21	33	Tidal wetland (non-forested, wetland)
	SC	S3	G3	1924-08-20	8	Tidal wetland (non-forested, wetland)
Pendulous Bulrush						
	SC	S2	G5	2008-06-28	8	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Pitch Pine Bog						
	<null>	S2	G3G5	1996-06-13	4	Forested wetland,Coastal non-tidal wetland (non-forested, wetland)
Pocket Swamp						

Rare and Exemplary Botanical Features within 4 miles of Project: #10602.002, Public Works, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	<null>	S2	G5	2004	18	Forested wetland,Hardwood to mixed forest (forest, upland)
Pygmyweed						
	SC	S2S3	G5	2009-07-29	25	Open water (non-forested, wetland)
	SC	S2S3	G5	2007-07-05	28	Open water (non-forested, wetland)
Raised Level Bog Ecosystem						
	<null>	S4	GNR	2006-07-12	3	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
Red Maple Swamp						
	<null>	S5	G3G5	2007-06-05	17	Forested wetland
Salt-hay Saltmarsh						
	<null>	S3	G5	2010-07-16	14	Tidal wetland (non-forested, wetland)
	<null>	S3	G5	2010-10-14	12	Tidal wetland (non-forested, wetland)
Saltmarsh False-foxglove						
	SC	S3	G5	1982	12	Tidal wetland (non-forested, wetland)
Slender Blue Flag						
	T	S2	G4G5	1995-07-18	18	Tidal wetland (non-forested, wetland)
Small Reed Grass						
	SC	S3	G5	2006-08-08	14	Old field/roadside (non-forested, wetland or upland)
Smooth Winterberry Holly						
	SC	S3	G5	2012-10	44	Forested wetland
	SC	S3	G5	1979	13	Forested wetland
	SC	S3	G5	1997-07-29	24	Forested wetland
	SC	S3	G5	2009-07-05	39	Forested wetland
	SC	S3	G5	2004	36	Forested wetland

Rare and Exemplary Botanical Features within 4 miles of Project: #10602.002, Public Works, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Spongy-leaved Arrowhead						
	SC	S3	G5T4	2012-10-21	42	Tidal wetland (non-forested, wetland)
Stiff Arrowhead						
	SC	S2	G5	2006-06-16	15	Tidal wetland (non-forested, wetland)
Tidal Marsh Estuary Ecosystem						
	<null>	S3	GNR	2010-07-16	6	Tidal wetland (non-forested, wetland)
	<null>	S3	GNR	2010-10-14	4	Tidal wetland (non-forested, wetland)
Water-plantain Spearwort						
	PE	SH	G4	1862-08	3	Open water (non-forested, wetland)
Water Pimpernel						
	SC	S3	G5T5	2012-10-21	26	Tidal wetland (non-forested, wetland)
Wild Ginger						
	T	S1S2	G5	1986	4	Hardwood to mixed forest (forest, upland)
Yellow Wild Indigo						
	PE	SH	G5	1960-06-21	2	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)

Broadwater Environmental, LLC
18 Grand St., South Portland, ME 04106

December 28, 2018

Mr. John Kuchinski, PE
CES, Inc.
146 Main St.
Saco, Maine 04072

Dear John,

Subject: Test Pit Logs for Proposed Saco Public Works Complex, Spring Hill Road, Saco, Maine

The purpose of this letter is to provide you with logs of eight test pits completed on a lot on Spring Hill Road in Saco. A new public works complex is being considered at this location.

CES, Inc. contracted Broadwater Environmental, LLC to complete logs for eight test pits at predetermined locations to support a Site Location of Development permit application. On December 18, 2018, I met personnel from the Town of Saco (Town) at the site. Town personnel used excavators to dig the test pits and I proceeded to log them using soil science techniques and standards.

The texture and drainage class were noted for each test pit. Two test pits (i.e., TP-1 and TP-2) were completed to a depth greater than 10 feet at your request. Other test pits were completed between 4 and 5 feet below ground surface.

Somewhat poorly drained conditions were observed in soils in four test pits; TP-3, TP-6, TP-7 and TP-8. The remaining four test pits showed soils in a moderately well drained condition. No hydric soils were observed in any of the test pits.

Logs for the test pits are attached to this letter. Please let me know if you have any questions regarding the logs. I can be reached at 207-653-8737.

Sincerely,

Ian Broadwater; Maine Certified Soil Scientist No. SS305
Broadwater Environmental, LLC

Attachments:
Test Pit Logs

Test Pit Logs Completed 12/18/18
Proposed Public Works Complex
Spring Hill Road
Saco, Maine

TP-1
0”-3” Fine sandy loam (10YR 3/2); v. friable; weak f. granular structure; many fine roots; moist

3”-6” Fine sandy loam (10YR 5/6); friable; weak f. granular structure; moist

6”-18” Fine sandy loam (10YR6/8); v. friable; weak f. granular structure; moist

18”-114” Fine-coarse sand (10YR 4/3); 20% rounded coarse fragments as gravel and cobbles; dense; moist; common depletions of 10YR 5/1 at 28” bags; iron staining on grains at 27”

114”-120” Silty clay (5Y 5/2); soft; plastic; massive; moist-saturated

TP-2
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-3” Fine loamy sand (10YR 3/2); frozen

3”-8” Sandy loam (10YR 4/6); friable; weak fine granular structure; moist

8”-16” Loamy sand (2.5Y 5/6); friable; weak fine granular structure; moist

16”-34” Loamy sand (10YR 4/6); friable; moist; 10% coarse fragments as rounded gravel and cobbles; common depletions of 2.5 Y 5/1 at 17” bgs; groundwater seeps at 33” bgs

34”-144” Gleyed silty clay; v. firm; moist

144-156” Gleyed silty clay (Gley 1 5/N); soft; plastic; moist-saturated

TP-3
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-2” Loamy sand (10YR 5/3); friable; weak fine granular structure; moist

2”-12” Loamy sand (10YR 5/1); friable; weak fine granular structure; moist; common redox depletions of 10YR 7/1 at 11” bgs

12”-15” Fine to coarse sand (5YR 4/6); cemented; iron staining on grains; 10% coarse fragments as gravel and cobbles; moist

15”-19” Fine to coarse sand (10YR 4/6); slightly cemented; iron staining on grains; 10% coarse fragments as gravel and cobbles; moist

19”-31” Silt loam (Gley 1 7/10Y); v. firm; 15% coarse fragments as gravel and fine cobbles; groundwater seep at 23” bgs; common redox concentrations of 7.5YR 6/8 at 20” bgs

TP-3 (continued)
31”-48” Sandy loam (10YR 6/1); friable, massive structure; moist; common redox concentrations of 7.5YR 6/8

TP-4
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-2” Fine sandy loam (10YR 3/2); friable; common fine roots; moist

2”-6” Loamy sand (10YR 5/6); friable; weak fine granular structure; common f-m roots; moist

6”-25” Loamy sand (2.5Y 5/8); friable; weak granular structure; moist; common redox concentrations at 25” bgs of 7.5YR 6/8; groundwater seep at 25” bgs

25”-54” Silty clay (2.5Y 4/3); v. firm; 10% coarse fragments as rounded gravel and cobbles; weak platey structure; moist-saturated; common redox concentrations of 7.5YR 6/8;

TP-5
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-3” Fine sandy loam (10YR 3/2); frozen

3”-7” Loamy sand (10YR 4/6); friable; weak granular structure; common f-m roots; moist

7”-25” Loamy sand (10YR 6/8); friable; weak granular structure; moist; common faint large redox depletions of 2.5Y 5/1 at 22” bgs

25”-50” Medium sand (2.5Y 7/4); loose-single grained; moist to saturated; pit walls collapse at 36” bgs and ground water collects to this level in the pit; weakly cemented 25”-28” bgs

TP-6
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-3” Fine loamy sand (10YR 3/2); friable; moist; common f. roots

3”-13” Fine loamy sand (2.5Y 5/1); v. friable; weak granular structure; common f. roots; moist

13”-16” Loamy sand (7.5YR 4/6); moderately cemented; moist; iron staining on sand grains

16”-23” Fine loamy sand (10YR 4/3); friable; moist

23”-54” Fine sand (2.5Y 6/2); weak platey structure; thin lenses (<0.5”) of silt and clay in this horizon; groundwater seeping out of pit wall at 23” bgs

Test Pit Logs Completed 12/18/18
Proposed Public Works Complex
Spring Hill Road
Saco, Maine

TP-7
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-3” Loam (10YR 3/2); friable; weak f. granular structure; many f-m roots; moist

3”-5” Fine sandy loam (7.5YR 5/1); friable; weak f. granular structure; common f-m roots; moist

5”-9” Fine sandy loam (10YR6/8); friable; weak f. granular structure; few f-m roots; moist

9”-14” Fine loamy sand (2.5Y 5/3); friable; weak f. granular structure; moist

14”-31” Silt loam (10YR 4/3); firm; moist; common redox depletions and concentrations. Concentrations are 7.5YR 6/8

31”-54” Silt loam (10YR 5/3); soft; slightly plastic; moist; common depletions of 2.5Y 6/1

TP-8
0”-1” Organic matter; moderately decomposed; variable colors; moist

1”-4” Fine loamy sand (7.5YR 6/1); v. friable; weak granular structure; few f-m roots; moist

4”-13” Fine loamy sand (10YR 5/4); friable; weak granular structure; moist; common large depletions of 2.5Y 6/1 at 13” bgs

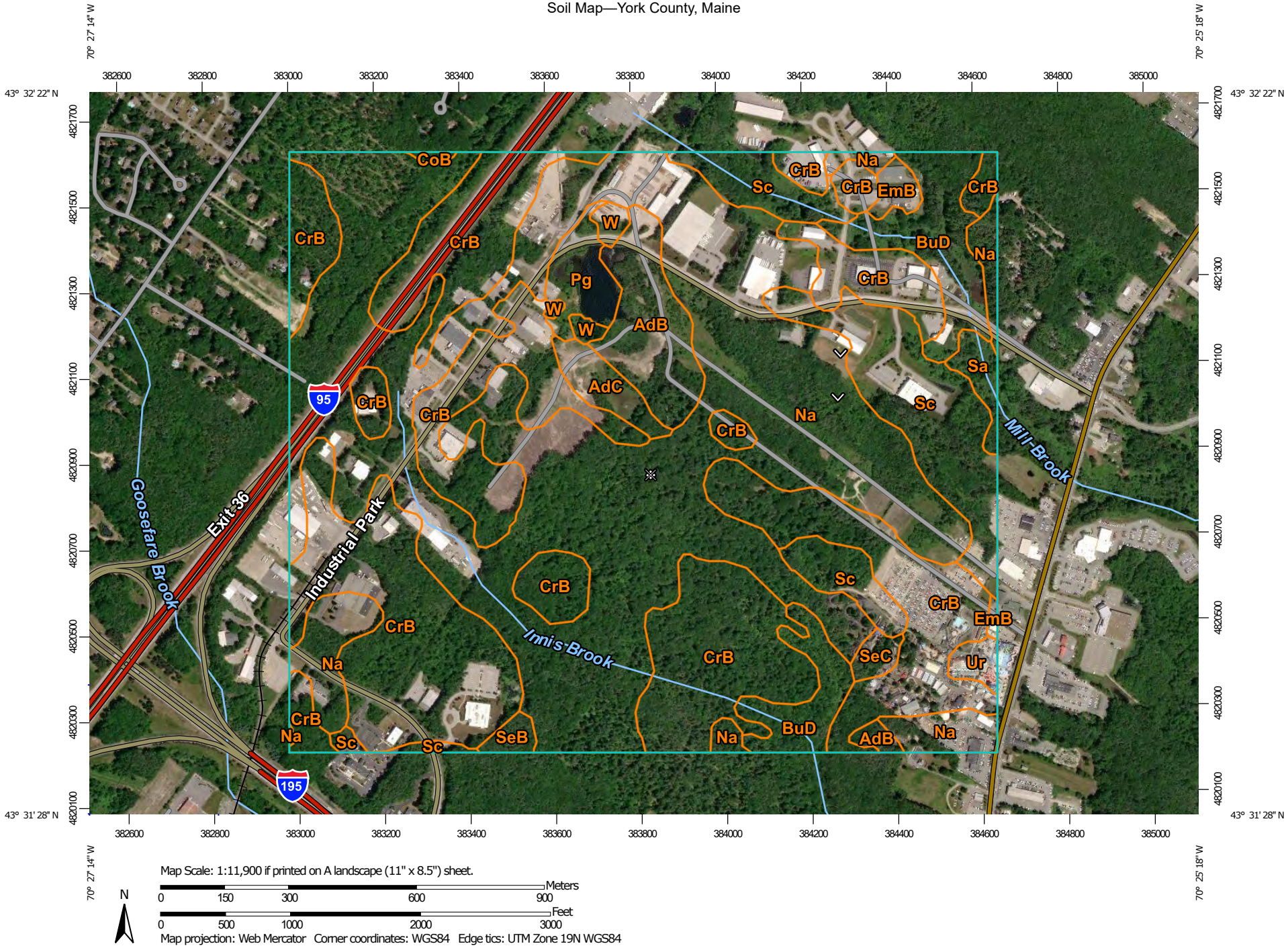
13”-17” Fine sand (10YR 5/3); weakly cemented; firm; moist

17”-42” Silt loam (2.5Y 5/2); firm; blocky structure; moist; common redox depletions and concentrations (7.5YR 6/8) at 17”; groundwater seep at 17” on pit face

42”-54” Silt loam (2.5Y 5/3); soft; moist; common redox depletions and concentrations (7.5YR 6/8)

Notes:
Bgs=below ground surface
f-m=fine to medium
f.=fine

Soil colors are in parenthesis


70° 27' 14" W
70° 25' 18" W
43° 32' 22" N
43° 31' 28" N
382600
382800
383000
383200
383400
383600
383800
384000
384200
384400
384600
384800
385000
4821700
4821500
4821300
4821100
4820900
4820700
4820500
4820300
4820100
CoB
CrB
Na
Sc
EmB
W
BuD
Pg
AdB
AdC
Sa
95
Exit 36
Goosefare Brook
Industrial Park
Mill Brook
Innis Brook
SeC
Ur
SeB
195
Map Scale: 1:11,900 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 150 300 600 900
Feet
0 500 1000 2000 3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: York County, Maine
Survey Area Data: Version 17, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AdB	Adams loamy sand, 0 to 8 percent slopes	19.5	3.4%
AdC	Adams loamy sand, 8 to 15 percent slopes	6.2	1.1%
BuD	Buxton silt loam, 15 to 25 percent slopes	28.1	4.9%
CoB	Colton gravelly loamy coarse sand, 0 to 8 percent slopes	0.5	0.1%
CrB	Croghan loamy sand, 0 to 8 percent slopes	203.2	35.3%
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	3.2	0.5%
Na	Naumburg sand	244.9	42.6%
Pg	Pits, gravel	8.0	1.4%
Sa	Saco mucky silt loam	3.8	0.7%
Sc	Scantic silt loam, 0 to 3 percent slopes	47.8	8.3%
SeB	Scio silt loam, 3 to 8 percent slopes	2.1	0.4%
SeC	Scio silt loam, 8 to 15 percent slopes	2.4	0.4%
Ur	Urban land	2.6	0.5%
W	Water bodies	2.9	0.5%
Totals for Area of Interest		**575.1**	**100.0%**

February 21st, 2019

John D. Kuchinski
146 Main St.
Suite 300
Saco, Me 04072

RE: Ability to Serve: City of Saco | New Public Works Facility and Expansion of the Saco Industrial Park, Saco, Maine - Project

Dear Mr. Kuchinski:

For Planning Board purposes, this letter is to confirm the availability of public water service to property located off Spring Hill Road and Industrial Park Road in Saco. We understand the property is proposed to be a new Public Works Facility, access road, and expansion of the Saco Industrial Park. In addition to the public works facility the development will include two additional industrial lots to be added to the Saco Industrial Park. We have sufficient flows in the area to support this project.

As this project progresses, it will be necessary to review your plans in more detail, gain approval, create the necessary paperwork to be executed, and provide inspections. If you have questions or need additional information please feel free to contact me at 1-800-287-1643.

Sincerely,

Kristopher White
Field Service Coordinator

From: Howard Carter
To: John Kuchinski
Cc: Joseph A. Laverriere; Emily C. Prescott
Subject: RE: Saco DPW ability to serve
Date: Friday, February 15, 2019 10:08:23 AM

John-
The City of Saco WRRD has the ability to transport and treat the 1300 gallons per day referenced in your letter to me dated January 8th, 2019.

Howard Carter
City of Saco, Maine
Water Resource Recovery Department, Director
(207) 282-3564
hcarter@sacomaine.org

From: John Kuchinski <jkuchinski@cesincusa.com>
Sent: Friday, February 15, 2019 8:52 AM
To: Howard Carter <HCarter@sacomaine.org>
Subject: Saco DPW ability to serve

[CAUTION: THIS EMAIL ORIGINATED FROM OUTSIDE THE CITY OF SACO DOMAIN]

Howard

Attached is our request for an "Ability To Serve" letter for the Saco DPW we sent on January 8. I am also attaching revised site plans. Please note that the City DPW is planning on a wash area for removing excess salt and sand from plow trucks during the winter season and this water will be discharged to the sewer. A series of settling pretreatment tanks will precede the discharge to the sewer.

Thank you
John

John Kuchinski, P.E. ◆ Senior Project Engineer
P 207.283.9151 | **F** 207.283.9151 | **C** 207.899.5307

CESINC

Engineers ◆ Environmental Scientists ◆ Surveyors

146 Main Street, Suite 300, Saco, ME 04072 | www.cesincusa.com

This e-mail may be confidential and is intended solely for the use of the individual to whom it is addressed. Any views or opinions expressed are solely those of the author and do not necessarily represent those of CES, Inc. If you are not the intended recipient (or responsible for delivery of the message to such person), you may not use, copy, distribute or deliver to anyone this message (or any part of its contents) or take any action in reliance on it. In such case, you should delete this message, and notify us immediately at 207 283-9151 or by email saco@cesincusa.com.

Staff Comments

Peer Review Memos

Applicant's Responses

GORRILL PALMER

707 Sable Oaks Drive, Suite 30
South Portland, ME 04106
207.772.2515

June 12, 2019

Emily Cole-Prescott, City Planner
City of Saco
300 Main Street
Saco, Maine 04072

RE: Saco DPW Site plan application
Civil Peer Review - #3

Dear Emily,

I have reviewed the Subdivision application materials prepared by CES Inc. on behalf of the DPW for their new facility off Spring Hill Road. Submission materials include the following:

- Subdivision plans for the Saco Industrial Park & New Public Works Facility dated May 9, 2019
- Response memo from CES to Planning Dated June 12, 2019
- Preliminary Subdivision plan by Dow and Coulombe dated May 10, 2019

I offer the following comments for your consideration:

General

1. As I stated in Peer review Letter #2 dated June 11, 2019, it appears that the project drawings have been separated to include the Plan and Profile sheets for the road with the Subdivision plan and application. I think it would be appropriate to make a reference within each set of plans (Site plan set and Subdivision plan Set) to the other set so a future reader of these documents can clearly understand what has been assembled. I assume that the road plan/profile will be part of the construction documents along with the Site plans and details, thus a clear recognition amongst all of the plans of what's involved seems critical. This applies to the Subdivision plan by Dow and Coulombe also; I suggest it contain cross references to the plans now prepared by CES for the site plan and subdivision plan applications.

Preliminary Subdivision plan

1. I assume that a final plan will be submitted for PB approval and signatures and the "Preliminary" taken off the current plan. Perhaps the "Lot __" notes on each lot can also be erased since each lot is adequately labeled it appears.
2. If any of the conveyances have now been completed, they should be identified with the recording information provided on the plan.
3. Its not clear whether the Subdivision plan is tied to State plane coordinate system and NAD88 vertical coordinate system. The surveyor should confirm.

4. The plan might identify whether it is the City's intention to make the access from Spring Hill Road a public way or not. That will provide clarity for prospective Lot 2 or 3 owners as to the access road condition.
5. It wasn't clear on the site plans that the rear of Lot 2 contains a drainage easement, presumably benefitting the City. Will the future Lot 2 owner also have rights to the drainage easement?
6. It might be worthy of identifying on the plan the wetland impacts to be permitted by the City for the DPW site and to alert prospective owners of Lot 2 and 3 as to the requirement for additional NRPA permitting if they intend to impact additional wetlands in the future.

Drawing Sheet C201 – Proposed Plan and Profile

1. The Maine Water Company should weigh in on the 12" water main vertical alignment and the need for blow offs anywhere along the run.
2. SMH-P1 should be labeled to identify the existing sewer pipe size and invert along Spring Hill Road as part of the CD production.
3. The invert for the 12" SD outfalling at Stat 3+40 left should be labeled.
4. The placement of all erosion control measures should be shown on the plan. As an example there doesn't appear to be shown any sediment barrier i.e. silt fence, at the toe of slope between Stat 4+00 to 5+50 right.
5. It might be beneficial to show any test pit or boring information along the access road to better depict any shallow rock etc.
6. The utility pole at Stat 2+00 right might need guy support into the Gravel Wetland Cell. This isn't likely to be a big issue but might be noted on the plan.

Drawing Sheet C202 – Proposed Plan and Profile

1. Is it the intent to have both sanitary services into SMH-P5 at the same invert of 116.8'? The alignment of the service from the DPW site enters P5 at less than a 90 degree angle so City staff should weigh in on the acceptability of this alignment.
2. It would be beneficial to run the road profile to the full length of the fill placement at the very end of the road just to show how that will be constructed. It appears that the grading at Sta 16+25 is elevation 120.00' on the plan and slightly higher than that on the profile, thus this should be made consistent between the two.

Drawing Sheet C504 – Details

1. The pond Bench detail basically indicates at least an 8' wide relatively level width over the bench and underdrain pipe. The plan view details on the same sheet clearly don't show similar grading at the locations of each of the pond benches in the gravel wetlands. The grading should be modified to reflect the detail.

Drawing Sheet C505 – Details

1. The profile view of the Soil Filter field detail should be revised to reflect the placement of the underdrain within a course gravel layer beneath the soil filter layer.

If you have any questions regarding these plan review comments please contact this office.

End of Memo

GORRILL PALMER

707 Sable Oaks Drive, Suite 30
South Portland, ME 04106
207.772.2515

June 11, 2019

Emily Cole-Prescott, City Planner
City of Saco
300 Main Street
Saco, Maine 04072

RE: Saco DPW Site plan application
Civil Peer Review - #2

Dear Emily,

I have reviewed the revised application materials prepared by CES Inc. on behalf of the DPW for their new facility off Spring Hill Road. Submission materials include the following:

- Site plans for the Saco Industrial Park & New Public Works Facility dated May 9, 2019
- Response memo from CES to Planning Dated May 13, 2019
- Subdivision Application materials dated May 14, 2019

I offer the following comments for your consideration:

General

1. It appears that the project drawings have been separated to include the Plan and Profile sheets for the road with the Subdivision plan and application. I didn't have any of those sheets to review but understand that is how the sheets have been assembled into two different sets. I think it would be appropriate to make a reference within each set of plans (Site plan set and Subdivision plan Set) to the other set so a future reader of these documents can clearly understand what has been assembled. I assume that the road plan/profile will be part of the construction documents along with the Site plans and details, thus a clear recognition amongst all of the plans of what's involved seems critical.

Cover Sheet

1. It would be beneficial to include all of the plans in the drawing index and simply cross reference those that are part of the Site Plan application and those that are part of the Subdivision application.

Drawing Sheet G101 – General Notes

1. I suggest that once the project is approved all waivers, Special conditions of approval and Standard Conditions of approval be included on the Notes along with any Conditions from other permits such as DEP, etc.

Drawing Sheet C101 – Existing Site plan

1. A note cross referencing the Subdivision plan should be added to the sheet so the reader understands the basis of the lot lines etc represented on the drawing.
2. The interior metes/bounds for all lot lines, Right of Way and easement lines should be represented on the plan in my opinion.
3. The 70' wide easement should be clearly noted as to whom it benefits (Sweetser) and if possible, any recording information ultimately for the easement. It may also be worthy of noting that it is an easement for both access and utilities extending from Spring Hill Road.
4. Is there recording information available on the transfers between the City and Cormier Land Co. Inc.? if so, it should be added to the plan.
5. It's unclear what the areas to the east side of Lots 2 and 3 are as the dashed line area is unlabeled as either a buffer, setback or other reserved area up against the land transferred to Cormier.
6. The plan might clarify whether future development area within lot 3 must be setback from the Sweetser buffer or can it extend directly up to the buffer.
7. The plan identifies the benchmark elevation but doesn't' actually describe what it is i.e nail in tree, chisel mark on ledge etc.
8. The frontage line along Spring Hill Road should be labeled accurately as to bearing and length.
9. The source of the wetland information including date at which the delineation was performed should be added to the plan so if permitting is required in the future, it's understood when the current information was gathered.
10. The westerly boundary line along Lot 3 should be clearly identified with the appropriate line type and not as an easement boundary line. I presume it's the east side of the easement.

Drawing Sheet C102 – Proposed Site plan

1. The DPW site involves a total wetland impact of 12,019 SF which will require a Tier 1 Natural Resources Protection Act Permit from the Maine DEP. That should be noted on the plan and it should be noted to the contractor and future lot owners that any additional wetland impacts would require authorization from the DEP.

Drawing Sheet C103 – Enlarged Site plan

1. The limits of curbing remain unclear on the plans, either through graphic representation or by labeling.
2. Although it was answered in the Consultant's responses it remains unclear what is the surface section for the access to GUSF 3 is expected to be on the plan?
3. The wall systems for the materials bins should be more clearly labeled and detailed on the plans so the contractor is fully directed as to what to supply and install.
4. There is not much detail on the installation of the fuel tanks in the NW corner of the site. The specifications for all tanks, enclosures/containment, underground piping etc should be detailed and permitting for the tanks and fuel islands will be required in accordance with State and Federal regulations. Setbacks to resources, and any nearby wells or water sources must be identified. A clear delineation of work responsibility should be noted on the plan if the fuel farm construction is to be a stand alone aspect of the proposal in our opinion.

5. The GUSF #5 has an emergency spillway discharging over the westerly site driveway which seems undesirable. The DPW staff should confirm this is acceptable. An alternative would be a piped conveyance for high rain events.
6. The ADA spaces must be noted to contain a maximum 2% grade in all directions across the parking.
7. The contours at the emergency spillways for each of the GUSF aren't entirely accurate as they extend across the spillway, despite a lower spillway height. It's a minor detail that might be worthy of correction for final construction documents.
8. The Transportation office finish floor elevation should be noted, particularly since there are ADA spaces proposed in front if it.

Drawing Sheet C104 – Proposed Utility Plan

1. Invert elevations should be provided for all of the sanitary sewer stubs so it's understood what is to be installed.
2. CB-P5 and CB-P7 are relatively deep catch basins with 3' sumps; each is at the beginning of the line; thus consideration might be given to reduce their depths to save expense. Its' understood that the structures have 3' deep sumps for pretreatment and collection of sediment, however it's not clear why the inverts out need to be so deep, resulting in CB's that will require perhaps greater than 10' of excavation, particularly as they are the start of drainage runs.
3. The rim elevations for the Gravel Wetland 2 Cell 2 outlet control structure and DMH-P3 should be provided.
4. It's not clear where the 10" SD into the GUSF 5 nyloplast structure comes from?
5. The sewer service from the SMH-P8 structure enters SMH-P5 at less than a 90-degree angle to the outlet thus it might be worthy of shifting P5 to the north a bit to improve the channel configuration in the structure.

Drawing Sheet C504 – Details

1. The pond Bench detail basically indicates at least an 8' wide relatively level width over the bench and underdrain pipe. The plan view details on the same sheet clearly don't show similar grading at the locations of each of the pond benches in the gravel wetlands. The grading should be modified to reflect the detail.

Drawing Sheet C505 – Details

1. The profile view of the Soil Filter field detail should be revised to reflect the placement of the underdrain within a course gravel layer beneath the soil filter layer.

If you have any questions regarding these plan review comments please contact this office.

End of Memo

GORRILL PALMER

707 Sable Oaks Drive, Suite 30
South Portland, ME 04106
207.772.2515

April 24, 2019

Emily Cole-Prescott, City Planner
City of Saco
300 Main Street
Saco, Maine 04072

RE: Saco DPW Site plan application
Civil Peer Review

Dear Emily,

I have reviewed the application materials prepared by CES Inc. on behalf of the DPW for their new facility off Spring Hill Road. Submission materials include the following:

- Site plans for the Saco Industrial Park & New Public Works Facility dated April 2, 2019
- Various application materials contained within the April 2, 2019 Site plan Review application package.

I offer the following comments for your consideration:

Drawing Sheet C101 – Existing Site plan

1. It would be beneficial to include a plan reference as to the source of the topographic and boundary survey information presented on the plan. Perhaps a reference to the work that Dow and Coulombe prepared for the site?
2. I also suggest a Zoning summary be added to the sheet to reference the site's positioning within the B-8 Zone and a table of the dimensional standards for the DPW site as well as any future lots to be created.

Drawing Sheet C102 – Proposed Site plan

1. I suggest the B-8 dimensional requirements be placed on the plan including zoning setbacks etc.
2. The DPW site involves a total wetland impact of 12,019 SF which will require a Tier I Natural Resources Protection Act Permit from the Maine DEP. That should be noted on the plan and it should be noted to the contractor that ay additional wetland impacts would require authorization from the DEP.

Drawing Sheet C103 – Enlarged Site plan

1. It might be helpful to shade/hatch to better distinguish between the Standard Duty and Heavy Duty pavement areas.

2. Will there be any directional signage placed including stop signs and other MUTCD related signs (ADA, visitor parking etc)?
3. What is the status of the completion of any geotechnical investigations performed for the site? This information may be worthy of placement on the plans. We note there are a few test pits identified however there appears to be nothing in the vicinity of any of the buildings and the gravel wetland cell #2 doesn't have any TP information.
4. The limits of curbing aren't clearly identified on the plans, either through graphic representation or by labeling.
5. Multiple sewer stubs are identified on the utility plan; should driveway aprons to these future lots be identified and provided?
6. It appears there is to be an access down to GUSF 2 & 3; what is the surface section for this access expected to be?
7. The materials storage areas appear to be surrounded with a wall system; what is the wall system to consist of and will there be details provided for its construction?
8. I recommend consideration be given to the placement of reinforced concrete pads beneath the materials storage bins rather than heavy duty asphalt, if the budget allows. Perhaps a bid alternate approach might be beneficial.
9. There is not much detail on the installation of the fuel tanks in the NW corner of the site. The specifications for all tanks, enclosures/containment, underground piping etc should be detailed and permitting for the tanks and fuel islands will be required in accordance with State and Federal regulations. Setbacks to resources, and any nearby wells or water sources must be identified. A clear delineation of work responsibility should be noted on the plan if the fuel farm construction is to be a stand alone aspect of the proposal in our opinion.
10. There is limited information outlining the construction details for all the forebays, including stone sizing, depths and geotextile placement. Additional details should be provided. The design contemplates that the Forebays need to fill up with water (thus surcharging the drainage pipes) before water spills into the GUSF zones. Is this the desired objective as surcharged drainage pipes are not always desirable?
11. The GUSF's all require emergency spillways. These locations have not been identified on the plan.
12. The ADA spaces must be noted to contain a maximum 2% grade in all directions across the parking.
13. Its unclear what is proposed along the northeasterly property boundary as to grading etc. the utility plan indicates a new 12" SD to be installed. Information on the DMH including rim information is missing.
14. The site appears to be an earthwork fill condition; have the earthwork quantities been evaluated to best determine an economic "best fit" as it relates to overall development costs and approach? Not necessary a Site plan question but perhaps of importance to the City as it relates to development costs.
15. I suggest consideration for some type of temporary barrier at the end of the road, before the steeper embankment slope to prevent a vehicle going off the end, particularly at night.

Drawing Sheet C104 – Proposed Utility Plan

1. The layout of underdrains within the Grassed Underdrain Soil Filters is not consistent with the details which call for 4" UD pipes to be spaces at a maximum of 8' apart. The Plan should be updated so that there is no ambiguity on the amount of underdrain pipe needed in each GUSF.
2. Each of the GUSF has a Nyloplast structure for the overflow outlet. These should be detailed and consideration given to using precast structures as these might be more cost effective.
3. There appear to be charging stations at the head of the fleet parking. Are there any details for these?
4. All drainage outlets should be provided with a riprap stabilized apron with appropriate sizing.
5. The Oil-water separator should be specified and sized. Will there be a wash basin in the building and if so, what volume of water etc is expected? Will there be any recycling of wash water?
6. Invert elevations should be provided for all of the sanitary sewer stubs so its understood what is to be installed.
7. CB-P5 and CB-P7 are relatively deep catch basins with 3' sumps; each is at the beginning of the line, thus consideration might be given to reduce their depths to save expense.
8. The Maine Water Company should provide a sign off on the water system design including sizing and related installation details.
9. We understand a separate lighting plan has been prepared by others. We have not reviewed that design.

Drawing C201 – Proposed Plan and Profile

1. Information regarding the existing conditions of the sewer line in Spring Hill Road should be provided, including depth and alignment so that the proposed SMH-P1 can be cast appropriately.
2. Will the apparent existing sanitary sewer service entering the property be abandoned or removed?
3. The Maine Water Company should provide input as to the proposal for the connection of a new 12" water line off the existing 16" main. Will this installation require a shutdown of the existing line and what might be involved with a shutdown, as it relates to abutting properties etc. The Water company might weigh in on the use of a Tee assembly versus tapping sleeve and valve. Is a 12" water line appropriately sized for the prospective land uses in the park?
4. The water line profile is not consistent with the apparent 6' required installation depth for the water main. Again, the Water Company should provide input on their acceptance of the design.
5. The proposed sewer is relatively deep, thus any information on ledge depths should be identified. The Water Resources Recovery Department should provide input on the sewer sizing (10") and depths. This appears to be a relatively robust sewer size for the overall development area, although there may be specific reasons for the sizing I am unaware of. Are there any concerns on minimum flow velocities in the pipe, particularly if only DPW flows are initially discharged to the sewer?
6. All Manholes with stubs for future lot development should be clearly identified and accounted for to assure proper casting.
7. All utility crossings should be verified and identified on the plan i.e. SD crossing at Station 10+08 +/-.
8. A temporary grading license may be required from the property owner near Station 5+00 right.

Drawing C202 – Proposed Plan and Profile

1. The sanitary sewer stub from SMH-P7 appears as though it will be very shallow at the stub end, at little to no cover.
2. The end of the road profile at Station 16+25 is not representative of the proposed slope. Again, consideration might be given to a barrier of some form at the end of the road, at least on a temporary basis.

Drawing Sheet C501 – Details

1. The 7" slab on grade detail should be updated to identify/specify the structural fill material. Why is it identified as existing?
2. The stone filter strip pretreatment detail indicates a thickness of 8" of 3" crushed stone. If 3" stone is used a more appropriate thickness might be 10" to 12" in my opinion.

Drawing Sheet C502 – Details

1. The typical Roadway cross section identifies the road buildup information as on that sheet. I believe it is on the previous sheet.
2. The DPW should verify if the polyethylene wrap for the catch basins is necessary.
3. The transformer sizing should be verified by an electrical designer or CMP.

Drawing Sheet C504 – Details

1. Some specifications should be provided for the wetland soil in the Gravel Wetland detail. Will the contractor be able to salvage wetland soil from the areas of impact for reuse in the gravel wetlands an if so, might this preclude any need for additional plantings?
2. It is uncertain where the pond bench detail applies to the site?
3. The Pond outlet structure may have an inadvertent elevation reference at the basin bottom?

Drawing Sheet C505 – Details

1. The grassed underdrain soil filter detail table appears to need some update for clarity and consistency. USF #4 is missing from table and the elevations on the rows for #5 and #6 seem inaccurate to the plans.
2. A table might be provided in the Emergency Spillway detail to provide information for each spillway at each GUSF etc.
3. Additional detail for the sizing of all culvert inlet/outlet protection should be provided.

Stormwater Management Report

I have performed a cursory review of the stormwater management report with the understanding that the project has been submitted to the Maine DEP as an amendment application, thus DEP staff will also be performing a more thorough review of the SWM report and designs to assure Chapter 500 compliance. I note the following general comments that should be addressed:

1. The Post Development Model indicates that Subarea 3 is part of the Point of Analysis #1 watershed. This appears inconsistent with the Post Development Plan which shows that Subarea 3 drains to the GW3/GW4 and Analysis Point 2
2. Similarly Subarea 1 contains GW1/GW2 and these appear to discharge to the Spring Hill Road Ditch and not to Analysis Point #1, as indicated in the HydroCAD model. This should be clarified.
3. Evidence including test pit information for each of the BMP's is required to verify the depth to groundwater so that a determination can be made for the separation requirements from the bottom of the BMP's to groundwater. This may influence the need for lining any of the BMP's and whether any further groundwater relieve is needed. The design detail does call for a 20 mil liner so that may be appropriate.
4. The design uses multiple Grassed underdrain soil filters for water quality treatment and quantity control. The designer should provide evidence of compliance with the BMP design guidance criteria including the following:
    a. Basin sizing – The BMP Chapter 7.1 indicates a maximum basin size of 3,000 SF. The plans indicate several GUSF are larger than 3,000 SF, thus they may need to be divided up a bit to achieve the design criteria.
    b. Calculations for Drain time for each of the basins should be provided. Typically this is achieved with some form of outlet orifice control.
    c. Sizing calculations for the sediment pretreatment basins should be provided.
5. The site is within the Goosefare Brook watershed which is identified by the DEP as an Urban Impaired Stream. We understand that the City has a Goosefare Brook Watershed Management Plan, thus the SWM report should address all requirements for compliance with both the DEP urban Impaired Stream standards as well as any specific objectives of the Goosefare Brook Watershed Management Plan. The SWM does not appear to provide evidence of how the development is achieving compliance with any of these standards.

If you have any questions regarding these plan review and SWM comments please contact this office.

End of Memo

MILONE & MACBROOM

May 14, 2019

Ms. Emily Cole-Prescott, City Planner
City of Saco
300 Main Street
Saco, ME 04072

RE: Public Works Facility
Landscape Plan – April 30, 2019
MMI #5344-10-01

Dear Ms. Cole-Prescott:

Thank you for sending the drawings and supporting materials relative to the Public Works Facility Site Plan Review application. At the request of the city, I have reviewed the plans to establish the proposed project's level of compliance with the City of Saco's landscape ordinances. I have the following comments pursuant to this review.

OVERVIEW
The project falls within the B-8 Office Park District within the Saco Industrial Park. The development includes parking areas for passenger vehicles and large trucks/trailers, triggering the Parking Design Criteria under Article VII Standards of Performance. The site is industrial in nature and includes exposed fuel tanks, a fuel island, electrical transformer, and material storage areas that trigger 230-807 screening requirements for storage areas. The project is subject to the Article VII Design Standards and the special requirements for sites within the B-8 zone.

REVIEW COMMENTS
The proposed development is located on approximately 13.7 acres of a 42-acre parcel and closely abuts properties to the northeast and northwest. The application notes that, "Disturbed areas that are not paved or gravel will be treated with 4 inches of topsoil and seeded. Existing trees will be retained beyond the disturbance limits. Buffers are located along the southern property lines. Planting species, location, and quantities are shown on the site plan."

The site plan does not currently include any references to landscaping or to existing trees/buffers. The plan does not address the required buffer and landscaping provisions under Article VII 230-708.C or the performance standards for exposed areas under Section 807.A. The Site Plan Approval Criteria under Article XI under Subsections C and F are not met.

<u>ARTICLE VII. STANDARDS OF PERFORMANCE</u>
230-708.C.8 BUFFERS
The configuration of the surface parking spaces and access drives complies with the setback requirements. There are no abutting residential uses that trigger additional landscaping requirements.

203-708.C.9 LANDSCAPING
The application does not demonstrate that it meets the applicable Standards of Performance for landscaping of off-street lots. The site plan should be revised to address the following:

a.1. Parking Lots in Residential Districts. N/A

a.2. Large Parking Areas. The land use ordinance requires off-street parking provisions for passenger vehicles. It is inferred that the proposed parking for large trucks and trailers does not therefore trigger the landscaping and buffer standards under Subsection C. The applicant proposes 89 parking spaces for passenger cars. This lot is subject to these standards.

The Site Plan should be updated to meet the following requirements for large parking areas:

- The ordinance requires three trees be located at representative points throughout the parking lot.

- The parking lot is over 10,000 square feet in size, which triggers a 10 percent internal landscaping requirement. The site plan proposes 25,500 square feet of parking lot and must include 2,500 square feet of internal landscaping.

a.3. Front Buffers. The project has frontage on a new access road. Assuming this will be a public access road, the ordinance requires a planted 15'-wide buffer to screen parking along public road frontages. The site plan should be updated to include the following minimum provisions:

- The site plan includes approximately 490 linear feet of frontage adjacent to the parking areas, which requires a minimum of 14 shade trees, ornamental trees, and dense, medium-height shrubs to screen parked vehicles.

a.4. Special Route 1 Standards. N/A

a.5. Alternate Buffers and Screening. N/A

a.6. Special Main Street Standards. N/A

a.7. Installation, Maintenance, and Financial Guarantees. The provisions for installation and maintenance guarantees for plant material should fully be disclosed on the site plan.

230-729 DESIGN STANDARDS:
Projects undergoing site plan review must comply with Section 230-729 design standards. Additionally, projects within the B-8 zone must comply with the additional standards outlined under paragraph K unless the Planning Board finds that a deviation from one or more of the standards will still enable the project to meet the intent and purpose of the following standards:

- Campus environment. The proposed use is not consistent with the office park environment. Consideration may want to be given to the adjacent zones. The property abuts the resource protection zone to the west, B-6 to the east, and the I-1 zone to the

north. The development is buffered by woodlands on all sides except the northerly and northeasterly boundaries.

- Open space. The project appears to comply with the open space requirement for 25 percent of the total area of the development devoted to green space. The applicant should demonstrate that the open space meets the intent for natural resource protection and recreational opportunities.

ARTICLE VIII. GOOD NEIGHBOR PERFORMANCE STANDARDS

230-804 EXTERIOR LIGHTING

The city has conducted a peer review by others of compliance with Section 230-804.A and B.

230-807.A SCREENING: EXPOSED AREAS

The site includes exposed fuel tanks, a fuel island, electrical transformer, and material storage areas that trigger 230-807 screening requirements for storage areas. The ordinance requires that exposed storage areas have sufficient setbacks and screening to provide a visual buffer sufficient to minimize their adverse impacts on other land uses within the development area or surrounding properties. If the Planning Board determines that the storage yard and trailer/large truck parking lot constitute exposed areas, the applicant should add fencing, or vegetative screen should be modified to provide a visual buffer or screen plantings where an on-site natural buffer cannot be maintained.

230-807.B SCREENING: NON-RESIDENTIAL USES ABUTTING RESIDENTIAL DISTRICTS: N/A

The requirements for screening are not applicable under this section.

ARTICLE XI. SITE PLAN REVIEW APPROVAL CRITERIA

230-1106.C NATURAL FEATURES

The site plan consolidates grading and drainage to meet existing grades at the property line. No unique or significant natural features were identified as part of the regulatory review process.

230-1106.F LANDSCAPING

The application does not currently meet the intent for buffers and screening of off-street parking under 230-708.C. The Planning Board should discuss whether the large truck/trailer parking lot and storage yard trigger additional requirements for buffering under 230-807.A Exposed Areas.

230-1106.G OFF-SITE IMPACTS

Reference paragraph F.

ADDITIONAL COMMENTS:

The site plan should be amended to show existing trees and wooded buffers to remain, both within and at the property lines. The site plan should be revised to include landscaping to meet the zoning ordinance requirements described herein, including plant species, location, and quantities as well as the provisions for the installation, maintenance, and financial guarantees.

Please feel free to contact me if you have any questions or would like to discuss my comments in greater detail.

Very truly yours,

MILONE & MACBROOM, INC.



Regina S. Leonard, PLA
Senior Landscape Architect

5344-10-01-m1419-ltr.docx

SUMMARY MEMORANDUM

TO: Ms. Emily Cole-Prescott
City Planner
Saco City Hall
300 Main Street
Saco, ME 04072-1538

DATE: June 11, 2019

RE: Traffic Review for New Public Works Facility on Spring Hill Road

---

Maine Traffic Resources (MTR) was requested by the City of Saco to review the Traffic Impact Study for the proposed new Public Works Facility, which will be located off Spring Hill Road in the Saco Industrial Park. An initial review of the April 2, 2019 CES submittal, in regard to traffic, was previously performed and summarized in my April 22, 2019 memorandum. The Traffic Impact Study was performed by Victor Smith, P.E. of CES and is dated 5/14/19. My review comments are summarized below:

1. ***Trip Generation.*** I concur with the trip generation results, which were based upon actual counts at the existing public works facility on North Street. The results show the facility will generate 103 trips (defined in terms of passenger car equivalents) during the AM peak hour period and 88 during the PM peak hour. Since the facility will generate in excess of 100 one-way trips in a peak hour it requires a Traffic Movement Permit (TMP) from MaineDOT.

2. ***Trip Assignments.*** Mr. Smith has assigned 80 % of the trips to and from the I-195 ramp area with only 20 % to and from Route 1. This conflicts with the April 22nd submittal, which stated that the majority of trips were expected to utilize Route 1 to access the site. The basis for the trip assignments should be clarified as the Route 1 percentage seems quite low, especially with consideration of the original statements.

3. ***Study Area.*** As outlined in the ordinance, the study area should extend to where traffic attributable to the development equals or exceeds 35 vehicles in a lane in a peak hour. Based upon the current trip assignments, the study area extends to the intersection of the I-195 eastbound ramps. Again, the change in trip assignments needs to be clarified before the study area can be confirmed. The study area does not extend to the intersection of North Street and Industrial Park Road.

4. ***Capacity Analysis.*** Capacity analysis was only provided in the Traffic Impact Study for the intersection of Industrial Park Road and North Street. As previously stated, this intersection is not within the study area based upon the trip

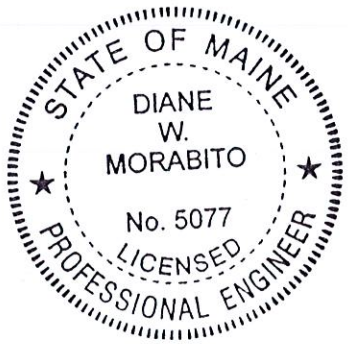
assignments. No analysis was provided for the intersection of the Industrial Park Road and the I-195 ramp intersections, which are within the study area based upon the current trip assignments. Once again, trip assignments need to be confirmed and then capacity analysis needs to be provided for the intersections determined to be within the impact area.

5. ***Accident data.*** Accident data was provided for an expanded study area, from Route 1 to the site to the North Street intersection. Two high crash locations were identified. Both are considered outside of the study area since they are on Industrial Park Road, west of the eastbound I-195 ramp intersections. Hence, no further accident review or evaluation is necessary.

6. ***Turn Lanes.*** Auxiliary turn lane warrants should be provided for Spring Hill Road at the site drive. I concur with the results that show that neither a right turn or left turn are needed on Spring Hill Road to store traffic entering the facility.

7. ***Sight Distance.*** Sight distance information was provided for the proposed site drive and they meet the requirements of Saco's ordinance. It is important to note that I did not perform a field review to verify the sight distances reported by Mr. Smith.

To summarize, the basis for the trip assignments needs to be clarified, especially since the assignments used in the traffic impact study are basically the opposite of statements made in the initial submittal. Once the study area is defined, capacity analysis needs to be provided for the study area intersections. All other items, such as safety, have been addressed. As always, please don't hesitate to contact me if you or the Board have any questions regarding my review comments.



Sincerely,

Diane W. Morabito

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering

SUMMARY MEMORANDUM

TO: Ms. Emily Cole-Prescott
City Planner
Saco City Hall
300 Main Street
Saco, ME 04072-1538

DATE: April 22, 2019

RE: Traffic Review for New Public Works Facility on Spring Hill Road

---

Maine Traffic Resources (MTR) was requested by the City of Saco to review traffic impact for the proposed new Public Works Facility, which will be located off Spring Hill Road in the Saco Industrial Park. Limited traffic information was provided in the application package, prepared by CES Inc. My preliminary review comments are summarized below:

1. ***Trip Generation.*** CES has estimated the facility will generate 448 daily one-way trips. This daily trip generation requires a Traffic Impact Analysis, prepared by a licensed professional engineer with experience in traffic engineering. This Traffic Impact Analysis was not provided in the application package.

   Additionally, no estimate has been provided for peak hour trips. It would appear with DPW staff and school staff arriving at the same for the beginning of operations at 6:30 and with fleet vehicles then departing, that there is a potential for the site to generate 100 peak hour trips, defined in terms of passenger car equivalents (where buses and trucks count as 1.5 to 2.0 pces each). If the facility was to generate 100 pces it would require a Traffic Movement Permit (TMP) from MaineDOT. Peak hour trip estimates and assignments need to be provided so that study area and impact can be assessed.

2. ***Study Area.*** As outlined in the ordinance, the study area should extend to where traffic attributable to the development equals or exceeds 35 vehicles in a lane in a peak hour. Given that most traffic is anticipated to utilize Route 1 for access, as reported by CES, the study area likely extends to Route 1 and will potentially extend to the I-195 ramp intersection(s).

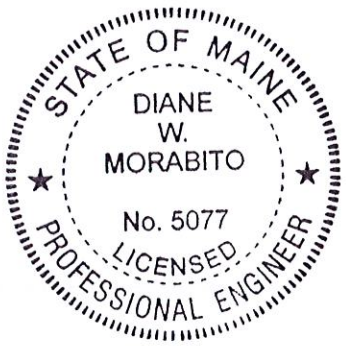
   I do concur with CES that the relocation of the facility will reduce trips at the intersection of North Street and Industrial Park Road. Hence, that intersection, which is known to be constrained, will not need to be studied.

3. ***Accident data.*** Accident data needs to be provided for the determined study area. If any high crash locations are identified then collision diagrams need to be provided and evaluated.

4. ***Turn Lanes.*** Auxiliary turn lane warrants should be provided for Spring Hill Road at the site drive, especially with consideration of the number of larger vehicles that will be slowing to enter the public works and school bus facilities.

5. ***Sight Distance.*** Sight distance information should be provided for the proposed site drive to assure it is adequate to meet safety standards, especially with consideration of the slower moving exiting buses and trucks.

As always, please don't hesitate to contact me if you or the Board have any questions regarding my preliminary review comments.



Sincerely,

Diane W. Morabito

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering

From:	Richard Lambert
To:	Maggie Edwards
Cc:	Emily C. Prescott
Subject:	RE: Public Works Facility
Date:	Wednesday, May 15, 2019 3:57:58 PM
Attachments:	image001.png image003.png

Maggie,
I'm fine with the responses.
Dick

From: Maggie Edwards
Sent: Wednesday, May 15, 2019 3:25 PM
To: Richard Lambert <RLambert@sacomaine.org>
Cc: Emily C. Prescott <EPrescott@sacomaine.org>
Subject: Public Works Facility

Dick,

Please review the attached revised submission responding to your comments. Please let us know if they answered your questions.

Thanks

MAGGIE EDWARDS
Administrative Assistant
Planning and Development
300 Main Street | Saco, ME 04072
t 207.282.3487| sacomaine.org
Follow us: Facebook | Twitter | Instagram

Planning and Development
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Emily C. Prescott
City Planner
EPrescott@sacomaine.org
Phone: (207) 282-3487 ext.357

TO: Review Committee

FROM: Maggie Edwards

DATE: 4/16/2019

Comments Due: 4/26/2019

Meeting Date: 5/7/2019

Review Type: Site Plan

RE: Saco Public Works Facility

Departments: D.Lambert; D.Twomey; K.Kern; J.Clements; Maine Water; D.Pendleton; H.Carter;

Reviewer: D. Lambert

Time: 40 minutes

Comments:

Project abuts a Resource Protection zone, Phillips Spring. Please address measures to be used to protect this resource. Project depends in large part on vegetative buffer located on adjacent land to screen parking lot. No internal trees within large parking areas are shown as required by 708-C 9 (a)(2). Waiver should be requested.

Will there be a sign on Spring Hill Road at the driveway entrance? May want to plan for electrical to be run out to this location.

Planning and Development
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Emily C. Prescott
City Planner
EPrescott@sacomaine.org
Phone: (207) 282-3487 ext.357

TO: Review Committee
FROM: Maggie Edwards
DATE: 4/16/2019

Comments Due: 4/26/2019
Meeting Date: 5/7/2019
Review Type: Site Plan

RE: Saco Public Works Facility

Departments: Fire

Reviewer: D Pendleton

Time: 15 minutes

Comments:

The Fire Department has met with DPW staff to review the site plan and comment on the items related to life safety. Hydrant placement was identified and fire department access for apparatus and personnel is being refined as necessary.

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

MAINE GENERAL PERMIT (GP)
AUTHORIZATION LETTER AND SCREENING SUMMARY

KEVIN SUTHERLAND
C/O CITY OF SACO
300 MAIN STREET
SACO, MAINE 04072

CORPS PERMIT # NAE-1998-02796-MOD
CORPS GP ID# 19-150
STATE ID# L-19786-TG-AG-N

DESCRIPTION OF WORK:
Place additional fill in approximately 12,020 s.f. (0.28 ac.) of freshwater wetlands within the Saco Industrial Park off Spring Hill Road at Saco, Maine in order to construct an access road and associated infrastructure for a new Department of Public Works facility. Cumulative freshwater wetland impacts associated with the Saco Industrial Park now totals 2.09 ac. This work is shown on the attached plans entitled "SITE LOCATION MAP" in one sheet dated "2/15/2019" and "PROPOSED SITE PLAN" in one sheet dated "2019-05-09".
See ADDITIONAL CONDITIONS attached.

LAT/LONG COORDINATES: 43.534031° N -70.435573° W **USGS QUAD:** OLD ORCHARD BEACH

I. CORPS DETERMINATION:
Based on our review of the information you provided, we have determined that your project will have only minimal individual and cumulative impacts on waters and wetlands of the United States. **Your work is therefore authorized by the U.S. Army Corps of Engineers under the Federal Permit, the Maine General Permit which can be found at:** https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/ Accordingly, we do not plan to take any further action on this project.

You must perform the activity authorized herein in compliance with all the terms and conditions of the GP [including any attached Additional Conditions and any conditions placed on the State 401 Water Quality Certification including any required mitigation]. Please review the enclosed GP carefully, including the GP conditions beginning on page 5, to familiarize yourself with its contents. You are responsible for complying with all of the GP requirements; therefore you should be certain that whoever does the work fully understands all of the conditions. You may wish to discuss the conditions of this authorization with your contractor to ensure the contractor can accomplish the work in a manner that conforms to all requirements.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

Condition 38 of the GP (page 16) provides one year for completion of work that has commenced or is under contract to commence prior to the expiration of the GP on October 13, 2020. You will need to apply for reauthorization for any work within Corps jurisdiction that is not completed by October 13, 2021.

This authorization presumes the work shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to the undersigned.

No work may be started unless and until all other required local, State and Federal licenses and permits have been obtained. **This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.**

II. STATE ACTIONS: PENDING [X], ISSUED [ ], DENIED [ ] DATE_____

APPLICATION TYPE: PBR: ___, TIER 1: ___, TIER 2 : ___, TIER 3: X, LURC: ___ DMR LEASE: ___ NA: ___

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING: 3/15/2019 LEVEL OF REVIEW: CATEGORY 1: ___ CATEGORY 2: X

AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10___, 404 X 10/404___, 103___

EXCLUSIONS: The exclusionary criteria identified in the general permit do not apply to this project.

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA NO, USF&WS NO, NMFS NO

If you have any questions on this matter, please contact my staff at 978-318-8676 at our Augusta, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

COLIN M. GREENAN
PROJECT MANAGER
MAINE PROJECT OFFICE

FOR LINDSEY E. LEFEBVRE DATE 6/5/19
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION

US Army Corps
of Engineers ®
New England District

PLEASE NOTE THE FOLLOWING ADDITIONAL CONDITIONS FOR DEPARTMENT OF THE ARMY GENERAL PERMIT NO. NAE-1998-02796-MOD

1. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work. **These forms are attached after the plans.**

2. The permittee shall assure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued aft.er construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.

3. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

4. All exposed soils resulting from the construction shall be promptly seeded and mulched in order to achieve vegetative stabilization.

5. The permittee must still obtain any other Federal, State or local permits as required by law before beginning work. This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.

6. Compensatory mitigation for unavoidable impacts to freshwater wetland is required. Mitigation shall consist of payment of $49,041.60 to the Maine Natural Resource Conservation Program. The attached completed In-Lieu-Fee (ILF) Project Data Worksheet shall be mailed with a cashier's check or bank draft made out to "Treasurer, State of Maine", with the permit number clearly noted on the check. The check and worksheet shall be mailed to Maine Department of Environmental Protection, Attention: ILF Program Administrator, 17 State House Station, Augusta, Maine 04333. This authorization is not valid until the permittee provides the Corps with a copy of the check with the permit number noted on the check. The ILF amount is only valid for a period of one year from the date on the authorization letter. After that time, the project shall be reevaluated and a new amount determined.

MAINE IN-LIEU-FEE (ILF)
PROJECT IMPACT WORKSHEET

DEP Invoice # *Filled in by ILF Administrator in Augusta*

Project name: City of Saco Department of Public Works Facility

Permittee(s): Kevin Sutherland c/o City of Saco

DEP/Corps permit #: L-19786-TG-AG-N/NAE-1998-02796-MOD *Attach a copy of the permit*

DEP/Corps Project Manager: Christine Woodruff/Colin Greenan

ILF Fee Amount: $49,041.60 (12,020 s.f. x $3.61 + $0.47)

Check Date: *Filled in by ILF Administrator in Augusta*

Project address: off Spring Hill Road Saco, Maine *Attach a locus map*

Biophysical region - Section: South Coastal

Biophysical region - Subsection: Gulf of Maine Coastal Lowland

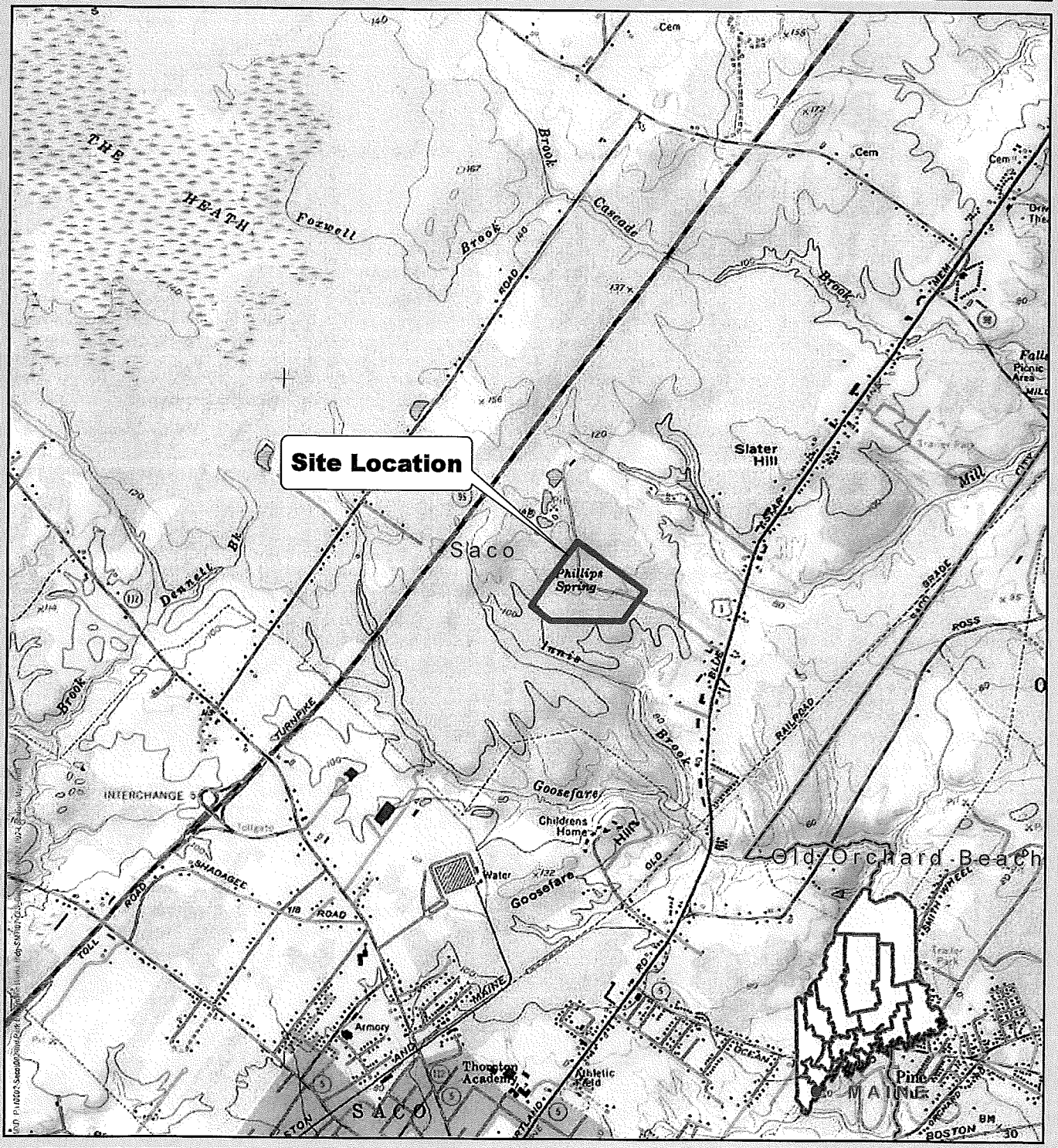
Total impact area subject to compensation: 12,020 s.f.

Resource(s) impacted:

Resource Types (list all that apply)	**Functions & Values** (for wetland impacts) (list all that apply, by resource type)	**Types of Impacts** (list all that apply, by resource type)	**SF Impacted** (by resource type)	**Linear FT of Streams Impacted (for Corps use)**
PFO	GWR, FF, STR, NR, PE, SS, WH	Fill	12,020 s.f.	
		Total impacts:	12,020 s.f.	

Resource Types: Wetlands by NWI Type (PEM, PFO, PSS, PUB, M1, M2, E1, E2, etc), significant vernal pool depression (SVP), significant vernal pool critical terrestrial habitat (VPCTH), shorebird feeding & staging habitat (shorebird), inland waterfowl & wading bird habitat (IWWH), Tidal waterfowl & wading bird habitat (TWWH), lake or pond (L1, L2), river/stream/brook (RSB)
Wetland Functions & Values: Groundwater recharge/discharge (GWR); floodflow alteration (FF); fish & shellfish habitat (FSH); sediment toxicant retention (STR); nutrient removal (NR); production export (PE); sediment/shoreline stabilization (SS); recreation (R); education/scientific value (ESV); uniqueness/heritage (UH); and visual quality/aesthetics (VQ); wildlife habitat (WH)
Types of Impacts: May include: filling, dredging, vegetation conversion (e.g. forested to shrub/scrub), excavation with associated discharge, etc.

Site Location Map



New Saco Public Works Facility
Spring Hill Road
Project No.: 10602.002
By: BQuimby
Updated: 2/15/2019

Site UTM Coordinates
X: 382983
Y: 4820083

43.534031
-70.435573

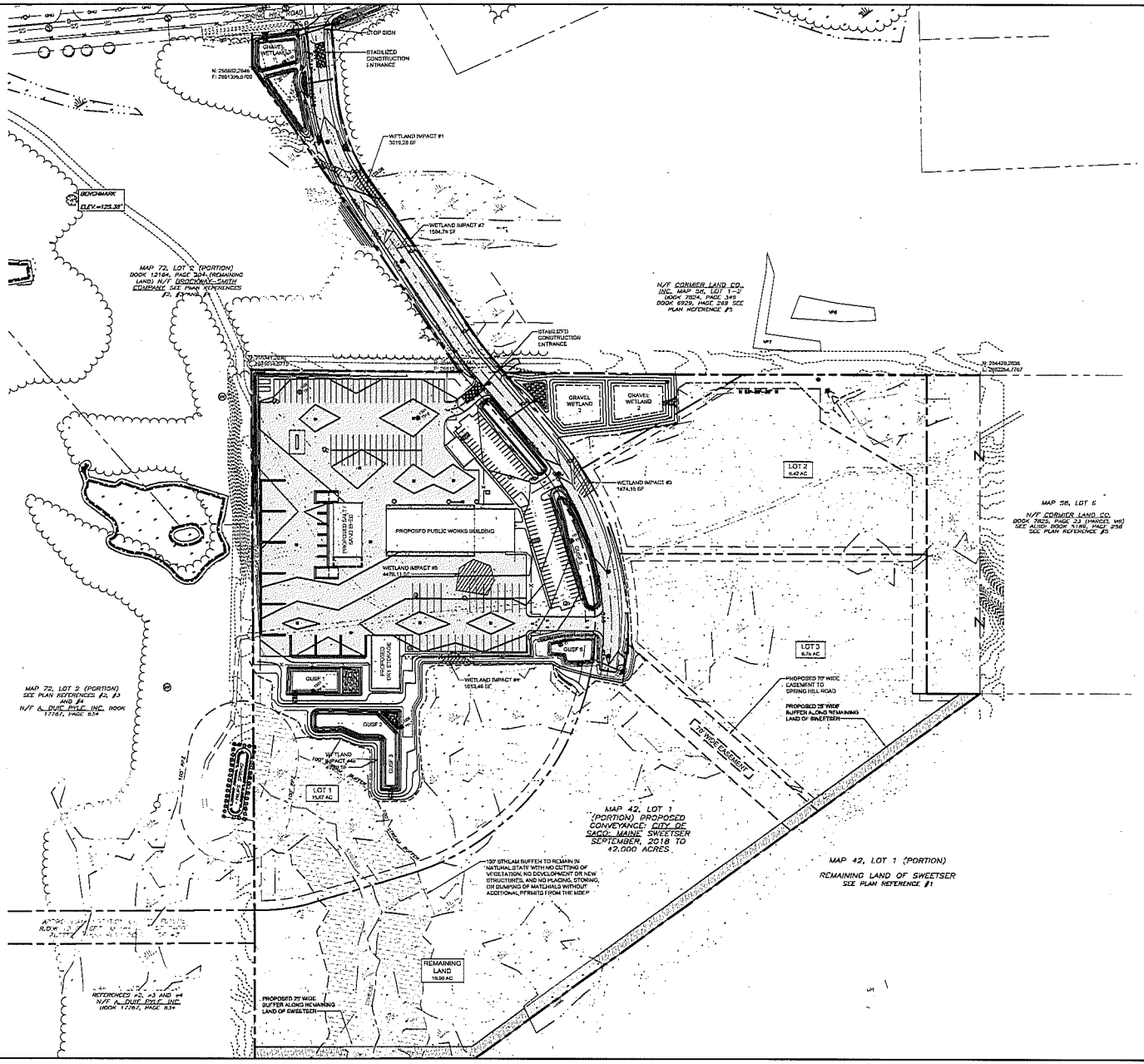
CES INC
Engineers • Environmental Scientists • Surveyors

N
W E
S

MAP NOTES:

1: BASE MAP COURTESY OF ESRI.
Service Layer Credits: Copyright© 2013 National Geographic Society, i-cubed

0 0.45 0.9 Miles



TEST PIT LOCATIONS

Pit	Desc	Grid Northing	Grid Easting	Longitude	Latitude
1003	TP-1	256342.7797'	2981008.2491'	W70° 26' 13.09"	N43° 31' 59.53"
1001	TP-2	255951.4291'	2981238.8869'	W70° 26' 10.79"	N43° 31' 59.02"
1002	TP-3	254857.5765'	2981372.5193'	W70° 26' 09.96"	N43° 31' 58.53"
1003	TP-4	254894.3969'	2981601.3724'	W70° 26' 07.70"	N43° 31' 58.51"
1004	TP-5	254648.5230'	2981347.3933'	W70° 26' 09.29"	N43° 31' 54.37"
1005	TP-8	254453.4398'	2981198.2154'	W70° 26' 11.32"	N43° 31' 52.42"
1006	TP-7	254537.3996'	2980822.7142'	W70° 26' 16.45"	N43° 31' 53.45"
1007	TP-8	254706.7602'	2980717.8246'	W70° 26' 17.84"	N43° 31' 54.84"

Wetland Impact Tabulation:		
No.	Area (SF)	Area (Ac)
1	3019	0.07
2	1685	0.04
3	1874	0.04
4	1013	0.02
4a	50	0.00
5	4478	0.10
Total	*12019*	*0.27582*

WETLAND NOTE:
WETLAND IMPACTS SUBJECT TO MAINE DEP NRPA PERMIT.

SURVEY NOTES:

1. BOUNDARY INFORMATION PROVIDED BY DOW AND COULOMBE, INC.
2. TOPOGRAPHY SHOWN IS 2FT LIDAR CONTOUR DATA, COMPLIMENTARY OF MAINE OFFICE OF GIS, SUPPLEMENTED BY TOPOGRAPHY FROM A GROUND SURVEY PERFORMED BY DOW AND COULOMBE, INC. FOR ENTRANCE DRIVE.

SITE DATA:

TAX MAP 42 / PORTION OF LOT 1

	PROPOSED	ALLOWED
MINIMUM LOT AREA:	16,000 SF	42 ACRES
MINIMUM STREET FRONTAGE:	50 FT	181.43 FT
MINIMUM FRONT YARD:	20 FT	1039 FT
MINIMUM SIDE YARD:	15 FT	328 FT
MINIMUM REAR YARD:	15 FT	1091 FT
MAXIMUM LOT COVERAGE:	18%	10%
MAXIMUM BUILDING HEIGHT:	60 FT	35 FT

THIS IS TO CERTIFY THAT AFTER REVIEWING THE SITE PLAN SUBMISSION INFORMATION FOR THE PROJECT SHOWN ON THIS PLAN AND CONSIDERING EACH OF THE CRITERIA SET FORTH BY THE CITY OF SACO CODE, AND IN ACCORDANCE WITH THE APPLICATION REQUIREMENTS, THE UNDERSIGNED HAVE MADE FINDINGS OF FACT ESTABLISHING THAT THIS PLAN ALONG WITH ITS ADDITIONAL SUBMISSION INFORMATION HAS MET ALL THE CRITERIA SET FORTH AND THEREFORE THE SITE PLAN IS APPROVED.

APPROVED BY THE CITY OF SACO PLANNING BOARD ON: _____

CONDITIONS:

PLANNING BOARD SIGNED ON: _____

PROPOSED SITE PLAN

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Barry & Associates, Inc.
400 Commercial Street, Suite 402
Portland, ME 04101
T 207.895.4901

Tidewater Engineering
44 Main Street
Kennebunk, ME 04043
T 207.985.3556

Pinkham & Greer
400 Commercial Street
Portland, ME 04101
T 207.775.1121

Sebago Technics
75 John Roberts Road, Suite 1A
South Portland, ME 04106
T 207.856.0277

Maine Land Development Consultants
PO Box 187
Cumberland Center, ME 04021
T 207.829.5016

Summit Surveying
54 Portland Street
PO Box 1237
Topsham, ME 04086
T 207.725.8578

CES INC
Engineers • Environmental Scientists • Surveyors

SACO INDUSTRIAL PARK & NEW PUBLIC WORKS FACILITY
SACO, MAINE

PROPOSED SITE PLAN

NO.	DATE	BY	DESCRIPTION
5	11/16/18	BJS	CITY REVIEW COMMENTS
4	10/15/18	BJS	ADDED STOP SIGN AND NOTES
3	10/10/18	BJS	SITE PLAN REVIEW
2	9/4/18	BJS	
1	8/24/18	BJS	

NOT FOR CONSTRUCTION

JOHN D. KUCHINSKI No. 9758 REGISTERED PROFESSIONAL ENGINEER

SCALE:	1"=100'
DATE:	2018-02-19
DRAWN BY:	SLC
CHECKED BY:	JDM
LEAD AGENCY:	SLC
APPROVED BY:	JDK
JOB NUMBER:	16032.002
DRAWING NUMBER:	C102

US Army Corps
of Engineers ®
New England District

GENERAL PERMIT
WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

MAIL TO: Colin M. Greenan
U.S. Army Corps of Engineers, New England District
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, Maine 04330

A Corps of Engineers Permit (NAE-1998-02796-MOD) was issued to Kevin Sutherland c/o City of Saco. The permit authorized the permittee to place additional fill in approximately 12,020 s.f. (0.28 ac.) of freshwater wetlands within the Saco Industrial Park off Spring Hill Road at Saco, Maine in order to construct an access road and associated infrastructure for a new Department of Public Works facility.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

_____

_____

Business Address: _____

_____

_____

Telephone: (____) _____ (____) _____

Proposed Work Dates: Start: _____

Finish: _____

PERMITTEE'S SIGNATURE: _____ DATE: _____

PRINTED NAME: _____ TITLE: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: GREENAN Submittals Required: No

Inspection Recommendation: random Maine General Permit compliance

US Army Corps
of Engineers ®
New England District

(Minimum Notice: Permittee must sign and return notification within one month of the completion of work.)

COMPLIANCE CERTIFICATION FORM

Corps of Engineers Permit No: NAE-1998-02796-MOD

Name of Permittee: Kevin Sutherland c/o City of Saco

Permit Issuance Date: June 5, 2019

Please sign this certification and return it to the following address upon completion of the activity and any mitigation required by the permit. You must submit this aft.er the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

****
* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Policy & Technical Support Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *
****

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

_____ _____
Signature of Permittee Date

_____ _____
Printed Name Date of Work Completion

(____) _____ (____) _____
Telephone Number Telephone Number

Planning and Development
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Emily Cole-Prescott
City Planner
Eprescott@sacomaine.org
Phone: (207) 282-3487 ext.357

TO:	Planning Board
CC:	Paul & Chris Hollis
FROM:	Emily Cole-Prescott, City Planner
DATE:	May 16, 2019 (May 21, 2019 Planning Board Meeting); revised June 13, 2019 (June 18, 2019 Planning Board Meeting)
RE:	193 Flag Pond Road (Map 92 Lot 19): Preliminary Plan Review – 4-lot subdivision

Overview: Applicant, Great Lots of Maine, LLC, has applied for preliminary plan review for a four-lot subdivision on Flag Pond Road. An existing house sits on the current property, which is approximately 30 acres in the C-1 zone. The applicant plans to retain the existing structures shown on the plan as lot 4. The applicant has completed a sketch plan review with the Planning Board earlier this year. The Planning Board reviewed the application materials submitted to date at the May 21st meeting, and moved to continue the application to a future meeting date.

Application Completeness: Since the last meeting, the applicant has submitted the remaining items. Staff has found the application complete. If the Board agrees, a suggested motion is: ***"I move to find the application for preliminary subdivision review complete."***

Departmental Reviews:

- Code Enforcement Department: Richard Lambert has indicated that sight distances submitted on the plan appear to comply. He also indicates that lot sizes appear to be in compliance with requirements, and the property sizes seem to be able to accommodate private wells and septic systems. He also notes that the wetlands edge should be properly marked prior to any development taking place.
- Public Works: Joe Laverriere notes that subdivision regulations prohibit new access drives directly off of Flag Pond Road. However, given the configuration of the subdivision, DPW does not have objections to the waiver request, noting that shared driveways should be considered.
- Fire Department: Dave Pendleton has recommended that each home be sprinklered. He noted that in lieu of sprinklers, measurements from fire water supplies to the most remote planned driveway should be indicated, to which the applicant has updated the proposed plan.

Public Hearing: The Board should hold a public hearing on the application. A motion is: ***"I move to open the public hearing."*** After comment received, a motion is: ***"I move to close the public hearing."***

Discussion: There are several items for the Board's consideration:

Environmental: At the sketch plan review, Paul and Chris Hollis presented information about the fact that this site abuts a superfund site. This area is labeled "State of Maine" on the submitted plan, as the State owns the site. The applicant has submitted much documentation from the DEP about the site, sent to the Board with the May 21st meeting packet. The applicant has also presented test pit data for the test pits indicated on the plan. The superfund site drains away from the proposed lots, but the applicant has also suggested a potential future condition on any single family home

construction that each require a water filtration system. The applicant plans to have the rear land remain with lot 4, so lot 4 is planned to be 20.43 acres.

Normandeau and Associates has peer-reviewed the wetland delineation, and in their memo dated June 6th, has stated that the wetlands delineated on the property accurately reflect the conditions on the site. The applicants have updated the plan accordingly, and presented a draft of the updated plan at the May 21st meeting.

The applicant has included an erosion control plan. Additionally, the applicant has considered the layout of the site in proposing the design for this subdivision, as the rear portion of property will remain with lot 4, and the applicant has proposed that a condition of approval include a requirement that no further subdivision is allowed.

Septic & Wells: The applicant plans for the houses to be served by septic systems and private wells. The applicant has indicated potential locations of proposed development, well exclusion zones, and approximate location of septic disposal fields for each of the lots. Per section 10.7, the Board may request a hydrogeologic assessment for review of the site relative to the request to serve the lots with private wells. As noted above, the applicant has suggested a condition that all future homes be served by water filtration systems. The applicant has indicated on the proposed plan that the distance to public water is 1,550' and the distance to public sewer is 8,100'.

Traffic & Access: Section 10.8.10 prohibits direct frontage/driveway access directly off Flag Pond Road and other specified roads. Per Section 10.8.10.1, the Board may waive this requirement based on their review of the following three standards: "a) there is too little road frontage to reasonable [sic] allow for the creation of a local street or private road; or b) the shape or physical condition of the parcel does not permit access to or the creation of a local street or private road; or c) there will be no further subdivision of the parcel."

In support of this waiver request, the applicant has submitted documentation from traffic engineer Bill Bray indicating sight distances for each of the proposed driveways. Diane Morabito has completed peer review of this documentation. One of the suggestions from Diane Morabito is to consider shared drives. At the May 21st meeting, the applicant agreed to revise the plans to provide a shared driveway for lots one and two and to agree that no further subdivision of this site is permitted. As the shared access drive is not shown on the recently submitted preliminary plan, a draft condition of approval includes a requirement that lots one and two be shown with a shared access drive on the final plan.

The Board should consider this waiver request, and ask any questions of the applicant. If the Board is in support of this waiver request, a motion is: ***"I move to grant a waiver to section 10.8.10.1, access limitation, per the conditions that there will be a shared drive for lots one and two and that there can be no further subdivision of this parcel."***

Impact Fees: The applicant plans to pay impact fees per lot in lieu of open space and recreation requirements. Additionally, a traffic impact fee per lot will be assessed, as indicated in the conditions of approval.
Impact fees for each new lot, payable upon building permit application filing:

- Open Space Impact Fee: $624
- Recreation Facilities Impact Fee: $1,500.80

- Subsurface Disposal Impact Fee: $500
- Fire/EMS Impact Fee: $500
- Traffic Impact Fee: $925

Conclusion: Staff has provided the below findings of fact and conditions of approval for the Board's review and consideration:

Saco Planning Board
Findings of Fact
Preliminary Subdivision Review
193 Flag Pond Road
Map 92 Lot 19
June 18, 2019

1. The applicant is Great Lots of Maine, 28 Weare Road, Seabrook, NH 03894.
2. The owner is Estate of Arthur Pereira, no address provided.
3. The applicant has presented right, title and interest with a purchase and sale agreement for the property. The warranty deed for the property has also been submitted, from York County Registry Book 15955 Page 625.
4. The parcel is identified as Tax Map 92 Lot 19 and is 28.96 acres.
5. The project requires subdivision review based on the City's Subdivision Regulations.
6. The applicant has presented a plan entitled "Plan Showing A Proposed 4 Lot Subdivision for Sebago Real Estate Investment LLC" revised through May 21, 2019, prepared by Dana A. Libby, State of Maine Registered Land Surveyor.
7. Since lot four is existing, the number of vehicle trips generated by the three additional lots will be three trips in the AM peak hour and three trips in the PM peak hour. No additional traffic study is needed per Subdivision Regulations. The applicants have submitted sight line distances by Bill Bray, Traffic Engineer, and peer-reviewed by Diane Morabito.
8. Sewer service is not available in the area, 8,100' away from the project site. Test pit data has been submitted, and individual septic systems are proposed for the subdivision. The Code Enforcement Director has reviewed the preliminary plan and commented it appears septic systems can be supported.
9. Public water is not available in the area, 1,550' away, and private individual wells are proposed for the subdivision.
10. The Planning Board has considered the following criteria from the Subdivision Regulations, and before granting approval for the preliminary plan, has determined that:
    1.1.1 Pollution. The proposed subdivision will not result in undue water or air pollution. In making this determination, it has at least considered:
        A. The elevation of the land above sea level and its relation to the flood plains;
        B. The nature of soils and subsoils and their ability to adequately support waste disposal;
        C. The slope of the land and its effect on effluents;
        D. The availability of streams for disposal of effluents; and
        E. The applicable state and local health and water resource rules and regulations;

    1.1.2 Sufficient water. The proposed subdivision has sufficient water available for the reasonably foreseeable needs of the subdivision based on the proximity of existing private wells in the area;

1.1.3 Municipal water supply. The proposed subdivision will not cause an unreasonable burden on the existing water supply, as no connection to the Maine Water Company system is available or proposed;

1.1.4 Erosion. The proposed subdivision will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy condition results, based on erosion controls that are proposed;

1.1.5 Traffic. The proposed subdivision will not cause unreasonable highway or public road congestion or unsafe conditions with respect to the use of the highways or public roads existing or proposed per the data received from Bill Bray, the applicant's traffic engineer and peer-reviewed by Diane Morabito, traffic engineer.

1.1.6 Sewage disposal. The proposed subdivision will provide for adequate sewage waste disposal and will not cause an unreasonable burden on municipal services based on test pit locations and soil logs submitted;

1.1.7 Municipal solid waste disposal. The proposed subdivision will not cause an unreasonable burden on the municipality's ability to dispose of solid waste;

1.1.8 Aesthetic, cultural and natural values. The proposed subdivision will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, significant wildlife habitat identified by the Department of Inland Fisheries and Wildlife or the municipality, or rare and irreplaceable natural areas or any public rights for physical or visual access to the shoreline. The applicant has presented the response letter from ME Dept. of Inland Fisheries and Wildlife, which does not identify concerns in this area.

1.1.9 Conformity with local ordinances and plans. The proposed subdivision conforms with a duly adopted subdivision regulation or ordinance, comprehensive plan, development plan or land use plan. The plan as presented, and with the conditions imposed, meets the standards of the Subdivision Regulations.

1.1.10 Financial and technical capacity. The subdivider has adequate financial and technical capacity to meet the standards of this section. The applicant has provided technical capacity documentation, listing other projects permitted. Although the applicant has presented financial capacity information, the Board has required a condition to provide additional detail on financial capacity to complete the project. It should be noted that the applicant does not plan to construct the structures, but rather to obtain permits to sell the lots to be developed at a future date.

1.1.11 Surface waters; outstanding river segments. Whenever situated entirely or partially within the watershed of any pond or lake or within 250 feet of any wetland, great pond or river as defined in Title 38, chapter 3, subchapter I, article 2-B, the proposed subdivision will not adversely affect the quality of that body of water or unreasonably affect the shoreline of that body of water.

A. When lots in a subdivision have frontage on an outstanding river segment, the proposed subdivision plan must require principal structures to have a combined lot shore frontage and setback from the normal high-water mark of 500 feet.

(1) To avoid circumventing the intent of this provision, whenever a proposed subdivision adjoins a shoreland strip narrower than 250 feet which is not lotted, the proposed subdivision shall be reviewed as if lot lines extended to the shore.
(2) The frontage and set-back provisions of this paragraph do not apply either within areas zoned as general development or its equivalent under shoreland zoning, Title 38, chapter 3, subchapter I, article 2-B, or within areas designated by ordinance as densely developed. The determination of which areas are densely developed must be based on a finding that existing development met the definitional requirements of section 4401, subsection 1, on September 23, 1983;
The lots are not proposed in a Shoreland Zone.

1.1.12 Ground water. The proposed subdivision will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water. The applicant has submitted test pits for the groundwater. The site abuts a superfund site, and the applicant has presented data from the DEP which outlines the monitoring and testing done on the site. The applicant has also suggested a condition of approval that all homes be outfitted with water filtration systems. A condition for final plan review includes the submission of a groundwater assessment.

1.1.13 Flood areas. Based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant whether the subdivision is in a flood-prone area. The subdivision is not in such an area.

1.1.14 Freshwater wetlands. All freshwater wetlands within the proposed subdivision have been identified on any maps submitted as part of the application, regardless of the size of these wetlands. The applicant has had wetland delineation completed by Ken Gardner, soil scientist. The City's wetland peer reviewer, Normandeau and Associates, has reviewed the delineation, and the applicant has revised the plan accordingly.

1.1.15 River, stream or brook. Any river, stream or brook within or abutting the proposed subdivision has been identified on any maps submitted as part of the application. For purposes of this section, "river, stream or brook" has the same meaning as in Title38, section 480-B, subsection 9.

1.1.16 Storm water. The proposed subdivision will provide for adequate storm water management, and the proposed building coverage is 6,000 square feet per lot. The site generally drains toward the rear, and additional stormwater management will be handled during the street opening permit process.

1.1.17 Spaghetti-lots prohibited. If any lots in the proposed subdivision have shore frontage on a river, stream, brook, great pond or coastal wetland as these features are defined in Title 38, section 480-B, none of the lots created within the subdivision have a lot depth to shore frontage ratio greater than 5 to 1. Spaghetti-lots are not proposed.

1.1.18 Lake phosphorus concentration. The long-term cumulative effects of the proposed subdivision will not unreasonably increase a great pond's phosphorus concentration during the construction phase and life of the proposed subdivision; and

1.1.19 Impact on adjoining municipality. The proposed subdivision will not cause unreasonable traffic congestion or unsafe conditions with respect to the use of existing public ways in an adjoining municipality.

Saco Planning Board
Conditions of Approval
Preliminary Subdivision Review
193 Flag Pond Road
Map 92 Lot 19
June 13, 2019

1. All details will conform to City of Saco standards, including but not limited to the City of Saco ordinances.
2. Approval of the subdivision plan is conditioned upon compliance by the applicant with any and all oral commitments regarding the project which were specifically made by the applicant to the Board in the course of its deliberations.
3. This approval is governed by the action taken by the Saco Planning Board for preliminary subdivision review.
4. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner for minor changes. The determination of major or minor shall be made by the City Planner.
5. The applicant shall adhere to all outstanding comments from City staff or consultants utilized by the City during review of the project. Failure to provide an adequate response to requests made during Planning Board review may result in denial or tabling.
6. All work shall be in conformance with the approved plan entitled "Plan Showing A Proposed 4 Lot Subdivision for Sebago Real Estate Investment LLC" revised through May 21, 2019, prepared by Dana A. Libby, State of Maine Registered Land Surveyor.
7. A Letter of Credit, acceptable to the City of Saco, shall be established for 150% of the construction cost of all required improvements, including but not limited to the following: utility installation; landscaping; paving; work within ROW; road construction, drainage, loam & seed; and sediment & erosion control. To establish the amount of the Letter of Credit, the applicant shall provide the City with itemized, per unit cost estimates, and a construction schedule, at least one week before any anticipated site work. This Letter of Credit shall be maintained for a period not less than three months beyond the anticipated completion of the project.
8. Prior to work commencing, the applicant shall establish a construction inspection account equal to 3% of the base cost of the Letter of Credit. To establish the letter of credit amount, the applicant shall provide the City with itemized, per unit cost estimates and a construction schedule, at least one week prior to start of site work.
9. No work shall commence until two mylar sets and three paper sets of the final plans have been received by the Planning & Development Department, signed by the Planning Board.
10. Prior to any construction activities, the applicant and contractor shall meet with the City Engineer and City Planner to review plans, inspection schedules and erosion control practices.
11. All plans and specifications shall be provided on disk in an AutoCAD format. The final plan shall be submitted in digital format as a single composite electronic file. The plan may be submitted on a disc, via e-mail, or other format acceptable to the City Planner, and shall be compatible with commonly used CAD and/or GIS software. See Section 6.2.6 of the Subdivision Regulations for further detail.

12. As-built plans shall be submitted before the final release of the Letter of Credit.
13. Stumps generated on site will be ground and either used on site for erosion control or will be hauled off-site. Stumps shall not be buried within areas shown as right-of-way on the final plan.
14. No filling or alteration of wetlands on individual lots shall be done without the appropriate state or local approvals.
15. Before applying for building permits, the applicant shall apply for and obtain a Maine Construction General Permit.
16. Proposed driveway locations to individual lots are subject to review and approval by the Department of Public Works prior to issuance of a building permit.
17. Each new single-family dwelling shall be served by water filtration systems, with a note indicating such on the final plan.
18. The applicant will perform a groundwater assessment before final plan review.
19. The applicant shall revise the plan to show a shared driveway for lots 1 and 2 on the plan, and shall add a note to the final plan that no further subdivision shall be permitted.
20. The applicant shall revise the final plan to show the location of the septic systems and wells that serve the existing lot that abuts proposed lot one.
21. The applicant will present septic system designs for review and approval by the Code Enforcement Department before final plan review.
22. The applicant will add "no cut areas" to the final plan.
23. The applicant will pay the following impact fees per lot to the Code Enforcement Department upon building permit stage:
    a. Open Space Impact Fee: $624
    b. Recreation Facilities Impact Fee: $1,500.80
    c. Subsurface Disposal Impact Fee: $500
    d. Fire/EMS Impact Fee: $500
    e. Traffic Impact Fee: $925

If the Board agrees with the conclusions, findings and conditions, a suggested motion is: ***"I move to approve the preliminary subdivision plan for 193 Flag Pond Road per the findings of fact and conditions of approval dated June 18, 2019."***

ADDENDUM 3 TO AGREEMENT

Addendum to contract dated November 29, 2018
between Estate of Arthur Periera (hereinafter "Seller")
and Great Lots of Maine (hereinafter "Buyer")
property 195 Flag Pond Rd, Saco, ME 04072-9629

By signatures below Buyer and Seller agree that time to close shall be extended to July 31, 2019

Parties acknowledge Agency's advice to seek legal, tax and other professional advice as necessary in connection with sale/purchase of property.

5/31/19
Buyer — Date
Great Lots of Maine

5-29-19
Seller — Date
Estate of Arthur Periera

Buyer — Date

Seller — Date

Projects Developed All in Maine except 1 by
Paul C. Hollis and his Great Crew.
1998 – Present updated 3/6/19

- ✓ **Phillips Farm (Cape Neddick) –** Cape Neddick, Maine – 12 lot ocean-view subdivision – built and sold out in six months – all multimillion dollar homes built **– Address: Phillips Cove Road Cape Neddick, Maine**

- ✓ **Tudor Drive (Kittery) –** on Spruce Creek in Kittery – 10 lot subdivision with water view and private community dock – Lots ranged in price from $300,000 to $700,000 – sold out in one year – **Address: Tudor Drive Kittery, Maine**

- ✓ **Cole Farm (Scarborough) –** Scarborough, Maine – 10 oceanfront lots with ocean view; developed and sold out in one year – **Address: Cole Farm Drive Scarborough, Maine**

- ✓ **Avandah Way (Wells) –** Avandah Way – 18 upper scale lots built and sold out in one year – **Address: Avandah Way Wells, Maine**

- ✓ **Callalilly Lane (Wells) –** Took over unfinished subdivision – 18 small lots, some with ocean view – sold out in 15 months – **Address: Callalilly Lane Wells, Maine**

- ✓ **Julian Huxley Lane (Wells) –**18 lot subdivision; 1800' roadway built and sold out in 18 months – **Address: Julian Huxley Lane Wells, Maine**

- ✓ **Kimberly Circle (Wells) –** Kimberly Circle – 8 lot subdivision – **Address: Kimberly Circle Wells, Maine**

- ✓ **Aimhi Campground on Little Sebago (Windham) –** 2013-2014 – 13 lot subdivision on 100 year old, family owned campground, 25 acres, 4,300 feet of lakefront – developed and sold out in 18 months **– Address: Aimhi Woods Road Windham, Maine**

- ✓ **Beacon Street (York)** – 7 ocean view lots – homes starting at $600,000 – brick roadway – sold out in one year (no realtor) – **Address: Beacon Street York, Maine**

- ✓ **Nubble Point (York) –** Bold ocean front lots on the rocks overlooking the Atlantic Ocean and the famous Nubble Lighthouse – brick roadway, professionally landscaped **–** built and sold out in less than a year – all multimillion dollar homes built – **Address: Lighthouse Watch York, Maine**

- ✓ **Stoneridge (York) –** 24 condominiums (12 per building) renovation and new construction – sold out in one year – **Address: Stoneridge Lane York, Maine**

- ✓ **Newport, Rhode Island – Consulting** Refurbished seven million dollar estate plus created two additional estate lots – property sold for 6.8 million – bank owned – bank made 1.3 million on sale after being in 3rd position on property (yes I saved their butts) – **Address: 36 Beacon Hill Road Newport, Rhode Island**

2015 – Present

Damariscotta, Maine - 140 acres, 6 residential lots and one 114 acre commercial lot created. 2 Lots remain – **Address: Heater Road Damariscotta, Ma**

- ✓ **Coulson Farm (Wells)** – Coulson Farm – 11 lot subdivision SOLD OUT – **Address: Treetop Lane Wells, Maine**

- ✓ **Grants Pasture (Wells)** - Small 7 lot subdivision, Sold out – **Address: Grants Pasture Way Wells, Maine**

- ✓ **Hubbard Farm (Wells)** - Small 4 lot subdivision – Sold out – Address:

- ✓ **Elizabeth Farms (Windham)** – 8 lots completion– SOLD OUT **Address: Strawberry Lane Windham, Maine**

- ✓ **Weeks Farm (Windham) -** 17 lot subdivision - 50,000 sq ft lots on public water, private sewer systems, and underground electric. 1 lot remains. Close to Highland Lake, sold out. – **Address: Overlook Road Windham, Maine**

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

May 30, 2019

Dana Libby
Corner Post Land Surveying, Inc.
600 Main Street
Springvale, ME 04083

RE: Information Request – Flag Pond Road Subdivision, Saco

Dear Dana:

Per your request received May 28, 2019, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Flag Pond Road Subdivision Project* in Saco.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat.

While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. We recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, 207-902-1569) for further guidance, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act. Otherwise, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Significant Vernal Pools

At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs subject to protection under the Natural Resources Protection Act (NRPA) within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been

completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

Fisheries Habitat

We recommend that 100-foot undisturbed vegetated buffers be maintained along streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams that support coldwater fisheries is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams, can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span at least 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,



John Perry
Environmental Review Coordinator

Notes:

1. Deed Reference:
a. **Teresa M. Pereira** to **Arthur A. Pereira** dated September 30, 2010 and recorded at the York County Registry of Deeds in book 15455 page 625.

2. Plan Reference:
a. **"Boundary Survey Map For Wayne F. Pereira, PR Estate of Arthur A. Pereira"** dated September 7, 2017 and surveyed by "Maine Boundary Consultants. (Unrecorded)
b. **"Hilltop On Jenkins Road"** dated October 28, 2016, last revised December 8, 2016, surveyed by Corner Post Land Surveying Inc. and recorded at the York County Registry of Deeds in plan book 386 page 22.

3. Basis of Bearings:
Bearings shown hereon are Grid North and refer to the Maine State Plane Coordinate System, Maine West Zone 4101, FIPS Zone 1802, North American Datum 1983, Unit Feet. Determined utilizing a Leica GS14 "RTK GPS Unit" (Real Time Kinematic Global Positioning System).

4. Road Record:
Flag Pond Road, 3 rods wide (49.50'). See layout dated November 3, 1806 and March 17, 1817, on file at the City of Saco Clerks Office. To determine sideline, held a line 1 ½ rods (24.75') from the center of the traveled way in accordance with Maine Revised Statutes Annotated, Title 23 Section 2103.

5. Certification:
The word "certify" or "certification" as shown and used hereon means an expression of professional opinion regarding the facts of the survey and does not constitute a warranty or guarantee, expressed or implied.

6. Underground Utilities:
No attempt has been made as a part of this boundary survey to obtain or show data concerning existence, size, depth, condition, capacity, or location of any underground utility, municipal or public service. For information concerning these utilities or facilities please contact the appropriate agencies.

7. Abutter Lines:
The abutter lines shown hereon are for reference purposes only. Any conflicts between the abutter lines shown hereon and existing monumentation should be resolved with a boundary survey, no assumptions should be made based on these abutter lines.

8. Topographic Information:
Topographic information shown hereon was downloaded from the Maine State GIS Web Site at URL http://megis.maine.gov/catalog/contours2ft_tiles.shtml. This is a composite data layer of 2' contours created from lidar data collected in Maine between 2006 and 2013. The contours were created using GDAL tools and an interval of 2'. Due to the fact that some areas were collected at high tide, some areas do not have contours that have a zero-value. The data are referenced to NAVD88. Vertical accuracy is 12cm or better.

9. Wetlands:
Wetland/Upland interface line was determined by Kenneth Gardiner, Soil Scientist #61 per the "Corps of Engineers Wetlands Delineation Manual" dated January, 1987. The Wetland/Upland interface line was located utilizing the Global Positioning System (GPS) with a Leica GS14 system. The horizontal positional tolerance is ± one meter.

10. Sight Distances:
Sight distances shown hereon were completed by Traffic Solutions. See report letter by William J. Bray, P.E. dated April 8, 2019 for additional information.

11. Sewer & Water:
All lots to be serviced by private water supply and private septic systems.

12. Soil Information:
Soils information shown hereon was taken from "Soil Survey of York County Maine" prepared by the United States Department of Agriculture, Soil Conservation Service in cooperation with the Maine Agricultural Experiment Station and the Maine Soil and Water Conservation Commission.

13. Zoning Information:
C1
Minimum Lot Size: 80,000 square feet
Minimum Frontage: 200.0'
Minimum Yard Dimensions:
Setback from street Right of Way: 30.0'
Side setback: 25.0'
Rear setback: 25.0'
Minimum Setback from normal high-water mark of freshwater bodies, maximum spring high tide lever of tidal waters, and upland edge of wetlands: 75.0'
Maximum Lot Coverage: 20%
Maximum Height: 35.0'

Timothy A. & Lucille Ferrante
Book 9910 Page 19
25 Hearn Road
Saco, Maine 04072
Saco Tax Map 92 Lot 16-2

Philip & Marion A. Sherman
Book 2744 Page 85
15 Hearn Road
Saco, Maine 04072
Saco Tax Map 92 Lot 16

David H. & Janet L. Perkins
Book 17622 Page 468
225 Flag Pond Road
Saco, Maine 04072
Saco Tax Map 92 Lot 18

David H. & Janet L. Perkins
Book 9513 Page 278
4 Perkins Way
Saco, Maine 04072
Saco Tax Map 92 Lot 18-4

Toni L. Rumery
Book 17667 Page 389
219 Flag Pond Road
Saco, Maine 04072
Saco Tax Map 92 Lot 18-1

State Of Maine
Book 11121 Page 262
State House Station 22
Augusta, Maine 04333
Saco Tax Map 92 Lot 20

State Of Maine
Book 11121 Page 262
State House Station 22
Augusta, Maine 04333
Saco Tax Map 9

Taken From Google Earth (Approximate)

Area of additional wetland per Nomandeau Associates May 20, 2019 Memo (Typical)

Total Area
28.96± Acres
Saco Tax Map 92 Lot 19
195 Flag Pond Road

1 — 2.65 Acres (81,719 Sq. Ft. Outside Wetland) (5,364 Sq. Ft. Proposed Developed - 6.6%)
2 — 2.19 Acres (95,252 Sq. Ft. Outside Wetland) (5,853 Sq. Ft. Proposed Developed - 6.1%)
3 — 3.68 Acres (83,192 Sq. Ft. Outside Wetland) (5,424 Sq. Ft. Proposed Developed - 6.5%)
4 — 20.43 Acres (91,517 Sq. Ft. Outside Wetland) (2,495 Sq. Ft. Developed - 2.7%)

Proposed Development Area (60'x80')
Proposed Driveway (Typical)
See Plan Reference 2a
Fire Cistern
To Public Sewer ± 700'
Existing House
Existing Barn
Jenkins Road
Leighton Way
Flag Pond Road
Ra
MaB
Ch
LnB
LnC
AdB

Right Of Way Easement For The Benefit Of The State Of Maine

To Public Water - 1,550'
To Hydrant 257 - 1,830'

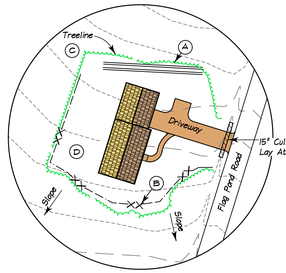
Graphic Scale: 1in = 80Ft.
80 40 0 40 80 160 240 320

Legend:

- ⅝" Iron Rod Set With Plastic Cap Marked "CNR POST LAND SURV PLS 1350"
- Stone Monument Found (Dimensions Labeled on Plan)
- Iron Rod Found (Dimensions Labeled on Plan)
- Drill Hole Found
- Corner, Nothing Found or Set
- Utility Pole
- Overhead Utility Lines
- Pavement
- Boundary Line Per Plan Reference 2a
- Proposed New Lot Lines
- Abutter Line (See Note 7)
- Right Of Way Line
- Building Setback Line
- Contour Lines (10' Interval) (See Note 8)
- Contour Lines (2' Interval) (See Note 8)
- Approximate Upland/Wetland Interface Line (See Note 9)
- Stonewall
- Approximate Location Of Septic Disposal Field
- Well Exclusion Zone (100.' From Septic Disposal Area)
- Approximate Building Location (Taken From Google Earth)
- Soil Boundary & Type (See Note 12)

Building Site Erosion Control

Not To Scale



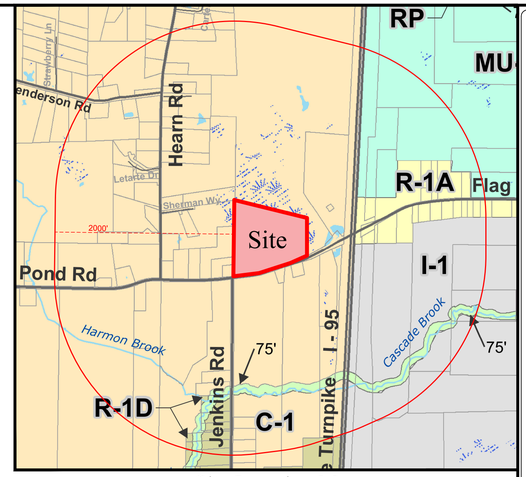
EROSION CONTROL NOTES:
This sketch is indicating the intent of the soil erosion measures. Actual site conditions and layouts will vary from site to site.

Building contractors must comply with the erosion control notes shown on these drawings and with "Maine erosion and sediment control handbook for construction: Best management practices".

A - Construct diversion ditch to keep upslope drainage from entering site.
B - Install silt fence below all disturbed areas.
C - Keep clearing to a minimum.
D - Reseed all disturbed areas.

Site Location Map

(Scale: 1"=800')



Approved By:	Date:

Planning Board

YORK, ss REGISTRY OF DEEDS
Received :
at _____h _____m _____M., and
Filed in Plan Book _____ Page _____
ATTEST:
_____
Register

Copyright © Corner Post Land Surveying, Inc. All rights reserved. No part of this drawing may be reproduced by photocopying, recording, or by any other means, or stored, processed or transmitted in or by any computer or other systems without the prior written permission of Corner Post Land Surveying, Inc.

Survey File Name:	2018158.crd
CAD File Name:	2018158.dwg
Drawn By:	KAL
Job Number:	2018158

Revisions	Date	By
1. Revised to show approximate areas of additional wetlands per 5-20-2019 Normandeau Associates memo	05-21-2019	DAL

Plan Showing A
Proposed 4 Lot Subdivision
For
Sebago Real Estate Investment, LLC.
28 Weare Road
Seabrook, NH 03874
Property Located On
Flag Pond Road
In
Saco, Maine

May 9, 2019
Scale: 1in. = 80ft.

Corner Post Land Surveying, Inc.
600 Main Street
Springvale, Maine 04083
Phone Number: (207) 324-2119

I hereby certify that this boundary survey conforms to the Maine Board of Licensure for Professional Land Surveyors, Chapter 90, Standards of Practice.

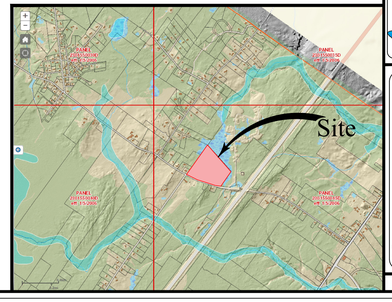
STATE OF MAINE
DANA A. LIBBY
NO.1350
PROFESSIONAL LAND SURVEYOR

Dana A. Libby
Professional Land Surveyor 1350
05-21-2019

SHEET 1

Limits Of 100 Year Flood Hazard Map

(Not to Scale)



NORMANDEAU ASSOCIATES
Environmental Consultants

Memorandum

Thursday, June 06, 2019

TO: Emily Prescott
FROM: Benjamin Griffith, Wetland Scientist, Normandeau Associates, Inc.
SUBJECT: Flag Pond Road, Wetland Delineation Peer Review

Normandeau Associates conducted a review on Wednesday, June 5, of the wetland delineation performed by Kenneth Gardner in December 2018 and May 2019, at the proposed subdivision on Flag Pond Road in Saco, Maine. The site is currently forested with a mixture of red maple (*Acer rubrum*), white pine (*Pinus strobus*), and black cherry (*Prunus serotina*). There is a large forested and shrub-scrub wetland extending from the northern part of the parcel nearly to the road. The review of the delineated wetland boundaries included an examination of the vegetation, soils, and hydrology to determine accuracy according to the guidelines contained in the 2012 regional supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual.

Normandeau finds that the wetland delineation as presently flagged accurately reflects the current conditions at the site within the proposed project area. However, the conditions depicted on the plans dated February 26, 2019 need to be updated to reflect the most recent wetland delineation, which was done after the lines were revisited by Mr. Gardner to reevaluate areas previously missed during the initial delineation conducted in December 2018.

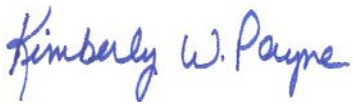
Please contact me at (603) 637-1136 or bgriffith@normandeau.com if you have any questions.

Regards,



Benjamin Griffith, Wetland Scientist

Normandeau Associates, Inc.



Kimberly Payne, Project Manager

Normandeau Associates, Inc.

From: Diane Morabito
To: Emily C. Prescott
Subject: 193 Flag Pond Road
Date: Friday, June 14, 2019 11:07:53 AM

[CAUTION: THIS EMAIL ORIGINATED FROM OUTSIDE THE CITY OF SACO DOMAIN]

Hi Emily,

In terms of traffic, the three new residential lots proposed as 193 Flagg Pond Road Subdivision will generate:

- 3 AM Peak Hour Trips
- 3 PM peak Hour Trips
- 30 One-Way Trips on a Daily Basis

Given this traffic level, a Traffic Impact Analysis is not required under the ordinance and I have no traffic operational concerns.

My only concern, which resulted in my original review recommendation, was the sharing of drives to reduce curb cuts as previously noted in my review memorandum.

As always, don't hesitate to contact me if you have any questions or if need any additional information.

Diane

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering
Sewall/Maine Traffic Resources
40 Forest Falls Drive
Suite 2
Yarmouth, ME 04096
direct line: 207 817 5440

SUMMARY MEMORANDUM

TO: Ms. Emily Cole-Prescott
City Planner
Saco City Hall
300 Main Street
Saco, ME 04072-1538

DATE: May 2, 2019

RE: Traffic Review for 193 Flag Pond Road Subdivision

Maine Traffic Resources (MTR) was requested by the City of Saco to review traffic impact for the proposed 193 Flag Pond Road Subdivision. This is a proposed four (4) lot residential subdivision.

The applicant has requested a waiver of Section 10.8.10 of the subdivision regulations. This section prohibits direct access to Flag Pond Road (as well as several other roads). The purpose of this regulation is to maintain capacity of the main road by limiting the number of allowable access points. Each curb cut along a roadway is a potential conflict point and each also reduces the capacity of a roadway since entering or exiting vehicles generally cause main line vehicles to slow.

The applicant is proposing four (4) separate drives to Flag Pond Road, one to serve each individual lot. Lot 4 currently has an existing home and barn, which is served by a loop driveway. The proposed plan reduces access to lot 4 to a single drive, from the two existing curb cuts. The subdivision regulations state that a waiver of the access prohibition is allowable for the following reasons:

A. There is too little road frontage to reasonable allow for the creation of a local street or private road

B. The shape or physical condition of the parcel does not permit access to or the creation of a local street or private road

C. There will be no further subdivision of the parcel

It is understood that the applicant plans no further subdivision of the parcel, leaving the remaining rear land with lot # 4, technically meeting condition C. above. I can see why the applicant would not want the expense of building an access road to serve only four lots. However, I strongly recommend that the lots share access drives where possible. This will reduce the number of proposed curb cuts, better meeting the intent of the regulation. The two westerly lots, 1 & 2, could share a drive along their common lot line.

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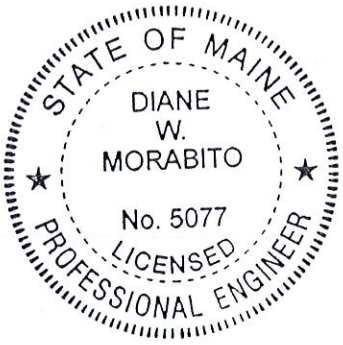
Maine Traffic Resources

Flag Pond Road Subdivision

May 2, 2019

Given the existing home/barn location it does not appear that the two easterly lots could easily share a curb cut. The westerly shared drive would be in close proximity to an originally proposed drive so I expect sight distances would be adequate to meet the City requirement. Note I have not performed a field review to verify the sight distances reported by William Bray, P.E. in his letter dated April 8, 2019. This letter indicates that sight distances from all four of the proposed lots exceeds the 350' required in both directions. This approach, with lots 1 & 2 sharing a drive, would reduce the four (4) proposed curb cuts to three (3), better meeting the regulations, and resulting in a net increase of just one from current conditions.

As always, do not hesitate to contact me if you or the Board have any questions or concerns regarding my recommendations



Sincerely,

Diane W. Morabito

Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering

Planning and Development
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Emily Cole-Prescott
City Planner
Eprescott@sacomaine.org
Phone: (207) 282-3487 ext.357

TO:	Planning Board
CC:	Star Homes Inc. (Joe Frustaci) Andy Morrell, Project Engineer (BH2M)
FROM:	Emily Cole-Prescott, City Planner
DATE:	June 13, 2019 (June 18, 2019 Planning Board Meeting)
RE:	Tax Map 88 Lot 12: Preliminary Subdivision Review – Sandy Brook – 21-lots off Chantelle Way

Overview: Applicant, Star Homes, Inc., has submitted revised materials to request preliminary subdivision review of a 21-lot subdivision off Chantelle Way, known as Sandy Brook. Review of this project began in 2016, when the applicant had originally proposed a 25-lot clustered subdivision. In June 2018, the applicant revised the plans to pursue a 21-lot conventional subdivision. The applicant met with the Planning Board in both 2017 and 2018 to obtain feedback about the initial application items, but at that time, there was not a finding on application completeness. City staff provided comments about the proposal, and the applicant has since responded to a number of those comments with several updates. The applicant has also attended the May 28th PDRC meeting to obtain additional feedback on the progress of plan revisions to date.

Proposal History: In 2016, Bob Hamblen provided the following information: "The Sierra Woods subdivision was approved by the Board on April 10, 2001, subject to both local subdivision and Site Location of Development review. The original, undeveloped parcel was 65.78 acres and had been owned for a number of years by the Laure Hill Cemetery Association. Sierra Woods occupies a 46.08-acre portion of that. Laurel Hill sold the rear 20+/- acres to Andy Howard dba Sierra Gardens Sierra Woods, Inc., in 2004. The current applicant acquired the parcel at auction in 2012 (now proposed as Sandy Brook Subdivision). The original developer left the country, and the City 'took' the remaining financial guarantee funds of roughly $110,000 with which it oversaw the completion of streets as far as the money would go. Blake and Jasmine were completed; Chantelle was built and base paved, but the money ran out before sidewalks and curb were installed, nor was finish paving done. It is the City's intent that the developer of "the back 20" will complete Chantelle Way."[1]

In 2017, the applicant obtained City Council's approval to construct and complete improvements to Chantelle Way. The applicant agreed to pay $57,920.50 to the City for the outstanding construction fees for Chantelle Way improvements.

Required Permits: This proposal is subject to the following reviews and permits:

- Subdivision Review with the City
- Site Location of Development – The City received a major amendment application to the Site Law permit. The City completed the site law review for the Sierra Woods subdivision in 2001, and will confirm with the DEP via municipal reviewing authority to accept this Site Law amendment application. The applicant should coordinate this review with the City's Planning & Development Department, and complete the review and approval process with the Planning Board before final subdivision review.

[1] Hamblen, B. (2016, February 23). Memo to Planning Board Members – Sketch Plan, Sandy Brook Subdivision.

- NRPA Permitting with the DEP: Correspondence in the file between Bob Hamblen and Bob Green (Project Manager at the DEP) indicate that this will be considered common scheme, and wetland impacts will therefore be considered cumulative over the entire parcel.[2]
- Army Corps Permit: The applicant will be required to amend the existing Army Corps permit for Sierra Woods to accommodate additional wetland impacts on the site.

Application Completeness: The applicant has submitted several revisions, but there are several items yet to be submitted to complete the preliminary subdivision application:

1. Letter from ME Department of Inland Fisheries and Wildlife to determine if there are any habitats to be considered in the design of the subdivision
2. Letter from ME State Historic Preservation Office to determine if there are any identified historic or archaeological resources on site
3. Response to traffic details as enumerated below in this memo, to offer evidence and support for the waiver the applicant requests of the traffic impact analysis
4. Confirmation from the Water Resource Recovery Director/Department that there is sewer capacity at this site to handle the additional 21 house lots.

Departmental Reviews:

- Public Works: City Engineer Joe Laverriere has provided an updated set of comments dated June 11, 2019 of the plan set revised through June 5, 2019. There are several comments that should be addressed. The memo also includes several recommended conditions of approval, which have been incorporated into the draft conditions for the Board's consideration.
- Code Enforcement Department: In 2017, Richard Lambert requested the 100-year flood hazard area be shown on the plan, and asked about the proposed "no disturbance" buffer, for clarification on the restrictions proposed with that buffer. The applicant has since added the 100-year flood hazard area to the plan, and has updated note 24 on sheet 1 of the plan set.
- Fire Department: Dave Pendleton had requested that the hydrant be moved closer to the wet pond, closer to the intersection of Chantelle Way and Sandy Brook Lane. The applicant responded in 2018 that the hydrant had been moved per this comment.
- Assessing: Kate Kern, Deputy Assessor, indicated that the parcel is not in any land use programs for tax exemption purposes.
- Maine Water: Comments from Maine Water were received in 2018. The applicant has indicated that these comments have been addressed, but the applicant should confirm all plan designs with Maine Water.
- Police Department: In 2018, Deputy Chief Huntress noted that he had no further concerns at the time.

Public Hearing: There is enough information in this record for the Board to receive public comment about the application and offer feedback to the applicant. A motion is: ***"I move to open the public hearing."***

Discussion: There are several items for the Board's review:

Traffic: The proposal is expected to generate 201 trips per day. The City's Subdivision Regulations (Section 5.2.3 (6)) require a traffic impact analysis if 200 daily trips or more are anticipated. The applicant has requested a waiver to this standard, citing the traffic study that was completed for the

[2] Green, B. (2018, January 19). Email to Bob Hamblen, Sandy Brook Subdivision.

original Sierra Woods Subdivision in 1999 which anticipated future development. The applicant referenced a meeting with the City Planner and Engineer about this matter in the May 29, 2018 letter.[3] Randy Dunton, traffic engineer on behalf of the City, has completed an initial review of the plan and suggests a traffic assessment, which would include: 1.) review of safety in the area; 2.) sight distance review at Route 112 to ensure original sight distances have been maintained; 3.) analysis of what construction has been completed relative to the common scheme of development in the original Traffic Movement Permit. The applicant should provide this information in support of the waiver request for the traffic impact analysis. Additionally, because of the increased number of trips to the site and the potential for increased traffic on Route 112, Staff recommends a traffic impact fee per lot be assessed.

Environmental: Wetland delineation has been completed, and peer reviewed by Normandeau and Associates. The site includes Deep Brook, and the applicant proposes a 100'-stream setback as a no-disturbance buffer. Several wetland impacts are identified, which will require NRPA permitting with the DEP, as noted above. The applicant should respond to a previous question raised by Christine Woodruff at the DEP via email asking whether significant vernal pools had been identified on site.[4] The site is located in Zone X with portions of the site as indicated on the subdivision plan in Zone A.

Stormwater: The applicant proposes to extend Chantelle Way by 800 feet, Blake Avenue by 400' with a connection road of 539'. This proposal will result in 2.87 acres of new impervious area, and 9.36 acres of developed area. Stormwater will be directed to existing wetponds one and two and an additional third wetpond is proposed, per the Stormwater Management Report.

Open Space & Recreation: The applicant proposes 9.467 acres of land to be dedicated to the City of Saco. The proposed average square foot per dwelling unit is 16,900.95, so the applicant is required to dedicate 10% of the site to open space per Section 10.2. Total parcel size is 19.45 acres, so the applicant is required to provide 1.945 acres of open space land that meets the requirement of the regulation. The applicant has not presented a plan for the recreation component outlined in the Subdivision Regulations. Although the applicant has met with Ryan Sommer (Parks & Rec Director) at the May 28th PDRC meeting to discuss the plan for the land to be dedicated to the City, the applicant should confirm the recreational component (trails, etc.) with Ryan Sommer. If no recreation component to the plan is achieved, the applicant will be required to pay the recreation facilities impact fee.

Conclusion: Staff has provided a first draft of findings and conditions for this proposal, and recommends that the applicant return to the Board at a future meeting date for both preliminary subdivision review and Site law major amendment review. A suggested motion is: ***"I move to continue application review to an upcoming meeting."***

[3] Morrell, A.S. (2018, May 29). Letter to Bob Hamblen, Sandy Brook Subdivision Revisions.
[4] Woodruff, C. (2016, October 12). Email to Andy Morrell, Sandy Brook Subdivision.

Saco Planning Board
Sandy Brook Preliminary Subdivision Review (Tax Map 88 Lot 12)
Draft Findings of Fact
June 13, 2019

1. Sandy Brook Subdivision has a project area of 19.45 acres. It is proposed for the development of single-family dwellings on 21 lots, served by a connecting road built to City standards, and a stormwater management system. The lots will be served by public water and sewer, and underground electric, telephone and cable utilities.
2. The record owner of the property and the applicant is Star Homes, Inc., 8 Rosewood Drive, Cape Elizabeth, ME 04107.
3. The project manager is Andy Morrell, BH2M Engineers, 28 State Street, Gorham, Maine 04038.
4. The project parcel is identified as Tax Map 88, Lot 12, in the R-1D zoning district. Said lot is referenced in Book 16382, Page 537, York County Registry of Deeds.
5. The project requires the following reviews and approvals:
   - Subdivision Review with the City
   - Site Location of Development Major Amendment
   - NRPA Permit
   - Army Corps Permit
6. The applicant has submitted a plan set dated February 2016 and revised through June 5, 2019. The sheets are listed as follows:

   - *Cover Sheet – Sandy Brook Chantelle Way and Blake Avenue*
   - *Sheet 1 – Amended Subdivision Preliminary Plan*
   - *Sheet 2 – Standard Boundary Survey & Existing Conditions*
   - *Sheet 3 – Roadway Profile Chantelle Way Extension*
   - *Sheet 4 – Roadway Profile Chantelle Way Extension*
   - *Sheet 5 – Roadway Profile Blake Avenue Extension*
   - *Sheet 6 – Roadway Profile Sandy Brook Lane*
   - *Sheet 7 – Pond Details*
   - *Sheet 8 – Details A*
   - *Sheet 9 – Details B*
   - *Sheet 10 – Details C*
   - *Sheet 11 – Erosion Control Plan*
   - *Pre-development Drainage Plan*
   - *Post-development Drainage Plan*

7. Traffic generated by the proposed lots would result in 201 trips per day. The applicant has requested a waiver, and should provide additional traffic assessment in support of the waiver request.
8. Pedestrian needs: The applicant proposes sidewalks along Chantelle Way extension and Blake Avenue extension. Many of the roads from the existing Sierra Woods subdivision are also served by sidewalks.
9. Sewer: The applicant proposes that the site be served by public sewer. The applicant should obtain verification letter from the WRRD Department, and complete the wastewater discharge application and submit to the WRRD Department.

10. Public Water: The applicant proposes that the lots be served by public water, and has presented a capacity letter in support of this proposal. The applicant plans to coordinate plans with Maine Water, and has received some initial feedback on an initial plan set. Note 32 on the preliminary subdivision plan indicates that each lot will be served by a booster pump to ensure appropriate water pressure.
11. Stormwater Management: A stormwater management report has been submitted that identifies the extension and construction of additional roads. The applicant proposes to extend Chantelle Way by 800 feet, Blake Avenue by 400' with a connection road of 539'. This proposal will result in 2.87 acres of new impervious area, and 9.36 acres of developed area. Stormwater will be directed to existing wetponds one and two and an additional third wetpond is proposed.
12. Wetlands: Total wetland impact is proposed to be 6,929 square feet, which will require a NRPA permit. Wetland delineation was completed by Mark Hampton and peer-reviewed on behalf of the City by Normandeau and Associates. The applicant was asked if vernal pools have been identified on the site, and should provide response. A Per Net Lot Area Calculation has been included on the preliminary subdivision plan detailed net lot area after wetland deductions.
13. Erosion and sedimentation control will be accomplished as detailed on Sheet 11 of the plan set.
14. The submissions detailed above are sufficient to make a determination on the completeness of submissions, and compliance with City of Saco Subdivision Regulations and Zoning Ordinance, of the preliminary subdivision plan.

The Planning Board has considered the following criteria from the Subdivision Regulations, and before granting approval for the preliminary plan has determined that:

1.1.1 Pollution. The proposed subdivision will not result in undue water or air pollution. In making this determination, it has at least considered:

A. The elevation of the land above sea level and its relation to the flood plains;
B. The nature of soils and subsoils and their ability to adequately support waste disposal;
C. The slope of the land and its effect on effluents;
D. The availability of streams for disposal of effluents; and
E. The applicable state and local health and water resource rules and regulations;

1.1.2 Sufficient water. The proposed subdivision has sufficient water available for the reasonably foreseeable needs of the subdivision based on the capacity letter received from Maine Water, initial feedback received from Maine Water representative on proposed plans, and the condition that lots will be provided a booster pump to ensure adequate water pressure.

1.1.3 Municipal water supply. The proposed subdivision will not cause an unreasonable burden on the existing water supply, as evidenced by the capacity letter received from Maine Water.

1.1.4 Erosion. The proposed subdivision will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy condition results, based on the temporary and permanent erosion controls that are proposed.

1.1.5 Traffic. Though the proposed subdivision will not cause unreasonable highway or public road congestion or unsafe conditions with respect to the use of the highways or public roads existing or proposed, the applicant has agreed with the Board that a portion of the vehicular trips generated by this subdivision will utilize the Rte. 112/Exit 36 corridor.

1.1.6 Sewage disposal. The proposed subdivision will provide for adequate sewage waste disposal and will not cause an unreasonable burden on municipal services: The applicant should

obtain verification of capacity with the WRRD Department and should submit the WRRD Wastewater Discharge Application.

1.1.7 Municipal solid waste disposal. The proposed subdivision will not cause an unreasonable burden on the municipality's ability to dispose of solid waste.

1.1.8 Aesthetic, cultural and natural values. The proposed subdivision will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, significant wildlife habitat: The applicant should obtain a letter from the ME Department of Inland Fisheries and Wildlife to make a determination on this standard.

1.1.9 Conformity with local ordinances and plans. The proposed subdivision conforms with a duly adopted subdivision regulation, zoning ordinance, and the 2011 Comprehensive Plan;

1.1.10 Financial and technical capacity. The subdivider has adequate financial and technical capacity to meet the standards of this section per the documentation submitted for the record.

1.1.11 Surface waters; outstanding river segments. Whenever situated entirely or partially within the watershed of any pond or lake or within 250 feet of any wetland, great pond or river as defined in Title 38, chapter 3, subchapter I, article 2-B, the proposed subdivision will not adversely affect the quality of that body of water or unreasonably affect the shoreline of that body of water.

A. When lots in a subdivision have frontage on an outstanding river segment, the proposed subdivision plan must require principal structures to have a combined lot shore frontage and setback from the normal high-water mark of 500 feet.

(1) To avoid circumventing the intent of this provision, whenever a proposed subdivision adjoins a shoreland strip narrower than 250 feet which is not lotted, the proposed subdivision shall be reviewed as if lot lines extended to the shore.

(2) The frontage and set-back provisions of this paragraph do not apply either within areas zoned as general development or its equivalent under shoreland zoning, Title 38, chapter 3, subchapter I, article 2-B, or within areas designated by ordinance as densely developed. The determination of which areas are densely developed must be based on a finding that existing development met the definitional requirements of section 4401, subsection 1, on September 23, 1983;

1.1.12 Ground water. The proposed subdivision will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of ground water;

1.1.13 Flood areas. Based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant whether the subdivision is in a flood-prone area. Flood areas have been identified on the preliminary subdivision plan, and note 24 on the plan set indicates a stream buffer.

1.1.14 Freshwater wetlands. All freshwater wetlands within the proposed subdivision have been identified on any maps submitted as part of the application, regardless of the size of these wetlands: Wetland delineation completed by Mark Hampton and peer reviewed for the City by Normandeau and Associates.

1.1.15 River, stream or brook. Any river, stream or brook within or abutting the proposed subdivision has been identified on any maps submitted as part of the application. For purposes of this section, "river, stream or brook" has the same meaning as in Title38, section 480-B, subsection 9. Deep Brook is identified on the plan, and a stream buffer is proposed.

1.1.16 Storm water. The proposed subdivision will provide for adequate storm water management, based on the submitted stormwater management report, pre- and post-development plans, and review of said plan by City Engineer Joseph Laverriere, P.E.

1.1.17 Spaghetti-lots prohibited. If any lots in the proposed subdivision have shore frontage on a river, stream, brook, great pond or coastal wetland as these features are defined in Title 38,

section 480-B, none of the lots created within the subdivision have a lot depth to shore frontage ratio greater than 5 to 1.

1.1.18 Lake phosphorus concentration. The long-term cumulative effects of the proposed subdivision will not unreasonably increase a great pond's phosphorus concentration during the construction phase and life of the proposed subdivision.

1.1.19 Impact on adjoining municipality. The proposed subdivision will not cause unreasonable traffic congestion or unsafe conditions with respect to the use of existing public ways in an adjoining municipality.

15. Based on the foregoing, the project meets the standards of approval for the preliminary subdivision plan, as outlined in the City of Saco Subdivision Regulations.

Voted by the Planning Board on _____. On Behalf of the Planning Board, Signed:

_____

Emily Cole-Prescott Date
City Planner

Saco Planning Board
Sandy Brook Subdivision (Map 88 Lot 12)
Preliminary Subdivision Plan Review
Draft: Conditions of Approval
June 14, 2019

1. All details will conform to City of Saco standards, including but not limited to the City of Saco Zoning Ordinance and Subdivision Regulations.
2. Approval of the preliminary plan is conditioned upon compliance by the applicant with any and all oral commitments regarding the project which were specifically made by the applicant to the Board in the course of its deliberations.
3. This approval is governed by the action taken by the Saco Planning Board for the final subdivision plan.
4. No deviations from the approved plans are permitted without prior approval from the Planning Board for major changes, and from the City Planner for minor changes. The determination of major or minor shall be made by the City Planner.
5. A Letter of Credit, acceptable to the City of Saco, shall be established for 150% of the construction cost of all required improvements, including but not limited to the following: utility installation, landscaping, paving, work within ROW, road construction, drainage, loam & seed, and sediment & erosion control. To establish the amount of the Letter of Credit, the applicant shall provide the City with itemized, per unit cost estimates, and a construction schedule, at least one week before any anticipated site work. This Letter of Credit shall be maintained for a period not less than three months beyond the anticipated completion of the project.
6. Prior to work commencing, the applicant shall establish a construction inspection account equal to 3% of the base cost of the Letter of Credit.
7. No work shall commence until two mylar sets and three paper sets of the final plans have been received by the Planning Office, signed by the Planning Board and recorded at the York County Registry of Deeds. Proof of recording shall be submitted to the Planning Office.
8. Prior to any construction activities, the applicant and contractor shall meet with the City Engineer and City Planner to review plans, inspection schedules and erosion control practices.

9. All plans and specifications shall be provided on disk in an AutoCAD format. The final plan shall be submitted in digital format as a single composite electronic file. The plan may be submitted on a disc, via e-mail, or other format acceptable to the City Planner, and shall be compatible with commonly used CAD and/or GIS software. See Section 6.2.6 of the Subdivision Regulations for further detail.
10. As-built plans shall be submitted before the final release of the Letter of Credit.
11. Stumps generated on-site will be ground and either used on-site for erosion control or will be hauled off-site. Stumps shall not be buried within areas shown as right of way on the final plan.
12. No filling or alteration of wetlands on individual lots shall be done without the appropriate state or local approvals.
14. The applicant shall be responsible for providing the following basic services:
    - Snow plowing of all ways in a manner similar to that provided by the City of Saco for City streets;
    - Trash pick-up from all inhabited units. This acknowledges that trash pick-up has customarily been provided by the City to homeowners on unaccepted subdivision streets if trash containers are transported to the corner of the unaccepted subdivision street and the nearest City street. If any homeowner is further than 500 feet from said City street, the applicant shall contract with a private hauler of solid waste in order to provide private curbside pick-up for such homeowners;
    - Maintenance of all roadway surfaces, drains, sewers and other utilities;
    - Installation of street signs and lights. Lights are to be energized no later than at the time of issuance of the Certificate of Occupancy to the first occupied residence in the subdivision;
    - The costs of performing the provisions of this section shall be added into the bond or surety provided for in Article 8 or included in the covenant provided for in Article 8
15. The applicant shall, upon beginning construction of Chantelle Way extension and other extensions, post a sign of a size no smaller than two feet by three feet and with two inch letters on black on a white background, with the following message: "This is not a public way owned by the City of Saco." The sign shall identify the developer and include an address and telephone number which may be used to contact the applicant.
16. The applicant shall confer with the Parks and Recreation Department prior to planting of street trees.
17. Upon completion, the subdivision is projected to generate 201 trips per day. The 2015 update of the Rte. 112 Corridor Study recommends a mix of mitigation measures designed to address existing and potential operational and safety deficiencies within the corridor. Based on the projected impacts of this project, a per-lot traffic impact fee will be assessed.
18. The applicant shall be required to reimburse the City's construction cost associated with the recent improvements along Chantelle Way in the amount of $57,920.50.
19. As part of the building permit process, the applicant shall submit a plot plan for each lot that shall include the location and footprint for the house, location of driveway and proposed grading. Any site constraints (i.e. wetlands, buffers, easements, etc.) shall be shown on the plot plan. DPW shall approve all driveway locations as part of the building permit process.
20. Prior to the start of construction, the applicant shall be required to execute Form 1 contained in Section 805 of the zoning ordinance and provide a recorded copy to the City.
21. Until such time that the stormwater facilities are offered and accepted by the City, the applicant shall be required to perform routine inspection and maintenance of the stormwater facilities as outlined in the operations and maintenance manual development specifically for

the site. A copy of the annual inspection and maintenance report including inspection log(s) shall be submitted annually (by July 15th of each year) to the City Public Works Department.

22. Prior to the start of construction, the stream buffer areas shall be marked in the field and copies of the recorded buffer deed restrictions shall be provided to the Planning Department.
23. The design engineer should be required to inspect the construction and stabilization of the stormwater management pond to be built on the site. Inspections shall consist of weekly visits to the site to inspect the construction (from initial ground disturbance to final stabilization of the pond) of the pond's embankment, stormwater inlet, underdrained gravel outlet, gravel outlet filter material makeup and placement, outlet control structure, clay liner and cover material, and emergency spillway. If necessary, the inspecting engineer shall interpret the pond's construction plan for the contractor. Once the pond is constructed and stabilized, the inspecting engineer will notify the City within 14 days to state the pond has been completed. Accompanying the engineer's notification shall be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of the gravel filter media. An inspection of the underdrained gravel outlet shall also be performed by a professional engineer one year after the final stabilization of the pond. The engineer shall notify the City as to the outlet's effectiveness and determine any maintenance items that are needed.
24. As part of the project's as-built certification for roadway and utility infrastructure, the applicant shall provide a Stormwater Basin As-Built Certification. Prior to the issuance of a Certificate of Occupancy for any lot, the Applicant shall submit evidence in the form of a letter with as-built survey plan prepared and stamped by a Professional Engineer who either prepared the Post-Construction Stormwater Management Plan and its associated Facilities or supervised the Plan and Facilities construction and implementation. The letter or plan shall certify that the Stormwater Management Facilities have been installed in accordance with the approved Post-Construction Stormwater Management Plan and that they will function as intended by said Plan. The as-built survey plan shall be performed for all post-construction stormwater facilities to document general conformance with the approved plan.
25. Prior to the start of construction, the applicant shall submit a copy of the CMP electrical plan for the development and the applicant shall confer with the DPW for the location of an electrical service and meter set to serve the street light system.
26. The applicant shall be required to perform routine inspection and maintenance of the stormwater facilities as outlined in the operations and maintenance manual development specifically for the site. A copy of the annual inspection and maintenance report including inspection log(s) shall be submitted annually (by July 15th of each year) to the City Public Works Department.
27. Proposed driveway locations to individual lots are subject to review and approval by the Department of Public Works prior to the issuance of a building permit.
28. Remaining engineering comments provided by City Engineer Joe Laverriere will be addressed to the satisfaction of City Staff.

With these Conditions and the accompanying Findings of Fact, the Saco Planning Board hereby finds that the applicant has satisfied the requirements set forth in the City of Saco Subdivision Regulations and in the Zoning Ordinance. Approval for the final subdivision plan is hereby granted, contingent on these Conditions of Approval. Voted by the Saco Planning Board on _____.

Signed, on behalf of the Planning Board:

_____

Emily Cole-Prescott Date
City Planner

BH2M

Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street, Gorham, Maine 04038
207 839-2771

WILLIAM A. THOMPSON
ROBERT C. LIBBY, Jr.
WALTER E. PELKEY
ANDREW S. MORRELL
STEVEN J. BLAKE

June 5, 2019

Emily Cole-Prescott, City Planner
City of Saco
300 Main Street
Saco, Maine 04072

RE: Preliminary Subdivision Revisions
Sandy Brook Subdivision

Dear Emily,

Please find attached three (3) full size plan sets of the following information in support of revisions for a Preliminary Subdivision for Sandy Brook Subdivision off Chantelle Way and Blake Avenue for Star Homes (please note an electronic set has also been emailed to your office as required by the City):

- Revised Subdivision Plans (full size)

These revisions come based on comments from the City Engineer and City staff at the PDRC meeting on May 27, 2019. The following is our response to these comments sorted by the source of the comment using the same numbering system for clarity:

Comments from City Engineer via memo dated May 28, 2019:

1. As recommended this item will be addressed prior to final approval. At this time the applicant is seeking Preliminary approval so that we can work with the Maine DEP on the NRPA permitting required for the project.
2. As recommended this item will also be addressed prior to final approval.
3. The applicant met with the PDRC on May 27, 2019. At that meeting the City Park and Recreation Department agreed to accept the Open Spaces as part of this project, therefore the configuration of the Wet Pond appears to be acceptable.
4. The intersection of Sandy Brook Lane and Chantelle Way has been revised as requested (see sheets 3 and 6). The grade along Sandy Brook Lane has been modified to meet the City standards for intersections grades. Please note the stormdrain system has also been modified accordingly to have the structures located at the low point of this roadway. We have redesigned the stormdrain for this entire intersection to assure runoff is collected appropriately in the closed drainage system. Please note the curbing at this intersection has also been updated as needed.
5. The sidewalk extension on Blake Avenue has been reconfigured as requested to provide a 5-foot wide esplanade (see sheet 6 of the plans). The 20-foot paved apron providing access to the existing wet pond has also been modified as

requested. The existing catch basin and drain manhole will be converted with new rims as recommended, please note plan labels have been added to the plans accordingly (see sheets 5 and 6 of the plans).

6. The sewer service clean out manhole detail on sheet 10 of the plans has been revised as requested. We have also added a plan note covering the requirements in both lawn areas and paved areas as recommended (see sheet 10).
7. As discussed with the City the applicant will be installing booster pumps for each of these lots (see note #32 on sheet 1 of the plans). The applicant will work with the Fire Department and Maine Water Company prior to final approval to assure all water pressure needs are met. This item was discussed at the PDRC meeting on May 27, 2019 and this was the process agreed to by all parties.
8. As recommended this item will be addressed with Maine Water Company prior to final approval.
9. The snout detail has been added to sheet 9 of the plans. Please note a snout is proposed at DMH #1 along Chantelle Way. The plan and profile sheets (Sheet 3) and detail sheet (sheet 9) have been revised to specifically reflect this drain manhole to have the infrastructure installed per City standards.
10. As described above the stormdrain system in this location has been altered and a drainage easement is no longer required at this location (see sheet 3 of the plans for more information).
11. The easement summary on sheet 1 of the plans has been revised to reflect this easement as being for CMP as requested.
12. The detail on sheet 7 of the plans has been revised along with the plan view on sheet 3 to be clearer as recommended. Please note a series of labels have also been added to the plan view on sheet 3.
13. As recommended a sewer manhole casting cut sheet will be provided for DPW review prior to construction as part of the submittal review process.
14. The detail on sheet 10 has been revised with updated dimensions as requested.
15. The locations of the tactile warning mats have been added to the plan and profile sheets as recommended (see sheets 3, 5 and 6).
16. This item is covered in note #30 on sheet 1 of the plans as well as on note #7 from the detail on sheet 10.
17. The grading has been reviewed in these areas. There is a cut in this location. For clarity see the grading on sheet 11 of the project plans.

As part of the comments there were some recommended conditions of approval. We previously had added all of this information as plan notes to sheet 1 of the plans as follows:

1. Plan note #40 was added to sheet 1 to cover this item.
2. Plan note #21 on sheet 1 of the plans covers this item.
3. Plan note #41 was added to sheet 1 to cover this item.
4. Plan note #42 was added to sheet 1 to cover this item.
5. Plan note #43 was added to sheet 1 to cover this item.
6. Plan note #44 was added to sheet 1 to cover this item.
7. Plan note #45 was added to sheet 1 to cover this item.

The applicant met with the PDRC on May 27, 2019 to review this project. The following design changes have also been made as a result of this meeting:

- A 25-foot wide access easement has been added on Lot 6 to allow City access to the Open Space on the Northern side of the parcel. Please note the plans have been revised accordingly (see sheet 1 of the plans for more information).
- The City of Saco would be interested in taking the Open Space as shown on the plans once the project has been approved (see above comments for more information).
- Plan Note #34 on sheet 1 of the plans has been revised to assure that the fire hydrant proposed at the intersection of Chantelle Way and Sandy Brook Lane will be installed as part of phase one of this project.

The applicant is anxious to get this project moving forward again and we look forward to working with the City to make this happen. We understand that by submitting this project today we are eligible to be considered for Preliminary Subdivision approval on June 18, 2019 with the Planning Board. Once preliminary subdivision approval is granted from the Planning Board the applicant intends to work through the Maine DEP permitting (NRPA only as the City has delegated authority for the Site Law permitting) prior to returning to the Planning Board for final subdivision approval.

Please call me if you have any questions regarding these revisions or if any additional information is needed.

Sincerely,

Andrew S. Morrell, P.E.
Project Engineer

cc: Joe Frustaci, Star Homes

13016-Revisions-6-5-2019

SANDY BROOK

CHANTELLE WAY AND BLAKE AVENUE
SACO, MAINE

A 21 LOT SUBDIVISION

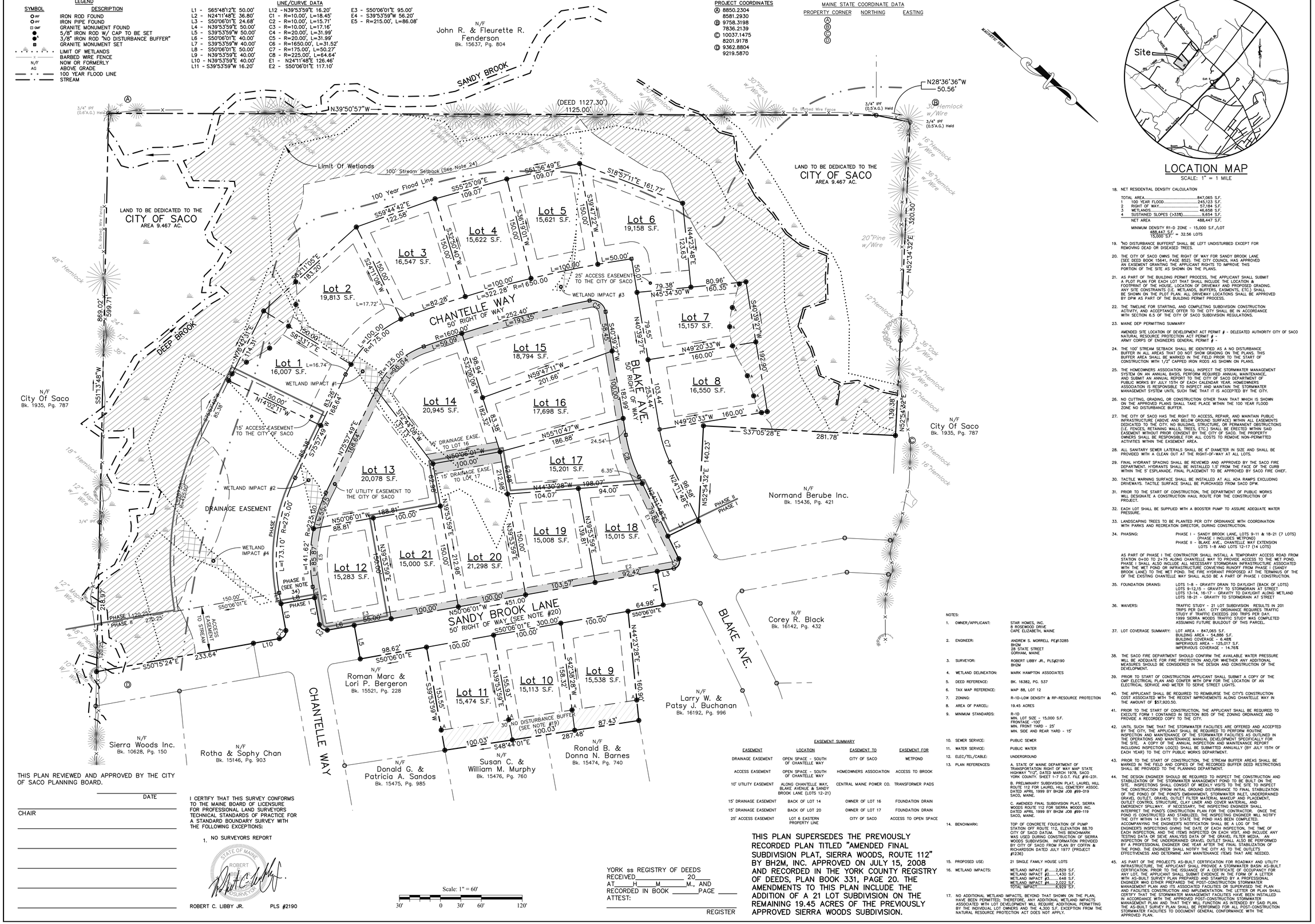
For
STAR HOMES
8 ROSEWOOD DRIVE
CAPE ELIZABETH, MAINE

PLAN INDEX

1	AMENDED SUBDIVISION - PRELIMINARY PLAN
2	STANDARD BOUNDARY SURVEY & EXISTING CONDITIONS
3	CHANTELLE WAY (STA 0+00 TO 5+00)
4	CHANTELLE WAY (STA. 5+00 TO END)
5	BLAKE AVENUE EXTENSION
6	SANDY BROOK LANE
7	POND DETAILS
8	DETAILS A
9	DETAILS B
10	DETAILS C
11	EROSION CONTROL PLAN

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors

28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250



18. NET RESIDENTIAL DENSITY CALCULATION

TOTAL AREA.....847,065 S.F.
1 100 YEAR FLOOD.....245,123 S.F.
2 RIGHT OF WAY.....57,184 S.F.
3 WETLANDS.....46,658 S.F.
4 SUSTAINED SLOPES (>33%).....9,654 S.F.
NET AREA 488,447 S.F.

MINIMUM DENSITY R1-D ZONE - 15,000 S.F./LOT
488,447 S.F. / 15,000 S.F. = 32.56 LOTS

19. "NO DISTURBANCE BUFFERS" SHALL BE LEFT UNDISTURBED EXCEPT FOR REMOVING DEAD OR DISEASED TREES.

20. THE CITY OF SACO OWNS THE RIGHT OF WAY FOR SANDY BROOK LANE (SEE DEED BOOK 15641, PAGE 852). THE CITY COUNCIL HAS APPROVED AN EASEMENT GRANTING THE APPLICANT RIGHTS TO IMPROVE THIS PORTION OF THE SITE AS SHOWN ON THE PLANS.

21. AS PART OF THE BUILDING PERMIT PROCESS, THE APPLICANT SHALL SUBMIT A PLOT PLAN FOR EACH LOT THAT SHALL INCLUDE THE LOCATION & FOOTPRINT OF THE HOUSE, LOCATION OF DRIVEWAY AND PROPOSED GRADING. ANY SITE CONSTRAINTS (I.E. WETLANDS, BUFFERS, EASMENTS, ETC.) SHALL BE SHOWN ON THE PLOT PLAN. ALL DRIVEWAY LOCATIONS SHALL BE APPROVED BY DPW AS PART OF THE BUILDING PERMIT PROCESS.

22. THE TIMELINE FOR STARTING, AND COMPLETING SUBDIVISION CONSTRUCTION ACTIVITY, AND ACCEPTANCE OFFER TO THE CITY SHALL BE IN ACCORDANCE WITH SECTION 6.5 OF THE CITY OF SACO SUBDIVISION REGULATIONS.

23. MAINE DEP PERMITTING SUMMARY

AMENDED SITE LOCATION OF DEVELOPMENT ACT PERMIT # - DELEGATED AUTHORITY CITY OF SACO
NATURAL RESOURCE PROTECTION ACT PERMIT # -
ARMY CORPS OF ENGINEERS GENERAL PERMIT # -

24. THE 100' STREAM SETBACK SHALL BE IDENTIFIED AS A NO DISTURBANCE BUFFER IN ALL AREAS THAT DO NOT SHOW GRADING ON THE PLANS. THIS BUFFER AREA SHALL BE MARKED IN THE FIELD PRIOR TO THE START OF CONSTRUCTION WITH 1/2" CAPPED IRON RODS AS SHOWN ON PLANS.

25. THE HOMEOWNERS ASSOCIATION SHALL INSPECT THE STORMWATER MANAGEMENT SYSTEM ON AN ANNUAL BASIS, PERFORM REQUIRED ANNUAL MAINTENANCE, AND SUBMIT AN ANNUAL REPORT TO THE CITY OF SACO DEPARTMENT OF PUBLIC WORKS BY JULY 15TH OF EACH CALENDAR YEAR. HOMEOWNERS ASSOCIATION IS RESPONSIBLE TO INSPECT AND MAINTAIN THE STORMWATER MANAGEMENT SYSTEM UNTIL SUCH TIME THAT IT IS ACCEPTED BY THE CITY.

26. NO CUTTING, GRADING, OR CONSTRUCTION OTHER THAN THAT WHICH IS SHOWN ON THE APPROVED PLANS SHALL TAKE PLACE WITHIN THE 100 YEAR FLOOD ZONE NO DISTURBANCE BUFFER.

27. THE CITY OF SACO HAS THE RIGHT TO ACCESS, REPAIR, AND MAINTAIN PUBLIC INFRASTRUCTURE (ABOVE AND BELOW GROUND SURFACE) WITHIN ALL EASEMENTS DEDICATED TO THE CITY. NO BUILDING, STRUCTURE, OR PERMANENT OBSTRUCTIONS (I.E. FENCES, RETAINING WALLS, TREES, ETC.) SHALL BE ERECTED WITHIN SAID EASEMENT WITHOUT PRIOR CONSENT BY THE CITY OF SACO, THE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR ALL COSTS TO REMOVE NON-PERMITTED ACTIVITIES WITHIN THE EASEMENT AREA.

28. ALL SANITARY SEWER LATERALS SHALL BE 6" DIAMETER IN SIZE AND SHALL BE PROVIDED WITH A CLEAN OUT AT THE RIGHT-OF-WAY AT ALL LOTS.

29. FINAL HYDRANT SPACING SHALL BE REVIEWED AND APPROVED BY THE SACO FIRE DEPARTMENT. HYDRANTS SHALL BE INSTALLED 1.5' FROM THE FACE OF THE CURB WITHIN THE 5' ESPLANADE. FINAL PLACEMENT TO BE APPROVED BY SACO FIRE CHIEF.

30. TACTILE WARNING SURFACE SHALL BE INSTALLED AT ALL ADA RAMPS EXCLUDING DRIVEWAYS. TACTILE SURFACE SHALL BE PURCHASED FROM SACO DPW.

31. PRIOR TO THE START OF CONSTRUCTION, THE DEPARTMENT OF PUBLIC WORKS WILL DESIGNATE A CONSTRUCTION HAUL ROUTE FOR THE CONSTRUCTION OF PROJECT.

32. EACH LOT SHALL BE SUPPLIED WITH A BOOSTER PUMP TO ASSURE ADEQUATE WATER PRESSURE.

33. LANDSCAPING TREES TO BE PLANTED PER CITY ORDINANCE WITH COORDINATION WITH PARKS AND RECREATION DIRECTOR, DURING CONSTRUCTION.

34. PHASING:
PHASE I - SANDY BROOK LANE, LOTS 9-11 & 18-21 (7 LOTS) (PHASE I INCLUDES WETPOND)
PHASE II - BLAKE AVE., CHANTELLE WAY EXTENSION LOTS 1-8 AND LOTS 12-17 (14 LOTS)

AS PART OF PHASE I THE CONTRACTOR SHALL INSTALL A TEMPORARY ACCESS ROAD FROM STATION 0+00 TO 2+75 ALONG CHANTELLE WAY TO PROVIDE ACCESS TO THE WET POND. PHASE I SHALL ALSO INCLUDE ALL NECESSARY STORMDRAIN INFRASTRUCTURE ASSOCIATED WITH THE WET POND OR INFRASTRUCTURE CONVEYING RUNOFF FROM PHASE I (SANDY BROOK LANE) TO THE WET POND. THE FIRE HYDRANT PROPOSED AT THE TERMINUS OF THE END OF THE EXISTING CHANTELLE WAY SHALL ALSO BE A PART OF PHASE I CONSTRUCTION.

35. FOUNDATION DRAINS:
LOTS 1-8 - GRAVITY DRAIN TO DAYLIGHT (BACK OF LOTS)
LOTS 9-12,15 - GRAVITY TO STORMDRAIN AT STREET
LOTS 13-14, 16-17 - GRAVITY TO DAYLIGHT ALONG WETLAND
LOTS 18-21 - GRAVITY TO STORMDRAIN AT STREET

36. WAIVERS:
TRAFFIC STUDY - 21 LOT SUBDIVISION RESULTS IN 201 TRIPS PER DAY. CITY ORDINANCE REQUIRES TRAFFIC STUDY IF TRAFFIC EXCEEDS 200 TRIPS PER DAY. 1999 SIERRA WOODS TRAFFIC STUDY WAS COMPLETED ASSUMING FUTURE BUILDOUT OF THIS PARCEL.

37. LOT COVERAGE SUMMARY:
LOT AREA - 847,065 S.F.
BUILDING AREA - 54,886 S.F.
BUILDING COVERAGE - 6.48%
IMPERVIOUS AREA - 125,017 S.F.
IMPERVIOUS COVERAGE - 14.76%

38. THE SACO FIRE DEPARTMENT SHOULD CONFIRM THE AVAILABLE WATER PRESSURE WILL BE ADEQUATE FOR FIRE PROTECTION AND/OR WHETHER ANY ADDITIONAL MEASURES SHOULD BE CONSIDERED IN THE DESIGN AND CONSTRUCTION OF THE DEVELOPMENT.

39. PRIOR TO START OF CONSTRUCTION APPLICANT SHALL SUBMIT A COPY OF THE CMP ELECTRICAL PLAN AND CONFER WITH DPW FOR THE LOCATION OF AN ELECTRICAL SERVICE AND METER TO SERVE STREET LIGHTS.

40. THE APPLICANT SHALL BE REQUIRED TO REIMBURSE THE CITY'S CONSTRUCTION COST ASSOCIATED WITH THE RECENT IMPROVEMENTS ALONG CHANTELLE WAY IN THE AMOUNT OF $57,920.50.

41. PRIOR TO THE START OF CONSTRUCTION, THE APPLICANT SHALL BE REQUIRED TO EXECUTE FORM I CONTAINED IN SECTION 805 OF THE ZONING ORDINANCE AND PROVIDE A RECORDED COPY TO THE CITY.

42. UNTIL SUCH TIME THAT THE STORMWATER FACILITIES ARE OFFERED AND ACCEPTED BY THE CITY, THE APPLICANT SHALL BE REQUIRED TO PERFORM ROUTINE INSPECTION AND MAINTENANCE OF THE STORMWATER FACILITIES AS OUTLINED IN THE OPERATIONS AND MAINTENANCE MANUAL DEVELOPMENT SPECIFICALLY FOR THE SITE. A COPY OF THE ANNUAL INSPECTION AND MAINTENANCE REPORT INCLUDING INSPECTION LOG(S) SHALL BE SUBMITTED ANNUALLY (BY JULY 15TH OF EACH YEAR) TO THE CITY PUBLIC WORKS DEPARTMENT.

43. PRIOR TO THE START OF CONSTRUCTION, THE STREAM BUFFER AREAS SHALL BE MARKED IN THE FIELD AND COPIES OF THE RECORDED BUFFER DEED RESTRICTIONS SHALL BE PROVIDED TO THE PLANNING DEPARTMENT.

44. THE DESIGN ENGINEER SHOULD BE REQUIRED TO INSPECT THE CONSTRUCTION AND STABILIZATION OF THE STORMWATER MANAGEMENT POND TO BE BUILT ON THE SITE. INSPECTIONS SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT THE CONSTRUCTION (FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE POND) OF THE POND'S EMBANKMENT, STORMWATER INLET, UNDERDRAINED GRAVEL OUTLET, GRAVEL OUTLET FILTER MATERIAL MAKEUP AND PLACEMENT, OUTLET CONTROL STRUCTURE, CLAY LINER AND COVER MATERIAL, AND EMERGENCY SPILLWAY. IF NECESSARY, THE INSPECTING ENGINEER SHALL INTERPRET THE POND'S CONSTRUCTION PLAN FOR THE CONTRACTOR. ONCE THE POND IS CONSTRUCTED AND STABILIZED, THE INSPECTING ENGINEER WILL NOTIFY THE CITY WITHIN 14 DAYS TO STATE THE POND HAS BEEN COMPLETED. ACCOMPANYING THE ENGINEER'S NOTIFICATION SHALL BE A LOG OF THE ENGINEER'S INSPECTIONS GIVING THE DATE OF EACH INSPECTION, THE TIME OF EACH INSPECTION, AND THE ITEMS INSPECTED ON EACH VISIT, AND INCLUDE ANY TESTING DATA OR SIEVE ANALYSIS DATA OF THE GRAVEL FILTER MEDIA. AN INSPECTION OF THE UNDERDRAINED GRAVEL OUTLET SHALL ALSO BE PERFORMED BY A PROFESSIONAL ENGINEER ONE YEAR AFTER THE FINAL STABILIZATION OF THE POND. THE ENGINEER SHALL NOTIFY THE CITY AS TO THE OUTLETS EFFECTIVENESS AND DETERMINE ANY MAINTENANCE ITEMS THAT ARE NEEDED.

45. AS PART OF THE PROJECT'S AS-BUILT CERTIFICATION FOR ROADWAY AND UTILITY INFRASTRUCTURE, THE APPLICANT SHALL PROVIDE A STORMWATER BASIN AS-BUILT CERTIFICATION. PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR ANY LOT, THE APPLICANT SHALL SUBMIT EVIDENCE IN THE FORM OF A LETTER WITH AS-BUILT SURVEY PLAN PREPARED AND STAMPED BY A PROFESSIONAL ENGINEER WHO EITHER PREPARED THE POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN AND ITS ASSOCIATED FACILITIES OR SUPERVISED THE PLAN AND FACILITIES CONSTRUCTION AND IMPLEMENTATION. THE LETTER OR PLAN SHALL CERTIFY THAT THE STORMWATER MANAGEMENT FACILITIES HAVE BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN AND THAT THEY WILL FUNCTION AS INTENDED BY SAID PLAN. THE AS-BUILT SURVEY PLAN SHALL BE PERFORMED FOR ALL POST-CONSTRUCTION STORMWATER FACILITIES TO DOCUMENT GENERAL CONFORMANCE WITH THE APPROVED PLAN.

NOTES:
1. OWNER/APPLICANT: STAR HOMES, INC. 8 ROSEWOOD DRIVE CAPE ELIZABETH, MAINE
2. ENGINEER: ANDREW S. MORRELL PE#13285 BH2M 28 STATE STREET GORHAM, MAINE
3. SURVEYOR: ROBERT LIBBY JR., PLS#2190 BH2M
4. WETLAND DELINEATION: MARK HAMPTON ASSOCIATES
5. DEED REFERENCE: BK. 16382, PG. 537
6. TAX MAP REFERENCE: MAP 88, LOT 12
7. ZONING: R-1D-LOW DENSITY & RP-RESOURCE PROTECTION
8. AREA OF PARCEL: 19.45 ACRES
9. MINIMUM STANDARDS: R-1D MIN. LOT SIZE - 15,000 S.F. FRONTAGE -100' MIN. FRONT YARD - 25' MIN. SIDE AND REAR YARD - 15'
10. SEWER SERVICE: PUBLIC SEWER
11. WATER SERVICE: PUBLIC WATER
12. ELEC/TEL/CABLE: UNDERGROUND
13. PLAN REFERENCES: A. STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP STATE HIGHWAY "112", DATED MARCH 1978, SACO YORK COUNTY, SHEET 1-7 D.O.T. FILE #16-231.
B. PRELIMINARY SUBDIVISION PLAT, LAUREL HILL ROUTE 112 FOR LAUREL HILL CEMETERY ASSOC. DATED APRIL 1999 BY BH2M JOB #99-019 SACO, MAINE.
C. AMENDED FINAL SUBDIVISION PLAT, SIERRA WOODS ROUTE 112 FOR SIERRA WOODS INC. DATED APRIL 1999 BY BH2M JOB #99-119 SACO, MAINE.
14. BENCHMARK: TOP OF CONCRETE FOUDATION OF PUMP STATION OFF ROUTE 112, ELEVATION 88.70 CITY OF SACO DATUM. THIS BENCHMARK WAS USED DURING CONSTRUCTION OF SIERRA WOODS SUBDIVISION. INFORMATION PROVIDED BY CITY OF SACO FROM PLAN BY COFFIN & RICHARDSON DATED JULY 1977 (PROJECT #1236)
15. PROPOSED USE: 21 SINGLE FAMILY HOUSE LOTS
16. WETLAND IMPACTS: WETLAND IMPACT #1.....2,829 S.F.
WETLAND IMPACT #2.....1,430 S.F.
WETLAND IMPACT #3.....648 S.F.
WETLAND IMPACT #4.....2,022 S.F.
TOTAL IMPACT.....6,929 S.F.
17. NO ADDITIONAL WETLAND IMPACTS, BEYOND THAT SHOWN ON THE PLAN, HAVE BEEN PERMITTED; THEREFORE, ANY ADDITIONAL WETLAND IMPACTS ASSOCIATED WITH LOT DEVELOPMENT WILL REQUIRE ADDITIONAL PERMITTING BY THE INDIVIDUAL LOT OWNERS AND THE 4,300 S.F. EXCEPTION FROM THE NATURAL RESOURCE PROTECTION ACT DOES NOT APPLY.

EASEMENT SUMMARY

EASEMENT	LOCATION	EASEMENT TO	EASEMENT FOR
DRAINAGE EASEMENT	OPEN SPACE - SOUTH OF CHANTELLE WAY	CITY OF SACO	WETPOND
ACCESS EASEMENT	OPEN SPACE - SOUTH OF CHANTELLE WAY	HOMEOWNERS ASSOCIATION	ACCESS TO BROOK
10' UTILITY EASEMENT	ALONG CHANTELLE WAY, BLAKE AVENUE & SANDY BROOK LANE (LOTS 12-21)	CENTRAL MAINE POWER CO.	TRANSFORMER PADS
15' DRAINAGE EASEMENT	BACK OF LOT 14	OWNER OF LOT 16	FOUNDATION DRAIN
15' DRAINAGE EASEMENT	BACK OF LOT 20	OWNER OF LOT 17	FOUNDATION DRAIN
25' ACCESS EASEMENT	LOT 6 EASTERN PROPERTY LINE	CITY OF SACO	ACCESS TO OPEN SPACE

THIS PLAN REVIEWED AND APPROVED BY THE CITY OF SACO PLANNING BOARD.

DATE

CHAIR

I CERTIFY THAT THIS SURVEY CONFORMS TO THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS TECHNICAL STANDARDS OF PRACTICE FOR A STANDARD BOUNDARY SURVEY WITH THE FOLLOWING EXCEPTIONS:

1. NO SURVEYORS REPORT

STATE OF MAINE ROBERT C. LIBBY 2190 LAND SURVEYOR

ROBERT C. LIBBY JR. PLS #2190

YORK ss REGISTRY OF DEEDS
RECEIVED _____ 20____
AT _____H _____M _____M., AND
RECORDED IN BOOK _____PAGE _____
ATTEST:

REGISTER

THIS PLAN SUPERSEDES THE PREVIOUSLY RECORDED PLAN TITLED "AMENDED FINAL SUBDIVISION PLAT, SIERRA WOODS, ROUTE 112" BY BH2M, INC. APPROVED ON JULY 15, 2008 AND RECORDED IN THE YORK COUNTY REGISTRY OF DEEDS, PLAN BOOK 331, PAGE 20. THE AMENDMENTS TO THIS PLAN INCLUDE THE ADDITION OF A 21 LOT SUBDIVISION ON THE REMAINING 19.45 ACRES OF THE PREVIOUSLY APPROVED SIERRA WOODS SUBDIVISION.

REVISION

NO.	DATE	DESCRIPTION
1	2/14/16	Submitted Sketch Plan to City
2	2/26/17	Preliminary Submission to the City
3	6/28/17	Revised Per City – Resubmitted 25 Lots – Cluster
4	12/15/17	21 Lot Preliminary Plan Submitted to City – Conventional
5	5/29/18	Revised Per City Comments
6	11/30/18	Revised Per City Comments
7	4/30/19	Revised Per City Comments
8	6/4/19	Revised Per City Comments

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

AMENDED SUBDIVISION PRELIMINARY PLAN

SANDY BROOK

CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Thompson	Feb. 2016
DRAWN	SCALE
Dept.	1"=60'
CHECKED	JOB. NO.
R. Libby Jr.	13016

SHEET
1

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LINE/CURVE DATA

L1 - S65°48'12"E 50.00'
L2 - N24°11'48"E 36.80'
L3 - S50°06'01"E 24.68'
L4 - N39°53'59"E 50.00'
L5 - S39°53'59"W 50.00'
L6 - S50°06'01"E 40.00'
L7 - S39°53'59"W 40.00'
L8 - S50°06'01"E 50.00'
L9 - N39°53'59"E 40.00'
L10 - S50°15'24"E 38.55'

C1 - R=10.00', L=18.45'
C2 - R=10.00', L=15.71'
C3 - R=10.00', L=17.16'

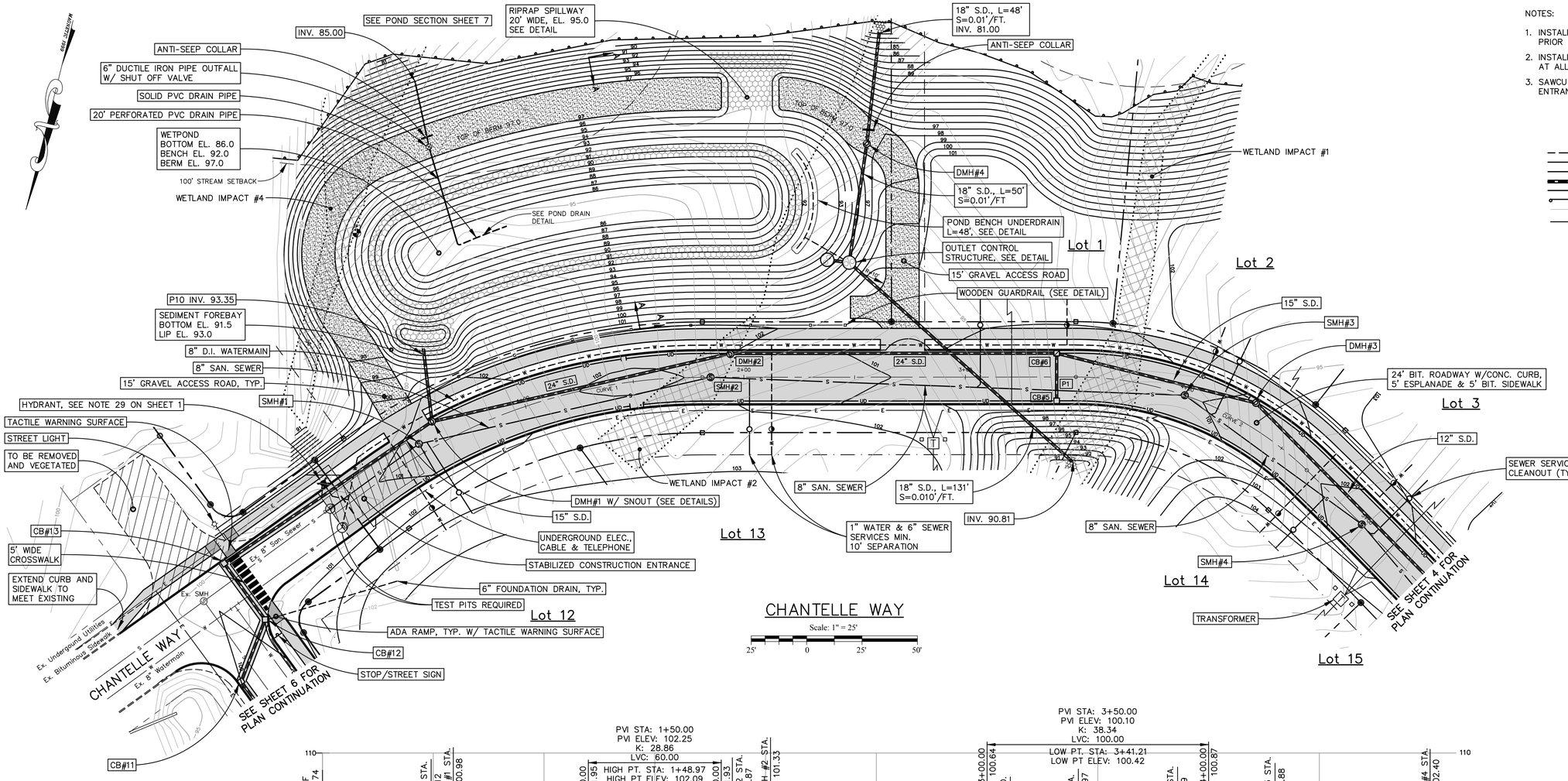


Scale: 1" = 60'
30' 0 30' 60' 120'

LEGEND

SYMBOL	DESCRIPTION
IRF	IRON ROD FOUND
IPF	IRON PIPE FOUND
GMF	GRANITE MONUMENT FOUND
	5/8" IRON ROD W/ CAP TO BE SET
GMS	GRANITE MONUMENT SET
	LIMIT OF WETLANDS
95	EXISTING CONTOUR
N/F	NOW OR FORMERLY
AG	ABOVE GRADE
	SOILS BOUNDRY
E	EXISTING ELECTRIC
S	EXISTING SEWER LINE
W	EXISTING WATER LINE
S	EXISTING SEWER MANHOLE
	TEST PIT LOCATION


Site
Saco
Biddeford
Scarborough
Ext 7
Ext 6
Ext 5
Ext 4
Ext 3
Ext 2
Ext 1
Route 1
Route 22
Route 98
Route 5
Route 9
Route 4
Route 3
Route 2
Route 1
Route 1
Route 1



NOTES:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE PRIOR TO CONSTRUCTION, SEE DETAIL.
2. INSTALL LOWPOINT SEDIMENT CONTROL BARRIERS AT ALL CATCH BASIN LOCATIONS, SEE DETAIL.
3. SAWCUT EXISTING PAVEMENT AT PROJECT ENTRANCE AND UTILITY TRENCHES AS REQUIRED.

LEGEND

- W — WATER SERVICE
- S — SANITARY SEWER
- E — UNDERGROUND ELECTRIC
- SD — STORM DRAIN
- PS — PRESSURE SEWER
- SILT FENCE/ EC BERM
- 160 — EXISTING CONTOUR
- 160 — PROPOSED CONTOUR
- T — TRANFORMER PAD
- UTILITY POLE
- S — SANITARY SEWER MANHOLE
- CB — CATCH BASIN
- DRAIN MANHOLE
- STREET LIGHT

STORM DRAIN DATA

CB#5 — RIM 99.97, INV OUT 96.08

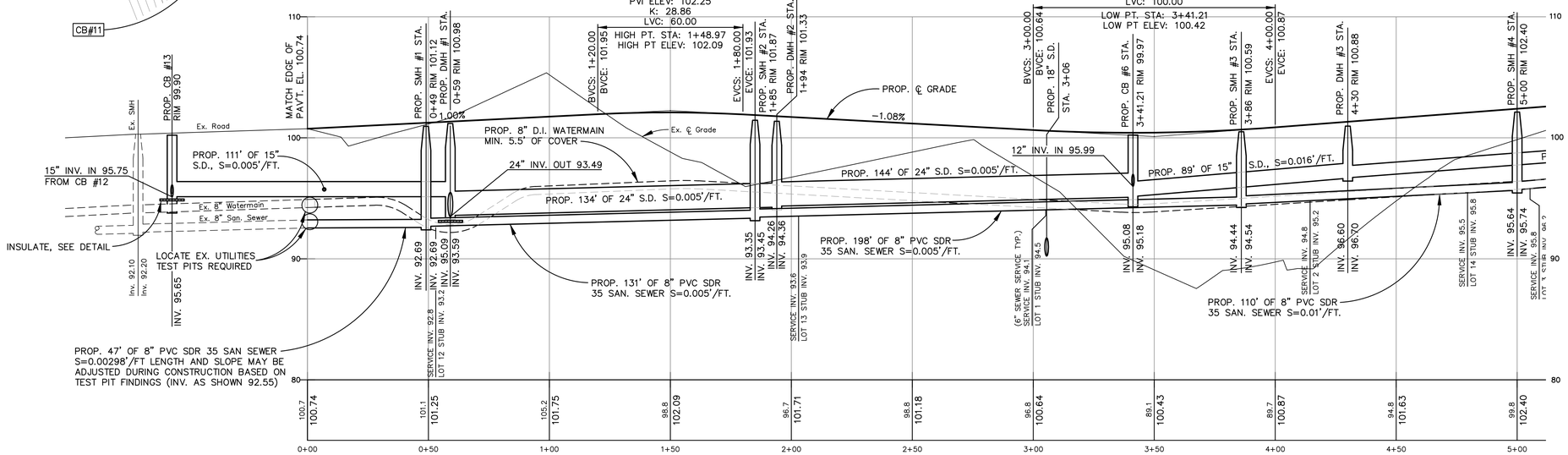
DMH#4 — RIM 97.80, INV IN 89.00, INV OUT 81.48

P1 - 12" S.D., L=18', S=0.005'/FT
P10 - 24" S.D., L=28', S=0.005'/FT

℄ CURVE DATA

CURVE #1 — R=250.00', L=157.36', T=81.38', D=36°03'51", PC=0+23.89, PT=1+81.25

CURVE #2 — R=150.00', L=115.25', T=60.64', D=44°01'25", PC=3+49.89, PCC=4+65.14



PROFILE

SCALE
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 25'

REVISION NO.	DATE	DESCRIPTION
1	2/14/16	Submitted Sketch Plan to City
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STATE OF MAINE — ANDREW S. MORRELL — No. 12881 — REGISTERED PROFESSIONAL ENGINEER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

ROADWAY PROFILE
CHANTELLE WAY EXTENSION
(STA. 0+00 TO STA. 5+00)

SANDY BROOK

CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

SHEET
3

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NOTE:

1. INSTALL LOWPOINT SEDIMENT CONTROL BARRIERS AT ALL CATCH BASIN LOCATIONS, SEE DETAIL.

LEGEND

- W — WATER SERVICE
- S — SANITARY SEWER
- E — UNDERGROUND ELECTRIC
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- SILT FENCE/ EC BERM
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- S — SANITARY SEWER MANHOLE
- CB — CATCH BASIN
- STREET LIGHT

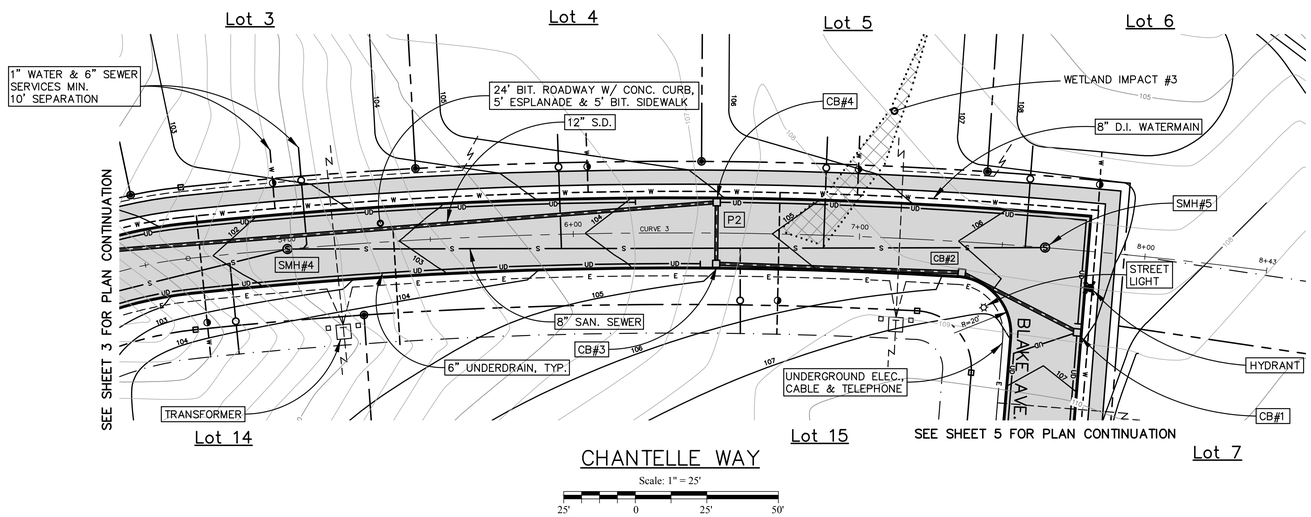
℄ CURVE DATA

CURVE #3
- R=1625.00'
- L=345.92'
- T=173.61'
- D=03°31'33"
- PCC=4+65.14
- PT=8+11.06

STORM DRAIN DATA

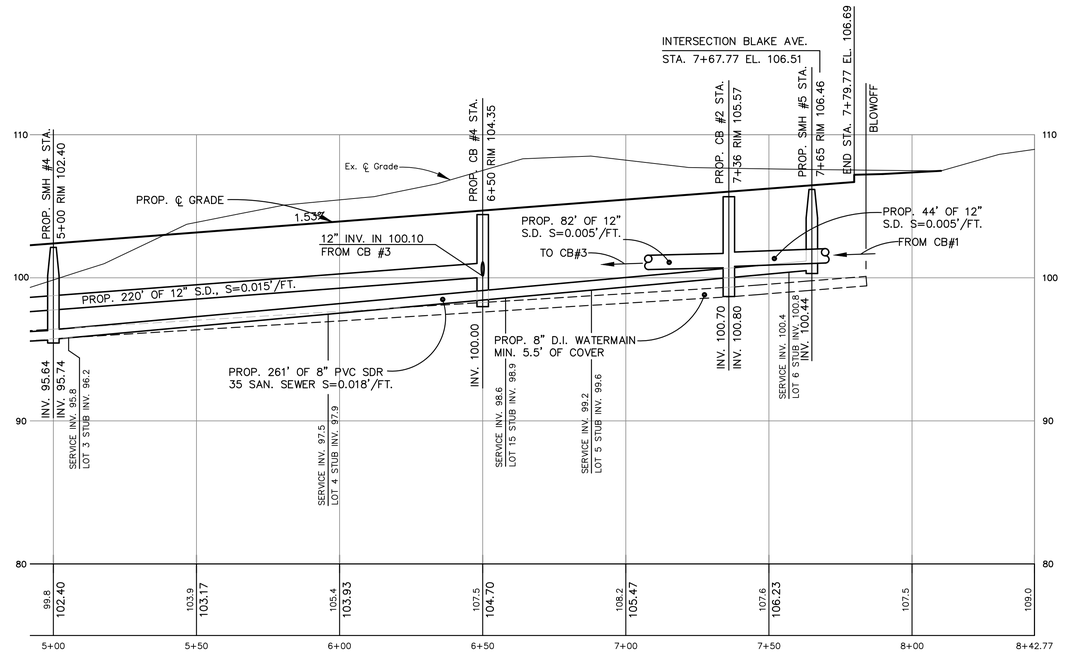
CB#3
- RIM - 104.35
- INV IN- 100.29
- INV OUT - 100.19

P2 - 12" S.D., L=18', S=0.005'/FT



CHANTELLE WAY

Scale: 1" = 25'



PROFILE

SCALE
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 25'

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7	4/30/19	Revised Per City Comments
8	6/4/19	Revised Per City Comments

STATE OF MAINE — ANDREW S. MORRELL — No. 12851 — REGISTERED PROFESSIONAL ENGINEER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

ROADWAY PROFILE
CHANTELLE WAY EXTENSION
(STA. 5+00 TO END)

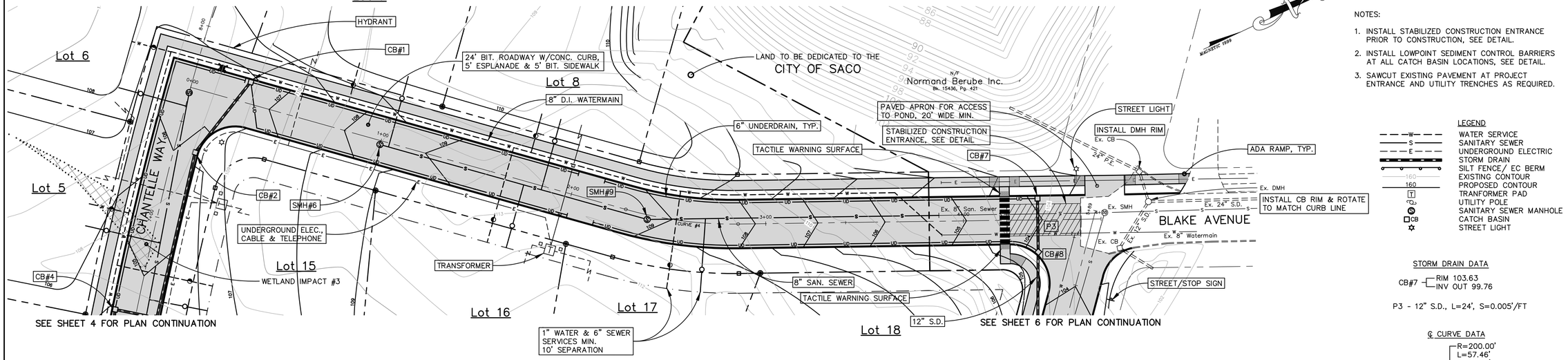
SANDY BROOK

CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

SHEET
4

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NOTES:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE PRIOR TO CONSTRUCTION, SEE DETAIL.
2. INSTALL LOWPOINT SEDIMENT CONTROL BARRIERS AT ALL CATCH BASIN LOCATIONS, SEE DETAIL.
3. SAWCUT EXISTING PAVEMENT AT PROJECT ENTRANCE AND UTILITY TRENCHES AS REQUIRED.

LEGEND

- W — WATER SERVICE
- S — SANITARY SEWER
- E — UNDERGROUND ELECTRIC
- STORM DRAIN
- SILT FENCE/ EC BERM
- 160 — EXISTING CONTOUR
- 160 — PROPOSED CONTOUR
- T — TRANFORMER PAD
- UTILITY POLE
- SANITARY SEWER MANHOLE
- CB — CATCH BASIN
- STREET LIGHT

STORM DRAIN DATA

CB#7 — RIM 103.63, INV OUT 99.76

P3 - 12" S.D., L=24', S=0.005'/FT

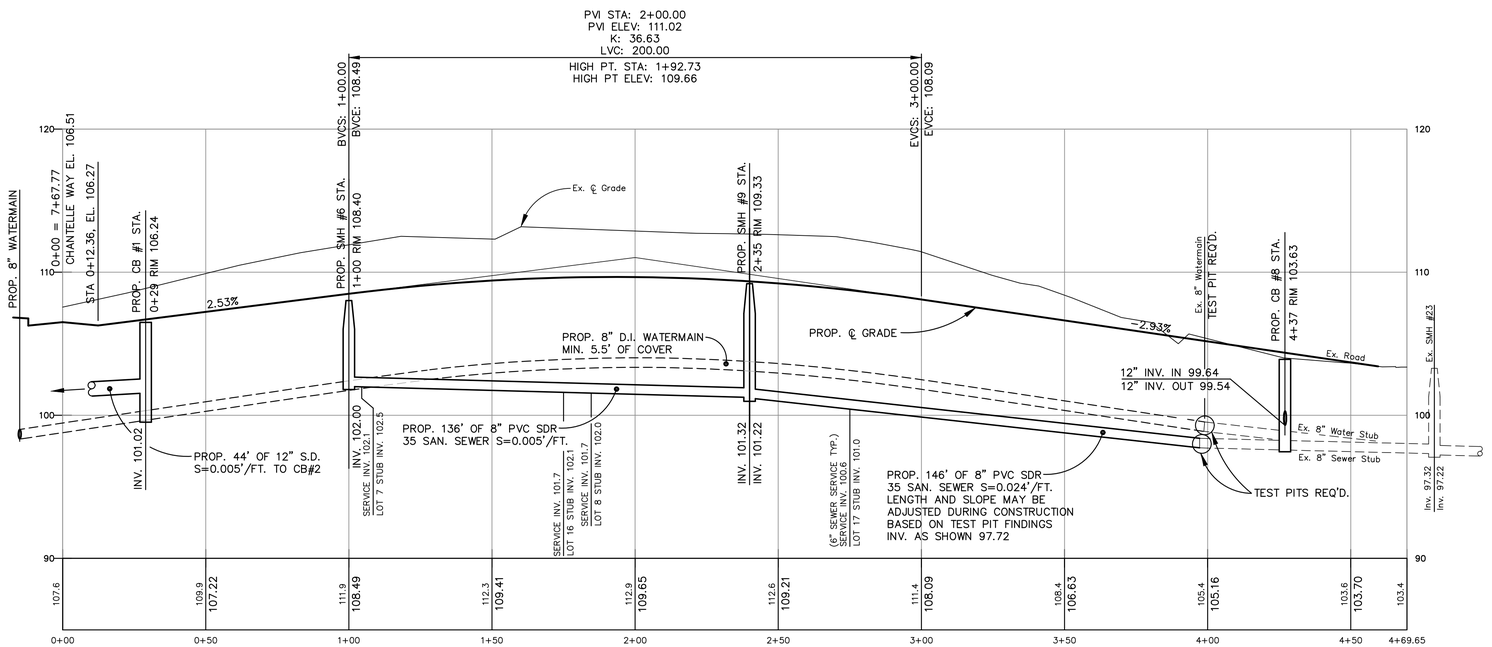
℄ CURVE DATA

CURVE #4 — R=200.00', L=57.46', T=28.93', D=16°27'39", PC=2+28.63, PT=2+86.09

BLAKE AVENUE

Scale: 1" = 25'

25' 0 25' 50'



PROFILE

SCALE
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 25'

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8	6/4/19	Revised Per City Comments

STATE OF MAINE — ANDREW S. MORRELL — No. 12861 — REGISTERED PROFESSIONAL ENGINEER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
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Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

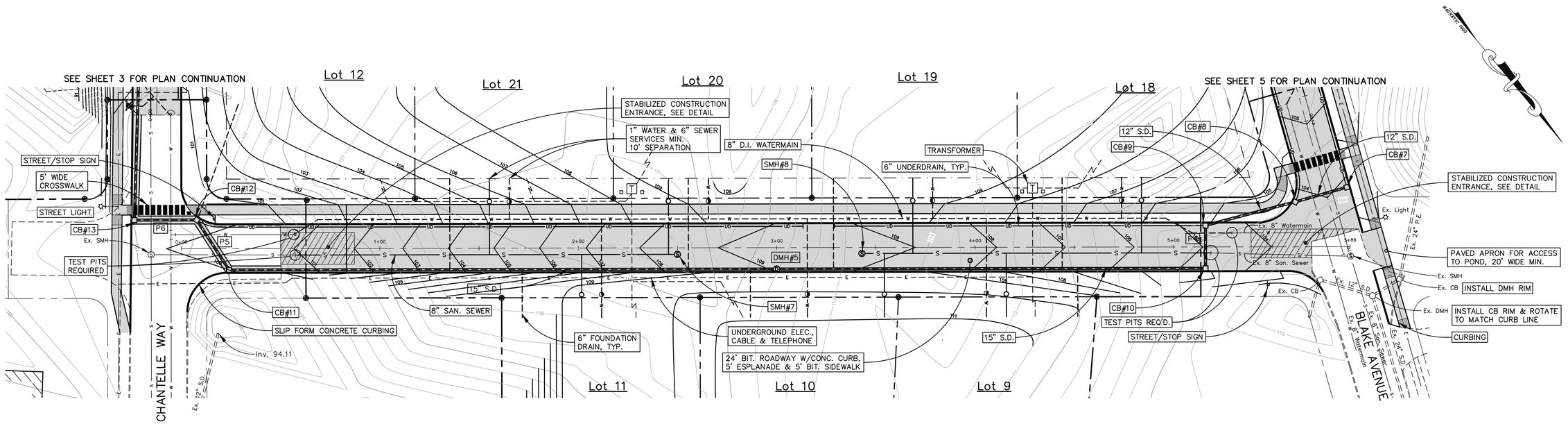
ROADWAY PROFILE
BLAKE AVENUE EXTENSION
SANDY BROOK

CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

SHEET
5

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LEGEND

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- E — UNDERGROUND ELECTRIC
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- 160 — EXISTING CONTOUR
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- T — TRANFORMER PAD
- UTILITY POLE
- SANITARY SEWER MANHOLE
- CB — CATCH BASIN
- STREET LIGHT

SANDY BROOK LANE

Scale: 1" = 25'

25' 0 25' 50'

STORM DRAIN DATA

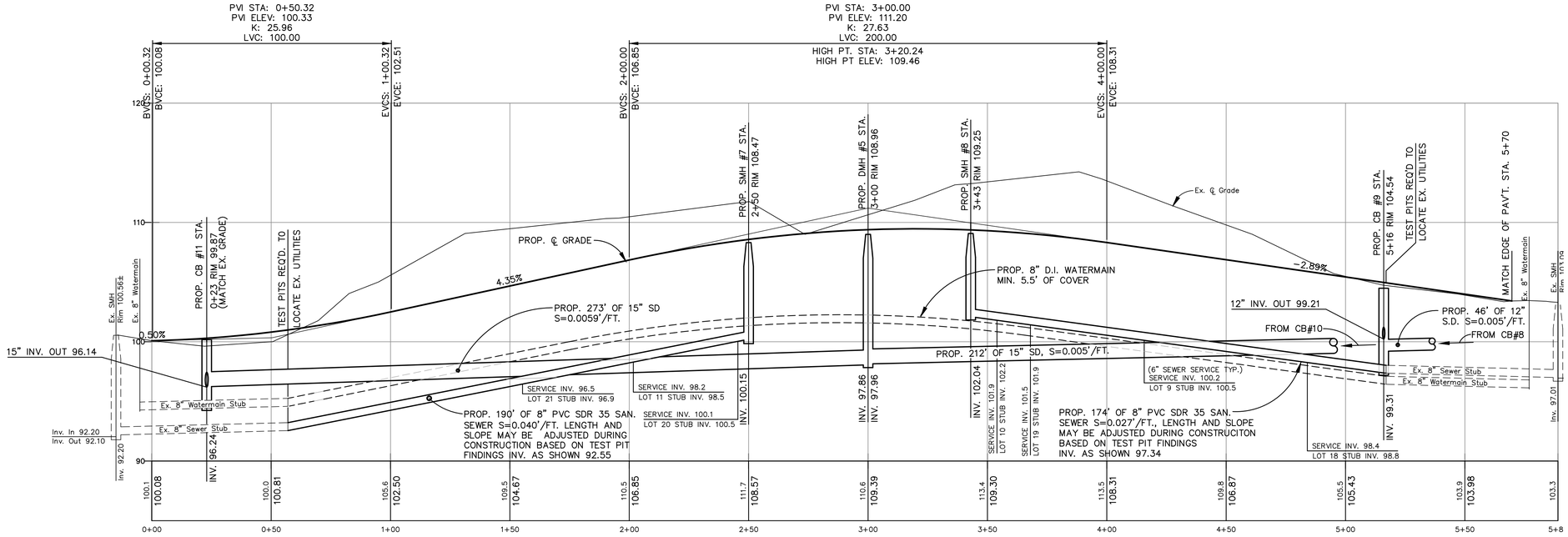
CB#10
- RIM 104.54
- INV. IN 99.12
- INV. OUT 99.02

CB#12
- RIM 99.87 (MATCH EX. GRADE)
- INV. IN 96.00
- INV. OUT 95.90

P4 - 12" S.D., L=18', S=0.005'/FT
P5 - 15" S.D., L=27', S=0.005'/FT
P6 - 15" S.D., L=29', S=0.005'/FT

NOTES:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE PRIOR TO CONSTRUCTION, SEE DETAIL.
2. INSTALL LOWPOINT SEDIMENT CONTROL BARRIERS AT ALL CATCH BASIN LOCATIONS, SEE DETAIL.
3. SAWCUT EXISTING PAVEMENT AT PROJECT ENTRANCE AND UTILITY TRENCHES, AS REQ'D..



PROFILE

SCALE
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 25'

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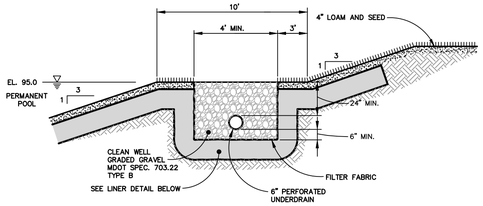
FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

ROADWAY PROFILE
SANDY BROOK LANE
SANDY BROOK
CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
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A. Morrell	13016

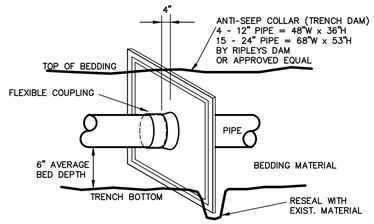
SHEET
6

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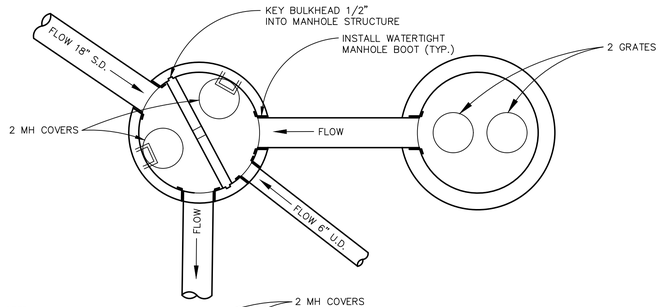
POND BENCH UNDERDRAIN GRAVEL FILTER DETAIL

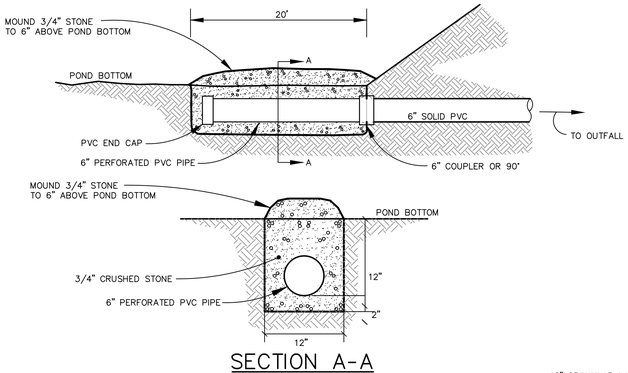
NTS



ANTISEEP COLLAR

NTS

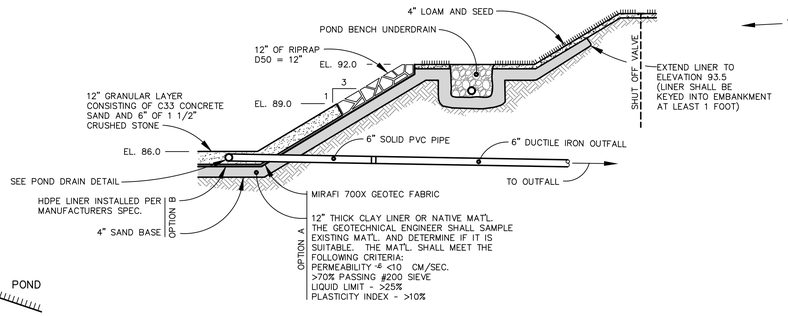




SECTION A-A

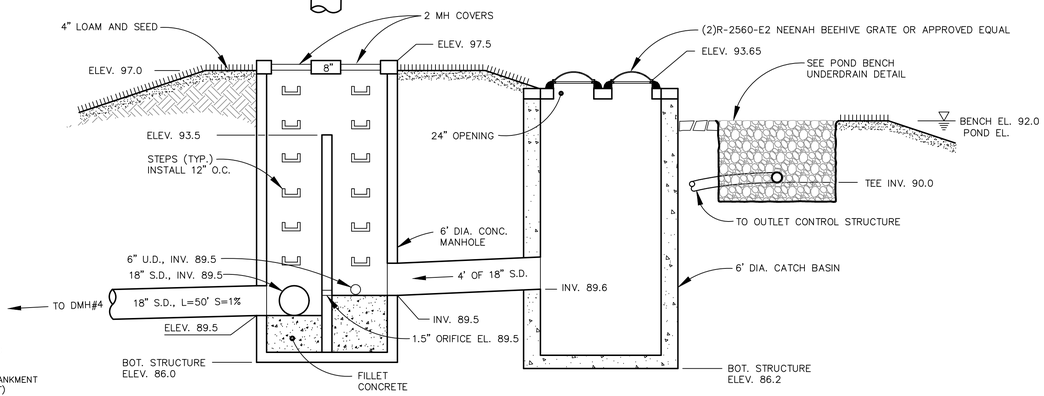
POND DRAIN

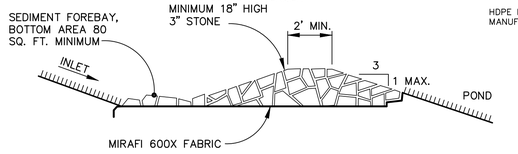
NTS



POND CONSTRUCTION

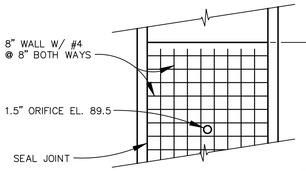
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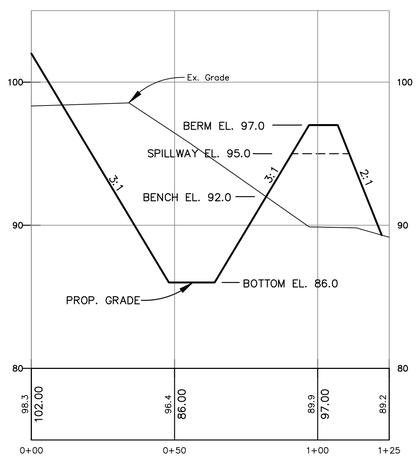
SEDIMENT FOREBAY

NTS



OUTLET CONTROL STRUCTURE

NTS

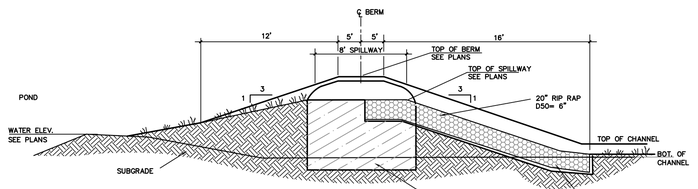


POND 3 SECTION

SCALE:
VERTICAL: 1" = 5'
HORIZONTAL: 1" = 25'

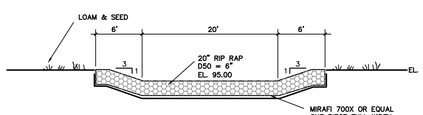
POND ELEVATIONS

PERMANENT POOL ELEVATION - 92.0
2 YEAR STORM ELEVATION - 93.70
10 YEAR STORM ELEVATION - 94.18
25 YEAR STORM ELEVATION - 94.49
50 YEAR STORM ELEVATION - 94.91
BERM ELEVATION - 97.0



SPILLWAY LONGITUDINAL SECTION

N.T.S.



SPILLWAY TRANSVERSE SECTION

N.T.S.

DETENTION / RETENTION POND EMBANKMENT NOTES:

THE FOUNDATION AREA SHALL BE CLEARED OF TREES, LOGS, ROOTS BRUSH, BOULDERS, SOD, RUBBISH & TOPSOIL. THE ENGINEER SHALL OBSERVE & APPROVE THE EMBANKMENT SUBGRADE PRIOR TO PLACING ANY FILL TO DETERMINE SUITABILITY & POSSIBLE NEED FOR A CUTOFF TRENCH.

FILL MATERIAL FOR THE EMBANKMENT SHALL CONSIST OF SILT AND/OR CLAY MATERIAL APPROVED BY THE ENGINEER. THE CONTRACTOR SHOULD NOTE THAT ACCEPTABLE MATERIAL MAY NOT BE FOUND ON-SITE. ALL FILL MATERIAL SHALL BE FREE OF SOD, ROOTS, FROZEN SOIL, STONES GREATER THAN 6" IN DIA. & OTHER OBJECTIONABLE MATERIAL. ALL SNOW, ICE, OR FROZEN FILL SHALL BE REMOVED PRIOR TO ADDING ADDITIONAL FILL. FILLING SHALL COMMENCE IN THE LOWEST POINT OF THE CUTOFF TRENCH AND/OR DAM & CONTINUE IN HORIZONTAL LIFTS NO GREATER THAN 12". 92% MODIFIED PROCTOR DENSITIES SHALL BE OBTAINED IN EACH LIFT PRIOR TO ADDITIONAL LIFTS. THE DISTRIBUTION & GRADATION OF THE FILL SHALL BE SUCH THAT NO LENSES, POCKETS, STREAKS, OR LAYERS OF SUBSTANTIALLY DIFFERENT MATERIALS ARE PLACED IN THE LAYERS IN THE EMBANKMENT. FILL WITHIN 5' OF THE DISCHARGE PIPE & STRUCTURE SHALL BE COMPACTED TO 95% MODIFIED PROCTOR.

RIPRAP SPILLWAY DETAIL

NTS

TEST PIT SUMMARY

POND	TP#	EX. GRADE	EXISTING SHWT DEPTH	EXISTING SHWT ELEV.	DESCRIPTION	FINAL DEPTH OF TP
WET POND 3 SECTION	TP1	88.0 ±	30"+	85.5	WETPOND 3 BOTTOM EL. 86.00	30"

NOTES:

CONSTRUCTION OVERSIGHT

THE APPLICANT WILL RETAIN THE SERVICES OF A PROFESSIONAL ENGINEER TO INSPECT THE CONSTRUCTION AND STABILIZATION OF ALL STORMWATER MANAGEMENT STRUCTURES. IF NECESSARY, THE INSPECTING ENGINEER WILL INTERPRET THE POND'S CONSTRUCTION PLAN FOR THE CONTRACTOR. ONCE ALL STORMWATER MANAGEMENT STRUCTURES ARE CONSTRUCTED AND STABILIZED, THE INSPECTING ENGINEER WILL NOTIFY THE DEPARTMENT IN WRITING WITHIN 30 DAYS TO STATE THAT THE POND HAS BEEN COMPLETED. ACCOMPANYING THE ENGINEER'S NOTIFICATION MUST BE A LOG OF THE ENGINEER'S INSPECTIONS GIVING THE DATE OF EACH INSPECTION, THE TIME OF EACH INSPECTION, AND THE ITEMS INSPECTED ON EACH VISIT, AND INCLUDE ANY TESTING DATA OR SIEVE ANALYSIS DATA OF EVERY MINERAL SOIL AND SOIL MEDIA SPECIFIED IN THE PLANS AND USED ON SITE.

WETPONDS

INSPECTION BY A PROFESSIONAL ENGINEER WILL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT THE INSTALLATION OF EACH POND'S EMBANKMENT CONSTRUCTION, STORMWATER INLET, UNDERDRAINED GRAVEL OUTLET, GRAVEL OUTLET FILTER MATERIAL MAKEUP AND PLACEMENT, OUTLET CONTROL STURCTURE, CLAY LINER, AND EMERGENCY SPILLWAY CONSTRUCTION FROM INITIAL GROUND DISTURBANCE TO FINAL STABILIZATION OF THE POND.
AN INSPECTION OF THE UNDER DRAINED GRAVEL OUTLET SHALL ALSO BE PERFORMED ONE YEAR AFTER THE FINAL STABILIZATION OF THE POND.

BASIC STANDARDS - EROSION CONTROL MEASURES:

MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL INSPECTIONS AND MAINTENANCE.

THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES AS PUBLISHED IN 1991 BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS BEEN CHANGED TO THE " MAINE EROSION AND SEDIMENT CONTROL BMPS" PUBLISHED BY THE MAINE DEP IN 2003. ALL REFRERNCES SHOULD BE CHANGED TO THE NEW MANUAL.
HTTP://WWW.MAINE.GOV/DEP/BLWQ/DOCSTAND/ESCBMPS/INDEX.HTM

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STATE OF MAINE ANDREW S. MORRELL No. 12867 REGISTERED PROFESSIONAL ENGINEER

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FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

POND DETAILS

SANDY BROOK

CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

SHEET
7

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EROSION AND SEDIMENT CONTROL PLAN

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN THE "MAINE EROSION AND SEDIMENT CONTROL BMP'S", DEPARTMENT OF ENVIRONMENTAL PROTECTION LATEST REVISION. FOR ADDITIONAL DETAILS AND SPECIFICATIONS SEE BMP'S MANUAL.

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES ARE SHOWN ON THE SITE PLAN.

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE "MAINE EROSION AND SEDIMENT CONTROL BMP'S", DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST REVISION.
2. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MINIMUM TIME. AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 7 DAYS OF INITIAL DISTURBANCE OF THE SOIL. IF THE DISTURBANCE IS WITHIN 100 FEET OF A STREAM OR POND, THE AREA SHALL BE STABILIZED WITHIN 2 DAYS OR PRIOR TO ANY STORM EVENT (THIS WOULD INCLUDE WETLANDS).
3. SEDIMENT BARRIERS (EROSION CONTROL MIX, STONE CHECK DAMS, STABILIZED CONSTRUCTION ENTRANCE, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.
4. INSTALL EROSION CONTROL MIX AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE E.C. MIX DETAIL FOR PROPER INSTALLATION. EROSION CONTROL MIX WILL REMAIN IN PLACE PER NOTE #5
5. ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY BEFORE AND FOLLOWING ANY SIGNIFICANT RAINFALL (0.5 INCHES) OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSURE. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY TURF. EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS OF PERMANENT STABILIZATION. PERMANENT STABILIZATION IS 90% GRASS CATCH IN VEGETATED AREAS.
6. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2 TO 1).
7. IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST KILLING FROST, USE TEMPORARY MULCHING (DORMANT SEEDING MAY BE ATTEMPTED AS WELL) TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.
8. TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED BY AUG. 15 OR 45 DAYS PRIOR TO THE FIRST KILLING FROST (OCT. 1) TO PROTECT FROM SPRING RUNOFF PROBLEMS.
9. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
10. REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND PREPARED FOR FINAL SEEDING AS FOLLOWS:
    a. FOUR INCHES OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE.
    b. APPLY LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, FERTILIZER MAY BE APPLIED AT THE RATE OF 800 POUNDS PER ACRE OR 18.4 POUNDS PER 1,000 SQUARE FEET USING 10-20-20 (N-P205-K20) OR EQUIVALENT. APPLY GROUND LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE (138 LB PER 1,000 SQ. FT.).
    c. FOLLOWING SEED BED PREPARATION, DITCHES AND BACK SLOPES WILL BE SEEDED TO A MIXTURE OF 47% CREEPING RED FESCUE, 5% REDTOP, AND 48% TALL FESCUE. THE LAWN AREAS WILL BE SEEDED TO A PREMIUM TURF MIXTURE OF 44% KENTUCKY BLUEGRASS, 44% CREEPING RED FESCUE, AND 12% PERENNIAL RYEGRASS; SEEDING RATE IS 1.03 LBS PER 1000 SQ. FT. LAWN QUALITY SOD MAY BE SUBSTITUTED FOR SEED. SEED MIX SHALL CONTAIN 10% ANNUAL RYE GRASS.
    d. HAY MULCH AT THE RATE OF 70–90 LBS PER 1000 SQUARE FEET OR A HYDRO–APPLICATION OF ASPHALT, WOOD OR PAPER FIBER SHALL BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS WILL BE USED ON HAY MULCH FOR WIND CONTROL.
11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS ONCE THE SITE IS STABILIZED WITH 90% GRASS CATCH IN VEGETATED AREAS. TEMPORARY EROSION AND SEDIMENT CONTROL BLANKET SHALL BE USED IN ALL DITCHES AND SWALES AS SHOWN IN DETAILS.
12. WETLANDS WILL BE PROTECTED WITH EROSION CONTROL MIX OR SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.

MULCH AND MULCH ANCHORING

MULCH

LOCATION	MULCH	RATE (1000 S.F.)
PROTECTED AREA	STRAW OR HAY *	100 POUNDS
WINDY AREAS	SHREDDED OR CHOPPED CORNSTALKS	185–275 POUNDS
	STRAW OR HAY (ANCHORED) *	100 POUNDS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES (GREATER THAN OR EQUAL TO 3:1)	JUTE MESH OR EXCELSIOR MAT	AS REQUIRED AS REQUIRED

(GREATER THAN OR EQUAL TO 3:1)

* A HYDRO–APPLICATION OF ASPHALT, WOOD, OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS SHALL BE USED ON HAY MULCH FOR WIND CONTROL.

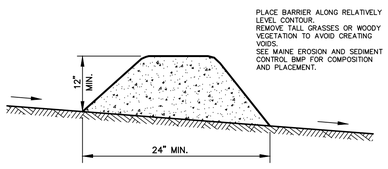
MULCH ANCHORING

ANCHOR MULCH WITH PEG AND TWINE (1 SQ. YD./BLOCK); MULCH NETTING (AS PER MANUFACTURED; ASPHALT EMULSION (0.04 GALLONS PER SQ YD.); LIQUID ASPHALT (0.10 GALLONS PER SQ. YD.); WOOD CELLULOSE FIBER (750 LBS/ACRE); CHEMICAL TACK (AS PER MANUFACTURERS SPECIFICATIONS); USE OF A SERRATED STRAIGHT DISK. WETTING FOR SMALL AREAS AND ROAD DITCHES MAY BE PERMITTED.

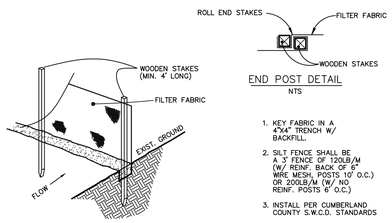
Additional temporary seed mixture (for periods less than 12 months).

Season	Seed	Rate
Summer (5/15 – 8/15)	Sudangrass	40 lbs/acre
	Oats	80 lbs/acre
Late Summer/Early Fall (8/15 – 9/15)	Prennial Ryegrass	40 lbs/acre
Fall (9/15 – 11/1)	Winter Rye	112 lbs/acre
Winter (11/1 – 4/1)	Mulch w/ Dormant Seed	80 lbs/acre*
Spring (4/1 – 7/1)	Oats	80 lbs/acre
	Annual Ryegrass	40 lbs/acre

*Seed Rate Only



EROSION CONTROL MIX BERM
NTS



END POST DETAIL
NTS

1. KEY FABRIC IN A 4"X4" TRENCH W/ BACKFILL.
2. SILT FENCE SHALL BE A 3' FENCE OF 120LB/M (W/ REINF. BACK OF 6" WIRE MESH, POSTS 10' O.C.) OR 200LB/M (W/ NO REINF. POSTS 6' O.C.)
3. INSTALL PER CUMBERLAND COUNTY S.W.C.D. STANDARDS

SILT FENCE DETAIL
N.T.S.

EROSION CONTROL DURING CONSTRUCTION

WINTER CONSTRUCTION

1. WINTER CONSTRUCTION PERIOD: OCTOBER 1 THROUGH APRIL 15
2. WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRES OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
3. EXPOSED AREA SHOULD BE LIMITED TO THAT WHICH CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
4. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO MORE THAN ONE ACRE OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION.
5. OVERWINTER STABILIZATION OF DITCHES AND CHANNELS:
   ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL GRASS LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED BY SEPTEMBER 1. IF A DITCH OR CHANNEL IS NOT GRASS-LINED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.
   A. INSTALL A SOD LINING IN THE DITCH:
      A DITCH MUST BE LINED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES: PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING SOD AT THE BASE OF THE DITCH WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD FROM SLOUGHING DURING FLOW CONDITIONS. SEE THE PERMANENT VEGETATION BMP SECTION.
   B. INSTALL A STONE LINING IN THE DITCH:
      A DITCH MUST BE LINED WITH STONE RIPRAP BY NOVEMBER 15. A REGISTERED PROFESSIONAL ENGINEER MUST BE HIRED TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
6. OVERWINTER STABILIZATION OF DISTURBED SLOPES:
   ALL STONE-COVERED SLOPES MUST BE CONSTRUCTED AND STABILIZED BY NOVEMBER 15. ALL SLOPES TO BE VEGETATED MUST BE SEEDED AND MULCHED BY SEPTEMBER 1. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% TO BE A SLOPE. IF A SLOPE TO BE VEGETATED IS NOT STABILIZED BY SEPTEMBER 1, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
   STABILIZE THE SOIL WITH TEMPORARY VEGATATION AND EROSION CONTROL MATS. BY OCTOBER 1 THE DISTURBED SLOPE MUST BE SEEDED WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED MULCH OVER THE SEEDING. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE SLOPE BY NOVEMBER 1, THEN THE CONTRACTOR WILL COVER THE SLOPE WITH A LAYER OF EROSION CONTROL MIX OR WITH STONE RIPRAP AS DESCRIBED IN THE FOLLOWING STANDARDS.
   A. STABILIZE THE SOIL WITH SOD:
      THE DISTURBED SLOPE MUST BE STABILIZED WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR WILL NOT USE LATE SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
   B. STABILIZE THE SOIL WITH EROSION CONTROL MIX:
      EROSION CONTROL MIX MUST BE PROPERLY INSTALLED BY NOVEMBER 15. THE CONTRACTOR WILL NOT USE EROSION CONTROL MIX TO STABILIZE SLOPES HAVING GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE. SEE THE TEMPORARY MULCHING BMP SECTION.
   C. STABILIZE THE SOIL WITH STONE RIPRAP:
      PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE DEVELOPMENT'S OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP. SEE THE RIPRAP SLOPE STABILIZATION BMP SECTION.
7. OVERWINTER STABILIZATION OF DISTURBED SOILS:
   BY SEPTEMBER 15, ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15% MUST BE SEEDED AND MULCHED. IF THE DISTURBED AREAS ARE NOT STABILIZED BY THIS DATE, THEN ONE OF THE FOLLOWING ACTIONS MUST BE TAKEN TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
   A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION:
      BY OCTOBER 1, SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SOILD BEFORE NOVEMBER 1, THEN MULCH THE AREA FOR OVER-WINTER PROTECTON AS DESCRIBED BELOW.
   B. STABILIZE THE SOIL WITH SOD:
      STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
   C. STABILIZE THE SOIL WITH MULCH:
      BY NOVEMBER 15, MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. IMMEDIATELY AFTER APPLYING THE MULCH, ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.
8. MAINTENANCE:
   MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. AFTER EACH RAINFALL/SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL, IN THE SPRING, INSPECT AND REPAIR ANY DAMAGES AND/OR BARE SPOTS. AN ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 85 TO 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

   STABILIZATION SCHEDULE BEFORE WINTER:

   SEPTEMBER 15 — ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED.
   ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED.
   ALL GRASS LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR AN EROSION CONTROL BLANKET

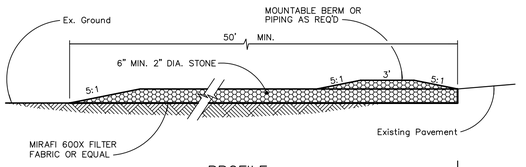
   OCTOBER 1 — IF THE SLOPE IS STABILIZED WITH AN EROSION CONTROL BLANKET AND SEEDED. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND MULCHED.

   NOVEMBER 15 — ALL STONE LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED.
   SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.
9. DURING WINTER CONSTRUCTION PERIOD ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.
10. AREAS WITHIN 100 FEET OF STREAMS THAT ARE NOT STABILIZED WITH VEGETATION BY DEC. 1 SHALL BE MULCHED AND ANCHORED WITH NETTING. IF WORK CONTINUES IN THIS AREA DURING THE WINTER, A DOUBLE LINE OF SEDIMENT BARRIERS MUST BE USED.

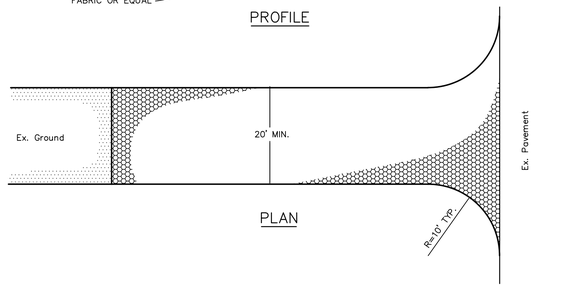
HOUSEKEEPING:

1. SPILL PREVENTION. CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.
2. GROUNDWATER PROTECTION. DURING CONSTRUCTION, LIQUID PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS WITH THE POTENTIAL TO CONTAMINATE GROUNDWATER MAY NOT BE STORED OR HANDLED IN AREAS OF THE SITE DRAINING TO AN INFILTRATION AREA. AN "INFILTRATION AREA" IS ANY AREA OF THE SITE THAT BY DESIGN OR AS A RESULT OF SOILS, TOPOGRAPHY, AND OTHER RELEVANT FACTORS ACCUMULATES RUNOFF THAT INFILTRATES INTO THE SOIL. DIKES, BERMS, SUMPS, AND OTHER FORMS OF SECONDARY CONTAINMENT THAT PREVENT DISCHARGE TO GROUNDWATER MAY BE USED TO ISOLATE PORTIONS OF THE SITE FOR THE PURPOSES OF STORAGE AND HANDLING OF THESE MATERIALS.
3. FUGITIVE SEDIMENT AND DUST. ACTIONS MUST BE TAKEN TO ENSURE THAT ACTIVITIES DO NOT RESULT IN NOTICEABLE EROSION OF SOILS OR FUGITIVE DUST EMISSIONS DURING OR AFTER CONSTRUCTION. OIL MY NOT BE USED FOR DUST CONTROL.
4. DEBRIS AND OTHER MATERIALS. LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.
5. TRENCH OR FOUNDATION DE-WATERING. TRENCH DE-WATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFER DAMS, PONDS, AND OTHER AREAS WITHIN THE CONSTRUCTION AREA THAT RETAIN WATER AFTER EXCAVATION. IN MOST CASES THE COLLECTED WATER IS HEAVILY SILTED AND HINDERS CORRECT SAFE CONSTRUCTION PRACTICES. THE COLLECTED WATER MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND MUST BE SPREAD THROUGH NATURAL WOODED BUFFERS OR REMOVED TO AREAS THAT ARE SPECIFICALLY DESIGNED TO COLLECT THE MAXIMUM AMOUNT OF SEDIMENT POSSIBLE, LIKE A COFFERDAM SEDIMENTATION BASIN AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.
6. NON-STORMWATER DISCHARGES. IDENTIFY AND PREVENT CONTAMINATION BY NON-STORMWATER DISCHARGES.
7. ADDITIONAL REQUIREMENTS. ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

TYPICAL LOAM DETAIL
N.T.S.

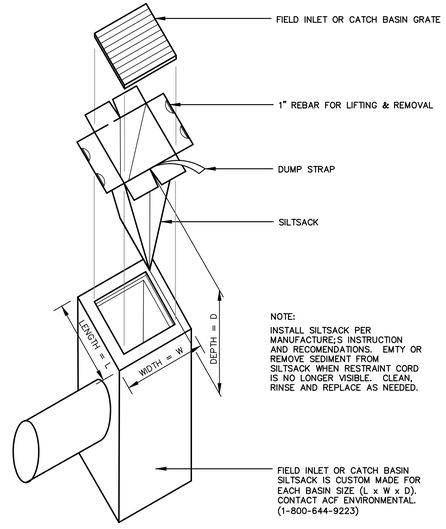


PROFILE



PLAN

STABILIZED CONSTRUCTION ENTRANCE
NTS

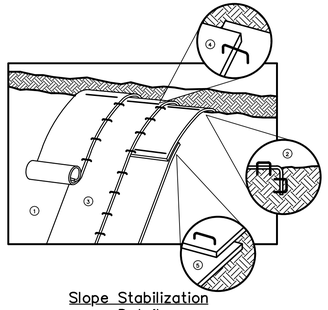


NOTE:
INSTALL SILTSACK PER MANUFACTURE'S INSTRUCTION AND RECOMENDATIONS. EMTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE AND REPLACE AS NEEDED.

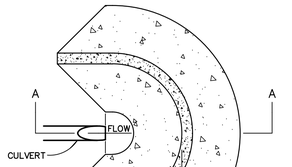
SILTSACK INLET SEDIMENT CONTROL DEVICE
NTS

1. Prepare soil before installing blankets, including lime, fertilizer & seed.
2. Begin at top of slope by anchoring blanket in 6" x 6" trench. Backfill & compact trench after stapling.
3. Roll blankets down or horizontally across slope.
4. The edges of parallel blankets must be stapled with approx. 2" overlap.
5. When blankets must be spliced down the slope, place blankets end over end (shingle style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Slope Stabilization:
Erosion Control Blanket shall be in accordance with M.D.O.T. standard specifications, Section 6.13, Temporary Erosion Control Blankets and Extended Use Erosion Control Blankets.

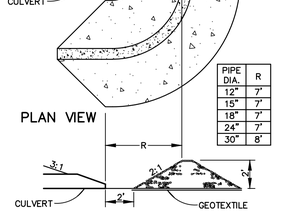


Slope Stabilization Detail
N.T.S.



PIPE DIA.	R
12"	7'
15"	7'
18"	7'
24"	7'
30"	8'

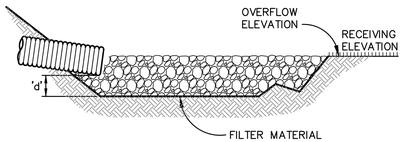
PLAN VIEW



SECTION A–A

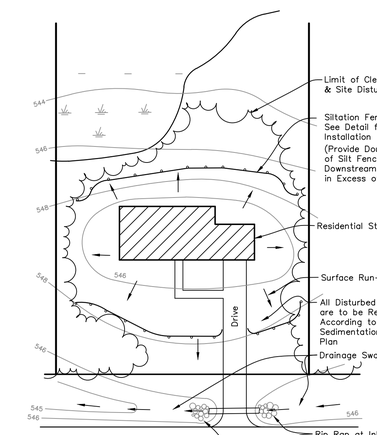
1. USE 2" TO 3" STONE.
2. PLACE STONE OVER GEOTEXTILE.
3. ONCE THE AREAS UPSTREAM FROM THE CHECK DAM ARE STABILIZED BY VEGETATION, THE SEDIMENT TRAPPED BEHIND/WITHIN THE DAM SHALL BE RELOCATED TO AN AREA UNDERGOING FINAL GRADING.
4. THE CHECK DAMS SHALL BE FLATTENED AND GRADED IN A MANNER WHICH PROTECTS THE AREA FROM EROSION AND CHANNEL BLOCKAGE. (GEOTEXTILE MUST BE REMOVED)
5. THE GEOTEXTILE SHALL BE DISPOSED OF OFF-SITE.
6. THE AREA CONTRIBUTING TO THE CHECK DAM SHALL NOT EXCEED 10 ACRES.

TEMPORARY CHECK DAM AT CULVERT INLET
NTS

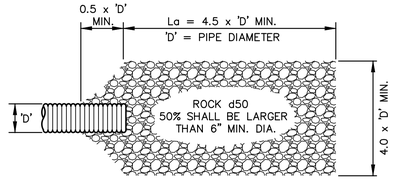


THICKNESS ('d') = 1.5 x MAX. ROCK DIA. - 6" MIN.

SECTION



TYPICAL EROSION CONTROL MEASURES FOR RESIDENTIAL LOTS
NTS

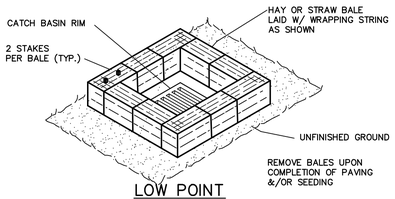


PLAN

NOTES:

1. CONSULT WITH IF&W IF FISH PASSAGE WILL BE INHIBITED DURING LONG FLOWS.
2. REFER TO DESIGN NOTES AND LIMITATIONS IN TEXT NO PIPE OUTLET PROTECTION.
3. IN DEFINED CHANNELS, APRON SHALL EXTEND FULL WIDTH OF BOTTOM AND ONE FOOT ABOVE MAX. TAILWATER OR UP TO BANK FULL, WHICHEVER IS LESS.

PIPE OUTLET PROTECTION
NTS



LOW POINT SEDIMENT CONTROL BARRIER
N.T.S.

REVISION NO.	DATE	DESCRIPTION
1	2/14/16	Submitted Sketch Plan to City
2	2/28/17	Preliminary Submission to the City
3	6/28/17	Revised Per City – Resubmitted 25 Lots – Cluster
4	12/15/17	21 Lot Preliminary Plan Submitted to City – Conventional
5	5/29/18	Revised Per City – resubmitted 21 Lot – Conventional
6	11/30/18	Revised Per City Comments
7	4/30/19	Revised Per City Comments
8	6/4/19	Revised Per City Comments

STATE OF MAINE — ANDREW S. MORRELL — No. 13016 — REGISTERED PROFESSIONAL ENGINEER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

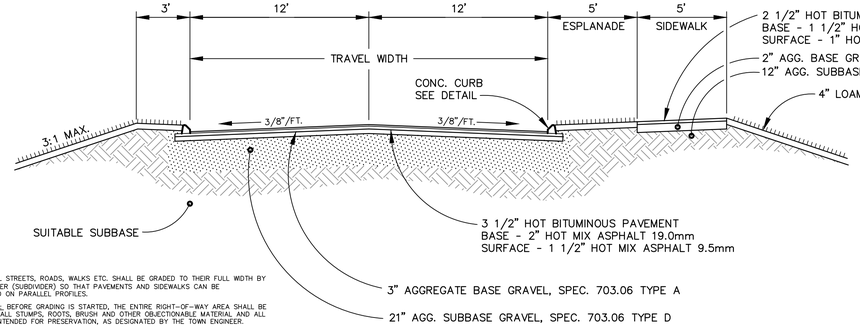
FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

DETAILS A
SANDY BROOK
CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	May 2013
DRAWN	SCALE
W. Pelkey	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

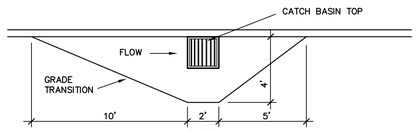
SHEET
8

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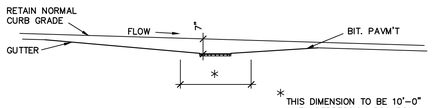


1. GRADING: ALL STREETS, ROADS, WALKS ETC. SHALL BE GRADED TO THEIR FULL WIDTH BY THE DEVELOPER (SUBDIVIDER) SO THAT PAVEMENTS AND SIDEWALKS CAN BE CONSTRUCTED ON PARALLEL PROFILES.
2. PREPARATION: BEFORE GRADING IS STARTED, THE ENTIRE RIGHT-OF-WAY AREA SHALL BE CLEARED OF ALL STUMPS, ROOTS, BRUSH AND OTHER OBJECTIONABLE MATERIAL AND ALL TREES NOT INTENDED FOR PRESERVATION, AS DESIGNATED BY THE TOWN ENGINEER.
3. CUTS: TREE STUMPS AND OTHER ORGANIC MATERIALS SHALL BE REMOVED TO A DEPTH OF 2 FEET BELOW THE SUB GRADE. ROCKS AND BOULDERS, WHEN ENCOUNTERED, SHALL BE REMOVED TO SUB GRADE.
4. FILL: ALL MATERIAL USED IN THE CONSTRUCTION OF EMBANKMENTS SHALL BE OF THE QUALITY TO MEET THE STANDARDS FOR EMBANKMENT CONSTRUCTION, SECTIONS 203.02 THROUGH 203.17 OF THE MAINE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, EXCEPT THAT COMPACTION SHALL NOT BE LESS THAN 95 % OF MAXIMUM DENSITY (PER ASTM D 1557 MOD.). EXCESS MATERIALS INCLUDING ORGANIC MATERIALS, SOFT CLAYS, WET AND NON COMPACTABLE MATERIALS, ETC. SHALL BE REMOVED FROM THE STREET SITE. THE FILL SHALL BE SPREAD IN LAYERS NOT TO EXCEED 8 INCHES LOOSE AND THEN COMPACTED. THE FILLING OF UTILITY TRENCHES AND OTHER PLACES SHALL BE MECHANICALLY TAMPERED.
5. ALL MATERIALS AND CONSTRUCTION REQUIREMENTS SHALL CONFORM TO MDOT STANDARD SPECIFICATIONS, REVISION DEC. 2002
6. THE BASE AND SURFACE PAVEMENT THICKNESS' NOTED IS THE MINIMUM REQUIRED THICKNESS. CORES WILL BE TAKEN TO VERIFY. FAILURE TO MEET THE MINIMUM THICKNESS IS CAUSE FOR NOT ACCEPTING ROADWAYS.

ROADWAY SECTION
NTS



PLAN

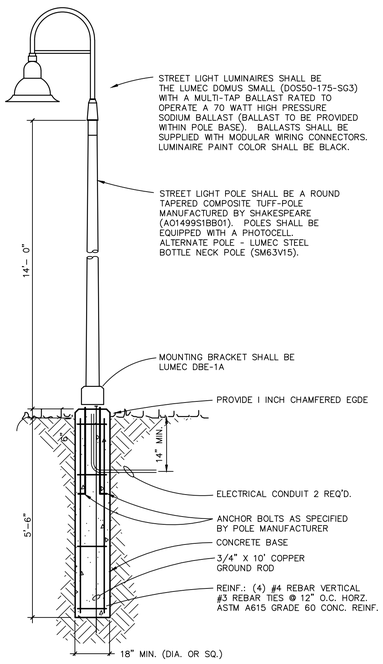


NOTE: THE GRATES SHALL BE DEPRESSED 1" BELOW GUTTER GRADE

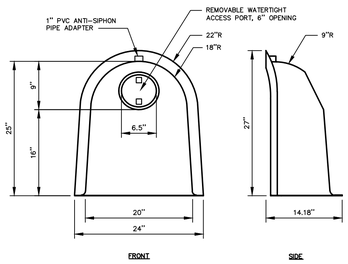
ELEVATION

* THIS DIMENSION TO BE 10'-0" WHEN DEPRESSION OCCURS AT BOTTOM OF SAG

GUTTER GRADE TRANSITION AT CURB @ CATCH BASIN
NTS

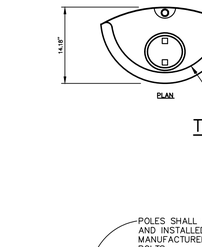


LIGHT POLE DETAIL
N.T.S.

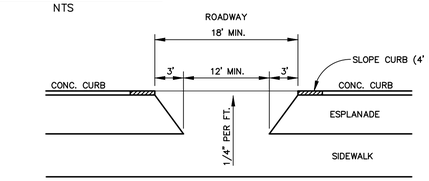


NOTE: THE SNOUT SHALL BE PROVIDED ON DRAIN MANHOLE #1

THE SNOUT
NTS



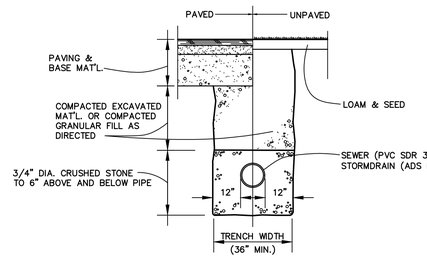
BOLT LAYOUT & MATERIALS



ALL DRIVEWAY ENTRANCES SHALL BE LOCATED AND CONSTRUCTED AS PART OF THE ROAD CONSTRUCTION

DRIVEWAY APRONS
NTS

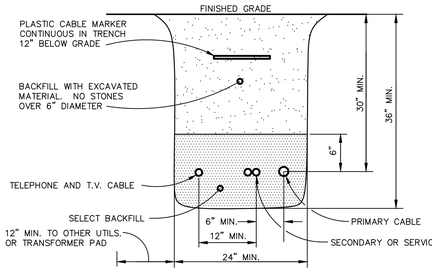
NOTES:
1. Trench width shown is payment width for rockexcavation & replacement of unsuitable material.
2. Do not mechanically compact directly over flexible pipe (e.g. PVC, Poltyethylene)
3. Concrete pipe shall have sand bedding.



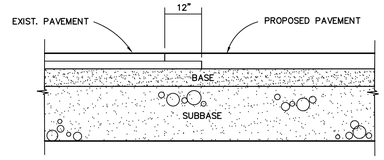
TRENCH DETAIL
NTS

NOTE:
CONDUITS FOR POWER AND COMMUNICATION CABLES SHALL BE SPECIFIED BY APPROPRIATE UTILITY COMPANIES

SEE PLAN FOR SURFACE FINISH

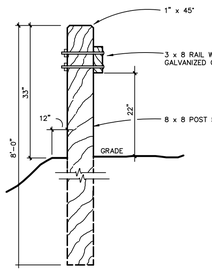


UNDERGROUND CABLE TRENCH
NTS

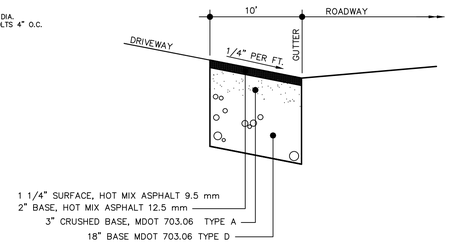


SAWCUT EXIST. PAVEMENT ALONG A SMOOTH LINE TO A NEAT EVEN VERTICAL JOINT, GRIND EXISTING SURFACE COURSE TO RESULT IN 12" OVERLAP OF PROPOSED PAV'T. APPLY TACK PRIOR TO PROPOSED PAVING (AS REQ'D)

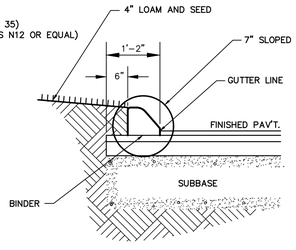
PAVEMENT JOINT DETAIL
N.T.S.

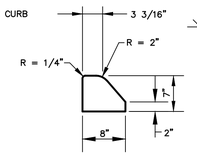


TYPICAL GUARD RAIL
N.T.S.



DRIVEWAY APRON SECTION
NTS





DETAIL "A"
NTS

1 LB. FIBER MESH SHALL BE ADDED TO EVERY CUBIC YARD OF CONCRETE. THE CONCRETE WILL CONTAIN THE MAXIMUM AMOUNT OF WATER TO BE OF A CONSISTENCY THAT THE CONCRETE WILL MAINTAIN THE SHAPE OF THE CURB SECTION WITHOUT SUPPORT. THIS MIX ALSO MEETS THE READY MIX REQUIREMENTS OF ASTM C94 AND WILL MEET OR EXCEED 4,000 PSI IN 28 DAYS.

THE PAVEMENT SHALL BE THOROUGHLY CLEANED TO REMOVE DUST, DIRT AND OIL BEFORE APPROVED ADHESIVE IS APPLIED PER MANUFACTURERS SPECIFICATIONS.

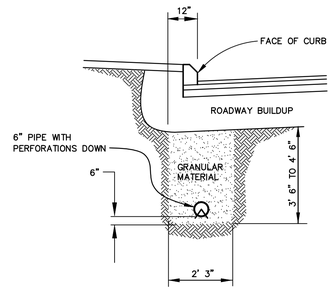
THE FIBER REINFORCED MIX SHALL BE FED INTO THE VIBRATING HOPPER WHERE IT IS COMPACTED INTO THE DESIRED MOLD PROFILE.

FRESHLY EXTRUDED CURB SHALL BE LIGHTLY TOUCHED UP WITH A STEEL HAND TROWEL. CONTROL JOINTS SHALL BE TOOLED AS SOON AS POSSIBLE AT 9' INTERVALS. ADDITIONAL CONTROL JOINTS ADDED ON RADIUS AS NECESSARY.

THE FINISHED CURB WILL BE COATED WITH AN APPROVED CURING COMPOUND.

FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS AND TEMPERATURE RESTRICTIONS.

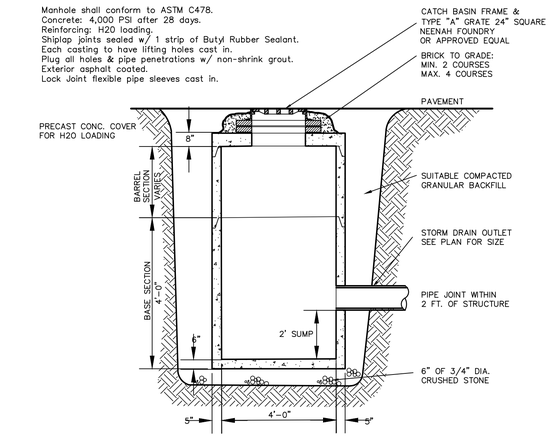
EXTRUDED CONCRETE CURB
NTS



BACKFILL MAT'L. SHALL BE MDOT SPEC.703.22 TYPE C

TYPE "B" UNDERDRAIN
NTS

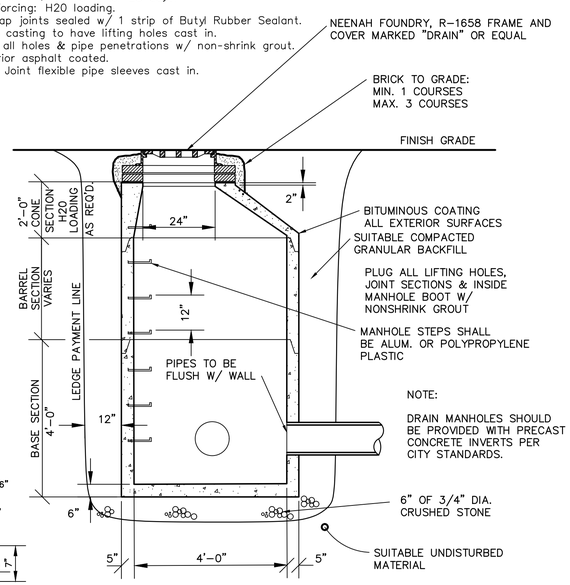
Manhole shall conform to ASTM C478.
Concrete: 4,000 PSI after 28 days.
Reinforcing: H20 loading.
Shiplap joints sealed w/ 1 strip of Butyl Rubber Sealant.
Each casting to have lifting holes cast in.
Plug all holes & pipe penetrations w/ non-shrink grout.
Exterior asphalt coated.
Lock Joint flexible pipe sleeves cast in.



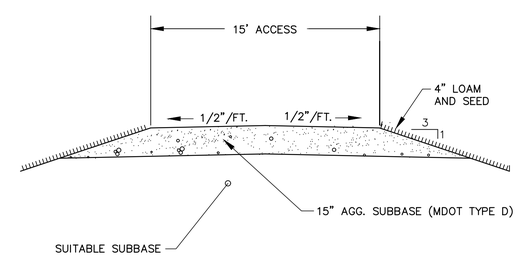
PRECAST CONCRETE CATCH BASIN DETAIL
N.T.S.

NOTES:
1. GRATE SHALL BE BICYCLE SAFE DESIGN PER CITY STANDARDS.
2. CONTRACTOR SHALL PROVIDE CATALOGUE CUT PRIOR TO CONSTRUCTION TO VERIFY ACCEPTABILITY WITH DPW

Manhole shall conform to ASTM C478.
Concrete: 4,000 PSI after 28 days.
Reinforcing: H20 loading.
Shiplap joints sealed w/ 1 strip of Butyl Rubber Sealant.
Each casting to have lifting holes cast in.
Plug all holes & pipe penetrations w/ non-shrink grout.
Exterior asphalt coated.
Lock Joint flexible pipe sleeves cast in.



PRECAST CONCRETE DRAIN MANHOLE
N.T.S.



POND ACCESS ROAD
N.T.S.

NO.	DATE	REVISION DESCRIPTION
1	2/14/16	Submitted Sketch Plan to City
2	2/28/17	Preliminary Submission to the City
3	6/28/17	Revised Per City - resubmitted 25 Lots - Cluster
4	12/15/17	21 Lot Preliminary Plan Submitted to City - Conventional
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6	11/30/18	Revised Per City Comments
7	4/30/19	Revised Per City Comments
8	6/4/19	Revised Per City Comments

STATE OF MAINE ANDREW S. MORRELL No. 13016 REGISTERED PROFESSIONAL ENGINEER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

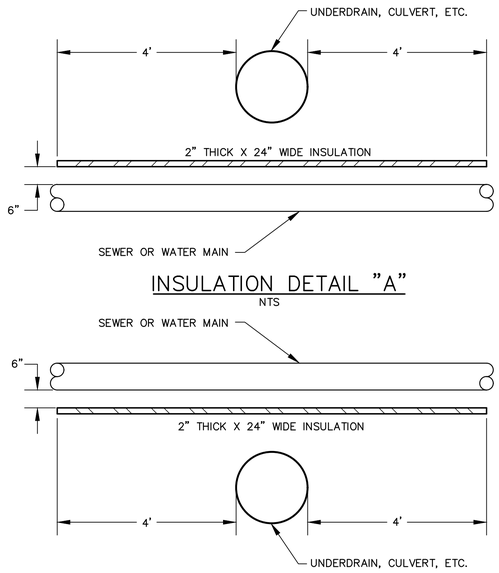
FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

DETAILS B
SANDY BROOK
CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

SHEET
9

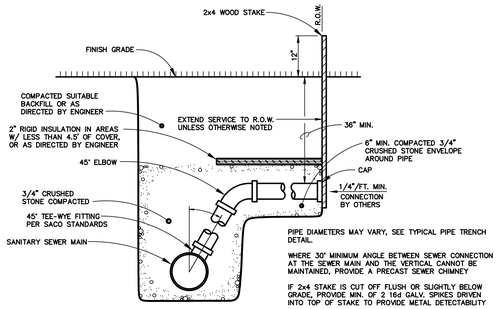
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INSULATION DETAIL "A"
NTS

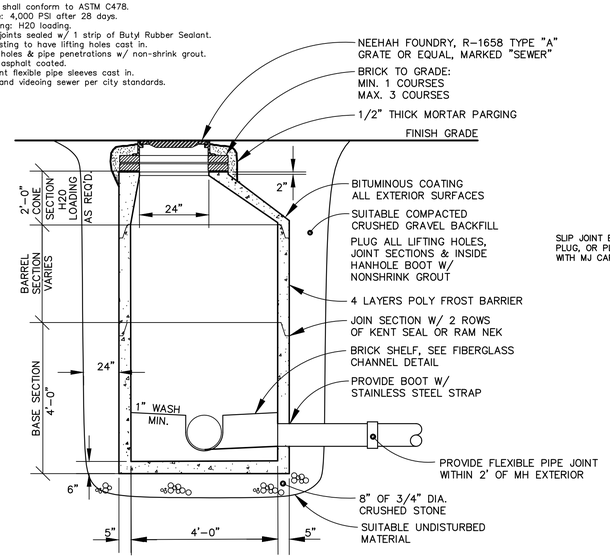
NOTE: 2" RIGID INSLUATION SHALL BE "HI 60" EXTRUDED POLYSTYRENE BY DOW CO. OR APPROVED EQUAL. CONTRACTOR SHALL INSULATE PER DETAIL WHEN PROPOSED SEWER COMES WITHIN 24" OF EXISTING CULVERT

INSULATION DETAIL "B"
NTS



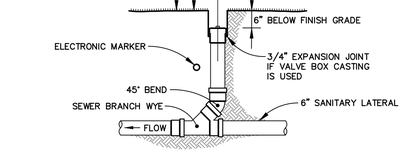
HORIZONTAL SEWER CONNECTION
NTS

Manhole shall conform to ASTM C478.
Concrete: 4,000 PSI after 28 days.
Reinforcing: H20 loading.
Shiplap joints sealed w/ 1 strip of Butyl Rubber Sealant.
Each casting to have lifting holes cast in.
Plug all holes & pipe penetrations w/ non-shrink grout.
Exterior asphalt coated.
Lock Joint flexible pipe sleeves cast in.
Testing and videoing sewer per city standards.



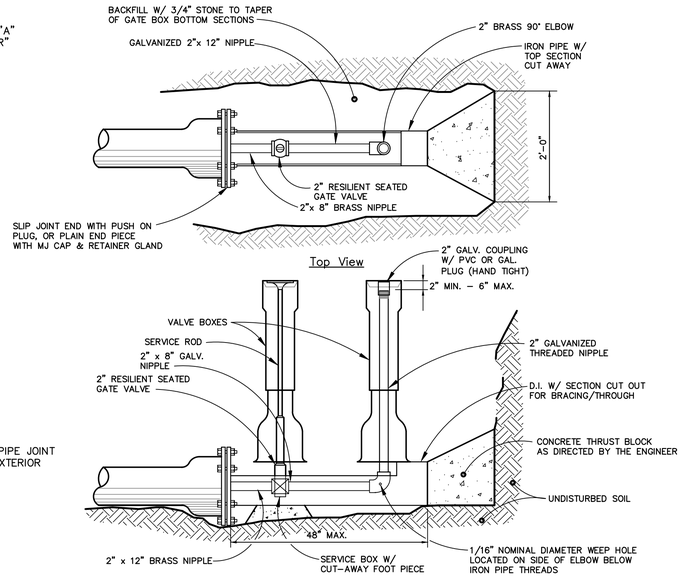
PRECAST CONCRETE SANITARY SEWER MANHOLE
N.T.S.

NOTE:
1. CONTRACTOR SHALL PROVIDE CATALOGUE CUT PRIOR TO CONSTRUCTION TO VERIFY ACCEPTABILITY WITH DPW

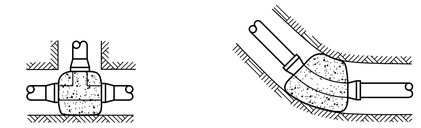


NOTE:
1. IN LAWN AREAS, THE TOP OF THE CLEAN OUT NEEDS TO HAVE A METALIC MARKER ATTACHED FOR LOCATING BY METAL DETECTOR. IN PAVED AREAS, A VALVE BOX CASTING NEEDS TO ME SET OVER THE CLEAN OUT.

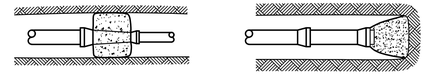
SEWER CLEANOUT DETAIL
N.T.S.



STANDARD 2" BLOW OFF
N.T.S.



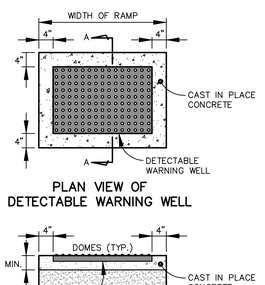
PIPE SIZE (IN)	BEARING SURFACE, SQ. FT. TEE 90	45	22 1/2	11 1/4
2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0
4	1.2	1.0	1.0	1.0
6	2.6	1.4	1.0	1.0
8	4.6	2.5	1.4	1.0
10	7.2	3.9	2.0	1.0
12	10.4	5.6	2.8	1.5
14	14.2	7.7	3.9	2.0
16	18.5	10.0	5.0	2.5
18	23.4	12.7	6.4	3.3



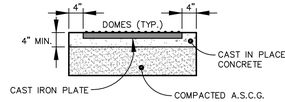
ANCHOR ALL 1/16, 1/8 & 1/4 BENDS
ANCHOR ALL TEES W/ BRANCH LARGER THAN 6"
PLACE CONCRETE AGAINST UNDISTURBED EARTH OR CONPACTED FILL

ANCHORAGE DETAILS
NTS

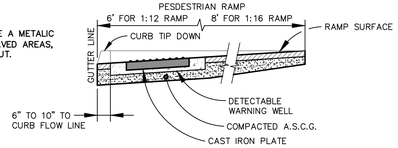
NOTE:
SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE CLAMPS) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTERACT THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSON AND/OR CONTRACTION (SEE DETAILS).



PLAN VIEW OF DETECTABLE WARNING WELL



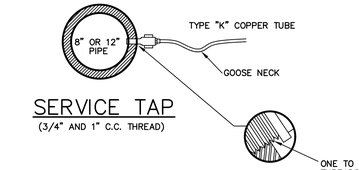
SECTION A-A



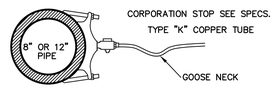
SIDE SECTION OF DETECTABLE WARNING, WELL, CURB AND GUTTER

NOTE: ALL DETECTABLE WARNING AREAS SHALL START 6-10" FROM THE FLOW LINE OF THE CURB, BE 24" IN DEPTH AND COVER THE COMPLETE WIDTH OF THE RAMP AREA ONLY.

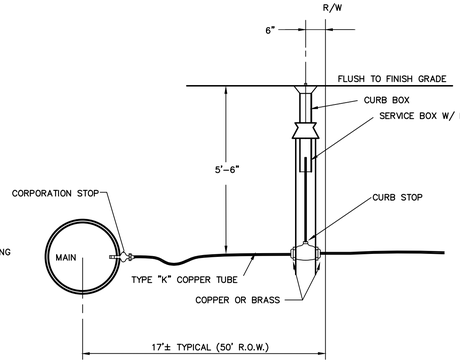
DETECTABLE WARNING MAT EMBEDDING
NTS



SERVICE TAP
(3/4" AND 1" C.C. THREAD)

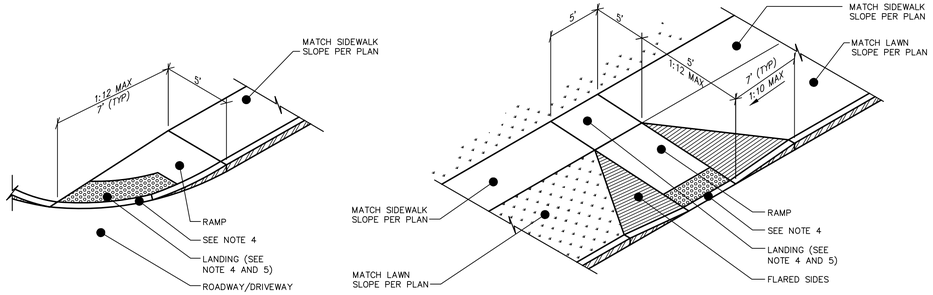


SERVICE SADDLE
(1-1/2" & 2" C.C. OR IRON PIPE THREAD)

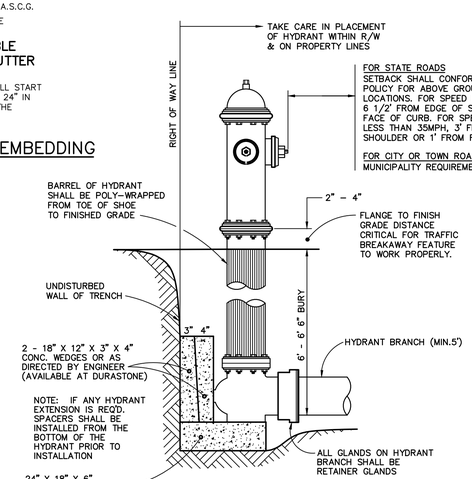


TYPICAL SERVICE CONNECTION
N.T.S.

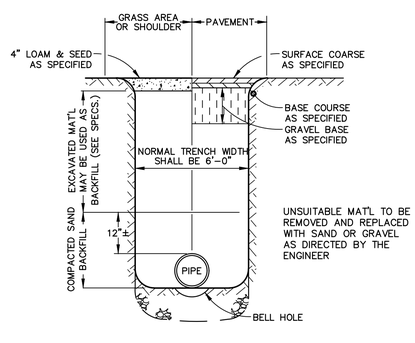
NOTES:
1. CURB RAMP LENGTHS ARE BASED ON SIX (6) INCH CURB REVEAL HEIGHT AND NO RUNNING SLOPE. RAMP LENGTHS SHALL BE ADJUSTED AS NECESSARY TO ACCOMMODATE VARYING CURB REVEAL HEIGHTS AND TO MATCH RUNNING SLOPES OF ADJACENT ROADWAY AND SIDEWALK SLOPES TO MAINTAIN A RAMP THAT DOES NOT EXCEED THE MAXIMUM RAMP SLOPE OF 1:12.
2. DETECTABLE WARNINGS SHALL CONSIST OF RAISED TRUNCATED DOMES AND SHALL HAVE A BASE DIAMETER OF 0.9 INCHES (23 mm) MINIMUM AND 1.4 INCHES (36 mm) MAXIMUM; A TOP DIAMETER OF 50 PERCENT OF THE BASE DIAMETER MINIMUM TO 65 PERCENT OF THE BASE DIAMETER MAXIMUM AND A HEIGHT OF 0.2 INCHES (5.1 mm), A CENTER-TO-CENTER SPACING OF 1.6 INCHES (41mm) MINIMUM AND 2.4 INCHES (61mm) MAXIMUM; AND A BASE-TO-BASE SPACING OF 0.65 INCHES (17mm) MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.
3. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACES SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND-ON-CANE CONTACT.
4. ALL ACCESSIBLE ROUTE SIDEWALKS INTERSECTING ROADWAYS OR OTHER VEHICULAR CROSSINGS REQUIRE DETECTABLE WARNINGS. DETECTABLE WARNING ZONES SHALL BE INSTALLED SIX (6) INCHES (OR THE HORIZONTAL THICKNESS OF THE ADJACENT CURB) FROM THE FLOW LINE OF THE CURB, EXTEND INTO THE SIDEWALK FOR A 24" DEPTH, AND COVER THE COMPLETE WIDTH OF THE SIDEWALK OR RAMP AREA. DETECTABLE WARNING ZONES SHALL CONFORM TO THE SLOPE REQUIREMENTS OF THE RAMP, LANDING, OR ACCESSIBLE ROUTE AS DEFINED IN THE SPECIFIED DETAIL. DETECTABLE WARNINGS SHALL NOT BE INSTALLED IN FLARED SIDES, IF THE RAMP INCLUDES FLARED SIDES.
5. ALL LANDING AREAS SHALL BE 4 FEET WIDE BY 4 FEET LONG (MINIMUM DIMENSIONS). THE SLOPE OF THE LANDING AREA SHALL NOT EXCEED A 1:48 IN ANY DIRECTION.
6. ALL ACCESSIBLE ROUTE SLOPES ADJOINING THE LANDING AREA, EXCLUDING THE CURB RAMP, SHALL NOT EXCEED A SLOPE OF 1:20 UNLESS OTHERWSE NOTED.
7. TACTILE WARNING SURFACE SHALL BE INSTALLED AT ALL ADA RAMPS EXCLUDING DRIVEWAYS. TACTILE SURFACE SHALL BE PURCHASED FROM SACO DPW.



HANDICAP RAMP
N.T.S.



TYPICAL HYDRANT INSTALLATION DETAIL
NTS



WATER THROUGH EARTH TRENCH
N.T.S.

NO.	DATE	REVISION DESCRIPTION
1	2/14/16	Submitted Sketch Plan to City
2	2/28/17	Preliminary Submission to the City
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BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

STATE OF MAINE — ANDREW S. MORRELL — No. 13016 — REGISTERED PROFESSIONAL ENGINEER

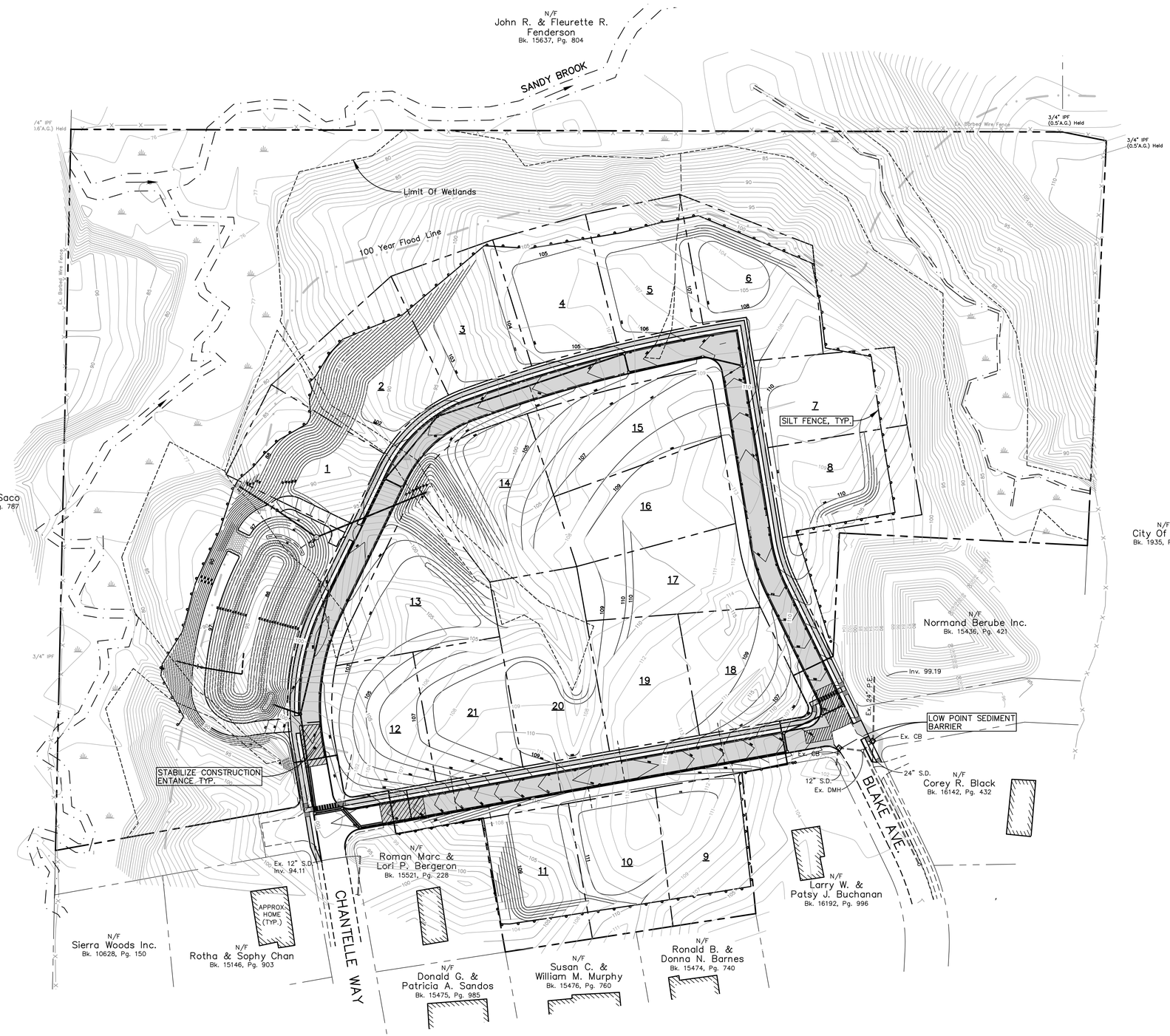
FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

DETAILS C
SANDY BROOK
CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
W. Pelkey	Feb. 2016
DRAWN	SCALE
Dept.	As Noted
CHECKED	JOB. NO.
A. Morrell	13016

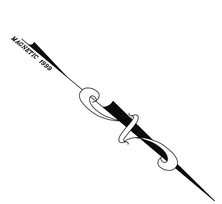
SHEET
10

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Scale: 1" = 60'

30' 0 30' 60' 120'



LOCATION MAP

SCALE: 1" = 1 MILE

FOUNDATION DRAIN SUMMARY

LOT#	FFE	BASEMENT ELEV.	FD OUTLET/ CONNECTION ELEV.
1	103.0	95.0	88+/-
2	104.0	96.0	84+/-
3	105.0	97.0	93+/-
4	107.0	99.0	96+/-
5	108.0	100.0	93+/-
6	110.0	102.0	93+/-
7	112.0	104.0	100+/-
8	112.0	104.0	100+/-
9	113.0	105.0	99+/-
10	113.0	105.0	98+/-
11	111.0	103.0	97+/-
12	108.0	100.0	96+/-
13	105.0	97.0	95+/-
14	106.0	98.0	95+/-
15	109.0	101.0	98+/-
16	111.0	103.0	100+/-
17	112.0	104.0	103+/-
18	111.0	103.0	99+/-
19	112.0	104.0	98+/-
20	111.0	103.0	98+/-
21	110.0	102.0	97+/-

NOTES:

1. SURVEYOR: ROBERT LIBBY JR., PLS#2190
   BH2M
   28 STATE STREET
   GORHAM, MAINE
2. HIGH INTENSITY SOILS: MARK HAMPTON ASSOCIATES
   PORTLAND, MAINE
3. WETLAND DELINEATION: MARK HAMPTON ASSOCIATES
4. BENCHMARK: SAME BENCHMARK USED FOR SIERRA WOODS SUBDIVISION. INFORMATION PROVIDED BY CITY FROM PLAN BY COFFIN & RICHARDSON DATED JULY 1977 (PROJECT # 1236)
5. FOUNDATION DRAINS: LOTS 1-8 - GRAVITY DRAIN TO DAYLIGHT (BACK OF LOTS)
   LOTS 9-12,15 - GRAVITY TO STORMDRAIN AT STREET
   LOTS 13-14, 16-17 - GRAVITY TO DAYLIGHT ALONG WETLAND
   LOTS 18-21 - GRAVITY TO STORMDRAIN AT STREET

REVISION

NO.	DATE	DESCRIPTION
1	2/14/16	Submitted Sketch Plan to City
2	2/28/17	Preliminary Submission to the City
3	6/28/17	Revised Per City – Resubmitted 25 Lots – Cluster
4	12/15/17	21 Lot Preliminary Plan Submitted to City – Conventional
5	5/29/18	Revised Per City – resubmitted 21 Lot – Conventional
6	11/30/18	Revised Per City Comments
7	4/30/19	Revised Per City Comments
8	6/4/19	Revised Per City Comments

STATE OF MAINE
ANDREW S. MORRELL
No. 12861
REGISTERED PROFESSIONAL ENGINEER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

FOR
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

EROSION CONTROL PLAN

SANDY BROOK

CHANTELLE WAY & BLAKE AVE.
SACO, MAINE

DESIGNED	DATE
A. Morrell	Feb. 2016
DRAWN	SCALE
Dept.	1"=60'
CHECKED	JOB. NO.
A. Morrell	13016

SHEET
11

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CITY OF SACO, MAINE

Saco Public Works Department
300 Main Street
Saco, Maine 04072

Joseph A. Laverriere, P.E. – City Engineer
Telephone: (207) 284-6641
Email: jlaverriere@sacomaine.org

MEMORANDUM

TO: Emily Cole-Prescott, Planner **Planning Account No.: 300152**

DATE: June 11, 2019

RE: Sandy Brook Subdivision – Revised Preliminary Plan
Tax Map 88, Lot 12

The Department of Public Works (DPW) has reviewed the revised preliminary subdivision plan application materials for the above referenced project prepared by BH2M, dated June 5, 2019.

In response to previous comments, the applicant has agreed to comply with the following to items prior to receiving final subdivision approval:

1. Provide conversion information for project bench mark stated in Note 14 on Sheet 1 to NAVD 1988.
2. Provide coordinates (**Maine State Coordinate System**) on at least four corners of the parcel for geo-referencing purposes.
3. Any public stormwater management system, not within the public right-of-way, shall be located on a separate parcel of land deeded to the City. If the City determines a willingness to accept the open space area, then the current configuration is acceptable. If the City is not willing to accept the open space area, then the current limits of the drainage easement around the pond will need to be an actual lot to be conveyed to the City at the time of acceptance.
4. The final design of the water distribution system shall be reviewed and approved by the Maine Water Company prior to Final Subdivision Approval. Specifically, the required horizontal and vertical clearance between the water system and other utilities is particularly important.

The following comments have been prepared based upon our review:

1. The final surface pavement along Chantelle Way should extend through the new intersection with Sandy Brook Lane to match the limits of the previous surface pavement work performed by the City. A butt joint should be ground at the match point, which is approximately Sta -1-00 (100' before Sta 0+00 as shown on Sheet 3 of the plan set).
2. The final surface pavement along Blake Avenue should extend through the new intersection with Sandy Brook Lane. A butt joint should be ground at Sta 4+85 as shown on Sheet 5 of the plan set.
3. The Snout detail dimensions are only applicable for 15" outlet pipes. In addition, the Snout cannot be installed in a drain manhole as indicated on the plans, as there is no sump. In order to keep the Snout sizes reasonable, recommend Snouts be installed in catch basins 4, 5 and 13.

As part of any subsequent subdivision approval, we recommend the following conditions be included:

1. The applicant shall be required to reimburse the City's construction cost associated with the recent improvements along Chantelle Way in the amount of $57,920.50.
2. As part of the building permit process, the applicant shall submit a plot plan for each lot that shall include the location and footprint for the house, location of driveway and proposed grading. Any site constraints (i.e. wetlands, buffers, easements, etc.) shall be shown on the plot plan. DPW shall approve all driveway locations as part of the building permit process.

3. Prior to the start of construction, the applicant shall be required to execute Form 1 contained in Section 805 of the zoning ordinance and provide a recorded copy to the City.
4. Until such time that the stormwater facilities are offered and accepted by the City, the applicant shall be required to perform routine inspection and maintenance of the stormwater facilities as outlined in the operations and maintenance manual development specifically for the site. A copy of the annual inspection and maintenance report including inspection log(s) shall be submitted annually (by July 15th of each year) to the City Public Works Department.
5. Prior to the start of construction, the stream buffer areas shall be marked in the field and copies of the recorded buffer deed restrictions shall be provided to the Planning Department.
6. The design engineer should be required to inspect the construction and stabilization of the stormwater management pond to be built on the site. Inspections shall consist of weekly visits to the site to inspect the construction (from initial ground disturbance to final stabilization of the pond) of the pond's embankment, stormwater inlet, underdrained gravel outlet, gravel outlet filter material makeup and placement, outlet control structure, clay liner and cover material, and emergency spillway. If necessary, the inspecting engineer shall interpret the pond's construction plan for the contractor. Once the pond is constructed and stabilized, the inspecting engineer will notify the City within 14 days to state the pond has been completed. Accompanying the engineer's notification shall be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of the gravel filter media. An inspection of the underdrained gravel outlet shall also be performed by a professional engineer one year after the final stabilization of the pond. The engineer shall notify the City as to the outlet's effectiveness and determine any maintenance items that are needed.
7. As part of the project's as-built certification for roadway and utility infrastructure, the applicant shall provide a Stormwater Basin As-Built Certification. Prior to the issuance of a Certificate of Occupancy for any lot, the Applicant shall submit evidence in the form of a letter with as-built survey plan prepared and stamped by a Professional Engineer who either prepared the Post-Construction Stormwater Management Plan and its associated Facilities or supervised the Plan and Facilities construction and implementation. The letter or plan shall certify that the Stormwater Management Facilities have been installed in accordance with the approved Post-Construction Stormwater Management Plan and that they will function as intended by said Plan. The as-built survey plan shall be performed for all post-construction stormwater facilities to document general conformance with the approved plan.
8. Prior to the start of construction, the applicant shall submit a copy of the CMP electrical plan for the development and the applicant shall confer with the DPW for the location of an electrical service and meter set to serve the street light system

We look forward to discussing this project further and would be happy to clarify any of our comments made within this review memo.

CITY OF SACO, MAINE

Saco Public Works Department
300 Main Street
Saco, Maine 04072

Joseph A. Laverriere, P.E. – City Engineer
Telephone: (207) 284-6641
Email: jlaverriere@sacomaine.org

MEMORANDUM

TO: Emily Cole-Prescott, Planner **Planning Account No.: 300152**

DATE: May 28, 2019

RE: Sandy Brook Subdivision – Revised Preliminary Plan
Tax Map 88, Lot 12

The Department of Public Works (DPW) has reviewed the revised preliminary subdivision plan application materials for the above referenced project prepared by BH2M, dated April 30, 2018. The following comments have been prepared based upon our review:

1. As commented previously, provide conversion information for project bench mark stated in Note 14 on Sheet 1 to NAVD 1988. This information should be provided prior to final approval.
2. As commented previously, in accordance with Section 5.2.2 of the Subdivision Regulations, the Subdivision Plan needs to contain coordinates (**Maine State Coordinate System**) on at least four corners of the parcel for geo-referencing purposes. This information should be provided prior to final approval.
3. As commented previously, any public stormwater management system, not within the public right-of-way, shall be located on a separate parcel of land deeded to the City. If the City determines a willingness to accept the open space area, then the current configuration is acceptable. If the City is not willing to accept the open space area, then the current limits of the drainage easement around the pond will need to be an actual lot to be conveyed to the City at the time of acceptance.
4. As commented previously, the intersection of Sandy Brook Lane at Chantelle Way needs revisions to locate catch basins at the low point and to comply with maximum grades at intersections. It is still unclear how the grading and drainage will work at the intersection of Sandy Brook Lane and Chantelle Way. In addition, the existing slip form concrete curb tip downs on Chantelle Way need to be removed and the slip form curb extended from this point into the new development.
5. On Blake Avenue, the sidewalk should be extended beyond what is shown on the plans to connect with the existing sidewalk on opposite side of the driveway at 27 Blake Avenue with a uniform 5′ wide esplanade. A twenty (20) foot wide paved apron should be provided opposite Sandy Brook Lane to access the existing storm water pond. The existing drain manhole in the intersection should be converted to a catch basin and the top rotated as necessary to locate the grate on the new curbline. The existing catch basin approximately 20′ from centerline (downstream of existing manhole) should be converted to a drain manhole. The short piece of existing radial curb should be removed along with all pavement behind curbline.
6. The sewer service clean out detail needs to be revised, such that the top of the clean out is set 6″ below finish grade. In lawn areas, the top of the clean out needs to have a metallic marker attached to the top of the clean out for locating by a metal detector in the future, but may be loamed over. In paved areas, a valve box casting needs to be set over the clean out.
7. Note 38 on Sheet 1 does not address the comment regarding available water pressure and Saco Fire Department confirmation for adequate fire protection and\or whether any additional measures should be considered in the design and construction of the development. The applicant should consult directly with

Maine Water Company and the Saco Fire Department on these issues as part of the subdivision design process.

8. As commented previously, the final design of the water distribution system shall be reviewed and approved by the Maine Water Company prior to Final Subdivision Approval. Specifically, the required horizontal and vertical clearance between the water system and other utilities is particularly important.
9. The previous plan set included a detail for "Snouts", but locations for the installation were no identified. Snouts or other form for capturing floatable materials within the stormdrain system need to be incorporated into the design.
10. A drainage easement should be provided at the corner of lot 12 that extends 15′ from the centerline of the pipe.
11. The 10′ utility easement on the inside loop of the streets as shown on the plans should be identified as being for CMP.
12. The details for the pond drain line are still confusing and not shown clearly on the plan view. The 20′ length of perforated pond drain should be within the bottom of the pond. Perhaps a 90˚ bend is required at the transition point from solid to perforated to then locate the perforated section along the long axis of the pond bottom.
13. Sewer manhole castings shall provide for a 24" diameter clear opening. Provide catalogue cut prior to construction to verify acceptability with DPW.
14. As commented previously, many of the dimensions shown on the handicap ramp detail on Sheet 10 of the plan set do not coincide with the proposed sidewalk and esplanade widths for this project. This detail should be revised accordingly.
15. The locations of the tactile warning surfaces need to be specifically identified on the roadway plans. Tactile warning surfaces are only to be provided on sidewalk ramps that cross public right-of-ways with painted crosswalks and not at other locations (i.e. driveways, etc.).
16. For consistency, the City has a standardized tactile warning surface that is installed for all sidewalk ADA ramps. The developer shall be required to purchase the tactile warning surface materials from DPW. A notation to this affect should be added to the plans.
17. Proposed contours appear incomplete in the R.O.W., specifically the frontage of Lots 16 & 17, and between Lots 19 & 20. The recent resubmission has attempted to address this and reference was made by the applicant to additional clarity on Sheet 11 of the plan set; however, our most recent resubmission materials did not include a Sheet 11.

As part of any subsequent subdivision approval, we recommend the following conditions be included:

1. The applicant shall be required to reimburse the City's construction cost associated with the recent improvements along Chantelle Way in the amount of $57,920.50.
2. As part of the building permit process, the applicant shall submit a plot plan for each lot that shall include the location and footprint for the house, location of driveway and proposed grading. Any site constraints (i.e. wetlands, buffers, easements, etc.) shall be shown on the plot plan. DPW shall approve all driveway locations as part of the building permit process.
3. Prior to the start of construction, the applicant shall be required to execute Form 1 contained in Section 805 of the zoning ordinance and provide a recorded copy to the City.
4. Until such time that the stormwater facilities are offered and accepted by the City, the applicant shall be required to perform routine inspection and maintenance of the stormwater facilities as outlined in the operations and maintenance manual development specifically for the site. A copy of the annual inspection

and maintenance report including inspection log(s) shall be submitted annually (by July 15th of each year) to the City Public Works Department.

5. Prior to the start of construction, the stream buffer areas shall be marked in the field and copies of the recorded buffer deed restrictions shall be provided to the Planning Department.

6. The design engineer should be required to inspect the construction and stabilization of the stormwater management pond to be built on the site. Inspections shall consist of weekly visits to the site to inspect the construction (from initial ground disturbance to final stabilization of the pond) of the pond's embankment, stormwater inlet, underdrained gravel outlet, gravel outlet filter material makeup and placement, outlet control structure, clay liner and cover material, and emergency spillway. If necessary, the inspecting engineer shall interpret the pond's construction plan for the contractor. Once the pond is constructed and stabilized, the inspecting engineer will notify the City within 14 days to state the pond has been completed. Accompanying the engineer's notification shall be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of the gravel filter media. An inspection of the underdrained gravel outlet shall also be performed by a professional engineer one year after the final stabilization of the pond. The engineer shall notify the City as to the outlet's effectiveness and determine any maintenance items that are needed.

7. As part of the project's as-built certification for roadway and utility infrastructure, the applicant shall provide a Stormwater Basin As-Built Certification. Prior to the issuance of a Certificate of Occupancy for any lot, the Applicant shall submit evidence in the form of a letter with as-built survey plan prepared and stamped by a Professional Engineer who either prepared the Post-Construction Stormwater Management Plan and its associated Facilities or supervised the Plan and Facilities construction and implementation. The letter or plan shall certify that the Stormwater Management Facilities have been installed in accordance with the approved Post-Construction Stormwater Management Plan and that they will function as intended by said Plan. The as-built survey plan shall be performed for all post-construction stormwater facilities to document general conformance with the approved plan.

We look forward to discussing this project further and would be happy to clarify any of our comments made within this review memo.

Sandy Brook

Previous Subdivision Submissions

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street, Gorham, Maine 04038
207 839-2771

WILLIAM A. THOMPSON
ROBERT C. LIBBY, Jr.
WALTER E. PELKEY
ANDREW S. MORRELL
STEVEN J. BLAKE

May 29, 2018

Bob Hamblen
Saco City Planner
300 Main Street
Saco, Me. 04072

Re: Sandy Brook Subdivision
Subdivision Revisions

Dear Bob;

Please find attached 10 sets and an electronic set (emailed) of the following information for revisions to the above referenced project:

1. Revised Preliminary Subdivision Application
2. Maine DEP Site Location of Development Application
3. Technical Capacity Information – Star Homes Inc.
4. Financial Capacity Information – Bangor Savings Bank
5. Revised Operations & Maintenance Manual
6. Sierra Woods Post-Development Plan (full size & reduced)
7. Revised Preliminary Subdivision Plans (2 full, 8 reduced and electronic copies)

These revisions are based on comments from the City and meetings held in the past. The following are our responses to the comments sorted by the source of the comment and utilizing the same numbering system for clarity.

Comments from Planning Board at meeting on 1/23/ 2018:

1. We are requesting a waiver for a traffic study for this project (see Note #36 on Sheet 1 of plans). A 21-lot subdivision is calculated (per Trip Generation Manual) to create 201 trips per day, and the City requires a traffic study for all projects that create more than 200 trips per day. Because a traffic study was completed for the original Sierra Woods subdivision that was approved in 1999 and that study was done assuming that this parcel would be developed in the future we believe that a new traffic study is not necessary for this project. As described below, our office met with City Staff on January 26, 2018 to review these comments and both the City Planner and City Engineer supported this waiver request at that time.
2. The applicant would like to dedicate all open space to the City as shown on the plans (9.46 acres). The City is looking into whether they will accept the open space at this time.

3. One of the Planning Board members wanted to know the Director of Public Works opinion on whether he prefers a new stormwater wetpond or prefers to use the existing ponds. As described below, our office met with the City Engineer on January 26, 2018. Since connecting to the existing wetponds would require upgrades to these facilities to meet current DEP standards the Director of Public Works prefers the design as shown on the attached plans, directing all runoff to a new wetpond meeting all Maine DEP standards on the subject parcel.
4. A no disturbance buffer has been shown on the plans along the stream and on Lots 1,2, 7 & 8 (see Note #34). Deed language for the proposed buffer will be provided prior to final approval.
5. No cut buffer pins have been added to the plans on Lots 1, 2, 7 & 8 (see Note #34 on Sheet 1).
6. Capped iron rods will be used to mark all proposed buffer areas as shown on the plans per Maine DEP requirements.
7. Proposed project phasing has been added to Sheet 1 of the plans.
8. Note 32 has been added to Sheet 1 of the plans stating that each lot shall be supplied with a booster pump to ensure that each lot has adequate water pressure.
9. Maine Water Company has no concerns with capacity for the proposed lots, or water pressure that will be provided to each lot (see comments below for more information).
10. The City will take ownership and maintenance responsibilities of all stormwater facilities within the public right-of-way as well as the proposed stormwater wetpond on land to be dedicated to the City (Open Space) if the road is accepted by the City.

Comments from meeting with the City on 1/26/2018:

1. A turnaround has been added to the wetpond access roads along with the other design changes requested (see Sheet 3).
2. Open space areas have been added to sheet 1 of the plans (9.46 acres).
3. Street lights have been shown on the plans at each proposed intersection where they do not already exist (see Sheets 3-6). A detail has also been added to Sheet 9 of the plans.
4. The dead-end stub of roadway (turnaround) near Lots 6 & 7 has been removed as requested and recommended by the City (see Sheets 1 & 4). Please note the plans have been revised accordingly.
5. A Note has been added to the plans stating that plot plans shall be provided for each lot showing the locations of house, driveway, etc. during the building permit process (see Note #21 on Sheet 1).
6. Foundation drains have been shown on the plans for lots that will have foundation drains tying into the stormwater infrastructure. All lots not shown on the plans will have gravity foundation drains outletting at the back of the lot or other location (see summary Note #35 on Sheet 1 of plans).
7. The errant line from the treatment plan on Lot 3 has been removed (see Sheet C).
8. Please find attached both a letter of financial and technical capacity for the applicant.
9. Note 33 has been added to Sheet 1 of the plans pertaining to street plantings. This is the same approach used for the last few projects within Saco (Precious Hidden Estates for example).

10. The hydrant along Chantelle Way has been moved closer to Sandy Brook intersection as requested (see Sheet 3).

Comments from the Department of Public Works dated 12/27/2017:

Outstanding Items:

1. This project is considered as a common scheme of development by the Maine DEP. The City of Saco has delegated authority for this review. Please find attached a copy of the Maine DEP SLODA application as requested.
2. See above comments where this item was addressed.
3. The applicant has agreed to this fee.

Additional Comments:

1. The Cities peer review consultant, as far as I understand, has reviewed and accepted the wetland delineation as shown on the plans. No vernal pools or wetlands of special significance were known to be found onsite.
2. Plan Note #31 was added to Sheet 1 of plans to cover this item.
3. The project is on the City of Saco's datum (see Plan Note #14 on Sheet 1 of plans).
4. The applicant will meet these requirements.
5. Plan Note #21 has been added to Sheet 1 of the plans.
6. See original Subdivision Plan (plan reference 13C on Sheet 1 of plans).
7. Plan Note #22 has been added to Sheet 1 of the plans.
8. See supersedes Note on Sheet 1 of the plans as well as Note 23 on sheet 1 of the plans. Permit numbers will be added to the plans upon permit approvals from the Maine DEP & ACOE.
9. See Sheet 1, Note 17.
10. The City is looking into whether they will accept the open space at this time.
11. See Sheet 1, Note 27.
12. All proposed easements are a minimum of 30' wide (see Sheet 1 of plans).
13. See Sheet 1, Note 24. No disturbance buffer pins have also been added to the plans (see Sheet 1).
14. Deed language for the proposed buffers will be provided prior to final approval.
15. See Sheet 1, Note 25.
16. As discussed with the City the easement within the open space is acceptable for the proposed wetpond since this land is proposed to be dedicated to the City of Saco.
17. The requested changes have been made to the plans (see Sheet 3).
18. The access road on the Western end of the wetpond has been extended to the emergency spillway. The access road on the Eastern end has been extended & regraded to reach the wet pond bench.
19. Turnaround provided (see Sheet 3).
20. We have met with DPW as described above.
21. N/A – see next comment
22. See Sheet 1, Note 21.
23. The intersection of Chantelle Way and Sandy Brook Lane has been updated to a typical 3-legged intersection as requested (see attached plans for more information). The

intersection of Blake Ave. and Sandy Brook Lane has not been changed as the existing turnaround stub provides access to an existing Sandy Brook Subdivision stormwater facility.

24. The proposed sidewalk along Sandy Brook Lane has been updated per City comments (see Sheet 6).
25. Drainage easement added (see Sheets 1 & 3 of plans).
26. See above comments.
27. See Sheet 1, Note 28.
28. Sewer service lateral inverts have been shown on the profile view of the plans (see Sheets 3-6).
29. Underdrains have been added along both curblines of the public roadway, as requested (see Sheets 3-6).
30. See Sheet 1, Note 29.
31. Maine Water Company has no concerns with capacity for the proposed lots, or water pressure that will be provided to each lot. However, to be sure, the applicant has chosen to provide Booster pumps to each lot per Sheet 1, Note 32. Please note our office met with Maine Water Company on January 31, 2018 to review this project and to discuss these items specifically.
32. We met with MWC on January 31, 2018. Many of the items discussed at this meeting have been added to the plans. These revised plans shall be forwarded to MWC for their review of the current design.
33. Street lights have been shown on the plans.
34. The applicant will meet this requirement.
35. Our office met with City Staff to review the stormdrain design. A series of minor design changes have been made based on this meeting (see attached plans for more information).
36. The note on Sheet 3 has been updated to show the outlet as ductile iron pipe.
37. The riprap within the sediment forebay has been updated as requested (see Sheet 3).
38. This area has been redesigned as requested (see Sheet 3).
39. See catch basin detail on Sheet 9.
40. See SMH detail on Sheet 9.
41. Driveway apron detail updated to meet City Standards (see Sheet 9).
42. See detail on Sheet 9.
43. See roadway cross section detail on Sheet 9.
44. See Sheet 1, Note 30.
45. Curb tipdown detail provide (see Sheet 10).
46. Guardrail detail updated (see Sheet 9).
47. Please find attached the Post Development Drainage Plan for the original subdivision for your review.
48. Sections 1 & 2 from Section 805 have been added to the O&M Plan (see attached)

Comments from Maine Water Company dated 1/16/2018:

1. Disinfection tap locations to be provided by Maine Water as part of this review.
2. Utility crossings to be reviewed as well.
3. We have met with Maine Water and are working to correct discrepancies in the plans.

Comments from Dave Pendleton dated 1/11/2018:

1. The hydrant along Chantelle Way has been moved closer to Sandy Brook intersection as requested (see Sheet 3).

Comments from Corey Huntress dated 12/20/2017:

1. Street lights have been shown on the plans at each proposed intersection (see above comments).
2. Stop signs and street signs have been added to the plans as requested (see Sheets 3-6).
3. Sidewalks will be installed per City standards (see Sheets 3-6).

Comments from R. Lambert dated 12/20/2017:

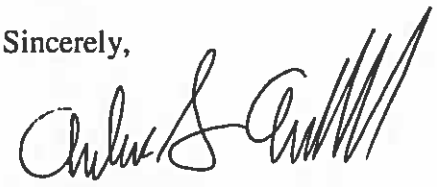
1. Flood Zone line (100-year) can be found on Sheet 1 of the plans.
2. See Sheet 1, Note 24 and above comments where this item was addressed.

Comments from Bob Hamblen from email dated January 18, 2018:

1. Note #37 has been added to Sheet 1 of the plans regarding lot coverage.

We feel these revisions address all of the outstanding issues remaining for this project. Please call me if you have any questions or need any additional information. We understand by submitting this plan today, we are eligible for the Planning Board meeting on June 19th, 2018. We look forward to workings with the Board and are hopeful to be considered for Preliminary Approval at this Planning Board meeting.

Sincerely,



Andrew S. Morrell. P.E.
Project Engineer

cc: Joe Frustaci, Star Homes

13-016-Comment Response 5-30-2018

Account Number_____

Fee_____

Received by_____

Date_____

SACO PLANNING BOARD
300 Main Street
Saco, Maine 04072

APPLICATION FORM FOR:

( ) Sketch Plan, Subdivision

(X) Preliminary Plan Subdivision

( ) Final Plan Subdivision

This application shall conform in all respects to the City of Saco Subdivision Regulations. It shall be accompanied by fourteen (12) copies of the Plan and all submissions.

A. INFORMATION ON SUBDIVISION

1. Proposed name of subdivision Sandy Brook Subdivision
2. Number of lots/units 21
3. Does the applicant propose to dedicate to the public all streets and open space shown on the plan? Yes - see plans
4. State number of acres which applicant proposes to dedicate to public usage for recreational or open space: Open Space proposed is 9.46 acres
5. Does owner intend to request any waivers of the requirements of the Subdivision Regulations of this Board upon the submission of the Final Plan for approval? Traffic Study
6. If any waivers of requirements are to be requested, list them and give reasons why such requirements should be waived: The proposed subdivision is expected to create 201 (21 single family lots) trips per day. The 1999 approval of Sierra Woods included a traffic study that accounted for this parcel being developed in the future. Based on the previous traffic study, we believe that a new traffic study is not necessary for this project.

B. APPLICANT INFORMATION

OWNER'S NAME Star Homes Inc.

Address 8 Rosewood Drive, Cape Elizabeth, Maine 04107

Telephone and Fax Numbers (207) 409-6755

E-mail Address joefru @ yahoo.com

APPLICANT'S NAME Star Homes Inc.

Address 8 Rosewood Drive, Cape Elizabeth, Maine 04107

Telephone and Fax Numbers (207) 409-6755

E-mail Address joefru @ yahoo.com

ARCHITECT/ENGINEER'S NAME Andrew S. Morrell

Address BH2M, 28 State Street, Gorham, Maine 04038

Telephone and Fax Numbers (207) 839-2771 x 206

E-mail Address amorrell @ bh2m.com

1. If Applicant is a Corporation, state whether the Corporation is licensed to do business in Maine X YES _____ NO and attach a copy of Secretary of State's Registration.
2. What interest does the Applicant have in the parcel to be subdivided (Option, land purchase contract, record ownership, etc.)? Ownership

C. INFORMATION ON PARCEL TO BE SUBDIVIDED

1. Location of property: Book 16382 Lot 537
   (from York County Register of Deeds)
2. Location of property: Map 88 Lot 12
   (from Assessor's Office)
3. Street Address: Chantelle Way & Blake Avenue
4. Present use of land: Undeveloped Land
5. Current zoning of property: R-10 Low Density & Resource Protection
6. Acreage of parcel to be subdivided: 19.45 acres

7. Indicate the nature of any restrictive covenants to be placed on the deeds:_____
To be determined

8. A complete statement of any easements relating to the property is attached. If none, please state. Easement to construct roadway to connect Chantelle Way & Blake Ave.

9. Does applicant have an interest in abutting property? If none, please state.
None

10. Does the Preliminary Plan cover the entire contiguous holdings of the Applicant?_
Yes

NOTE:All plans submitted for review should contain all required information outlined in the City of Saco Subdivision Regulations, or a waiver request for specific items and reasons why specific items should be waived.

NOTE: Complete this form and return it with the required documents and fourteen (12) drawings of the plan.

To the best of my knowledge, all information submitted on this application is true and correct.

Signed Arthur D. Cunniff - agent
APPLICANT

Date 5/29/18

The Planning Board normally meets the first and third Tuesdays of the month. Applicants must submit materials THREE WEEKS prior to the scheduled meeting for placement on the Board's agenda. If application and submission materials are not complete, placement on an agenda may be delayed. Applications are placed on the Planning Board's agenda at the conclusion of staff review only.

FEE: A $25.00 non-refundable fee must be deposited with all applications. The required deposit is $1000 on an existing street, or $1500 if on a proposed street, as determined by the City Planner. A copy of the Cost Recovery Ordinance is attached.

Department of Environmental Protection
Bureau of Land & Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: 207-287-3901

FOR DEP USE
ATS # _____
L-_____
Total Fees: _____
Date: Received _____

FORM A PAGE 1

****

SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.S.A. §§481-490

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)	☐ 20 acre development ☐ Planning Permit ☐ Metallic Mining	☐ Marine Oil Terminal ☐ Structure ☐ Subdivision	■ Major Amendment ☐ Minor Amendment

1. Name of Applicant:	Star Homes Inc.	**6. Name of Agent (if applicable):**	Andrew S. Morrell
2. Applicant's Mailing Address:	8 Rosewood Dr., Cape Elizabeth, ME	**7. Agent's Mailing Address:**	28 State St., Gorham, ME 04038
3. Applicant's Daytime Phone #:	207-409-6755	**8. Agent's Daytime Phone # :**	207-839-2771
4. Applicant's Fax # (if available):	N/A	**9. Agent's Fax # (if available):**	207-839-8250
5. Applicant's *e-mail address* (REQUIRED -license will be sent via: e-mail):	joefru@yahoo.com	**10. Agent's *e-mail address* (REQUIRED - license will be sent via e-mail):**	amorrell@bh2m.com

PROJECT INFORMATION

11. Name of Development:	Sandy Brook Subdivision (Previously Sierra Woods)						
12. Map and Lot #'s:	**Map #:** 88	**Lot #:** 12	**13. Deed Reference #'s:**	**Book #:** 16382	**Page #:** 537		
14. Location of Project City/Town:	Saco	**15. County:**	York	**16. UTM Northing**	N/A	**17. UTM Easting**	N/A
18. Brief Description of Project including total parcel size:	The applicant is proposing a 21 lot single family residential subdivision on the remaining 19.45 acres of the Sierra Woods Subdivision.						

19. Type of Direct Watershed: (Check all that apply)	☐ Lake not most at risk ☐ Lake most at risk ☐ Lake most at risk, severely blooming	■ River, stream or brook ☐ Urban impaired stream ☐ Freshwater wetland	☐ Coastal wetland ☐ Wellhead or public water

20. Name of Waterbody Project Site drains to:	Deep Brook and Sandy Brook		
21. Amount of Developed Area:	Total acres: 9.36	Existing Developed area: N/A acres	New Developed area: 9.4 acres
22. Amount of Impervious Area:	Total acres: 2.87	Existing Impervious areas N/A acres	New Impervious area: 2.9 acres

23. Development started prior to obtaining a license?:	☐ Yes ■ No				
24. .Development or any portion of the site subject to enforcement action?	☐ Yes ■ No	If yes, name of enforcement staff involved? N/A			
25. Common scheme of development?:	■ Yes ☐ No	**26. Title, Right or Interest:**	☒ own ☐ lease	☐ purchase option ☐ written agreement	
27. Natural Resources Protection Act permit required?:	■ Yes ☐ No	If yes:	■ PBR	☐ Tier 1 ☐ Full Permit ■ Tier 2	
28. Existing DEP Permit number (if applicable):	Delegated Authority by City of Saco				
29. Names of DEP staff person(s) present at the pre-application meeting:	N/A				
30. Does agent have an interest in project? If yes, what is the interest?	☐ Yes ■ No				

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following :

CERTIFICATIONS / SIGNATURES

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the electronic address located on the front page of this application (see #5 for the applicant and #10 for the agent)"..

Signed: Andrew S Morrell **Title** Civil Engineer - Bittah **Date:** 5/29/18

Notice of Intent to Comply with Maine Construction General Permit	**With this Site Law application form and my signature, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.** **If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.** **Signed** Andrew S Morrell **Date:** 5/29/18

NOTE: You must file a MCGP Notice of Termination (Form K) within 20 days of completing permanent stabilization of the project site.

CERTIFICATION

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for development approval is complete and accurate to the best of his/her knowledge.

Signature: Andrew S Morrell

Name (print): Andrew S. Morrell

Date: 05/31/2018

Re/Cert/Lic No.:
Engineer PE #13285
Geologist
Soil Scientist
Land Surveyor
Site Evaluator
Active Member of the Maine Bar
Professional Landscape Architect
Other

JANUARY 26, 2018

TO WHOM IT MAY CONCERN;

THE PRINCIPAL OF STAR HOMES, JOSEPH A FRUSTACI, HAS BEEN BUILDING HOMES SINCE 1972 AND DEVELOPING LAND IN THE GREATER PORTLAND AREA SINCE 1987.

SEVERAL OF THE LARGER AND MORE SIGNIFICANT SUBDIVISIONS ARE THE FOLLOWING:

MARLBOROUGH GARDENS	1988	7 LOTS PORTLAND
ROSEWOOD	1991	5 LOTS CAPE ELIZABETH
BALTIMORE AVE	1994	7 LOTS SOUTH PORTLAND
ARBOR PLACE	1995	12 LOTS FALMOUTH
LEDGEFIELD	1997	19 LOTS SOUTH PORTLAND
VICTORIA COURT	2000	12 UNIT CONDO DEVELOPMENT
BLUEBERRY RIDGE	2005	19 LOTS CAPE ELIZABETH
GREENACRES	2011	7 LOTS SCARBOROUGH
SAWGRASS	2014	24 LOTS SCARBOROUGH

JOSEPH FRUSTACI

Bangor
Savings Bank

You matter more.

May 30, 2018

Joseph A Frustaci
D/B/A Star Homes Inc.
8 Rosewood Dr.
Cape Elizabeth, ME 04107

To Whom it May Concern:

This is a letter stating that above client has the financial capability for the 21 lot subdivision at Sandy Brook in Saco Maine off Blake Avenue. If you have any further questions please don't hesitate to call or e-mail me.

Sincerely

Cynthia Axelsen
Assistant Manager II
Bangor Savings Bank
180 Waterman Dr.
South Portland, ME 04106
PH: 207-767-0814
Cynthia.axelsen@bangor.com

OPERATIONS & MAINTENANCE PLAN

For: Sandy Brook Subdivision

The applicant, Star Homes Inc., will be responsible for all maintenance of the entire site until the roadways are accepted by the City of Saco. At that time the City of Saco will be responsible for all operation and maintenance. The following is a summary of the required maintenance:

Roadways

1. On-site inspection of the roads on an annual schedule or after a significant period of rainfall.
   a.) All low spots of pooling water shall be regraded to direct the water off the pavement.
   b.) Areas of erosions shall be repaired immediately.
   c.) Sweeping the roadway free of sand after the winter season should be completed annually.

Stormdrain Inlet & Outlet

1. On-site inspection of the rip-rap surrounding the stormdrain inlets and outlets on a monthly schedule or after a significant period of rainfall.
   a.) Carefully inspect to determine if high flows have caused scour beneath the rip-rap or dislodged any of the stones. If repairs are needed, they should be accomplished immediately.

Vegetated Swale with Check Dams

1. On-site inspection of the vegetated ditches on a monthly schedule or after a significant period of rainfall.
   a.) Ditches should be inspected to repair erosion problems, remove any accumulated debris and to check the condition and integrity of the check dams.

Storm Drain System Includes Catchbasins

1. Inspect catchbasin inlets, culvert entrances and field inlets on a monthly basis for debris or conditions, which could inhibit flow entry. Remove debris.
2. Inspect all catchbasin structures on an annual basis.
   a.) Check that rim elevations are property set to optimize flow entry.
   b.) Measure and record silt accumulation, if any.
3. Check pipelines on an annual basis to determine silt accumulation, if any.
4. Inspect swales, channels, and ditches on a semi-annual basis.

a.) Check for debris that may inhibit flow – remove as warranted.
b.) Note and remove excessive vegetation – mow monthly.
c.) Note any erosion or non-vegetated areas, which could lead to erosion.

Wet Ponds

1. Inlet & Outlet Inspections: The inlet and outlet of the basin should be checked periodically to ensure that flow structures are not blocked by debris. Inspections should be conducted monthly during wet weather conditions from March to November.

2. Erosion & Instability: Basins should be inspected annually for erosion, destabilization of side slopes, embankment settling and other signs of structural failure, and loss of storage volume due to sediment accumulation. Corrective action should be taken immediately upon identification of problems.

3. Embankment Maintenance: Embankments should be maintained to preserve their integrity as impoundment structures, including, but not necessarily limited to, vegetative maintenance (mowing, control of woody vegetation), rodent control, erosion control and repair, and outlet control structure maintenance and repair. Basins should be mowed no more than twice a year during the growing season to maintain maximum grass heights less than 12 inches. All accumulated trash and debris shall be removed.

4. Sediment Removal: Sediment should be removed from the pretreatment structure at least annually and from the basin when necessary.

5. Measurement of Sediment Accumulation: Inspect for sediment accumulation. If sediment reaches 2' in depth, the pond shall be drained and the sediment removed.

6. Gravel Trench Outlet Inspection: The gravel trench outlet should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the gravel trench should be inspected at least once every six months. Inspection consists of verifying that the pond is slowly emptying through the gravel filter for a short time (12-24 hours) after a storm and that potentially clogging material such as accumulations of decaying leaves are not preventing discharge through the gravel.

7. Gravel Replacement: The top several inches of the gravel in the outlet trench must be replaced with fresh material when water ponds above the permanent pool for more than 72 hours. The removed sediments should be disposed of in an acceptable manner.

8. Maintenance Dredging: Wet ponds lose 0.5-1.0% of their volume annually due to sediment accumulation. Dredging is required when accumulated volume loss reaches 15%, or approximately every 15-20 years.

9. Outlet Control Structures: Remove covers and check for clogging, debris accumulation or structural problems a minimum of two times per year and clean as needed.

Normal Annual Maintenance

Normal annual maintenance is defined as that work required to routinely maintain the facility in a sound condition to meet its intended function. It does not include major reconstruction or maintenance such as, cleaning of sediment from the detention ponds, or removing sediment from catchbasin sumps, or cleaning pipelines. Normal Maintenance should be conducted as needed or after significant storm events.

1. Conduct Routine Annual Maintenance

   a) Cut aquatic vegetation and remove from outlet ditch.
   b) Remove any debris and excess vegetation stored on site during the inspection described in above. Materials to be disposed of in accordance with applicable local and state codes and ordinances.
   c) Make minor repairs to rip-rap in channels or slopes as required to maintain its integrity.

2. Conduct Routine Annual Maintenance on Control Structures

   a) Remove any debris or sediment stored on site during inspections. Materials to be disposed of in accordance with applicable local and state codes and ordinances.
   b) Make minor repairs to rip-rap slopes and channels.

Wire brush weir and/or orifice plates to remove corrosion. Repaint as appropriate.

Housekeeping

1. Use attached "Inspection & Maintenance Log" and keep records in three-ring binder.
2. See attached Appendix B "Inspection and Maintenance" from MDEP Stormwater Regulations.
3. See attached "Appendix C" from MDEP Stormwater Regulations for performance standards.
4. Use attached "Article VIII Stormwater runoff" from City of Saco.

SANDY BROOK SUBDIVISION
STORMWATER MANAGEMENT
INSPECTION & MAINTENANCE LOG

FACILITY:		**YEAR:**	
LOCATION:		**CONTRACTOR:**	
FUNCTION:		**DEP PROJ. MANAGER:**	
DATE OF INSPECTION:		**INSPECTOR:**	
ITEM ID	**DESCRIPTION OF CONDITIONS**	**MAINTENANCE ACCOMPLISHED**	**DATE OF MAINTENANCE**
ROADWAYS			
STORMDRAIN INLET & OUTLET			
STORMDRAIN SYSTEM			
VEGETATED SWALES WITH CHECK DAMS			
STORMDRAIN SYSTEM INCLUDES CATCH BASINS			
WETPOND			

This appendix applies to all projects. A project that is only required to meet basic standards (stormwater PBR) must meet the standards in Section 1. All other projects must meet standards in Sections 1 through 5.

See Appendix D(5) for additional maintenance requirements related to infiltration of stormwater.

1. **During construction.** The following standards must be met during construction.

   (a) Inspection and corrective action. Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.

   (b) Maintenance. Maintain all measures in effective operating condition until areas are permanently stabilized. If best management practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).

   (c) Documentation. Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

   The log must be made accessible to department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

2. **Post-construction.** The following standards must be met after construction.

   (a) Plan. Carry out an approved inspection and maintenance plan that is consistent with the minimum requirements of this section. The plan must address inspection and maintenance of the project's permanent erosion control measures and stormwater management system. This plan may be combined with the plan listed in Section 2(a) of this appendix. See Section 8(C)(2) for submission requirements.

   (b) Inspection and corrective action. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site. Inspection

or maintenance tasks other than those discussed below must be included in the maintenance plan developed for a specific site.

NOTE: Expanded and more-detailed descriptions for specific maintenance tasks may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

(i) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. See permanent stabilization standards in Appendix A(5).

(ii) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

(iii) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

(iv) Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at inlet any grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

(v) Inspect resource and treatment buffers at least once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.

(c) Regular maintenance

(i) Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the

road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.

(ii) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

NOTE: Contact the department's Division of Watershed Management (Maine DEP) for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site. The maintenance needs for most measures may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

(d) Documentation. Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal.

The log must be made accessible to department staff and a copy provided to the department upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

3. Maintenance contract. Contract with a third-party or other qualified professional, as approved by the department, for the removal of accumulated sediments, oils, and debris within any proprietary devices and the replacement of any absorptive filters. The frequency of sediment clean-out and filter replacements must be consistent with the unit's storage capacity and the estimated pollutant load from the contributing drainage area. This clean-out frequency is usually established by the manufacturer of the proprietary system when sizing the device for the project.

4. Re-certification. Submit a certification of the following to the department within three months of the expiration of each five-year interval from the date of issuance of the permit.

(a) Identification and repair of erosion problems. All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
(b) Inspection and repair of stormwater control system. All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.
(c) Maintenance. The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by MPDES, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

5. **Duration of maintenance.** Perform maintenance as described and required in the permit unless and until the system is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the department stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with department standards. Upon such assumption of responsibility, and approval by the department, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

6. **Additional requirements.** Additional requirements may be applied on a site-specific basis.

These performance standards apply to all projects.

1. **Spill prevention.** Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

   See Appendix D for license by rule standards for infiltration.

   NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

   NOTE: An example of the use of BMPs to control fugitive sediment and dust is as follows. Operations during wet months that experience tracking of mud off the site onto public roads should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently as needed.

   NOTE: Dewatering a stream without a permit from the department violates state water quality standards and the Natural Resources Protection Act.

4. **Debris and other materials.** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. **Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe

construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the department.

NOTE: For guidance on de-watering controls, consult the Maine Erosion and Sediment Control BMPs", Maine Department of Environmental Protection."

6. **Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges.

7. **Additional requirements.** Additional requirements may be applied on a site-specific basis.

Chapter 230. Zoning

Article VIII. "Good Neighbor" Performance Standards

§ 230-805. Stormwater runoff.

[Amended 3-2-1992; 6-18-2001; 6-1-2009; 7-16-2012; 3-28-2016]

A. General provisions.

(1) In general, surface water runoff shall be minimized, and it shall be the responsibility of the person developing the land to demonstrate that the work will not have an adverse impact on abutting or downstream properties. Sites shall be designed to minimize the amount of impervious area with a focus on reducing vehicle areas, including parking, drives aisles, and service areas.

(2) The volume of stormwater discharged from any parcel shall be minimized through the use of on-site infiltration, detention, or retention to the extent practical. When stormwater must be discharged from a parcel, the preferred method is to discharge into the natural drainage system. Discharge of stormwater to the City's municipal separate storm sewer system (MS4) shall be allowed only when on-site retention and/or discharge to the natural system is not practical.

(3) Infiltration, detention, or retention of stormwater shall assure that the total maximum daily loads (TMDLs) that have been established by the United States Environmental Protection Agency for various water bodies in the City will be met to the extent practical. The disposal of stormwater shall not constitute a threat to public health, safety and welfare and shall not degrade the quality of surface water or groundwater below City, state or federal standards.

(4) The City is a regulated community under the National Pollutant Discharge Elimination System (NPDES) MS4 Program; therefore, provisions for stormwater runoff management are required for all new development or redevelopment projects (site plan and subdivision) that result in one or more acres of disturbed area. In determining if the threshold has been met, all disturbed area created after December 27, 2006 (original effective date of this provision), shall be included in this total. This provision also applies to projects disturbing less than one acre, if the construction activity is part of a larger common plan or development or sale that would disturb one or more acres. This provision does not apply to any new development or redevelopment on a parcel that is part of a subdivision previously approved under this chapter that has a compliant post-construction stormwater management plan with sufficient capacity to accept and treat increases in stormwater discharges associated with the project.

(5) Projects resulting in one or more acres of disturbed area shall be subject to the requirements of the Maine general construction permit (MGCP); Maine State Stormwater Management Law, 38 M.R.S.A. § 420-D, and the latest revision of the "Stormwater Management Rules," Chapters 500, 501 and 502; and the requirements of Subsections B and C of this section. Where the standards or provisions of such stormwater rules conflict with City ordinances, the stricter (more-protective) standard shall apply.

(6) Smaller projects resulting in less than one acre of disturbed area but more than 10,000 square feet of new or redeveloped impervious area are subject to the requirements of Subsection D of this section.

B. Stormwater quantity and quality control. All projects subject to this section shall be designed with adequate provisions for the proper quantity and quality control management of all stormwater from a proposed development through a stormwater drainage system that will not have adverse impacts on abutting or

downstream properties. The stormwater drainage system shall be designed to meet the standards contained in the most recently revised version of the Maine Department of Environmental Protection's "Stormwater Management Rules," Chapters 500, 501 and 502; comply with the practices described in the most recently revised version of the "Maine Stormwater Best Management Practices Manual"; and meet the requirements of Subsection C of this section.

(1) To the extent possible, the design shall dispose of stormwater runoff on the land at the proposed development through the appropriate use of the natural features of the site. Stormwater runoff systems will infiltrate, detain, or retain stormwater falling on the site such that the rate of flow from the site does not exceed that which would occur in the undeveloped state for a storm of intensity equal to the two-, ten-, twenty-five- and fifty-year storm events.

(2) If the post-development peak runoff rate exceeds the predevelopment peak runoff rate, on-site mitigation measures, such as detention basins or flow restrictors, shall be required.

(3) All natural drainageways shall be preserved at their natural gradients and shall not be filled or converted to a closed system except as approved by the Planning Board and appropriate state agencies.

(4) The design of the storm drain system shall fully incorporate the existing upstream runoff which must pass over and/or through the site to be developed. The system shall be designed to pass upstream flows without surcharging the system. Any special roadway culvert crossing designed to meet other applicable state regulations (i.e., fish passage) shall be specifically identified on the plans.

(5) Proposed alterations in stormwater drainage paths shall not enable the crossing of runoff over a City street in order to enter a drainage system.

(6) A waiver may be granted by the Department of Public Works to discharge an insignificant increase in stormwater runoff to the MS4 when all of the following conditions are met:

(a) A drainage study is prepared by a professional engineer licensed in the State of Maine, which demonstrates that the increase has no adverse impact to the downstream conditions, including impacts on abutting or City properties. Improvements may be required of the developer to prevent adverse downstream impacts caused by the project.

(b) The increase in the peak flow from the site or in the peak flow of the receiving waters cannot be avoided by reasonable changes in project design or density.

(c) Written authorization to discharge the increased peak flow rates has been provided by the Director of Public Works.

(7) At the time of application, the applicant shall notify the Department of Public Works if its stormwater management system includes any stormwater BMP(s) that will discharge to the City's MS4 and shall include in this notification a listing of which stormwater BMP(s) will so discharge.

C. Post-construction stormwater management plan. All projects subject to this section shall be designed to meet the following requirements:

(1) The applicant may meet the quantity and quality standards listed in Subsection B above either on site or off site; but where off-site facilities are used, the applicant shall submit documentation to the City that the applicant has sufficient property interest where the off-site facilities are located - by perpetual easement or other appropriate legal instrument - to ensure that the facilities will be available to provide post-construction stormwater management for the project and that the property will not be altered in a way that interferes with the off-site facilities.

(2) Where the applicant proposes to retain ownership of the stormwater management facilities shown in its post-construction stormwater management plan, and the stormwater management facilities will not be dedicated to the City, the applicant shall enter into a maintenance agreement with the City. The form of the maintenance agreement is attached as Form 1. The applicant shall cause the maintenance agreement to be recorded in the York County Registry of Deeds within 30 days of the date of execution of the agreement. Failure to comply with the terms of the maintenance agreement shall constitute a violation of this chapter.

(3) Whenever elements of the stormwater management facilities are not within the right-of-way of a public street and the facilities will not be offered to the City for acceptance as public facilities, the Planning Board may require that perpetual easements be provided to the City allowing access for maintenance, repair, replacement and improvement of the stormwater management facilities in accordance with the approved drainage maintenance agreement. If an offer of dedication is proposed, the applicant shall be responsible for the maintenance of these stormwater management facilities until such time (if ever) as they are accepted by the City. Nothing in this chapter requires the City to accept any stormwater management facilities offered or dedicated by the applicant.

(4) Any person, business, corporation or other entity owning, leasing or having control over stormwater management facilities required by a post-construction stormwater management plan shall demonstrate compliance with that plan as follows:

(a) That person shall, at least annually, inspect, clean and maintain the stormwater management facilities, including, but not limited to, any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all City and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

(b) That person shall repair any deficiencies found during inspection of the stormwater management facilities.

(c) That person shall, on or by July 15 of each year, provide a completed and signed certification to the Department of Public Works certifying that the person has inspected, cleaned and maintained the stormwater management facilities, describing any deficiencies found during inspection of the stormwater management facilities, and certifying that the person has repaired any deficiencies in the stormwater management facilities noted during the annual inspection. The form of the annual stormwater certification is attached as Form 2.

(d) The required inspection(s) must be conducted by a qualified inspector employed by the responsible person. The qualified inspector shall perform an initial inspection to determine the status of the stormwater management facilities. If the initial inspection identifies any deficiencies with the facilities, the same qualified inspector shall reinspect the facilities after they have been maintained or repaired to determine if they are performing as intended.

(e) The "qualified inspector" means a person who conducts post-construction stormwater management facilities, best management practice ("BMP") inspections and meets the following qualifications:

[1] The inspector shall not have any ownership or financial interest in the property being inspected nor be an employee or partner of any entity having an ownership or financial interest in the property; and

[2] The inspector shall have a working knowledge of Chapter 500, Stormwater Management Rules, and Maine's Stormwater BMP Manual, and

[3] The qualified inspector shall meet at least one of the following criteria outlined in Subsection C(4)(e)[3][a][i] to [iii] below; or the qualified inspector must be on the DEP's list of approved post-construction stormwater BMP inspectors.

[a] Nonproprietary stormwater management facilities.

[i] Has a college degree in environmental science or civil engineering and is a professional engineer with at least three years of experience designing, evaluating or inspecting stormwater management facilities; or

[ii] Has a college degree in an environmental science or civil engineering, or comparable expertise, and has demonstrated a practical knowledge of stormwater hydrology and stormwater management techniques, including the maintenance requirements for stormwater management facilities, and has the ability to

determine if stormwater facilities are performing as intended. This qualification must be accompanied by two professional references to be valid; or

[iii] Has successfully completed the requirements of a DEP training course on inspecting post-construction stormwater management facilities. Note: successful completion may require receiving a passing grade in an examination at the conclusion of the course.

[b] Proprietary stormwater management facilities.

[i] Proprietary stormwater management facilities must be inspected by a person approved by the manufacturer.

(5) In order to determine compliance with this section and with the post-construction stormwater management plan, the Director of the Department of Public Works or his/her designee may enter upon a property at reasonable hours and after making a good-faith effort to contact the owner, occupant or agent to inspect the stormwater management facilities. Entry into a building shall only be after actual notice to the owner, occupant or agent.

(6) Submission requirements.

(a) The post-construction stormwater management plan shall conform to the applicable submission requirements of Section 8 of DEP Chapter 500 Rules.

[1] The applicant shall provide the City with an electronic version of the post-construction stormwater management plan in a format that is compatible with the City's requirements. Following completion of construction, the applicant shall provide the City with an updated version of the plan showing the stormwater management facilities as actually constructed.

[2] The Planning Board may modify or waive any of the submission requirements for a post-construction stormwater management plan if the Board finds that, due to the unique physical characteristics of the site or the scale of the proposed activity, the information is not required to allow the Board to determine if the applicable stormwater management standards are met.

(b) As-built certification. Prior to the issuance of a certificate of occupancy for a project requiring a post-construction stormwater management plan under this chapter, the applicant shall submit evidence in the form of a letter with as-built survey plan prepared and stamped by a professional engineer who either prepared the post-construction stormwater management plan and its associated facilities or supervised the plan and facilities construction and implementation. The letter or plan shall certify that the stormwater management facilities have been installed in accordance with the approved post-construction stormwater management plan and that they will function as intended by said plan. The as-built survey plan shall be performed for all post-construction stormwater facilities to document general conformance with the approved plans.

D. Drainage plan.

(1) Activities that are not subject to site plan review that result in the expansion or alteration of an existing building or structure that results in the creation or redevelopment of 10,000 square feet of impervious surface area shall meet the requirements for a drainage plan. New principal buildings that are located in a subdivision with an approved post-construction stormwater management plan are not required to comply with the requirement for a drainage plan if the approved stormwater management plan contains provisions that adequately address surface drainage related to the construction of the building as determined by the Code Enforcement Officer.

(2) The drainage plan shall meet the "urban impaired stream standard" when located within a watershed designated by the Maine Department of Environmental Protection as an urban impaired watershed.

(3) The drainage plan shall demonstrate that the proposed improvements are designed to minimize the amount of stormwater leaving the site. This shall include consideration of the design and location of improvements to minimize the total area of impervious surface on the site and stormwater

management techniques to minimize both the volume and rate of runoff from the lot. The drainage plan shall provide for the treatment of 0.5 inch of runoff from 90% of the new or redeveloped impervious area and 0.2 inch of runoff from 75% of the new or redeveloped nonimpervious surface area. The use of LID practices appropriate for the type of development as set forth in Chapter 10 of the DEP Stormwater Manual, Volume III - BMPs Technical Design Manual, is encouraged but not required.

(4) The drainage plan must also demonstrate that:

(a) Any stormwater draining onto or across the lot in its pre-improvement state will not be impeded or redirected so as to create ponding on, or flooding of, adjacent lots;

(b) Any increase in volume or rate of stormwater draining from the lot onto an adjacent lot following the improvement can be handled on the adjacent lot without creating ponding, flooding or other drainage problems and that the owner of the lot being improved has the legal right to increase the flow of stormwater onto the adjacent lot;

(c) Any increase in volume or rate of stormwater draining from the lot onto City property following the improvement can be handled without creating ponding, flooding or other drainage problems and that the owner of the lot being improved has the legal right to increase the flow of stormwater onto the City's property; and

(d) Any increase in volume or rate of stormwater draining from the lot into the City's separate storm sewer system can be accommodated in the system without creating downstream problems or exceeding the capacity of the storm sewer system.

(5) Submission requirements.

(a) A drainage plan must include a written statement demonstrating how the project has been designed to minimize the volume and rate of stormwater leaving the site, including provisions for minimizing the area of impervious surface or the use of LID practices, and a plan and supporting documentation with at least the following information:

[1] The location and characteristics of any streams or drainagecourses existing on the parcel and/or abutting parcels.

[2] The existing and proposed grading of the site using one-foot contours.

[3] The location and area of existing and proposed buildings and impervious surfaces on the site.

[4] The existing pattern of stormwater drainage on the site, including points of discharge to the City's storm sewer system or adjacent properties.

[5] The proposed pattern of stormwater drainage after development, including the location and design of any stormwater facilities.

(b) The Planning Board may modify or waive any of the submission requirements for a drainage Plan if the Planning Board determines that the information is not required to determine if the drainage standard is met.

E. Standards for easements and rights-of-way. Drainage easements containing components of the stormwater water runoff system lying outside of the public right-of-way lines shall conform to the following standards:

(1) The minimum width of the easement shall be 30 feet, provided that where a watercourse or retention area is wider than 30 feet, the Planning Board may require a drainage easement of adequate width to conform substantially to the lines of such watercourse or retention area, including additional width to provide access. The Planning Board may reduce the width of the easement upon a positive recommendation from the Director of Public Works if the narrower easement will allow the stormwater facilities to be maintained or if the unique characteristics of the site make the creation of a wider easement impractical.

(2) Where a drainage easement will contain an open channel, stream or drainageway, the easement shall be designed and landscaped to further the objectives of the stormwater management plan. The natural

landscape shall be retained to the extent practical as determined by the Planning Board.

(3) Where a drainage easement will contain a closed conduit, the easement shall be centered along the conduit.

(4) Any public stormwater management system that will be offered to the City for acceptance as public facilities shall be located on the separate parcel of land deeded to the City.

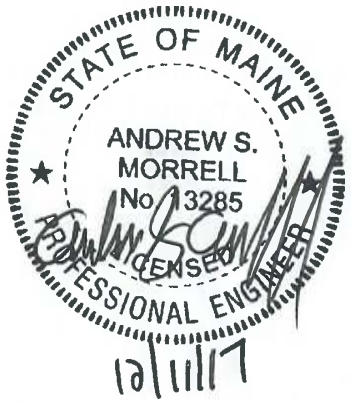
STORMWATER MANAGEMENT REPORT
FOR
Sandy Brook Subdivision
A 21 Lot Subdivision
Saco, Maine

For
Star Homes
8 Rosewood Drive
Cape Elizabeth, Maine

February 2017

Revised

December 2017



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- **BASIC STANDARDS**
- **FLOODING STANDARDS**
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STORMWATER MANAGEMENT REPORT

For:
Sandy Brook Subdivision
Saco, Maine

Introduction:

Star Homes owns a 19.45-acre parcel of land off of Chantelles Way and Blake Ave in Saco, abutting the existing Sierra Woods Subdivision. At this time the applicant would like to develop this parcel into twenty one (21) single family residential house lots. Refer to Appendix A for maps of the project area. Please note this parcel was remaining land as part of the Sierra Woods Subdivision approved and constructed in early 2001. BH2M designed this project and completed a Stormwater Report for this project (dated July 2000 with revisions thru September 2000) that included the subject parcel within the stormwater study. This report is an update to this original report.

The proposed twenty one lots range in size from 15,000 sf to 20,945 sf. The project will result in the construction of two roadway extensions and a connecting road between Chantelles Way and Blake Ave creating a looped roadway system. Chantelles Way will be extended approximately 800 linear feet, Blake Avenue will be extended approximately 400 linear feet, and the connecting road will be approximately 539 linear feet (1,739 linear feet total). All of the twenty one lots will be served by public sewer, public water and underground electric utilities. The proposed project (roads and house allotments), as shown on the plans, will result in approximately 2.87 acres of new impervious area and 9.36 acres of developed area. The applicants will be constructing the homes for this project, therefore, they are considered part of this permit. Please note that the houses and driveways have been allotted 0.08 acres of impervious area per lot for treatment and infrastructure sizing. Please also note that the developed areas for these lots have been modeled as shown with the lot grading (see Sheet 11 of the plans). This project is subsequently subject to the Maine DEP Chapter 500 Basic and General Standards including an Amendment to the Site Location Permit (DEP Permit #L-20451-TE-B-N) for the Sierra Woods Subdivision, which the City of Saco has delegated authority to review. The following report has been prepared to address the Maine DEP Standards as well as the City of Saco Stormwater Standards.

The applicant will need to amend the existing Tier 2 Wetland Permit for Sierra Woods Subdivision (ll31/ L 20451) with both the Maine DEP and ACOE to include wetland compensation for the wetlands proposed to be filled for this project (6,980 s.f.).

Existing Conditions

The Existing Conditions are shown on the Existing Conditions Plan (Sheet 2). The parcel is located off Buxton Road (Route 112) in Saco. The site is wooded with light underbrush and the Sierra Woods Subdivision is located to the northeast of the proposed

project. The land slopes on the north towards an existing stream that feeds into Sandy Brook, and south portions of the parcel slope directly towards Sandy Brook. The onsite wetlands have been delineated by Mark Hampton Associates. Runoff from the site flows overland to both or the aforementioned waterways. Wetlands exist in multiple areas throughout the site (see sheet 2 for more details).

Soils

High Intensity Soils have been delineated by Mark Hampton Associates on the subject parcel only (see Sheet 2 of the plans). Medium Intensity soils from the State of Maine can be found in Appendix A within this report. Please note this stormwater analysis was completed using high intensity soil data from both projects delineated by Mark Hampton.

The soils on this parcel include:

Soil Name	Hydrologic Soil Group
Buxton	C
Scantic	D
Lamione	D

Proposed Project

Most of the runoff from the site is directed to the following proposed stormwater treatment facility:

Pond 3 (Proposed pond off of Chantelle Way extension abutting lot 1)

Please note that Ponds 1 and 2 are existing Wet Ponds that were created to treat stormwater runoff from the existing Sierra Woods Subdivision. The proposed Stormwater Pond (Wet Pond 3) has been designed to meet the Maine DEP Chapter 500 Standards (see Appendix E). A breakdown of each watershed can be found in Appendix C- Post Development Calculations as well as on the Treatment Calculations (see Appendix D).

In order to properly size the proposed stormwater infrastructure for this site we allocated expected impervious areas for homes and driveways for each of the proposed 25 lots. These house sizes and locations are conceptual in nature, however, the following allocations have been shown on the plans and included in the calculations for each lot:

	House & Garage Area	Driveway Area
Lot	Area (Ac.)	Area (Ac.)
Lots 1-25 =	0.06	0.02

For each lot 0.08 ac. of Impervious Area has been allocated (1.68 ac. total).

Each lots landscaped area was also considered based on the grading shown for each lot

(see Sheet B).

The following Analysis Points has been utilized as part of this analysis:

Analysis Point #1 – Furthest reach on property (Sandy Brook)

Pre Development Calculations

The Pre-Development Drainage Plan is sheet A of the plans and the Calculations are included in Appendix B of this report.

As mentioned above this report is an amendment to a Stormwater Report completed by BH2M in 2000 for the Sierra Woods Subdivision. The original analysis was completed using HydroCAD version 5.11. BH2M has recreated this analysis using version 10.20. Please note the transition between these versions of the program have resulted in some minor discrepancies between the results. Please also note that rainfall totals have increased since that time.

Subcatchments 3 and 4 (see plans in Appendix H) as part of the original analysis were determined using approximate USGS topography. As part of this project we have completed an on-ground topography survey of the parcel, therefore, a more accurate representation of these watersheds is now available as shown on the plans (see Sheets A-C). Please note these changes resulted in a change in the runoff totals for each of these watersheds (SA-3 & SA-4). For this analysis the time of concentration routes for each of these subcatchments was modeled using the original information (see plans in Appendix H).

The Pre-development Drainage Study resulted in the following peak flow rates:

Analysis Point #1 (Reach 10):

Storm Event	**AP #1**
2 year storm	26.72 cfs
10 year storm	65.40 cfs
25 year storm	101.79 cfs
50 year storm	138.07 cfs

Post Development Calculations

The Post Development Calculations are included in Appendixes C (new subdivision & 1A) and the Post Development Drainage Plan is shown on Sheet B of the plans

When completing this analysis a small discrepancy in the original areas associated with the 2000 Stormwater Report completed by BH2M for the Sierra Woods Subdivision was found. Please note this issue has been fixed as part of this analysis. Since this is a large

stormwater model we had to use several files to complete the analysis. We have included two files in Appendix C as follows:

- Sandy Brook New Subdivision
  This includes the model for the new proposed Sandy Brook Subdivision as shown on Sheet B of the plans.
- Sandy Brook #1A (entire project)
  This includes the model for the entire project as setup in 2000 by BH2M for the Sierra Woods Subdivision.

In order to allow the City a complete review of the project we have also included the remaining calculations that complete the stormwater analysis as part of the 2000 study (as described above transposed to current software) – see Appendix G for these four files of calculations.

The Post Development Drainage Study resulted in the following peak flow rates:

Analysis Point #1 (Reach 100):

Storm Event	**AP #1**
2 Year Storm	23.94 cfs (26.72 cfs)
10 Year Storm	60.90 cfs (65.40 cfs)
25 Year Storm	96.73 cfs (101.79 cfs)
50 Year Storm	126.68 cfs (138.07 cfs)

The proposed stormwater design treats the runoff and reduces the post development peak flow rates to less than the pre development peak flow rates for all storm events.

Basic Standards

Basic Standards are the Erosion and Sediment Control measures detailed in the E & S plans shown on Sheets 8 & 11 of the project plans.

The effectiveness of the proposed Wet Pond is directly related to the maintenance and protection received during construction. This includes both the site work such as the storm water infrastructure and utility construction as well as the house lot construction.

Flooding Standard

This project is not subject to the Flooding standards for the Maine DEP but this information is included as part of the City Standards. The following is a summary of the peak flow rates at the analysis points included within this report:

AP	Storm Event	Pre Development	Post Development
1	2 Year Storm	26.72 cfs	23.94 cfs
1	10 Year Storm	65.40 cfs	60.90 cfs
1	25 Year Storm	101.79 cfs	96.73 cfs
1	50 Year Storm	138.07 cfs	126.68 cfs

General Standards

Treatment calculations can be found in Appendix D. See Treatment Plan attached as Plan C for more information

Treatment Requirements

The Maine DEP requires the following treatment percentages for Stormwater projects:

Impervious Area = 95% = 2.73 ac.
Developed Area = 80% = 7.49 ac.

Provided Treatment

The total treatment provided can be found on the treatment chart in Appendix D or on Sheet D of the plans.

Total Impervious Area Treated = 2.81 Ac.> 2.73 Ac. **Therefore, GOOD**

Total Developed Area Treated=7.97 Ac.> 7.49 Ac. **Therefore GOOD**

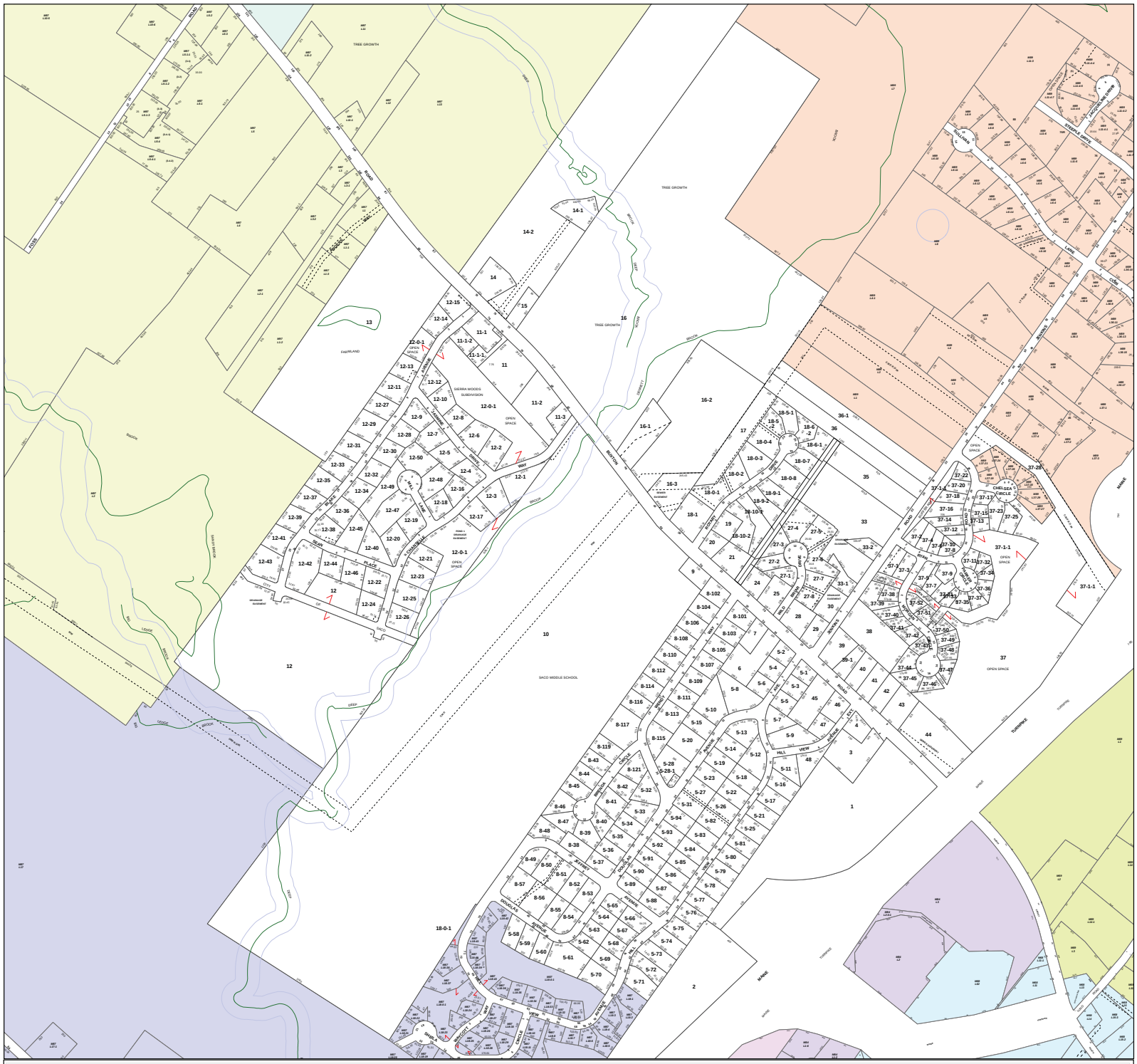
Proposed Wet Pond Sizing Calculations

(Pond 3)

Please see Appendix E – Wetpond sizing calculations

Appendix A

Maps



Misc
Condo
Easement/ROW
Hook
Hydro
Bordering Towns
Private ROW
Railway

THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY WITHIN CITY OF SACO AND IS COMPILED FROM RECORDED DEEDS, PLATS, TAX MAPS, SURVEYS, AERIAL PHOTOGRAPHS, AND OTHER PUBLIC RECORDS AND DATA. USERS OF THIS TAX MAP SHOULD BE AWARE THAT PRIMARY INFORMATION SOURCES SHOULD BE CONSULTED FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE CITY OF SACO ASSUMES NO LEGAL RESPONSIBILITY FOR THE INFORMATION CONTAINED HEREON, BEYOND IT'S USE IN THE CITY'S ASSESSMENT FUNCTION.

Map as of April 1, 2014

Scale: 1 inch = 200

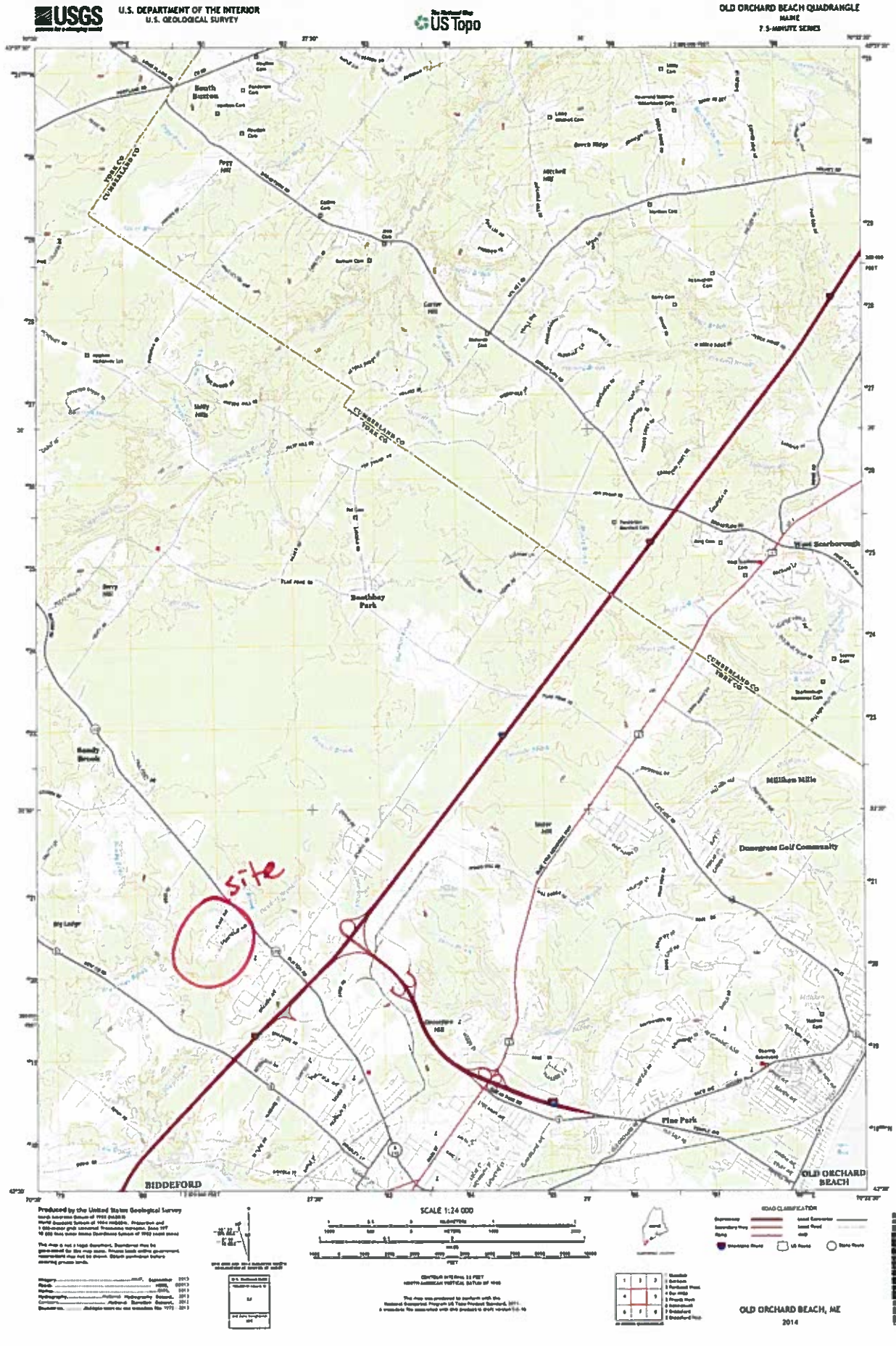
CITY OF SACO

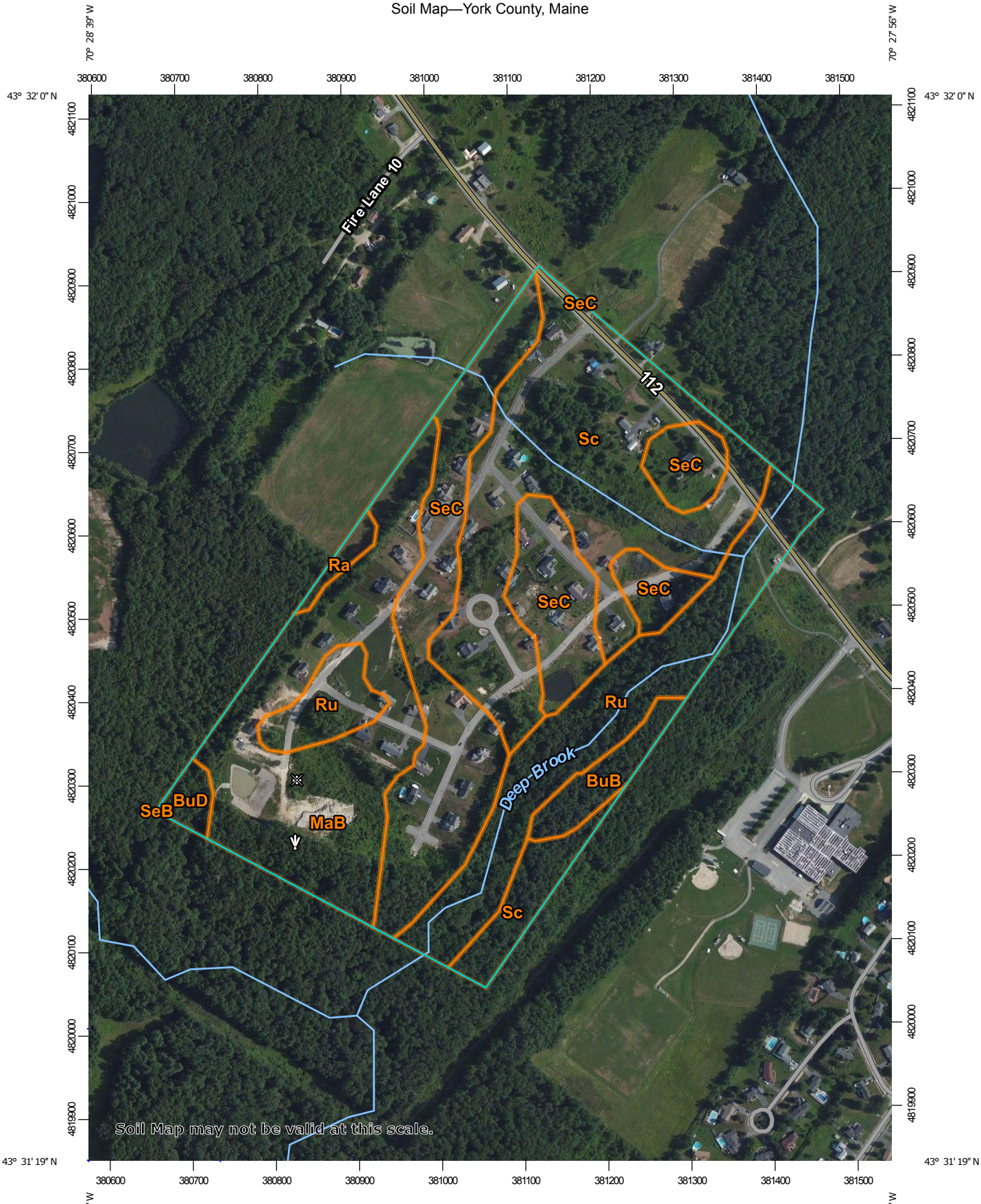
YORK COUNTY, MAINE

Tax Map

Number 88

100 0 100 200 Feet


USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
US Topo
OLD ORCHARD BEACH QUADRANGLE
MAINE
7.5-MINUTE SERIES
South Buxton
Scarborough
Saco
Boothbay Park
Sandy Brook
Big Ledge
Milliken Mills
Dunegrass Golf Community
Pine Park
BIDDEFORD
OLD ORCHARD BEACH
YORK CO
CUMBERLAND CO
site
SCALE 1:24 000
ROAD CLASSIFICATION
OLD ORCHARD BEACH, ME
2014



Map Scale: 1:6,230 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: York County, Maine
Survey Area Data: Version 15, Sep 15, 2016

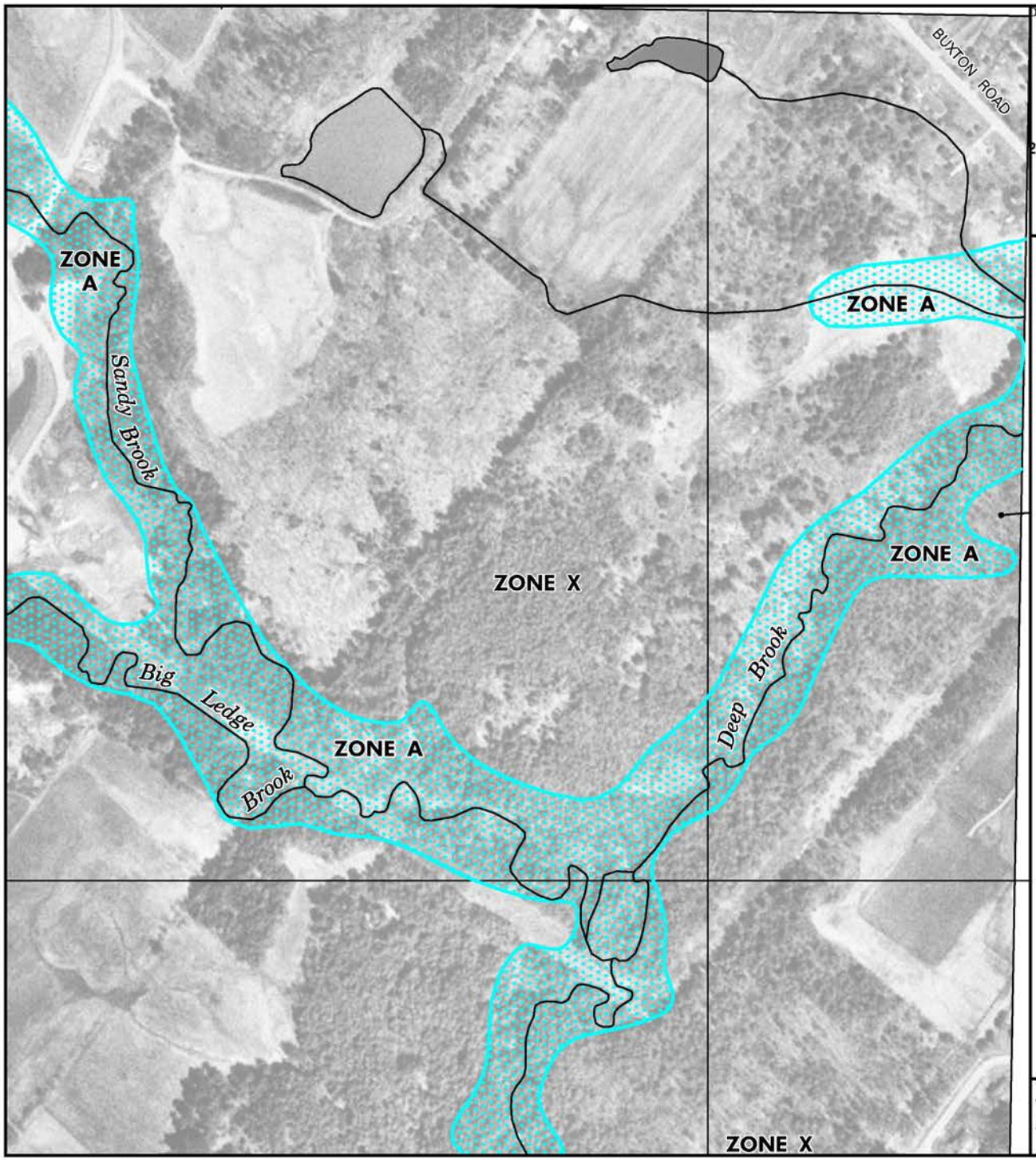
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 20, 2010—Jul 18, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

York County, Maine (ME031)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BuB	Buxton silt loam, 3 to 8 percent slopes	2.2	2.7%
BuD	Buxton silt loam, 15 to 25 percent slopes	0.9	1.1%
MaB	Madawaska fine sandy loam, 0 to 8 percent slopes	17.7	21.3%
Ra	Raynham silt loam	0.7	0.8%
Ru	Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded	14.9	17.9%
Sc	Scantic silt loam, 0 to 3 percent slopes	25.1	30.2%
SeB	Scio silt loam, 3 to 8 percent slopes	0.0	0.0%
SeC	Scio silt loam, 8 to 15 percent slopes	21.6	26.0%
Totals for Area of Interest		**83.0**	**100.0%**



...onal Flood Insurance Program" at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
SACO,
MAINE
YORK COUNTY

PANEL 38 OF 135

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SACO, CITY OF	230155	0038	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
2301550038D

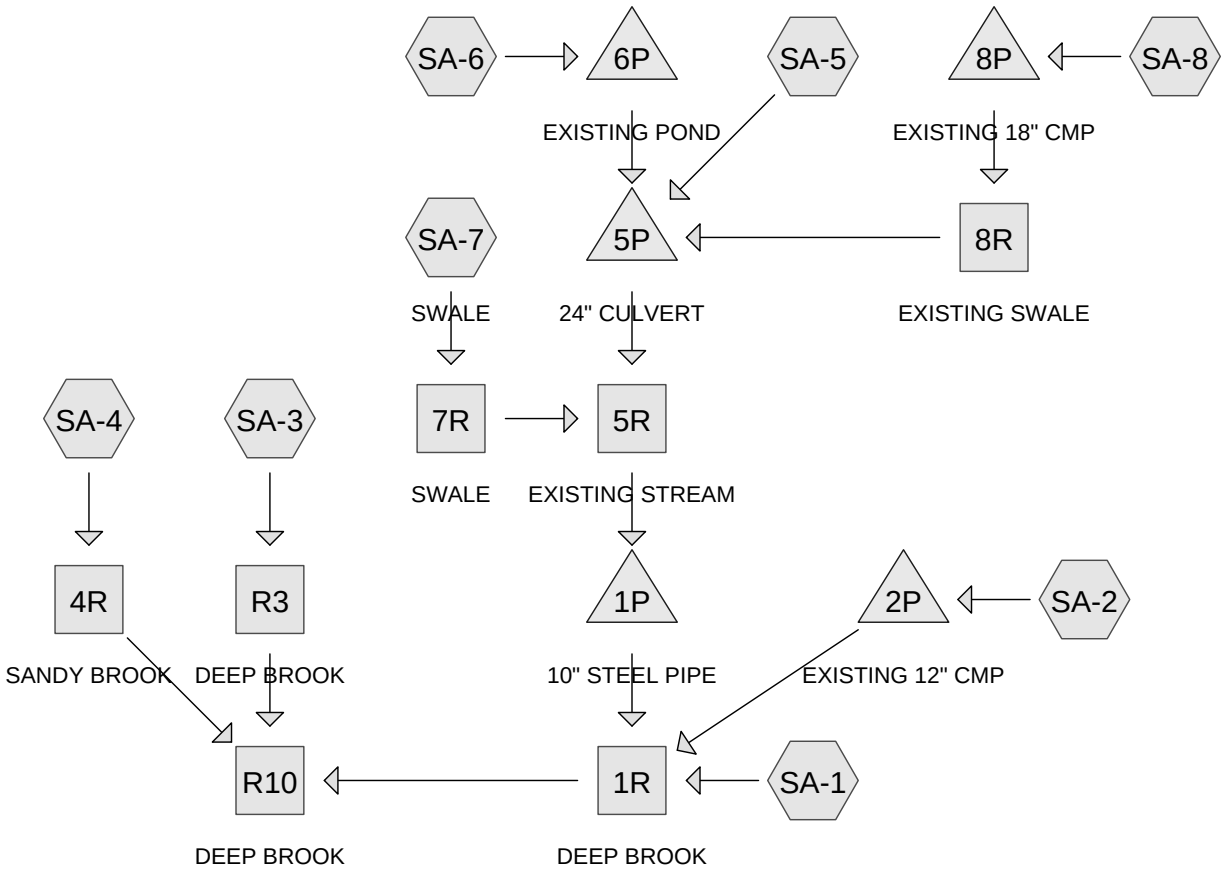
MAP REVISED
JANUARY 5, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix B

Pre Development Calculations



Subcat Reach Pond Link

Routing Diagram for Predevelopment
Prepared by BH2M, Printed 11/29/2017
HydroCAD® 10.00-20 s/n 00619 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.950	77	2 acre lots, 12% imp, HSG C (SA-5, SA-6, SA-7)
2.010	82	2 acre lots, 12% imp, HSG D (SA-2)
13.850	74	>75% Grass cover, Good, HSG C (SA-1, SA-3, SA-5, SA-6, SA-8)
7.370	80	>75% Grass cover, Good, HSG D (SA-1, SA-2, SA-3)
1.550	98	Impervious (SA-1, SA-2, SA-5, SA-7, SA-8)
67.070	70	Woods, Good, HSG C (SA-1, SA-3, SA-4, SA-5, SA-6, SA-8)
24.510	77	Woods, Good, HSG D (SA-1, SA-3, SA-4)
126.310	**73**	**TOTAL AREA**

Summary for Subcatchment SA-1:

Runoff = 10.92 cfs @ 12.72 hrs, Volume= 1.664 af, Depth> 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
	0.440	74	>75% Grass cover, Good, HSG C
	0.720	70	Woods, Good, HSG C
	6.250	80	>75% Grass cover, Good, HSG D
	8.910	77	Woods, Good, HSG D
*	0.080	98	Impervious
	16.400	78	Weighted Average
	16.320		99.51% Pervious Area
	0.080		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0050	0.07		**Sheet Flow,** n= 0.240 P2= 3.30"
19.3	410	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	1,000	0.0050	2.26	27.17	**Channel Flow,** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
51.2	1,510	Total			

Summary for Subcatchment SA-2:

Runoff = 2.17 cfs @ 12.79 hrs, Volume= 0.350 af, Depth> 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.230	98	Impervious
	0.480	80	>75% Grass cover, Good, HSG D
	2.010	82	2 acre lots, 12% imp, HSG D
	2.720	83	Weighted Average
	2.249		82.68% Pervious Area
	0.471		17.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
57.4	850	Total			

Summary for Subcatchment SA-3:

Runoff = 19.85 cfs @ 12.70 hrs, Volume= 2.985 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

Area (ac)	CN	Description
0.610	74	>75% Grass cover, Good, HSG C
0.640	80	>75% Grass cover, Good, HSG D
15.100	77	Woods, Good, HSG D
21.920	70	Woods, Good, HSG C
38.270	73	Weighted Average
38.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.4	200	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
26.2	1,100	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
47.4	1,450	Total			

Summary for Subcatchment SA-4:

Runoff = 4.07 cfs @ 12.99 hrs, Volume= 0.772 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

Area (ac)	CN	Description
0.500	77	Woods, Good, HSG D
11.430	70	Woods, Good, HSG C
11.930	70	Weighted Average
11.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9	150	0.0330	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
43.5	1,700	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
67.4	1,850	Total			

Summary for Subcatchment SA-5:

Runoff = 5.21 cfs @ 13.52 hrs, Volume= 1.284 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
	10.000	70	Woods, Good, HSG C
	4.000	77	2 acre lots, 12% imp, HSG C
*	0.500	98	Impervious
	2.500	74	>75% Grass cover, Good, HSG C
	17.000	73	Weighted Average
	16.020		94.24% Pervious Area
	0.980		5.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment SA-6:

Runoff = 6.12 cfs @ 13.99 hrs, Volume= 1.769 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

Area (ac)	CN	Description
4.000	77	2 acre lots, 12% imp, HSG C
4.300	74	>75% Grass cover, Good, HSG C
17.000	70	Woods, Good, HSG C
25.300	72	Weighted Average
24.820		98.10% Pervious Area
0.480		1.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment SA-7: SWALE

Runoff = 1.88 cfs @ 12.41 hrs, Volume= 0.214 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.140	98	Impervious
	1.950	77	2 acre lots, 12% imp, HSG C
	2.090	78	Weighted Average
	1.716		82.11% Pervious Area
	0.374		17.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
28.1	510	Total			

Summary for Subcatchment SA-8:

Runoff = 3.20 cfs @ 13.95 hrs, Volume= 0.930 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
	6.000	74	>75% Grass cover, Good, HSG C
	6.000	70	Woods, Good, HSG C
*	0.600	98	Impervious
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
140.6	1,250	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 76.110 ac, 3.92% Impervious, Inflow Depth > 0.73" for 2 YEAR STORM event
Inflow = 13.05 cfs @ 12.76 hrs, Volume= 4.643 af
Outflow = 9.90 cfs @ 13.73 hrs, Volume= 4.185 af, Atten= 24%, Lag= 58.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.63 fps, Min. Travel Time= 34.8 min
Avg. Velocity = 1.08 fps, Avg. Travel Time= 52.6 min

Peak Storage= 20,705 cf @ 13.15 hrs
Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 86.29', Outlet Invert= 76.09'



Summary for Reach 4R: SANDY BROOK

Inflow Area = 11.930 ac, 0.00% Impervious, Inflow Depth > 0.78" for 2 YEAR STORM event
Inflow = 4.07 cfs @ 12.99 hrs, Volume= 0.772 af
Outflow = 4.00 cfs @ 13.23 hrs, Volume= 0.759 af, Atten= 2%, Lag= 14.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.23 fps, Min. Travel Time= 8.1 min
Avg. Velocity = 0.66 fps, Avg. Travel Time= 15.1 min

Peak Storage= 1,953 cf @ 13.09 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 2.00' Flow Area= 21.2 sf, Capacity= 75.22 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.20'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 77.89', Outlet Invert= 76.09'



Summary for Reach 5R: EXISTING STREAM

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 0.63" for 2 YEAR STORM event
Inflow = 6.51 cfs @ 13.88 hrs, Volume= 2.972 af
Outflow = 6.44 cfs @ 14.32 hrs, Volume= 2.836 af, Atten= 1%, Lag= 26.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.26 fps, Min. Travel Time= 15.9 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 22.5 min

Peak Storage= 6,139 cf @ 14.06 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 2.00' Flow Area= 20.8 sf, Capacity= 56.70 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 0.2 '/' Top Width= 10.80'
Length= 1,200.0' Slope= 0.0050 '/'
Inlet Invert= 92.37', Outlet Invert= 86.37'



Summary for Reach 7R: SWALE

Inflow Area = 2.090 ac, 17.89% Impervious, Inflow Depth > 1.23" for 2 YEAR STORM event
Inflow = 1.88 cfs @ 12.41 hrs, Volume= 0.214 af
Outflow = 1.77 cfs @ 12.64 hrs, Volume= 0.211 af, Atten= 6%, Lag= 13.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.09 fps, Min. Travel Time= 8.0 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 20.1 min

Peak Storage= 851 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 10.1 sf, Capacity= 33.43 cfs

10.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 0.1 '/' Top Width= 10.20'
Length= 520.0' Slope= 0.0100 '/'
Inlet Invert= 97.57', Outlet Invert= 92.37'



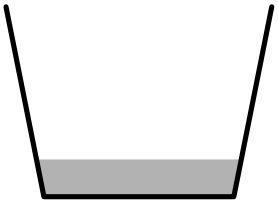
Summary for Reach 8R: EXISTING SWALE

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 0.86" for 2 YEAR STORM event
Inflow = 2.81 cfs @ 14.58 hrs, Volume= 0.906 af
Outflow = 2.79 cfs @ 14.99 hrs, Volume= 0.875 af, Atten= 1%, Lag= 24.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.51 fps, Min. Travel Time= 14.3 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 21.0 min

Peak Storage= 2,392 cf @ 14.75 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 3.00' Flow Area= 10.8 sf, Capacity= 31.76 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.2 '/' Top Width= 4.20'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 99.70', Outlet Invert= 93.20'



Summary for Reach R10: DEEP BROOK

Inflow Area = 126.310 ac, 2.36% Impervious, Inflow Depth > 0.75" for 2 YEAR STORM event
Inflow = 26.72 cfs @ 13.29 hrs, Volume= 7.842 af
Outflow = 26.71 cfs @ 13.31 hrs, Volume= 7.826 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.35 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1,135 cf @ 13.30 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 76.09', Outlet Invert= 75.79'



Summary for Reach R3: DEEP BROOK

Inflow Area = 38.270 ac, 0.00% Impervious, Inflow Depth > 0.94" for 2 YEAR STORM event
Inflow = 19.85 cfs @ 12.70 hrs, Volume= 2.985 af
Outflow = 18.17 cfs @ 13.10 hrs, Volume= 2.899 af, Atten= 8%, Lag= 23.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.17 fps, Min. Travel Time= 13.8 min
Avg. Velocity = 1.05 fps, Avg. Travel Time= 28.6 min

Peak Storage= 15,091 cf @ 12.87 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 3.00' Flow Area= 32.7 sf, Capacity= 141.32 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.80'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 81.49', Outlet Invert= 76.09'



Summary for Pond 1P: 10" STEEL PIPE

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 0.60" for 2 YEAR STORM event
Inflow = 6.44 cfs @ 14.32 hrs, Volume= 2.836 af
Outflow = 6.43 cfs @ 14.40 hrs, Volume= 2.630 af, Atten= 0%, Lag= 5.0 min
Primary = 6.43 cfs @ 14.40 hrs, Volume= 2.630 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 87.61' @ 14.40 hrs Surf.Area= 16,719 sf Storage= 10,128 cf

Plug-Flow detention time= 31.8 min calculated for 2.621 af (92% of inflow)
Center-of-Mass det. time= 15.8 min (985.4 - 969.6)

Volume	Invert	Avail.Storage	Storage Description
#1	86.40'	143,396 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.40	20	0	0
88.00	22,100	17,696	17,696
90.00	103,600	125,700	143,396

Device	Routing	Invert	Outlet Devices
#1	Primary	86.40'	**10.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.40' / 86.30' S= 0.0050 '/' Cc= 0.900

n= 0.013, Flow Area= 0.55 sf

#2	Primary	87.50'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.39 cfs @ 14.40 hrs HW=87.61' (Free Discharge)
1=Culvert (Barrel Controls 1.84 cfs @ 3.37 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 4.55 cfs @ 0.83 fps)

Summary for Pond 2P: EXISTING 12" CMP

Inflow Area = 2.720 ac, 17.32% Impervious, Inflow Depth > 1.54" for 2 YEAR STORM event
Inflow = 2.17 cfs @ 12.79 hrs, Volume= 0.350 af
Outflow = 2.11 cfs @ 12.89 hrs, Volume= 0.349 af, Atten= 3%, Lag= 5.8 min
Primary = 2.11 cfs @ 12.89 hrs, Volume= 0.349 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 88.00' @ 12.89 hrs Surf.Area= 849 sf Storage= 524 cf

Plug-Flow detention time= 4.6 min calculated for 0.347 af (99% of inflow)
Center-of-Mass det. time= 3.5 min (838.5 - 835.0)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	4,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	200	0	0
89.00	1,500	1,700	1,700
90.00	5,000	3,250	4,950

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**12.0" Round Culvert**
			L= 30.0' CMP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 87.00' / 86.10' S= 0.0300 '/' Cc= 0.900
			n= 0.024, Flow Area= 0.79 sf
#2	Primary	89.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.11 cfs @ 12.89 hrs HW=88.00' (Free Discharge)
1=Culvert (Inlet Controls 2.11 cfs @ 2.69 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: 24" CULVERT

Inflow Area = 54.900 ac, 3.75% Impervious, Inflow Depth > 0.61" for 2 YEAR STORM event
Inflow = 6.20 cfs @ 13.85 hrs, Volume= 2.770 af
Outflow = 6.18 cfs @ 13.91 hrs, Volume= 2.761 af, Atten= 0%, Lag= 3.5 min
Primary = 6.18 cfs @ 13.91 hrs, Volume= 2.761 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 93.77' @ 13.91 hrs Surf.Area= 1,706 sf Storage= 1,119 cf

Plug-Flow detention time= 2.9 min calculated for 2.752 af (99% of inflow)
Center-of-Mass det. time= 2.1 min (955.6 - 953.5)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.18 cfs @ 13.91 hrs HW=93.77' (Free Discharge)
└**1=Culvert** (Barrel Controls 6.18 cfs @ 4.17 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: EXISTING POND

Inflow Area = 25.300 ac, 1.90% Impervious, Inflow Depth > 0.84" for 2 YEAR STORM event
Inflow = 6.12 cfs @ 13.99 hrs, Volume= 1.769 af
Outflow = 2.10 cfs @ 16.88 hrs, Volume= 0.611 af, Atten= 66%, Lag= 173.2 min
Primary = 2.10 cfs @ 16.88 hrs, Volume= 0.611 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.20' @ 16.88 hrs Surf.Area= 28,519 sf Storage= 53,331 cf

Plug-Flow detention time= 248.1 min calculated for 0.611 af (35% of inflow)
Center-of-Mass det. time= 143.2 min (1,060.0 - 916.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	100.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.09 cfs @ 16.88 hrs HW=96.20' (Free Discharge)
└**1=Culvert** (Passes 2.09 cfs of 5.85 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 2.09 cfs @ 1.79 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: EXISTING 18" CMP

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 0.89" for 2 YEAR STORM event
Inflow = 3.20 cfs @ 13.95 hrs, Volume= 0.930 af
Outflow = 2.81 cfs @ 14.58 hrs, Volume= 0.906 af, Atten= 12%, Lag= 37.9 min
Primary = 2.81 cfs @ 14.58 hrs, Volume= 0.906 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.02' @ 14.58 hrs Surf.Area= 10,470 sf Storage= 5,609 cf

Plug-Flow detention time= 32.0 min calculated for 0.906 af (97% of inflow)
Center-of-Mass det. time= 24.9 min (943.6 - 918.7)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=2.81 cfs @ 14.58 hrs HW=101.02' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.81 cfs @ 3.09 fps)

Summary for Subcatchment SA-1:

Runoff = 21.78 cfs @ 12.70 hrs, Volume= 3.290 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
	0.440	74	>75% Grass cover, Good, HSG C
	0.720	70	Woods, Good, HSG C
	6.250	80	>75% Grass cover, Good, HSG D
	8.910	77	Woods, Good, HSG D
*	0.080	98	Impervious
	16.400	78	Weighted Average
	16.320		99.51% Pervious Area
	0.080		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0050	0.07		**Sheet Flow,** n= 0.240 P2= 3.30"
19.3	410	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	1,000	0.0050	2.26	27.17	**Channel Flow,** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
51.2	1,510	Total			

Summary for Subcatchment SA-2:

Runoff = 3.96 cfs @ 12.78 hrs, Volume= 0.644 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.230	98	Impervious
	0.480	80	>75% Grass cover, Good, HSG D
	2.010	82	2 acre lots, 12% imp, HSG D
	2.720	83	Weighted Average
	2.249		82.68% Pervious Area
	0.471		17.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
57.4	850	Total			

Summary for Subcatchment SA-3:

Runoff = 43.92 cfs @ 12.68 hrs, Volume= 6.389 af, Depth> 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

Area (ac)	CN	Description
0.610	74	>75% Grass cover, Good, HSG C
0.640	80	>75% Grass cover, Good, HSG D
15.100	77	Woods, Good, HSG D
21.920	70	Woods, Good, HSG C
38.270	73	Weighted Average
38.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.4	200	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
26.2	1,100	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
47.4	1,450	Total			

Summary for Subcatchment SA-4:

Runoff = 9.79 cfs @ 12.95 hrs, Volume= 1.749 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

Area (ac)	CN	Description
0.500	77	Woods, Good, HSG D
11.430	70	Woods, Good, HSG C
11.930	70	Weighted Average
11.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9	150	0.0330	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
43.5	1,700	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
67.4	1,850	Total			

Summary for Subcatchment SA-5:

Runoff = 11.65 cfs @ 13.42 hrs, Volume= 2.763 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
	10.000	70	Woods, Good, HSG C
	4.000	77	2 acre lots, 12% imp, HSG C
*	0.500	98	Impervious
	2.500	74	>75% Grass cover, Good, HSG C
	17.000	73	Weighted Average
	16.020		94.24% Pervious Area
	0.980		5.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment SA-6:

Runoff = 13.98 cfs @ 13.85 hrs, Volume= 3.886 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

Area (ac)	CN	Description
4.000	77	2 acre lots, 12% imp, HSG C
4.300	74	>75% Grass cover, Good, HSG C
17.000	70	Woods, Good, HSG C
25.300	72	Weighted Average
24.820		98.10% Pervious Area
0.480		1.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment SA-7: SWALE

Runoff = 3.74 cfs @ 12.40 hrs, Volume= 0.423 af, Depth> 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.140	98	Impervious
	1.950	77	2 acre lots, 12% imp, HSG C
	2.090	78	Weighted Average
	1.716		82.11% Pervious Area
	0.374		17.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
28.1	510	Total			

Summary for Subcatchment SA-8:

Runoff = 7.16 cfs @ 13.91 hrs, Volume= 2.009 af, Depth> 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
	6.000	74	>75% Grass cover, Good, HSG C
	6.000	70	Woods, Good, HSG C
*	0.600	98	Impervious
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
140.6	1,250	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 76.110 ac, 3.92% Impervious, Inflow Depth > 1.77" for 10 YEAR STORM event
Inflow = 26.08 cfs @ 12.74 hrs, Volume= 11.233 af
Outflow = 24.03 cfs @ 13.76 hrs, Volume= 10.546 af, Atten= 8%, Lag= 61.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.27 fps, Min. Travel Time= 25.0 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 41.5 min

Peak Storage= 36,081 cf @ 13.34 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 86.29', Outlet Invert= 76.09'



Summary for Reach 4R: SANDY BROOK

Inflow Area = 11.930 ac, 0.00% Impervious, Inflow Depth > 1.76" for 10 YEAR STORM event
Inflow = 9.79 cfs @ 12.95 hrs, Volume= 1.749 af
Outflow = 9.70 cfs @ 13.11 hrs, Volume= 1.729 af, Atten= 1%, Lag= 9.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.72 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 12.3 min

Peak Storage= 3,382 cf @ 13.01 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 2.00' Flow Area= 21.2 sf, Capacity= 75.22 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.20'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 77.89', Outlet Invert= 76.09'



Summary for Reach 5R: EXISTING STREAM

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 1.63" for 10 YEAR STORM event
Inflow = 18.26 cfs @ 14.29 hrs, Volume= 7.727 af
Outflow = 18.18 cfs @ 14.68 hrs, Volume= 7.528 af, Atten= 0%, Lag= 23.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.85 fps, Min. Travel Time= 10.8 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 17.6 min

Peak Storage= 11,821 cf @ 14.50 hrs
Average Depth at Peak Storage= 0.97'
Bank-Full Depth= 2.00' Flow Area= 20.8 sf, Capacity= 56.70 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 0.2 '/' Top Width= 10.80'
Length= 1,200.0' Slope= 0.0050 '/'
Inlet Invert= 92.37', Outlet Invert= 86.37'



Summary for Reach 7R: SWALE

Inflow Area = 2.090 ac, 17.89% Impervious, Inflow Depth > 2.43" for 10 YEAR STORM event
Inflow = 3.74 cfs @ 12.40 hrs, Volume= 0.423 af
Outflow = 3.62 cfs @ 12.56 hrs, Volume= 0.418 af, Atten= 3%, Lag= 10.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.44 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 16.7 min

Peak Storage= 1,313 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.00' Flow Area= 10.1 sf, Capacity= 33.43 cfs

10.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 0.1 '/' Top Width= 10.20'
Length= 520.0' Slope= 0.0100 '/'
Inlet Invert= 97.57', Outlet Invert= 92.37'



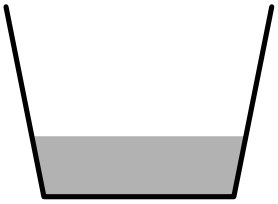
Summary for Reach 8R: EXISTING SWALE

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 1.87" for 10 YEAR STORM event
Inflow = 5.83 cfs @ 14.63 hrs, Volume= 1.966 af
Outflow = 5.81 cfs @ 14.96 hrs, Volume= 1.920 af, Atten= 0%, Lag= 19.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 11.4 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 17.9 min

Peak Storage= 3,967 cf @ 14.77 hrs
Average Depth at Peak Storage= 0.96'
Bank-Full Depth= 3.00' Flow Area= 10.8 sf, Capacity= 31.76 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.2 '/' Top Width= 4.20'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 99.70', Outlet Invert= 93.20'



Summary for Reach R10: DEEP BROOK

Inflow Area = 126.310 ac, 2.36% Impervious, Inflow Depth > 1.76" for 10 YEAR STORM event
Inflow = 65.40 cfs @ 13.10 hrs, Volume= 18.544 af
Outflow = 65.35 cfs @ 13.12 hrs, Volume= 18.521 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 1.0 min

Peak Storage= 2,022 cf @ 13.11 hrs
Average Depth at Peak Storage= 1.58'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 76.09', Outlet Invert= 75.79'



Summary for Reach R3: DEEP BROOK

Inflow Area = 38.270 ac, 0.00% Impervious, Inflow Depth > 2.00" for 10 YEAR STORM event
Inflow = 43.92 cfs @ 12.68 hrs, Volume= 6.389 af
Outflow = 41.76 cfs @ 12.96 hrs, Volume= 6.269 af, Atten= 5%, Lag= 17.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.92 fps, Min. Travel Time= 10.3 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 23.6 min

Peak Storage= 25,828 cf @ 12.79 hrs
Average Depth at Peak Storage= 1.38'
Bank-Full Depth= 3.00' Flow Area= 32.7 sf, Capacity= 141.32 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.80'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 81.49', Outlet Invert= 76.09'



Summary for Pond 1P: 10" STEEL PIPE

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 1.59" for 10 YEAR STORM event
Inflow = 18.18 cfs @ 14.68 hrs, Volume= 7.528 af
Outflow = 18.17 cfs @ 14.74 hrs, Volume= 7.301 af, Atten= 0%, Lag= 3.8 min
Primary = 18.17 cfs @ 14.74 hrs, Volume= 7.301 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 87.75' @ 14.74 hrs Surf.Area= 18,715 sf Storage= 12,690 cf

Plug-Flow detention time= 15.4 min calculated for 7.301 af (97% of inflow)
Center-of-Mass det. time= 8.2 min (964.6 - 956.4)

Volume	Invert	Avail.Storage	Storage Description
#1	86.40'	143,396 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.40	20	0	0
88.00	22,100	17,696	17,696
90.00	103,600	125,700	143,396

Device	Routing	Invert	Outlet Devices
#1	Primary	86.40'	**10.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.40' / 86.30' S= 0.0050 '/' Cc= 0.900

n= 0.013, Flow Area= 0.55 sf
#2 Primary 87.50' **50.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=18.13 cfs @ 14.74 hrs HW=87.75' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.01 cfs @ 3.68 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 16.13 cfs @ 1.27 fps)

Summary for Pond 2P: EXISTING 12" CMP

Inflow Area = 2.720 ac, 17.32% Impervious, Inflow Depth > 2.84" for 10 YEAR STORM event
Inflow = 3.96 cfs @ 12.78 hrs, Volume= 0.644 af
Outflow = 3.59 cfs @ 12.98 hrs, Volume= 0.643 af, Atten= 9%, Lag= 11.9 min
Primary = 3.59 cfs @ 12.98 hrs, Volume= 0.643 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 88.94' @ 12.98 hrs Surf.Area= 1,464 sf Storage= 1,618 cf

Plug-Flow detention time= 5.3 min calculated for 0.641 af (99% of inflow)
Center-of-Mass det. time= 4.5 min (826.1 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	4,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	200	0	0
89.00	1,500	1,700	1,700
90.00	5,000	3,250	4,950

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**12.0" Round Culvert**
			L= 30.0' CMP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 87.00' / 86.10' S= 0.0300 '/' Cc= 0.900
			n= 0.024, Flow Area= 0.79 sf
#2	Primary	89.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.58 cfs @ 12.98 hrs HW=88.94' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.58 cfs @ 4.56 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: 24" CULVERT

Inflow Area = 54.900 ac, 3.75% Impervious, Inflow Depth > 1.60" for 10 YEAR STORM event
Inflow = 17.79 cfs @ 14.31 hrs, Volume= 7.327 af
Outflow = 17.79 cfs @ 14.33 hrs, Volume= 7.309 af, Atten= 0%, Lag= 1.0 min
Primary = 17.79 cfs @ 14.33 hrs, Volume= 7.309 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.08' @ 14.33 hrs Surf.Area= 3,618 sf Storage= 4,567 cf

Plug-Flow detention time= 4.0 min calculated for 7.309 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (946.3 - 942.9)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=17.74 cfs @ 14.33 hrs HW=95.08' (Free Discharge)
└**1=Culvert** (Inlet Controls 15.00 cfs @ 4.78 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.74 cfs @ 0.70 fps)

Summary for Pond 6P: EXISTING POND

Inflow Area = 25.300 ac, 1.90% Impervious, Inflow Depth > 1.84" for 10 YEAR STORM event
Inflow = 13.98 cfs @ 13.85 hrs, Volume= 3.886 af
Outflow = 6.54 cfs @ 15.66 hrs, Volume= 2.644 af, Atten= 53%, Lag= 108.5 min
Primary = 6.54 cfs @ 15.66 hrs, Volume= 2.644 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.12' @ 15.66 hrs Surf.Area= 32,105 sf Storage= 81,381 cf

Plug-Flow detention time= 161.5 min calculated for 2.636 af (68% of inflow)
Center-of-Mass det. time= 99.3 min (1,001.8 - 902.5)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	100.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.54 cfs @ 15.66 hrs HW=97.12' (Free Discharge)
└**1=Culvert** (Passes 6.54 cfs of 7.37 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 6.54 cfs @ 5.33 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: EXISTING 18" CMP

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 1.91" for 10 YEAR STORM event
Inflow = 7.16 cfs @ 13.91 hrs, Volume= 2.009 af
Outflow = 5.83 cfs @ 14.63 hrs, Volume= 1.966 af, Atten= 19%, Lag= 43.1 min
Primary = 5.83 cfs @ 14.63 hrs, Volume= 1.966 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.66' @ 14.63 hrs Surf.Area= 16,715 sf Storage= 14,314 cf

Plug-Flow detention time= 35.9 min calculated for 1.966 af (98% of inflow)
Center-of-Mass det. time= 29.8 min (934.6 - 904.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=5.83 cfs @ 14.63 hrs HW=101.66' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.83 cfs @ 3.71 fps)

Summary for Subcatchment SA-1:

Runoff = 31.17 cfs @ 12.70 hrs, Volume= 4.732 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
	0.440	74	>75% Grass cover, Good, HSG C
	0.720	70	Woods, Good, HSG C
	6.250	80	>75% Grass cover, Good, HSG D
	8.910	77	Woods, Good, HSG D
*	0.080	98	Impervious
	16.400	78	Weighted Average
	16.320		99.51% Pervious Area
	0.080		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0050	0.07		**Sheet Flow,** n= 0.240 P2= 3.30"
19.3	410	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	1,000	0.0050	2.26	27.17	**Channel Flow,** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
51.2	1,510	Total			

Summary for Subcatchment SA-2:

Runoff = 5.46 cfs @ 12.77 hrs, Volume= 0.898 af, Depth> 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.230	98	Impervious
	0.480	80	>75% Grass cover, Good, HSG D
	2.010	82	2 acre lots, 12% imp, HSG D
	2.720	83	Weighted Average
	2.249		82.68% Pervious Area
	0.471		17.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
57.4	850	Total			

Summary for Subcatchment SA-3:

Runoff = 65.52 cfs @ 12.66 hrs, Volume= 9.516 af, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

Area (ac)	CN	Description
0.610	74	>75% Grass cover, Good, HSG C
0.640	80	>75% Grass cover, Good, HSG D
15.100	77	Woods, Good, HSG D
21.920	70	Woods, Good, HSG C
38.270	73	Weighted Average
38.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.4	200	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
26.2	1,100	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
47.4	1,450	Total			

Summary for Subcatchment SA-4:

Runoff = 15.08 cfs @ 12.94 hrs, Volume= 2.667 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

Area (ac)	CN	Description
0.500	77	Woods, Good, HSG D
11.430	70	Woods, Good, HSG C
11.930	70	Weighted Average
11.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9	150	0.0330	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
43.5	1,700	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
67.4	1,850	Total			

Summary for Subcatchment SA-5:

Runoff = 17.49 cfs @ 13.40 hrs, Volume= 4.124 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
	10.000	70	Woods, Good, HSG C
	4.000	77	2 acre lots, 12% imp, HSG C
*	0.500	98	Impervious
	2.500	74	>75% Grass cover, Good, HSG C
	17.000	73	Weighted Average
	16.020		94.24% Pervious Area
	0.980		5.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment SA-6:

Runoff = 21.23 cfs @ 13.77 hrs, Volume= 5.853 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

Area (ac)	CN	Description
4.000	77	2 acre lots, 12% imp, HSG C
4.300	74	>75% Grass cover, Good, HSG C
17.000	70	Woods, Good, HSG C
25.300	72	Weighted Average
24.820		98.10% Pervious Area
0.480		1.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment SA-7: SWALE

Runoff = 5.35 cfs @ 12.39 hrs, Volume= 0.608 af, Depth> 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.140	98	Impervious
	1.950	77	2 acre lots, 12% imp, HSG C
	2.090	78	Weighted Average
	1.716		82.11% Pervious Area
	0.374		17.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
28.1	510	Total			

Summary for Subcatchment SA-8:

Runoff = 10.74 cfs @ 13.90 hrs, Volume= 3.004 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
	6.000	74	>75% Grass cover, Good, HSG C
	6.000	70	Woods, Good, HSG C
*	0.600	98	Impervious
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
140.6	1,250	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 76.110 ac, 3.92% Impervious, Inflow Depth > 2.66" for 25 YEAR STORM event
Inflow = 44.24 cfs @ 12.84 hrs, Volume= 16.853 af
Outflow = 39.26 cfs @ 13.44 hrs, Volume= 15.959 af, Atten= 11%, Lag= 36.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.71 fps, Min. Travel Time= 20.9 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 37.6 min

Peak Storage= 49,352 cf @ 13.10 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 86.29', Outlet Invert= 76.09'



Summary for Reach 4R: SANDY BROOK

Inflow Area = 11.930 ac, 0.00% Impervious, Inflow Depth > 2.68" for 25 YEAR STORM event
Inflow = 15.08 cfs @ 12.94 hrs, Volume= 2.667 af
Outflow = 14.96 cfs @ 13.07 hrs, Volume= 2.644 af, Atten= 1%, Lag= 7.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.02 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 11.0 min

Peak Storage= 4,444 cf @ 12.98 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00' Flow Area= 21.2 sf, Capacity= 75.22 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.20'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 77.89', Outlet Invert= 76.09'



Summary for Reach 5R: EXISTING STREAM

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 2.48" for 25 YEAR STORM event
Inflow = 27.64 cfs @ 13.85 hrs, Volume= 11.773 af
Outflow = 27.45 cfs @ 14.12 hrs, Volume= 11.476 af, Atten= 1%, Lag= 16.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.13 fps, Min. Travel Time= 9.4 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 15.9 min

Peak Storage= 15,432 cf @ 13.97 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 2.00' Flow Area= 20.8 sf, Capacity= 56.70 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 0.2 '/' Top Width= 10.80'
Length= 1,200.0' Slope= 0.0050 '/'
Inlet Invert= 92.37', Outlet Invert= 86.37'



Summary for Reach 7R: SWALE

Inflow Area = 2.090 ac, 17.89% Impervious, Inflow Depth > 3.49" for 25 YEAR STORM event
Inflow = 5.35 cfs @ 12.39 hrs, Volume= 0.608 af
Outflow = 5.20 cfs @ 12.54 hrs, Volume= 0.602 af, Atten= 3%, Lag= 8.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.65 fps, Min. Travel Time= 5.2 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 15.2 min

Peak Storage= 1,642 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 10.1 sf, Capacity= 33.43 cfs

10.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 0.1 '/' Top Width= 10.20'
Length= 520.0' Slope= 0.0100 '/'
Inlet Invert= 97.57', Outlet Invert= 92.37'



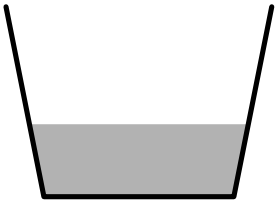
Summary for Reach 8R: EXISTING SWALE

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 2.80" for 25 YEAR STORM event
Inflow = 7.63 cfs @ 14.83 hrs, Volume= 2.943 af
Outflow = 7.61 cfs @ 15.14 hrs, Volume= 2.885 af, Atten= 0%, Lag= 18.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 10.5 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 16.4 min

Peak Storage= 4,807 cf @ 14.97 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 3.00' Flow Area= 10.8 sf, Capacity= 31.76 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.2 '/' Top Width= 4.20'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 99.70', Outlet Invert= 93.20'



Summary for Reach R10: DEEP BROOK

Inflow Area = 126.310 ac, 2.36% Impervious, Inflow Depth > 2.66" for 25 YEAR STORM event
Inflow = 101.79 cfs @ 13.07 hrs, Volume= 27.974 af
Outflow = 101.74 cfs @ 13.08 hrs, Volume= 27.944 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.85 fps, Avg. Travel Time= 0.9 min

Peak Storage= 2,711 cf @ 13.07 hrs
Average Depth at Peak Storage= 2.08'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 76.09', Outlet Invert= 75.79'



Summary for Reach R3: DEEP BROOK

Inflow Area = 38.270 ac, 0.00% Impervious, Inflow Depth > 2.98" for 25 YEAR STORM event
Inflow = 65.52 cfs @ 12.66 hrs, Volume= 9.516 af
Outflow = 63.15 cfs @ 12.91 hrs, Volume= 9.371 af, Atten= 4%, Lag= 15.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.35 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 21.3 min

Peak Storage= 33,931 cf @ 12.77 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 3.00' Flow Area= 32.7 sf, Capacity= 141.32 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.80'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 81.49', Outlet Invert= 76.09'



Summary for Pond 1P: 10" STEEL PIPE

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 2.42" for 25 YEAR STORM event
Inflow = 27.45 cfs @ 14.12 hrs, Volume= 11.476 af
Outflow = 27.42 cfs @ 14.17 hrs, Volume= 11.225 af, Atten= 0%, Lag= 3.2 min
Primary = 27.42 cfs @ 14.17 hrs, Volume= 11.225 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 87.84' @ 14.17 hrs Surf.Area= 19,910 sf Storage= 14,363 cf

Plug-Flow detention time= 11.8 min calculated for 11.225 af (98% of inflow)
Center-of-Mass det. time= 6.4 min (957.7 - 951.3)

Volume	Invert	Avail.Storage	Storage Description
#1	86.40'	143,396 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.40	20	0	0
88.00	22,100	17,696	17,696
90.00	103,600	125,700	143,396

Device	Routing	Invert	Outlet Devices
#1	Primary	86.40'	**10.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.40' / 86.30' S= 0.0050 '/' Cc= 0.900

n= 0.013, Flow Area= 0.55 sf

#2	Primary	87.50'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=27.41 cfs @ 14.17 hrs HW=87.84' (Free Discharge)
- **1=Culvert** (Inlet Controls 2.10 cfs @ 3.85 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 25.31 cfs @ 1.48 fps)

Summary for Pond 2P: EXISTING 12" CMP

Inflow Area = 2.720 ac, 17.32% Impervious, Inflow Depth > 3.96" for 25 YEAR STORM event
Inflow = 5.46 cfs @ 12.77 hrs, Volume= 0.898 af
Outflow = 5.46 cfs @ 12.79 hrs, Volume= 0.896 af, Atten= 0%, Lag= 1.1 min
Primary = 5.46 cfs @ 12.79 hrs, Volume= 0.896 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 89.10' @ 12.79 hrs Surf.Area= 1,848 sf Storage= 1,867 cf

Plug-Flow detention time= 5.3 min calculated for 0.893 af (99% of inflow)
Center-of-Mass det. time= 4.6 min (818.7 - 814.1)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	4,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	200	0	0
89.00	1,500	1,700	1,700
90.00	5,000	3,250	4,950

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**12.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.00' / 86.10' S= 0.0300 '/' Cc= 0.900 n= 0.024, Flow Area= 0.79 sf
#2	Primary	89.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.45 cfs @ 12.79 hrs HW=89.10' (Free Discharge)
- **1=Culvert** (Inlet Controls 3.78 cfs @ 4.81 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 1.68 cfs @ 0.84 fps)

Summary for Pond 5P: 24" CULVERT

Inflow Area = 54.900 ac, 3.75% Impervious, Inflow Depth > 2.45" for 25 YEAR STORM event
Inflow = 26.87 cfs @ 13.85 hrs, Volume= 11.210 af
Outflow = 26.87 cfs @ 13.86 hrs, Volume= 11.171 af, Atten= 0%, Lag= 0.7 min
Primary = 26.87 cfs @ 13.86 hrs, Volume= 11.171 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.20' @ 13.86 hrs Surf.Area= 3,802 sf Storage= 5,023 cf

Plug-Flow detention time= 3.7 min calculated for 11.171 af (100% of inflow)
Center-of-Mass det. time= 2.8 min (944.2 - 941.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=26.83 cfs @ 13.86 hrs HW=95.20' (Free Discharge)
└─**1=Culvert** (Inlet Controls 15.58 cfs @ 4.96 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 11.25 cfs @ 1.12 fps)

Summary for Pond 6P: EXISTING POND

Inflow Area = 25.300 ac, 1.90% Impervious, Inflow Depth > 2.78" for 25 YEAR STORM event
Inflow = 21.23 cfs @ 13.77 hrs, Volume= 5.853 af
Outflow = 8.94 cfs @ 15.77 hrs, Volume= 4.201 af, Atten= 58%, Lag= 120.3 min
Primary = 8.94 cfs @ 15.77 hrs, Volume= 4.201 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.30' @ 15.77 hrs Surf.Area= 36,651 sf Storage= 121,714 cf

Plug-Flow detention time= 163.4 min calculated for 4.187 af (72% of inflow)
Center-of-Mass det. time= 106.5 min (1,001.3 - 894.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	100.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.94 cfs @ 15.77 hrs HW=98.30' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.94 cfs @ 7.28 fps)
└**2=Orifice/Grate** (Passes 8.94 cfs of 9.15 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: EXISTING 18" CMP

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 2.86" for 25 YEAR STORM event
Inflow = 10.74 cfs @ 13.90 hrs, Volume= 3.004 af
Outflow = 7.63 cfs @ 14.83 hrs, Volume= 2.943 af, Atten= 29%, Lag= 55.8 min
Primary = 7.63 cfs @ 14.83 hrs, Volume= 2.943 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.29' @ 14.83 hrs Surf.Area= 22,910 sf Storage= 26,743 cf

Plug-Flow detention time= 45.3 min calculated for 2.933 af (98% of inflow)
Center-of-Mass det. time= 39.4 min (936.7 - 897.3)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=7.63 cfs @ 14.83 hrs HW=102.29' (Free Discharge)
└**1=Culvert** (Barrel Controls 7.63 cfs @ 4.32 fps)

Summary for Subcatchment SA-1:

Runoff = 39.29 cfs @ 12.69 hrs, Volume= 6.003 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
	0.440	74	>75% Grass cover, Good, HSG C
	0.720	70	Woods, Good, HSG C
	6.250	80	>75% Grass cover, Good, HSG D
	8.910	77	Woods, Good, HSG D
*	0.080	98	Impervious
	16.400	78	Weighted Average
	16.320		99.51% Pervious Area
	0.080		0.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	100	0.0050	0.07		**Sheet Flow,** n= 0.240 P2= 3.30"
19.3	410	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	1,000	0.0050	2.26	27.17	**Channel Flow,** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
51.2	1,510	Total			

Summary for Subcatchment SA-2:

Runoff = 6.74 cfs @ 12.76 hrs, Volume= 1.118 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.230	98	Impervious
	0.480	80	>75% Grass cover, Good, HSG D
	2.010	82	2 acre lots, 12% imp, HSG D
	2.720	83	Weighted Average
	2.249		82.68% Pervious Area
	0.471		17.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
57.4	850	Total			

Summary for Subcatchment SA-3:

Runoff = 84.60 cfs @ 12.65 hrs, Volume= 12.318 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

Area (ac)	CN	Description
0.610	74	>75% Grass cover, Good, HSG C
0.640	80	>75% Grass cover, Good, HSG D
15.100	77	Woods, Good, HSG D
21.920	70	Woods, Good, HSG C
38.270	73	Weighted Average
38.270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.4	200	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
26.2	1,100	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
47.4	1,450	Total			

Summary for Subcatchment SA-4:

Runoff = 19.80 cfs @ 12.93 hrs, Volume= 3.500 af, Depth> 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

Area (ac)	CN	Description
0.500	77	Woods, Good, HSG D
11.430	70	Woods, Good, HSG C
11.930	70	Weighted Average
11.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9	150	0.0330	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
43.5	1,700	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
67.4	1,850	Total			

Summary for Subcatchment SA-5:

Runoff = 22.66 cfs @ 13.39 hrs, Volume= 5.345 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
	10.000	70	Woods, Good, HSG C
	4.000	77	2 acre lots, 12% imp, HSG C
*	0.500	98	Impervious
	2.500	74	>75% Grass cover, Good, HSG C
	17.000	73	Weighted Average
	16.020		94.24% Pervious Area
	0.980		5.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment SA-6:

Runoff = 27.68 cfs @ 13.76 hrs, Volume= 7.625 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

Area (ac)	CN	Description
4.000	77	2 acre lots, 12% imp, HSG C
4.300	74	>75% Grass cover, Good, HSG C
17.000	70	Woods, Good, HSG C
25.300	72	Weighted Average
24.820		98.10% Pervious Area
0.480		1.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment SA-7: SWALE

Runoff = 6.74 cfs @ 12.39 hrs, Volume= 0.771 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.140	98	Impervious
	1.950	77	2 acre lots, 12% imp, HSG C
	2.090	78	Weighted Average
	1.716		82.11% Pervious Area
	0.374		17.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
28.1	510	Total			

Summary for Subcatchment SA-8:

Runoff = 13.91 cfs @ 13.89 hrs, Volume= 3.896 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
	6.000	74	>75% Grass cover, Good, HSG C
	6.000	70	Woods, Good, HSG C
*	0.600	98	Impervious
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
140.6	1,250	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 76.110 ac, 3.92% Impervious, Inflow Depth > 3.39" for 50 YEAR STORM event
Inflow = 58.10 cfs @ 12.79 hrs, Volume= 21.476 af
Outflow = 52.36 cfs @ 13.34 hrs, Volume= 20.415 af, Atten= 10%, Lag= 32.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.99 fps, Min. Travel Time= 18.9 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 35.5 min

Peak Storage= 59,498 cf @ 13.02 hrs
Average Depth at Peak Storage= 1.38'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 86.29', Outlet Invert= 76.09'



Summary for Reach 4R: SANDY BROOK

Inflow Area = 11.930 ac, 0.00% Impervious, Inflow Depth > 3.52" for 50 YEAR STORM event
Inflow = 19.80 cfs @ 12.93 hrs, Volume= 3.500 af
Outflow = 19.67 cfs @ 13.05 hrs, Volume= 3.474 af, Atten= 1%, Lag= 7.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 10.2 min

Peak Storage= 5,288 cf @ 12.97 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 2.00' Flow Area= 21.2 sf, Capacity= 75.22 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.20'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 77.89', Outlet Invert= 76.09'



Summary for Reach 5R: EXISTING STREAM

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 3.16" for 50 YEAR STORM event
Inflow = 35.35 cfs @ 13.69 hrs, Volume= 14.996 af
Outflow = 35.15 cfs @ 13.94 hrs, Volume= 14.625 af, Atten= 1%, Lag= 14.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.32 fps, Min. Travel Time= 8.6 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 15.0 min

Peak Storage= 18,146 cf @ 13.80 hrs
Average Depth at Peak Storage= 1.47'
Bank-Full Depth= 2.00' Flow Area= 20.8 sf, Capacity= 56.70 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 0.2 '/' Top Width= 10.80'
Length= 1,200.0' Slope= 0.0050 '/'
Inlet Invert= 92.37', Outlet Invert= 86.37'



Summary for Reach 7R: SWALE

Inflow Area = 2.090 ac, 17.89% Impervious, Inflow Depth > 4.43" for 50 YEAR STORM event
Inflow = 6.74 cfs @ 12.39 hrs, Volume= 0.771 af
Outflow = 6.58 cfs @ 12.52 hrs, Volume= 0.764 af, Atten= 2%, Lag= 8.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 14.2 min

Peak Storage= 1,897 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 10.1 sf, Capacity= 33.43 cfs

10.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 0.1 '/' Top Width= 10.20'
Length= 520.0' Slope= 0.0100 '/'
Inlet Invert= 97.57', Outlet Invert= 92.37'



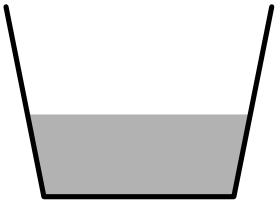
Summary for Reach 8R: EXISTING SWALE

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 3.64" for 50 YEAR STORM event
Inflow = 9.19 cfs @ 14.93 hrs, Volume= 3.818 af
Outflow = 9.18 cfs @ 15.23 hrs, Volume= 3.749 af, Atten= 0%, Lag= 17.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.17 fps, Min. Travel Time= 10.0 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 15.5 min

Peak Storage= 5,505 cf @ 15.06 hrs
Average Depth at Peak Storage= 1.30'
Bank-Full Depth= 3.00' Flow Area= 10.8 sf, Capacity= 31.76 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 0.2 '/' Top Width= 4.20'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 99.70', Outlet Invert= 93.20'



Summary for Reach R10: DEEP BROOK

Inflow Area = 126.310 ac, 2.36% Impervious, Inflow Depth > 3.42" for 50 YEAR STORM event
Inflow = 138.07 cfs @ 13.04 hrs, Volume= 36.043 af
Outflow = 137.99 cfs @ 13.05 hrs, Volume= 36.008 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.15 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.96 fps, Avg. Travel Time= 0.8 min

Peak Storage= 3,329 cf @ 13.05 hrs
Average Depth at Peak Storage= 2.51'
Bank-Full Depth= 3.00' Flow Area= 40.5 sf, Capacity= 183.88 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.5 '/' Top Width= 15.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 76.09', Outlet Invert= 75.79'



Summary for Reach R3: DEEP BROOK

Inflow Area = 38.270 ac, 0.00% Impervious, Inflow Depth > 3.86" for 50 YEAR STORM event
Inflow = 84.60 cfs @ 12.65 hrs, Volume= 12.318 af
Outflow = 81.83 cfs @ 12.89 hrs, Volume= 12.154 af, Atten= 3%, Lag= 14.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.65 fps, Min. Travel Time= 8.2 min
Avg. Velocity = 1.50 fps, Avg. Travel Time= 20.0 min

Peak Storage= 40,448 cf @ 12.75 hrs
Average Depth at Peak Storage= 2.11'
Bank-Full Depth= 3.00' Flow Area= 32.7 sf, Capacity= 141.32 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 0.3 '/' Top Width= 11.80'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 81.49', Outlet Invert= 76.09'



Summary for Pond 1P: 10" STEEL PIPE

Inflow Area = 56.990 ac, 4.27% Impervious, Inflow Depth > 3.08" for 50 YEAR STORM event
Inflow = 35.15 cfs @ 13.94 hrs, Volume= 14.625 af
Outflow = 35.11 cfs @ 13.99 hrs, Volume= 14.356 af, Atten= 0%, Lag= 2.9 min
Primary = 35.11 cfs @ 13.99 hrs, Volume= 14.356 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 87.90' @ 13.99 hrs Surf.Area= 20,775 sf Storage= 15,638 cf

Plug-Flow detention time= 10.3 min calculated for 14.356 af (98% of inflow)
Center-of-Mass det. time= 5.7 min (952.5 - 946.8)

Volume	Invert	Avail.Storage	Storage Description
#1	86.40'	143,396 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.40	20	0	0
88.00	22,100	17,696	17,696
90.00	103,600	125,700	143,396

Device	Routing	Invert	Outlet Devices
#1	Primary	86.40'	**10.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.40' / 86.30' S= 0.0050 '/' Cc= 0.900

n= 0.013, Flow Area= 0.55 sf

#2	Primary	87.50'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=35.06 cfs @ 13.99 hrs HW=87.90' (Free Discharge)
- **1=Culvert** (Inlet Controls 2.16 cfs @ 3.96 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 32.89 cfs @ 1.63 fps)

Summary for Pond 2P: EXISTING 12" CMP

Inflow Area = 2.720 ac, 17.32% Impervious, Inflow Depth > 4.93" for 50 YEAR STORM event
Inflow = 6.74 cfs @ 12.76 hrs, Volume= 1.118 af
Outflow = 6.74 cfs @ 12.78 hrs, Volume= 1.116 af, Atten= 0%, Lag= 0.9 min
Primary = 6.74 cfs @ 12.78 hrs, Volume= 1.116 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 89.14' @ 12.78 hrs Surf.Area= 2,001 sf Storage= 1,950 cf

Plug-Flow detention time= 5.1 min calculated for 1.112 af (99% of inflow)
Center-of-Mass det. time= 4.4 min (813.4 - 809.0)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	4,950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	200	0	0
89.00	1,500	1,700	1,700
90.00	5,000	3,250	4,950

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**12.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.00' / 86.10' S= 0.0300 '/' Cc= 0.900 n= 0.024, Flow Area= 0.79 sf
#2	Primary	89.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.72 cfs @ 12.78 hrs HW=89.14' (Free Discharge)
- **1=Culvert** (Inlet Controls 3.83 cfs @ 4.87 fps)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 2.89 cfs @ 1.01 fps)

Summary for Pond 5P: 24" CULVERT

Inflow Area = 54.900 ac, 3.75% Impervious, Inflow Depth > 3.13" for 50 YEAR STORM event
Inflow = 34.33 cfs @ 13.71 hrs, Volume= 14.298 af
Outflow = 34.32 cfs @ 13.72 hrs, Volume= 14.232 af, Atten= 0%, Lag= 0.7 min
Primary = 34.32 cfs @ 13.72 hrs, Volume= 14.232 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 95.28' @ 13.72 hrs Surf.Area= 3,916 sf Storage= 5,315 cf

Plug-Flow detention time= 3.4 min calculated for 14.232 af (100% of inflow)
Center-of-Mass det. time= 2.2 min (941.4 - 939.1)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=34.28 cfs @ 13.72 hrs HW=95.28' (Free Discharge)
└**1=Culvert** (Inlet Controls 15.92 cfs @ 5.07 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 18.36 cfs @ 1.33 fps)

Summary for Pond 6P: EXISTING POND

Inflow Area = 25.300 ac, 1.90% Impervious, Inflow Depth > 3.62" for 50 YEAR STORM event
Inflow = 27.68 cfs @ 13.76 hrs, Volume= 7.625 af
Outflow = 10.23 cfs @ 15.99 hrs, Volume= 5.204 af, Atten= 63%, Lag= 133.9 min
Primary = 10.23 cfs @ 15.99 hrs, Volume= 5.204 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 99.44' @ 15.99 hrs Surf.Area= 41,065 sf Storage= 165,982 cf

Plug-Flow detention time= 173.9 min calculated for 5.186 af (68% of inflow)
Center-of-Mass det. time= 111.9 min (1,001.5 - 889.6)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	100.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=10.23 cfs @ 15.99 hrs HW=99.44' (Free Discharge)
└**1=Culvert** (Inlet Controls 10.23 cfs @ 8.34 fps)
└**2=Orifice/Grate** (Passes 10.23 cfs of 11.11 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: EXISTING 18" CMP

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 3.71" for 50 YEAR STORM event
Inflow = 13.91 cfs @ 13.89 hrs, Volume= 3.896 af
Outflow = 9.19 cfs @ 14.93 hrs, Volume= 3.818 af, Atten= 34%, Lag= 62.1 min
Primary = 9.19 cfs @ 14.93 hrs, Volume= 3.818 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.78' @ 14.93 hrs Surf.Area= 27,848 sf Storage= 39,274 cf

Plug-Flow detention time= 53.9 min calculated for 3.806 af (98% of inflow)
Center-of-Mass det. time= 47.9 min (940.1 - 892.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

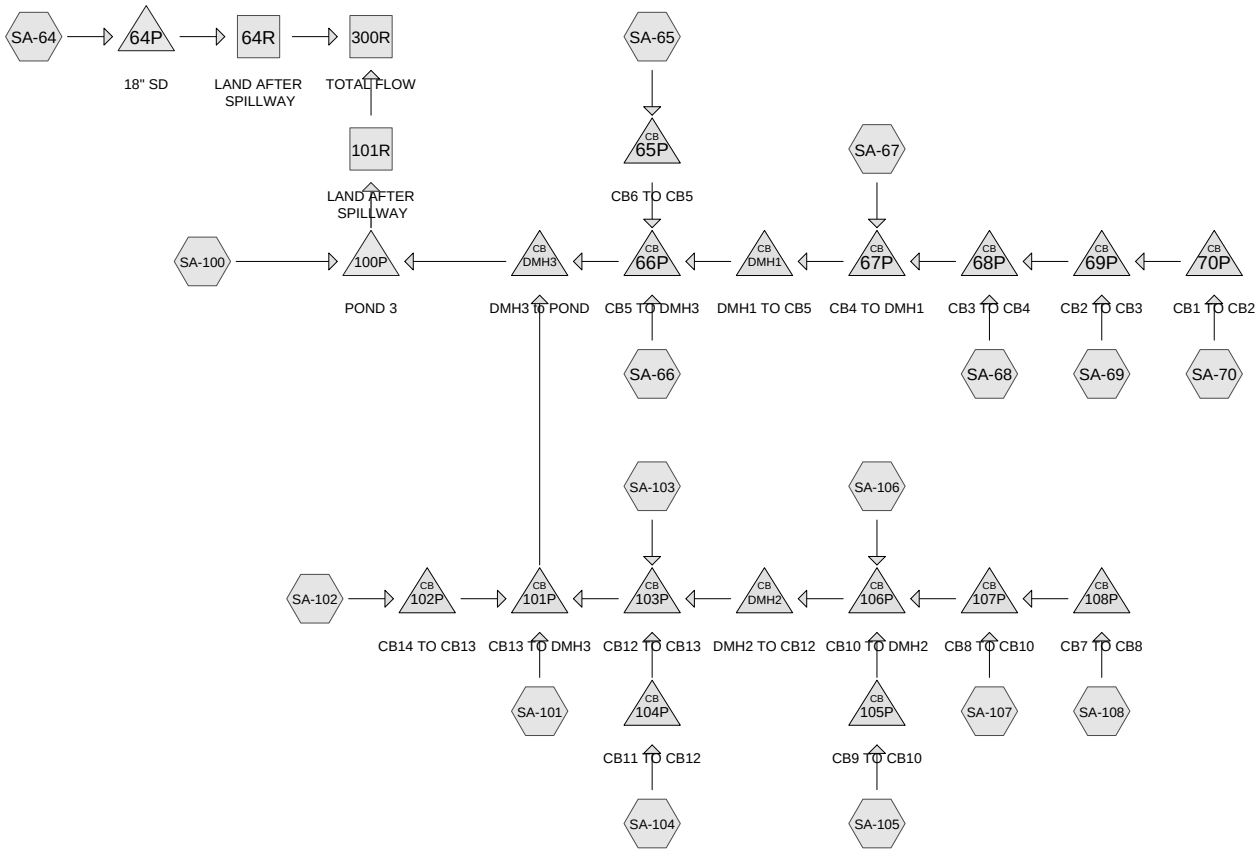
Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=9.19 cfs @ 14.93 hrs HW=102.78' (Free Discharge)
└**1=Culvert** (Barrel Controls 9.19 cfs @ 5.20 fps)

Appendix C

Post Development Calculations

- **Sandy Brook New Subdivision**
- **Sandy Brook #1A (entire project)**



Subcat Reach Pond Link

Routing Diagram for Sandy Brook Postdevelopment New Sub
Prepared by BH2M, Printed 12/4/2017
HydroCAD® 10.00-20 s/n 00619 © 2017 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.440	98	Allocated Impervious (SA-101, SA-103, SA-104, SA-105, SA-106, SA-107, SA-64, SA-65, SA-66, SA-67, SA-68, SA-69, SA-70)
0.221	70	Existing Woods (C) (SA-64)
0.281	77	Existing Woods (D) (SA-64)
4.361	74	Proposed Grass (C) (SA-100, SA-101, SA-102, SA-103, SA-104, SA-105, SA-106, SA-107, SA-108, SA-64, SA-65, SA-66, SA-67, SA-68, SA-69, SA-70)
0.428	80	Proposed Grass (D) (SA-100, SA-103, SA-104, SA-64, SA-65, SA-66)
1.165	98	Proposed Impervious (SA-100, SA-101, SA-102, SA-103, SA-104, SA-105, SA-106, SA-107, SA-108, SA-65, SA-66, SA-67, SA-68, SA-69, SA-70)
7.896	**82**	**TOTAL AREA**

Summary for Subcatchment SA-100:

Runoff = 0.70 cfs @ 12.21 hrs, Volume= 0.061 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	759	98	Proposed Impervious
*	21,152	74	Proposed Grass (C)
*	6,639	80	Proposed Grass (D)
	28,550	76	Weighted Average
	27,791		97.34% Pervious Area
	759		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
6.0	150		0.42		**Direct Entry,**
14.1	190	Total			

Summary for Subcatchment SA-101:

Runoff = 0.49 cfs @ 12.24 hrs, Volume= 0.045 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	1,814	98	Proposed Impervious
*	4,356	98	Allocated Impervious
*	7,624	74	Proposed Grass (C)
	13,794	85	Weighted Average
	7,624		55.27% Pervious Area
	6,170		44.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	71	0.0270	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	77	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.3	298	Total			

Summary for Subcatchment SA-102:

Runoff = 0.24 cfs @ 12.03 hrs, Volume= 0.015 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	2,669	98	Proposed Impervious
*	640	74	Proposed Grass (C)
	3,309	93	Weighted Average
	640		19.34% Pervious Area
	2,669		80.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0150	1.35		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"

Summary for Subcatchment SA-103:

Runoff = 0.82 cfs @ 12.23 hrs, Volume= 0.075 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	4,576	98	Proposed Impervious
*	3,541	80	Proposed Grass (D)
*	6,764	74	Proposed Grass (C)
*	6,098	98	Allocated Impervious
	20,979	87	Weighted Average
	10,305		49.12% Pervious Area
	10,674		50.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	150	0.0130	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.2	22	0.0130	1.71		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	101	0.0490	4.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.5	273	Total			

Summary for Subcatchment SA-104:

Runoff = 0.42 cfs @ 12.15 hrs, Volume= 0.033 af, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	3,069	98	Proposed Impervious
*	1,742	98	Allocated Impervious
*	4,110	74	Proposed Grass (C)
*	682	80	Proposed Grass (D)
	9,603	86	Weighted Average
	4,792		49.90% Pervious Area
	4,811		50.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	88	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	62	0.0448	1.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.2	64	0.0448	4.30		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	214	Total			

Summary for Subcatchment SA-105:

Runoff = 0.35 cfs @ 12.06 hrs, Volume= 0.022 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	871	98	Allocated Impervious
*	2,232	98	Proposed Impervious
*	3,701	74	Proposed Grass (C)
	6,804	85	Weighted Average
	3,701		54.39% Pervious Area
	3,103		45.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0570	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.1	115	0.0300	1.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	55	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	205	Total			

Summary for Subcatchment SA-106:

Runoff = 0.72 cfs @ 12.25 hrs, Volume= 0.068 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	3,562	98	Proposed Impervious
*	6,098	98	Allocated Impervious
*	11,021	74	Proposed Grass (C)
	20,681	85	Weighted Average
	11,021		53.29% Pervious Area
	9,660		46.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	150	0.0100	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.1	216	Total			

Summary for Subcatchment SA-107:

Runoff = 0.66 cfs @ 12.29 hrs, Volume= 0.065 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	2,573	98	Proposed Impervious
*	3,485	98	Allocated Impervious
*	18,781	74	Proposed Grass (C)
	24,839	80	Weighted Average
	18,781		75.61% Pervious Area
	6,058		24.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	50	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	19	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.9	219	Total			

Summary for Subcatchment SA-108:

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.022 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	3,533	98	Proposed Impervious
*	2,038	74	Proposed Grass (C)
	5,571	89	Weighted Average
	2,038		36.58% Pervious Area
	3,533		63.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	25	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.2	125	0.0318	1.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	61	0.0318	3.62		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	211	Total			

Summary for Subcatchment SA-64:

Runoff = 1.12 cfs @ 12.31 hrs, Volume= 0.114 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	2,614	98	Allocated Impervious
*	24,647	74	Proposed Grass (C)
*	4,300	80	Proposed Grass (D)
*	9,626	70	Existing Woods (C)
*	12,226	77	Existing Woods (D)
	53,413	76	Weighted Average
	50,799		95.11% Pervious Area
	2,614		4.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.1	156	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	306	Total			

Summary for Subcatchment SA-65:

Runoff = 1.72 cfs @ 12.34 hrs, Volume= 0.183 af, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	9,059	98	Proposed Impervious
*	16,553	98	Allocated Impervious
*	25,516	74	Proposed Grass (C)
*	2,518	80	Proposed Grass (D)
	53,646	86	Weighted Average
	28,034		52.26% Pervious Area
	25,612		47.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
8.6	377	0.0110	0.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.3	527	Total			

Summary for Subcatchment SA-66:

Runoff = 1.62 cfs @ 12.20 hrs, Volume= 0.137 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	7,841	98	Allocated Impervious
*	6,129	98	Proposed Impervious
*	37,701	74	Proposed Grass (C)
*	983	80	Proposed Grass (D)
	52,654	80	Weighted Average
	38,684		73.47% Pervious Area
	13,970		26.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.2	137	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	58	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.6	345	Total			

Summary for Subcatchment SA-67:

Runoff = 0.81 cfs @ 12.07 hrs, Volume= 0.053 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	3,154	98	Proposed Impervious
*	7,936	74	Proposed Grass (C)
	15,446	86	Weighted Average
	7,936		51.38% Pervious Area
	7,510		48.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	90	0.3000	0.50		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.9	60	0.0150	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	120	0.0153	2.51		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	270	Total			

Summary for Subcatchment SA-68:

Runoff = 0.36 cfs @ 12.20 hrs, Volume= 0.031 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	1,125	98	Proposed Impervious
*	6,530	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	10,269	83	Weighted Average
	6,530		63.59% Pervious Area
	3,739		36.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	150	0.0200	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	50	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	200	Total			

Summary for Subcatchment SA-69:

Runoff = 0.63 cfs @ 12.17 hrs, Volume= 0.051 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	3,807	98	Proposed Impervious
*	8,093	74	Proposed Grass (C)
*	3,485	98	Allocated Impervious
	15,385	85	Weighted Average
	8,093		52.60% Pervious Area
	7,292		47.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0300	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.8	230	Total			

Summary for Subcatchment SA-70:

Runoff = 0.42 cfs @ 12.15 hrs, Volume= 0.034 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	2,692	98	Proposed Impervious
*	3,696	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	9,002	88	Weighted Average
	3,696		41.06% Pervious Area
	5,306		58.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	80	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.4	73	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.0	223	Total			

Summary for Reach 64R: LAND AFTER SPILLWAY

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 1.09" for 2 YEAR STORM event
Inflow = 1.11 cfs @ 12.33 hrs, Volume= 0.111 af
Outflow = 1.08 cfs @ 12.46 hrs, Volume= 0.110 af, Atten= 3%, Lag= 7.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.60 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 6.2 min

Peak Storage= 271 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 858.59 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 150.0' Slope= 0.0373 '/'
Inlet Invert= 82.10', Outlet Invert= 76.50'



‡

Summary for Reach 101R: LAND AFTER SPILLWAY

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 0.89" for 2 YEAR STORM event
Inflow = 1.51 cfs @ 13.10 hrs, Volume= 0.494 af
Outflow = 1.50 cfs @ 13.19 hrs, Volume= 0.491 af, Atten= 0%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.84 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.58 fps, Avg. Travel Time= 4.4 min

Peak Storage= 276 cf @ 13.14 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 1,220.86 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 155.0' Slope= 0.0755 '/'
Inlet Invert= 88.50', Outlet Invert= 76.80'



‡

Summary for Reach 300R: TOTAL FLOW

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 0.91" for 2 YEAR STORM event
Inflow = 1.80 cfs @ 13.12 hrs, Volume= 0.602 af
Outflow = 1.80 cfs @ 13.12 hrs, Volume= 0.602 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 64P: 18" SD

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 1.11" for 2 YEAR STORM event
Inflow = 1.12 cfs @ 12.31 hrs, Volume= 0.114 af
Outflow = 1.11 cfs @ 12.33 hrs, Volume= 0.111 af, Atten= 1%, Lag= 1.2 min
Primary = 1.11 cfs @ 12.33 hrs, Volume= 0.111 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.27' @ 12.33 hrs Surf.Area= 307 sf Storage= 215 cf
Flood Elev= 101.00' Surf.Area= 10,000 sf Storage= 42,482 cf

Plug-Flow detention time= 14.1 min calculated for 0.111 af (97% of inflow)
Center-of-Mass det. time= 5.1 min (828.6 - 823.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	42,482 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	100	0	0
91.00	195	148	148
92.00	611	403	551
93.00	1,192	902	1,452
94.00	1,813	1,503	2,955
95.00	2,645	2,229	5,184
96.00	3,623	3,134	8,318
97.00	4,791	4,207	12,525
98.00	6,087	5,439	17,964
99.00	7,525	6,806	24,770
100.00	8,950	8,238	33,007
101.00	10,000	9,475	42,482

Device	Routing	Invert	Outlet Devices
#1	Primary	90.80'	**18.0" Round Culvert** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.80' / 82.10' S= 0.0640 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.09 cfs @ 12.33 hrs HW=91.27' (Free Discharge)
1=Culvert (Inlet Controls 1.09 cfs @ 2.33 fps)

Summary for Pond 65P: CB6 TO CB5

Inflow Area = 1.232 ac, 47.74% Impervious, Inflow Depth > 1.79" for 2 YEAR STORM event
Inflow = 1.72 cfs @ 12.34 hrs, Volume= 0.183 af
Outflow = 1.72 cfs @ 12.34 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min
Primary = 1.72 cfs @ 12.34 hrs, Volume= 0.183 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.53' @ 12.34 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.67'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.67' / 96.58' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.71 cfs @ 12.34 hrs HW=97.53' (Free Discharge)
1=Culvert (Barrel Controls 1.71 cfs @ 3.21 fps)

Summary for Pond 66P: CB5 TO DMH3

Inflow Area = 3.590 ac, 40.56% Impervious, Inflow Depth > 1.63" for 2 YEAR STORM event
Inflow = 4.78 cfs @ 12.20 hrs, Volume= 0.489 af
Outflow = 4.78 cfs @ 12.20 hrs, Volume= 0.489 af, Atten= 0%, Lag= 0.0 min
Primary = 4.78 cfs @ 12.20 hrs, Volume= 0.489 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.48' @ 12.20 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.48'	**24.0" Round Culvert** L= 254.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.48' / 95.21' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=4.77 cfs @ 12.20 hrs HW=97.48' (Free Discharge)
1=Culvert (Barrel Controls 4.77 cfs @ 4.41 fps)

Summary for Pond 67P: CB4 TO DMH1

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 1.75" for 2 YEAR STORM event
Inflow = 1.99 cfs @ 12.12 hrs, Volume= 0.168 af
Outflow = 1.99 cfs @ 12.12 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min
Primary = 1.99 cfs @ 12.12 hrs, Volume= 0.168 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.78' @ 12.12 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**12.0" Round Culvert** L= 156.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 97.66' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.95 cfs @ 12.12 hrs HW=100.77' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.95 cfs @ 3.00 fps)

Summary for Pond 68P: CB3 TO CB4

Inflow Area = 0.796 ac, 47.14% Impervious, Inflow Depth > 1.73" for 2 YEAR STORM event
Inflow = 1.40 cfs @ 12.17 hrs, Volume= 0.115 af
Outflow = 1.40 cfs @ 12.17 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min
Primary = 1.40 cfs @ 12.17 hrs, Volume= 0.115 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.95' @ 12.17 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.19'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.19' / 100.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.37 cfs @ 12.17 hrs HW=100.94' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.37 cfs @ 3.03 fps)

Summary for Pond 69P: CB2 TO CB3

Inflow Area = 0.560 ac, 51.66% Impervious, Inflow Depth > 1.80" for 2 YEAR STORM event
Inflow = 1.05 cfs @ 12.16 hrs, Volume= 0.084 af
Outflow = 1.05 cfs @ 12.16 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min
Primary = 1.05 cfs @ 12.16 hrs, Volume= 0.084 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.30' @ 12.16 hrs
Flood Elev= 105.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.70'	**12.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.70' / 100.29' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.03 cfs @ 12.16 hrs HW=101.30' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.03 cfs @ 3.03 fps)

Summary for Pond 70P: CB1 TO CB2

Inflow Area = 0.207 ac, 58.94% Impervious, Inflow Depth > 1.95" for 2 YEAR STORM event
Inflow = 0.42 cfs @ 12.15 hrs, Volume= 0.034 af
Outflow = 0.42 cfs @ 12.15 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.15 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.39' @ 12.15 hrs
Flood Elev= 106.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.02'	**12.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.02' / 100.80' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.15 hrs HW=101.39' (Free Discharge)
1=Culvert (Barrel Controls 0.42 cfs @ 2.36 fps)

Summary for Pond 100P: POND 3

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 1.61" for 2 YEAR STORM event
Inflow = 8.88 cfs @ 12.21 hrs, Volume= 0.895 af
Outflow = 1.51 cfs @ 13.10 hrs, Volume= 0.494 af, Atten= 83%, Lag= 53.5 min
Primary = 1.51 cfs @ 13.10 hrs, Volume= 0.494 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 93.67' @ 13.10 hrs Surf.Area= 13,054 sf Storage= 55,488 cf (19,286 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 14.1 min (813.3 - 799.2)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	89.50'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.50' / 88.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Device 1	93.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 1	89.50'	**1.5" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.46 cfs @ 13.10 hrs HW=93.67' (Free Discharge)
└─**1=Culvert** (Passes 1.46 cfs of 15.73 cfs potential flow)
  ├─**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.34 cfs @ 1.34 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.12 cfs @ 9.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 101P: CB13 TO DMH3

Inflow Area = 2.424 ac, 44.21% Impervious, Inflow Depth > 1.71" for 2 YEAR STORM event
Inflow = 3.41 cfs @ 12.22 hrs, Volume= 0.345 af
Outflow = 3.41 cfs @ 12.22 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min
Primary = 3.41 cfs @ 12.22 hrs, Volume= 0.345 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.17' @ 12.22 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.20'	**15.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.20' / 95.21' S= 0.0121 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.39 cfs @ 12.22 hrs HW=97.16' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.39 cfs @ 3.34 fps)

Summary for Pond 102P: CB14 TO CB13

Inflow Area = 0.076 ac, 80.66% Impervious, Inflow Depth > 2.41" for 2 YEAR STORM event
Inflow = 0.24 cfs @ 12.03 hrs, Volume= 0.015 af
Outflow = 0.24 cfs @ 12.03 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.24 cfs @ 12.03 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.67' @ 12.03 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.39'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.39' / 96.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.23 cfs @ 12.03 hrs HW=96.67' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.23 cfs @ 1.94 fps)

Summary for Pond 103P: CB12 TO CB13

Inflow Area = 2.031 ac, 42.77% Impervious, Inflow Depth > 1.68" for 2 YEAR STORM event
Inflow = 2.84 cfs @ 12.22 hrs, Volume= 0.284 af
Outflow = 2.84 cfs @ 12.22 hrs, Volume= 0.284 af, Atten= 0%, Lag= 0.0 min
Primary = 2.84 cfs @ 12.22 hrs, Volume= 0.284 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.22' @ 12.22 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.36'	**15.0" Round Culvert** L= 88.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.36' / 96.30' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.82 cfs @ 12.22 hrs HW=98.22' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.82 cfs @ 3.15 fps)

Summary for Pond 104P: CB11 TO CB12

Inflow Area = 0.220 ac, 50.10% Impervious, Inflow Depth > 1.79" for 2 YEAR STORM event
Inflow = 0.42 cfs @ 12.15 hrs, Volume= 0.033 af
Outflow = 0.42 cfs @ 12.15 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.15 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.93' @ 12.15 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.55' / 97.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.15 hrs HW=97.93' (Free Discharge)
1=Culvert (Barrel Controls 0.42 cfs @ 2.26 fps)

Summary for Pond 105P: CB9 TO CB10

Inflow Area = 0.156 ac, 45.61% Impervious, Inflow Depth > 1.72" for 2 YEAR STORM event
Inflow = 0.35 cfs @ 12.06 hrs, Volume= 0.022 af
Outflow = 0.35 cfs @ 12.06 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.35 cfs @ 12.06 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.42' @ 12.06 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.07'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.07' / 100.98' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.06 hrs HW=101.41' (Free Discharge)
1=Culvert (Barrel Controls 0.34 cfs @ 2.14 fps)

Summary for Pond 106P: CB10 TO DMH2

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 1.59" for 2 YEAR STORM event
Inflow = 1.67 cfs @ 12.25 hrs, Volume= 0.177 af
Outflow = 1.67 cfs @ 12.25 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 12.25 hrs, Volume= 0.177 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.57' @ 12.25 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.88'	**15.0" Round Culvert** L= 212.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.88' / 99.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.67 cfs @ 12.25 hrs HW=101.57' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.67 cfs @ 3.49 fps)

Summary for Pond 107P: CB8 TO CB10

Inflow Area = 0.698 ac, 31.54% Impervious, Inflow Depth > 1.48" for 2 YEAR STORM event
Inflow = 0.80 cfs @ 12.26 hrs, Volume= 0.086 af
Outflow = 0.80 cfs @ 12.26 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
Primary = 0.80 cfs @ 12.26 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.87' @ 12.26 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.36'	**12.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.36' / 100.98' S= 0.0058 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.26 hrs HW=101.86' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.80 cfs @ 2.93 fps)

Summary for Pond 108P: CB7 TO CB8

Inflow Area = 0.128 ac, 63.42% Impervious, Inflow Depth > 2.04" for 2 YEAR STORM event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.022 af
Outflow = 0.32 cfs @ 12.09 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.32 cfs @ 12.09 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.88' @ 12.09 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.55' / 101.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.31 cfs @ 12.09 hrs HW=101.87' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.31 cfs @ 2.09 fps)

Summary for Pond DMH1: DMH1 TO CB5

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 1.75" for 2 YEAR STORM event
Inflow = 1.99 cfs @ 12.12 hrs, Volume= 0.168 af
Outflow = 1.99 cfs @ 12.12 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min
Primary = 1.99 cfs @ 12.12 hrs, Volume= 0.168 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.27' @ 12.12 hrs
Flood Elev= 102.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.56'	**15.0" Round Culvert** L= 140.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.56' / 96.58' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.95 cfs @ 12.12 hrs HW=98.26' (Free Discharge)
1=Culvert (Barrel Controls 1.95 cfs @ 3.96 fps)

Summary for Pond DMH2: DMH2 TO CB12

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 1.59" for 2 YEAR STORM event
Inflow = 1.67 cfs @ 12.25 hrs, Volume= 0.177 af
Outflow = 1.67 cfs @ 12.25 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 12.25 hrs, Volume= 0.177 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.35' @ 12.25 hrs
Flood Elev= 109.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	99.72'	**15.0" Round Culvert** L= 226.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.72' / 97.46' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.67 cfs @ 12.25 hrs HW=100.35' (Free Discharge)
1=Culvert (Inlet Controls 1.67 cfs @ 2.70 fps)

Summary for Pond DMH3: DMH3 to POND

Inflow Area = 6.014 ac, 42.03% Impervious, Inflow Depth > 1.66" for 2 YEAR STORM event
Inflow = 8.18 cfs @ 12.21 hrs, Volume= 0.834 af
Outflow = 8.18 cfs @ 12.21 hrs, Volume= 0.834 af, Atten= 0%, Lag= 0.0 min
Primary = 8.18 cfs @ 12.21 hrs, Volume= 0.834 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.64' @ 12.21 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.11'	**24.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.11' / 94.95' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=8.14 cfs @ 12.21 hrs HW=96.63' (Free Discharge)
1=Culvert (Barrel Controls 8.14 cfs @ 4.39 fps)

Summary for Subcatchment SA-100:

Runoff = 1.45 cfs @ 12.20 hrs, Volume= 0.124 af, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	759	98	Proposed Impervious
*	21,152	74	Proposed Grass (C)
*	6,639	80	Proposed Grass (D)
	28,550	76	Weighted Average
	27,791		97.34% Pervious Area
	759		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
6.0	150		0.42		**Direct Entry,**
14.1	190	Total			

Summary for Subcatchment SA-101:

Runoff = 0.86 cfs @ 12.24 hrs, Volume= 0.081 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	1,814	98	Proposed Impervious
*	4,356	98	Allocated Impervious
*	7,624	74	Proposed Grass (C)
	13,794	85	Weighted Average
	7,624		55.27% Pervious Area
	6,170		44.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	71	0.0270	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	77	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.3	298	Total			

Summary for Subcatchment SA-102:

Runoff = 0.37 cfs @ 12.03 hrs, Volume= 0.025 af, Depth> 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	2,669	98	Proposed Impervious
*	640	74	Proposed Grass (C)
	3,309	93	Weighted Average
	640		19.34% Pervious Area
	2,669		80.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0150	1.35		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"

Summary for Subcatchment SA-103:

Runoff = 1.41 cfs @ 12.22 hrs, Volume= 0.131 af, Depth> 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	4,576	98	Proposed Impervious
*	3,541	80	Proposed Grass (D)
*	6,764	74	Proposed Grass (C)
*	6,098	98	Allocated Impervious
	20,979	87	Weighted Average
	10,305		49.12% Pervious Area
	10,674		50.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	150	0.0130	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.2	22	0.0130	1.71		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	101	0.0490	4.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.5	273	Total			

Summary for Subcatchment SA-104:

Runoff = 0.73 cfs @ 12.15 hrs, Volume= 0.058 af, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	3,069	98	Proposed Impervious
*	1,742	98	Allocated Impervious
*	4,110	74	Proposed Grass (C)
*	682	80	Proposed Grass (D)
	9,603	86	Weighted Average
	4,792		49.90% Pervious Area
	4,811		50.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	88	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	62	0.0448	1.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.2	64	0.0448	4.30		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	214	Total			

Summary for Subcatchment SA-105:

Runoff = 0.62 cfs @ 12.06 hrs, Volume= 0.040 af, Depth> 3.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	871	98	Allocated Impervious
*	2,232	98	Proposed Impervious
*	3,701	74	Proposed Grass (C)
	6,804	85	Weighted Average
	3,701		54.39% Pervious Area
	3,103		45.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0570	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.1	115	0.0300	1.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	55	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	205	Total			

Summary for Subcatchment SA-106:

Runoff = 1.27 cfs @ 12.25 hrs, Volume= 0.121 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	3,562	98	Proposed Impervious
*	6,098	98	Allocated Impervious
*	11,021	74	Proposed Grass (C)
	20,681	85	Weighted Average
	11,021		53.29% Pervious Area
	9,660		46.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	150	0.0100	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.1	216	Total			

Summary for Subcatchment SA-107:

Runoff = 1.27 cfs @ 12.27 hrs, Volume= 0.124 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	2,573	98	Proposed Impervious
*	3,485	98	Allocated Impervious
*	18,781	74	Proposed Grass (C)
	24,839	80	Weighted Average
	18,781		75.61% Pervious Area
	6,058		24.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	50	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	19	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.9	219	Total			

Summary for Subcatchment SA-108:

Runoff = 0.53 cfs @ 12.08 hrs, Volume= 0.037 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	3,533	98	Proposed Impervious
*	2,038	74	Proposed Grass (C)
	5,571	89	Weighted Average
	2,038		36.58% Pervious Area
	3,533		63.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	25	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.2	125	0.0318	1.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	61	0.0318	3.62		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	211	Total			

Summary for Subcatchment SA-64:

Runoff = 2.32 cfs @ 12.30 hrs, Volume= 0.232 af, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	2,614	98	Allocated Impervious
*	24,647	74	Proposed Grass (C)
*	4,300	80	Proposed Grass (D)
*	9,626	70	Existing Woods (C)
*	12,226	77	Existing Woods (D)
	53,413	76	Weighted Average
	50,799		95.11% Pervious Area
	2,614		4.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.1	156	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	306	Total			

Summary for Subcatchment SA-65:

Runoff = 2.99 cfs @ 12.33 hrs, Volume= 0.324 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	9,059	98	Proposed Impervious
*	16,553	98	Allocated Impervious
*	25,516	74	Proposed Grass (C)
*	2,518	80	Proposed Grass (D)
	53,646	86	Weighted Average
	28,034		52.26% Pervious Area
	25,612		47.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
8.6	377	0.0110	0.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.3	527	Total			

Summary for Subcatchment SA-66:

Runoff = 3.10 cfs @ 12.19 hrs, Volume= 0.263 af, Depth> 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	7,841	98	Allocated Impervious
*	6,129	98	Proposed Impervious
*	37,701	74	Proposed Grass (C)
*	983	80	Proposed Grass (D)
	52,654	80	Weighted Average
	38,684		73.47% Pervious Area
	13,970		26.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.2	137	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	58	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.6	345	Total			

Summary for Subcatchment SA-67:

Runoff = 1.41 cfs @ 12.07 hrs, Volume= 0.094 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	3,154	98	Proposed Impervious
*	7,936	74	Proposed Grass (C)
	15,446	86	Weighted Average
	7,936		51.38% Pervious Area
	7,510		48.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	90	0.3000	0.50		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.9	60	0.0150	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	120	0.0153	2.51		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	270	Total			

Summary for Subcatchment SA-68:

Runoff = 0.66 cfs @ 12.19 hrs, Volume= 0.057 af, Depth> 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	1,125	98	Proposed Impervious
*	6,530	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	10,269	83	Weighted Average
	6,530		63.59% Pervious Area
	3,739		36.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	150	0.0200	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	50	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	200	Total			

Summary for Subcatchment SA-69:

Runoff = 1.11 cfs @ 12.16 hrs, Volume= 0.090 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	3,807	98	Proposed Impervious
*	8,093	74	Proposed Grass (C)
*	3,485	98	Allocated Impervious
	15,385	85	Weighted Average
	8,093		52.60% Pervious Area
	7,292		47.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0300	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.8	230	Total			

Summary for Subcatchment SA-70:

Runoff = 0.71 cfs @ 12.15 hrs, Volume= 0.058 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	2,692	98	Proposed Impervious
*	3,696	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	9,002	88	Weighted Average
	3,696		41.06% Pervious Area
	5,306		58.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	80	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.4	73	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.0	223	Total			

Summary for Reach 64R: LAND AFTER SPILLWAY

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 2.24" for 10 YEAR STORM event
Inflow = 2.31 cfs @ 12.32 hrs, Volume= 0.229 af
Outflow = 2.27 cfs @ 12.41 hrs, Volume= 0.228 af, Atten= 2%, Lag= 5.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.80 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.42 fps, Avg. Travel Time= 6.0 min

Peak Storage= 429 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 858.59 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 150.0' Slope= 0.0373 '/'
Inlet Invert= 82.10', Outlet Invert= 76.50'



‡

Summary for Reach 101R: LAND AFTER SPILLWAY

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 2.19" for 10 YEAR STORM event
Inflow = 10.21 cfs @ 12.47 hrs, Volume= 1.219 af
Outflow = 10.14 cfs @ 12.51 hrs, Volume= 1.215 af, Atten= 1%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.78 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 4.0 min

Peak Storage= 886 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 1,220.86 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 155.0' Slope= 0.0755 '/'
Inlet Invert= 88.50', Outlet Invert= 76.80'



‡

Summary for Reach 300R: TOTAL FLOW

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 2.19" for 10 YEAR STORM event
Inflow = 12.23 cfs @ 12.49 hrs, Volume= 1.443 af
Outflow = 12.23 cfs @ 12.49 hrs, Volume= 1.443 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 64P: 18" SD

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 2.27" for 10 YEAR STORM event
Inflow = 2.32 cfs @ 12.30 hrs, Volume= 0.232 af
Outflow = 2.31 cfs @ 12.32 hrs, Volume= 0.229 af, Atten= 0%, Lag= 1.2 min
Primary = 2.31 cfs @ 12.32 hrs, Volume= 0.229 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.50' @ 12.32 hrs Surf.Area= 403 sf Storage= 297 cf
Flood Elev= 101.00' Surf.Area= 10,000 sf Storage= 42,482 cf

Plug-Flow detention time= 8.8 min calculated for 0.229 af (99% of inflow)
Center-of-Mass det. time= 4.0 min (811.9 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	42,482 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	100	0	0
91.00	195	148	148
92.00	611	403	551
93.00	1,192	902	1,452
94.00	1,813	1,503	2,955
95.00	2,645	2,229	5,184
96.00	3,623	3,134	8,318
97.00	4,791	4,207	12,525
98.00	6,087	5,439	17,964
99.00	7,525	6,806	24,770
100.00	8,950	8,238	33,007
101.00	10,000	9,475	42,482

Device	Routing	Invert	Outlet Devices
#1	Primary	90.80'	**18.0" Round Culvert** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.80' / 82.10' S= 0.0640 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.29 cfs @ 12.32 hrs HW=91.50' (Free Discharge)
1=Culvert (Inlet Controls 2.29 cfs @ 2.84 fps)

Summary for Pond 65P: CB6 TO CB5

Inflow Area = 1.232 ac, 47.74% Impervious, Inflow Depth > 3.16" for 10 YEAR STORM event
Inflow = 2.99 cfs @ 12.33 hrs, Volume= 0.324 af
Outflow = 2.99 cfs @ 12.33 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.0 min
Primary = 2.99 cfs @ 12.33 hrs, Volume= 0.324 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.03' @ 12.33 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.67'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.67' / 96.58' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.96 cfs @ 12.33 hrs HW=98.02' (Free Discharge)
1=Culvert (Barrel Controls 2.96 cfs @ 3.77 fps)

Summary for Pond 66P: CB5 TO DMH3

Inflow Area = 3.590 ac, 40.56% Impervious, Inflow Depth > 2.96" for 10 YEAR STORM event
Inflow = 8.64 cfs @ 12.20 hrs, Volume= 0.886 af
Outflow = 8.64 cfs @ 12.20 hrs, Volume= 0.886 af, Atten= 0%, Lag= 0.0 min
Primary = 8.64 cfs @ 12.20 hrs, Volume= 0.886 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.90' @ 12.20 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.48'	**24.0" Round Culvert** L= 254.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.48' / 95.21' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=8.61 cfs @ 12.20 hrs HW=97.90' (Free Discharge)
1=Culvert (Barrel Controls 8.61 cfs @ 5.07 fps)

Summary for Pond 67P: CB4 TO DMH1

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 3.12" for 10 YEAR STORM event
Inflow = 3.49 cfs @ 12.12 hrs, Volume= 0.299 af
Outflow = 3.49 cfs @ 12.12 hrs, Volume= 0.299 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.12 hrs, Volume= 0.299 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.35' @ 12.12 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**12.0" Round Culvert** L= 156.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 97.66' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.42 cfs @ 12.12 hrs HW=101.32' (Free Discharge)
└**1=Culvert** (Inlet Controls 3.42 cfs @ 4.36 fps)

Summary for Pond 68P: CB3 TO CB4

Inflow Area = 0.796 ac, 47.14% Impervious, Inflow Depth > 3.09" for 10 YEAR STORM event
Inflow = 2.46 cfs @ 12.17 hrs, Volume= 0.205 af
Outflow = 2.46 cfs @ 12.17 hrs, Volume= 0.205 af, Atten= 0%, Lag= 0.0 min
Primary = 2.46 cfs @ 12.17 hrs, Volume= 0.205 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.29' @ 12.16 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.19'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.19' / 100.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.42 cfs @ 12.17 hrs HW=101.28' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.42 cfs @ 3.53 fps)

Summary for Pond 69P: CB2 TO CB3

Inflow Area = 0.560 ac, 51.66% Impervious, Inflow Depth > 3.18" for 10 YEAR STORM event
Inflow = 1.82 cfs @ 12.16 hrs, Volume= 0.148 af
Outflow = 1.82 cfs @ 12.16 hrs, Volume= 0.148 af, Atten= 0%, Lag= 0.0 min
Primary = 1.82 cfs @ 12.16 hrs, Volume= 0.148 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.55' @ 12.16 hrs
Flood Elev= 105.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.70'	**12.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.70' / 100.29' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.80 cfs @ 12.16 hrs HW=101.54' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.80 cfs @ 3.45 fps)

Summary for Pond 70P: CB1 TO CB2

Inflow Area = 0.207 ac, 58.94% Impervious, Inflow Depth > 3.37" for 10 YEAR STORM event
Inflow = 0.71 cfs @ 12.15 hrs, Volume= 0.058 af
Outflow = 0.71 cfs @ 12.15 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 12.15 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.51' @ 12.15 hrs
Flood Elev= 106.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.02'	**12.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.02' / 100.80' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.15 hrs HW=101.51' (Free Discharge)
1=Culvert (Barrel Controls 0.71 cfs @ 2.69 fps)

Summary for Pond 100P: POND 3

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 2.93" for 10 YEAR STORM event
Inflow = 16.10 cfs @ 12.20 hrs, Volume= 1.627 af
Outflow = 10.21 cfs @ 12.47 hrs, Volume= 1.219 af, Atten= 37%, Lag= 15.7 min
Primary = 10.21 cfs @ 12.47 hrs, Volume= 1.219 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 94.14' @ 12.47 hrs Surf.Area= 13,795 sf Storage= 61,855 cf (25,652 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= 317.6 min calculated for 0.387 af (24% of inflow)
Center-of-Mass det. time= 24.3 min (810.2 - 785.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	89.50'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.50' / 88.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Device 1	93.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 1	89.50'	**1.5" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=10.17 cfs @ 12.47 hrs HW=94.14' (Free Discharge)
└**1=Culvert** (Passes 10.17 cfs of 16.78 cfs potential flow)
  ├**3=Sharp-Crested Vee/Trap Weir** (Weir Controls 10.04 cfs @ 2.62 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.13 cfs @ 10.30 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 101P: CB13 TO DMH3

Inflow Area = 2.424 ac, 44.21% Impervious, Inflow Depth > 3.06" for 10 YEAR STORM event
Inflow = 6.03 cfs @ 12.22 hrs, Volume= 0.617 af
Outflow = 6.03 cfs @ 12.22 hrs, Volume= 0.617 af, Atten= 0%, Lag= 0.0 min
Primary = 6.03 cfs @ 12.22 hrs, Volume= 0.617 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.87' @ 12.22 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.20'	**15.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.20' / 95.21' S= 0.0121 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.99 cfs @ 12.22 hrs HW=97.85' (Free Discharge)
1=Culvert (Inlet Controls 5.99 cfs @ 4.89 fps)

Summary for Pond 102P: CB14 TO CB13

Inflow Area = 0.076 ac, 80.66% Impervious, Inflow Depth > 3.89" for 10 YEAR STORM event
Inflow = 0.37 cfs @ 12.03 hrs, Volume= 0.025 af
Outflow = 0.37 cfs @ 12.03 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.03 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.75' @ 12.03 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.39'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.39' / 96.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.36 cfs @ 12.03 hrs HW=96.74' (Free Discharge)
1=Culvert (Barrel Controls 0.36 cfs @ 2.17 fps)

Summary for Pond 103P: CB12 TO CB13

Inflow Area = 2.031 ac, 42.77% Impervious, Inflow Depth > 3.02" for 10 YEAR STORM event
Inflow = 5.04 cfs @ 12.21 hrs, Volume= 0.511 af
Outflow = 5.04 cfs @ 12.21 hrs, Volume= 0.511 af, Atten= 0%, Lag= 0.0 min
Primary = 5.04 cfs @ 12.21 hrs, Volume= 0.511 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.71' @ 12.21 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.36'	**15.0" Round Culvert** L= 88.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.36' / 96.30' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.01 cfs @ 12.21 hrs HW=98.70' (Free Discharge)
1=Culvert (Inlet Controls 5.01 cfs @ 4.08 fps)

Summary for Pond 104P: CB11 TO CB12

Inflow Area = 0.220 ac, 50.10% Impervious, Inflow Depth > 3.17" for 10 YEAR STORM event
Inflow = 0.73 cfs @ 12.15 hrs, Volume= 0.058 af
Outflow = 0.73 cfs @ 12.15 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.15 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.07' @ 12.15 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.55' / 97.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.73 cfs @ 12.15 hrs HW=98.07' (Free Discharge)
1=Culvert (Barrel Controls 0.73 cfs @ 2.59 fps)

Summary for Pond 105P: CB9 TO CB10

Inflow Area = 0.156 ac, 45.61% Impervious, Inflow Depth > 3.08" for 10 YEAR STORM event
Inflow = 0.62 cfs @ 12.06 hrs, Volume= 0.040 af
Outflow = 0.62 cfs @ 12.06 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Primary = 0.62 cfs @ 12.06 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.54' @ 12.06 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.07'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.07' / 100.98' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.60 cfs @ 12.06 hrs HW=101.53' (Free Discharge)
1=Culvert (Barrel Controls 0.60 cfs @ 2.47 fps)

Summary for Pond 106P: CB10 TO DMH2

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 2.91" for 10 YEAR STORM event
Inflow = 3.03 cfs @ 12.24 hrs, Volume= 0.322 af
Outflow = 3.03 cfs @ 12.24 hrs, Volume= 0.322 af, Atten= 0%, Lag= 0.0 min
Primary = 3.03 cfs @ 12.24 hrs, Volume= 0.322 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.86' @ 12.24 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.88'	**15.0" Round Culvert** L= 212.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.88' / 99.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.02 cfs @ 12.24 hrs HW=101.86' (Free Discharge)
1=Culvert (Barrel Controls 3.02 cfs @ 4.02 fps)

Summary for Pond 107P: CB8 TO CB10

Inflow Area = 0.698 ac, 31.54% Impervious, Inflow Depth > 2.77" for 10 YEAR STORM event
Inflow = 1.50 cfs @ 12.25 hrs, Volume= 0.161 af
Outflow = 1.50 cfs @ 12.25 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min
Primary = 1.50 cfs @ 12.25 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.09' @ 12.25 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.36'	**12.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.36' / 100.98' S= 0.0058 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.50 cfs @ 12.25 hrs HW=102.09' (Free Discharge)
1=Culvert (Barrel Controls 1.50 cfs @ 3.40 fps)

Summary for Pond 108P: CB7 TO CB8

Inflow Area = 0.128 ac, 63.42% Impervious, Inflow Depth > 3.47" for 10 YEAR STORM event
Inflow = 0.53 cfs @ 12.08 hrs, Volume= 0.037 af
Outflow = 0.53 cfs @ 12.08 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.08 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.98' @ 12.08 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.55' / 101.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.08 hrs HW=101.98' (Free Discharge)
1=Culvert (Barrel Controls 0.51 cfs @ 2.37 fps)

Summary for Pond DMH1: DMH1 TO CB5

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 3.12" for 10 YEAR STORM event
Inflow = 3.49 cfs @ 12.12 hrs, Volume= 0.299 af
Outflow = 3.49 cfs @ 12.12 hrs, Volume= 0.299 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 12.12 hrs, Volume= 0.299 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.57' @ 12.12 hrs
Flood Elev= 102.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.56'	**15.0" Round Culvert** L= 140.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.56' / 96.58' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.42 cfs @ 12.12 hrs HW=98.55' (Free Discharge)
1=Culvert (Barrel Controls 3.42 cfs @ 4.49 fps)

Summary for Pond DMH2: DMH2 TO CB12

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 2.91" for 10 YEAR STORM event
Inflow = 3.03 cfs @ 12.24 hrs, Volume= 0.322 af
Outflow = 3.03 cfs @ 12.24 hrs, Volume= 0.322 af, Atten= 0%, Lag= 0.0 min
Primary = 3.03 cfs @ 12.24 hrs, Volume= 0.322 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.62' @ 12.24 hrs
Flood Elev= 109.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	99.72'	**15.0" Round Culvert** L= 226.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.72' / 97.46' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=3.02 cfs @ 12.24 hrs HW=100.61' (Free Discharge)
1=Culvert (Inlet Controls 3.02 cfs @ 3.22 fps)

Summary for Pond DMH3: DMH3 to POND

Inflow Area = 6.014 ac, 42.03% Impervious, Inflow Depth > 3.00" for 10 YEAR STORM event
Inflow = 14.65 cfs @ 12.20 hrs, Volume= 1.503 af
Outflow = 14.65 cfs @ 12.20 hrs, Volume= 1.503 af, Atten= 0%, Lag= 0.0 min
Primary = 14.65 cfs @ 12.20 hrs, Volume= 1.503 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.38' @ 12.20 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.11'	**24.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.11' / 94.95' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=14.63 cfs @ 12.20 hrs HW=97.37' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 14.63 cfs @ 5.15 fps)

Summary for Subcatchment SA-100:

Runoff = 2.10 cfs @ 12.20 hrs, Volume= 0.181 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	759	98	Proposed Impervious
*	21,152	74	Proposed Grass (C)
*	6,639	80	Proposed Grass (D)
	28,550	76	Weighted Average
	27,791		97.34% Pervious Area
	759		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
6.0	150		0.42		**Direct Entry,**
14.1	190	Total			

Summary for Subcatchment SA-101:

Runoff = 1.17 cfs @ 12.23 hrs, Volume= 0.111 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	1,814	98	Proposed Impervious
*	4,356	98	Allocated Impervious
*	7,624	74	Proposed Grass (C)
	13,794	85	Weighted Average
	7,624		55.27% Pervious Area
	6,170		44.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	71	0.0270	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	77	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.3	298	Total			

Summary for Subcatchment SA-102:

Runoff = 0.48 cfs @ 12.03 hrs, Volume= 0.032 af, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	2,669	98	Proposed Impervious
*	640	74	Proposed Grass (C)
	3,309	93	Weighted Average
	640		19.34% Pervious Area
	2,669		80.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0150	1.35		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"

Summary for Subcatchment SA-103:

Runoff = 1.88 cfs @ 12.22 hrs, Volume= 0.178 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	4,576	98	Proposed Impervious
*	3,541	80	Proposed Grass (D)
*	6,764	74	Proposed Grass (C)
*	6,098	98	Allocated Impervious
	20,979	87	Weighted Average
	10,305		49.12% Pervious Area
	10,674		50.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	150	0.0130	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.2	22	0.0130	1.71		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	101	0.0490	4.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.5	273	Total			

Summary for Subcatchment SA-104:

Runoff = 0.99 cfs @ 12.15 hrs, Volume= 0.080 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	3,069	98	Proposed Impervious
*	1,742	98	Allocated Impervious
*	4,110	74	Proposed Grass (C)
*	682	80	Proposed Grass (D)
	9,603	86	Weighted Average
	4,792		49.90% Pervious Area
	4,811		50.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	88	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	62	0.0448	1.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.2	64	0.0448	4.30		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	214	Total			

Summary for Subcatchment SA-105:

Runoff = 0.84 cfs @ 12.06 hrs, Volume= 0.055 af, Depth> 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	871	98	Allocated Impervious
*	2,232	98	Proposed Impervious
*	3,701	74	Proposed Grass (C)
	6,804	85	Weighted Average
	3,701		54.39% Pervious Area
	3,103		45.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0570	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.1	115	0.0300	1.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	55	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	205	Total			

Summary for Subcatchment SA-106:

Runoff = 1.72 cfs @ 12.24 hrs, Volume= 0.167 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	3,562	98	Proposed Impervious
*	6,098	98	Allocated Impervious
*	11,021	74	Proposed Grass (C)
	20,681	85	Weighted Average
	11,021		53.29% Pervious Area
	9,660		46.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	150	0.0100	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.1	216	Total			

Summary for Subcatchment SA-107:

Runoff = 1.78 cfs @ 12.27 hrs, Volume= 0.176 af, Depth> 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	2,573	98	Proposed Impervious
*	3,485	98	Allocated Impervious
*	18,781	74	Proposed Grass (C)
	24,839	80	Weighted Average
	18,781		75.61% Pervious Area
	6,058		24.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	50	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	19	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.9	219	Total			

Summary for Subcatchment SA-108:

Runoff = 0.70 cfs @ 12.08 hrs, Volume= 0.050 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	3,533	98	Proposed Impervious
*	2,038	74	Proposed Grass (C)
	5,571	89	Weighted Average
	2,038		36.58% Pervious Area
	3,533		63.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	25	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.2	125	0.0318	1.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	61	0.0318	3.62		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	211	Total			

Summary for Subcatchment SA-64:

Runoff = 3.37 cfs @ 12.29 hrs, Volume= 0.337 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	2,614	98	Allocated Impervious
*	24,647	74	Proposed Grass (C)
*	4,300	80	Proposed Grass (D)
*	9,626	70	Existing Woods (C)
*	12,226	77	Existing Woods (D)
	53,413	76	Weighted Average
	50,799		95.11% Pervious Area
	2,614		4.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.1	156	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	306	Total			

Summary for Subcatchment SA-65:

Runoff = 4.03 cfs @ 12.33 hrs, Volume= 0.443 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	9,059	98	Proposed Impervious
*	16,553	98	Allocated Impervious
*	25,516	74	Proposed Grass (C)
*	2,518	80	Proposed Grass (D)
	53,646	86	Weighted Average
	28,034		52.26% Pervious Area
	25,612		47.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
8.6	377	0.0110	0.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.3	527	Total			

Summary for Subcatchment SA-66:

Runoff = 4.36 cfs @ 12.19 hrs, Volume= 0.373 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	7,841	98	Allocated Impervious
*	6,129	98	Proposed Impervious
*	37,701	74	Proposed Grass (C)
*	983	80	Proposed Grass (D)
	52,654	80	Weighted Average
	38,684		73.47% Pervious Area
	13,970		26.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.2	137	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	58	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.6	345	Total			

Summary for Subcatchment SA-67:

Runoff = 1.90 cfs @ 12.07 hrs, Volume= 0.128 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	3,154	98	Proposed Impervious
*	7,936	74	Proposed Grass (C)
	15,446	86	Weighted Average
	7,936		51.38% Pervious Area
	7,510		48.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	90	0.3000	0.50		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.9	60	0.0150	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	120	0.0153	2.51		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	270	Total			

Summary for Subcatchment SA-68:

Runoff = 0.90 cfs @ 12.19 hrs, Volume= 0.079 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	1,125	98	Proposed Impervious
*	6,530	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	10,269	83	Weighted Average
	6,530		63.59% Pervious Area
	3,739		36.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	150	0.0200	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	50	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	200	Total			

Summary for Subcatchment SA-69:

Runoff = 1.50 cfs @ 12.16 hrs, Volume= 0.124 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	3,807	98	Proposed Impervious
*	8,093	74	Proposed Grass (C)
*	3,485	98	Allocated Impervious
	15,385	85	Weighted Average
	8,093		52.60% Pervious Area
	7,292		47.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0300	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.8	230	Total			

Summary for Subcatchment SA-70:

Runoff = 0.95 cfs @ 12.15 hrs, Volume= 0.078 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	2,692	98	Proposed Impervious
*	3,696	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	9,002	88	Weighted Average
	3,696		41.06% Pervious Area
	5,306		58.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	80	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.4	73	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.0	223	Total			

Summary for Reach 64R: LAND AFTER SPILLWAY

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 3.27" for 25 YEAR STORM event
Inflow = 3.36 cfs @ 12.31 hrs, Volume= 0.334 af
Outflow = 3.31 cfs @ 12.39 hrs, Volume= 0.333 af, Atten= 1%, Lag= 4.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.93 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 5.8 min

Peak Storage= 538 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 858.59 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 150.0' Slope= 0.0373 '/'
Inlet Invert= 82.10', Outlet Invert= 76.50'



‡

Summary for Reach 101R: LAND AFTER SPILLWAY

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 3.31" for 25 YEAR STORM event
Inflow = 16.98 cfs @ 12.38 hrs, Volume= 1.842 af
Outflow = 16.92 cfs @ 12.41 hrs, Volume= 1.837 af, Atten= 0%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.18 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 3.7 min

Peak Storage= 1,206 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 1,220.86 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 155.0' Slope= 0.0755 '/'
Inlet Invert= 88.50', Outlet Invert= 76.80'



‡

Summary for Reach 300R: TOTAL FLOW

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 3.30" for 25 YEAR STORM event
Inflow = 20.23 cfs @ 12.40 hrs, Volume= 2.170 af
Outflow = 20.23 cfs @ 12.40 hrs, Volume= 2.170 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 64P: 18" SD

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 3.30" for 25 YEAR STORM event
Inflow = 3.37 cfs @ 12.29 hrs, Volume= 0.337 af
Outflow = 3.36 cfs @ 12.31 hrs, Volume= 0.334 af, Atten= 0%, Lag= 1.2 min
Primary = 3.36 cfs @ 12.31 hrs, Volume= 0.334 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.67' @ 12.31 hrs Surf.Area= 473 sf Storage= 370 cf
Flood Elev= 101.00' Surf.Area= 10,000 sf Storage= 42,482 cf

Plug-Flow detention time= 6.9 min calculated for 0.334 af (99% of inflow)
Center-of-Mass det. time= 3.5 min (802.9 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	42,482 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	100	0	0
91.00	195	148	148
92.00	611	403	551
93.00	1,192	902	1,452
94.00	1,813	1,503	2,955
95.00	2,645	2,229	5,184
96.00	3,623	3,134	8,318
97.00	4,791	4,207	12,525
98.00	6,087	5,439	17,964
99.00	7,525	6,806	24,770
100.00	8,950	8,238	33,007
101.00	10,000	9,475	42,482

Device	Routing	Invert	Outlet Devices
#1	Primary	90.80'	**18.0" Round Culvert** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.80' / 82.10' S= 0.0640 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.34 cfs @ 12.31 hrs HW=91.66' (Free Discharge)
1=Culvert (Inlet Controls 3.34 cfs @ 3.17 fps)

Summary for Pond 65P: CB6 TO CB5

Inflow Area = 1.232 ac, 47.74% Impervious, Inflow Depth > 4.32" for 25 YEAR STORM event
Inflow = 4.03 cfs @ 12.33 hrs, Volume= 0.443 af
Outflow = 4.03 cfs @ 12.33 hrs, Volume= 0.443 af, Atten= 0%, Lag= 0.0 min
Primary = 4.03 cfs @ 12.33 hrs, Volume= 0.443 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.39' @ 12.33 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.67'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.67' / 96.58' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.01 cfs @ 12.33 hrs HW=98.38' (Free Discharge)
1=Culvert (Barrel Controls 4.01 cfs @ 5.11 fps)

Summary for Pond 66P: CB5 TO DMH3

Inflow Area = 3.590 ac, 40.56% Impervious, Inflow Depth > 4.10" for 25 YEAR STORM event
Inflow = 11.85 cfs @ 12.19 hrs, Volume= 1.227 af
Outflow = 11.85 cfs @ 12.19 hrs, Volume= 1.227 af, Atten= 0%, Lag= 0.0 min
Primary = 11.85 cfs @ 12.19 hrs, Volume= 1.227 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.23' @ 12.19 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.48'	**24.0" Round Culvert** L= 254.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.48' / 95.21' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=11.80 cfs @ 12.19 hrs HW=98.22' (Free Discharge)
1=Culvert (Barrel Controls 11.80 cfs @ 5.43 fps)

Summary for Pond 67P: CB4 TO DMH1

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 4.28" for 25 YEAR STORM event
Inflow = 4.72 cfs @ 12.12 hrs, Volume= 0.410 af
Outflow = 4.72 cfs @ 12.12 hrs, Volume= 0.410 af, Atten= 0%, Lag= 0.0 min
Primary = 4.72 cfs @ 12.12 hrs, Volume= 0.410 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.05' @ 12.12 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**12.0" Round Culvert** L= 156.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 97.66' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.63 cfs @ 12.12 hrs HW=102.00' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.63 cfs @ 5.90 fps)

Summary for Pond 68P: CB3 TO CB4

Inflow Area = 0.796 ac, 47.14% Impervious, Inflow Depth > 4.25" for 25 YEAR STORM event
Inflow = 3.33 cfs @ 12.16 hrs, Volume= 0.282 af
Outflow = 3.33 cfs @ 12.16 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min
Primary = 3.33 cfs @ 12.16 hrs, Volume= 0.282 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.66' @ 12.17 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.19'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.19' / 100.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=3.28 cfs @ 12.16 hrs HW=101.64' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.28 cfs @ 4.17 fps)

Summary for Pond 69P: CB2 TO CB3

Inflow Area = 0.560 ac, 51.66% Impervious, Inflow Depth > 4.35" for 25 YEAR STORM event
Inflow = 2.45 cfs @ 12.16 hrs, Volume= 0.203 af
Outflow = 2.45 cfs @ 12.16 hrs, Volume= 0.203 af, Atten= 0%, Lag= 0.0 min
Primary = 2.45 cfs @ 12.16 hrs, Volume= 0.203 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.75' @ 12.16 hrs
Flood Elev= 105.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.70'	**12.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.70' / 100.29' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.42 cfs @ 12.16 hrs HW=101.74' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.42 cfs @ 3.68 fps)

Summary for Pond 70P: CB1 TO CB2

Inflow Area = 0.207 ac, 58.94% Impervious, Inflow Depth > 4.55" for 25 YEAR STORM event
Inflow = 0.95 cfs @ 12.15 hrs, Volume= 0.078 af
Outflow = 0.95 cfs @ 12.15 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min
Primary = 0.95 cfs @ 12.15 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.60' @ 12.15 hrs
Flood Elev= 106.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.02'	**12.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.02' / 100.80' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.95 cfs @ 12.15 hrs HW=101.60' (Free Discharge)
1=Culvert (Barrel Controls 0.95 cfs @ 2.88 fps)

Summary for Pond 100P: POND 3

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 4.06" for 25 YEAR STORM event
Inflow = 22.13 cfs @ 12.20 hrs, Volume= 2.257 af
Outflow = 16.98 cfs @ 12.38 hrs, Volume= 1.842 af, Atten= 23%, Lag= 10.5 min
Primary = 16.98 cfs @ 12.38 hrs, Volume= 1.842 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 94.44' @ 12.38 hrs Surf.Area= 14,269 sf Storage= 66,007 cf (29,804 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= 200.6 min calculated for 1.008 af (45% of inflow)
Center-of-Mass det. time= 26.6 min (805.0 - 778.4)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	89.50'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.50' / 88.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Device 1	93.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 1	89.50'	**1.5" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=17.41 cfs @ 12.38 hrs HW=94.43' (Free Discharge)
└**1=Culvert** (Inlet Controls 17.41 cfs @ 9.85 fps)
  ├**3=Sharp-Crested Vee/Trap Weir** (Passes < 17.75 cfs potential flow)
  └**4=Orifice/Grate** (Passes < 0.13 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 101P: CB13 TO DMH3

Inflow Area = 2.424 ac, 44.21% Impervious, Inflow Depth > 4.20" for 25 YEAR STORM event
Inflow = 8.20 cfs @ 12.21 hrs, Volume= 0.849 af
Outflow = 8.20 cfs @ 12.21 hrs, Volume= 0.849 af, Atten= 0%, Lag= 0.0 min
Primary = 8.20 cfs @ 12.21 hrs, Volume= 0.849 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.75' @ 12.21 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.20'	**15.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.20' / 95.21' S= 0.0121 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=8.15 cfs @ 12.21 hrs HW=98.73' (Free Discharge)
1=Culvert (Inlet Controls 8.15 cfs @ 6.64 fps)

Summary for Pond 102P: CB14 TO CB13

Inflow Area = 0.076 ac, 80.66% Impervious, Inflow Depth > 5.12" for 25 YEAR STORM event
Inflow = 0.48 cfs @ 12.03 hrs, Volume= 0.032 af
Outflow = 0.48 cfs @ 12.03 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min
Primary = 0.48 cfs @ 12.03 hrs, Volume= 0.032 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.80' @ 12.03 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.39'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.39' / 96.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.46 cfs @ 12.03 hrs HW=96.79' (Free Discharge)
1=Culvert (Barrel Controls 0.46 cfs @ 2.31 fps)

Summary for Pond 103P: CB12 TO CB13

Inflow Area = 2.031 ac, 42.77% Impervious, Inflow Depth > 4.17" for 25 YEAR STORM event
Inflow = 6.86 cfs @ 12.21 hrs, Volume= 0.705 af
Outflow = 6.86 cfs @ 12.21 hrs, Volume= 0.705 af, Atten= 0%, Lag= 0.0 min
Primary = 6.86 cfs @ 12.21 hrs, Volume= 0.705 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 99.33' @ 12.21 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.36'	**15.0" Round Culvert** L= 88.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.36' / 96.30' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=6.83 cfs @ 12.21 hrs HW=99.32' (Free Discharge)
1=Culvert (Inlet Controls 6.83 cfs @ 5.56 fps)

Summary for Pond 104P: CB11 TO CB12

Inflow Area = 0.220 ac, 50.10% Impervious, Inflow Depth > 4.34" for 25 YEAR STORM event
Inflow = 0.99 cfs @ 12.15 hrs, Volume= 0.080 af
Outflow = 0.99 cfs @ 12.15 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.15 hrs, Volume= 0.080 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.16' @ 12.15 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.55' / 97.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.98 cfs @ 12.15 hrs HW=98.16' (Free Discharge)
1=Culvert (Barrel Controls 0.98 cfs @ 2.79 fps)

Summary for Pond 105P: CB9 TO CB10

Inflow Area = 0.156 ac, 45.61% Impervious, Inflow Depth > 4.24" for 25 YEAR STORM event
Inflow = 0.84 cfs @ 12.06 hrs, Volume= 0.055 af
Outflow = 0.84 cfs @ 12.06 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.06 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.63' @ 12.06 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.07'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.07' / 100.98' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.82 cfs @ 12.06 hrs HW=101.62' (Free Discharge)
1=Culvert (Barrel Controls 0.82 cfs @ 2.66 fps)

Summary for Pond 106P: CB10 TO DMH2

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 4.04" for 25 YEAR STORM event
Inflow = 4.17 cfs @ 12.24 hrs, Volume= 0.448 af
Outflow = 4.17 cfs @ 12.24 hrs, Volume= 0.448 af, Atten= 0%, Lag= 0.0 min
Primary = 4.17 cfs @ 12.24 hrs, Volume= 0.448 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.11' @ 12.24 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.88'	**15.0" Round Culvert** L= 212.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.88' / 99.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.14 cfs @ 12.24 hrs HW=102.11' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.14 cfs @ 4.28 fps)

Summary for Pond 107P: CB8 TO CB10

Inflow Area = 0.698 ac, 31.54% Impervious, Inflow Depth > 3.88" for 25 YEAR STORM event
Inflow = 2.09 cfs @ 12.25 hrs, Volume= 0.226 af
Outflow = 2.09 cfs @ 12.25 hrs, Volume= 0.226 af, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.25 hrs, Volume= 0.226 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.27' @ 12.25 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.36'	**12.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.36' / 100.98' S= 0.0058 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.09 cfs @ 12.25 hrs HW=102.27' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.09 cfs @ 3.66 fps)

Summary for Pond 108P: CB7 TO CB8

Inflow Area = 0.128 ac, 63.42% Impervious, Inflow Depth > 4.67" for 25 YEAR STORM event
Inflow = 0.70 cfs @ 12.08 hrs, Volume= 0.050 af
Outflow = 0.70 cfs @ 12.08 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.08 hrs, Volume= 0.050 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.05' @ 12.08 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.55' / 101.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.68 cfs @ 12.08 hrs HW=102.05' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.68 cfs @ 2.54 fps)

Summary for Pond DMH1: DMH1 TO CB5

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 4.28" for 25 YEAR STORM event
Inflow = 4.72 cfs @ 12.12 hrs, Volume= 0.410 af
Outflow = 4.72 cfs @ 12.12 hrs, Volume= 0.410 af, Atten= 0%, Lag= 0.0 min
Primary = 4.72 cfs @ 12.12 hrs, Volume= 0.410 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.82' @ 12.12 hrs
Flood Elev= 102.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.56'	**15.0" Round Culvert** L= 140.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.56' / 96.58' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.65 cfs @ 12.12 hrs HW=98.80' (Free Discharge)
1=Culvert (Inlet Controls 4.65 cfs @ 3.79 fps)

Summary for Pond DMH2: DMH2 TO CB12

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 4.04" for 25 YEAR STORM event
Inflow = 4.17 cfs @ 12.24 hrs, Volume= 0.448 af
Outflow = 4.17 cfs @ 12.24 hrs, Volume= 0.448 af, Atten= 0%, Lag= 0.0 min
Primary = 4.17 cfs @ 12.24 hrs, Volume= 0.448 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.84' @ 12.24 hrs
Flood Elev= 109.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	99.72'	**15.0" Round Culvert** L= 226.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.72' / 97.46' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.15 cfs @ 12.24 hrs HW=100.83' (Free Discharge)
1=Culvert (Inlet Controls 4.15 cfs @ 3.59 fps)

Summary for Pond DMH3: DMH3 to POND

Inflow Area = 6.014 ac, 42.03% Impervious, Inflow Depth > 4.14" for 25 YEAR STORM event
Inflow = 20.03 cfs @ 12.20 hrs, Volume= 2.076 af
Outflow = 20.03 cfs @ 12.20 hrs, Volume= 2.076 af, Atten= 0%, Lag= 0.0 min
Primary = 20.03 cfs @ 12.20 hrs, Volume= 2.076 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.11' @ 12.20 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.11'	**24.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.11' / 94.95' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=20.02 cfs @ 12.20 hrs HW=98.11' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 20.02 cfs @ 6.37 fps)

Summary for Subcatchment SA-100:

Runoff = 2.67 cfs @ 12.20 hrs, Volume= 0.231 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	759	98	Proposed Impervious
*	21,152	74	Proposed Grass (C)
*	6,639	80	Proposed Grass (D)
	28,550	76	Weighted Average
	27,791		97.34% Pervious Area
	759		2.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	40	0.0050	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
6.0	150		0.42		**Direct Entry,**
14.1	190	Total			

Summary for Subcatchment SA-101:

Runoff = 1.43 cfs @ 12.23 hrs, Volume= 0.138 af, Depth> 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	1,814	98	Proposed Impervious
*	4,356	98	Allocated Impervious
*	7,624	74	Proposed Grass (C)
	13,794	85	Weighted Average
	7,624		55.27% Pervious Area
	6,170		44.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	71	0.0270	1.15		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	77	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
17.3	298	Total			

Summary for Subcatchment SA-102:

Runoff = 0.57 cfs @ 12.03 hrs, Volume= 0.039 af, Depth> 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	2,669	98	Proposed Impervious
*	640	74	Proposed Grass (C)
	3,309	93	Weighted Average
	640		19.34% Pervious Area
	2,669		80.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0150	1.35		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"

Summary for Subcatchment SA-103:

Runoff = 2.29 cfs @ 12.22 hrs, Volume= 0.219 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	4,576	98	Proposed Impervious
*	3,541	80	Proposed Grass (D)
*	6,764	74	Proposed Grass (C)
*	6,098	98	Allocated Impervious
	20,979	87	Weighted Average
	10,305		49.12% Pervious Area
	10,674		50.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	150	0.0130	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.2	22	0.0130	1.71		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	101	0.0490	4.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
16.5	273	Total			

Summary for Subcatchment SA-104:

Runoff = 1.20 cfs @ 12.15 hrs, Volume= 0.098 af, Depth> 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	3,069	98	Proposed Impervious
*	1,742	98	Allocated Impervious
*	4,110	74	Proposed Grass (C)
*	682	80	Proposed Grass (D)
	9,603	86	Weighted Average
	4,792		49.90% Pervious Area
	4,811		50.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	88	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	62	0.0448	1.75		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.2	64	0.0448	4.30		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	214	Total			

Summary for Subcatchment SA-105:

Runoff = 1.03 cfs @ 12.06 hrs, Volume= 0.068 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	871	98	Allocated Impervious
*	2,232	98	Proposed Impervious
*	3,701	74	Proposed Grass (C)
	6,804	85	Weighted Average
	3,701		54.39% Pervious Area
	3,103		45.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0570	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.1	115	0.0300	1.69		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	55	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.1	205	Total			

Summary for Subcatchment SA-106:

Runoff = 2.10 cfs @ 12.24 hrs, Volume= 0.206 af, Depth> 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	3,562	98	Proposed Impervious
*	6,098	98	Allocated Impervious
*	11,021	74	Proposed Grass (C)
	20,681	85	Weighted Average
	11,021		53.29% Pervious Area
	9,660		46.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.6	150	0.0100	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	41	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	25	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
18.1	216	Total			

Summary for Subcatchment SA-107:

Runoff = 2.22 cfs @ 12.27 hrs, Volume= 0.221 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	2,573	98	Proposed Impervious
*	3,485	98	Allocated Impervious
*	18,781	74	Proposed Grass (C)
	24,839	80	Weighted Average
	18,781		75.61% Pervious Area
	6,058		24.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	50	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	19	0.0300	3.52		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
19.9	219	Total			

Summary for Subcatchment SA-108:

Runoff = 0.84 cfs @ 12.08 hrs, Volume= 0.061 af, Depth> 5.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	3,533	98	Proposed Impervious
*	2,038	74	Proposed Grass (C)
	5,571	89	Weighted Average
	2,038		36.58% Pervious Area
	3,533		63.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	25	0.0100	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.2	125	0.0318	1.76		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.3	61	0.0318	3.62		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.7	211	Total			

Summary for Subcatchment SA-64:

Runoff = 4.29 cfs @ 12.29 hrs, Volume= 0.431 af, Depth> 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	2,614	98	Allocated Impervious
*	24,647	74	Proposed Grass (C)
*	4,300	80	Proposed Grass (D)
*	9,626	70	Existing Woods (C)
*	12,226	77	Existing Woods (D)
	53,413	76	Weighted Average
	50,799		95.11% Pervious Area
	2,614		4.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	150	0.0600	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.30"
2.1	156	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
20.9	306	Total			

Summary for Subcatchment SA-65:

Runoff = 4.92 cfs @ 12.32 hrs, Volume= 0.546 af, Depth> 5.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	9,059	98	Proposed Impervious
*	16,553	98	Allocated Impervious
*	25,516	74	Proposed Grass (C)
*	2,518	80	Proposed Grass (D)
	53,646	86	Weighted Average
	28,034		52.26% Pervious Area
	25,612		47.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	150	0.0133	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
8.6	377	0.0110	0.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.3	527	Total			

Summary for Subcatchment SA-66:

Runoff = 5.44 cfs @ 12.19 hrs, Volume= 0.470 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	7,841	98	Allocated Impervious
*	6,129	98	Proposed Impervious
*	37,701	74	Proposed Grass (C)
*	983	80	Proposed Grass (D)
	52,654	80	Weighted Average
	38,684		73.47% Pervious Area
	13,970		26.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
2.2	137	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	58	0.0110	2.13		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.6	345	Total			

Summary for Subcatchment SA-67:

Runoff = 2.31 cfs @ 12.07 hrs, Volume= 0.158 af, Depth> 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	3,154	98	Proposed Impervious
*	7,936	74	Proposed Grass (C)
	15,446	86	Weighted Average
	7,936		51.38% Pervious Area
	7,510		48.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	90	0.3000	0.50		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.9	60	0.0150	1.12		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.8	120	0.0153	2.51		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.7	270	Total			

Summary for Subcatchment SA-68:

Runoff = 1.11 cfs @ 12.19 hrs, Volume= 0.098 af, Depth> 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	1,125	98	Proposed Impervious
*	6,530	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	10,269	83	Weighted Average
	6,530		63.59% Pervious Area
	3,739		36.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.3	150	0.0200	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.6	50	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	200	Total			

Summary for Subcatchment SA-69:

Runoff = 1.83 cfs @ 12.16 hrs, Volume= 0.154 af, Depth> 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	3,807	98	Proposed Impervious
*	8,093	74	Proposed Grass (C)
*	3,485	98	Allocated Impervious
	15,385	85	Weighted Average
	8,093		52.60% Pervious Area
	7,292		47.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	150	0.0300	0.22		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.5	80	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.8	230	Total			

Summary for Subcatchment SA-70:

Runoff = 1.15 cfs @ 12.15 hrs, Volume= 0.096 af, Depth> 5.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	2,692	98	Proposed Impervious
*	3,696	74	Proposed Grass (C)
*	2,614	98	Allocated Impervious
	9,002	88	Weighted Average
	3,696		41.06% Pervious Area
	5,306		58.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	70	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	80	0.0200	1.34		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.4	73	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
11.0	223	Total			

Summary for Reach 64R: LAND AFTER SPILLWAY

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 4.19" for 50 YEAR STORM event
Inflow = 4.27 cfs @ 12.31 hrs, Volume= 0.428 af
Outflow = 4.21 cfs @ 12.38 hrs, Volume= 0.427 af, Atten= 1%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.01 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 5.7 min

Peak Storage= 625 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 858.59 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 150.0' Slope= 0.0373 '/'
Inlet Invert= 82.10', Outlet Invert= 76.50'



‡

Summary for Reach 101R: LAND AFTER SPILLWAY

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 4.29" for 50 YEAR STORM event
Inflow = 18.17 cfs @ 12.43 hrs, Volume= 2.383 af
Outflow = 18.16 cfs @ 12.46 hrs, Volume= 2.378 af, Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 3.5 min

Peak Storage= 1,258 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 1.00' Flow Area= 105.0 sf, Capacity= 1,220.86 cfs

100.00' x 1.00' deep channel, n= 0.034
Side Slope Z-value= 5.0 '/' Top Width= 110.00'
Length= 155.0' Slope= 0.0755 '/'
Inlet Invert= 88.50', Outlet Invert= 76.80'



‡

Summary for Reach 300R: TOTAL FLOW

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 4.26" for 50 YEAR STORM event
Inflow = 22.31 cfs @ 12.40 hrs, Volume= 2.805 af
Outflow = 22.31 cfs @ 12.40 hrs, Volume= 2.805 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 64P: 18" SD

Inflow Area = 1.226 ac, 4.89% Impervious, Inflow Depth > 4.22" for 50 YEAR STORM event
Inflow = 4.29 cfs @ 12.29 hrs, Volume= 0.431 af
Outflow = 4.27 cfs @ 12.31 hrs, Volume= 0.428 af, Atten= 0%, Lag= 1.3 min
Primary = 4.27 cfs @ 12.31 hrs, Volume= 0.428 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 91.80' @ 12.31 hrs Surf.Area= 528 sf Storage= 437 cf
Flood Elev= 101.00' Surf.Area= 10,000 sf Storage= 42,482 cf

Plug-Flow detention time= 6.0 min calculated for 0.428 af (99% of inflow)
Center-of-Mass det. time= 3.2 min (797.0 - 793.8)

Volume	Invert	Avail.Storage	Storage Description
#1	90.00'	42,482 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.00	100	0	0
91.00	195	148	148
92.00	611	403	551
93.00	1,192	902	1,452
94.00	1,813	1,503	2,955
95.00	2,645	2,229	5,184
96.00	3,623	3,134	8,318
97.00	4,791	4,207	12,525
98.00	6,087	5,439	17,964
99.00	7,525	6,806	24,770
100.00	8,950	8,238	33,007
101.00	10,000	9,475	42,482

Device	Routing	Invert	Outlet Devices
#1	Primary	90.80'	**18.0" Round Culvert** L= 136.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 90.80' / 82.10' S= 0.0640 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.24 cfs @ 12.31 hrs HW=91.80' (Free Discharge)
1=Culvert (Inlet Controls 4.24 cfs @ 3.40 fps)

Summary for Pond 65P: CB6 TO CB5

Inflow Area = 1.232 ac, 47.74% Impervious, Inflow Depth > 5.32" for 50 YEAR STORM event
Inflow = 4.92 cfs @ 12.32 hrs, Volume= 0.546 af
Outflow = 4.92 cfs @ 12.32 hrs, Volume= 0.546 af, Atten= 0%, Lag= 0.0 min
Primary = 4.92 cfs @ 12.32 hrs, Volume= 0.546 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.86' @ 12.32 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.67'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.67' / 96.58' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.89 cfs @ 12.32 hrs HW=98.84' (Free Discharge)
1=Culvert (Inlet Controls 4.89 cfs @ 6.22 fps)

Summary for Pond 66P: CB5 TO DMH3

Inflow Area = 3.590 ac, 40.56% Impervious, Inflow Depth > 5.09" for 50 YEAR STORM event
Inflow = 14.59 cfs @ 12.19 hrs, Volume= 1.522 af
Outflow = 14.59 cfs @ 12.19 hrs, Volume= 1.522 af, Atten= 0%, Lag= 0.0 min
Primary = 14.59 cfs @ 12.19 hrs, Volume= 1.522 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.52' @ 12.19 hrs
Flood Elev= 100.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.48'	**24.0" Round Culvert** L= 254.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.48' / 95.21' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=14.51 cfs @ 12.19 hrs HW=98.51' (Free Discharge)
1=Culvert (Barrel Controls 14.51 cfs @ 5.65 fps)

Summary for Pond 67P: CB4 TO DMH1

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 5.28" for 50 YEAR STORM event
Inflow = 5.76 cfs @ 12.12 hrs, Volume= 0.506 af
Outflow = 5.76 cfs @ 12.12 hrs, Volume= 0.506 af, Atten= 0%, Lag= 0.0 min
Primary = 5.76 cfs @ 12.12 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 103.38' @ 12.12 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**12.0" Round Culvert** L= 156.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.00' / 97.66' S= 0.0150 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=5.66 cfs @ 12.12 hrs HW=103.23' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.66 cfs @ 7.20 fps)

Summary for Pond 68P: CB3 TO CB4

Inflow Area = 0.796 ac, 47.14% Impervious, Inflow Depth > 5.25" for 50 YEAR STORM event
Inflow = 4.07 cfs @ 12.16 hrs, Volume= 0.348 af
Outflow = 4.07 cfs @ 12.16 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Primary = 4.07 cfs @ 12.16 hrs, Volume= 0.348 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.93' @ 12.16 hrs
Flood Elev= 104.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.19'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.19' / 100.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.01 cfs @ 12.16 hrs HW=101.90' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.01 cfs @ 5.10 fps)

Summary for Pond 69P: CB2 TO CB3

Inflow Area = 0.560 ac, 51.66% Impervious, Inflow Depth > 5.35" for 50 YEAR STORM event
Inflow = 2.98 cfs @ 12.16 hrs, Volume= 0.250 af
Outflow = 2.98 cfs @ 12.16 hrs, Volume= 0.250 af, Atten= 0%, Lag= 0.0 min
Primary = 2.98 cfs @ 12.16 hrs, Volume= 0.250 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.11' @ 12.15 hrs
Flood Elev= 105.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.70'	**12.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.70' / 100.29' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.92 cfs @ 12.16 hrs HW=102.08' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.92 cfs @ 3.72 fps)

Summary for Pond 70P: CB1 TO CB2

Inflow Area = 0.207 ac, 58.94% Impervious, Inflow Depth > 5.57" for 50 YEAR STORM event
Inflow = 1.15 cfs @ 12.15 hrs, Volume= 0.096 af
Outflow = 1.15 cfs @ 12.15 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.15 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.67' @ 12.15 hrs
Flood Elev= 106.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.02'	**12.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.02' / 100.80' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.15 cfs @ 12.15 hrs HW=101.67' (Free Discharge)
1=Culvert (Barrel Controls 1.15 cfs @ 3.02 fps)

Summary for Pond 100P: POND 3

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 5.04" for 50 YEAR STORM event
Inflow = 27.26 cfs @ 12.20 hrs, Volume= 2.802 af
Outflow = 18.17 cfs @ 12.43 hrs, Volume= 2.383 af, Atten= 33%, Lag= 14.0 min
Primary = 18.17 cfs @ 12.43 hrs, Volume= 2.383 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 94.81' @ 12.43 hrs Surf.Area= 14,867 sf Storage= 71,445 cf (35,243 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= 166.5 min calculated for 1.548 af (55% of inflow)
Center-of-Mass det. time= 29.1 min (802.5 - 773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	89.50'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.50' / 88.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Device 1	93.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 1	89.50'	**1.5" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=18.16 cfs @ 12.43 hrs HW=94.81' (Free Discharge)
└**1=Culvert** (Inlet Controls 18.16 cfs @ 10.28 fps)
  └**3=Sharp-Crested Vee/Trap Weir** (Passes < 29.37 cfs potential flow)
  └**4=Orifice/Grate** (Passes < 0.14 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 101P: CB13 TO DMH3

Inflow Area = 2.424 ac, 44.21% Impervious, Inflow Depth > 5.20" for 50 YEAR STORM event
Inflow = 10.04 cfs @ 12.21 hrs, Volume= 1.050 af
Outflow = 10.04 cfs @ 12.21 hrs, Volume= 1.050 af, Atten= 0%, Lag= 0.0 min
Primary = 10.04 cfs @ 12.21 hrs, Volume= 1.050 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 99.71' @ 12.21 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.20'	**15.0" Round Culvert** L= 82.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.20' / 95.21' S= 0.0121 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=9.99 cfs @ 12.21 hrs HW=99.68' (Free Discharge)
└**1=Culvert** (Inlet Controls 9.99 cfs @ 8.14 fps)

Summary for Pond 102P: CB14 TO CB13

Inflow Area = 0.076 ac, 80.66% Impervious, Inflow Depth > 6.16" for 50 YEAR STORM event
Inflow = 0.57 cfs @ 12.03 hrs, Volume= 0.039 af
Outflow = 0.57 cfs @ 12.03 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 12.03 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.84' @ 12.03 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.39'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 96.39' / 96.30' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 12.03 hrs HW=96.83' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.55 cfs @ 2.41 fps)

Summary for Pond 103P: CB12 TO CB13

Inflow Area = 2.031 ac, 42.77% Impervious, Inflow Depth > 5.16" for 50 YEAR STORM event
Inflow = 8.40 cfs @ 12.21 hrs, Volume= 0.873 af
Outflow = 8.40 cfs @ 12.21 hrs, Volume= 0.873 af, Atten= 0%, Lag= 0.0 min
Primary = 8.40 cfs @ 12.21 hrs, Volume= 0.873 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 100.01' @ 12.21 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.36'	**15.0" Round Culvert** L= 88.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.36' / 96.30' S= 0.0120 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=8.37 cfs @ 12.21 hrs HW=99.99' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.37 cfs @ 6.82 fps)

Summary for Pond 104P: CB11 TO CB12

Inflow Area = 0.220 ac, 50.10% Impervious, Inflow Depth > 5.34" for 50 YEAR STORM event
Inflow = 1.20 cfs @ 12.15 hrs, Volume= 0.098 af
Outflow = 1.20 cfs @ 12.15 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.15 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.24' @ 12.15 hrs
Flood Elev= 100.56'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.55' / 97.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.15 hrs HW=98.24' (Free Discharge)
1=Culvert (Barrel Controls 1.19 cfs @ 2.93 fps)

Summary for Pond 105P: CB9 TO CB10

Inflow Area = 0.156 ac, 45.61% Impervious, Inflow Depth > 5.24" for 50 YEAR STORM event
Inflow = 1.03 cfs @ 12.06 hrs, Volume= 0.068 af
Outflow = 1.03 cfs @ 12.06 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.06 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.70' @ 12.06 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.07'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.07' / 100.98' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.00 cfs @ 12.06 hrs HW=101.69' (Free Discharge)
1=Culvert (Barrel Controls 1.00 cfs @ 2.80 fps)

Summary for Pond 106P: CB10 TO DMH2

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 5.02" for 50 YEAR STORM event
Inflow = 5.13 cfs @ 12.24 hrs, Volume= 0.556 af
Outflow = 5.13 cfs @ 12.24 hrs, Volume= 0.556 af, Atten= 0%, Lag= 0.0 min
Primary = 5.13 cfs @ 12.24 hrs, Volume= 0.556 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.40' @ 12.24 hrs
Flood Elev= 104.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.88'	**15.0" Round Culvert** L= 212.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 100.88' / 99.82' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.11 cfs @ 12.24 hrs HW=102.39' (Free Discharge)
1=Culvert (Barrel Controls 5.11 cfs @ 4.37 fps)

Summary for Pond 107P: CB8 TO CB10

Inflow Area = 0.698 ac, 31.54% Impervious, Inflow Depth > 4.85" for 50 YEAR STORM event
Inflow = 2.60 cfs @ 12.25 hrs, Volume= 0.282 af
Outflow = 2.60 cfs @ 12.25 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min
Primary = 2.60 cfs @ 12.25 hrs, Volume= 0.282 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.44' @ 12.25 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.36'	**12.0" Round Culvert** L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.36' / 100.98' S= 0.0058 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.60 cfs @ 12.25 hrs HW=102.44' (Free Discharge)
1=Culvert (Barrel Controls 2.60 cfs @ 3.82 fps)

Summary for Pond 108P: CB7 TO CB8

Inflow Area = 0.128 ac, 63.42% Impervious, Inflow Depth > 5.69" for 50 YEAR STORM event
Inflow = 0.84 cfs @ 12.08 hrs, Volume= 0.061 af
Outflow = 0.84 cfs @ 12.08 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.08 hrs, Volume= 0.061 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 102.11' @ 12.08 hrs
Flood Elev= 104.61'

Device	Routing	Invert	Outlet Devices
#1	Primary	101.55'	**12.0" Round Culvert** L= 18.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.55' / 101.46' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.08 hrs HW=102.10' (Free Discharge)
1=Culvert (Barrel Controls 0.81 cfs @ 2.66 fps)

Summary for Pond DMH1: DMH1 TO CB5

Inflow Area = 1.150 ac, 47.60% Impervious, Inflow Depth > 5.28" for 50 YEAR STORM event
Inflow = 5.76 cfs @ 12.12 hrs, Volume= 0.506 af
Outflow = 5.76 cfs @ 12.12 hrs, Volume= 0.506 af, Atten= 0%, Lag= 0.0 min
Primary = 5.76 cfs @ 12.12 hrs, Volume= 0.506 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 99.13' @ 12.12 hrs
Flood Elev= 102.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.56'	**15.0" Round Culvert** L= 140.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.56' / 96.58' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.66 cfs @ 12.12 hrs HW=99.10' (Free Discharge)
1=Culvert (Inlet Controls 5.66 cfs @ 4.61 fps)

Summary for Pond DMH2: DMH2 TO CB12

Inflow Area = 1.329 ac, 38.61% Impervious, Inflow Depth > 5.02" for 50 YEAR STORM event
Inflow = 5.13 cfs @ 12.24 hrs, Volume= 0.556 af
Outflow = 5.13 cfs @ 12.24 hrs, Volume= 0.556 af, Atten= 0%, Lag= 0.0 min
Primary = 5.13 cfs @ 12.24 hrs, Volume= 0.556 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 101.10' @ 12.24 hrs
Flood Elev= 109.09'

Device	Routing	Invert	Outlet Devices
#1	Primary	99.72'	**15.0" Round Culvert** L= 226.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 99.72' / 97.46' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=5.10 cfs @ 12.24 hrs HW=101.09' (Free Discharge)
1=Culvert (Inlet Controls 5.10 cfs @ 4.16 fps)

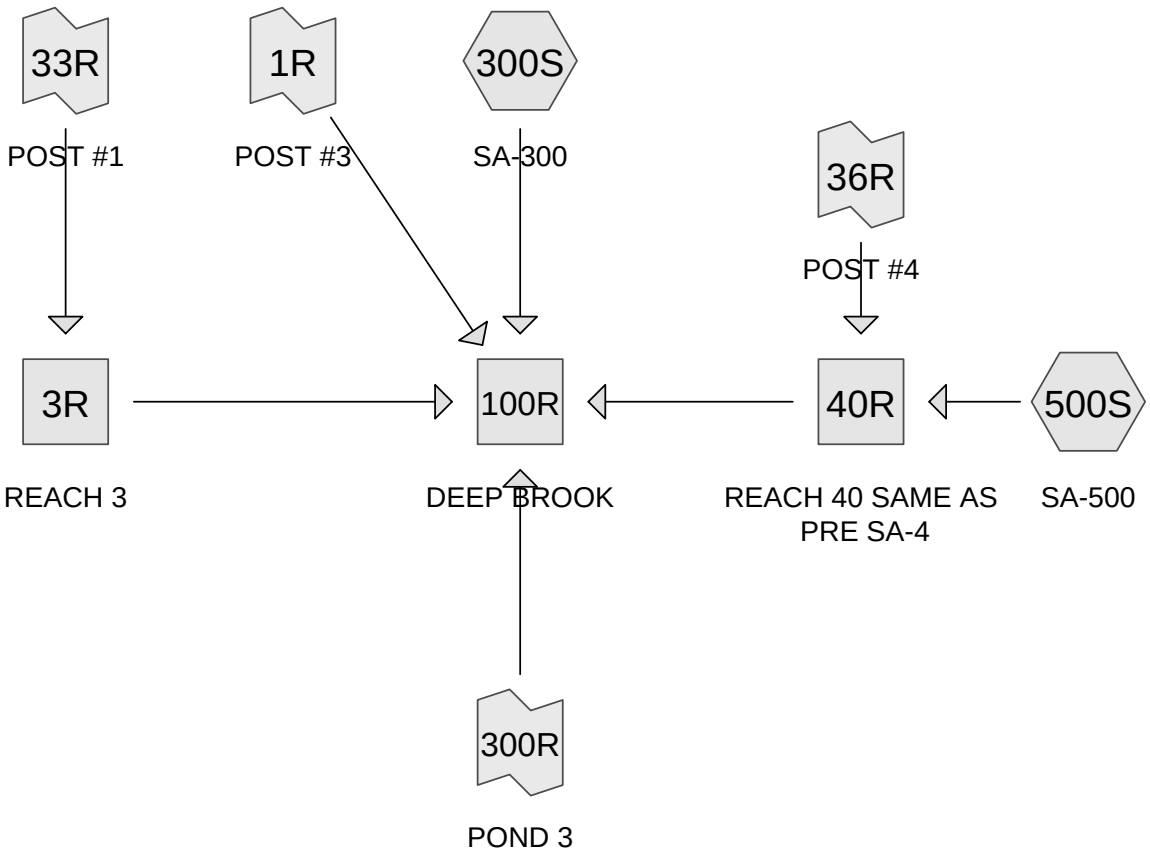
Summary for Pond DMH3: DMH3 to POND

Inflow Area = 6.014 ac, 42.03% Impervious, Inflow Depth > 5.13" for 50 YEAR STORM event
Inflow = 24.59 cfs @ 12.20 hrs, Volume= 2.571 af
Outflow = 24.59 cfs @ 12.20 hrs, Volume= 2.571 af, Atten= 0%, Lag= 0.0 min
Primary = 24.59 cfs @ 12.20 hrs, Volume= 2.571 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.75' @ 12.20 hrs
Flood Elev= 100.41'

Device	Routing	Invert	Outlet Devices
#1	Primary	95.11'	**24.0" Round Culvert** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 95.11' / 94.95' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=24.57 cfs @ 12.20 hrs HW=98.75' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 24.57 cfs @ 7.82 fps)



Subcat Reach Pond Link

Routing Diagram for Sandy Brook POSTDEVELOPMENT #1A
Prepared by BH2M, Printed 12/1/2017
HydroCAD® 10.00-20 s/n 00619 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
12.110	80	Existing Grass (D) (300S)
0.560	98	Existing Impervious (300S)
0.400	74	Proposed Grass (C) (300S, 500S)
0.500	80	Proposed Grass (D) (300S)
0.490	70	Woods, Good, HSG C (500S)
6.590	77	Woods, Good, HSG D (500S)
20.650	**79**	**TOTAL AREA**

Summary for Subcatchment 300S: SA-300

Runoff = 16.17 cfs @ 12.24 hrs, Volume= 1.597 af, Depth> 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.560	98	Existing Impervious
*	0.500	80	Proposed Grass (D)
*	0.290	74	Proposed Grass (C)
*	12.110	80	Existing Grass (D)
	13.460	81	Weighted Average
	12.900		95.84% Pervious Area
	0.560		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	150	0.1000	0.16		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.00"
0.5	70	0.1000	2.21		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
3.5	895	0.0030	4.26	242.80	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=3.00' Z= 3.0 '/' Top.W=28.00' n= 0.030
20.1	1,115	Total			

Summary for Subcatchment 500S: SA-500

Runoff = 7.10 cfs @ 12.21 hrs, Volume= 0.670 af, Depth> 1.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
	0.490	70	Woods, Good, HSG C
*	0.110	74	Proposed Grass (C)
	6.590	77	Woods, Good, HSG D
	7.190	76	Weighted Average
	7.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	70	0.3000	2.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	540	0.0030	1.85	24.04	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 10.0 '/' Top.W=23.00' n= 0.030
3.2	650	0.0030	3.42	109.31	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=2.00' Z= 3.0 '/' Top.W=22.00' n= 0.030
16.7	1,410	Total			

Summary for Reach 3R: REACH 3

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 1.11" for 2 YEAR STORM event
Inflow = 7.49 cfs @ 12.45 hrs, Volume= 2.193 af
Outflow = 6.63 cfs @ 13.19 hrs, Volume= 2.073 af, Atten= 11%, Lag= 44.0 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.41 fps, Min. Travel Time= 21.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 32.7 min

Peak Storage= 8,509 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 3.00' Flow Area= 57.0 sf, Capacity= 242.80 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 28.00'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -5.40'



‡

Summary for Reach 40R: REACH 40 SAME AS PRE SA-4

Inflow Area = 15.623 ac, 8.25% Impervious, Inflow Depth > 0.78" for 2 YEAR STORM event
Inflow = 7.35 cfs @ 12.21 hrs, Volume= 1.019 af
Outflow = 6.61 cfs @ 12.43 hrs, Volume= 0.995 af, Atten= 10%, Lag= 12.8 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.41 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 14.5 min

Peak Storage= 2,852 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 109.31 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.80'



‡

Summary for Reach 100R: DEEP BROOK

Inflow Area = 130.888 ac, 7.46% Impervious, Inflow Depth > 0.94" for 2 YEAR STORM event
Inflow = 23.94 cfs @ 12.34 hrs, Volume= 10.298 af
Outflow = 23.61 cfs @ 12.37 hrs, Volume= 10.279 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 1.0 min

Peak Storage= 1,110 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.30'



‡

Summary for Link 1R: POST #3

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 0.87" for 2 YEAR STORM event
Inflow = 11.52 cfs @ 14.86 hrs, Volume= 5.103 af
Primary = 11.52 cfs @ 14.86 hrs, Volume= 5.103 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

2 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #3~Reach 1R.hce

Summary for Link 33R: POST #1

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 1.11" for 2 YEAR STORM event
Inflow = 7.49 cfs @ 12.45 hrs, Volume= 2.193 af
Primary = 7.49 cfs @ 12.45 hrs, Volume= 2.193 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

2 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #1~Reach 33R.hce

Summary for Link 36R: POST #4

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 0.50" for 2 YEAR STORM event
Inflow = 0.55 cfs @ 16.44 hrs, Volume= 0.349 af
Primary = 0.55 cfs @ 16.44 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

2 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #4~Reach 36R.hce

Summary for Link 300R: POND 3

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 0.81" for 2 YEAR STORM event
Inflow = 1.80 cfs @ 13.13 hrs, Volume= 0.530 af
Primary = 1.80 cfs @ 13.13 hrs, Volume= 0.530 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

2 YEAR STORM Outflow Imported from Sandy Brook Postdevelopment New Sub~Reach 300R.hce

Summary for Subcatchment 300S: SA-300

Runoff = 30.49 cfs @ 12.23 hrs, Volume= 2.968 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.560	98	Existing Impervious
*	0.500	80	Proposed Grass (D)
*	0.290	74	Proposed Grass (C)
*	12.110	80	Existing Grass (D)
	13.460	81	Weighted Average
	12.900		95.84% Pervious Area
	0.560		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	150	0.1000	0.16		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.00"
0.5	70	0.1000	2.21		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
3.5	895	0.0030	4.26	242.80	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=3.00' Z= 3.0 '/' Top.W=28.00' n= 0.030
20.1	1,115	Total			

Summary for Subcatchment 500S: SA-500

Runoff = 14.66 cfs @ 12.20 hrs, Volume= 1.352 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
	0.490	70	Woods, Good, HSG C
*	0.110	74	Proposed Grass (C)
	6.590	77	Woods, Good, HSG D
	7.190	76	Weighted Average
	7.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	70	0.3000	2.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	540	0.0030	1.85	24.04	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 10.0 '/' Top.W=23.00' n= 0.030
3.2	650	0.0030	3.42	109.31	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=2.00' Z= 3.0 '/' Top.W=22.00' n= 0.030
16.7	1,410	Total			

Summary for Reach 3R: REACH 3

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 2.29" for 10 YEAR STORM event
Inflow = 24.00 cfs @ 12.60 hrs, Volume= 4.509 af
Outflow = 22.32 cfs @ 13.05 hrs, Volume= 4.386 af, Atten= 7%, Lag= 26.9 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.12 fps, Min. Travel Time= 14.2 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 26.0 min

Peak Storage= 19,041 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 3.00' Flow Area= 57.0 sf, Capacity= 242.80 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 28.00'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -5.40'



‡

Summary for Reach 40R: REACH 40 SAME AS PRE SA-4

Inflow Area = 15.623 ac, 8.25% Impervious, Inflow Depth > 1.83" for 10 YEAR STORM event
Inflow = 15.08 cfs @ 12.20 hrs, Volume= 2.383 af
Outflow = 13.94 cfs @ 12.36 hrs, Volume= 2.352 af, Atten= 8%, Lag= 9.9 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 10.5 min

Peak Storage= 4,640 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 109.31 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.80'



‡

Summary for Reach 100R: DEEP BROOK

Inflow Area = 130.888 ac, 7.46% Impervious, Inflow Depth > 2.01" for 10 YEAR STORM event
Inflow = 60.90 cfs @ 12.43 hrs, Volume= 21.897 af
Outflow = 60.87 cfs @ 12.44 hrs, Volume= 21.867 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.95 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.8 min

Peak Storage= 2,070 cf @ 12.43 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.30'



‡

Summary for Link 1R: POST #3

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 1.85" for 10 YEAR STORM event
Inflow = 23.94 cfs @ 14.44 hrs, Volume= 10.820 af
Primary = 23.94 cfs @ 14.44 hrs, Volume= 10.820 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

10 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #3~Reach 1R.hce

Summary for Link 33R: POST #1

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 2.29" for 10 YEAR STORM event
Inflow = 24.00 cfs @ 12.60 hrs, Volume= 4.509 af
Primary = 24.00 cfs @ 12.60 hrs, Volume= 4.509 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

10 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #1~Reach 33R.hce

Summary for Link 36R: POST #4

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 1.47" for 10 YEAR STORM event
Inflow = 2.72 cfs @ 13.31 hrs, Volume= 1.031 af
Primary = 2.72 cfs @ 13.31 hrs, Volume= 1.031 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

10 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #4~Reach 36R.hce

Summary for Link 300R: POND 3

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 2.08" for 10 YEAR STORM event
Inflow = 12.22 cfs @ 12.50 hrs, Volume= 1.371 af
Primary = 12.22 cfs @ 12.50 hrs, Volume= 1.371 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

10 YEAR STORM Outflow Imported from Sandy Brook Postdevelopment New Sub~Reach 300R.hce

Summary for Subcatchment 300S: SA-300

Runoff = 42.59 cfs @ 12.23 hrs, Volume= 4.128 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.560	98	Existing Impervious
*	0.500	80	Proposed Grass (D)
*	0.290	74	Proposed Grass (C)
*	12.110	80	Existing Grass (D)
	13.460	81	Weighted Average
	12.900		95.84% Pervious Area
	0.560		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	150	0.1000	0.16		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.00"
0.5	70	0.1000	2.21		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
3.5	895	0.0030	4.26	242.80	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=3.00' Z= 3.0 '/' Top.W=28.00' n= 0.030
20.1	1,115	Total			

Summary for Subcatchment 500S: SA-500

Runoff = 21.28 cfs @ 12.19 hrs, Volume= 1.948 af, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
	0.490	70	Woods, Good, HSG C
*	0.110	74	Proposed Grass (C)
	6.590	77	Woods, Good, HSG D
	7.190	76	Weighted Average
	7.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	70	0.3000	2.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	540	0.0030	1.85	24.04	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 10.0 '/' Top.W=23.00' n= 0.030
3.2	650	0.0030	3.42	109.31	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=2.00' Z= 3.0 '/' Top.W=22.00' n= 0.030
16.7	1,410	Total			

Summary for Reach 3R: REACH 3

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 3.30" for 25 YEAR STORM event
Inflow = 35.46 cfs @ 12.55 hrs, Volume= 6.491 af
Outflow = 33.69 cfs @ 12.94 hrs, Volume= 6.354 af, Atten= 5%, Lag= 23.6 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.41 fps, Min. Travel Time= 12.5 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 23.2 min

Peak Storage= 25,193 cf @ 12.73 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 3.00' Flow Area= 57.0 sf, Capacity= 242.80 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 28.00'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -5.40'



‡

Summary for Reach 40R: REACH 40 SAME AS PRE SA-4

Inflow Area = 15.623 ac, 8.25% Impervious, Inflow Depth > 2.81" for 25 YEAR STORM event
Inflow = 21.90 cfs @ 12.20 hrs, Volume= 3.655 af
Outflow = 20.67 cfs @ 12.35 hrs, Volume= 3.618 af, Atten= 6%, Lag= 8.8 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 9.0 min

Peak Storage= 6,016 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 109.31 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.80'



‡

Summary for Reach 100R: DEEP BROOK

Inflow Area = 130.888 ac, 7.46% Impervious, Inflow Depth > 2.92" for 25 YEAR STORM event
Inflow = 96.73 cfs @ 12.45 hrs, Volume= 31.838 af
Outflow = 96.64 cfs @ 12.46 hrs, Volume= 31.799 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.41 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.36 fps, Avg. Travel Time= 0.7 min

Peak Storage= 2,835 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.81'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.30'



‡

Summary for Link 1R: POST #3

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 2.67" for 25 YEAR STORM event
Inflow = 35.06 cfs @ 14.10 hrs, Volume= 15.642 af
Primary = 35.06 cfs @ 14.10 hrs, Volume= 15.642 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

25 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #3~Reach 1R.hce

Summary for Link 33R: POST #1

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 3.30" for 25 YEAR STORM event
Inflow = 35.46 cfs @ 12.55 hrs, Volume= 6.491 af
Primary = 35.46 cfs @ 12.55 hrs, Volume= 6.491 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

25 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #1~Reach 33R.hce

Summary for Link 36R: POST #4

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 2.43" for 25 YEAR STORM event
Inflow = 4.74 cfs @ 13.05 hrs, Volume= 1.706 af
Primary = 4.74 cfs @ 13.05 hrs, Volume= 1.706 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

25 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #4~Reach 36R.hce

Summary for Link 300R: POND 3

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 3.19" for 25 YEAR STORM event
Inflow = 20.24 cfs @ 12.41 hrs, Volume= 2.097 af
Primary = 20.24 cfs @ 12.41 hrs, Volume= 2.097 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

25 YEAR STORM Outflow Imported from Sandy Brook Postdevelopment New Sub~Reach 300R.hce

Summary for Subcatchment 300S: SA-300

Runoff = 52.94 cfs @ 12.23 hrs, Volume= 5.123 af, Depth> 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.560	98	Existing Impervious
*	0.500	80	Proposed Grass (D)
*	0.290	74	Proposed Grass (C)
*	12.110	80	Existing Grass (D)
	13.460	81	Weighted Average
	12.900		95.84% Pervious Area
	0.560		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	150	0.1000	0.16		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.00"
0.5	70	0.1000	2.21		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
3.5	895	0.0030	4.26	242.80	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=3.00' Z= 3.0 '/' Top.W=28.00' n= 0.030
20.1	1,115	Total			

Summary for Subcatchment 500S: SA-500

Runoff = 27.02 cfs @ 12.19 hrs, Volume= 2.467 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
	0.490	70	Woods, Good, HSG C
*	0.110	74	Proposed Grass (C)
	6.590	77	Woods, Good, HSG D
	7.190	76	Weighted Average
	7.190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	70	0.3000	2.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.9	540	0.0030	1.85	24.04	**Trap/Vee/Rect Channel Flow,** Bot.W=3.00' D=1.00' Z= 10.0 '/' Top.W=23.00' n= 0.030
3.2	650	0.0030	3.42	109.31	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=2.00' Z= 3.0 '/' Top.W=22.00' n= 0.030
16.7	1,410	Total			

Summary for Reach 3R: REACH 3

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 4.17" for 50 YEAR STORM event
Inflow = 47.68 cfs @ 12.57 hrs, Volume= 8.194 af
Outflow = 45.65 cfs @ 12.93 hrs, Volume= 8.046 af, Atten= 4%, Lag= 21.6 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.64 fps, Min. Travel Time= 11.3 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 21.5 min

Peak Storage= 31,112 cf @ 12.74 hrs
Average Depth at Peak Storage= 1.26'
Bank-Full Depth= 3.00' Flow Area= 57.0 sf, Capacity= 242.80 cfs

10.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 28.00'
Length= 1,800.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -5.40'



‡

Summary for Reach 40R: REACH 40 SAME AS PRE SA-4

Inflow Area = 15.623 ac, 8.25% Impervious, Inflow Depth > 3.66" for 50 YEAR STORM event
Inflow = 28.48 cfs @ 12.21 hrs, Volume= 4.759 af
Outflow = 26.98 cfs @ 12.35 hrs, Volume= 4.717 af, Atten= 5%, Lag= 8.2 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.25 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 8.2 min

Peak Storage= 7,238 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 2.00' Flow Area= 32.0 sf, Capacity= 109.31 cfs

10.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 22.00'
Length= 600.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -1.80'



‡

Summary for Reach 100R: DEEP BROOK

Inflow Area = 130.888 ac, 7.46% Impervious, Inflow Depth > 3.70" for 50 YEAR STORM event
Inflow = 126.68 cfs @ 12.68 hrs, Volume= 40.323 af
Outflow = 126.60 cfs @ 12.69 hrs, Volume= 40.277 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.55 fps, Avg. Travel Time= 0.7 min

Peak Storage= 3,419 cf @ 12.68 hrs
Average Depth at Peak Storage= 2.11'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 100.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.30'



‡

Summary for Link 1R: POST #3

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 3.36" for 50 YEAR STORM event
Inflow = 44.48 cfs @ 13.85 hrs, Volume= 19.712 af
Primary = 44.48 cfs @ 13.85 hrs, Volume= 19.712 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

50 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #3~Reach 1R.hce

Summary for Link 33R: POST #1

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 4.17" for 50 YEAR STORM event
Inflow = 47.68 cfs @ 12.57 hrs, Volume= 8.194 af
Primary = 47.68 cfs @ 12.57 hrs, Volume= 8.194 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

50 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #1~Reach 33R.hce

Summary for Link 36R: POST #4

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 3.26" for 50 YEAR STORM event
Inflow = 9.07 cfs @ 12.87 hrs, Volume= 2.292 af
Primary = 9.07 cfs @ 12.87 hrs, Volume= 2.292 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

50 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #4~Reach 36R.hce

Summary for Link 300R: POND 3

Inflow Area = 7.896 ac, 32.99% Impervious, Inflow Depth > 4.14" for 50 YEAR STORM event
Inflow = 22.31 cfs @ 12.40 hrs, Volume= 2.726 af
Primary = 22.31 cfs @ 12.40 hrs, Volume= 2.726 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

50 YEAR STORM Outflow Imported from Sandy Brook Postdevelopment New Sub~Reach 300R.hce

Appendix D

Treatment Calculations

BH2M
28 State Street
Gorham, Maine 04038

WATER QUALITY CALCULATIONS
Sandy Brook

Subcatchment ID	Proposed Impervious Area (ac.)	Proposed Lawn Area (ac.)	Proposed Developed Area (ac.)	Existing Impervious Area (ac.)	Existing Lawn Area (ac.)	Existing Developed Area (ac.)	Treated Prop. Impervious Area (ac.)	Treated Prop. Developed Area (ac.)	Total Treated Impervious Area (ac.)	Total Area (ac.)	BMP ID
65	0.59	0.64	1.23	0.00	0.00	0.00	0.59	1.23	0.59	1.23	Pond 3
66	0.32	0.89	1.21	0.00	0.00	0.00	0.32	1.21	0.32	1.21	Pond 3
67	0.17	0.18	0.35	0.00	0.00	0.00	0.17	0.35	0.17	0.35	Pond 3
68	0.09	0.15	0.24	0.00	0.00	0.00	0.09	0.24	0.09	0.24	Pond 3
69	0.17	0.19	0.35	0.00	0.00	0.00	0.17	0.35	0.17	0.35	Pond 3
70	0.12	0.08	0.21	0.00	0.00	0.00	0.12	0.21	0.12	0.21	Pond 3
100	0.02	0.64	0.66	0.00	0.00	0.00	0.02	0.66	0.02	0.66	Pond 3
101	0.14	0.18	0.32	0.00	0.00	0.00	0.14	0.32	0.14	0.32	Pond 3
102	0.06	0.01	0.08	0.00	0.00	0.00	0.06	0.08	0.06	0.08	Pond 3
103	0.25	0.24	0.48	0.00	0.00	0.00	0.25	0.48	0.25	0.48	Pond 3
104	0.11	0.11	0.22	0.00	0.00	0.00	0.11	0.22	0.11	0.22	Pond 3
105	0.07	0.08	0.16	0.00	0.00	0.00	0.07	0.16	0.07	0.16	Pond 3
106	0.22	0.25	0.47	0.00	0.00	0.00	0.22	0.47	0.22	0.47	Pond 3
107	0.14	0.43	0.57	0.00	0.00	0.00	0.14	0.57	0.14	0.57	Pond 3
108	0.08	0.05	0.13	0.00	0.00	0.00	0.08	0.13	0.08	0.13	Pond 3
16	0.00	0.00	0.00	0.51	0.84	1.35	0.00	0.00	0.51	1.35	Pond 2
17	0.00	0.00	0.00	0.23	0.67	0.90	0.00	0.00	0.23	0.90	Pond 2
18	0.04	0.15	0.19	0.31	1.25	1.56	0.04	0.19	0.35	1.75	Pond 2
19	0.02	0.13	0.15	0.25	0.00	0.25	0.02	0.15	0.27	0.40	Pond 2
20	0.06	0.00	0.06	0.07	0.25	0.32	0.06	0.06	0.13	0.38	Pond 2
21	0.02	0.21	0.23	0.23	1.42	1.65	0.02	0.23	0.25	1.88	Pond 2
23	0.00	0.00	0.00	0.34	1.12	1.46	0.00	0.00	0.34	1.46	Pond 2
55	0.00	0.00	0.00	0.12	0.02	0.14	0.00	0.00	0.12	0.14	Pond 2
56	0.00	0.00	0.00	0.06	0.00	0.06	0.00	0.00	0.06	0.06	Pond 2
90	0.00	0.00	0.00	0.11	0.00	0.11	0.00	0.00	0.11	0.11	Pond 2
10	0.00	0.00	0.00	0.64	2.16	2.80	0.00	0.00	0.64	2.80	Pond 1
13	0.00	0.00	0.00	0.31	1.48	1.79	0.00	0.00	0.31	1.79	Pond 1
14	0.00	0.00	0.00	0.35	0.44	0.79	0.00	0.00	0.35	0.79	Pond 1
15	0.00	0.00	0.00	0.26	0.46	0.72	0.00	0.00	0.26	0.72	Pond 1
22	0.00	0.00	0.00	0.28	0.57	0.85	0.00	0.00	0.28	0.85	Pond 1
26	0.00	0.00	0.00	0.16	0.01	0.17	0.00	0.00	0.16	0.17	Pond 1
27	0.00	0.00	0.00	0.27	0.07	0.34	0.00	0.00	0.27	0.34	Pond 1
28	0.00	0.00	0.00	0.14	0.03	0.17	0.00	0.00	0.14	0.17	Pond 1
32	0.00	0.00	0.00	0.27	0.10	0.37	0.00	0.00	0.27	0.37	Pond 1
36	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.10	Pond 1
37	0.00	0.00	0.00	0.33	0.41	0.74	0.00	0.00	0.33	0.74	Pond 1
38	0.00	0.00	0.00	0.50	1.63	2.13	0.00	0.00	0.50	2.13	Pond 1
39	0.00	0.00	0.00	0.07	0.13	0.20	0.00	0.00	0.07	0.20	Pond 1
40	0.00	0.00	0.00	0.15	0.05	0.20	0.00	0.00	0.15	0.20	Pond 1
41	0.00	0.00	0.00	0.12	0.06	0.18	0.00	0.00	0.12	0.18	Pond 1
43	0.00	0.00	0.00	0.00	0.53	0.53	0.00	0.00	0.00	0.53	Pond 1
44	0.00	0.00	0.00	0.03	0.03	0.06	0.00	0.00	0.03	0.06	Pond 1
45	0.00	0.00	0.00	0.21	0.39	0.60	0.00	0.00	0.21	0.60	Pond 1
46	0.00	0.00	0.00	0.31	0.37	0.68	0.00	0.00	0.31	0.68	Pond 1
47	0.10	0.43	0.53	0.16	0.47	0.62	0.10	0.53	0.26	1.15	Pond 1
48	0.00	0.00	0.00	0.16	0.05	0.21	0.00	0.00	0.16	0.21	Pond 1
49	0.00	0.00	0.00	0.28	0.47	0.75	0.00	0.00	0.28	0.75	Pond 1
51	0.00	0.00	0.00	0.05	0.01	0.06	0.00	0.00	0.05	0.06	Pond 1
52	0.00	0.00	0.00	0.11	0.03	0.14	0.00	0.00	0.11	0.14	Pond 1
53	0.00	0.00	0.00	0.10	0.02	0.12	0.00	0.00	0.10	0.12	Pond 1
54	0.00	0.00	0.00	0.18	0.06	0.24	0.00	0.00	0.18	0.24	Pond 1
61	0.02	0.11	0.13	0.16	0.02	0.18	0.02	0.13	0.19	0.32	Pond 1
12	0.00	0.00	0.00	0.21	1.45	1.66	0.00	0.00	0.00	1.66	Untreated
24	0.00	0.00	0.00	0.99	3.11	4.10	0.00	0.00	0.00	4.10	Untreated
25	0.00	0.00	0.00	0.64	2.45	3.09	0.00	0.00	0.00	3.09	Untreated
29	0.00	0.00	0.00	1.01	8.73	9.74	0.00	0.00	0.00	9.74	Untreated
30	0.00	0.00	0.00	0.19	0.03	0.22	0.00	0.00	0.00	0.22	Untreated
34	0.00	0.00	0.00	0.18	0.89	1.07	0.00	0.00	0.00	1.07	Untreated
50	0.00	0.00	0.00	0.98	16.02	17.00	0.00	0.00	0.00	17.00	Untreated
60	0.00	0.00	0.00	0.48	24.82	25.30	0.00	0.00	0.00	25.30	Untreated
64	0.06	0.66	0.72	0.00	0.51	0.51	0.00	0.00	0.00	1.23	Untreated
80	0.00	0.00	0.00	0.60	12.00	12.60	0.00	0.00	0.00	12.60	Untreated
200	0.00	0.00	0.00	0.47	2.25	2.72	0.00	0.00	0.00	2.72	Untreated
300	0.00	0.56	0.56	0.56	12.35	12.91	0.00	0.00	0.00	13.46	Untreated
500	0.00	0.11	0.11	0.00	7.08	7.08	0.00	0.00	0.00	7.19	Untreated
Total	**2.87**	**6.49**	**9.36**	**14.23**	**107.31**	**121.54**	**2.81**	**7.97**	**10.74**	**130.90**	

Please note that the "Existing Lawn Areas" for subcatchments 300 and 500 are actually undeveloped at this time. The areas have been added in order to account for all land for this parcel. These numbers do not effect treatment percentages in any way.

Treatment Summary	
Total Proposed Impervious Area (sq. ft.)=	2.87
Total Proposed Developed Area (sq. ft.)=	9.36
Total Treated Impervious Area (sq. ft.)=	2.81
Total Treated Developed Area (sq. ft.)=	7.97
Impervious Area Treatment % =	**97.91%**
Developed Area Treatment % =	**85.14%**

Appendix E

Wet Pond 3 Sizing Calculations

BH2M
28 State Street
Gorham, Maine 04038

WET POND DESIGN
Sandy Brook
Pond 3

Elevation	Surface Area (ft^2)	Stage Volume (ft^3)	Cumulative Volume (ft^3)	Volume Above Permanent Pool (ft^3)	Comments
86	2,229	0	0		
87	3,175	2,702	2,702		
88	4,177	3,676	6,378		
89	5,235	4,706	11,084		
90	6,350	5,793	16,877		
91	7,519	6,935	23,811		Mean Depth= 3.17
92	8,745	8,132	31,943	0	Water Quality Elevation
93	10,408	9,577	41,520	9,577	
93.5	11,263	5,418	46,937	14,994	Channel Protection Elevation
94	12,117	5,845	52,782	20,839	
95	13,598	12,858	65,640	33,697	
96	15,137	14,368	80,007	48,064	
97	16,713	15,925	95,932	63,989	

Summary of Wet Pond Criteria	
WQ Volume Required (ft^3)	20,287
WQ Volume Provided (ft^3)	31,943
WQ Surface Elevation	92.00
CP Volume Required (ft^3)	14,822
CP Volume Provided (ft^3)	14,994
CP Surface Elevation	93.5
Length of Underdrain Bench Req'd	44
Invert of Underdrain	89.5
Length to Width Ratio	>3:1
Mean Depth	3.17
Embankment Elevation	97.0
Spillway Elevation	95.0
25 Year Surface Elevation (Plugged OCS)	95.38
100 Year Surface Elevation (Plugged OCS)	95.61

Freeboard (ft)
1.62
1.39

Subcatchments Tributary to Wet Pond		
Subcatchment ID	Imp. Area (ac.)	Lawn Area (ac.)
65	0.588	0.644
66	0.321	0.888
67	0.172	0.182
68	0.086	0.150
69	0.167	0.186
70	0.122	0.085
100	0.017	0.638
101	0.142	0.175
102	0.061	0.015
103	0.245	0.237
104	0.110	0.110
105	0.071	0.085
106	0.222	0.253
107	0.139	0.431
108	0.081	0.047
Total	2.545	4.125

Orifice Sizing	
Discharge Coefficient	0.62
Orifice Diameter (inches)	1.5
Orifice Diameter (feet)	0.13
Orifice Area (ft^2)	0.012
Orifice Centerline Elevation	89.56

Orifice Eqn: $C*A*(2gH)^{\wedge 1/2}$

Q (cfs)	Stage Elevation	Total Drawdown at Stage (feet)		Pond Area (ft^2)	Drawdown Time (hrs)
0.0953	92.0	0.00		6,350	0.00
0.1211	93.5	1.50		12,117	41.70
			Total Drawdown Time =		**41.70**

Required Sediment Storage		
Area to be Sanded	1.5	acres
Sand Used per Storm	500	lbs/acre-storm
Weight of Sand	90	lbs/cf
# of Storms per Year	10	storms/year
Sediment Storage Required	**83.33**	**cf/year**

Provided Storage Volume			
Total # of CB's		14	
Sump Depth		2	ft
CB Diameter		4	ft
CB Sediment Storage Volume		351.68	cf
Forebay Volume			cf
Total Volume		**351.68**	**cf**

Appendix F

Operations and Maintenance Plan

OPERATIONS & MAINTENANCE PLAN

For: Sandy Brook Subdivision

The applicant, Star Homes Inc., will be responsible for all maintenance of the entire site until the roadways are accepted by the City of Saco. At that time the City of Saco will be responsible for all operation and maintenance responsibilities within the public right-of-way and the Sandy Brook Subdivision Home Owners Association will be responsible for all other stormwater facilities outside the public right of way. The following is a summary of the required maintenance:

Roadways

1. On-site inspection of the roads on an annual schedule or after a significant period of rainfall.
   a.) All low spots of pooling water shall be regraded to direct the water off the pavement.
   b.) Areas of erosions shall be repaired immediately.
   c.) Sweeping the roadway free of sand after the winter season should be completed annually.

Stormdrain Inlet & Outlet

1. On-site inspection of the rip-rap surrounding the stormdrain inlets and outlets on a monthly schedule or after a significant period of rainfall.
   a.) Carefully inspect to determine if high flows have caused scour beneath the rip-rap or dislodged any of the stones. If repairs are needed, they should be accomplished immediately.

Vegetated Swale with Check Dams

1. On-site inspection of the vegetated ditches on a monthly schedule or after a significant period of rainfall.
   a.) Ditches should be inspected to repair erosion problems, remove any accumulated debris and to check the condition and integrity of the check dams.

Storm Drain System Includes Catchbasins

1. Inspect catchbasin inlets, culvert entrances and field inlets on a monthly basis for debris or conditions, which could inhibit flow entry. Remove debris.
2. Inspect all catchbasin structures on an annual basis.
   a.) Check that rim elevations are property set to optimize flow entry.
   b.) Measure and record silt accumulation, if any.

3. Check pipelines on an annual basis to determine silt accumulation, if any.
4. Inspect swales, channels, and ditches on a semi-annual basis.
   a.) Check for debris that may inhibit flow – remove as warranted.
   b.) Note and remove excessive vegetation – mow monthly.
   c.) Note any erosion or non-vegetated areas, which could lead to erosion.

Wet Ponds

1. Inlet & Outlet Inspections: The inlet and outlet of the basin should be checked periodically to ensure that flow structures are not blocked by debris. Inspections should be conducted monthly during wet weather conditions from March to November.

2. Erosion & Instability: Basins should be inspected annually for erosion, destabilization of side slopes, embankment settling and other signs of structural failure, and loss of storage volume due to sediment accumulation. Corrective action should be taken immediately upon identification of problems.

3. Embankment Maintenance: Embankments should be maintained to preserve their integrity as impoundment structures, including, but not necessarily limited to, vegetative maintenance (mowing, control of woody vegetation), rodent control, erosion control and repair, and outlet control structure maintenance and repair. Basins should be mowed no more than twice a year during the growing season to maintain maximum grass heights less than 12 inches. All accumulated trash and debris shall be removed.

4. Sediment Removal: Sediment should be removed from the pretreatment structure at least annually and from the basin when necessary.

5. Measurement of Sediment Accumulation: Inspect for sediment accumulation. If sediment reaches 2’ in depth, the pond shall be drained and the sediment removed.

6. Gravel Trench Outlet Inspection: The gravel trench outlet should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the gravel trench should be inspected at least once every six months. Inspection consists of verifying that the pond is slowly emptying through the gravel filter for a short time (12-24 hours) after a storm and that potentially clogging material such as accumulations of decaying leaves are not preventing discharge through the gravel.

7. Gravel Replacement: The top several inches of the gravel in the outlet trench must be replaced with fresh material when water ponds above the permanent pool for more than 72 hours. The removed sediments should be disposed of in an acceptable manner.

8. Maintenance Dredging: Wet ponds lose 0.5-1.0% of their volume annually due to sediment accumulation. Dredging is required when accumulated volume loss reaches 15%, or approximately every 15-20 years.

9. Outlet Control Structures: Remove covers and check for clogging, debris accumulation or structural problems a minimum of two times per year and clean as needed.

Normal Annual Maintenance

Normal annual maintenance is defined as that work required to routinely maintain the facility in a sound condition to meet its intended function. It does not include major reconstruction or maintenance such as, cleaning of sediment from the detention ponds, or removing sediment from catchbasin sumps, or cleaning pipelines. Normal Maintenance should be conducted as needed or after significant storm events.

1. Conduct Routine Annual Maintenance

    a) Cut aquatic vegetation and remove from outlet ditch.
    b) Remove any debris and excess vegetation stored on site during the inspection described in above. Materials to be disposed of in accordance with applicable local and state codes and ordinances.
    c) Make minor repairs to rip-rap in channels or slopes as required to maintain its integrity.

2. Conduct Routine Annual Maintenance on Control Structures

    a) Remove any debris or sediment stored on site during inspections. Materials to be disposed of in accordance with applicable local and state codes and ordinances.
    b) Make minor repairs to rip-rap slopes and channels.

Wire brush weir and/or orifice plates to remove corrosion. Repaint as appropriate.

Housekeeping

1. Use attached "Inspection & Maintenance Log" and keep records in three-ring binder.

2. See attached Appendix B "Inspection and Maintenance" from MDEP Stormwater Regulations.

3. See attached "Appendix C" from MDEP Stormwater Regulations for performance standards.

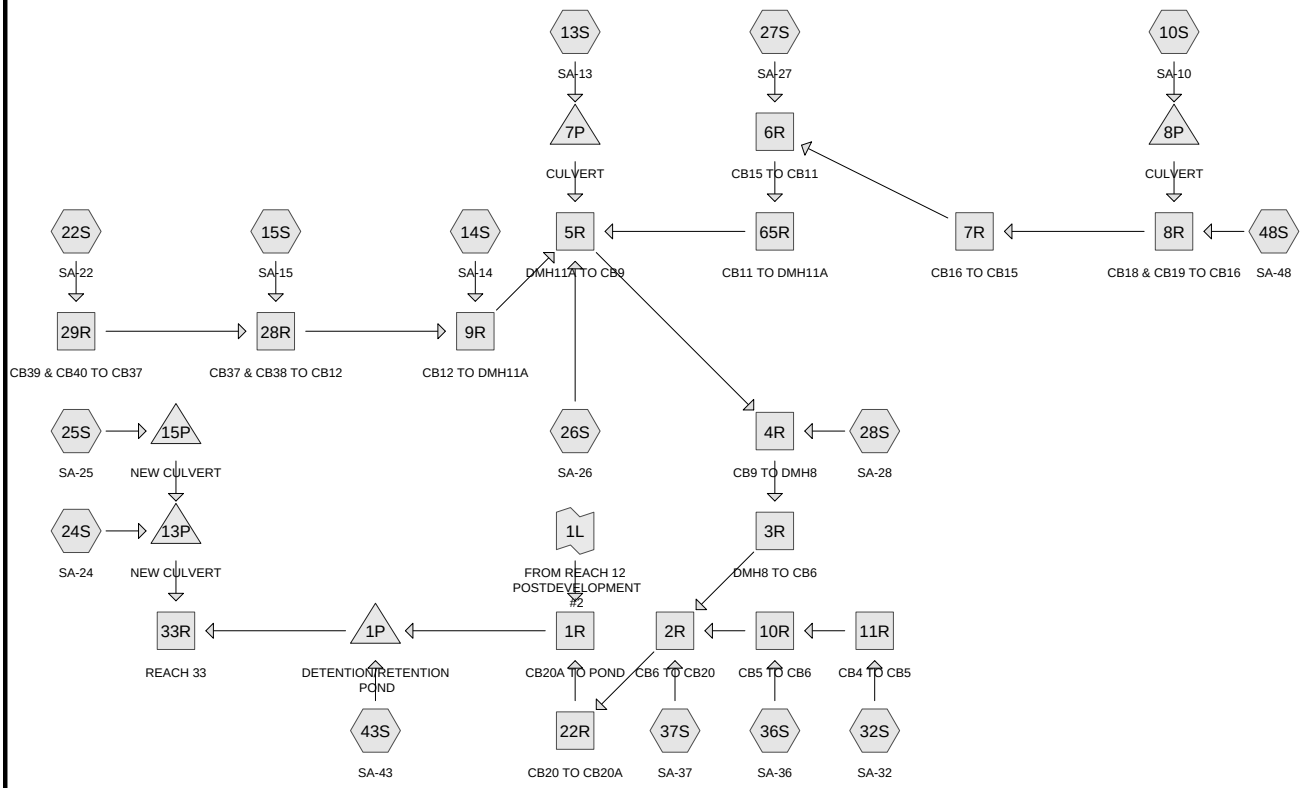
SANDY BROOK SUBDIVISION
STORMWATER MANAGEMENT
INSPECTION & MAINTENANCE LOG

FACILITY:		**YEAR:**	
LOCATION:		**CONTRACTOR:**	
FUNCTION:		**DEP PROJ. MANAGER:**	
DATE OF INSPECTION:		**INSPECTOR:**	
ITEM ID	**DESCRIPTION OF CONDITIONS**	**MAINTENANCE ACCOMPLISHED**	**DATE OF MAINTENANCE**
ROADWAYS			
STORMDRAIN INLET & OUTLET			
STORMDRAIN SYSTEM			
VEGETATED SWALES WITH CHECK DAMS			
STORMDRAIN SYSTEM INCLUDES CATCH BASINS			
WETPOND			

Appendix G

Post Development Calculations – Sierra Woods

- **Post Development 1**
- **Post Development 2**
- **Post Development 3**
- **Post Development 4**



Subcat Reach Pond Link

Routing Diagram for Sandy Brook POSTDEVELOPMENT #1
Prepared by BH2M, Printed 11/29/2017
HydroCAD® 10.00-20 s/n 00619 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.690	80	1/2 ACRE C (22S)
5.740	80	1/2 ACRE LOTS C (10S, 13S, 14S, 15S, 24S, 25S, 37S)
3.980	85	1/2 ACRE LOTS D (10S, 13S, 14S, 24S, 25S)
1.950	77	2 ACRE LOTS C (10S)
1.700	98	IMPERVIOUS (13S, 14S, 22S, 26S, 27S, 28S, 32S, 36S, 37S, 48S)
0.160	74	OPEN C, GOOD CONDITION (14S, 22S, 24S, 37S)
1.050	80	OPEN D, GOOD CONDITION (13S, 14S, 24S, 25S, 26S, 27S, 28S, 32S, 37S, 43S, 48S)
0.370	98	ROAD (10S, 15S)
0.270	70	WOODED C, GOOD CONDITION (13S)
0.810	77	WOODED D, GOOD CONDITION (13S, 24S, 25S)
0.050	77	WOODS D, GOOD CONDITION (14S, 32S)
16.770	**83**	**TOTAL AREA**

Summary for Subcatchment 10S: SA-10

Runoff = 2.73 cfs @ 12.37 hrs, Volume= 0.317 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.360	80	1/2 ACRE LOTS C
*	0.230	85	1/2 ACRE LOTS D
*	1.950	77	2 ACRE LOTS C
*	0.260	98	ROAD
	2.800	80	Weighted Average
	2.540		90.71% Pervious Area
	0.260		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.0	160	0.0100	2.64	15.86	**Channel Flow, Segment ID:** Area= 6.0 sf Perim= 10.0' r= 0.60' n= 0.040
29.1	670	Total			

Summary for Subcatchment 13S: SA-13

Runoff = 2.27 cfs @ 12.15 hrs, Volume= 0.203 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.430	80	1/2 ACRE LOTS C
*	0.670	85	1/2 ACRE LOTS D
*	0.080	80	OPEN D, GOOD CONDITION
*	0.270	70	WOODED C, GOOD CONDITION
*	0.310	77	WOODED D, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	1.790	80	Weighted Average
	1.760		98.32% Pervious Area
	0.030		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.1	190	0.0430	1.04		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
13.7	290	Total			

Summary for Subcatchment 14S: SA-14

Runoff = 1.24 cfs @ 12.17 hrs, Volume= 0.111 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.450	80	1/2 ACRE LOTS C
*	0.020	85	1/2 ACRE LOTS D
*	0.040	74	OPEN C, GOOD CONDITION
*	0.040	80	OPEN D, GOOD CONDITION
*	0.010	77	WOODS D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.790	85	Weighted Average
	0.560		70.89% Pervious Area
	0.230		29.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	70	0.0400	0.10		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.3	120	0.0500	1.57		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.5	180	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
14.8	370	Total			

Summary for Subcatchment 15S: SA-15

Runoff = 0.86 cfs @ 12.31 hrs, Volume= 0.093 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.610	80	1/2 ACRE LOTS C
*	0.110	98	ROAD
	0.720	83	Weighted Average
	0.610		84.72% Pervious Area
	0.110		15.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.1	180	0.0180	2.72		**Shallow Concentrated Flow, Segment ID:** Paved Kv= 20.3 fps
25.4	320	Total			

Summary for Subcatchment 22S: SA-22

Runoff = 1.01 cfs @ 12.28 hrs, Volume= 0.105 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.690	80	1/2 ACRE C
*	0.050	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.850	82	Weighted Average
	0.740		87.06% Pervious Area
	0.110		12.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.4	230	0.0184	2.75		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
22.9	350	Total			

Summary for Subcatchment 24S: SA-24

Runoff = 4.88 cfs @ 12.25 hrs, Volume= 0.487 af, Depth> 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.020	80	OPEN D, GOOD CONDITION
*	2.700	80	1/2 ACRE LOTS C
*	1.270	85	1/2 ACRE LOTS D
*	0.050	77	WOODED D, GOOD CONDITION
	4.100	81	Weighted Average
	4.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0270	0.13		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.8	260	0.0260	1.13		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
4.3	210	0.0260	0.81		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
20.6	570	Total			

Summary for Subcatchment 25S: SA-25

Runoff = 2.71 cfs @ 12.58 hrs, Volume= 0.381 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.780	80	1/2 ACRE LOTS C
*	1.790	85	1/2 ACRE LOTS D
*	0.450	77	WOODED D, GOOD CONDITION
	3.090	82	Weighted Average
	3.090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
18.9	400	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
44.5	550	Total			

Summary for Subcatchment 26S: SA-26

Runoff = 0.54 cfs @ 11.99 hrs, Volume= 0.035 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.010	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.170	97	Weighted Average
	0.010		5.88% Pervious Area
	0.160		94.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 27S: SA-27

Runoff = 1.02 cfs @ 11.99 hrs, Volume= 0.065 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.340	94	Weighted Average
	0.070		20.59% Pervious Area
	0.270		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 28S: SA-28

Runoff = 0.52 cfs @ 11.99 hrs, Volume= 0.033 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.170	95	Weighted Average
	0.030		17.65% Pervious Area
	0.140		82.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 32S: SA-32

Runoff = 1.07 cfs @ 12.00 hrs, Volume= 0.069 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.060	80	OPEN D, GOOD CONDITION
*	0.040	77	WOODS D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.370	93	Weighted Average
	0.100		27.03% Pervious Area
	0.270		72.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 36S: SA-36

Runoff = 0.33 cfs @ 12.00 hrs, Volume= 0.021 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.100	98	IMPERVIOUS
	0.100		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0140	1.31		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	150	0.0140	2.40		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.9	300	Total			

Summary for Subcatchment 37S: SA-37

Runoff = 1.55 cfs @ 12.02 hrs, Volume= 0.108 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.410	80	1/2 ACRE LOTS C
*	0.010	74	OPEN C, GOOD CONDITION
*	0.090	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.740	86	Weighted Average
	0.510		68.92% Pervious Area
	0.230		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	115	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
5.1	165	Total			

Summary for Subcatchment 43S: SA-43

Runoff = 0.93 cfs @ 11.99 hrs, Volume= 0.060 af, Depth> 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.530	80	OPEN D, GOOD CONDITION
	0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.3300	0.26		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 48S: SA-48

Runoff = 0.63 cfs @ 11.99 hrs, Volume= 0.040 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.210	94	Weighted Average
	0.050		23.81% Pervious Area
	0.160		76.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	150	0.0130	1.28		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

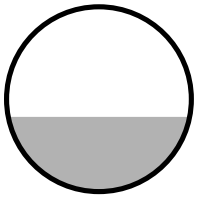
Summary for Reach 1R: CB20A TO POND

Inflow Area = 15.879 ac, 23.75% Impervious, Inflow Depth > 1.60" for 2 YEAR STORM event
Inflow = 16.14 cfs @ 12.19 hrs, Volume= 2.114 af
Outflow = 16.11 cfs @ 12.19 hrs, Volume= 2.115 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.17 fps, Avg. Travel Time= 0.3 min

Peak Storage= 144 cf @ 12.19 hrs
Average Depth at Peak Storage= 1.21'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 47.16 cfs

36.0" Round Pipe
n= 0.013
Length= 54.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.27'



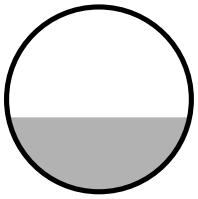
Summary for Reach 2R: CB6 TO CB20

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 1.58" for 2 YEAR STORM event
Inflow = 9.01 cfs @ 12.25 hrs, Volume= 1.194 af
Outflow = 8.98 cfs @ 12.26 hrs, Volume= 1.193 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.87 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.56 fps, Avg. Travel Time= 2.0 min

Peak Storage= 578 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.54 cfs

30.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.63'



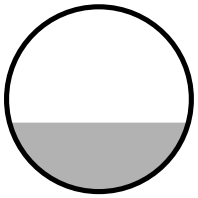
Summary for Reach 3R: DMH8 TO CB6

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 1.53" for 2 YEAR STORM event
Inflow = 7.89 cfs @ 12.27 hrs, Volume= 0.997 af
Outflow = 7.83 cfs @ 12.28 hrs, Volume= 0.997 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.70 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.43 fps, Avg. Travel Time= 1.6 min

Peak Storage= 398 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.55 cfs

30.0" Round Pipe
n= 0.009
Length= 239.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.48'



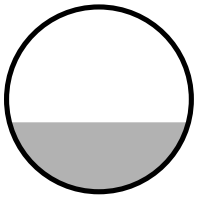
Summary for Reach 4R: CB9 TO DMH8

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 1.53" for 2 YEAR STORM event
Inflow = 7.94 cfs @ 12.26 hrs, Volume= 0.998 af
Outflow = 7.89 cfs @ 12.27 hrs, Volume= 0.997 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.69 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.43 fps, Avg. Travel Time= 1.3 min

Peak Storage= 312 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.42 cfs

30.0" Round Pipe
n= 0.009
Length= 186.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.37'



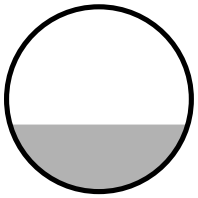
Summary for Reach 5R: DMH11A TO CB9

Inflow Area = 7.670 ac, 17.34% Impervious, Inflow Depth > 1.51" for 2 YEAR STORM event
Inflow = 7.83 cfs @ 12.26 hrs, Volume= 0.966 af
Outflow = 7.77 cfs @ 12.27 hrs, Volume= 0.965 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.84 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 1.6 min

Peak Storage= 394 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 27.76 cfs

30.0" Round Pipe
n= 0.009
Length= 246.0' Slope= 0.0022 '/'
Inlet Invert= 0.00', Outlet Invert= -0.54'



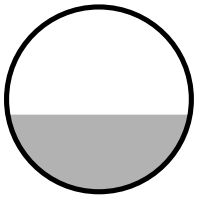
Summary for Reach 6R: CB15 TO CB11

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 1.51" for 2 YEAR STORM event
Inflow = 3.04 cfs @ 12.38 hrs, Volume= 0.420 af
Outflow = 3.01 cfs @ 12.40 hrs, Volume= 0.420 af, Atten= 1%, Lag= 0.9 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.32 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 2.3 min

Peak Storage= 219 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.30 cfs

18.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.94'



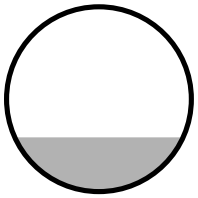
Summary for Reach 7R: CB16 TO CB15

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 1.42" for 2 YEAR STORM event
Inflow = 2.83 cfs @ 12.41 hrs, Volume= 0.355 af
Outflow = 2.82 cfs @ 12.41 hrs, Volume= 0.355 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.57 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.35 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



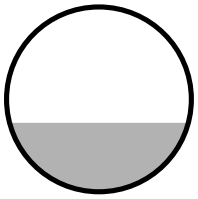
Summary for Reach 8R: CB18 & CB19 TO CB16

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 1.42" for 2 YEAR STORM event
Inflow = 2.85 cfs @ 12.39 hrs, Volume= 0.356 af
Outflow = 2.83 cfs @ 12.41 hrs, Volume= 0.355 af, Atten= 1%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.72 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.43 fps, Avg. Travel Time= 2.2 min

Peak Storage= 191 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 9.60 cfs

18.0" Round Pipe
n= 0.009
Length= 320.0' Slope= 0.0040 '/'
Inlet Invert= 0.00', Outlet Invert= -1.28'



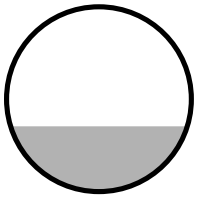
Summary for Reach 9R: CB12 TO DMH11A

Inflow Area = 2.360 ac, 19.07% Impervious, Inflow Depth > 1.57" for 2 YEAR STORM event
Inflow = 2.93 cfs @ 12.25 hrs, Volume= 0.309 af
Outflow = 2.93 cfs @ 12.25 hrs, Volume= 0.309 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.24 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.56 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.04 cfs

18.0" Round Pipe
n= 0.009
Length= 17.0' Slope= 0.0053 '/'
Inlet Invert= 0.00', Outlet Invert= -0.09'



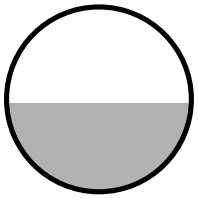
Summary for Reach 10R: CB5 TO CB6

Inflow Area = 0.470 ac, 78.72% Impervious, Inflow Depth > 2.28" for 2 YEAR STORM event
Inflow = 1.30 cfs @ 12.01 hrs, Volume= 0.089 af
Outflow = 1.29 cfs @ 12.02 hrs, Volume= 0.089 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.45 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.4 min

Peak Storage= 14 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.009
Length= 38.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.11'



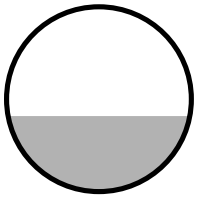
Summary for Reach 11R: CB4 TO CB5

Inflow Area = 0.370 ac, 72.97% Impervious, Inflow Depth > 2.23" for 2 YEAR STORM event
Inflow = 1.07 cfs @ 12.00 hrs, Volume= 0.069 af
Outflow = 0.98 cfs @ 12.02 hrs, Volume= 0.069 af, Atten= 9%, Lag= 1.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 3.4 min

Peak Storage= 85 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.83 cfs

12.0" Round Pipe
n= 0.009
Length= 282.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'



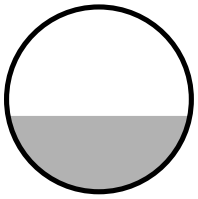
Summary for Reach 22R: CB20 TO CB20A

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 1.58" for 2 YEAR STORM event
Inflow = 8.98 cfs @ 12.26 hrs, Volume= 1.193 af
Outflow = 8.99 cfs @ 12.26 hrs, Volume= 1.193 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.76 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.1 min

Peak Storage= 30 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 25.65 cfs

30.0" Round Pipe
n= 0.009
Length= 16.0' Slope= 0.0019 '/'
Inlet Invert= 0.00', Outlet Invert= -0.03'



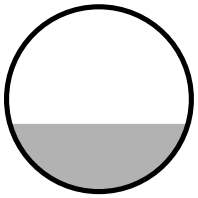
Summary for Reach 28R: CB37 & CB38 TO CB12

Inflow Area = 1.570 ac, 14.01% Impervious, Inflow Depth > 1.52" for 2 YEAR STORM event
Inflow = 1.87 cfs @ 12.30 hrs, Volume= 0.198 af
Outflow = 1.88 cfs @ 12.31 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.63 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.25 fps, Avg. Travel Time= 1.6 min

Peak Storage= 88 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



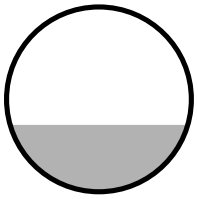
Summary for Reach 29R: CB39 & CB40 TO CB37

Inflow Area = 0.850 ac, 12.94% Impervious, Inflow Depth > 1.49" for 2 YEAR STORM event
Inflow = 1.01 cfs @ 12.28 hrs, Volume= 0.105 af
Outflow = 1.01 cfs @ 12.30 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.97 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 1.9 min

Peak Storage= 55 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



Summary for Reach 33R: REACH 33

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 1.12" for 2 YEAR STORM event
Inflow = 7.55 cfs @ 12.42 hrs, Volume= 2.207 af
Outflow = 7.49 cfs @ 12.45 hrs, Volume= 2.193 af, Atten= 1%, Lag= 2.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.51 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 3.7 min

Peak Storage= 1,087 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 90.11 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 20.00'
Length= 220.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.10'



‡

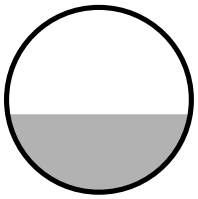
Summary for Reach 65R: CB11 TO DMH11A

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 1.50" for 2 YEAR STORM event
Inflow = 3.01 cfs @ 12.40 hrs, Volume= 0.420 af
Outflow = 3.00 cfs @ 12.40 hrs, Volume= 0.419 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.24 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 0.2 min

Peak Storage= 20 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.11 cfs

18.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.08'



Summary for Pond 1P: DETENTION/RETENTION POND

Inflow Area = 16.409 ac, 22.98% Impervious, Inflow Depth > 1.59" for 2 YEAR STORM event
Inflow = 16.52 cfs @ 12.17 hrs, Volume= 2.175 af
Outflow = 3.61 cfs @ 13.28 hrs, Volume= 1.316 af, Atten= 78%, Lag= 66.5 min
Primary = 3.61 cfs @ 13.28 hrs, Volume= 1.316 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 82.00' Surf.Area= 17,450 sf Storage= 78,269 cf
Peak Elev= 84.47' @ 13.28 hrs Surf.Area= 23,550 sf Storage= 129,836 cf (51,567 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 116.8 min (922.2 - 805.4)

Volume	Invert	Avail.Storage	Storage Description
#1	74.00'	224,019 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.00	6,030	0	0
76.00	7,980	14,010	14,010
78.00	9,450	17,430	31,440
80.00	10,936	20,386	51,826
81.00	12,250	11,593	63,419
82.00	17,450	14,850	78,269
84.00	22,700	40,150	118,419
86.00	26,350	49,050	167,469
88.00	30,200	56,550	224,019

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**24.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.22' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	82.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	84.00'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	86.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	86.50'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 3.11 3.40

Primary OutFlow Max=3.58 cfs @ 13.28 hrs HW=84.47' (Free Discharge)
- **1=Culvert** (Passes 3.58 cfs of 19.03 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.41 cfs @ 7.17 fps)
  - **3=Orifice/Grate** (Orifice Controls 2.17 cfs @ 2.32 fps)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: CULVERT

Inflow Area = 1.790 ac, 1.68% Impervious, Inflow Depth > 1.36" for 2 YEAR STORM event
Inflow = 2.27 cfs @ 12.15 hrs, Volume= 0.203 af
Outflow = 2.28 cfs @ 12.20 hrs, Volume= 0.202 af, Atten= 0%, Lag= 2.8 min
Primary = 2.28 cfs @ 12.20 hrs, Volume= 0.202 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 94.86' @ 12.20 hrs Surf.Area= 618 sf Storage= 346 cf

Plug-Flow detention time= 5.8 min calculated for 0.200 af (98% of inflow)
Center-of-Mass det. time= 3.6 min (810.3 - 806.7)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	3,315 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	100	0	0
95.00	700	400	400
96.00	1,200	950	1,350
97.00	2,730	1,965	3,315

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**12.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 94.00' / 92.60' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.28 cfs @ 12.20 hrs HW=94.86' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.28 cfs @ 3.16 fps)

Summary for Pond 8P: CULVERT

Inflow Area = 2.800 ac, 9.29% Impervious, Inflow Depth > 1.36" for 2 YEAR STORM event
Inflow = 2.73 cfs @ 12.37 hrs, Volume= 0.317 af
Outflow = 2.73 cfs @ 12.41 hrs, Volume= 0.316 af, Atten= 0%, Lag= 1.9 min
Primary = 2.73 cfs @ 12.41 hrs, Volume= 0.316 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 92.83' @ 12.41 hrs Surf.Area= 542 sf Storage= 416 cf

Plug-Flow detention time= 4.4 min calculated for 0.315 af (100% of inflow)
Center-of-Mass det. time= 3.1 min (821.5 - 818.4)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	3,462 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	25	0	0
92.00	375	20	20
93.00	575	475	495
94.00	1,580	1,078	1,572
95.00	2,200	1,890	3,462

Device	Routing	Invert	Outlet Devices
#1	Primary	91.90'	**15.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 91.90' / 91.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.71 cfs @ 12.41 hrs HW=92.83' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.71 cfs @ 3.85 fps)

Summary for Pond 13P: NEW CULVERT

Inflow Area = 7.190 ac, 0.00% Impervious, Inflow Depth > 1.49" for 2 YEAR STORM event
Inflow = 6.53 cfs @ 12.32 hrs, Volume= 0.895 af
Outflow = 6.36 cfs @ 12.40 hrs, Volume= 0.891 af, Atten= 3%, Lag= 4.7 min
Primary = 6.36 cfs @ 12.40 hrs, Volume= 0.891 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 88.10' @ 12.40 hrs Surf.Area= 1,621 sf Storage= 1,018 cf

Plug-Flow detention time= 9.9 min calculated for 0.874 af (98% of inflow)
Center-of-Mass det. time= 2.9 min (813.5 - 810.6)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	7,573 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	125	0	0
88.00	1,390	758	758
89.00	3,620	2,505	3,263
90.00	5,000	4,310	7,573

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**24.0" Round Culvert** L= 85.0' Ke= 0.500 Inlet / Outlet Invert= 87.00' / 85.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=6.35 cfs @ 12.40 hrs HW=88.10' (Free Discharge)
1=Culvert (Inlet Controls 6.35 cfs @ 3.58 fps)

Summary for Pond 15P: NEW CULVERT

Inflow Area = 3.090 ac, 0.00% Impervious, Inflow Depth > 1.48" for 2 YEAR STORM event
Inflow = 2.71 cfs @ 12.58 hrs, Volume= 0.381 af
Outflow = 3.49 cfs @ 10.00 hrs, Volume= 0.408 af, Atten= 0%, Lag= 0.0 min
Primary = 3.49 cfs @ 10.00 hrs, Volume= 0.408 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 92.00' Surf.Area= 300 sf Storage= 225 cf
Peak Elev= 92.00' @ 10.00 hrs Surf.Area= 309 sf Storage= 230 cf (5 cf above start)
Flood Elev= 94.00' Surf.Area= 6,200 sf Storage= 3,475 cf (3,250 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	3,475 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	150	0	0
92.00	300	225	225
93.00	6,200	3,250	3,475

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**18.0" Round Culvert** L= 184.0' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.08' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.49 cfs @ 10.00 hrs HW=92.00' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.49 cfs @ 3.94 fps)

Summary for Link 1L: FROM REACH 12 POSTDEVELOPMENT #2

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 1.62" for 2 YEAR STORM event
Inflow = 7.46 cfs @ 12.14 hrs, Volume= 0.922 af
Primary = 7.46 cfs @ 12.14 hrs, Volume= 0.922 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

2 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #2~Reach 12R.hce

Summary for Subcatchment 10S: SA-10

Runoff = 5.23 cfs @ 12.36 hrs, Volume= 0.599 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.360	80	1/2 ACRE LOTS C
*	0.230	85	1/2 ACRE LOTS D
*	1.950	77	2 ACRE LOTS C
*	0.260	98	ROAD
	2.800	80	Weighted Average
	2.540		90.71% Pervious Area
	0.260		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.0	160	0.0100	2.64	15.86	**Channel Flow, Segment ID:** Area= 6.0 sf Perim= 10.0' r= 0.60' n= 0.040
29.1	670	Total			

Summary for Subcatchment 13S: SA-13

Runoff = 4.46 cfs @ 12.14 hrs, Volume= 0.383 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.430	80	1/2 ACRE LOTS C
*	0.670	85	1/2 ACRE LOTS D
*	0.080	80	OPEN D, GOOD CONDITION
*	0.270	70	WOODED C, GOOD CONDITION
*	0.310	77	WOODED D, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	1.790	80	Weighted Average
	1.760		98.32% Pervious Area
	0.030		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.1	190	0.0430	1.04		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
13.7	290	Total			

Summary for Subcatchment 14S: SA-14

Runoff = 2.19 cfs @ 12.16 hrs, Volume= 0.195 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.450	80	1/2 ACRE LOTS C
*	0.020	85	1/2 ACRE LOTS D
*	0.040	74	OPEN C, GOOD CONDITION
*	0.040	80	OPEN D, GOOD CONDITION
*	0.010	77	WOODS D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.790	85	Weighted Average
	0.560		70.89% Pervious Area
	0.230		29.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	70	0.0400	0.10		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.3	120	0.0500	1.57		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.5	180	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
14.8	370	Total			

Summary for Subcatchment 15S: SA-15

Runoff = 1.57 cfs @ 12.31 hrs, Volume= 0.168 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.610	80	1/2 ACRE LOTS C
*	0.110	98	ROAD
	0.720	83	Weighted Average
	0.610		84.72% Pervious Area
	0.110		15.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.1	180	0.0180	2.72		**Shallow Concentrated Flow, Segment ID:** Paved Kv= 20.3 fps
25.4	320	Total			

Summary for Subcatchment 22S: SA-22

Runoff = 1.87 cfs @ 12.27 hrs, Volume= 0.193 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.690	80	1/2 ACRE C
*	0.050	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.850	82	Weighted Average
	0.740		87.06% Pervious Area
	0.110		12.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.4	230	0.0184	2.75		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
22.9	350	Total			

Summary for Subcatchment 24S: SA-24

Runoff = 9.20 cfs @ 12.24 hrs, Volume= 0.904 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.020	80	OPEN D, GOOD CONDITION
*	2.700	80	1/2 ACRE LOTS C
*	1.270	85	1/2 ACRE LOTS D
*	0.050	77	WOODED D, GOOD CONDITION
	4.100	81	Weighted Average
	4.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0270	0.13		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.8	260	0.0260	1.13		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
4.3	210	0.0260	0.81		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
20.6	570	Total			

Summary for Subcatchment 25S: SA-25

Runoff = 5.02 cfs @ 12.56 hrs, Volume= 0.701 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.780	80	1/2 ACRE LOTS C
*	1.790	85	1/2 ACRE LOTS D
*	0.450	77	WOODED D, GOOD CONDITION
	3.090	82	Weighted Average
	3.090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
18.9	400	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
44.5	550	Total			

Summary for Subcatchment 26S: SA-26

Runoff = 0.82 cfs @ 11.99 hrs, Volume= 0.053 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.010	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.170	97	Weighted Average
	0.010		5.88% Pervious Area
	0.160		94.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 27S: SA-27

Runoff = 1.59 cfs @ 11.99 hrs, Volume= 0.101 af, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.340	94	Weighted Average
	0.070		20.59% Pervious Area
	0.270		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 28S: SA-28

Runoff = 0.80 cfs @ 11.99 hrs, Volume= 0.051 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.170	95	Weighted Average
	0.030		17.65% Pervious Area
	0.140		82.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 32S: SA-32

Runoff = 1.68 cfs @ 12.00 hrs, Volume= 0.108 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.060	80	OPEN D, GOOD CONDITION
*	0.040	77	WOODS D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.370	93	Weighted Average
	0.100		27.03% Pervious Area
	0.270		72.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 36S: SA-36

Runoff = 0.49 cfs @ 12.00 hrs, Volume= 0.031 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.100	98	IMPERVIOUS
	0.100		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0140	1.31		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	150	0.0140	2.40		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.9	300	Total			

Summary for Subcatchment 37S: SA-37

Runoff = 2.70 cfs @ 12.02 hrs, Volume= 0.187 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.410	80	1/2 ACRE LOTS C
*	0.010	74	OPEN C, GOOD CONDITION
*	0.090	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.740	86	Weighted Average
	0.510		68.92% Pervious Area
	0.230		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	115	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
5.1	165	Total			

Summary for Subcatchment 43S: SA-43

Runoff = 1.75 cfs @ 11.99 hrs, Volume= 0.113 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.530	80	OPEN D, GOOD CONDITION
	0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.3300	0.26		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 48S: SA-48

Runoff = 0.98 cfs @ 11.99 hrs, Volume= 0.062 af, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.210	94	Weighted Average
	0.050		23.81% Pervious Area
	0.160		76.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	150	0.0130	1.28		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

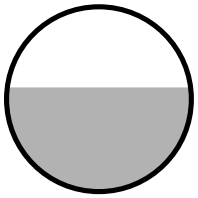
Summary for Reach 1R: CB20A TO POND

Inflow Area = 15.879 ac, 23.75% Impervious, Inflow Depth > 2.83" for 10 YEAR STORM event
Inflow = 28.74 cfs @ 12.18 hrs, Volume= 3.747 af
Outflow = 28.69 cfs @ 12.18 hrs, Volume= 3.748 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.00 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.73 fps, Avg. Travel Time= 0.2 min

Peak Storage= 221 cf @ 12.18 hrs
Average Depth at Peak Storage= 1.69'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 47.16 cfs

36.0" Round Pipe
n= 0.013
Length= 54.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.27'



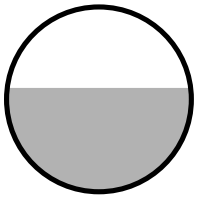
Summary for Reach 2R: CB6 TO CB20

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 2.81" for 10 YEAR STORM event
Inflow = 16.11 cfs @ 12.27 hrs, Volume= 2.121 af
Outflow = 16.05 cfs @ 12.27 hrs, Volume= 2.119 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.66 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.03 fps, Avg. Travel Time= 1.7 min

Peak Storage= 890 cf @ 12.27 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.54 cfs

30.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.63'



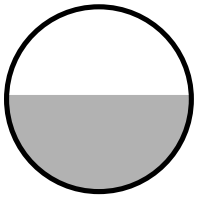
Summary for Reach 3R: DMH8 TO CB6

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 2.75" for 10 YEAR STORM event
Inflow = 14.37 cfs @ 12.29 hrs, Volume= 1.797 af
Outflow = 14.28 cfs @ 12.30 hrs, Volume= 1.796 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.51 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 1.4 min

Peak Storage= 620 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.31'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.55 cfs

30.0" Round Pipe
n= 0.009
Length= 239.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.48'



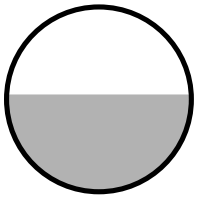
Summary for Reach 4R: CB9 TO DMH8

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 2.75" for 10 YEAR STORM event
Inflow = 14.45 cfs @ 12.28 hrs, Volume= 1.798 af
Outflow = 14.37 cfs @ 12.29 hrs, Volume= 1.797 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.49 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.88 fps, Avg. Travel Time= 1.1 min

Peak Storage= 486 cf @ 12.29 hrs
Average Depth at Peak Storage= 1.31'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.42 cfs

30.0" Round Pipe
n= 0.009
Length= 186.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.37'



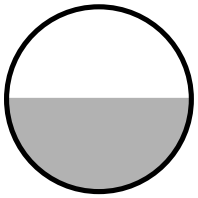
Summary for Reach 5R: DMH11A TO CB9

Inflow Area = 7.670 ac, 17.34% Impervious, Inflow Depth > 2.73" for 10 YEAR STORM event
Inflow = 14.30 cfs @ 12.28 hrs, Volume= 1.748 af
Outflow = 14.20 cfs @ 12.29 hrs, Volume= 1.747 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.69 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.96 fps, Avg. Travel Time= 1.4 min

Peak Storage= 614 cf @ 12.29 hrs
Average Depth at Peak Storage= 1.27'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 27.76 cfs

30.0" Round Pipe
n= 0.009
Length= 246.0' Slope= 0.0022 '/'
Inlet Invert= 0.00', Outlet Invert= -0.54'



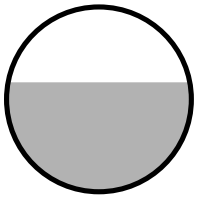
Summary for Reach 6R: CB15 TO CB11

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 5.50 cfs @ 12.41 hrs, Volume= 0.760 af
Outflow = 5.46 cfs @ 12.42 hrs, Volume= 0.759 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.01 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.75 fps, Avg. Travel Time= 1.9 min

Peak Storage= 342 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.30 cfs

18.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.94'



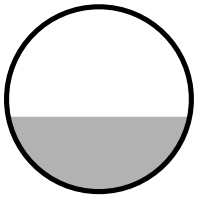
Summary for Reach 7R: CB16 TO CB15

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 2.63" for 10 YEAR STORM event
Inflow = 5.21 cfs @ 12.43 hrs, Volume= 0.659 af
Outflow = 5.21 cfs @ 12.43 hrs, Volume= 0.659 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.77 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.03 fps, Avg. Travel Time= 0.1 min

Peak Storage= 15 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



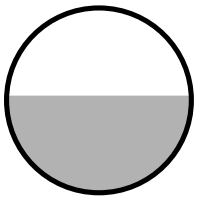
Summary for Reach 8R: CB18 & CB19 TO CB16

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 2.63" for 10 YEAR STORM event
Inflow = 5.24 cfs @ 12.42 hrs, Volume= 0.660 af
Outflow = 5.21 cfs @ 12.43 hrs, Volume= 0.659 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.54 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.92 fps, Avg. Travel Time= 1.8 min

Peak Storage= 301 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 9.60 cfs

18.0" Round Pipe
n= 0.009
Length= 320.0' Slope= 0.0040 '/'
Inlet Invert= 0.00', Outlet Invert= -1.28'



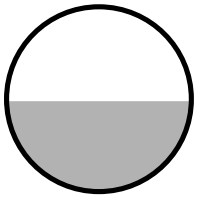
Summary for Reach 9R: CB12 TO DMH11A

Inflow Area = 2.360 ac, 19.07% Impervious, Inflow Depth > 2.82" for 10 YEAR STORM event
Inflow = 5.33 cfs @ 12.24 hrs, Volume= 0.555 af
Outflow = 5.31 cfs @ 12.24 hrs, Volume= 0.555 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.16 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.04 fps, Avg. Travel Time= 0.1 min

Peak Storage= 15 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.04 cfs

18.0" Round Pipe
n= 0.009
Length= 17.0' Slope= 0.0053 '/'
Inlet Invert= 0.00', Outlet Invert= -0.09'



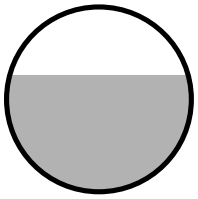
Summary for Reach 10R: CB5 TO CB6

Inflow Area = 0.470 ac, 78.72% Impervious, Inflow Depth > 3.55" for 10 YEAR STORM event
Inflow = 2.03 cfs @ 12.01 hrs, Volume= 0.139 af
Outflow = 2.01 cfs @ 12.02 hrs, Volume= 0.139 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.84 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 0.4 min

Peak Storage= 20 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.009
Length= 38.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.11'



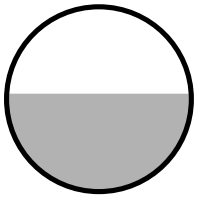
Summary for Reach 11R: CB4 TO CB5

Inflow Area = 0.370 ac, 72.97% Impervious, Inflow Depth > 3.51" for 10 YEAR STORM event
Inflow = 1.68 cfs @ 12.00 hrs, Volume= 0.108 af
Outflow = 1.55 cfs @ 12.02 hrs, Volume= 0.108 af, Atten= 8%, Lag= 1.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.67 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 3.0 min

Peak Storage= 119 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.83 cfs

12.0" Round Pipe
n= 0.009
Length= 282.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'



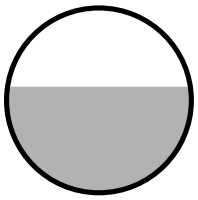
Summary for Reach 22R: CB20 TO CB20A

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 2.81" for 10 YEAR STORM event
Inflow = 16.05 cfs @ 12.27 hrs, Volume= 2.119 af
Outflow = 16.06 cfs @ 12.27 hrs, Volume= 2.119 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.51 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.96 fps, Avg. Travel Time= 0.1 min

Peak Storage= 47 cf @ 12.27 hrs
Average Depth at Peak Storage= 1.43'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 25.65 cfs

30.0" Round Pipe
n= 0.009
Length= 16.0' Slope= 0.0019 '/'
Inlet Invert= 0.00', Outlet Invert= -0.03'



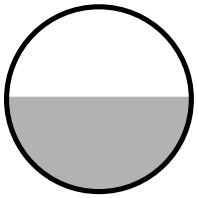
Summary for Reach 28R: CB37 & CB38 TO CB12

Inflow Area = 1.570 ac, 14.01% Impervious, Inflow Depth > 2.76" for 10 YEAR STORM event
Inflow = 3.44 cfs @ 12.29 hrs, Volume= 0.361 af
Outflow = 3.45 cfs @ 12.30 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.44 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.69 fps, Avg. Travel Time= 1.3 min

Peak Storage= 137 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



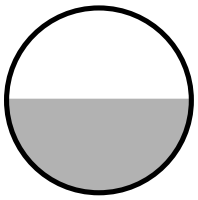
Summary for Reach 29R: CB39 & CB40 TO CB37

Inflow Area = 0.850 ac, 12.94% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 1.87 cfs @ 12.27 hrs, Volume= 0.193 af
Outflow = 1.87 cfs @ 12.29 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.66 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 1.6 min

Peak Storage= 87 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



Summary for Reach 33R: REACH 33

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 2.30" for 10 YEAR STORM event
Inflow = 24.01 cfs @ 12.58 hrs, Volume= 4.525 af
Outflow = 24.00 cfs @ 12.60 hrs, Volume= 4.509 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.20 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 3.0 min

Peak Storage= 2,404 cf @ 12.60 hrs
Average Depth at Peak Storage= 0.99'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 90.11 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 20.00'
Length= 220.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.10'



‡

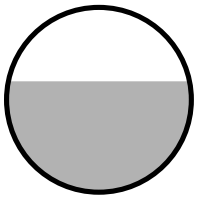
Summary for Reach 65R: CB11 TO DMH11A

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 5.46 cfs @ 12.42 hrs, Volume= 0.759 af
Outflow = 5.44 cfs @ 12.42 hrs, Volume= 0.759 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.92 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.2 min

Peak Storage= 31 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.90'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.11 cfs

18.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.08'



Summary for Pond 1P: DETENTION/RETENTION POND

Inflow Area = 16.409 ac, 22.98% Impervious, Inflow Depth > 2.82" for 10 YEAR STORM event
Inflow = 29.45 cfs @ 12.16 hrs, Volume= 3.861 af
Outflow = 14.70 cfs @ 12.71 hrs, Volume= 2.899 af, Atten= 50%, Lag= 33.3 min
Primary = 14.70 cfs @ 12.71 hrs, Volume= 2.899 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 82.00' Surf.Area= 17,450 sf Storage= 78,269 cf
Peak Elev= 85.33' @ 12.71 hrs Surf.Area= 25,133 sf Storage= 151,110 cf (72,841 cf above start)

Plug-Flow detention time= 295.9 min calculated for 1.091 af (28% of inflow)
Center-of-Mass det. time= 69.1 min (866.7 - 797.7)

Volume	Invert	Avail.Storage	Storage Description
#1	74.00'	224,019 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.00	6,030	0	0
76.00	7,980	14,010	14,010
78.00	9,450	17,430	31,440
80.00	10,936	20,386	51,826
81.00	12,250	11,593	63,419
82.00	17,450	14,850	78,269
84.00	22,700	40,150	118,419
86.00	26,350	49,050	167,469
88.00	30,200	56,550	224,019

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**24.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.22' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	82.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	84.00'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	86.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	86.50'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 3.11 3.40

Primary OutFlow Max=14.67 cfs @ 12.71 hrs HW=85.33' (Free Discharge)
- **1=Culvert** (Passes 14.67 cfs of 24.77 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.66 cfs @ 8.45 fps)
  - **3=Orifice/Grate** (Orifice Controls 13.01 cfs @ 3.93 fps)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: CULVERT

Inflow Area = 1.790 ac, 1.68% Impervious, Inflow Depth > 2.57" for 10 YEAR STORM event
Inflow = 4.46 cfs @ 12.14 hrs, Volume= 0.383 af
Outflow = 3.84 cfs @ 12.24 hrs, Volume= 0.382 af, Atten= 14%, Lag= 5.9 min
Primary = 3.84 cfs @ 12.24 hrs, Volume= 0.382 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 95.53' @ 12.24 hrs Surf.Area= 965 sf Storage= 904 cf

Plug-Flow detention time= 5.2 min calculated for 0.377 af (99% of inflow)
Center-of-Mass det. time= 3.2 min (799.2 - 796.0)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	3,315 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	100	0	0
95.00	700	400	400
96.00	1,200	950	1,350
97.00	2,730	1,965	3,315

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**12.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 94.00' / 92.60' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.77 cfs @ 12.24 hrs HW=95.49' (Free Discharge)
1=Culvert (Inlet Controls 3.77 cfs @ 4.80 fps)

Summary for Pond 8P: CULVERT

Inflow Area = 2.800 ac, 9.29% Impervious, Inflow Depth > 2.57" for 10 YEAR STORM event
Inflow = 5.23 cfs @ 12.36 hrs, Volume= 0.599 af
Outflow = 5.07 cfs @ 12.43 hrs, Volume= 0.597 af, Atten= 3%, Lag= 4.4 min
Primary = 5.07 cfs @ 12.43 hrs, Volume= 0.597 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 93.36' @ 12.43 hrs Surf.Area= 935 sf Storage= 881 cf

Plug-Flow detention time= 4.1 min calculated for 0.591 af (99% of inflow)
Center-of-Mass det. time= 2.7 min (810.0 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	3,462 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	25	0	0
92.00	375	20	20
93.00	575	475	495
94.00	1,580	1,078	1,572
95.00	2,200	1,890	3,462

Device	Routing	Invert	Outlet Devices
#1	Primary	91.90'	**15.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 91.90' / 91.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.01 cfs @ 12.43 hrs HW=93.34' (Free Discharge)
1=Culvert (Barrel Controls 5.01 cfs @ 4.44 fps)

Summary for Pond 13P: NEW CULVERT

Inflow Area = 7.190 ac, 0.00% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 12.28 cfs @ 12.28 hrs, Volume= 1.631 af
Outflow = 11.89 cfs @ 12.35 hrs, Volume= 1.626 af, Atten= 3%, Lag= 4.0 min
Primary = 11.89 cfs @ 12.35 hrs, Volume= 1.626 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 88.63' @ 12.35 hrs Surf.Area= 2,789 sf Storage= 2,329 cf

Plug-Flow detention time= 7.0 min calculated for 1.601 af (98% of inflow)
Center-of-Mass det. time= 2.7 min (806.7 - 804.0)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	7,573 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	125	0	0
88.00	1,390	758	758
89.00	3,620	2,505	3,263
90.00	5,000	4,310	7,573

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**24.0" Round Culvert** L= 85.0' Ke= 0.500 Inlet / Outlet Invert= 87.00' / 85.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=11.65 cfs @ 12.35 hrs HW=88.60' (Free Discharge)
1=Culvert (Inlet Controls 11.65 cfs @ 4.31 fps)

Summary for Pond 15P: NEW CULVERT

Inflow Area = 3.090 ac, 0.00% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 5.02 cfs @ 12.56 hrs, Volume= 0.701 af
Outflow = 4.73 cfs @ 12.69 hrs, Volume= 0.727 af, Atten= 6%, Lag= 7.8 min
Primary = 4.73 cfs @ 12.69 hrs, Volume= 0.727 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 92.00' Surf.Area= 300 sf Storage= 225 cf
Peak Elev= 92.21' @ 12.69 hrs Surf.Area= 1,544 sf Storage= 910 cf (685 cf above start)
Flood Elev= 94.00' Surf.Area= 6,200 sf Storage= 3,475 cf (3,250 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	3,475 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	150	0	0
92.00	300	225	225
93.00	6,200	3,250	3,475

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**18.0" Round Culvert** L= 184.0' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.08' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=4.72 cfs @ 12.69 hrs HW=92.21' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.72 cfs @ 4.22 fps)

Summary for Link 1L: FROM REACH 12 POSTDEVELOPMENT #2

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 2.86" for 10 YEAR STORM event
Inflow = 13.45 cfs @ 12.14 hrs, Volume= 1.628 af
Primary = 13.45 cfs @ 12.14 hrs, Volume= 1.628 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

10 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #2~Reach 12R.hce

Summary for Subcatchment 10S: SA-10

Runoff = 7.36 cfs @ 12.35 hrs, Volume= 0.839 af, Depth> 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.360	80	1/2 ACRE LOTS C
*	0.230	85	1/2 ACRE LOTS D
*	1.950	77	2 ACRE LOTS C
*	0.260	98	ROAD
	2.800	80	Weighted Average
	2.540		90.71% Pervious Area
	0.260		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.0	160	0.0100	2.64	15.86	**Channel Flow, Segment ID:** Area= 6.0 sf Perim= 10.0' r= 0.60' n= 0.040
29.1	670	Total			

Summary for Subcatchment 13S: SA-13

Runoff = 6.28 cfs @ 12.14 hrs, Volume= 0.536 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.430	80	1/2 ACRE LOTS C
*	0.670	85	1/2 ACRE LOTS D
*	0.080	80	OPEN D, GOOD CONDITION
*	0.270	70	WOODED C, GOOD CONDITION
*	0.310	77	WOODED D, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	1.790	80	Weighted Average
	1.760		98.32% Pervious Area
	0.030		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.1	190	0.0430	1.04		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
13.7	290	Total			

Summary for Subcatchment 14S: SA-14

Runoff = 2.97 cfs @ 12.16 hrs, Volume= 0.264 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.450	80	1/2 ACRE LOTS C
*	0.020	85	1/2 ACRE LOTS D
*	0.040	74	OPEN C, GOOD CONDITION
*	0.040	80	OPEN D, GOOD CONDITION
*	0.010	77	WOODS D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.790	85	Weighted Average
	0.560		70.89% Pervious Area
	0.230		29.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	70	0.0400	0.10		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.3	120	0.0500	1.57		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.5	180	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
14.8	370	Total			

Summary for Subcatchment 15S: SA-15

Runoff = 2.16 cfs @ 12.30 hrs, Volume= 0.231 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.610	80	1/2 ACRE LOTS C
*	0.110	98	ROAD
	0.720	83	Weighted Average
	0.610		84.72% Pervious Area
	0.110		15.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.1	180	0.0180	2.72		**Shallow Concentrated Flow, Segment ID:** Paved Kv= 20.3 fps
25.4	320	Total			

Summary for Subcatchment 22S: SA-22

Runoff = 2.59 cfs @ 12.27 hrs, Volume= 0.267 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.690	80	1/2 ACRE C
*	0.050	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.850	82	Weighted Average
	0.740		87.06% Pervious Area
	0.110		12.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.4	230	0.0184	2.75		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
22.9	350	Total			

Summary for Subcatchment 24S: SA-24

Runoff = 12.85 cfs @ 12.23 hrs, Volume= 1.257 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.020	80	OPEN D, GOOD CONDITION
*	2.700	80	1/2 ACRE LOTS C
*	1.270	85	1/2 ACRE LOTS D
*	0.050	77	WOODED D, GOOD CONDITION
	4.100	81	Weighted Average
	4.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0270	0.13		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.8	260	0.0260	1.13		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
4.3	210	0.0260	0.81		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
20.6	570	Total			

Summary for Subcatchment 25S: SA-25

Runoff = 6.97 cfs @ 12.55 hrs, Volume= 0.971 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.780	80	1/2 ACRE LOTS C
*	1.790	85	1/2 ACRE LOTS D
*	0.450	77	WOODED D, GOOD CONDITION
	3.090	82	Weighted Average
	3.090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
18.9	400	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
44.5	550	Total			

Summary for Subcatchment 26S: SA-26

Runoff = 1.04 cfs @ 11.99 hrs, Volume= 0.067 af, Depth> 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.010	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.170	97	Weighted Average
	0.010		5.88% Pervious Area
	0.160		94.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 27S: SA-27

Runoff = 2.04 cfs @ 11.99 hrs, Volume= 0.130 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.340	94	Weighted Average
	0.070		20.59% Pervious Area
	0.270		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 28S: SA-28

Runoff = 1.03 cfs @ 11.99 hrs, Volume= 0.066 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.170	95	Weighted Average
	0.030		17.65% Pervious Area
	0.140		82.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 32S: SA-32

Runoff = 2.18 cfs @ 12.00 hrs, Volume= 0.140 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	80	OPEN D, GOOD CONDITION
*	0.040	77	WOODS D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.370	93	Weighted Average
	0.100		27.03% Pervious Area
	0.270		72.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 36S: SA-36

Runoff = 0.62 cfs @ 12.00 hrs, Volume= 0.040 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.100	98	IMPERVIOUS
	0.100		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0140	1.31		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	150	0.0140	2.40		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.9	300	Total			

Summary for Subcatchment 37S: SA-37

Runoff = 3.64 cfs @ 12.02 hrs, Volume= 0.251 af, Depth> 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.410	80	1/2 ACRE LOTS C
*	0.010	74	OPEN C, GOOD CONDITION
*	0.090	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.740	86	Weighted Average
	0.510		68.92% Pervious Area
	0.230		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	115	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
5.1	165	Total			

Summary for Subcatchment 43S: SA-43

Runoff = 2.45 cfs @ 11.99 hrs, Volume= 0.158 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.530	80	OPEN D, GOOD CONDITION
	0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.3300	0.26		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 48S: SA-48

Runoff = 1.25 cfs @ 11.99 hrs, Volume= 0.080 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.210	94	Weighted Average
	0.050		23.81% Pervious Area
	0.160		76.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	150	0.0130	1.28		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

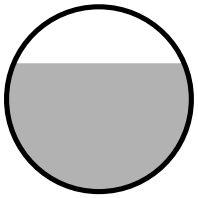
Summary for Reach 1R: CB20A TO POND

Inflow Area = 15.879 ac, 23.75% Impervious, Inflow Depth > 3.86" for 25 YEAR STORM event
Inflow = 39.09 cfs @ 12.14 hrs, Volume= 5.112 af
Outflow = 39.02 cfs @ 12.14 hrs, Volume= 5.113 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.44 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.07 fps, Avg. Travel Time= 0.2 min

Peak Storage= 283 cf @ 12.14 hrs
Average Depth at Peak Storage= 2.08'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 47.16 cfs

36.0" Round Pipe
n= 0.013
Length= 54.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.27'



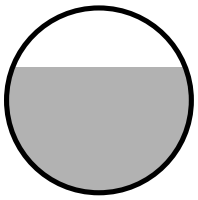
Summary for Reach 2R: CB6 TO CB20

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 3.84" for 25 YEAR STORM event
Inflow = 21.43 cfs @ 12.28 hrs, Volume= 2.899 af
Outflow = 21.36 cfs @ 12.28 hrs, Volume= 2.896 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.01 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 1.6 min

Peak Storage= 1,115 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.70'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.54 cfs

30.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.63'



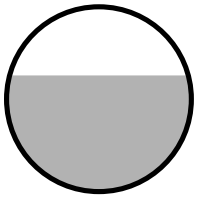
Summary for Reach 3R: DMH8 TO CB6

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 3.78" for 25 YEAR STORM event
Inflow = 19.20 cfs @ 12.30 hrs, Volume= 2.470 af
Outflow = 19.10 cfs @ 12.31 hrs, Volume= 2.469 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.89 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.16 fps, Avg. Travel Time= 1.3 min

Peak Storage= 776 cf @ 12.31 hrs
Average Depth at Peak Storage= 1.57'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.55 cfs

30.0" Round Pipe
n= 0.009
Length= 239.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.48'



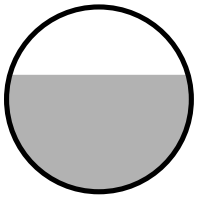
Summary for Reach 4R: CB9 TO DMH8

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 3.78" for 25 YEAR STORM event
Inflow = 19.29 cfs @ 12.30 hrs, Volume= 2.471 af
Outflow = 19.20 cfs @ 12.30 hrs, Volume= 2.470 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.87 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.15 fps, Avg. Travel Time= 1.0 min

Peak Storage= 608 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.58'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.42 cfs

30.0" Round Pipe
n= 0.009
Length= 186.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.37'



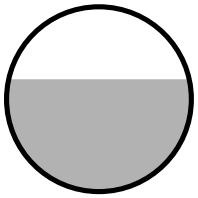
Summary for Reach 5R: DMH11A TO CB9

Inflow Area = 7.670 ac, 17.34% Impervious, Inflow Depth > 3.77" for 25 YEAR STORM event
Inflow = 19.09 cfs @ 12.30 hrs, Volume= 2.407 af
Outflow = 18.99 cfs @ 12.30 hrs, Volume= 2.405 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.09 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.24 fps, Avg. Travel Time= 1.3 min

Peak Storage= 767 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.52'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 27.76 cfs

30.0" Round Pipe
n= 0.009
Length= 246.0' Slope= 0.0022 '/'
Inlet Invert= 0.00', Outlet Invert= -0.54'



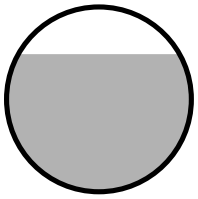
Summary for Reach 6R: CB15 TO CB11

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 3.75" for 25 YEAR STORM event
Inflow = 7.57 cfs @ 12.42 hrs, Volume= 1.047 af
Outflow = 7.50 cfs @ 12.43 hrs, Volume= 1.046 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.32 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 1.7 min

Peak Storage= 443 cf @ 12.43 hrs
Average Depth at Peak Storage= 1.12'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.30 cfs

18.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.94'



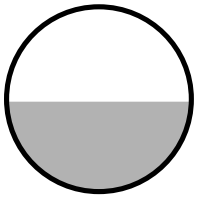
Summary for Reach 7R: CB16 TO CB15

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 3.65" for 25 YEAR STORM event
Inflow = 7.21 cfs @ 12.44 hrs, Volume= 0.917 af
Outflow = 7.21 cfs @ 12.44 hrs, Volume= 0.917 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.46 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.44 fps, Avg. Travel Time= 0.1 min

Peak Storage= 19 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



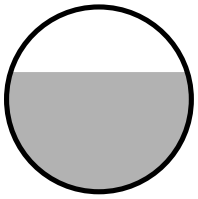
Summary for Reach 8R: CB18 & CB19 TO CB16

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 3.66" for 25 YEAR STORM event
Inflow = 7.28 cfs @ 12.43 hrs, Volume= 0.918 af
Outflow = 7.21 cfs @ 12.44 hrs, Volume= 0.917 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.95 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.21 fps, Avg. Travel Time= 1.7 min

Peak Storage= 387 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.97'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 9.60 cfs

18.0" Round Pipe
n= 0.009
Length= 320.0' Slope= 0.0040 '/'
Inlet Invert= 0.00', Outlet Invert= -1.28'



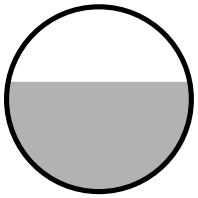
Summary for Reach 9R: CB12 TO DMH11A

Inflow Area = 2.360 ac, 19.07% Impervious, Inflow Depth > 3.87" for 25 YEAR STORM event
Inflow = 7.32 cfs @ 12.23 hrs, Volume= 0.760 af
Outflow = 7.29 cfs @ 12.24 hrs, Volume= 0.760 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.33 fps, Avg. Travel Time= 0.1 min

Peak Storage= 19 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.04 cfs

18.0" Round Pipe
n= 0.009
Length= 17.0' Slope= 0.0053 '/'
Inlet Invert= 0.00', Outlet Invert= -0.09'



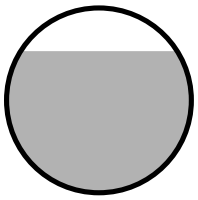
Summary for Reach 10R: CB5 TO CB6

Inflow Area = 0.470 ac, 78.72% Impervious, Inflow Depth > 4.58" for 25 YEAR STORM event
Inflow = 2.62 cfs @ 12.01 hrs, Volume= 0.179 af
Outflow = 2.59 cfs @ 12.02 hrs, Volume= 0.179 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.3 min

Peak Storage= 25 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.009
Length= 38.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.11'



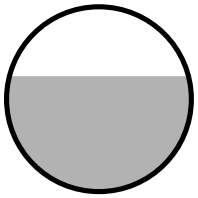
Summary for Reach 11R: CB4 TO CB5

Inflow Area = 0.370 ac, 72.97% Impervious, Inflow Depth > 4.55" for 25 YEAR STORM event
Inflow = 2.18 cfs @ 12.00 hrs, Volume= 0.140 af
Outflow = 2.01 cfs @ 12.02 hrs, Volume= 0.140 af, Atten= 8%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.90 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.72 fps, Avg. Travel Time= 2.7 min

Peak Storage= 145 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.83 cfs

12.0" Round Pipe
n= 0.009
Length= 282.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'



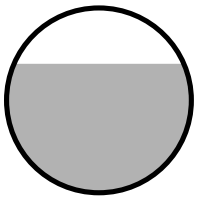
Summary for Reach 22R: CB20 TO CB20A

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 3.84" for 25 YEAR STORM event
Inflow = 21.36 cfs @ 12.28 hrs, Volume= 2.896 af
Outflow = 21.37 cfs @ 12.28 hrs, Volume= 2.896 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.85 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.23 fps, Avg. Travel Time= 0.1 min

Peak Storage= 58 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.74'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 25.65 cfs

30.0" Round Pipe
n= 0.009
Length= 16.0' Slope= 0.0019 '/'
Inlet Invert= 0.00', Outlet Invert= -0.03'



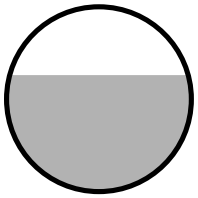
Summary for Reach 28R: CB37 & CB38 TO CB12

Inflow Area = 1.570 ac, 14.01% Impervious, Inflow Depth > 3.80" for 25 YEAR STORM event
Inflow = 4.75 cfs @ 12.29 hrs, Volume= 0.497 af
Outflow = 4.76 cfs @ 12.30 hrs, Volume= 0.496 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.86 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.95 fps, Avg. Travel Time= 1.2 min

Peak Storage= 176 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



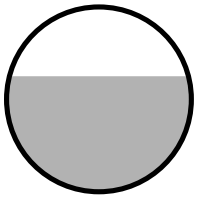
Summary for Reach 29R: CB39 & CB40 TO CB37

Inflow Area = 0.850 ac, 12.94% Impervious, Inflow Depth > 3.77" for 25 YEAR STORM event
Inflow = 2.59 cfs @ 12.27 hrs, Volume= 0.267 af
Outflow = 2.60 cfs @ 12.28 hrs, Volume= 0.266 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.03 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.52 fps, Avg. Travel Time= 1.4 min

Peak Storage= 111 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



Summary for Reach 33R: REACH 33

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 3.31" for 25 YEAR STORM event
Inflow = 35.48 cfs @ 12.53 hrs, Volume= 6.510 af
Outflow = 35.46 cfs @ 12.55 hrs, Volume= 6.491 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 2.7 min

Peak Storage= 3,161 cf @ 12.55 hrs
Average Depth at Peak Storage= 1.23'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 90.11 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 20.00'
Length= 220.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.10'



‡

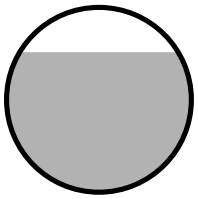
Summary for Reach 65R: CB11 TO DMH11A

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 3.75" for 25 YEAR STORM event
Inflow = 7.50 cfs @ 12.43 hrs, Volume= 1.046 af
Outflow = 7.48 cfs @ 12.44 hrs, Volume= 1.046 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.20 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.95 fps, Avg. Travel Time= 0.2 min

Peak Storage= 40 cf @ 12.44 hrs
Average Depth at Peak Storage= 1.14'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.11 cfs

18.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.08'



Summary for Pond 1P: DETENTION/RETENTION POND

Inflow Area = 16.409 ac, 22.98% Impervious, Inflow Depth > 3.85" for 25 YEAR STORM event
Inflow = 40.04 cfs @ 12.13 hrs, Volume= 5.271 af
Outflow = 21.99 cfs @ 12.68 hrs, Volume= 4.262 af, Atten= 45%, Lag= 32.5 min
Primary = 21.99 cfs @ 12.68 hrs, Volume= 4.262 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 82.00' Surf.Area= 17,450 sf Storage= 78,269 cf
Peak Elev= 86.08' @ 12.68 hrs Surf.Area= 26,502 sf Storage= 169,696 cf (91,427 cf above start)

Plug-Flow detention time= 207.0 min calculated for 2.465 af (47% of inflow)
Center-of-Mass det. time= 57.4 min (851.7 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	74.00'	224,019 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.00	6,030	0	0
76.00	7,980	14,010	14,010
78.00	9,450	17,430	31,440
80.00	10,936	20,386	51,826
81.00	12,250	11,593	63,419
82.00	17,450	14,850	78,269
84.00	22,700	40,150	118,419
86.00	26,350	49,050	167,469
88.00	30,200	56,550	224,019

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**24.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.22' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	82.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	84.00'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	86.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	86.50'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 3.11 3.40

Primary OutFlow Max=21.82 cfs @ 12.68 hrs HW=86.07' (Free Discharge)
- **1=Culvert** (Passes 21.82 cfs of 28.60 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.85 cfs @ 9.42 fps)
  - **3=Orifice/Grate** (Orifice Controls 19.58 cfs @ 5.54 fps)
  - **4=Sharp-Crested Rectangular Weir** (Weir Controls 0.39 cfs @ 0.89 fps)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: CULVERT

Inflow Area = 1.790 ac, 1.68% Impervious, Inflow Depth > 3.59" for 25 YEAR STORM event
Inflow = 6.28 cfs @ 12.14 hrs, Volume= 0.536 af
Outflow = 4.90 cfs @ 12.27 hrs, Volume= 0.534 af, Atten= 22%, Lag= 8.0 min
Primary = 4.90 cfs @ 12.27 hrs, Volume= 0.534 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 96.18' @ 12.27 hrs Surf.Area= 1,475 sf Storage= 1,703 cf

Plug-Flow detention time= 5.5 min calculated for 0.534 af (100% of inflow)
Center-of-Mass det. time= 3.5 min (794.9 - 791.3)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	3,315 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	100	0	0
95.00	700	400	400
96.00	1,200	950	1,350
97.00	2,730	1,965	3,315

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**12.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 94.00' / 92.60' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.87 cfs @ 12.27 hrs HW=96.16' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.87 cfs @ 6.20 fps)

Summary for Pond 8P: CULVERT

Inflow Area = 2.800 ac, 9.29% Impervious, Inflow Depth > 3.60" for 25 YEAR STORM event
Inflow = 7.36 cfs @ 12.35 hrs, Volume= 0.839 af
Outflow = 7.07 cfs @ 12.44 hrs, Volume= 0.838 af, Atten= 4%, Lag= 5.3 min
Primary = 7.07 cfs @ 12.44 hrs, Volume= 0.838 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 93.96' @ 12.44 hrs Surf.Area= 1,544 sf Storage= 1,534 cf

Plug-Flow detention time= 4.2 min calculated for 0.837 af (100% of inflow)
Center-of-Mass det. time= 2.8 min (805.2 - 802.4)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	3,462 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	25	0	0
92.00	375	20	20
93.00	575	475	495
94.00	1,580	1,078	1,572
95.00	2,200	1,890	3,462

Device	Routing	Invert	Outlet Devices
#1	Primary	91.90'	**15.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 91.90' / 91.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=6.95 cfs @ 12.44 hrs HW=93.93' (Free Discharge)
└**1=Culvert** (Barrel Controls 6.95 cfs @ 5.67 fps)

Summary for Pond 13P: NEW CULVERT

Inflow Area = 7.190 ac, 0.00% Impervious, Inflow Depth > 3.76" for 25 YEAR STORM event
Inflow = 16.67 cfs @ 12.25 hrs, Volume= 2.253 af
Outflow = 15.49 cfs @ 12.36 hrs, Volume= 2.247 af, Atten= 7%, Lag= 6.8 min
Primary = 15.49 cfs @ 12.36 hrs, Volume= 2.247 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 89.05' @ 12.36 hrs Surf.Area= 3,689 sf Storage= 3,478 cf

Plug-Flow detention time= 6.1 min calculated for 2.238 af (99% of inflow)
Center-of-Mass det. time= 2.7 min (803.6 - 800.9)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	7,573 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	125	0	0
88.00	1,390	758	758
89.00	3,620	2,505	3,263
90.00	5,000	4,310	7,573

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**24.0" Round Culvert** L= 85.0' Ke= 0.500 Inlet / Outlet Invert= 87.00' / 85.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=15.41 cfs @ 12.36 hrs HW=89.04' (Free Discharge)
└**1=Culvert** (Inlet Controls 15.41 cfs @ 4.90 fps)

Summary for Pond 15P: NEW CULVERT

Inflow Area = 3.090 ac, 0.00% Impervious, Inflow Depth > 3.77" for 25 YEAR STORM event
Inflow = 6.97 cfs @ 12.55 hrs, Volume= 0.971 af
Outflow = 6.47 cfs @ 12.70 hrs, Volume= 0.995 af, Atten= 7%, Lag= 8.8 min
Primary = 6.47 cfs @ 12.70 hrs, Volume= 0.995 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 92.00' Surf.Area= 300 sf Storage= 225 cf
Peak Elev= 92.51' @ 12.70 hrs Surf.Area= 3,337 sf Storage= 1,898 cf (1,673 cf above start)
Flood Elev= 94.00' Surf.Area= 6,200 sf Storage= 3,475 cf (3,250 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	3,475 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	150	0	0
92.00	300	225	225
93.00	6,200	3,250	3,475

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**18.0" Round Culvert** L= 184.0' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.08' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=6.47 cfs @ 12.70 hrs HW=92.51' (Free Discharge)
1=Culvert (Barrel Controls 6.47 cfs @ 4.51 fps)

Summary for Link 1L: FROM REACH 12 POSTDEVELOPMENT #2

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 3.89" for 25 YEAR STORM event
Inflow = 18.34 cfs @ 12.13 hrs, Volume= 2.216 af
Primary = 18.34 cfs @ 12.13 hrs, Volume= 2.216 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

25 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #2~Reach 12R.hce

Summary for Subcatchment 10S: SA-10

Runoff = 9.25 cfs @ 12.35 hrs, Volume= 1.046 af, Depth> 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.360	80	1/2 ACRE LOTS C
*	0.230	85	1/2 ACRE LOTS D
*	1.950	77	2 ACRE LOTS C
*	0.260	98	ROAD
	2.800	80	Weighted Average
	2.540		90.71% Pervious Area
	0.260		9.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
6.6	390	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.0	160	0.0100	2.64	15.86	**Channel Flow, Segment ID:** Area= 6.0 sf Perim= 10.0' r= 0.60' n= 0.040
29.1	670	Total			

Summary for Subcatchment 13S: SA-13

Runoff = 7.84 cfs @ 12.14 hrs, Volume= 0.668 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.430	80	1/2 ACRE LOTS C
*	0.670	85	1/2 ACRE LOTS D
*	0.080	80	OPEN D, GOOD CONDITION
*	0.270	70	WOODED C, GOOD CONDITION
*	0.310	77	WOODED D, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	1.790	80	Weighted Average
	1.760		98.32% Pervious Area
	0.030		1.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.1	190	0.0430	1.04		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
13.7	290	Total			

Summary for Subcatchment 14S: SA-14

Runoff = 3.63 cfs @ 12.15 hrs, Volume= 0.322 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.450	80	1/2 ACRE LOTS C
*	0.020	85	1/2 ACRE LOTS D
*	0.040	74	OPEN C, GOOD CONDITION
*	0.040	80	OPEN D, GOOD CONDITION
*	0.010	77	WOODS D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.790	85	Weighted Average
	0.560		70.89% Pervious Area
	0.230		29.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	70	0.0400	0.10		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.3	120	0.0500	1.57		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
1.5	180	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
14.8	370	Total			

Summary for Subcatchment 15S: SA-15

Runoff = 2.67 cfs @ 12.30 hrs, Volume= 0.285 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.610	80	1/2 ACRE LOTS C
*	0.110	98	ROAD
	0.720	83	Weighted Average
	0.610		84.72% Pervious Area
	0.110		15.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.1	180	0.0180	2.72		**Shallow Concentrated Flow, Segment ID:** Paved Kv= 20.3 fps
25.4	320	Total			

Summary for Subcatchment 22S: SA-22

Runoff = 3.20 cfs @ 12.26 hrs, Volume= 0.330 af, Depth> 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.690	80	1/2 ACRE C
*	0.050	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.850	82	Weighted Average
	0.740		87.06% Pervious Area
	0.110		12.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	120	0.0100	0.09		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.4	230	0.0184	2.75		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
22.9	350	Total			

Summary for Subcatchment 24S: SA-24

Runoff = 15.97 cfs @ 12.23 hrs, Volume= 1.561 af, Depth> 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.020	80	OPEN D, GOOD CONDITION
*	2.700	80	1/2 ACRE LOTS C
*	1.270	85	1/2 ACRE LOTS D
*	0.050	77	WOODED D, GOOD CONDITION
	4.100	81	Weighted Average
	4.100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0270	0.13		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.8	260	0.0260	1.13		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
4.3	210	0.0260	0.81		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
20.6	570	Total			

Summary for Subcatchment 25S: SA-25

Runoff = 8.65 cfs @ 12.55 hrs, Volume= 1.202 af, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.780	80	1/2 ACRE LOTS C
*	1.790	85	1/2 ACRE LOTS D
*	0.450	77	WOODED D, GOOD CONDITION
	3.090	82	Weighted Average
	3.090		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
18.9	400	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
44.5	550	Total			

Summary for Subcatchment 26S: SA-26

Runoff = 1.23 cfs @ 11.99 hrs, Volume= 0.079 af, Depth> 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.010	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.170	97	Weighted Average
	0.010		5.88% Pervious Area
	0.160		94.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 27S: SA-27

Runoff = 2.42 cfs @ 11.99 hrs, Volume= 0.155 af, Depth> 5.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.070	80	OPEN D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.340	94	Weighted Average
	0.070		20.59% Pervious Area
	0.270		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 28S: SA-28

Runoff = 1.22 cfs @ 11.99 hrs, Volume= 0.078 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.170	95	Weighted Average
	0.030		17.65% Pervious Area
	0.140		82.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 32S: SA-32

Runoff = 2.59 cfs @ 12.00 hrs, Volume= 0.167 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.060	80	OPEN D, GOOD CONDITION
*	0.040	77	WOODS D, GOOD CONDITION
*	0.270	98	IMPERVIOUS
	0.370	93	Weighted Average
	0.100		27.03% Pervious Area
	0.270		72.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 36S: SA-36

Runoff = 0.73 cfs @ 12.00 hrs, Volume= 0.047 af, Depth> 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.100	98	IMPERVIOUS
	0.100		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	150	0.0140	1.31		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	150	0.0140	2.40		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.9	300	Total			

Summary for Subcatchment 37S: SA-37

Runoff = 4.44 cfs @ 12.02 hrs, Volume= 0.306 af, Depth> 4.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.410	80	1/2 ACRE LOTS C
*	0.010	74	OPEN C, GOOD CONDITION
*	0.090	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	0.740	86	Weighted Average
	0.510		68.92% Pervious Area
	0.230		31.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.2	50	0.1000	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	115	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
5.1	165	Total			

Summary for Subcatchment 43S: SA-43

Runoff = 3.05 cfs @ 11.99 hrs, Volume= 0.197 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.530	80	OPEN D, GOOD CONDITION
	0.530		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	20	0.3300	0.26		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 48S: SA-48

Runoff = 1.49 cfs @ 11.99 hrs, Volume= 0.096 af, Depth> 5.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.160	98	IMPERVIOUS
	0.210	94	Weighted Average
	0.050		23.81% Pervious Area
	0.160		76.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	150	0.0130	1.28		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

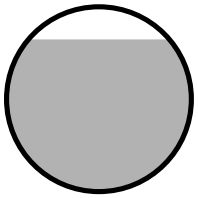
Summary for Reach 1R: CB20A TO POND

Inflow Area = 15.879 ac, 23.75% Impervious, Inflow Depth > 4.74" for 50 YEAR STORM event
Inflow = 47.49 cfs @ 12.13 hrs, Volume= 6.277 af
Outflow = 47.38 cfs @ 12.13 hrs, Volume= 6.277 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.61 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.31 fps, Avg. Travel Time= 0.2 min

Peak Storage= 336 cf @ 12.13 hrs
Average Depth at Peak Storage= 2.47'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 47.16 cfs

36.0" Round Pipe
n= 0.013
Length= 54.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.27'



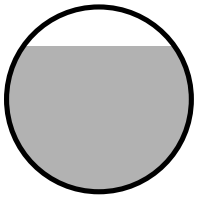
Summary for Reach 2R: CB6 TO CB20

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 4.72" for 50 YEAR STORM event
Inflow = 25.64 cfs @ 12.28 hrs, Volume= 3.563 af
Outflow = 25.56 cfs @ 12.28 hrs, Volume= 3.560 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.16 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 3.50 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1,303 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.97'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.54 cfs

30.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.63'



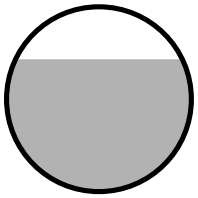
Summary for Reach 3R: DMH8 TO CB6

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 4.66" for 50 YEAR STORM event
Inflow = 22.98 cfs @ 12.30 hrs, Volume= 3.046 af
Outflow = 22.86 cfs @ 12.31 hrs, Volume= 3.045 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.08 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.36 fps, Avg. Travel Time= 1.2 min

Peak Storage= 898 cf @ 12.31 hrs
Average Depth at Peak Storage= 1.79'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.55 cfs

30.0" Round Pipe
n= 0.009
Length= 239.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.48'



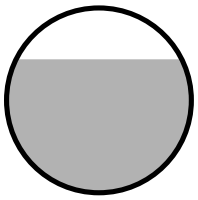
Summary for Reach 4R: CB9 TO DMH8

Inflow Area = 7.840 ac, 18.75% Impervious, Inflow Depth > 4.66" for 50 YEAR STORM event
Inflow = 23.10 cfs @ 12.30 hrs, Volume= 3.047 af
Outflow = 22.98 cfs @ 12.30 hrs, Volume= 3.046 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.06 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.34 fps, Avg. Travel Time= 0.9 min

Peak Storage= 705 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 26.42 cfs

30.0" Round Pipe
n= 0.009
Length= 186.0' Slope= 0.0020 '/'
Inlet Invert= 0.00', Outlet Invert= -0.37'



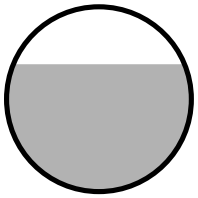
Summary for Reach 5R: DMH11A TO CB9

Inflow Area = 7.670 ac, 17.34% Impervious, Inflow Depth > 4.65" for 50 YEAR STORM event
Inflow = 22.88 cfs @ 12.30 hrs, Volume= 2.971 af
Outflow = 22.75 cfs @ 12.30 hrs, Volume= 2.969 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.31 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.44 fps, Avg. Travel Time= 1.2 min

Peak Storage= 887 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.72'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 27.76 cfs

30.0" Round Pipe
n= 0.009
Length= 246.0' Slope= 0.0022 '/'
Inlet Invert= 0.00', Outlet Invert= -0.54'



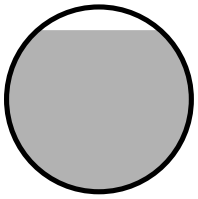
Summary for Reach 6R: CB15 TO CB11

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 4.63" for 50 YEAR STORM event
Inflow = 8.76 cfs @ 12.43 hrs, Volume= 1.293 af
Outflow = 8.72 cfs @ 12.46 hrs, Volume= 1.292 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.36 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 3.18 fps, Avg. Travel Time= 1.6 min

Peak Storage= 515 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.31'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.30 cfs

18.0" Round Pipe
n= 0.009
Length= 314.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.94'



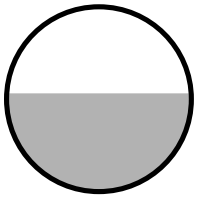
Summary for Reach 7R: CB16 TO CB15

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 4.54" for 50 YEAR STORM event
Inflow = 8.39 cfs @ 12.48 hrs, Volume= 1.138 af
Outflow = 8.39 cfs @ 12.48 hrs, Volume= 1.139 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.80 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.73 fps, Avg. Travel Time= 0.1 min

Peak Storage= 21 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



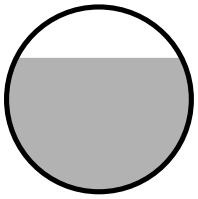
Summary for Reach 8R: CB18 & CB19 TO CB16

Inflow Area = 3.010 ac, 13.95% Impervious, Inflow Depth > 4.54" for 50 YEAR STORM event
Inflow = 8.41 cfs @ 12.46 hrs, Volume= 1.140 af
Outflow = 8.39 cfs @ 12.48 hrs, Volume= 1.138 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.12 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 3.41 fps, Avg. Travel Time= 1.6 min

Peak Storage= 438 cf @ 12.48 hrs
Average Depth at Peak Storage= 1.09'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 9.60 cfs

18.0" Round Pipe
n= 0.009
Length= 320.0' Slope= 0.0040 '/'
Inlet Invert= 0.00', Outlet Invert= -1.28'



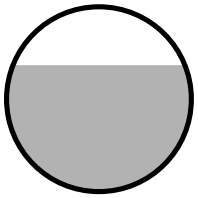
Summary for Reach 9R: CB12 TO DMH11A

Inflow Area = 2.360 ac, 19.07% Impervious, Inflow Depth > 4.76" for 50 YEAR STORM event
Inflow = 9.01 cfs @ 12.23 hrs, Volume= 0.935 af
Outflow = 8.96 cfs @ 12.24 hrs, Volume= 0.935 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.94 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.53 fps, Avg. Travel Time= 0.1 min

Peak Storage= 22 cf @ 12.24 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 11.04 cfs

18.0" Round Pipe
n= 0.009
Length= 17.0' Slope= 0.0053 '/'
Inlet Invert= 0.00', Outlet Invert= -0.09'



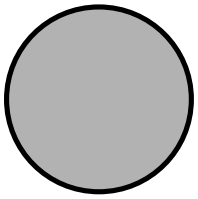
Summary for Reach 10R: CB5 TO CB6

Inflow Area = 0.470 ac, 78.72% Impervious, Inflow Depth > 5.44" for 50 YEAR STORM event
Inflow = 3.11 cfs @ 12.01 hrs, Volume= 0.213 af
Outflow = 2.86 cfs @ 12.04 hrs, Volume= 0.213 af, Atten= 8%, Lag= 1.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.3 min

Peak Storage= 30 cf @ 12.02 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.009
Length= 38.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.11'



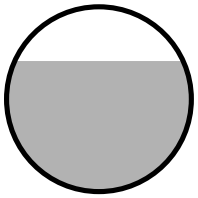
Summary for Reach 11R: CB4 TO CB5

Inflow Area = 0.370 ac, 72.97% Impervious, Inflow Depth > 5.42" for 50 YEAR STORM event
Inflow = 2.59 cfs @ 12.00 hrs, Volume= 0.167 af
Outflow = 2.39 cfs @ 12.02 hrs, Volume= 0.166 af, Atten= 8%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 4.03 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 2.6 min

Peak Storage= 167 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.83 cfs

12.0" Round Pipe
n= 0.009
Length= 282.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -0.85'



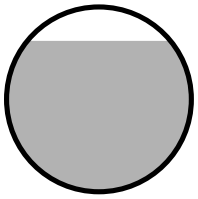
Summary for Reach 22R: CB20 TO CB20A

Inflow Area = 9.050 ac, 22.87% Impervious, Inflow Depth > 4.72" for 50 YEAR STORM event
Inflow = 25.56 cfs @ 12.28 hrs, Volume= 3.560 af
Outflow = 25.55 cfs @ 12.28 hrs, Volume= 3.560 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.96 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.42 fps, Avg. Travel Time= 0.1 min

Peak Storage= 69 cf @ 12.28 hrs
Average Depth at Peak Storage= 2.04'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 25.65 cfs

30.0" Round Pipe
n= 0.009
Length= 16.0' Slope= 0.0019 '/'
Inlet Invert= 0.00', Outlet Invert= -0.03'



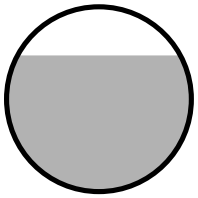
Summary for Reach 28R: CB37 & CB38 TO CB12

Inflow Area = 1.570 ac, 14.01% Impervious, Inflow Depth > 4.69" for 50 YEAR STORM event
Inflow = 5.87 cfs @ 12.29 hrs, Volume= 0.614 af
Outflow = 5.88 cfs @ 12.30 hrs, Volume= 0.613 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.08 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.13 fps, Avg. Travel Time= 1.2 min

Peak Storage= 209 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



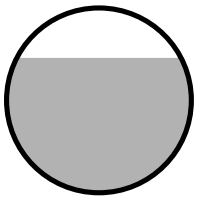
Summary for Reach 29R: CB39 & CB40 TO CB37

Inflow Area = 0.850 ac, 12.94% Impervious, Inflow Depth > 4.66" for 50 YEAR STORM event
Inflow = 3.20 cfs @ 12.26 hrs, Volume= 0.330 af
Outflow = 3.21 cfs @ 12.28 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.23 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 1.3 min

Peak Storage= 133 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 216.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.08'



Summary for Reach 33R: REACH 33

Inflow Area = 23.599 ac, 15.98% Impervious, Inflow Depth > 4.18" for 50 YEAR STORM event
Inflow = 47.94 cfs @ 12.54 hrs, Volume= 8.213 af
Outflow = 47.68 cfs @ 12.57 hrs, Volume= 8.194 af, Atten= 1%, Lag= 1.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 2.5 min

Peak Storage= 3,899 cf @ 12.57 hrs
Average Depth at Peak Storage= 1.44'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 90.11 cfs

8.00' x 2.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 20.00'
Length= 220.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.10'



‡

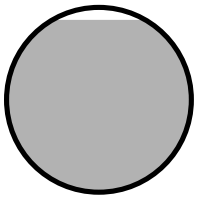
Summary for Reach 65R: CB11 TO DMH11A

Inflow Area = 3.350 ac, 20.60% Impervious, Inflow Depth > 4.63" for 50 YEAR STORM event
Inflow = 8.72 cfs @ 12.46 hrs, Volume= 1.292 af
Outflow = 8.74 cfs @ 12.47 hrs, Volume= 1.292 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.23 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.12 fps, Avg. Travel Time= 0.1 min

Peak Storage= 48 cf @ 12.48 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 8.11 cfs

18.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0029 '/'
Inlet Invert= 0.00', Outlet Invert= -0.08'



Summary for Pond 1P: DETENTION/RETENTION POND

Inflow Area = 16.409 ac, 22.98% Impervious, Inflow Depth > 4.73" for 50 YEAR STORM event
Inflow = 48.69 cfs @ 12.12 hrs, Volume= 6.475 af
Outflow = 30.55 cfs @ 12.66 hrs, Volume= 5.433 af, Atten= 37%, Lag= 32.2 min
Primary = 30.55 cfs @ 12.66 hrs, Volume= 5.433 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 82.00' Surf.Area= 17,450 sf Storage= 78,269 cf
Peak Elev= 86.52' @ 12.66 hrs Surf.Area= 27,350 sf Storage= 182,157 cf (103,888 cf above start)

Plug-Flow detention time= 170.8 min calculated for 3.600 af (56% of inflow)
Center-of-Mass det. time= 51.5 min (843.8 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	74.00'	224,019 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
74.00	6,030	0	0
76.00	7,980	14,010	14,010
78.00	9,450	17,430	31,440
80.00	10,936	20,386	51,826
81.00	12,250	11,593	63,419
82.00	17,450	14,850	78,269
84.00	22,700	40,150	118,419
86.00	26,350	49,050	167,469
88.00	30,200	56,550	224,019

Device	Routing	Invert	Outlet Devices
#1	Primary	81.50'	**24.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 81.50' / 81.22' S= 0.0051 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	82.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	84.00'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	86.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	86.50'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 3.11 3.40

Primary OutFlow Max=30.34 cfs @ 12.66 hrs HW=86.51' (Free Discharge)
- **1=Culvert** (Inlet Controls 30.29 cfs @ 9.64 fps)
  - **2=Orifice/Grate** (Passes < 1.95 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 22.58 cfs potential flow)
  - **4=Sharp-Crested Rectangular Weir** (Passes < 7.14 cfs potential flow)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 0.05 cfs @ 0.32 fps)

Summary for Pond 7P: CULVERT

Inflow Area = 1.790 ac, 1.68% Impervious, Inflow Depth > 4.47" for 50 YEAR STORM event
Inflow = 7.84 cfs @ 12.14 hrs, Volume= 0.668 af
Outflow = 5.59 cfs @ 12.31 hrs, Volume= 0.666 af, Atten= 29%, Lag= 10.1 min
Primary = 5.59 cfs @ 12.31 hrs, Volume= 0.666 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 96.68' @ 12.31 hrs Surf.Area= 2,243 sf Storage= 2,690 cf

Plug-Flow detention time= 6.1 min calculated for 0.665 af (100% of inflow)
Center-of-Mass det. time= 4.1 min (792.8 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	3,315 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	100	0	0
95.00	700	400	400
96.00	1,200	950	1,350
97.00	2,730	1,965	3,315

Device	Routing	Invert	Outlet Devices
#1	Primary	94.00'	**12.0" Round Culvert** L= 70.0' Ke= 0.500 Inlet / Outlet Invert= 94.00' / 92.60' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=5.57 cfs @ 12.31 hrs HW=96.67' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.57 cfs @ 7.10 fps)

Summary for Pond 8P: CULVERT

Inflow Area = 2.800 ac, 9.29% Impervious, Inflow Depth > 4.48" for 50 YEAR STORM event
Inflow = 9.25 cfs @ 12.35 hrs, Volume= 1.046 af
Outflow = 8.21 cfs @ 12.48 hrs, Volume= 1.044 af, Atten= 11%, Lag= 8.2 min
Primary = 8.21 cfs @ 12.48 hrs, Volume= 1.044 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 94.46' @ 12.48 hrs Surf.Area= 1,863 sf Storage= 2,434 cf

Plug-Flow detention time= 4.4 min calculated for 1.033 af (99% of inflow)
Center-of-Mass det. time= 3.1 min (802.7 - 799.6)

Volume	Invert	Avail.Storage	Storage Description
#1	91.90'	3,462 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.90	25	0	0
92.00	375	20	20
93.00	575	475	495
94.00	1,580	1,078	1,572
95.00	2,200	1,890	3,462

Device	Routing	Invert	Outlet Devices
#1	Primary	91.90'	**15.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 91.90' / 91.68' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=8.18 cfs @ 12.48 hrs HW=94.44' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.18 cfs @ 6.67 fps)

Summary for Pond 13P: NEW CULVERT

Inflow Area = 7.190 ac, 0.00% Impervious, Inflow Depth > 4.65" for 50 YEAR STORM event
Inflow = 19.95 cfs @ 12.26 hrs, Volume= 2.786 af
Outflow = 18.23 cfs @ 12.42 hrs, Volume= 2.780 af, Atten= 9%, Lag= 9.3 min
Primary = 18.23 cfs @ 12.42 hrs, Volume= 2.780 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 89.45' @ 12.42 hrs Surf.Area= 4,244 sf Storage= 5,210 cf

Plug-Flow detention time= 5.9 min calculated for 2.770 af (99% of inflow)
Center-of-Mass det. time= 3.0 min (802.1 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	87.00'	7,573 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
87.00	125	0	0
88.00	1,390	758	758
89.00	3,620	2,505	3,263
90.00	5,000	4,310	7,573

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	**24.0" Round Culvert** L= 85.0' Ke= 0.500 Inlet / Outlet Invert= 87.00' / 85.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=18.16 cfs @ 12.42 hrs HW=89.44' (Free Discharge)
1=Culvert (Inlet Controls 18.16 cfs @ 5.78 fps)

Summary for Pond 15P: NEW CULVERT

Inflow Area = 3.090 ac, 0.00% Impervious, Inflow Depth > 4.67" for 50 YEAR STORM event
Inflow = 8.65 cfs @ 12.55 hrs, Volume= 1.202 af
Outflow = 7.78 cfs @ 12.72 hrs, Volume= 1.225 af, Atten= 10%, Lag= 10.3 min
Primary = 7.78 cfs @ 12.72 hrs, Volume= 1.225 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 92.00' Surf.Area= 300 sf Storage= 225 cf
Peak Elev= 92.82' @ 12.72 hrs Surf.Area= 5,159 sf Storage= 2,902 cf (2,677 cf above start)
Flood Elev= 94.00' Surf.Area= 6,200 sf Storage= 3,475 cf (3,250 cf above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	91.00'	3,475 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
91.00	150	0	0
92.00	300	225	225
93.00	6,200	3,250	3,475

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**18.0" Round Culvert** L= 184.0' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.08' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

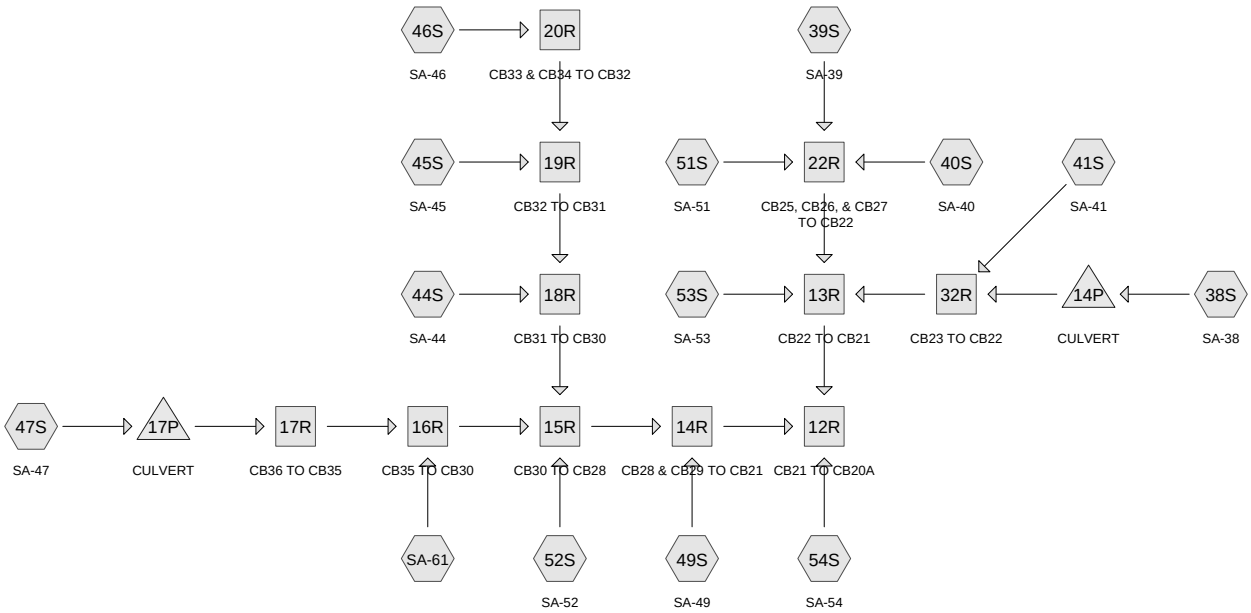
Primary OutFlow Max=7.76 cfs @ 12.72 hrs HW=92.82' (Free Discharge)
1=Culvert (Barrel Controls 7.76 cfs @ 4.60 fps)

Summary for Link 1L: FROM REACH 12 POSTDEVELOPMENT #2

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 4.77" for 50 YEAR STORM event
Inflow = 22.36 cfs @ 12.12 hrs, Volume= 2.717 af
Primary = 22.36 cfs @ 12.12 hrs, Volume= 2.717 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs

50 YEAR STORM Outflow Imported from Sandy Brook POSTDEVELOPMENT #2~Reach 12R.hce



Subcat Reach Pond Link

Routing Diagram for Sandy Brook POSTDEVELOPMENT #2
Prepared by BH2M, Printed 11/29/2017
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.250	80	1/2 ACRE LOTS C (38S, 45S, 46S, 49S)
1.140	85	1/2 ACRE LOTS D (38S)
0.624	80	1/2 acre lots, 25% imp, HSG C (47S)
0.020	74	>75% Grass cover, Good, HSG C (SA-61)
0.100	98	Allocated Impervious (47S)
0.060	74	Existing Grass (C) (45S)
0.262	98	Existing Impervious (45S, SA-61)
1.110	98	IMPERVIOUS (39S, 40S, 41S, 44S, 46S, 49S, 52S, 53S, 54S)
0.290	74	OPEN C, GOOD CONDITION (41S, 44S, 46S, 49S, 52S, 54S)
0.010	80	OPEN D (51S)
0.350	80	OPEN D, GOOD CONDITION (38S, 39S, 40S, 53S, 54S)
0.540	74	Proposed Grass (C) (47S, SA-61)
0.023	98	Proposed Impervious (SA-61)
0.050	98	ROAD (51S)
6.829	**84**	**TOTAL AREA**

Summary for Subcatchment 38S: SA-38

Runoff = 2.55 cfs @ 12.32 hrs, Volume= 0.276 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.870	80	1/2 ACRE LOTS C
*	1.140	85	1/2 ACRE LOTS D
*	0.120	80	OPEN D, GOOD CONDITION
	2.130	83	Weighted Average
	2.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.0470	0.18		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
11.7	380	0.0060	0.54		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.5	530	Total			

Summary for Subcatchment 39S: SA-39

Runoff = 0.38 cfs @ 12.10 hrs, Volume= 0.029 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.130	80	OPEN D, GOOD CONDITION
*	0.070	98	IMPERVIOUS
	0.200	86	Weighted Average
	0.130		65.00% Pervious Area
	0.070		35.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	40	0.0100	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
10.1	190	Total			

Summary for Subcatchment 40S: SA-40

Runoff = 0.58 cfs @ 12.01 hrs, Volume= 0.038 af, Depth> 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.150	98	IMPERVIOUS
	0.200	94	Weighted Average
	0.050		25.00% Pervious Area
	0.150		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.8	215	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
4.0	365	Total			

Summary for Subcatchment 41S: SA-41

Runoff = 0.47 cfs @ 12.00 hrs, Volume= 0.030 af, Depth> 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.180	90	Weighted Average
	0.060		33.33% Pervious Area
	0.120		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 44S: SA-44

Runoff = 0.13 cfs @ 11.98 hrs, Volume= 0.009 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	0.060	86	Weighted Average
	0.030		50.00% Pervious Area
	0.030		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	90	0.0330	1.67		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 45S: SA-45

Runoff = 0.94 cfs @ 12.11 hrs, Volume= 0.075 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.060	74	Existing Grass (C)
*	0.440	80	1/2 ACRE LOTS C
*	0.100	98	Existing Impervious
	0.600	82	Weighted Average
	0.500		83.33% Pervious Area
	0.100		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0900	0.23		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 46S: SA-46

Runoff = 1.06 cfs @ 12.18 hrs, Volume= 0.096 af, Depth> 1.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.070	74	OPEN C, GOOD CONDITION
*	0.400	80	1/2 ACRE LOTS C
*	0.210	98	IMPERVIOUS
	0.680	85	Weighted Average
	0.470		69.12% Pervious Area
	0.210		30.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	125	0.0250	0.14		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.4	85	0.0330	3.69		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
15.8	210	Total			

Summary for Subcatchment 47S: SA-47

Runoff = 0.97 cfs @ 12.48 hrs, Volume= 0.124 af, Depth> 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	18,683	74	Proposed Grass (C)
	27,165	80	1/2 acre lots, 25% imp, HSG C
	50,204	79	Weighted Average
	39,057		77.80% Pervious Area
	11,147		22.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	150	0.0130	0.07		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.5	160	0.0670	1.81		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
36.2	310	Total			

Summary for Subcatchment 49S: SA-49

Runoff = 1.25 cfs @ 12.10 hrs, Volume= 0.097 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.540	80	1/2 ACRE LOTS C
*	0.070	74	OPEN C, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.750	83	Weighted Average
	0.610		81.33% Pervious Area
	0.140		18.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0730	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.7	80	0.0730	1.89		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
9.9	280	Total			

Summary for Subcatchment 51S: SA-51

Runoff = 0.18 cfs @ 11.98 hrs, Volume= 0.012 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.010	80	OPEN D
*	0.050	98	ROAD
	0.060	95	Weighted Average
	0.010		16.67% Pervious Area
	0.050		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 52S: SA-52

Runoff = 0.41 cfs @ 12.00 hrs, Volume= 0.026 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.140	93	Weighted Average
	0.030		21.43% Pervious Area
	0.110		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	150	0.0100	1.09		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.00"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.3	270	Total			

Summary for Subcatchment 53S: SA-53

Runoff = 0.37 cfs @ 11.99 hrs, Volume= 0.024 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.020	80	OPEN D, GOOD CONDITION
*	0.100	98	IMPERVIOUS
	0.120	95	Weighted Average
	0.020		16.67% Pervious Area
	0.100		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 54S: SA-54

Runoff = 0.70 cfs @ 12.00 hrs, Volume= 0.045 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	80	OPEN D, GOOD CONDITION
*	0.180	98	IMPERVIOUS
	0.240	93	Weighted Average
	0.060		25.00% Pervious Area
	0.180		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment SA-61:

Runoff = 0.59 cfs @ 12.14 hrs, Volume= 0.050 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	1,023	98	Proposed Impervious
*	4,844	74	Proposed Grass (C)
*	7,057	98	Existing Impervious
	870	74	>75% Grass cover, Good, HSG C
	13,794	88	Weighted Average
	5,714		41.42% Pervious Area
	8,080		58.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	150	0.0400	0.25		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
2.0	110	0.0180	0.94		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
1.3	190	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.4	450	Total			

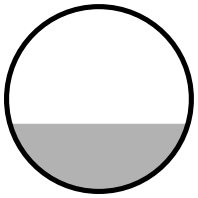
Summary for Reach 12R: CB21 TO CB20A

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 1.62" for 2 YEAR STORM event
Inflow = 7.49 cfs @ 12.14 hrs, Volume= 0.922 af
Outflow = 7.46 cfs @ 12.14 hrs, Volume= 0.922 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 12.76 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 6.56 fps, Avg. Travel Time= 0.4 min

Peak Storage= 93 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 26.28 cfs

18.0" Round Pipe
n= 0.009
Length= 160.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -4.80'



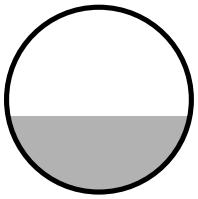
Summary for Reach 13R: CB22 TO CB21

Inflow Area = 2.890 ac, 16.96% Impervious, Inflow Depth > 1.69" for 2 YEAR STORM event
Inflow = 3.28 cfs @ 12.28 hrs, Volume= 0.408 af
Outflow = 3.29 cfs @ 12.29 hrs, Volume= 0.408 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.94 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 0.1 min

Peak Storage= 15 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 32.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.32'



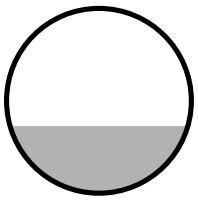
Summary for Reach 14R: CB28 & CB29 TO CB21

Inflow Area = 3.699 ac, 27.88% Impervious, Inflow Depth > 1.52" for 2 YEAR STORM event
Inflow = 4.27 cfs @ 12.13 hrs, Volume= 0.470 af
Outflow = 4.23 cfs @ 12.13 hrs, Volume= 0.469 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.32 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.65 fps, Avg. Travel Time= 0.6 min

Peak Storage= 79 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 138.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -1.38'



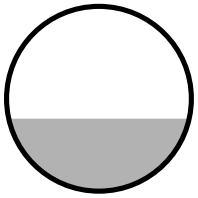
Summary for Reach 15R: CB30 TO CB28

Inflow Area = 2.949 ac, 30.23% Impervious, Inflow Depth > 1.52" for 2 YEAR STORM event
Inflow = 3.10 cfs @ 12.15 hrs, Volume= 0.373 af
Outflow = 3.01 cfs @ 12.16 hrs, Volume= 0.372 af, Atten= 3%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.77 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.49 fps, Avg. Travel Time= 1.3 min

Peak Storage= 120 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.49'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



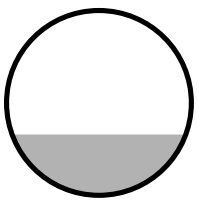
Summary for Reach 16R: CB35 TO CB30

Inflow Area = 1.469 ac, 30.04% Impervious, Inflow Depth > 1.37" for 2 YEAR STORM event
Inflow = 1.20 cfs @ 12.45 hrs, Volume= 0.168 af
Outflow = 1.19 cfs @ 12.45 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.32 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.81 fps, Avg. Travel Time= 1.6 min

Peak Storage= 60 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



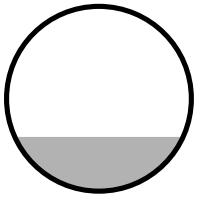
Summary for Reach 17R: CB36 TO CB35

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 1.23" for 2 YEAR STORM event
Inflow = 0.96 cfs @ 12.53 hrs, Volume= 0.118 af
Outflow = 0.96 cfs @ 12.53 hrs, Volume= 0.118 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.01 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.71 fps, Avg. Travel Time= 0.1 min

Peak Storage= 4 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



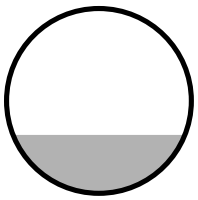
Summary for Reach 18R: CB31 TO CB30

Inflow Area = 1.340 ac, 25.37% Impervious, Inflow Depth > 1.60" for 2 YEAR STORM event
Inflow = 2.01 cfs @ 12.14 hrs, Volume= 0.179 af
Outflow = 2.00 cfs @ 12.14 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.02 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.77 fps, Avg. Travel Time= 0.2 min

Peak Storage= 9 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



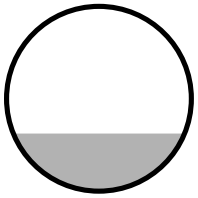
Summary for Reach 19R: CB32 TO CB31

Inflow Area = 1.280 ac, 24.22% Impervious, Inflow Depth > 1.59" for 2 YEAR STORM event
Inflow = 1.95 cfs @ 12.14 hrs, Volume= 0.170 af
Outflow = 1.95 cfs @ 12.14 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.96 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.73 fps, Avg. Travel Time= 0.2 min

Peak Storage= 9 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



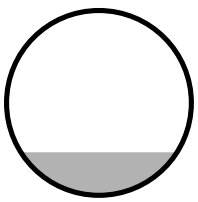
Summary for Reach 20R: CB33 & CB34 TO CB32

Inflow Area = 0.680 ac, 30.88% Impervious, Inflow Depth > 1.69" for 2 YEAR STORM event
Inflow = 1.06 cfs @ 12.18 hrs, Volume= 0.096 af
Outflow = 1.05 cfs @ 12.18 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.61 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.48 fps, Avg. Travel Time= 0.3 min

Peak Storage= 10 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 8.91 cfs

12.0" Round Pipe
n= 0.009
Length= 70.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -2.10'



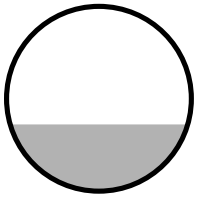
Summary for Reach 22R: CB25, CB26, & CB27 TO CB22

Inflow Area = 0.460 ac, 58.70% Impervious, Inflow Depth > 2.07" for 2 YEAR STORM event
Inflow = 1.04 cfs @ 12.02 hrs, Volume= 0.079 af
Outflow = 1.01 cfs @ 12.03 hrs, Volume= 0.079 af, Atten= 3%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 3.94 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.75 fps, Avg. Travel Time= 2.0 min

Peak Storage= 53 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 208.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.04'



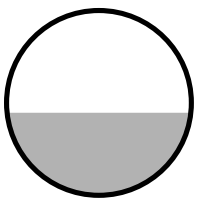
Summary for Reach 32R: CB23 TO CB22

Inflow Area = 2.310 ac, 5.19% Impervious, Inflow Depth > 1.59" for 2 YEAR STORM event
Inflow = 2.69 cfs @ 12.32 hrs, Volume= 0.305 af
Outflow = 2.70 cfs @ 12.32 hrs, Volume= 0.305 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.10 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.57 fps, Avg. Travel Time= 0.2 min

Peak Storage= 13 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



Summary for Pond 14P: CULVERT

Inflow Area = 2.130 ac, 0.00% Impervious, Inflow Depth > 1.55" for 2 YEAR STORM event
Inflow = 2.55 cfs @ 12.32 hrs, Volume= 0.276 af
Outflow = 2.55 cfs @ 12.33 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.7 min
Primary = 2.55 cfs @ 12.33 hrs, Volume= 0.275 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 91.50' @ 12.33 hrs Surf.Area= 276 sf Storage= 191 cf

Plug-Flow detention time= 3.1 min calculated for 0.275 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (811.2 - 809.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.70'	1,109 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.70	75	0	0
92.00	400	309	309
93.00	1,200	800	1,109

Device	Routing	Invert	Outlet Devices
#1	Primary	90.70'	**15.0" Round Culvert** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 90.70' / 90.14' S= 0.0400 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=2.50 cfs @ 12.33 hrs HW=91.50' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.50 cfs @ 3.04 fps)

Summary for Pond 17P: CULVERT

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 1.29" for 2 YEAR STORM event
Inflow = 0.97 cfs @ 12.48 hrs, Volume= 0.124 af
Outflow = 0.96 cfs @ 12.53 hrs, Volume= 0.118 af, Atten= 1%, Lag= 2.9 min
Primary = 0.96 cfs @ 12.53 hrs, Volume= 0.118 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 96.51' @ 12.53 hrs Surf.Area= 540 sf Storage= 478 cf
Flood Elev= 98.00' Surf.Area= 675 sf Storage= 743 cf

Plug-Flow detention time= 28.0 min calculated for 0.118 af (95% of inflow)
Center-of-Mass det. time= 11.5 min (837.6 - 826.0)

Volume	Invert	Avail.Storage	Storage Description
#1	95.00'	743 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.00	10	0	0
96.00	400	205	205
97.00	675	538	743

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.34' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.95 cfs @ 12.53 hrs HW=96.51' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.95 cfs @ 3.48 fps)

Summary for Subcatchment 38S: SA-38

Runoff = 4.64 cfs @ 12.31 hrs, Volume= 0.498 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.870	80	1/2 ACRE LOTS C
*	1.140	85	1/2 ACRE LOTS D
*	0.120	80	OPEN D, GOOD CONDITION
	2.130	83	Weighted Average
	2.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.0470	0.18		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
11.7	380	0.0060	0.54		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.5	530	Total			

Summary for Subcatchment 39S: SA-39

Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.050 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.130	80	OPEN D, GOOD CONDITION
*	0.070	98	IMPERVIOUS
	0.200	86	Weighted Average
	0.130		65.00% Pervious Area
	0.070		35.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	40	0.0100	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
10.1	190	Total			

Summary for Subcatchment 40S: SA-40

Runoff = 0.91 cfs @ 12.01 hrs, Volume= 0.060 af, Depth> 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.150	98	IMPERVIOUS
	0.200	94	Weighted Average
	0.050		25.00% Pervious Area
	0.150		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.8	215	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
4.0	365	Total			

Summary for Subcatchment 41S: SA-41

Runoff = 0.78 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.180	90	Weighted Average
	0.060		33.33% Pervious Area
	0.120		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 44S: SA-44

Runoff = 0.23 cfs @ 11.98 hrs, Volume= 0.015 af, Depth> 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	0.060	86	Weighted Average
	0.030		50.00% Pervious Area
	0.030		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	90	0.0330	1.67		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 45S: SA-45

Runoff = 1.74 cfs @ 12.11 hrs, Volume= 0.136 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.060	74	Existing Grass (C)
*	0.440	80	1/2 ACRE LOTS C
*	0.100	98	Existing Impervious
	0.600	82	Weighted Average
	0.500		83.33% Pervious Area
	0.100		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0900	0.23		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 46S: SA-46

Runoff = 1.86 cfs @ 12.18 hrs, Volume= 0.168 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.070	74	OPEN C, GOOD CONDITION
*	0.400	80	1/2 ACRE LOTS C
*	0.210	98	IMPERVIOUS
	0.680	85	Weighted Average
	0.470		69.12% Pervious Area
	0.210		30.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	125	0.0250	0.14		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.4	85	0.0330	3.69		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
15.8	210	Total			

Summary for Subcatchment 47S: SA-47

Runoff = 1.89 cfs @ 12.46 hrs, Volume= 0.239 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	18,683	74	Proposed Grass (C)
	27,165	80	1/2 acre lots, 25% imp, HSG C
	50,204	79	Weighted Average
	39,057		77.80% Pervious Area
	11,147		22.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	150	0.0130	0.07		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.5	160	0.0670	1.81		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
36.2	310	Total			

Summary for Subcatchment 49S: SA-49

Runoff = 2.27 cfs @ 12.10 hrs, Volume= 0.175 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.540	80	1/2 ACRE LOTS C
*	0.070	74	OPEN C, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.750	83	Weighted Average
	0.610		81.33% Pervious Area
	0.140		18.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0730	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.7	80	0.0730	1.89		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
9.9	280	Total			

Summary for Subcatchment 51S: SA-51

Runoff = 0.27 cfs @ 11.98 hrs, Volume= 0.018 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.010	80	OPEN D
*	0.050	98	ROAD
	0.060	95	Weighted Average
	0.010		16.67% Pervious Area
	0.050		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 52S: SA-52

Runoff = 0.64 cfs @ 12.00 hrs, Volume= 0.041 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.140	93	Weighted Average
	0.030		21.43% Pervious Area
	0.110		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	150	0.0100	1.09		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.00"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.3	270	Total			

Summary for Subcatchment 53S: SA-53

Runoff = 0.57 cfs @ 11.99 hrs, Volume= 0.036 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.020	80	OPEN D, GOOD CONDITION
*	0.100	98	IMPERVIOUS
	0.120	95	Weighted Average
	0.020		16.67% Pervious Area
	0.100		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 54S: SA-54

Runoff = 1.09 cfs @ 12.00 hrs, Volume= 0.070 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	80	OPEN D, GOOD CONDITION
*	0.180	98	IMPERVIOUS
	0.240	93	Weighted Average
	0.060		25.00% Pervious Area
	0.180		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment SA-61:

Runoff = 1.00 cfs @ 12.13 hrs, Volume= 0.084 af, Depth> 3.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	1,023	98	Proposed Impervious
*	4,844	74	Proposed Grass (C)
*	7,057	98	Existing Impervious
	870	74	>75% Grass cover, Good, HSG C
	13,794	88	Weighted Average
	5,714		41.42% Pervious Area
	8,080		58.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	150	0.0400	0.25		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
2.0	110	0.0180	0.94		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
1.3	190	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.4	450	Total			

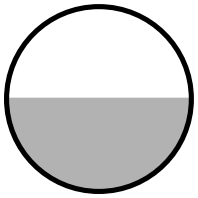
Summary for Reach 12R: CB21 TO CB20A

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 2.86" for 10 YEAR STORM event
Inflow = 13.49 cfs @ 12.14 hrs, Volume= 1.628 af
Outflow = 13.45 cfs @ 12.14 hrs, Volume= 1.628 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 14.92 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 7.73 fps, Avg. Travel Time= 0.3 min

Peak Storage= 144 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 26.28 cfs

18.0" Round Pipe
n= 0.009
Length= 160.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -4.80'



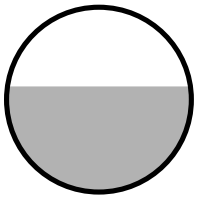
Summary for Reach 13R: CB22 TO CB21

Inflow Area = 2.890 ac, 16.96% Impervious, Inflow Depth > 2.95" for 10 YEAR STORM event
Inflow = 5.80 cfs @ 12.28 hrs, Volume= 0.710 af
Outflow = 5.81 cfs @ 12.28 hrs, Volume= 0.710 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 8.01 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.20 fps, Avg. Travel Time= 0.1 min

Peak Storage= 23 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 32.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.32'



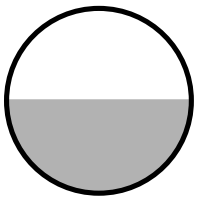
Summary for Reach 14R: CB28 & CB29 TO CB21

Inflow Area = 3.699 ac, 27.88% Impervious, Inflow Depth > 2.75" for 10 YEAR STORM event
Inflow = 7.83 cfs @ 12.13 hrs, Volume= 0.848 af
Outflow = 7.78 cfs @ 12.13 hrs, Volume= 0.848 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.61 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.33 fps, Avg. Travel Time= 0.5 min

Peak Storage= 124 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 138.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -1.38'



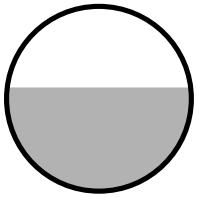
Summary for Reach 15R: CB30 TO CB28

Inflow Area = 2.949 ac, 30.23% Impervious, Inflow Depth > 2.74" for 10 YEAR STORM event
Inflow = 5.70 cfs @ 12.14 hrs, Volume= 0.674 af
Outflow = 5.63 cfs @ 12.15 hrs, Volume= 0.673 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.90 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 1.1 min

Peak Storage= 191 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



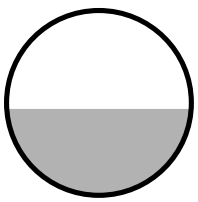
Summary for Reach 16R: CB35 TO CB30

Inflow Area = 1.469 ac, 30.04% Impervious, Inflow Depth > 2.58" for 10 YEAR STORM event
Inflow = 2.29 cfs @ 12.43 hrs, Volume= 0.316 af
Outflow = 2.28 cfs @ 12.43 hrs, Volume= 0.316 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.35 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.38 fps, Avg. Travel Time= 1.3 min

Peak Storage= 97 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



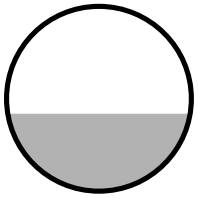
Summary for Reach 17R: CB36 TO CB35

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 2.42" for 10 YEAR STORM event
Inflow = 1.88 cfs @ 12.50 hrs, Volume= 0.232 af
Outflow = 1.88 cfs @ 12.50 hrs, Volume= 0.232 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 7 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



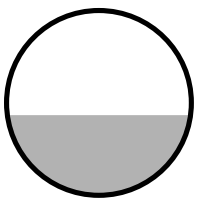
Summary for Reach 18R: CB31 TO CB30

Inflow Area = 1.340 ac, 25.37% Impervious, Inflow Depth > 2.84" for 10 YEAR STORM event
Inflow = 3.62 cfs @ 12.13 hrs, Volume= 0.317 af
Outflow = 3.62 cfs @ 12.13 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 0.1 min

Peak Storage= 14 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



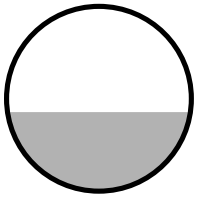
Summary for Reach 19R: CB32 TO CB31

Inflow Area = 1.280 ac, 24.22% Impervious, Inflow Depth > 2.84" for 10 YEAR STORM event
Inflow = 3.52 cfs @ 12.13 hrs, Volume= 0.303 af
Outflow = 3.52 cfs @ 12.13 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.03 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.23 fps, Avg. Travel Time= 0.1 min

Peak Storage= 14 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



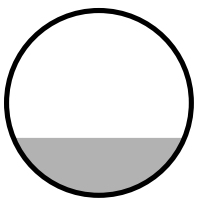
Summary for Reach 20R: CB33 & CB34 TO CB32

Inflow Area = 0.680 ac, 30.88% Impervious, Inflow Depth > 2.96" for 10 YEAR STORM event
Inflow = 1.86 cfs @ 12.18 hrs, Volume= 0.168 af
Outflow = 1.86 cfs @ 12.18 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.10 fps, Avg. Travel Time= 0.3 min

Peak Storage= 15 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 8.91 cfs

12.0" Round Pipe
n= 0.009
Length= 70.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -2.10'



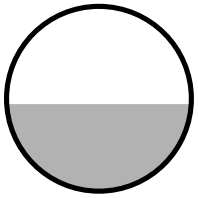
Summary for Reach 22R: CB25, CB26, & CB27 TO CB22

Inflow Area = 0.460 ac, 58.70% Impervious, Inflow Depth > 3.34" for 10 YEAR STORM event
Inflow = 1.68 cfs @ 12.02 hrs, Volume= 0.128 af
Outflow = 1.63 cfs @ 12.03 hrs, Volume= 0.128 af, Atten= 3%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.48 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 1.7 min

Peak Storage= 75 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 208.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.04'



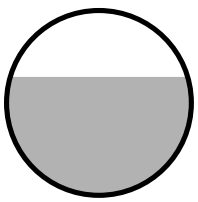
Summary for Reach 32R: CB23 TO CB22

Inflow Area = 2.310 ac, 5.19% Impervious, Inflow Depth > 2.84" for 10 YEAR STORM event
Inflow = 4.86 cfs @ 12.31 hrs, Volume= 0.546 af
Outflow = 4.88 cfs @ 12.31 hrs, Volume= 0.546 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.88 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.04 fps, Avg. Travel Time= 0.1 min

Peak Storage= 20 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



Summary for Pond 14P: CULVERT

Inflow Area = 2.130 ac, 0.00% Impervious, Inflow Depth > 2.80" for 10 YEAR STORM event
Inflow = 4.64 cfs @ 12.31 hrs, Volume= 0.498 af
Outflow = 4.62 cfs @ 12.32 hrs, Volume= 0.497 af, Atten= 0%, Lag= 1.0 min
Primary = 4.62 cfs @ 12.32 hrs, Volume= 0.497 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 91.93' @ 12.32 hrs Surf.Area= 383 sf Storage= 292 cf

Plug-Flow detention time= 2.7 min calculated for 0.496 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (801.9 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.70'	1,109 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.70	75	0	0
92.00	400	309	309
93.00	1,200	800	1,109

Device	Routing	Invert	Outlet Devices
#1	Primary	90.70'	**15.0" Round Culvert** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 90.70' / 90.14' S= 0.0400 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=4.56 cfs @ 12.32 hrs HW=91.91' (Free Discharge)
1=Culvert (Inlet Controls 4.56 cfs @ 3.75 fps)

Summary for Pond 17P: CULVERT

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 2.48" for 10 YEAR STORM event
Inflow = 1.89 cfs @ 12.46 hrs, Volume= 0.239 af
Outflow = 1.88 cfs @ 12.50 hrs, Volume= 0.232 af, Atten= 1%, Lag= 2.6 min
Primary = 1.88 cfs @ 12.50 hrs, Volume= 0.232 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 96.76' @ 12.50 hrs Surf.Area= 610 sf Storage= 615 cf
Flood Elev= 98.00' Surf.Area= 675 sf Storage= 743 cf

Plug-Flow detention time= 18.3 min calculated for 0.232 af (97% of inflow)
Center-of-Mass det. time= 8.3 min (822.2 - 813.9)

Volume	Invert	Avail.Storage	Storage Description
#1	95.00'	743 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.00	10	0	0
96.00	400	205	205
97.00	675	538	743

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.34' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.88 cfs @ 12.50 hrs HW=96.76' (Free Discharge)
1=Culvert (Barrel Controls 1.88 cfs @ 4.04 fps)

Summary for Subcatchment 38S: SA-38

Runoff = 6.39 cfs @ 12.30 hrs, Volume= 0.683 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.870	80	1/2 ACRE LOTS C
*	1.140	85	1/2 ACRE LOTS D
*	0.120	80	OPEN D, GOOD CONDITION
	2.130	83	Weighted Average
	2.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.0470	0.18		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
11.7	380	0.0060	0.54		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.5	530	Total			

Summary for Subcatchment 39S: SA-39

Runoff = 0.88 cfs @ 12.10 hrs, Volume= 0.068 af, Depth> 4.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.130	80	OPEN D, GOOD CONDITION
*	0.070	98	IMPERVIOUS
	0.200	86	Weighted Average
	0.130		65.00% Pervious Area
	0.070		35.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	40	0.0100	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
10.1	190	Total			

Summary for Subcatchment 40S: SA-40

Runoff = 1.17 cfs @ 12.01 hrs, Volume= 0.077 af, Depth> 4.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.150	98	IMPERVIOUS
	0.200	94	Weighted Average
	0.050		25.00% Pervious Area
	0.150		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.8	215	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
4.0	365	Total			

Summary for Subcatchment 41S: SA-41

Runoff = 1.02 cfs @ 12.00 hrs, Volume= 0.065 af, Depth> 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.180	90	Weighted Average
	0.060		33.33% Pervious Area
	0.120		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 44S: SA-44

Runoff = 0.31 cfs @ 11.98 hrs, Volume= 0.020 af, Depth> 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	0.060	86	Weighted Average
	0.030		50.00% Pervious Area
	0.030		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	90	0.0330	1.67		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 45S: SA-45

Runoff = 2.41 cfs @ 12.11 hrs, Volume= 0.188 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	74	Existing Grass (C)
*	0.440	80	1/2 ACRE LOTS C
*	0.100	98	Existing Impervious
	0.600	82	Weighted Average
	0.500		83.33% Pervious Area
	0.100		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0900	0.23		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 46S: SA-46

Runoff = 2.52 cfs @ 12.17 hrs, Volume= 0.227 af, Depth> 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.070	74	OPEN C, GOOD CONDITION
*	0.400	80	1/2 ACRE LOTS C
*	0.210	98	IMPERVIOUS
	0.680	85	Weighted Average
	0.470		69.12% Pervious Area
	0.210		30.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	125	0.0250	0.14		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.4	85	0.0330	3.69		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
15.8	210	Total			

Summary for Subcatchment 47S: SA-47

Runoff = 2.69 cfs @ 12.45 hrs, Volume= 0.337 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	18,683	74	Proposed Grass (C)
	27,165	80	1/2 acre lots, 25% imp, HSG C
	50,204	79	Weighted Average
	39,057		77.80% Pervious Area
	11,147		22.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	150	0.0130	0.07		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.5	160	0.0670	1.81		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
36.2	310	Total			

Summary for Subcatchment 49S: SA-49

Runoff = 3.12 cfs @ 12.10 hrs, Volume= 0.240 af, Depth> 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.540	80	1/2 ACRE LOTS C
*	0.070	74	OPEN C, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.750	83	Weighted Average
	0.610		81.33% Pervious Area
	0.140		18.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0730	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.7	80	0.0730	1.89		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
9.9	280	Total			

Summary for Subcatchment 51S: SA-51

Runoff = 0.35 cfs @ 11.98 hrs, Volume= 0.023 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.010	80	OPEN D
*	0.050	98	ROAD
	0.060	95	Weighted Average
	0.010		16.67% Pervious Area
	0.050		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 52S: SA-52

Runoff = 0.83 cfs @ 12.00 hrs, Volume= 0.053 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.140	93	Weighted Average
	0.030		21.43% Pervious Area
	0.110		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	150	0.0100	1.09		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.00"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.3	270	Total			

Summary for Subcatchment 53S: SA-53

Runoff = 0.73 cfs @ 11.99 hrs, Volume= 0.046 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.020	80	OPEN D, GOOD CONDITION
*	0.100	98	IMPERVIOUS
	0.120	95	Weighted Average
	0.020		16.67% Pervious Area
	0.100		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 54S: SA-54

Runoff = 1.41 cfs @ 12.00 hrs, Volume= 0.091 af, Depth> 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	80	OPEN D, GOOD CONDITION
*	0.180	98	IMPERVIOUS
	0.240	93	Weighted Average
	0.060		25.00% Pervious Area
	0.180		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment SA-61:

Runoff = 1.33 cfs @ 12.13 hrs, Volume= 0.112 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	1,023	98	Proposed Impervious
*	4,844	74	Proposed Grass (C)
*	7,057	98	Existing Impervious
	870	74	>75% Grass cover, Good, HSG C
	13,794	88	Weighted Average
	5,714		41.42% Pervious Area
	8,080		58.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	150	0.0400	0.25		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
2.0	110	0.0180	0.94		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
1.3	190	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.4	450	Total			

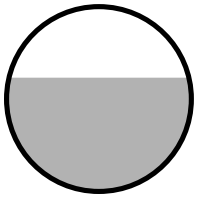
Summary for Reach 12R: CB21 TO CB20A

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 3.89" for 25 YEAR STORM event
Inflow = 18.39 cfs @ 12.13 hrs, Volume= 2.216 af
Outflow = 18.34 cfs @ 12.13 hrs, Volume= 2.216 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 16.06 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 8.44 fps, Avg. Travel Time= 0.3 min

Peak Storage= 182 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 26.28 cfs

18.0" Round Pipe
n= 0.009
Length= 160.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -4.80'



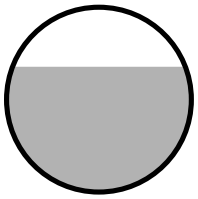
Summary for Reach 13R: CB22 TO CB21

Inflow Area = 2.890 ac, 16.96% Impervious, Inflow Depth > 3.99" for 25 YEAR STORM event
Inflow = 7.49 cfs @ 12.30 hrs, Volume= 0.961 af
Outflow = 7.47 cfs @ 12.30 hrs, Volume= 0.961 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 8.45 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.57 fps, Avg. Travel Time= 0.1 min

Peak Storage= 28 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 32.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.32'



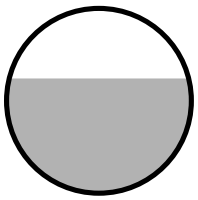
Summary for Reach 14R: CB28 & CB29 TO CB21

Inflow Area = 3.699 ac, 27.88% Impervious, Inflow Depth > 3.78" for 25 YEAR STORM event
Inflow = 10.78 cfs @ 12.13 hrs, Volume= 1.166 af
Outflow = 10.72 cfs @ 12.13 hrs, Volume= 1.165 af, Atten= 1%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 9.29 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 4.74 fps, Avg. Travel Time= 0.5 min

Peak Storage= 159 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 138.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -1.38'



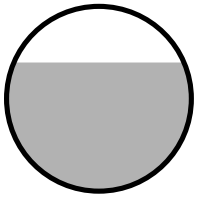
Summary for Reach 15R: CB30 TO CB28

Inflow Area = 2.949 ac, 30.23% Impervious, Inflow Depth > 3.77" for 25 YEAR STORM event
Inflow = 7.86 cfs @ 12.14 hrs, Volume= 0.926 af
Outflow = 7.76 cfs @ 12.15 hrs, Volume= 0.926 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.46 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 4.52 fps, Avg. Travel Time= 1.0 min

Peak Storage= 246 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



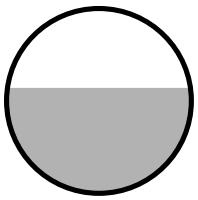
Summary for Reach 16R: CB35 TO CB30

Inflow Area = 1.469 ac, 30.04% Impervious, Inflow Depth > 3.61" for 25 YEAR STORM event
Inflow = 3.21 cfs @ 12.42 hrs, Volume= 0.442 af
Outflow = 3.19 cfs @ 12.43 hrs, Volume= 0.442 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.90 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 3.74 fps, Avg. Travel Time= 1.2 min

Peak Storage= 125 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



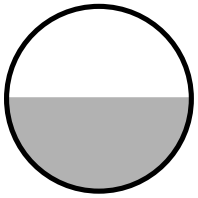
Summary for Reach 17R: CB36 TO CB35

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 3.44" for 25 YEAR STORM event
Inflow = 2.64 cfs @ 12.50 hrs, Volume= 0.331 af
Outflow = 2.64 cfs @ 12.50 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.60 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.47 fps, Avg. Travel Time= 0.1 min

Peak Storage= 9 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



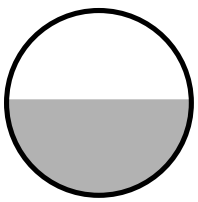
Summary for Reach 18R: CB31 TO CB30

Inflow Area = 1.340 ac, 25.37% Impervious, Inflow Depth > 3.86" for 25 YEAR STORM event
Inflow = 4.96 cfs @ 12.13 hrs, Volume= 0.431 af
Outflow = 4.96 cfs @ 12.13 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.69 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.58 fps, Avg. Travel Time= 0.1 min

Peak Storage= 18 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



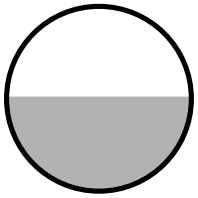
Summary for Reach 19R: CB32 TO CB31

Inflow Area = 1.280 ac, 24.22% Impervious, Inflow Depth > 3.87" for 25 YEAR STORM event
Inflow = 4.83 cfs @ 12.13 hrs, Volume= 0.413 af
Outflow = 4.83 cfs @ 12.13 hrs, Volume= 0.411 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.64 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.53 fps, Avg. Travel Time= 0.1 min

Peak Storage= 18 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



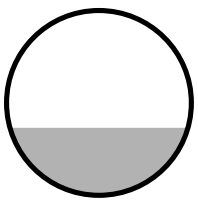
Summary for Reach 20R: CB33 & CB34 TO CB32

Inflow Area = 0.680 ac, 30.88% Impervious, Inflow Depth > 4.01" for 25 YEAR STORM event
Inflow = 2.52 cfs @ 12.17 hrs, Volume= 0.227 af
Outflow = 2.52 cfs @ 12.17 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 9.74 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.48 fps, Avg. Travel Time= 0.3 min

Peak Storage= 18 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 8.91 cfs

12.0" Round Pipe
n= 0.009
Length= 70.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -2.10'



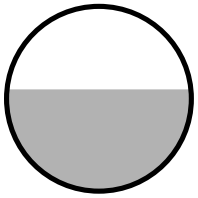
Summary for Reach 22R: CB25, CB26, & CB27 TO CB22

Inflow Area = 0.460 ac, 58.70% Impervious, Inflow Depth > 4.38" for 25 YEAR STORM event
Inflow = 2.19 cfs @ 12.02 hrs, Volume= 0.168 af
Outflow = 2.13 cfs @ 12.03 hrs, Volume= 0.167 af, Atten= 3%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.80 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 1.6 min

Peak Storage= 92 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 208.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.04'



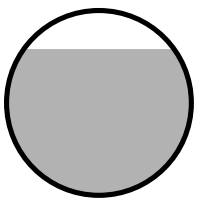
Summary for Reach 32R: CB23 TO CB22

Inflow Area = 2.310 ac, 5.19% Impervious, Inflow Depth > 3.88" for 25 YEAR STORM event
Inflow = 6.38 cfs @ 12.36 hrs, Volume= 0.748 af
Outflow = 6.38 cfs @ 12.35 hrs, Volume= 0.747 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 0.1 min

Peak Storage= 25 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.99'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



Summary for Pond 14P: CULVERT

Inflow Area = 2.130 ac, 0.00% Impervious, Inflow Depth > 3.85" for 25 YEAR STORM event
Inflow = 6.39 cfs @ 12.30 hrs, Volume= 0.683 af
Outflow = 6.12 cfs @ 12.37 hrs, Volume= 0.682 af, Atten= 4%, Lag= 4.0 min
Primary = 6.12 cfs @ 12.37 hrs, Volume= 0.682 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 92.40' @ 12.37 hrs Surf.Area= 719 sf Storage= 627 cf

Plug-Flow detention time= 2.6 min calculated for 0.682 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (797.9 - 796.5)

Volume	Invert	Avail.Storage	Storage Description
#1	90.70'	1,109 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.70	75	0	0
92.00	400	309	309
93.00	1,200	800	1,109

Device	Routing	Invert	Outlet Devices
#1	Primary	90.70'	**15.0" Round Culvert** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 90.70' / 90.14' S= 0.0400 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=6.05 cfs @ 12.37 hrs HW=92.37' (Free Discharge)
1=Culvert (Inlet Controls 6.05 cfs @ 4.93 fps)

Summary for Pond 17P: CULVERT

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 3.51" for 25 YEAR STORM event
Inflow = 2.69 cfs @ 12.45 hrs, Volume= 0.337 af
Outflow = 2.64 cfs @ 12.50 hrs, Volume= 0.331 af, Atten= 2%, Lag= 3.0 min
Primary = 2.64 cfs @ 12.50 hrs, Volume= 0.331 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 96.98' @ 12.50 hrs Surf.Area= 671 sf Storage= 734 cf
Flood Elev= 98.00' Surf.Area= 675 sf Storage= 743 cf

Plug-Flow detention time= 14.2 min calculated for 0.327 af (97% of inflow)
Center-of-Mass det. time= 6.8 min (815.5 - 808.7)

Volume	Invert	Avail.Storage	Storage Description
#1	95.00'	743 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.00	10	0	0
96.00	400	205	205
97.00	675	538	743

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.34' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=2.64 cfs @ 12.50 hrs HW=96.98' (Free Discharge)
1=Culvert (Inlet Controls 2.64 cfs @ 3.38 fps)

Summary for Subcatchment 38S: SA-38

Runoff = 7.87 cfs @ 12.30 hrs, Volume= 0.842 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.870	80	1/2 ACRE LOTS C
*	1.140	85	1/2 ACRE LOTS D
*	0.120	80	OPEN D, GOOD CONDITION
	2.130	83	Weighted Average
	2.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	150	0.0470	0.18		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
11.7	380	0.0060	0.54		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.5	530	Total			

Summary for Subcatchment 39S: SA-39

Runoff = 1.07 cfs @ 12.10 hrs, Volume= 0.083 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.130	80	OPEN D, GOOD CONDITION
*	0.070	98	IMPERVIOUS
	0.200	86	Weighted Average
	0.130		65.00% Pervious Area
	0.070		35.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	40	0.0100	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
10.1	190	Total			

Summary for Subcatchment 40S: SA-40

Runoff = 1.38 cfs @ 12.01 hrs, Volume= 0.091 af, Depth> 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.050	80	OPEN D, GOOD CONDITION
*	0.150	98	IMPERVIOUS
	0.200	94	Weighted Average
	0.050		25.00% Pervious Area
	0.150		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.8	215	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
4.0	365	Total			

Summary for Subcatchment 41S: SA-41

Runoff = 1.22 cfs @ 12.00 hrs, Volume= 0.079 af, Depth> 5.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.060	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.180	90	Weighted Average
	0.060		33.33% Pervious Area
	0.120		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment 44S: SA-44

Runoff = 0.37 cfs @ 11.98 hrs, Volume= 0.025 af, Depth> 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	98	IMPERVIOUS
	0.060	86	Weighted Average
	0.030		50.00% Pervious Area
	0.030		50.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	90	0.0330	1.67		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 45S: SA-45

Runoff = 2.98 cfs @ 12.11 hrs, Volume= 0.232 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.060	74	Existing Grass (C)
*	0.440	80	1/2 ACRE LOTS C
*	0.100	98	Existing Impervious
	0.600	82	Weighted Average
	0.500		83.33% Pervious Area
	0.100		16.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	150	0.0900	0.23		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"

Summary for Subcatchment 46S: SA-46

Runoff = 3.08 cfs @ 12.17 hrs, Volume= 0.278 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.070	74	OPEN C, GOOD CONDITION
*	0.400	80	1/2 ACRE LOTS C
*	0.210	98	IMPERVIOUS
	0.680	85	Weighted Average
	0.470		69.12% Pervious Area
	0.210		30.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	125	0.0250	0.14		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.4	85	0.0330	3.69		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
15.8	210	Total			

Summary for Subcatchment 47S: SA-47

Runoff = 3.37 cfs @ 12.45 hrs, Volume= 0.422 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	4,356	98	Allocated Impervious
*	18,683	74	Proposed Grass (C)
	27,165	80	1/2 acre lots, 25% imp, HSG C
	50,204	79	Weighted Average
	39,057		77.80% Pervious Area
	11,147		22.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.7	150	0.0130	0.07		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
1.5	160	0.0670	1.81		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
36.2	310	Total			

Summary for Subcatchment 49S: SA-49

Runoff = 3.84 cfs @ 12.10 hrs, Volume= 0.295 af, Depth> 4.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.540	80	1/2 ACRE LOTS C
*	0.070	74	OPEN C, GOOD CONDITION
*	0.140	98	IMPERVIOUS
	0.750	83	Weighted Average
	0.610		81.33% Pervious Area
	0.140		18.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	100	0.0730	0.20		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.7	80	0.0730	1.89		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
9.9	280	Total			

Summary for Subcatchment 51S: SA-51

Runoff = 0.42 cfs @ 11.98 hrs, Volume= 0.028 af, Depth> 5.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.010	80	OPEN D
*	0.050	98	ROAD
	0.060	95	Weighted Average
	0.010		16.67% Pervious Area
	0.050		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.99		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 52S: SA-52

Runoff = 0.98 cfs @ 12.00 hrs, Volume= 0.063 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.110	98	IMPERVIOUS
	0.140	93	Weighted Average
	0.030		21.43% Pervious Area
	0.110		78.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	150	0.0100	1.09		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.00"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.3	270	Total			

Summary for Subcatchment 53S: SA-53

Runoff = 0.86 cfs @ 11.99 hrs, Volume= 0.055 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.020	80	OPEN D, GOOD CONDITION
*	0.100	98	IMPERVIOUS
	0.120	95	Weighted Average
	0.020		16.67% Pervious Area
	0.100		83.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"

Summary for Subcatchment 54S: SA-54

Runoff = 1.68 cfs @ 12.00 hrs, Volume= 0.108 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.030	74	OPEN C, GOOD CONDITION
*	0.030	80	OPEN D, GOOD CONDITION
*	0.180	98	IMPERVIOUS
	0.240	93	Weighted Average
	0.060		25.00% Pervious Area
	0.180		75.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.2	150	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.4	300	Total			

Summary for Subcatchment SA-61:

Runoff = 1.61 cfs @ 12.13 hrs, Volume= 0.135 af, Depth> 5.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	1,023	98	Proposed Impervious
*	4,844	74	Proposed Grass (C)
*	7,057	98	Existing Impervious
	870	74	>75% Grass cover, Good, HSG C
	13,794	88	Weighted Average
	5,714		41.42% Pervious Area
	8,080		58.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	150	0.0400	0.25		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
2.0	110	0.0180	0.94		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
1.3	190	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
13.4	450	Total			

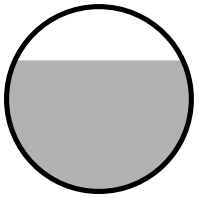
Summary for Reach 12R: CB21 TO CB20A

Inflow Area = 6.829 ac, 24.91% Impervious, Inflow Depth > 4.78" for 50 YEAR STORM event
Inflow = 22.43 cfs @ 12.12 hrs, Volume= 2.718 af
Outflow = 22.36 cfs @ 12.12 hrs, Volume= 2.717 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 16.69 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 8.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 214 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 26.28 cfs

18.0" Round Pipe
n= 0.009
Length= 160.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -4.80'



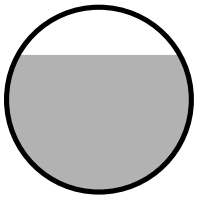
Summary for Reach 13R: CB22 TO CB21

Inflow Area = 2.890 ac, 16.96% Impervious, Inflow Depth > 4.88" for 50 YEAR STORM event
Inflow = 8.37 cfs @ 12.16 hrs, Volume= 1.174 af
Outflow = 8.39 cfs @ 12.17 hrs, Volume= 1.174 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 8.60 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.83 fps, Avg. Travel Time= 0.1 min

Peak Storage= 31 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 32.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.32'



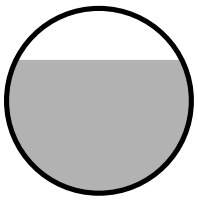
Summary for Reach 14R: CB28 & CB29 TO CB21

Inflow Area = 3.699 ac, 27.88% Impervious, Inflow Depth > 4.66" for 50 YEAR STORM event
Inflow = 13.28 cfs @ 12.12 hrs, Volume= 1.437 af
Outflow = 13.20 cfs @ 12.13 hrs, Volume= 1.435 af, Atten= 1%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 9.66 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 5.03 fps, Avg. Travel Time= 0.5 min

Peak Storage= 188 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.08'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 15.17 cfs

18.0" Round Pipe
n= 0.009
Length= 138.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -1.38'



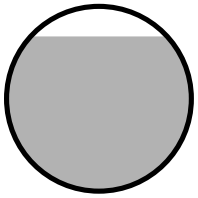
Summary for Reach 15R: CB30 TO CB28

Inflow Area = 2.949 ac, 30.23% Impervious, Inflow Depth > 4.65" for 50 YEAR STORM event
Inflow = 9.70 cfs @ 12.14 hrs, Volume= 1.142 af
Outflow = 9.57 cfs @ 12.15 hrs, Volume= 1.141 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.67 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 4.79 fps, Avg. Travel Time= 0.9 min

Peak Storage= 297 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.05'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



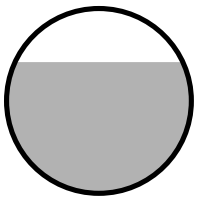
Summary for Reach 16R: CB35 TO CB30

Inflow Area = 1.469 ac, 30.04% Impervious, Inflow Depth > 4.50" for 50 YEAR STORM event
Inflow = 4.43 cfs @ 12.39 hrs, Volume= 0.551 af
Outflow = 4.38 cfs @ 12.40 hrs, Volume= 0.550 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.36 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 3.98 fps, Avg. Travel Time= 1.1 min

Peak Storage= 161 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 270.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -2.70'



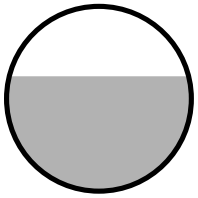
Summary for Reach 17R: CB36 TO CB35

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 4.33" for 50 YEAR STORM event
Inflow = 3.64 cfs @ 12.41 hrs, Volume= 0.416 af
Outflow = 3.64 cfs @ 12.41 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.10 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.71 fps, Avg. Travel Time= 0.1 min

Peak Storage= 11 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.15 cfs

12.0" Round Pipe
n= 0.009
Length= 22.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.22'



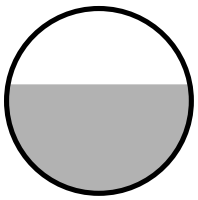
Summary for Reach 18R: CB31 TO CB30

Inflow Area = 1.340 ac, 25.37% Impervious, Inflow Depth > 4.73" for 50 YEAR STORM event
Inflow = 6.10 cfs @ 12.13 hrs, Volume= 0.529 af
Outflow = 6.10 cfs @ 12.13 hrs, Volume= 0.528 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.08 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.80 fps, Avg. Travel Time= 0.1 min

Peak Storage= 21 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



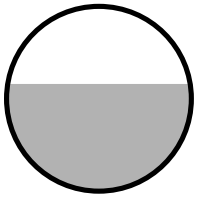
Summary for Reach 19R: CB32 TO CB31

Inflow Area = 1.280 ac, 24.22% Impervious, Inflow Depth > 4.75" for 50 YEAR STORM event
Inflow = 5.95 cfs @ 12.13 hrs, Volume= 0.507 af
Outflow = 5.94 cfs @ 12.13 hrs, Volume= 0.504 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.03 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.74 fps, Avg. Travel Time= 0.1 min

Peak Storage= 21 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 28.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.28'



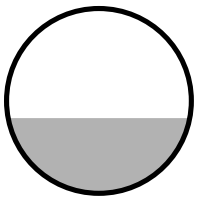
Summary for Reach 20R: CB33 & CB34 TO CB32

Inflow Area = 0.680 ac, 30.88% Impervious, Inflow Depth > 4.90" for 50 YEAR STORM event
Inflow = 3.08 cfs @ 12.17 hrs, Volume= 0.278 af
Outflow = 3.08 cfs @ 12.17 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 10.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.74 fps, Avg. Travel Time= 0.2 min

Peak Storage= 21 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 8.91 cfs

12.0" Round Pipe
n= 0.009
Length= 70.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -2.10'



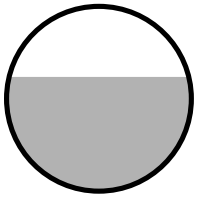
Summary for Reach 22R: CB25, CB26, & CB27 TO CB22

Inflow Area = 0.460 ac, 58.70% Impervious, Inflow Depth > 5.25" for 50 YEAR STORM event
Inflow = 2.63 cfs @ 12.02 hrs, Volume= 0.201 af
Outflow = 2.55 cfs @ 12.03 hrs, Volume= 0.201 af, Atten= 3%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.00 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 1.5 min

Peak Storage= 106 cf @ 12.03 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 208.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.04'



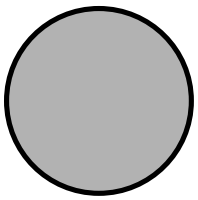
Summary for Reach 32R: CB23 TO CB22

Inflow Area = 2.310 ac, 5.19% Impervious, Inflow Depth > 4.78" for 50 YEAR STORM event
Inflow = 7.73 cfs @ 12.37 hrs, Volume= 0.920 af
Outflow = 6.60 cfs @ 12.30 hrs, Volume= 0.919 af, Atten= 15%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.48 fps, Avg. Travel Time= 0.1 min

Peak Storage= 29 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.60 cfs

15.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



Summary for Pond 14P: CULVERT

Inflow Area = 2.130 ac, 0.00% Impervious, Inflow Depth > 4.74" for 50 YEAR STORM event
Inflow = 7.87 cfs @ 12.30 hrs, Volume= 0.842 af
Outflow = 7.44 cfs @ 12.38 hrs, Volume= 0.841 af, Atten= 5%, Lag= 4.9 min
Primary = 7.44 cfs @ 12.38 hrs, Volume= 0.841 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 92.91' @ 12.38 hrs Surf.Area= 1,127 sf Storage= 1,036 cf

Plug-Flow detention time= 2.6 min calculated for 0.832 af (99% of inflow)
Center-of-Mass det. time= 1.5 min (795.7 - 794.2)

Volume	Invert	Avail.Storage	Storage Description
#1	90.70'	1,109 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.70	75	0	0
92.00	400	309	309
93.00	1,200	800	1,109

Device	Routing	Invert	Outlet Devices
#1	Primary	90.70'	**15.0" Round Culvert** L= 14.0' Ke= 0.500 Inlet / Outlet Invert= 90.70' / 90.14' S= 0.0400 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=7.37 cfs @ 12.38 hrs HW=92.88' (Free Discharge)
1=Culvert (Inlet Controls 7.37 cfs @ 6.01 fps)

Summary for Pond 17P: CULVERT

Inflow Area = 1.153 ac, 22.20% Impervious, Inflow Depth > 4.40" for 50 YEAR STORM event
Inflow = 3.37 cfs @ 12.45 hrs, Volume= 0.422 af
Outflow = 3.64 cfs @ 12.41 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min
Primary = 3.64 cfs @ 12.41 hrs, Volume= 0.416 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 97.53' @ 12.41 hrs Surf.Area= 675 sf Storage= 743 cf
Flood Elev= 98.00' Surf.Area= 675 sf Storage= 743 cf

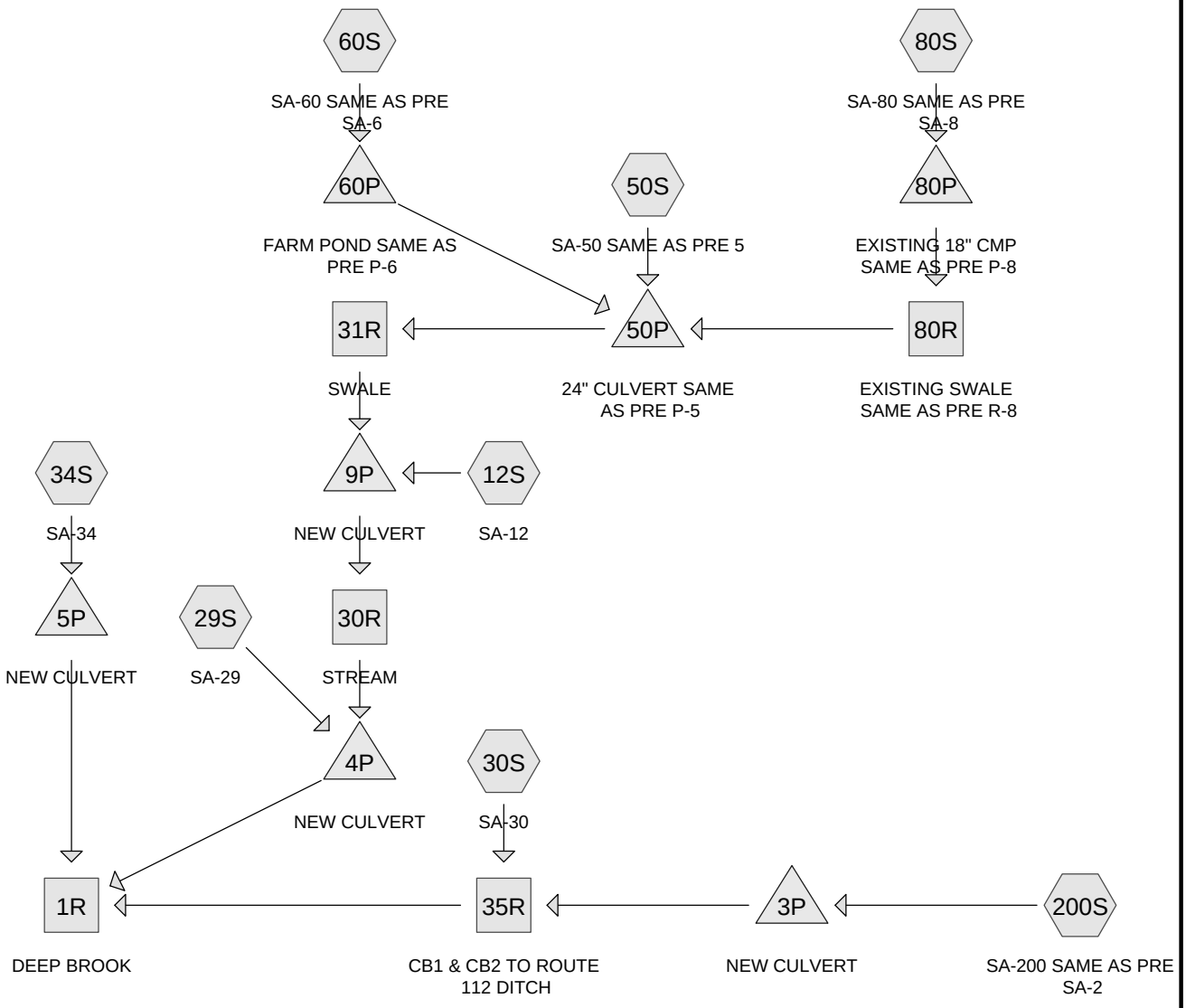
Plug-Flow detention time= 12.6 min calculated for 0.415 af (98% of inflow)
Center-of-Mass det. time= 5.9 min (811.6 - 805.7)

Volume	Invert	Avail.Storage	Storage Description
#1	95.00'	743 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.00	10	0	0
96.00	400	205	205
97.00	675	538	743

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 96.00' / 95.34' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=3.57 cfs @ 12.41 hrs HW=97.48' (Free Discharge)
1=Culvert (Barrel Controls 3.57 cfs @ 4.54 fps)



Subcat Reach Pond Link

Routing Diagram for Sandy Brook POSTDEVELOPMENT #3
Prepared by BH2M, Printed 11/29/2017
HydroCAD® 10.00-20 s/n 00619 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.110	80	1/2 ACRE LOT C (34S)
0.620	85	1/2 ACRE LOT D (34S)
1.120	80	1/2 ACRE LOTS C (12S, 29S)
2.260	85	1/2 ACRE LOTS D (29S)
8.000	77	2 ACRE LOTS C (50S, 60S)
4.980	82	2 ACRE LOTS D (29S, 200S)
0.440	98	IMPERVIOUS (29S, 30S, 200S)
8.530	74	OPEN C (34S, 50S, 80S)
4.920	74	OPEN C, GOOD CONDITION (12S, 29S, 60S)
0.070	80	OPEN D (34S)
0.800	80	OPEN D, GOOD CONDITION (29S, 30S, 200S)
0.500	98	ROAD (50S)
0.600	98	ROAD & LOTS IMP. (80S)
17.000	70	WOODED C, GOOD CONDITION (60S)
3.890	77	WOODED D, GOOD CONDITION (29S)
16.000	70	WOODS C (50S, 80S)
0.470	77	WOODS D (12S, 34S)
70.310	**74**	**TOTAL AREA**

Summary for Subcatchment 12S: SA-12

Runoff = 1.78 cfs @ 12.18 hrs, Volume= 0.163 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.580	74	OPEN C, GOOD CONDITION
*	0.230	77	WOODS D
*	0.850	80	1/2 ACRE LOTS C
	1.660	77	Weighted Average
	1.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	150	0.0700	0.21		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.0	250	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
14.8	400	Total			

Summary for Subcatchment 29S: SA-29

Runoff = 7.28 cfs @ 12.71 hrs, Volume= 1.143 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.270	80	1/2 ACRE LOTS C
*	2.260	85	1/2 ACRE LOTS D
*	2.970	82	2 ACRE LOTS D
*	3.890	77	WOODED D, GOOD CONDITION
*	0.040	74	OPEN C, GOOD CONDITION
*	0.290	80	OPEN D, GOOD CONDITION
*	0.020	98	IMPERVIOUS
	9.740	81	Weighted Average
	9.720		99.79% Pervious Area
	0.020		0.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
14.1	300	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
6.6	900	0.0050	2.26	27.17	**Channel Flow, Segment ID:** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
54.5	1,350	Total			

Summary for Subcatchment 30S: SA-30

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.044 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.190	98	IMPERVIOUS
	0.220	96	Weighted Average
	0.030		13.64% Pervious Area
	0.190		86.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.2	270	Total			

Summary for Subcatchment 34S: SA-34

Runoff = 1.46 cfs @ 12.18 hrs, Volume= 0.133 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.110	80	1/2 ACRE LOT C
*	0.620	85	1/2 ACRE LOT D
*	0.070	80	OPEN D
*	0.240	77	WOODS D
*	0.030	74	OPEN C
	1.070	82	Weighted Average
	1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0500	0.17		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
5.9	230	0.0170	0.65		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
15.6	330	Total			

Summary for Subcatchment 50S: SA-50 SAME AS PRE 5

Runoff = 5.21 cfs @ 13.47 hrs, Volume= 1.288 af, Depth> 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	10.000	70	WOODS C
*	4.000	77	2 ACRE LOTS C
*	0.500	98	ROAD
*	2.500	74	OPEN C
	17.000	73	Weighted Average
	16.500		97.06% Pervious Area
	0.500		2.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment 60S: SA-60 SAME AS PRE SA-6

Runoff = 6.11 cfs @ 13.92 hrs, Volume= 1.774 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	4.300	74	OPEN C, GOOD CONDITION
*	17.000	70	WOODED C, GOOD CONDITION
*	4.000	77	2 ACRE LOTS C
	25.300	72	Weighted Average
	25.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment 80S: SA-80 SAME AS PRE SA-8

Runoff = 3.20 cfs @ 13.94 hrs, Volume= 0.933 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	6.000	74	OPEN C
*	6.000	70	WOODS C
*	0.600	98	ROAD & LOTS IMP.
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow, Segment ID:** n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
140.6	1,250	Total			

Summary for Subcatchment 200S: SA-200 SAME AS PRE SA-2

Runoff = 2.17 cfs @ 12.74 hrs, Volume= 0.349 af, Depth> 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	2.010	82	2 ACRE LOTS D
*	0.480	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	2.720	83	Weighted Average
	2.490		91.54% Pervious Area
	0.230		8.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
57.4	850	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 0.92" for 2 YEAR STORM event
Inflow = 11.68 cfs @ 14.45 hrs, Volume= 5.365 af
Outflow = 11.52 cfs @ 14.86 hrs, Volume= 5.103 af, Atten= 1%, Lag= 24.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.67 fps, Min. Travel Time= 34.0 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 48.2 min

Peak Storage= 23,498 cf @ 14.86 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -10.20'



‡

Summary for Reach 30R: STREAM

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 0.81" for 2 YEAR STORM event
Inflow = 9.72 cfs @ 14.67 hrs, Volume= 3.812 af
Outflow = 9.70 cfs @ 14.80 hrs, Volume= 3.745 af, Atten= 0%, Lag= 8.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.28 fps, Min. Travel Time= 11.7 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 14.7 min

Peak Storage= 6,826 cf @ 14.80 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 2.00' Flow Area= 40.0 sf, Capacity= 100.95 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 900.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -4.50'



‡

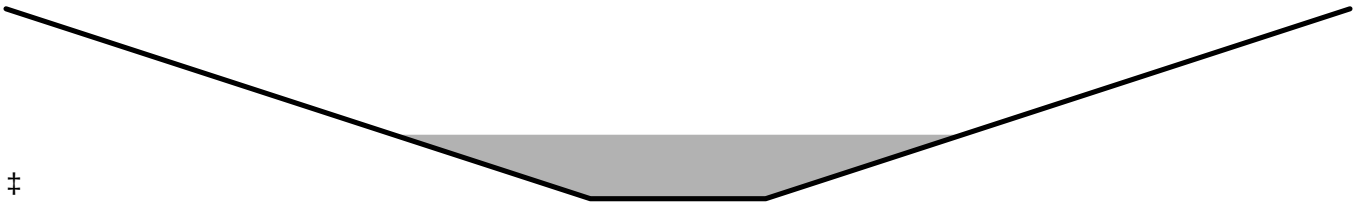
Summary for Reach 31R: SWALE

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 0.81" for 2 YEAR STORM event
Inflow = 9.57 cfs @ 14.56 hrs, Volume= 3.716 af
Outflow = 9.57 cfs @ 14.58 hrs, Volume= 3.710 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 1.8 min

Peak Storage= 774 cf @ 14.58 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00' Flow Area= 26.0 sf, Capacity= 108.09 cfs

3.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 23.00'
Length= 180.0' Slope= 0.0170 '/'
Inlet Invert= 0.00', Outlet Invert= -3.06'



‡

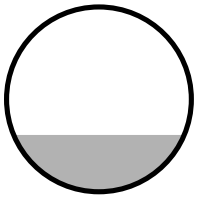
Summary for Reach 35R: CB1 & CB2 TO ROUTE 112 DITCH

Inflow Area = 2.940 ac, 14.29% Impervious, Inflow Depth > 1.51" for 2 YEAR STORM event
Inflow = 2.18 cfs @ 12.83 hrs, Volume= 0.370 af
Outflow = 2.18 cfs @ 12.83 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.76 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.66 fps, Avg. Travel Time= 0.3 min

Peak Storage= 18 cf @ 12.83 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 40.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.20'



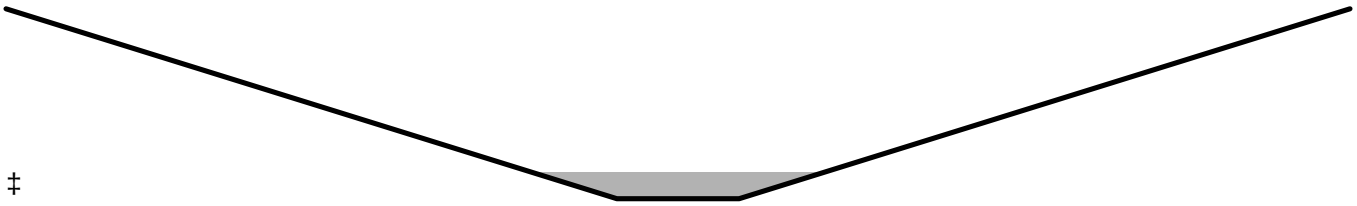
Summary for Reach 80R: EXISTING SWALE SAME AS PRE R-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 0.79" for 2 YEAR STORM event
Inflow = 2.58 cfs @ 14.72 hrs, Volume= 0.828 af
Outflow = 2.52 cfs @ 14.99 hrs, Volume= 0.803 af, Atten= 2%, Lag= 16.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.17 fps, Min. Travel Time= 18.6 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 25.8 min

Peak Storage= 2,808 cf @ 14.99 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 194.65 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 5.0 '/' Top Width= 33.00'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -6.50'



‡

Summary for Pond 3P: NEW CULVERT

Inflow Area = 2.720 ac, 8.46% Impervious, Inflow Depth > 1.54" for 2 YEAR STORM event
Inflow = 2.17 cfs @ 12.74 hrs, Volume= 0.349 af
Outflow = 2.12 cfs @ 12.84 hrs, Volume= 0.326 af, Atten= 2%, Lag= 5.6 min
Primary = 2.12 cfs @ 12.84 hrs, Volume= 0.326 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 87.29' @ 12.84 hrs Surf.Area= 981 sf Storage= 1,945 cf

Plug-Flow detention time= 39.9 min calculated for 0.326 af (93% of inflow)
Center-of-Mass det. time= 18.7 min (852.2 - 833.5)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	6,050 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	25	0	0
90.00	3,000	6,050	6,050

Device	Routing	Invert	Outlet Devices
#1	Primary	86.50'	**24.0" Round Culvert** L= 10.0' Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.45' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=2.11 cfs @ 12.84 hrs HW=87.28' (Free Discharge)
1=Culvert (Barrel Controls 2.11 cfs @ 2.74 fps)

Summary for Pond 4P: NEW CULVERT

Inflow Area = 66.300 ac, 1.69% Impervious, Inflow Depth > 0.88" for 2 YEAR STORM event
Inflow = 11.00 cfs @ 14.57 hrs, Volume= 4.889 af
Outflow = 11.00 cfs @ 14.60 hrs, Volume= 4.875 af, Atten= 0%, Lag= 1.5 min
Primary = 11.00 cfs @ 14.60 hrs, Volume= 4.875 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 86.72' @ 14.60 hrs Surf.Area= 2,597 sf Storage= 1,408 cf

Plug-Flow detention time= 2.5 min calculated for 4.875 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (929.5 - 927.8)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	48,500 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	500	0	0
87.00	3,410	1,955	1,955
88.00	19,500	11,455	13,410
89.00	50,680	35,090	48,500

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	**72.0" W x 36.0" H Box Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 86.00' / 85.40' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 18.00 sf

Primary OutFlow Max=11.00 cfs @ 14.60 hrs HW=86.72' (Free Discharge)
1=Culvert (Barrel Controls 11.00 cfs @ 3.39 fps)

Summary for Pond 5P: NEW CULVERT

Inflow Area = 1.070 ac, 0.00% Impervious, Inflow Depth > 1.49" for 2 YEAR STORM event
Inflow = 1.46 cfs @ 12.18 hrs, Volume= 0.133 af
Outflow = 0.67 cfs @ 12.53 hrs, Volume= 0.120 af, Atten= 54%, Lag= 20.8 min
Primary = 0.67 cfs @ 12.53 hrs, Volume= 0.120 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 89.36' @ 12.53 hrs Surf.Area= 4,220 sf Storage= 2,092 cf

Plug-Flow detention time= 85.0 min calculated for 0.120 af (90% of inflow)
Center-of-Mass det. time= 53.1 min (857.1 - 804.1)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	5,815 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	130	0	0
90.00	11,500	5,815	5,815

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**18.0" Round Culvert** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 89.00' / 88.25' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=0.66 cfs @ 12.53 hrs HW=89.36' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.66 cfs @ 2.04 fps)

Summary for Pond 9P: NEW CULVERT

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 0.82" for 2 YEAR STORM event
Inflow = 9.74 cfs @ 14.56 hrs, Volume= 3.872 af
Outflow = 9.72 cfs @ 14.67 hrs, Volume= 3.812 af, Atten= 0%, Lag= 6.4 min
Primary = 9.72 cfs @ 14.67 hrs, Volume= 3.812 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 92.70' @ 14.67 hrs Surf.Area= 7,283 sf Storage= 6,198 cf

Plug-Flow detention time= 13.0 min calculated for 3.812 af (98% of inflow)
Center-of-Mass det. time= 8.4 min (947.0 - 938.6)

Volume	Invert	Avail.Storage	Storage Description
#1	90.90'	67,412 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.90	200	0	0
92.00	3,250	1,897	1,897
93.00	8,990	6,120	8,017
94.00	17,700	13,345	21,362
95.00	23,700	20,700	42,062
96.00	27,000	25,350	67,412

Device	Routing	Invert	Outlet Devices
#1	Primary	91.50'	**30.0" Round Culvert X 2.00** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 91.50' / 91.12' S= 0.0051 '/' Cc= 0.900 n= 0.024, Flow Area= 4.91 sf

Primary OutFlow Max=9.72 cfs @ 14.67 hrs HW=92.70' (Free Discharge)
└**1=Culvert** (Barrel Controls 9.72 cfs @ 3.05 fps)

Summary for Pond 50P: 24" CULVERT SAME AS PRE P-5

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 0.82" for 2 YEAR STORM event
Inflow = 9.59 cfs @ 14.46 hrs, Volume= 3.733 af
Outflow = 9.57 cfs @ 14.56 hrs, Volume= 3.716 af, Atten= 0%, Lag= 6.1 min
Primary = 9.57 cfs @ 14.56 hrs, Volume= 3.716 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 94.18' @ 14.56 hrs Surf.Area= 2,276 sf Storage= 2,182 cf

Plug-Flow detention time= 3.7 min calculated for 3.679 af (99% of inflow)
Center-of-Mass det. time= 2.6 min (943.0 - 940.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.35 1.88

Primary OutFlow Max=9.57 cfs @ 14.56 hrs HW=94.18' (Free Discharge)
└**1=Culvert** (Barrel Controls 9.57 cfs @ 4.58 fps)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 60P: FARM POND SAME AS PRE P-6

Inflow Area = 25.300 ac, 0.00% Impervious, Inflow Depth > 0.84" for 2 YEAR STORM event
Inflow = 6.11 cfs @ 13.92 hrs, Volume= 1.774 af
Outflow = 4.28 cfs @ 14.93 hrs, Volume= 1.643 af, Atten= 30%, Lag= 60.6 min
Primary = 4.28 cfs @ 14.93 hrs, Volume= 1.643 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 95.90' Surf.Area= 27,363 sf Storage= 45,169 cf
Peak Elev= 96.50' @ 14.93 hrs Surf.Area= 29,680 sf Storage= 63,504 cf (18,335 cf above start)

Plug-Flow detention time= 267.6 min calculated for 0.606 af (34% of inflow)
Center-of-Mass det. time= 46.1 min (960.8 - 914.7)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	94.00'	**15.0" Round Culvert** L= 38.0' Ke= 0.600 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Primary	100.00'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.65 1.88

Primary OutFlow Max=4.28 cfs @ 14.93 hrs HW=96.50' (Free Discharge)
- **1=Orifice/Grate** (Passes 4.28 cfs of 4.57 cfs potential flow)
  - **2=Culvert** (Inlet Controls 4.28 cfs @ 3.49 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 80P: EXISTING 18" CMP SAME AS PRE P-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 0.89" for 2 YEAR STORM event
Inflow = 3.20 cfs @ 13.94 hrs, Volume= 0.933 af
Outflow = 2.58 cfs @ 14.72 hrs, Volume= 0.828 af, Atten= 19%, Lag= 46.5 min
Primary = 2.58 cfs @ 14.72 hrs, Volume= 0.828 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 100.97' @ 14.72 hrs Surf.Area= 9,975 sf Storage= 9,961 cf

Plug-Flow detention time= 73.0 min calculated for 0.820 af (88% of inflow)
Center-of-Mass det. time= 46.1 min (962.7 - 916.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.900

Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900
n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=2.58 cfs @ 14.72 hrs HW=100.97' (Free Discharge)
↑**1=Culvert** (Barrel Controls 2.58 cfs @ 3.03 fps)

Summary for Subcatchment 12S: SA-12

Runoff = 3.60 cfs @ 12.17 hrs, Volume= 0.323 af, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.580	74	OPEN C, GOOD CONDITION
*	0.230	77	WOODS D
*	0.850	80	1/2 ACRE LOTS C
	1.660	77	Weighted Average
	1.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	150	0.0700	0.21		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.0	250	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
14.8	400	Total			

Summary for Subcatchment 29S: SA-29

Runoff = 13.74 cfs @ 12.69 hrs, Volume= 2.141 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.270	80	1/2 ACRE LOTS C
*	2.260	85	1/2 ACRE LOTS D
*	2.970	82	2 ACRE LOTS D
*	3.890	77	WOODED D, GOOD CONDITION
*	0.040	74	OPEN C, GOOD CONDITION
*	0.290	80	OPEN D, GOOD CONDITION
*	0.020	98	IMPERVIOUS
	9.740	81	Weighted Average
	9.720		99.79% Pervious Area
	0.020		0.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
14.1	300	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
6.6	900	0.0050	2.26	27.17	**Channel Flow, Segment ID:** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
54.5	1,350	Total			

Summary for Subcatchment 30S: SA-30

Runoff = 1.05 cfs @ 12.00 hrs, Volume= 0.067 af, Depth> 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.190	98	IMPERVIOUS
	0.220	96	Weighted Average
	0.030		13.64% Pervious Area
	0.190		86.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.2	270	Total			

Summary for Subcatchment 34S: SA-34

Runoff = 2.70 cfs @ 12.18 hrs, Volume= 0.243 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.110	80	1/2 ACRE LOT C
*	0.620	85	1/2 ACRE LOT D
*	0.070	80	OPEN D
*	0.240	77	WOODS D
*	0.030	74	OPEN C
	1.070	82	Weighted Average
	1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0500	0.17		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
5.9	230	0.0170	0.65		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
15.6	330	Total			

Summary for Subcatchment 50S: SA-50 SAME AS PRE 5

Runoff = 11.64 cfs @ 13.39 hrs, Volume= 2.769 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	10.000	70	WOODS C
*	4.000	77	2 ACRE LOTS C
*	0.500	98	ROAD
*	2.500	74	OPEN C
	17.000	73	Weighted Average
	16.500		97.06% Pervious Area
	0.500		2.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment 60S: SA-60 SAME AS PRE SA-6

Runoff = 13.98 cfs @ 13.79 hrs, Volume= 3.896 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	4.300	74	OPEN C, GOOD CONDITION
*	17.000	70	WOODED C, GOOD CONDITION
*	4.000	77	2 ACRE LOTS C
	25.300	72	Weighted Average
	25.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment 80S: SA-80 SAME AS PRE SA-8

Runoff = 7.14 cfs @ 13.88 hrs, Volume= 2.014 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	6.000	74	OPEN C
*	6.000	70	WOODS C
*	0.600	98	ROAD & LOTS IMP.
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow, Segment ID:** n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
140.6	1,250	Total			

Summary for Subcatchment 200S: SA-200 SAME AS PRE SA-2

Runoff = 3.96 cfs @ 12.73 hrs, Volume= 0.634 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	2.010	82	2 ACRE LOTS D
*	0.480	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	2.720	83	Weighted Average
	2.490		91.54% Pervious Area
	0.230		8.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
57.4	850	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 1.92" for 10 YEAR STORM event
Inflow = 24.21 cfs @ 14.18 hrs, Volume= 11.251 af
Outflow = 23.94 cfs @ 14.44 hrs, Volume= 10.820 af, Atten= 1%, Lag= 15.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.16 fps, Min. Travel Time= 26.3 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 36.2 min

Peak Storage= 37,715 cf @ 14.44 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -10.20'



‡

Summary for Reach 30R: STREAM

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 1.77" for 10 YEAR STORM event
Inflow = 20.21 cfs @ 14.22 hrs, Volume= 8.351 af
Outflow = 20.16 cfs @ 14.35 hrs, Volume= 8.231 af, Atten= 0%, Lag= 7.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.60 fps, Min. Travel Time= 9.4 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 11.9 min

Peak Storage= 11,330 cf @ 14.35 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 2.00' Flow Area= 40.0 sf, Capacity= 100.95 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 900.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -4.50'



‡

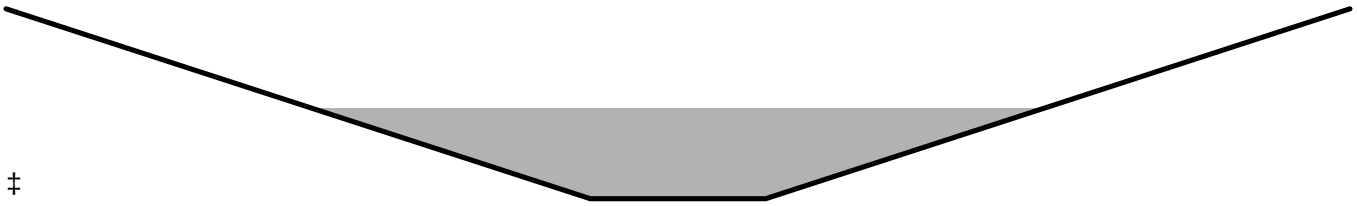
Summary for Reach 31R: SWALE

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 1.78" for 10 YEAR STORM event
Inflow = 20.06 cfs @ 13.96 hrs, Volume= 8.149 af
Outflow = 20.11 cfs @ 13.93 hrs, Volume= 8.136 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.70 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1,338 cf @ 13.93 hrs
Average Depth at Peak Storage= 0.96'
Bank-Full Depth= 2.00' Flow Area= 26.0 sf, Capacity= 108.09 cfs

3.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 23.00'
Length= 180.0' Slope= 0.0170 '/'
Inlet Invert= 0.00', Outlet Invert= -3.06'



‡

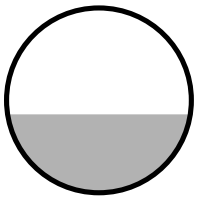
Summary for Reach 35R: CB1 & CB2 TO ROUTE 112 DITCH

Inflow Area = 2.940 ac, 14.29% Impervious, Inflow Depth > 2.76" for 10 YEAR STORM event
Inflow = 4.01 cfs @ 12.79 hrs, Volume= 0.677 af
Outflow = 4.00 cfs @ 12.79 hrs, Volume= 0.676 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.63 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.16 fps, Avg. Travel Time= 0.2 min

Peak Storage= 28 cf @ 12.79 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 40.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.20'



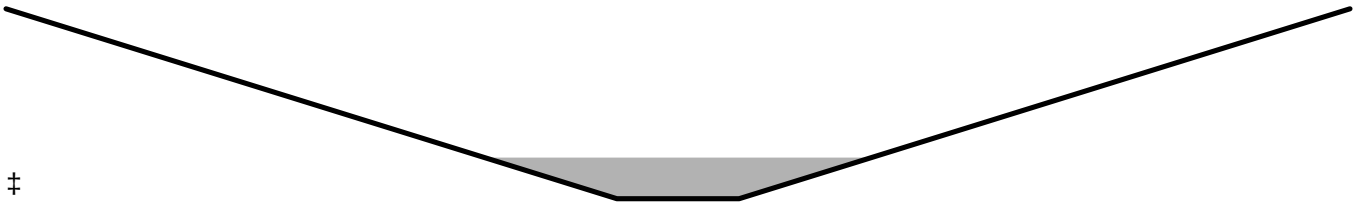
Summary for Reach 80R: EXISTING SWALE SAME AS PRE R-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 1.79" for 10 YEAR STORM event
Inflow = 6.07 cfs @ 14.51 hrs, Volume= 1.875 af
Outflow = 6.00 cfs @ 14.70 hrs, Volume= 1.838 af, Atten= 1%, Lag= 11.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.48 fps, Min. Travel Time= 14.7 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 22.7 min

Peak Storage= 5,275 cf @ 14.70 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 194.65 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 5.0 '/' Top Width= 33.00'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -6.50'



‡

Summary for Pond 3P: NEW CULVERT

Inflow Area = 2.720 ac, 8.46% Impervious, Inflow Depth > 2.80" for 10 YEAR STORM event
Inflow = 3.96 cfs @ 12.73 hrs, Volume= 0.634 af
Outflow = 3.91 cfs @ 12.80 hrs, Volume= 0.610 af, Atten= 1%, Lag= 4.3 min
Primary = 3.91 cfs @ 12.80 hrs, Volume= 0.610 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 87.60' @ 12.80 hrs Surf.Area= 1,215 sf Storage= 2,420 cf

Plug-Flow detention time= 27.6 min calculated for 0.609 af (96% of inflow)
Center-of-Mass det. time= 13.8 min (837.6 - 823.8)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	6,050 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	25	0	0
90.00	3,000	6,050	6,050

Device	Routing	Invert	Outlet Devices
#1	Primary	86.50'	**24.0" Round Culvert** L= 10.0' Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.45' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=3.91 cfs @ 12.80 hrs HW=87.60' (Free Discharge)
1=Culvert (Barrel Controls 3.91 cfs @ 3.20 fps)

Summary for Pond 4P: NEW CULVERT

Inflow Area = 66.300 ac, 1.69% Impervious, Inflow Depth > 1.88" for 10 YEAR STORM event
Inflow = 22.97 cfs @ 14.14 hrs, Volume= 10.372 af
Outflow = 22.89 cfs @ 14.27 hrs, Volume= 10.348 af, Atten= 0%, Lag= 7.7 min
Primary = 22.89 cfs @ 14.27 hrs, Volume= 10.348 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 87.19' @ 14.27 hrs Surf.Area= 6,475 sf Storage= 4,137 cf

Plug-Flow detention time= 2.5 min calculated for 10.346 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (926.4 - 924.6)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	48,500 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	500	0	0
87.00	3,410	1,955	1,955
88.00	19,500	11,455	13,410
89.00	50,680	35,090	48,500

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	**72.0" W x 36.0" H Box Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 86.00' / 85.40' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 18.00 sf

Primary OutFlow Max=22.89 cfs @ 14.27 hrs HW=87.19' (Free Discharge)
1=Culvert (Barrel Controls 22.89 cfs @ 4.27 fps)

Summary for Pond 5P: NEW CULVERT

Inflow Area = 1.070 ac, 0.00% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 2.70 cfs @ 12.18 hrs, Volume= 0.243 af
Outflow = 1.57 cfs @ 12.43 hrs, Volume= 0.227 af, Atten= 42%, Lag= 15.3 min
Primary = 1.57 cfs @ 12.43 hrs, Volume= 0.227 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 89.57' @ 12.43 hrs Surf.Area= 6,585 sf Storage= 3,301 cf

Plug-Flow detention time= 64.5 min calculated for 0.226 af (93% of inflow)
Center-of-Mass det. time= 40.9 min (835.6 - 794.7)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	5,815 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	130	0	0
90.00	11,500	5,815	5,815

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**18.0" Round Culvert** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 89.00' / 88.25' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=1.56 cfs @ 12.43 hrs HW=89.56' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.56 cfs @ 2.56 fps)

Summary for Pond 9P: NEW CULVERT

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 1.79" for 10 YEAR STORM event
Inflow = 20.46 cfs @ 13.93 hrs, Volume= 8.459 af
Outflow = 20.21 cfs @ 14.22 hrs, Volume= 8.351 af, Atten= 1%, Lag= 17.6 min
Primary = 20.21 cfs @ 14.22 hrs, Volume= 8.351 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 93.29' @ 14.22 hrs Surf.Area= 11,478 sf Storage= 11,829 cf

Plug-Flow detention time= 10.5 min calculated for 8.350 af (99% of inflow)
Center-of-Mass det. time= 6.8 min (943.7 - 936.9)

Volume	Invert	Avail.Storage	Storage Description
#1	90.90'	67,412 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.90	200	0	0
92.00	3,250	1,897	1,897
93.00	8,990	6,120	8,017
94.00	17,700	13,345	21,362
95.00	23,700	20,700	42,062
96.00	27,000	25,350	67,412

Device	Routing	Invert	Outlet Devices
#1	Primary	91.50'	**30.0" Round Culvert X 2.00** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 91.50' / 91.12' S= 0.0051 '/' Cc= 0.900 n= 0.024, Flow Area= 4.91 sf

Primary OutFlow Max=20.20 cfs @ 14.22 hrs HW=93.29' (Free Discharge)
└**1=Culvert** (Barrel Controls 20.20 cfs @ 3.77 fps)

Summary for Pond 50P: 24" CULVERT SAME AS PRE P-5

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 1.79" for 10 YEAR STORM event
Inflow = 20.07 cfs @ 13.94 hrs, Volume= 8.178 af
Outflow = 20.06 cfs @ 13.96 hrs, Volume= 8.149 af, Atten= 0%, Lag= 1.0 min
Primary = 20.06 cfs @ 13.96 hrs, Volume= 8.149 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 95.17' @ 13.96 hrs Surf.Area= 3,751 sf Storage= 5,624 cf

Plug-Flow detention time= 4.7 min calculated for 8.149 af (100% of inflow)
Center-of-Mass det. time= 3.7 min (941.5 - 937.7)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.35 1.88

Primary OutFlow Max=20.05 cfs @ 13.96 hrs HW=95.17' (Free Discharge)
└**1=Culvert** (Inlet Controls 15.42 cfs @ 4.91 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 4.62 cfs @ 0.55 fps)

Summary for Pond 60P: FARM POND SAME AS PRE P-6

Inflow Area = 25.300 ac, 0.00% Impervious, Inflow Depth > 1.85" for 10 YEAR STORM event
Inflow = 13.98 cfs @ 13.79 hrs, Volume= 3.896 af
Outflow = 7.38 cfs @ 15.34 hrs, Volume= 3.571 af, Atten= 47%, Lag= 93.1 min
Primary = 7.38 cfs @ 15.34 hrs, Volume= 3.571 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 95.90' Surf.Area= 27,363 sf Storage= 45,169 cf
Peak Elev= 97.68' @ 15.34 hrs Surf.Area= 34,246 sf Storage= 100,762 cf (55,593 cf above start)

Plug-Flow detention time= 200.8 min calculated for 2.509 af (64% of inflow)
Center-of-Mass det. time= 77.0 min (977.3 - 900.3)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	94.00'	**15.0" Round Culvert** L= 38.0' Ke= 0.600 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Primary	100.00'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.65 1.88

Primary OutFlow Max=7.38 cfs @ 15.34 hrs HW=97.68' (Free Discharge)
- **1=Orifice/Grate** (Passes 7.38 cfs of 7.87 cfs potential flow)
  - **2=Culvert** (Inlet Controls 7.38 cfs @ 6.02 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 80P: EXISTING 18" CMP SAME AS PRE P-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 1.92" for 10 YEAR STORM event
Inflow = 7.14 cfs @ 13.88 hrs, Volume= 2.014 af
Outflow = 6.07 cfs @ 14.51 hrs, Volume= 1.875 af, Atten= 15%, Lag= 37.7 min
Primary = 6.07 cfs @ 14.51 hrs, Volume= 1.875 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 101.72' @ 14.51 hrs Surf.Area= 17,297 sf Storage= 17,658 cf

Plug-Flow detention time= 56.0 min calculated for 1.874 af (93% of inflow)
Center-of-Mass det. time= 37.7 min (940.3 - 902.6)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.900

Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900
n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=6.07 cfs @ 14.51 hrs HW=101.72' (Free Discharge)
↑**1=Culvert** (Barrel Controls 6.07 cfs @ 3.75 fps)

Summary for Subcatchment 12S: SA-12

Runoff = 5.17 cfs @ 12.16 hrs, Volume= 0.462 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.580	74	OPEN C, GOOD CONDITION
*	0.230	77	WOODS D
*	0.850	80	1/2 ACRE LOTS C
	1.660	77	Weighted Average
	1.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	150	0.0700	0.21		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.0	250	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
14.8	400	Total			

Summary for Subcatchment 29S: SA-29

Runoff = 19.22 cfs @ 12.68 hrs, Volume= 2.989 af, Depth> 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.270	80	1/2 ACRE LOTS C
*	2.260	85	1/2 ACRE LOTS D
*	2.970	82	2 ACRE LOTS D
*	3.890	77	WOODED D, GOOD CONDITION
*	0.040	74	OPEN C, GOOD CONDITION
*	0.290	80	OPEN D, GOOD CONDITION
*	0.020	98	IMPERVIOUS
	9.740	81	Weighted Average
	9.720		99.79% Pervious Area
	0.020		0.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
14.1	300	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
6.6	900	0.0050	2.26	27.17	**Channel Flow, Segment ID:** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
54.5	1,350	Total			

Summary for Subcatchment 30S: SA-30

Runoff = 1.34 cfs @ 12.00 hrs, Volume= 0.086 af, Depth> 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.190	98	IMPERVIOUS
	0.220	96	Weighted Average
	0.030		13.64% Pervious Area
	0.190		86.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.2	270	Total			

Summary for Subcatchment 34S: SA-34

Runoff = 3.74 cfs @ 12.17 hrs, Volume= 0.335 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.110	80	1/2 ACRE LOT C
*	0.620	85	1/2 ACRE LOT D
*	0.070	80	OPEN D
*	0.240	77	WOODS D
*	0.030	74	OPEN C
	1.070	82	Weighted Average
	1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0500	0.17		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
5.9	230	0.0170	0.65		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
15.6	330	Total			

Summary for Subcatchment 50S: SA-50 SAME AS PRE 5

Runoff = 17.46 cfs @ 13.36 hrs, Volume= 4.128 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	10.000	70	WOODS C
*	4.000	77	2 ACRE LOTS C
*	0.500	98	ROAD
*	2.500	74	OPEN C
	17.000	73	Weighted Average
	16.500		97.06% Pervious Area
	0.500		2.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment 60S: SA-60 SAME AS PRE SA-6

Runoff = 21.23 cfs @ 13.74 hrs, Volume= 5.865 af, Depth> 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	4.300	74	OPEN C, GOOD CONDITION
*	17.000	70	WOODED C, GOOD CONDITION
*	4.000	77	2 ACRE LOTS C
	25.300	72	Weighted Average
	25.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment 80S: SA-80 SAME AS PRE SA-8

Runoff = 10.72 cfs @ 13.85 hrs, Volume= 3.009 af, Depth> 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	6.000	74	OPEN C
*	6.000	70	WOODS C
*	0.600	98	ROAD & LOTS IMP.
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow, Segment ID:** n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
140.6	1,250	Total			

Summary for Subcatchment 200S: SA-200 SAME AS PRE SA-2

Runoff = 5.46 cfs @ 12.72 hrs, Volume= 0.874 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	2.010	82	2 ACRE LOTS D
*	0.480	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	2.720	83	Weighted Average
	2.490		91.54% Pervious Area
	0.230		8.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
57.4	850	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 2.76" for 25 YEAR STORM event
Inflow = 35.43 cfs @ 13.91 hrs, Volume= 16.192 af
Outflow = 35.06 cfs @ 14.10 hrs, Volume= 15.642 af, Atten= 1%, Lag= 11.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 23.1 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 31.4 min

Peak Storage= 48,505 cf @ 14.10 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -10.20'



‡

Summary for Reach 30R: STREAM

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 2.58" for 25 YEAR STORM event
Inflow = 29.00 cfs @ 13.93 hrs, Volume= 12.142 af
Outflow = 28.86 cfs @ 14.04 hrs, Volume= 11.983 af, Atten= 0%, Lag= 6.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.78 fps, Min. Travel Time= 8.4 min
Avg. Velocity = 1.37 fps, Avg. Travel Time= 10.9 min

Peak Storage= 14,596 cf @ 14.04 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 2.00' Flow Area= 40.0 sf, Capacity= 100.95 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 900.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -4.50'



‡

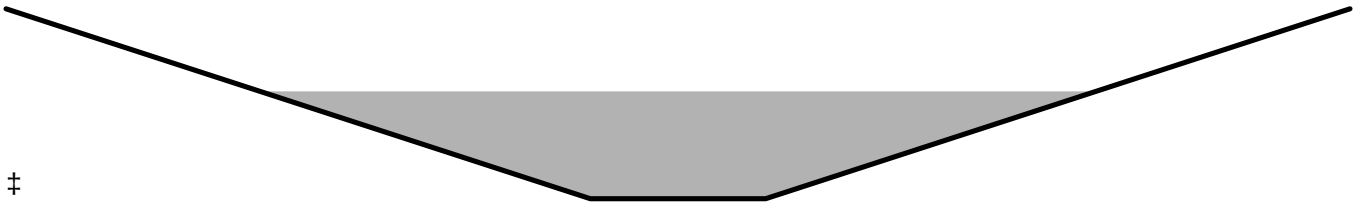
Summary for Reach 31R: SWALE

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 2.59" for 25 YEAR STORM event
Inflow = 29.02 cfs @ 13.72 hrs, Volume= 11.840 af
Outflow = 29.08 cfs @ 13.73 hrs, Volume= 11.823 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.98 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,759 cf @ 13.73 hrs
Average Depth at Peak Storage= 1.13'
Bank-Full Depth= 2.00' Flow Area= 26.0 sf, Capacity= 108.09 cfs

3.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 23.00'
Length= 180.0' Slope= 0.0170 '/'
Inlet Invert= 0.00', Outlet Invert= -3.06'



‡

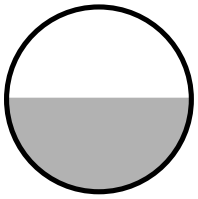
Summary for Reach 35R: CB1 & CB2 TO ROUTE 112 DITCH

Inflow Area = 2.940 ac, 14.29% Impervious, Inflow Depth > 3.81" for 25 YEAR STORM event
Inflow = 5.53 cfs @ 12.78 hrs, Volume= 0.935 af
Outflow = 5.53 cfs @ 12.78 hrs, Volume= 0.934 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.11 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.49 fps, Avg. Travel Time= 0.2 min

Peak Storage= 36 cf @ 12.78 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 40.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.20'



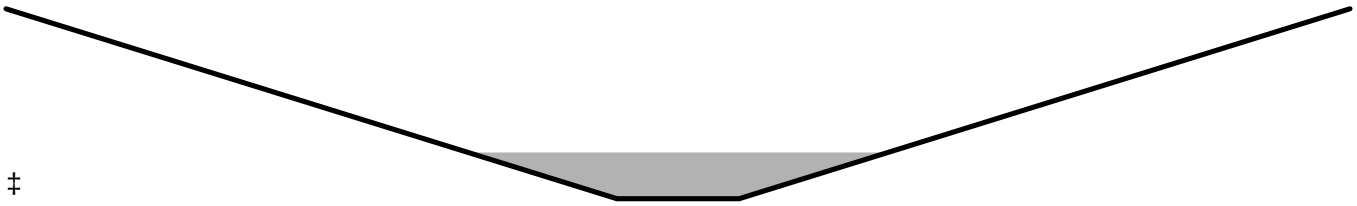
Summary for Reach 80R: EXISTING SWALE SAME AS PRE R-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 2.71" for 25 YEAR STORM event
Inflow = 7.67 cfs @ 14.77 hrs, Volume= 2.845 af
Outflow = 7.64 cfs @ 14.95 hrs, Volume= 2.800 af, Atten= 0%, Lag= 10.8 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.58 fps, Min. Travel Time= 13.7 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 20.2 min

Peak Storage= 6,305 cf @ 14.95 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 194.65 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 5.0 '/' Top Width= 33.00'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -6.50'



‡

Summary for Pond 3P: NEW CULVERT

Inflow Area = 2.720 ac, 8.46% Impervious, Inflow Depth > 3.86" for 25 YEAR STORM event
Inflow = 5.46 cfs @ 12.72 hrs, Volume= 0.874 af
Outflow = 5.40 cfs @ 12.78 hrs, Volume= 0.849 af, Atten= 1%, Lag= 3.8 min
Primary = 5.40 cfs @ 12.78 hrs, Volume= 0.849 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 87.82' @ 12.78 hrs Surf.Area= 1,380 sf Storage= 2,755 cf

Plug-Flow detention time= 22.0 min calculated for 0.839 af (96% of inflow)
Center-of-Mass det. time= 11.5 min (831.0 - 819.5)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	6,050 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	25	0	0
90.00	3,000	6,050	6,050

Device	Routing	Invert	Outlet Devices
#1	Primary	86.50'	**24.0" Round Culvert** L= 10.0' Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.45' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=5.38 cfs @ 12.78 hrs HW=87.82' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.38 cfs @ 3.47 fps)

Summary for Pond 4P: NEW CULVERT

Inflow Area = 66.300 ac, 1.69% Impervious, Inflow Depth > 2.71" for 25 YEAR STORM event
Inflow = 33.46 cfs @ 13.89 hrs, Volume= 14.973 af
Outflow = 33.34 cfs @ 13.99 hrs, Volume= 14.941 af, Atten= 0%, Lag= 6.3 min
Primary = 33.34 cfs @ 13.99 hrs, Volume= 14.941 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 87.55' @ 13.99 hrs Surf.Area= 12,249 sf Storage= 8,247 cf

Plug-Flow detention time= 3.3 min calculated for 14.790 af (99% of inflow)
Center-of-Mass det. time= 2.6 min (923.6 - 921.0)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	48,500 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	500	0	0
87.00	3,410	1,955	1,955
88.00	19,500	11,455	13,410
89.00	50,680	35,090	48,500

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	**72.0" W x 36.0" H Box Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 86.00' / 85.40' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 18.00 sf

Primary OutFlow Max=33.33 cfs @ 13.99 hrs HW=87.55' (Free Discharge)
└**1=Culvert** (Barrel Controls 33.33 cfs @ 4.78 fps)

Summary for Pond 5P: NEW CULVERT

Inflow Area = 1.070 ac, 0.00% Impervious, Inflow Depth > 3.76" for 25 YEAR STORM event
Inflow = 3.74 cfs @ 12.17 hrs, Volume= 0.335 af
Outflow = 2.38 cfs @ 12.40 hrs, Volume= 0.317 af, Atten= 36%, Lag= 13.3 min
Primary = 2.38 cfs @ 12.40 hrs, Volume= 0.317 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 89.71' @ 12.40 hrs Surf.Area= 8,247 sf Storage= 4,152 cf

Plug-Flow detention time= 55.7 min calculated for 0.317 af (94% of inflow)
Center-of-Mass det. time= 35.6 min (826.2 - 790.5)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	5,815 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	130	0	0
90.00	11,500	5,815	5,815

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**18.0" Round Culvert** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 89.00' / 88.25' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=2.37 cfs @ 12.40 hrs HW=89.71' (Free Discharge)
↳**1=Culvert** (Barrel Controls 2.37 cfs @ 4.20 fps)

Summary for Pond 9P: NEW CULVERT

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 2.61" for 25 YEAR STORM event
Inflow = 29.59 cfs @ 13.72 hrs, Volume= 12.284 af
Outflow = 29.00 cfs @ 13.93 hrs, Volume= 12.142 af, Atten= 2%, Lag= 12.3 min
Primary = 29.00 cfs @ 13.93 hrs, Volume= 12.142 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 93.72' @ 13.93 hrs Surf.Area= 15,224 sf Storage= 17,569 cf

Plug-Flow detention time= 10.2 min calculated for 12.142 af (99% of inflow)
Center-of-Mass det. time= 6.9 min (940.1 - 933.1)

Volume	Invert	Avail.Storage	Storage Description
#1	90.90'	67,412 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.90	200	0	0
92.00	3,250	1,897	1,897
93.00	8,990	6,120	8,017
94.00	17,700	13,345	21,362
95.00	23,700	20,700	42,062
96.00	27,000	25,350	67,412

Device	Routing	Invert	Outlet Devices
#1	Primary	91.50'	**30.0" Round Culvert X 2.00** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 91.50' / 91.12' S= 0.0051 '/' Cc= 0.900 n= 0.024, Flow Area= 4.91 sf

Primary OutFlow Max=28.97 cfs @ 13.93 hrs HW=93.71' (Free Discharge)
↳**1=Culvert** (Barrel Controls 28.97 cfs @ 4.18 fps)

Summary for Pond 50P: 24" CULVERT SAME AS PRE P-5

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 2.60" for 25 YEAR STORM event
Inflow = 29.02 cfs @ 13.71 hrs, Volume= 11.888 af
Outflow = 29.02 cfs @ 13.72 hrs, Volume= 11.840 af, Atten= 0%, Lag= 1.0 min
Primary = 29.02 cfs @ 13.72 hrs, Volume= 11.840 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 95.33' @ 13.72 hrs Surf.Area= 3,996 sf Storage= 6,196 cf

Plug-Flow detention time= 4.5 min calculated for 11.722 af (99% of inflow)
Center-of-Mass det. time= 3.3 min (937.8 - 934.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.35 1.88

Primary OutFlow Max=28.98 cfs @ 13.72 hrs HW=95.33' (Free Discharge)
└**1=Culvert** (Inlet Controls 16.16 cfs @ 5.14 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 12.82 cfs @ 0.78 fps)

Summary for Pond 60P: FARM POND SAME AS PRE P-6

Inflow Area = 25.300 ac, 0.00% Impervious, Inflow Depth > 2.78" for 25 YEAR STORM event
Inflow = 21.23 cfs @ 13.74 hrs, Volume= 5.865 af
Outflow = 9.45 cfs @ 15.60 hrs, Volume= 4.960 af, Atten= 55%, Lag= 111.5 min
Primary = 9.45 cfs @ 15.60 hrs, Volume= 4.960 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 95.90' Surf.Area= 27,363 sf Storage= 45,169 cf
Peak Elev= 98.81' @ 15.60 hrs Surf.Area= 38,637 sf Storage= 142,871 cf (97,703 cf above start)

Plug-Flow detention time= 196.9 min calculated for 3.922 af (67% of inflow)
Center-of-Mass det. time= 87.4 min (980.1 - 892.6)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	94.00'	**15.0" Round Culvert** L= 38.0' Ke= 0.600 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Primary	100.00'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.65 1.88

Primary OutFlow Max=9.45 cfs @ 15.60 hrs HW=98.81' (Free Discharge)
- **1=Orifice/Grate** (Passes 9.45 cfs of 10.08 cfs potential flow)
  - **2=Culvert** (Inlet Controls 9.45 cfs @ 7.70 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 80P: EXISTING 18" CMP SAME AS PRE P-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 2.87" for 25 YEAR STORM event
Inflow = 10.72 cfs @ 13.85 hrs, Volume= 3.009 af
Outflow = 7.67 cfs @ 14.77 hrs, Volume= 2.845 af, Atten= 28%, Lag= 55.4 min
Primary = 7.67 cfs @ 14.77 hrs, Volume= 2.845 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.30' @ 14.77 hrs Surf.Area= 23,035 sf Storage= 29,605 cf

Plug-Flow detention time= 57.9 min calculated for 2.817 af (94% of inflow)
Center-of-Mass det. time= 43.1 min (938.3 - 895.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.900

Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900
n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=7.67 cfs @ 14.77 hrs HW=102.30' (Free Discharge)
↑**1=Culvert** (Barrel Controls 7.67 cfs @ 4.34 fps)

Summary for Subcatchment 12S: SA-12

Runoff = 6.54 cfs @ 12.16 hrs, Volume= 0.582 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.580	74	OPEN C, GOOD CONDITION
*	0.230	77	WOODS D
*	0.850	80	1/2 ACRE LOTS C
	1.660	77	Weighted Average
	1.660		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	150	0.0700	0.21		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
3.0	250	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
14.8	400	Total			

Summary for Subcatchment 29S: SA-29

Runoff = 23.91 cfs @ 12.68 hrs, Volume= 3.718 af, Depth> 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.270	80	1/2 ACRE LOTS C
*	2.260	85	1/2 ACRE LOTS D
*	2.970	82	2 ACRE LOTS D
*	3.890	77	WOODED D, GOOD CONDITION
*	0.040	74	OPEN C, GOOD CONDITION
*	0.290	80	OPEN D, GOOD CONDITION
*	0.020	98	IMPERVIOUS
	9.740	81	Weighted Average
	9.720		99.79% Pervious Area
	0.020		0.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
14.1	300	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
6.6	900	0.0050	2.26	27.17	**Channel Flow, Segment ID:** Area= 12.0 sf Perim= 15.0' r= 0.80' n= 0.040
54.5	1,350	Total			

Summary for Subcatchment 30S: SA-30

Runoff = 1.58 cfs @ 12.00 hrs, Volume= 0.102 af, Depth> 5.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.030	80	OPEN D, GOOD CONDITION
*	0.190	98	IMPERVIOUS
	0.220	96	Weighted Average
	0.030		13.64% Pervious Area
	0.190		86.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
1.0	120	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
3.2	270	Total			

Summary for Subcatchment 34S: SA-34

Runoff = 4.62 cfs @ 12.17 hrs, Volume= 0.415 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.110	80	1/2 ACRE LOT C
*	0.620	85	1/2 ACRE LOT D
*	0.070	80	OPEN D
*	0.240	77	WOODS D
*	0.030	74	OPEN C
	1.070	82	Weighted Average
	1.070		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0500	0.17		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
5.9	230	0.0170	0.65		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
15.6	330	Total			

Summary for Subcatchment 50S: SA-50 SAME AS PRE 5

Runoff = 22.64 cfs @ 13.35 hrs, Volume= 5.336 af, Depth> 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	10.000	70	WOODS C
*	4.000	77	2 ACRE LOTS C
*	0.500	98	ROAD
*	2.500	74	OPEN C
	17.000	73	Weighted Average
	16.500		97.06% Pervious Area
	0.500		2.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
55.6	1,650	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
106.5	1,800	Total			

Summary for Subcatchment 60S: SA-60 SAME AS PRE SA-6

Runoff = 27.67 cfs @ 13.73 hrs, Volume= 7.630 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	4.300	74	OPEN C, GOOD CONDITION
*	17.000	70	WOODED C, GOOD CONDITION
*	4.000	77	2 ACRE LOTS C
	25.300	72	Weighted Average
	25.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
50.9	150	0.0050	0.05		**Sheet Flow, Segment ID:** n= 0.400 P2= 3.30"
84.9	1,800	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
135.8	1,950	Total			

Summary for Subcatchment 80S: SA-80 SAME AS PRE SA-8

Runoff = 13.88 cfs @ 13.83 hrs, Volume= 3.897 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	6.000	74	OPEN C
*	6.000	70	WOODS C
*	0.600	98	ROAD & LOTS IMP.
	12.600	73	Weighted Average
	12.000		95.24% Pervious Area
	0.600		4.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
88.7	150	0.0050	0.03		**Sheet Flow, Segment ID:** n= 0.800 P2= 3.30"
51.9	1,100	0.0050	0.35		**Shallow Concentrated Flow, Segment ID:** Kv= 5.0 fps
140.6	1,250	Total			

Summary for Subcatchment 200S: SA-200 SAME AS PRE SA-2

Runoff = 6.73 cfs @ 12.71 hrs, Volume= 1.079 af, Depth> 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	2.010	82	2 ACRE LOTS D
*	0.480	80	OPEN D, GOOD CONDITION
*	0.230	98	IMPERVIOUS
	2.720	83	Weighted Average
	2.490		91.54% Pervious Area
	0.230		8.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
33.8	150	0.0050	0.07		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
23.6	700	0.0050	0.49		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
57.4	850	Total			

Summary for Reach 1R: DEEP BROOK

Inflow Area = 70.310 ac, 2.19% Impervious, Inflow Depth > 3.47" for 50 YEAR STORM event
Inflow = 45.34 cfs @ 12.86 hrs, Volume= 20.352 af
Outflow = 44.48 cfs @ 13.85 hrs, Volume= 19.712 af, Atten= 2%, Lag= 59.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.66 fps, Min. Travel Time= 21.3 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 28.8 min

Peak Storage= 56,844 cf @ 13.85 hrs
Average Depth at Peak Storage= 1.17'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 242.12 cfs

12.00' x 3.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 3,400.0' Slope= 0.0030 '/'
Inlet Invert= 0.00', Outlet Invert= -10.20'



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Summary for Reach 30R: STREAM

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 3.25" for 50 YEAR STORM event
Inflow = 35.70 cfs @ 13.86 hrs, Volume= 15.312 af
Outflow = 35.59 cfs @ 13.96 hrs, Volume= 15.123 af, Atten= 0%, Lag= 6.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 7.9 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 10.3 min

Peak Storage= 16,943 cf @ 13.96 hrs
Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 2.00' Flow Area= 40.0 sf, Capacity= 100.95 cfs

10.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 30.00'
Length= 900.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -4.50'



‡

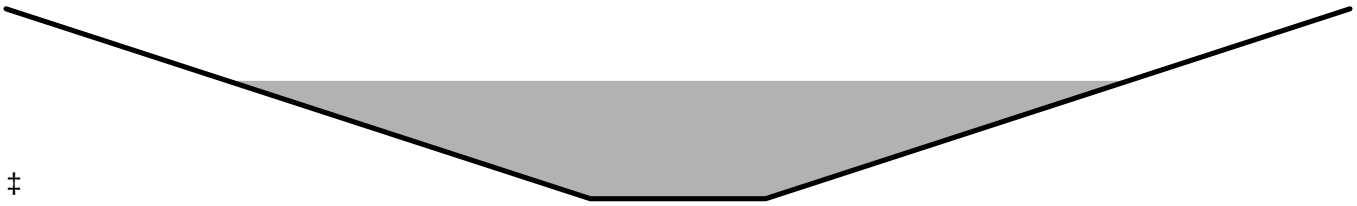
Summary for Reach 31R: SWALE

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 3.26" for 50 YEAR STORM event
Inflow = 36.00 cfs @ 13.61 hrs, Volume= 14.918 af
Outflow = 35.94 cfs @ 13.64 hrs, Volume= 14.896 af, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 3.14 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 2.44 fps, Avg. Travel Time= 1.2 min

Peak Storage= 2,059 cf @ 13.64 hrs
Average Depth at Peak Storage= 1.24'
Bank-Full Depth= 2.00' Flow Area= 26.0 sf, Capacity= 108.09 cfs

3.00' x 2.00' deep channel, n= 0.050
Side Slope Z-value= 5.0 '/' Top Width= 23.00'
Length= 180.0' Slope= 0.0170 '/'
Inlet Invert= 0.00', Outlet Invert= -3.06'



‡

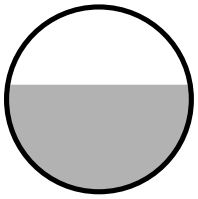
Summary for Reach 35R: CB1 & CB2 TO ROUTE 112 DITCH

Inflow Area = 2.940 ac, 14.29% Impervious, Inflow Depth > 4.71" for 50 YEAR STORM event
Inflow = 6.83 cfs @ 12.77 hrs, Volume= 1.155 af
Outflow = 6.82 cfs @ 12.77 hrs, Volume= 1.153 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.43 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.71 fps, Avg. Travel Time= 0.2 min

Peak Storage= 42 cf @ 12.77 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 40.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.20'



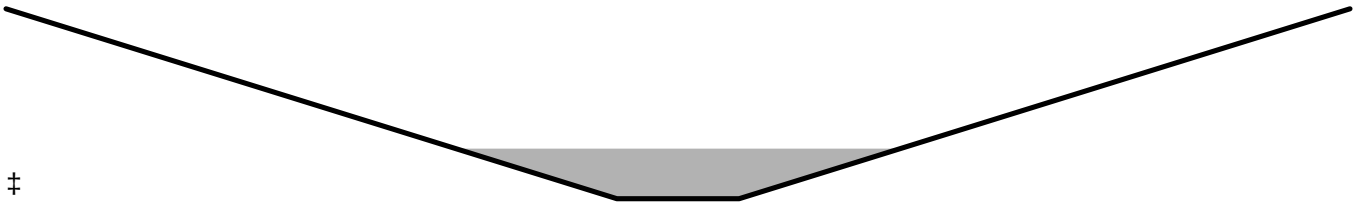
Summary for Reach 80R: EXISTING SWALE SAME AS PRE R-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 3.54" for 50 YEAR STORM event
Inflow = 9.08 cfs @ 14.90 hrs, Volume= 3.713 af
Outflow = 9.06 cfs @ 15.08 hrs, Volume= 3.661 af, Atten= 0%, Lag= 10.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.65 fps, Min. Travel Time= 13.1 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 18.5 min

Peak Storage= 7,144 cf @ 15.08 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 3.00' Flow Area= 54.0 sf, Capacity= 194.65 cfs

3.00' x 3.00' deep channel, n= 0.040
Side Slope Z-value= 5.0 '/' Top Width= 33.00'
Length= 1,300.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -6.50'



‡

Summary for Pond 3P: NEW CULVERT

Inflow Area = 2.720 ac, 8.46% Impervious, Inflow Depth > 4.76" for 50 YEAR STORM event
Inflow = 6.73 cfs @ 12.71 hrs, Volume= 1.079 af
Outflow = 6.67 cfs @ 12.77 hrs, Volume= 1.053 af, Atten= 1%, Lag= 3.5 min
Primary = 6.67 cfs @ 12.77 hrs, Volume= 1.053 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 88.00' @ 12.77 hrs Surf.Area= 1,509 sf Storage= 3,018 cf

Plug-Flow detention time= 19.8 min calculated for 1.051 af (97% of inflow)
Center-of-Mass det. time= 10.2 min (827.2 - 817.0)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	6,050 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	25	0	0
90.00	3,000	6,050	6,050

Device	Routing	Invert	Outlet Devices
#1	Primary	86.50'	**24.0" Round Culvert** L= 10.0' Ke= 0.900 Inlet / Outlet Invert= 86.50' / 86.45' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=6.64 cfs @ 12.77 hrs HW=87.99' (Free Discharge)
└**1=Culvert** (Barrel Controls 6.64 cfs @ 3.68 fps)

Summary for Pond 4P: NEW CULVERT

Inflow Area = 66.300 ac, 1.69% Impervious, Inflow Depth > 3.41" for 50 YEAR STORM event
Inflow = 41.91 cfs @ 13.70 hrs, Volume= 18.841 af
Outflow = 41.78 cfs @ 13.81 hrs, Volume= 18.803 af, Atten= 0%, Lag= 6.4 min
Primary = 41.78 cfs @ 13.81 hrs, Volume= 18.803 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 87.82' @ 13.81 hrs Surf.Area= 16,564 sf Storage= 11,320 cf

Plug-Flow detention time= 3.8 min calculated for 18.614 af (99% of inflow)
Center-of-Mass det. time= 3.1 min (921.4 - 918.4)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	48,500 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	500	0	0
87.00	3,410	1,955	1,955
88.00	19,500	11,455	13,410
89.00	50,680	35,090	48,500

Device	Routing	Invert	Outlet Devices
#1	Primary	86.00'	**72.0" W x 36.0" H Box Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 86.00' / 85.40' S= 0.0100 '/' Cc= 0.900 n= 0.024, Flow Area= 18.00 sf

Primary OutFlow Max=41.77 cfs @ 13.81 hrs HW=87.82' (Free Discharge)
└**1=Culvert** (Barrel Controls 41.77 cfs @ 5.11 fps)

Summary for Pond 5P: NEW CULVERT

Inflow Area = 1.070 ac, 0.00% Impervious, Inflow Depth > 4.65" for 50 YEAR STORM event
Inflow = 4.62 cfs @ 12.17 hrs, Volume= 0.415 af
Outflow = 3.07 cfs @ 12.37 hrs, Volume= 0.395 af, Atten= 34%, Lag= 12.2 min
Primary = 3.07 cfs @ 12.37 hrs, Volume= 0.395 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 89.83' @ 12.37 hrs Surf.Area= 9,550 sf Storage= 4,818 cf

Plug-Flow detention time= 50.8 min calculated for 0.394 af (95% of inflow)
Center-of-Mass det. time= 32.6 min (820.7 - 788.1)

Volume	Invert	Avail.Storage	Storage Description
#1	89.00'	5,815 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
89.00	130	0	0
90.00	11,500	5,815	5,815

Device	Routing	Invert	Outlet Devices
#1	Primary	89.00'	**18.0" Round Culvert** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 89.00' / 88.25' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.04 cfs @ 12.37 hrs HW=89.82' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.04 cfs @ 4.43 fps)

Summary for Pond 9P: NEW CULVERT

Inflow Area = 56.560 ac, 1.94% Impervious, Inflow Depth > 3.28" for 50 YEAR STORM event
Inflow = 36.60 cfs @ 13.63 hrs, Volume= 15.478 af
Outflow = 35.70 cfs @ 13.86 hrs, Volume= 15.312 af, Atten= 2%, Lag= 13.7 min
Primary = 35.70 cfs @ 13.86 hrs, Volume= 15.312 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 94.05' @ 13.86 hrs Surf.Area= 17,990 sf Storage= 22,364 cf

Plug-Flow detention time= 10.1 min calculated for 15.311 af (99% of inflow)
Center-of-Mass det. time= 7.1 min (937.5 - 930.4)

Volume	Invert	Avail.Storage	Storage Description
#1	90.90'	67,412 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.90	200	0	0
92.00	3,250	1,897	1,897
93.00	8,990	6,120	8,017
94.00	17,700	13,345	21,362
95.00	23,700	20,700	42,062
96.00	27,000	25,350	67,412

Device	Routing	Invert	Outlet Devices
#1	Primary	91.50'	**30.0" Round Culvert X 2.00** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 91.50' / 91.12' S= 0.0051 '/' Cc= 0.900 n= 0.024, Flow Area= 4.91 sf

Primary OutFlow Max=35.68 cfs @ 13.86 hrs HW=94.05' (Free Discharge)
└**1=Culvert** (Barrel Controls 35.68 cfs @ 4.43 fps)

Summary for Pond 50P: 24" CULVERT SAME AS PRE P-5

Inflow Area = 54.900 ac, 2.00% Impervious, Inflow Depth > 3.28" for 50 YEAR STORM event
Inflow = 36.00 cfs @ 13.60 hrs, Volume= 14.996 af
Outflow = 36.00 cfs @ 13.61 hrs, Volume= 14.918 af, Atten= 0%, Lag= 0.8 min
Primary = 36.00 cfs @ 13.61 hrs, Volume= 14.918 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 95.44' @ 13.61 hrs Surf.Area= 4,153 sf Storage= 6,561 cf

Plug-Flow detention time= 4.1 min calculated for 14.768 af (98% of inflow)
Center-of-Mass det. time= 2.7 min (935.1 - 932.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.50'	8,538 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.50	50	0	0
94.00	2,000	1,538	1,538
96.00	5,000	7,000	8,538

Device	Routing	Invert	Outlet Devices
#1	Primary	92.50'	**24.0" Round Culvert** L= 30.0' Ke= 0.900 Inlet / Outlet Invert= 92.50' / 92.20' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	95.00'	**50.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.35 1.88

Primary OutFlow Max=35.96 cfs @ 13.61 hrs HW=95.43' (Free Discharge)
└**1=Culvert** (Inlet Controls 16.61 cfs @ 5.29 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 19.35 cfs @ 0.89 fps)

Summary for Pond 60P: FARM POND SAME AS PRE P-6

Inflow Area = 25.300 ac, 0.00% Impervious, Inflow Depth > 3.62" for 50 YEAR STORM event
Inflow = 27.67 cfs @ 13.73 hrs, Volume= 7.630 af
Outflow = 11.03 cfs @ 15.78 hrs, Volume= 5.999 af, Atten= 60%, Lag= 122.8 min
Primary = 11.03 cfs @ 15.78 hrs, Volume= 5.999 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 95.90' Surf.Area= 27,363 sf Storage= 45,169 cf
Peak Elev= 99.86' @ 15.78 hrs Surf.Area= 42,722 sf Storage= 184,387 cf (139,218 cf above start)

Plug-Flow detention time= 197.6 min calculated for 4.912 af (64% of inflow)
Center-of-Mass det. time= 92.0 min (979.8 - 887.8)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	310,063 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.00	20,000	0	0
95.00	23,875	21,938	21,938
96.00	27,750	25,813	47,750
98.00	35,500	63,250	111,000
100.00	43,250	78,750	189,750
102.50	53,000	120,313	310,063

Device	Routing	Invert	Outlet Devices
#1	Primary	95.90'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	94.00'	**15.0" Round Culvert** L= 38.0' Ke= 0.600 Inlet / Outlet Invert= 94.00' / 92.10' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Primary	100.00'	**15.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00 Coef. (English) 1.65 1.88

Primary OutFlow Max=11.03 cfs @ 15.78 hrs HW=99.86' (Free Discharge)
- **1=Orifice/Grate** (Passes 11.03 cfs of 11.76 cfs potential flow)
  - **2=Culvert** (Inlet Controls 11.03 cfs @ 8.99 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 80P: EXISTING 18" CMP SAME AS PRE P-8

Inflow Area = 12.600 ac, 4.76% Impervious, Inflow Depth > 3.71" for 50 YEAR STORM event
Inflow = 13.88 cfs @ 13.83 hrs, Volume= 3.897 af
Outflow = 9.08 cfs @ 14.90 hrs, Volume= 3.713 af, Atten= 35%, Lag= 64.2 min
Primary = 9.08 cfs @ 14.90 hrs, Volume= 3.713 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.75' @ 14.90 hrs Surf.Area= 27,470 sf Storage= 42,910 cf

Plug-Flow detention time= 65.2 min calculated for 3.676 af (94% of inflow)
Center-of-Mass det. time= 51.9 min (942.5 - 890.5)

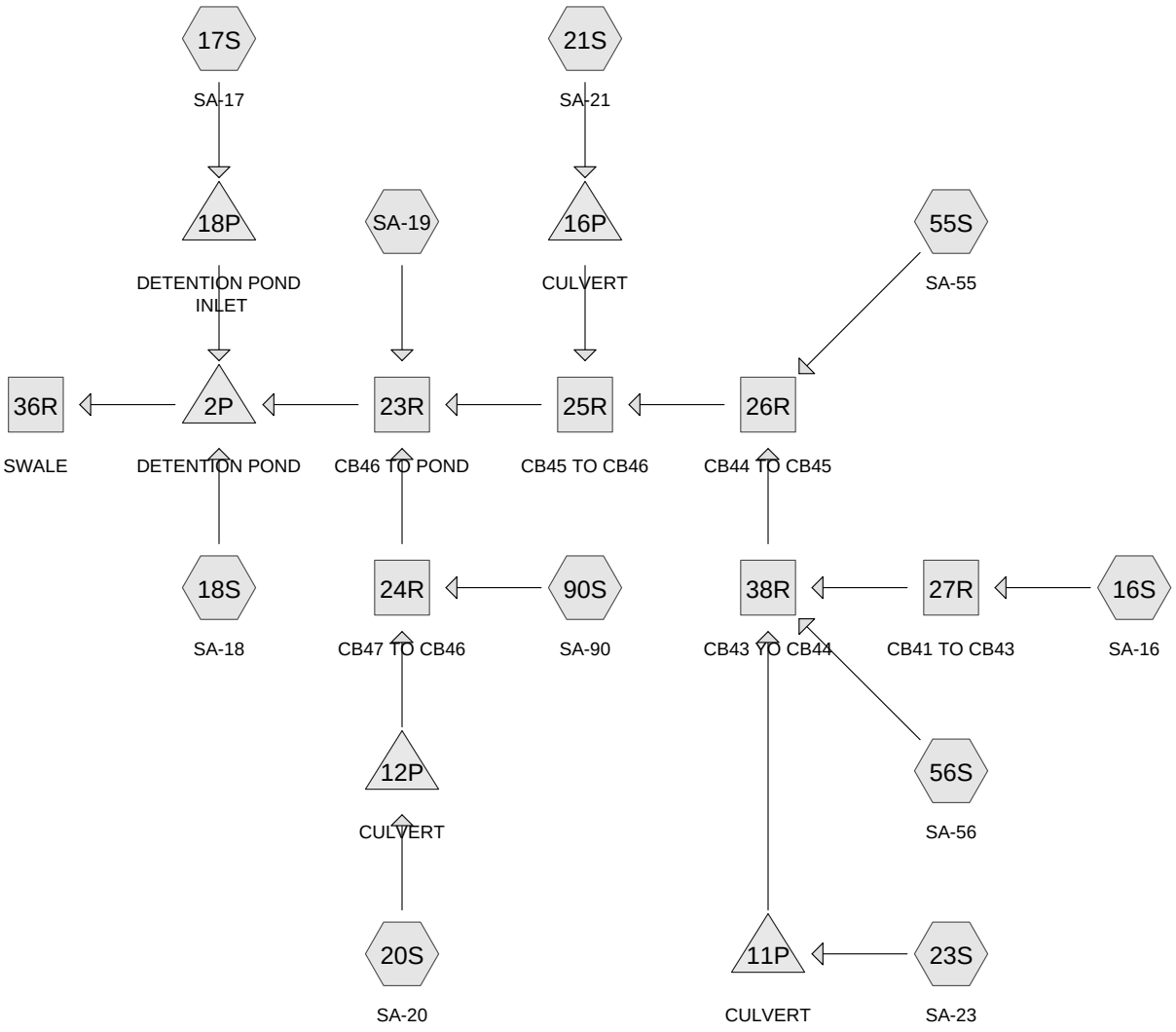
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	80,500 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	500	0	0
102.00	20,000	20,500	20,500
104.00	40,000	60,000	80,500

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.900

Inlet / Outlet Invert= 100.00' / 99.70' S= 0.0100 '/' Cc= 0.900
n= 0.024, Flow Area= 1.77 sf

Primary OutFlow Max=9.08 cfs @ 14.90 hrs HW=102.75' (Free Discharge)
↑**1=Culvert** (Barrel Controls 9.08 cfs @ 5.14 fps)



Subcat Reach Pond Link

Routing Diagram for Sandy Brook POSTDEVELOPMENT #4
Prepared by BH2M, Printed 12/1/2017
HydroCAD® 10.00-20 s/n 00619 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.540	80	1/2 ACRE LOTS C (16S, 17S, 21S, 23S)
0.140	98	Allocated Impervious (18S, 20S, 21S, SA-19)
0.253	74	Existing Grass (20S)
1.110	74	Existing Grass (C) (18S)
0.425	98	Existing Impervious (20S, 90S, SA-19)
0.080	98	Existing Imprvious (18S)
0.230	98	Existing Pond (18S)
0.180	98	IMPERVIOUS (55S, 56S)
0.110	74	OPEN C, GOOD CONDITION (23S, 55S)
0.491	74	Proposed Grass (C) (18S, 21S, SA-19)
0.004	98	Proposed Impervious (90S, SA-19)
0.230	98	ROAD (16S)
0.640	70	Woods, Good, HSG C (18S, 21S)
8.433	**81**	**TOTAL AREA**

Summary for Subcatchment 16S: SA-16

Runoff = 1.61 cfs @ 12.32 hrs, Volume= 0.175 af, Depth> 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	1.120	80	1/2 ACRE LOTS C
*	0.230	98	ROAD
	1.350	83	Weighted Average
	1.120		82.96% Pervious Area
	0.230		17.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow,** n= 0.240 P2= 3.30"
1.4	60	0.0100	0.70		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.7	200	Total			

Summary for Subcatchment 17S: SA-17

Runoff = 1.32 cfs @ 12.10 hrs, Volume= 0.102 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.900	80	1/2 ACRE LOTS C
	0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.7	55	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.3	205	Total			

Summary for Subcatchment 18S: SA-18

Runoff = 2.33 cfs @ 12.10 hrs, Volume= 0.181 af, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.230	98	Existing Pond
*	0.080	98	Existing Imprvious
*	0.040	98	Allocated Impervious
*	1.110	74	Existing Grass (C)
*	0.150	74	Proposed Grass (C)
	0.140	70	Woods, Good, HSG C
	1.750	78	Weighted Average
	1.400		80.00% Pervious Area
	0.350		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.6	140	0.3000	3.83		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
8.8	290	Total			

Summary for Subcatchment 20S: SA-20

Runoff = 0.61 cfs @ 12.11 hrs, Volume= 0.048 af, Depth> 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	3,049	98	Existing Impervious
*	11,037	74	Existing Grass
*	2,614	98	Allocated Impervious
	16,700	82	Weighted Average
	11,037		66.09% Pervious Area
	5,663		33.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
1.3	130	0.0600	1.71		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.9	280	Total			

Summary for Subcatchment 21S: SA-21

Runoff = 2.00 cfs @ 12.19 hrs, Volume= 0.184 af, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.210	74	Proposed Grass (C)
*	1.150	80	1/2 ACRE LOTS C
*	0.020	98	Allocated Impervious
	0.500	70	Woods, Good, HSG C
	1.880	77	Weighted Average
	1.860		98.94% Pervious Area
	0.020		1.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
4.6	275	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
15.5	425	Total			

Summary for Subcatchment 23S: SA-23

Runoff = 2.03 cfs @ 12.12 hrs, Volume= 0.166 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.090	74	OPEN C, GOOD CONDITION
*	1.370	80	1/2 ACRE LOTS C
	1.460	80	Weighted Average
	1.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	60	0.0250	1.11		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
11.5	160	Total			

Summary for Subcatchment 55S: SA-55

Runoff = 0.43 cfs @ 12.00 hrs, Volume= 0.027 af, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.020	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.140	95	Weighted Average
	0.020		14.29% Pervious Area
	0.120		85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.6	200	Total			

Summary for Subcatchment 56S: SA-56

Runoff = 0.20 cfs @ 11.99 hrs, Volume= 0.013 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (ac)	CN	Description
*	0.060	98	IMPERVIOUS
	0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.3	40	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.5	190	Total			

Summary for Subcatchment 90S: SA-90

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	4,657	98	Existing Impervious
*	70	98	Proposed Impervious
	4,727	98	Weighted Average
	4,727		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	75	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.0	140	Total			

Summary for Subcatchment SA-19:

Runoff = 0.69 cfs @ 12.23 hrs, Volume= 0.068 af, Depth> 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 2 YEAR STORM Rainfall=3.30"

	Area (sf)	CN	Description
*	10,790	98	Existing Impervious
*	122	98	Proposed Impervious
*	5,696	74	Proposed Grass (C)
*	871	98	Allocated Impervious
	17,479	90	Weighted Average
	5,696		32.59% Pervious Area
	11,783		67.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	93	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	308	Total			

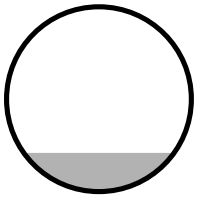
Summary for Reach 23R: CB46 TO POND

Inflow Area = 5.783 ac, 16.24% Impervious, Inflow Depth > 1.44" for 2 YEAR STORM event
Inflow = 6.46 cfs @ 12.23 hrs, Volume= 0.696 af
Outflow = 6.46 cfs @ 12.23 hrs, Volume= 0.696 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 13.57 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 6.56 fps, Avg. Travel Time= 0.2 min

Peak Storage= 31 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 67.87 cfs

24.0" Round Pipe
n= 0.013
Length= 66.0' Slope= 0.0900 '/'
Inlet Invert= 0.00', Outlet Invert= -5.94'



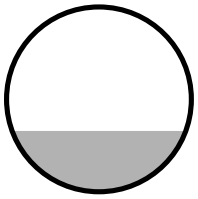
Summary for Reach 24R: CB47 TO CB46

Inflow Area = 0.492 ac, 48.49% Impervious, Inflow Depth > 1.71" for 2 YEAR STORM event
Inflow = 0.85 cfs @ 12.12 hrs, Volume= 0.070 af
Outflow = 0.84 cfs @ 12.12 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 3.76 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.69 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



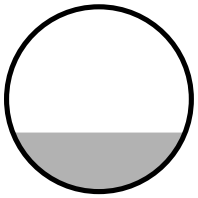
Summary for Reach 25R: CB45 TO CB46

Inflow Area = 4.890 ac, 8.79% Impervious, Inflow Depth > 1.37" for 2 YEAR STORM event
Inflow = 5.10 cfs @ 12.25 hrs, Volume= 0.559 af
Outflow = 5.06 cfs @ 12.26 hrs, Volume= 0.558 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.87 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.88 fps, Avg. Travel Time= 0.8 min

Peak Storage= 122 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 23.11 cfs

24.0" Round Pipe
n= 0.009
Length= 142.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.71'



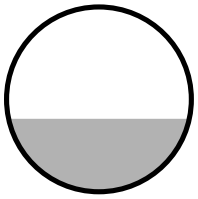
Summary for Reach 26R: CB44 TO CB45

Inflow Area = 3.010 ac, 13.62% Impervious, Inflow Depth > 1.51" for 2 YEAR STORM event
Inflow = 3.53 cfs @ 12.21 hrs, Volume= 0.379 af
Outflow = 3.50 cfs @ 12.22 hrs, Volume= 0.379 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 5.42 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 1.2 min

Peak Storage= 126 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 196.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.98'



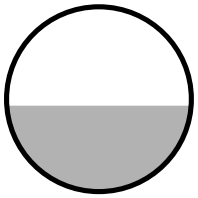
Summary for Reach 27R: CB41 TO CB43

Inflow Area = 1.350 ac, 17.04% Impervious, Inflow Depth > 1.55" for 2 YEAR STORM event
Inflow = 1.61 cfs @ 12.32 hrs, Volume= 0.175 af
Outflow = 1.60 cfs @ 12.32 hrs, Volume= 0.174 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.48 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 1.0 min

Peak Storage= 46 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 128.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.64'



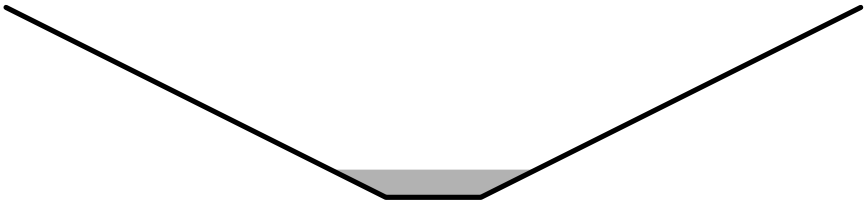
Summary for Reach 36R: SWALE

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 0.51" for 2 YEAR STORM event
Inflow = 0.55 cfs @ 16.32 hrs, Volume= 0.356 af
Outflow = 0.55 cfs @ 16.44 hrs, Volume= 0.349 af, Atten= 0%, Lag= 7.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.20 fps, Min. Travel Time= 9.7 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 11.4 min

Peak Storage= 323 cf @ 16.44 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 35.16 cfs

1.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 9.00'
Length= 700.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -3.50'



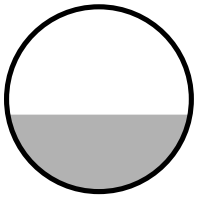
Summary for Reach 38R: CB43 YO CB44

Inflow Area = 2.870 ac, 10.10% Impervious, Inflow Depth > 1.47" for 2 YEAR STORM event
Inflow = 3.37 cfs @ 12.22 hrs, Volume= 0.352 af
Outflow = 3.37 cfs @ 12.22 hrs, Volume= 0.352 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 6.98 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.40 fps, Avg. Travel Time= 0.2 min

Peak Storage= 17 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 36.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.36'



Summary for Pond 2P: DETENTION POND

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 1.39" for 2 YEAR STORM event
Inflow = 9.23 cfs @ 12.18 hrs, Volume= 0.979 af
Outflow = 0.55 cfs @ 16.32 hrs, Volume= 0.356 af, Atten= 94%, Lag= 248.2 min
Primary = 0.55 cfs @ 16.32 hrs, Volume= 0.356 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 88.50' Surf.Area= 12,300 sf Storage= 55,528 cf
Peak Elev= 90.41' @ 16.32 hrs Surf.Area= 16,781 sf Storage= 84,797 cf (29,270 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 155.2 min (965.2 - 809.9)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	155,028 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,900	0	0
82.00	4,300	7,200	7,200
84.00	6,020	10,320	17,520
86.00	8,050	14,070	31,590
88.00	10,250	18,300	49,890
88.50	12,300	5,638	55,528
89.00	14,520	6,705	62,233
90.00	16,150	15,335	77,568
92.00	19,240	35,390	112,958
94.00	22,830	42,070	155,028

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 88.00' / 87.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	88.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	90.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	92.50'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	92.50'	**12.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00

Coef. (English) 3.11 3.40

Primary OutFlow Max=0.55 cfs @ 16.32 hrs HW=90.41' (Free Discharge)
- **1=Culvert** (Passes 0.55 cfs of 17.81 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.55 cfs @ 6.35 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: CULVERT

Inflow Area = 1.460 ac, 0.00% Impervious, Inflow Depth > 1.36" for 2 YEAR STORM event
Inflow = 2.03 cfs @ 12.12 hrs, Volume= 0.166 af
Outflow = 1.91 cfs @ 12.18 hrs, Volume= 0.165 af, Atten= 6%, Lag= 3.3 min
Primary = 1.91 cfs @ 12.18 hrs, Volume= 0.165 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 101.68' @ 12.18 hrs Surf.Area= 743 sf Storage= 408 cf

Plug-Flow detention time= 8.8 min calculated for 0.164 af (99% of inflow)
Center-of-Mass det. time= 5.4 min (810.4 - 805.0)

Volume	Invert	Avail.Storage	Storage Description
#1	101.00'	3,600 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.00	200	0	0
102.00	1,000	600	600
104.00	2,000	3,000	3,600

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**15.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 99.10' S= 0.0190 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.86 cfs @ 12.18 hrs HW=101.67' (Free Discharge)
- **1=Culvert** (Inlet Controls 1.86 cfs @ 2.78 fps)

Summary for Pond 12P: CULVERT

Inflow Area = 0.383 ac, 33.91% Impervious, Inflow Depth > 1.49" for 2 YEAR STORM event
Inflow = 0.61 cfs @ 12.11 hrs, Volume= 0.048 af
Outflow = 0.57 cfs @ 12.15 hrs, Volume= 0.047 af, Atten= 7%, Lag= 2.5 min
Primary = 0.57 cfs @ 12.15 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 101.78' @ 12.15 hrs Surf.Area= 416 sf Storage= 133 cf

Plug-Flow detention time= 10.0 min calculated for 0.047 af (98% of inflow)
Center-of-Mass det. time= 6.2 min (806.0 - 799.8)

Volume	Invert	Avail.Storage	Storage Description
#1	101.40'	1,960 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.40	100	0	0
102.00	600	210	210
103.00	2,900	1,750	1,960

Device	Routing	Invert	Outlet Devices
#1	Primary	101.40'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 101.40' / 98.20' S= 0.1600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 12.15 hrs HW=101.77' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.54 cfs @ 2.06 fps)

Summary for Pond 16P: CULVERT

Inflow Area = 1.880 ac, 1.06% Impervious, Inflow Depth > 1.18" for 2 YEAR STORM event
Inflow = 2.00 cfs @ 12.19 hrs, Volume= 0.184 af
Outflow = 1.73 cfs @ 12.31 hrs, Volume= 0.180 af, Atten= 13%, Lag= 6.9 min
Primary = 1.73 cfs @ 12.31 hrs, Volume= 0.180 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 99.71' @ 12.31 hrs Surf.Area= 2,133 sf Storage= 1,093 cf

Plug-Flow detention time= 23.0 min calculated for 0.180 af (98% of inflow)
Center-of-Mass det. time= 13.9 min (828.7 - 814.8)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	5,388 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	125	0	0
100.00	2,950	1,538	1,538
101.00	4,750	3,850	5,388

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 99.00' / 98.83' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=1.72 cfs @ 12.31 hrs HW=99.71' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.72 cfs @ 3.07 fps)

Summary for Pond 18P: DETENTION POND INLET

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth > 1.36" for 2 YEAR STORM event
Inflow = 1.32 cfs @ 12.10 hrs, Volume= 0.102 af
Outflow = 1.25 cfs @ 12.13 hrs, Volume= 0.102 af, Atten= 5%, Lag= 1.9 min
Primary = 1.25 cfs @ 12.13 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 92.58' @ 12.13 hrs Surf.Area= 420 sf Storage= 221 cf

Plug-Flow detention time= 7.5 min calculated for 0.101 af (98% of inflow)
Center-of-Mass det. time= 4.5 min (807.9 - 803.4)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	6,455 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	150	0	0
93.00	620	385	385
94.00	1,390	1,005	1,390
95.00	2,500	1,945	3,335
96.00	3,740	3,120	6,455

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**15.0" Round Culvert** L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 92.00' / 91.72' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=1.19 cfs @ 12.13 hrs HW=92.56' (Free Discharge)
1=Culvert (Barrel Controls 1.19 cfs @ 3.31 fps)

Summary for Subcatchment 16S: SA-16

Runoff = 2.93 cfs @ 12.31 hrs, Volume= 0.315 af, Depth> 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	1.120	80	1/2 ACRE LOTS C
*	0.230	98	ROAD
	1.350	83	Weighted Average
	1.120		82.96% Pervious Area
	0.230		17.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow,** n= 0.240 P2= 3.30"
1.4	60	0.0100	0.70		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.7	200	Total			

Summary for Subcatchment 17S: SA-17

Runoff = 2.52 cfs @ 12.10 hrs, Volume= 0.193 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.900	80	1/2 ACRE LOTS C
	0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.7	55	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.3	205	Total			

Summary for Subcatchment 18S: SA-18

Runoff = 4.61 cfs @ 12.09 hrs, Volume= 0.352 af, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.230	98	Existing Pond
*	0.080	98	Existing Imprvious
*	0.040	98	Allocated Impervious
*	1.110	74	Existing Grass (C)
*	0.150	74	Proposed Grass (C)
	0.140	70	Woods, Good, HSG C
	1.750	78	Weighted Average
	1.400		80.00% Pervious Area
	0.350		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.6	140	0.3000	3.83		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
8.8	290	Total			

Summary for Subcatchment 20S: SA-20

Runoff = 1.13 cfs @ 12.10 hrs, Volume= 0.087 af, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	3,049	98	Existing Impervious
*	11,037	74	Existing Grass
*	2,614	98	Allocated Impervious
	16,700	82	Weighted Average
	11,037		66.09% Pervious Area
	5,663		33.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
1.3	130	0.0600	1.71		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.9	280	Total			

Summary for Subcatchment 21S: SA-21

Runoff = 4.04 cfs @ 12.18 hrs, Volume= 0.366 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.210	74	Proposed Grass (C)
*	1.150	80	1/2 ACRE LOTS C
*	0.020	98	Allocated Impervious
	0.500	70	Woods, Good, HSG C
	1.880	77	Weighted Average
	1.860		98.94% Pervious Area
	0.020		1.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
4.6	275	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
15.5	425	Total			

Summary for Subcatchment 23S: SA-23

Runoff = 3.90 cfs @ 12.12 hrs, Volume= 0.312 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.090	74	OPEN C, GOOD CONDITION
*	1.370	80	1/2 ACRE LOTS C
	1.460	80	Weighted Average
	1.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	60	0.0250	1.11		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
11.5	160	Total			

Summary for Subcatchment 55S: SA-55

Runoff = 0.66 cfs @ 12.00 hrs, Volume= 0.042 af, Depth> 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.020	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.140	95	Weighted Average
	0.020		14.29% Pervious Area
	0.120		85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.6	200	Total			

Summary for Subcatchment 56S: SA-56

Runoff = 0.29 cfs @ 11.99 hrs, Volume= 0.019 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (ac)	CN	Description
*	0.060	98	IMPERVIOUS
	0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.3	40	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.5	190	Total			

Summary for Subcatchment 90S: SA-90

Runoff = 0.44 cfs @ 12.08 hrs, Volume= 0.034 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	4,657	98	Existing Impervious
*	70	98	Proposed Impervious
	4,727	98	Weighted Average
	4,727		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	75	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.0	140	Total			

Summary for Subcatchment SA-19:

Runoff = 1.14 cfs @ 12.23 hrs, Volume= 0.112 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 10 YEAR STORM Rainfall=4.90"

	Area (sf)	CN	Description
*	10,790	98	Existing Impervious
*	122	98	Proposed Impervious
*	5,696	74	Proposed Grass (C)
*	871	98	Allocated Impervious
	17,479	90	Weighted Average
	5,696		32.59% Pervious Area
	11,783		67.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	93	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	308	Total			

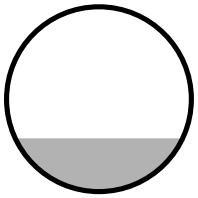
Summary for Reach 23R: CB46 TO POND

Inflow Area = 5.783 ac, 16.24% Impervious, Inflow Depth > 2.65" for 10 YEAR STORM event
Inflow = 12.19 cfs @ 12.22 hrs, Volume= 1.277 af
Outflow = 12.18 cfs @ 12.22 hrs, Volume= 1.276 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 16.35 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 7.85 fps, Avg. Travel Time= 0.1 min

Peak Storage= 49 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 67.87 cfs

24.0" Round Pipe
n= 0.013
Length= 66.0' Slope= 0.0900 '/'
Inlet Invert= 0.00', Outlet Invert= -5.94'



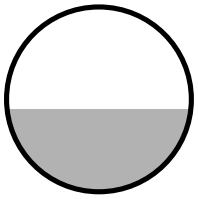
Summary for Reach 24R: CB47 TO CB46

Inflow Area = 0.492 ac, 48.49% Impervious, Inflow Depth > 2.94" for 10 YEAR STORM event
Inflow = 1.50 cfs @ 12.12 hrs, Volume= 0.120 af
Outflow = 1.50 cfs @ 12.12 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.40 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



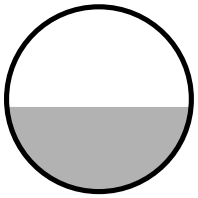
Summary for Reach 25R: CB45 TO CB46

Inflow Area = 4.890 ac, 8.79% Impervious, Inflow Depth > 2.57" for 10 YEAR STORM event
Inflow = 9.93 cfs @ 12.23 hrs, Volume= 1.045 af
Outflow = 9.86 cfs @ 12.23 hrs, Volume= 1.045 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.05 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.47 fps, Avg. Travel Time= 0.7 min

Peak Storage= 198 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 23.11 cfs

24.0" Round Pipe
n= 0.009
Length= 142.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.71'



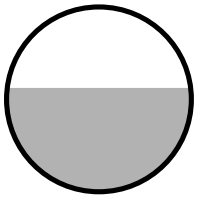
Summary for Reach 26R: CB44 TO CB45

Inflow Area = 3.010 ac, 13.62% Impervious, Inflow Depth > 2.73" for 10 YEAR STORM event
Inflow = 6.53 cfs @ 12.20 hrs, Volume= 0.686 af
Outflow = 6.50 cfs @ 12.21 hrs, Volume= 0.686 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.36 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.17 fps, Avg. Travel Time= 1.0 min

Peak Storage= 200 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 196.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.98'



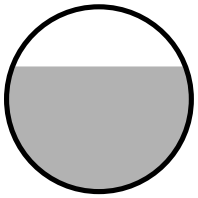
Summary for Reach 27R: CB41 TO CB43

Inflow Area = 1.350 ac, 17.04% Impervious, Inflow Depth > 2.80" for 10 YEAR STORM event
Inflow = 2.93 cfs @ 12.31 hrs, Volume= 0.315 af
Outflow = 2.91 cfs @ 12.31 hrs, Volume= 0.315 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.15 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.65 fps, Avg. Travel Time= 0.8 min

Peak Storage= 72 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 128.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.64'



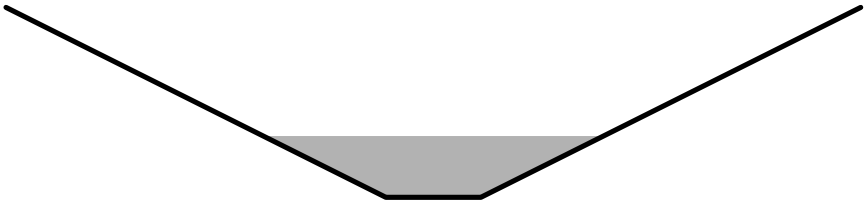
Summary for Reach 36R: SWALE

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 1.48" for 10 YEAR STORM event
Inflow = 2.73 cfs @ 13.22 hrs, Volume= 1.040 af
Outflow = 2.72 cfs @ 13.31 hrs, Volume= 1.031 af, Atten= 0%, Lag= 5.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 1.84 fps, Min. Travel Time= 6.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 8.6 min

Peak Storage= 1,035 cf @ 13.31 hrs
Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 35.16 cfs

1.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 9.00'
Length= 700.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -3.50'



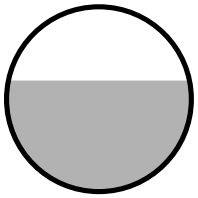
Summary for Reach 38R: CB43 YO CB44

Inflow Area = 2.870 ac, 10.10% Impervious, Inflow Depth > 2.69" for 10 YEAR STORM event
Inflow = 6.28 cfs @ 12.21 hrs, Volume= 0.644 af
Outflow = 6.28 cfs @ 12.21 hrs, Volume= 0.644 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.16 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.06 fps, Avg. Travel Time= 0.1 min

Peak Storage= 28 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 36.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.36'



Summary for Pond 2P: DETENTION POND

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 2.59" for 10 YEAR STORM event
Inflow = 18.16 cfs @ 12.15 hrs, Volume= 1.820 af
Outflow = 2.73 cfs @ 13.22 hrs, Volume= 1.040 af, Atten= 85%, Lag= 64.3 min
Primary = 2.73 cfs @ 13.22 hrs, Volume= 1.040 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 88.50' Surf.Area= 12,300 sf Storage= 55,528 cf
Peak Elev= 91.30' @ 13.22 hrs Surf.Area= 18,157 sf Storage= 100,551 cf (45,024 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 117.1 min (916.5 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	155,028 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,900	0	0
82.00	4,300	7,200	7,200
84.00	6,020	10,320	17,520
86.00	8,050	14,070	31,590
88.00	10,250	18,300	49,890
88.50	12,300	5,638	55,528
89.00	14,520	6,705	62,233
90.00	16,150	15,335	77,568
92.00	19,240	35,390	112,958
94.00	22,830	42,070	155,028

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 88.00' / 87.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	88.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	90.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	92.50'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	92.50'	**12.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00

Coef. (English) 3.11 3.40

Primary OutFlow Max=2.73 cfs @ 13.22 hrs HW=91.30' (Free Discharge)
- **1=Culvert** (Passes 2.73 cfs of 22.93 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.68 cfs @ 7.81 fps)
  - **3=Orifice/Grate** (Orifice Controls 2.05 cfs @ 3.04 fps)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: CULVERT

Inflow Area = 1.460 ac, 0.00% Impervious, Inflow Depth > 2.57" for 10 YEAR STORM event
Inflow = 3.90 cfs @ 12.12 hrs, Volume= 0.312 af
Outflow = 3.66 cfs @ 12.16 hrs, Volume= 0.311 af, Atten= 6%, Lag= 2.6 min
Primary = 3.66 cfs @ 12.16 hrs, Volume= 0.311 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.01' @ 12.16 hrs Surf.Area= 1,007 sf Storage= 620 cf

Plug-Flow detention time= 7.0 min calculated for 0.307 af (98% of inflow)
Center-of-Mass det. time= 4.1 min (798.5 - 794.4)

Volume	Invert	Avail.Storage	Storage Description
#1	101.00'	3,600 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.00	200	0	0
102.00	1,000	600	600
104.00	2,000	3,000	3,600

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**15.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 99.10' S= 0.0190 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.53 cfs @ 12.16 hrs HW=101.99' (Free Discharge)
- **1=Culvert** (Inlet Controls 3.53 cfs @ 3.39 fps)

Summary for Pond 12P: CULVERT

Inflow Area = 0.383 ac, 33.91% Impervious, Inflow Depth > 2.72" for 10 YEAR STORM event
Inflow = 1.13 cfs @ 12.10 hrs, Volume= 0.087 af
Outflow = 1.07 cfs @ 12.13 hrs, Volume= 0.086 af, Atten= 5%, Lag= 1.8 min
Primary = 1.07 cfs @ 12.13 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 101.94' @ 12.13 hrs Surf.Area= 548 sf Storage= 188 cf

Plug-Flow detention time= 8.1 min calculated for 0.086 af (99% of inflow)
Center-of-Mass det. time= 4.7 min (795.3 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1	101.40'	1,960 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.40	100	0	0
102.00	600	210	210
103.00	2,900	1,750	1,960

Device	Routing	Invert	Outlet Devices
#1	Primary	101.40'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 101.40' / 98.20' S= 0.1600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.02 cfs @ 12.13 hrs HW=101.92' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.02 cfs @ 2.46 fps)

Summary for Pond 16P: CULVERT

Inflow Area = 1.880 ac, 1.06% Impervious, Inflow Depth > 2.33" for 10 YEAR STORM event
Inflow = 4.04 cfs @ 12.18 hrs, Volume= 0.366 af
Outflow = 3.47 cfs @ 12.28 hrs, Volume= 0.360 af, Atten= 14%, Lag= 6.2 min
Primary = 3.47 cfs @ 12.28 hrs, Volume= 0.360 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 100.06' @ 12.28 hrs Surf.Area= 3,055 sf Storage= 1,762 cf

Plug-Flow detention time= 17.3 min calculated for 0.356 af (97% of inflow)
Center-of-Mass det. time= 10.8 min (812.4 - 801.6)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	5,388 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	125	0	0
100.00	2,950	1,538	1,538
101.00	4,750	3,850	5,388

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 99.00' / 98.83' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=3.45 cfs @ 12.28 hrs HW=100.05' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.45 cfs @ 3.65 fps)

Summary for Pond 18P: DETENTION POND INLET

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth > 2.57" for 10 YEAR STORM event
Inflow = 2.52 cfs @ 12.10 hrs, Volume= 0.193 af
Outflow = 2.43 cfs @ 12.12 hrs, Volume= 0.192 af, Atten= 3%, Lag= 1.4 min
Primary = 2.43 cfs @ 12.12 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 92.85' @ 12.12 hrs Surf.Area= 551 sf Storage= 328 cf

Plug-Flow detention time= 6.1 min calculated for 0.191 af (99% of inflow)
Center-of-Mass det. time= 3.5 min (796.3 - 792.8)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	6,455 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	150	0	0
93.00	620	385	385
94.00	1,390	1,005	1,390
95.00	2,500	1,945	3,335
96.00	3,740	3,120	6,455

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**15.0" Round Culvert** L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 92.00' / 91.72' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.34 cfs @ 12.12 hrs HW=92.83' (Free Discharge)
1=Culvert (Barrel Controls 2.34 cfs @ 3.82 fps)

Summary for Subcatchment 16S: SA-16

Runoff = 4.04 cfs @ 12.31 hrs, Volume= 0.433 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	1.120	80	1/2 ACRE LOTS C
*	0.230	98	ROAD
	1.350	83	Weighted Average
	1.120		82.96% Pervious Area
	0.230		17.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow,** n= 0.240 P2= 3.30"
1.4	60	0.0100	0.70		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.7	200	Total			

Summary for Subcatchment 17S: SA-17

Runoff = 3.53 cfs @ 12.09 hrs, Volume= 0.269 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.900	80	1/2 ACRE LOTS C
	0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.7	55	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.3	205	Total			

Summary for Subcatchment 18S: SA-18

Runoff = 6.56 cfs @ 12.09 hrs, Volume= 0.499 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.230	98	Existing Pond
*	0.080	98	Existing Imprvious
*	0.040	98	Allocated Impervious
*	1.110	74	Existing Grass (C)
*	0.150	74	Proposed Grass (C)
	0.140	70	Woods, Good, HSG C
	1.750	78	Weighted Average
	1.400		80.00% Pervious Area
	0.350		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.6	140	0.3000	3.83		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
8.8	290	Total			

Summary for Subcatchment 20S: SA-20

Runoff = 1.56 cfs @ 12.10 hrs, Volume= 0.120 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	3,049	98	Existing Impervious
*	11,037	74	Existing Grass
*	2,614	98	Allocated Impervious
	16,700	82	Weighted Average
	11,037		66.09% Pervious Area
	5,663		33.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
1.3	130	0.0600	1.71		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.9	280	Total			

Summary for Subcatchment 21S: SA-21

Runoff = 5.81 cfs @ 12.18 hrs, Volume= 0.523 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.210	74	Proposed Grass (C)
*	1.150	80	1/2 ACRE LOTS C
*	0.020	98	Allocated Impervious
	0.500	70	Woods, Good, HSG C
	1.880	77	Weighted Average
	1.860		98.94% Pervious Area
	0.020		1.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
4.6	275	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
15.5	425	Total			

Summary for Subcatchment 23S: SA-23

Runoff = 5.48 cfs @ 12.12 hrs, Volume= 0.437 af, Depth> 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.090	74	OPEN C, GOOD CONDITION
*	1.370	80	1/2 ACRE LOTS C
	1.460	80	Weighted Average
	1.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	60	0.0250	1.11		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
11.5	160	Total			

Summary for Subcatchment 55S: SA-55

Runoff = 0.85 cfs @ 12.00 hrs, Volume= 0.054 af, Depth> 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.020	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.140	95	Weighted Average
	0.020		14.29% Pervious Area
	0.120		85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.6	200	Total			

Summary for Subcatchment 56S: SA-56

Runoff = 0.37 cfs @ 11.99 hrs, Volume= 0.024 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (ac)	CN	Description
*	0.060	98	IMPERVIOUS
	0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.3	40	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.5	190	Total			

Summary for Subcatchment 90S: SA-90

Runoff = 0.56 cfs @ 12.08 hrs, Volume= 0.043 af, Depth> 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	4,657	98	Existing Impervious
*	70	98	Proposed Impervious
	4,727	98	Weighted Average
	4,727		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	75	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.0	140	Total			

Summary for Subcatchment SA-19:

Runoff = 1.50 cfs @ 12.23 hrs, Volume= 0.147 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 25 YEAR STORM Rainfall=6.20"

	Area (sf)	CN	Description
*	10,790	98	Existing Impervious
*	122	98	Proposed Impervious
*	5,696	74	Proposed Grass (C)
*	871	98	Allocated Impervious
	17,479	90	Weighted Average
	5,696		32.59% Pervious Area
	11,783		67.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	93	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	308	Total			

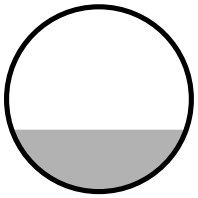
Summary for Reach 23R: CB46 TO POND

Inflow Area = 5.783 ac, 16.24% Impervious, Inflow Depth > 3.67" for 25 YEAR STORM event
Inflow = 16.29 cfs @ 12.23 hrs, Volume= 1.768 af
Outflow = 16.28 cfs @ 12.23 hrs, Volume= 1.767 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 17.72 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 8.64 fps, Avg. Travel Time= 0.1 min

Peak Storage= 61 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 67.87 cfs

24.0" Round Pipe
n= 0.013
Length= 66.0' Slope= 0.0900 '/'
Inlet Invert= 0.00', Outlet Invert= -5.94'



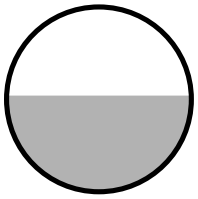
Summary for Reach 24R: CB47 TO CB46

Inflow Area = 0.492 ac, 48.49% Impervious, Inflow Depth > 3.97" for 25 YEAR STORM event
Inflow = 1.94 cfs @ 12.12 hrs, Volume= 0.163 af
Outflow = 1.94 cfs @ 12.12 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.70 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.16 fps, Avg. Travel Time= 0.2 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



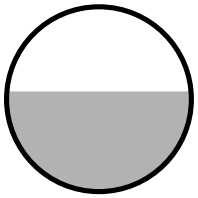
Summary for Reach 25R: CB45 TO CB46

Inflow Area = 4.890 ac, 8.79% Impervious, Inflow Depth > 3.58" for 25 YEAR STORM event
Inflow = 13.27 cfs @ 12.25 hrs, Volume= 1.460 af
Outflow = 13.21 cfs @ 12.25 hrs, Volume= 1.460 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.57 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 3.83 fps, Avg. Travel Time= 0.6 min

Peak Storage= 247 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.08'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 23.11 cfs

24.0" Round Pipe
n= 0.009
Length= 142.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.71'



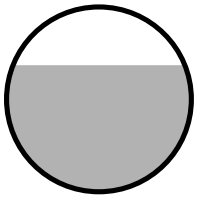
Summary for Reach 26R: CB44 TO CB45

Inflow Area = 3.010 ac, 13.62% Impervious, Inflow Depth > 3.76" for 25 YEAR STORM event
Inflow = 8.81 cfs @ 12.22 hrs, Volume= 0.944 af
Outflow = 8.73 cfs @ 12.23 hrs, Volume= 0.944 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.76 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.48 fps, Avg. Travel Time= 0.9 min

Peak Storage= 253 cf @ 12.23 hrs
Average Depth at Peak Storage= 1.03'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 196.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.98'



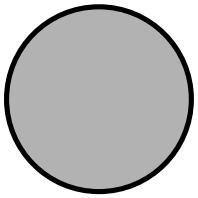
Summary for Reach 27R: CB41 TO CB43

Inflow Area = 1.350 ac, 17.04% Impervious, Inflow Depth > 3.85" for 25 YEAR STORM event
Inflow = 4.04 cfs @ 12.31 hrs, Volume= 0.433 af
Outflow = 3.68 cfs @ 12.50 hrs, Volume= 0.432 af, Atten= 9%, Lag= 11.7 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.28 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.87 fps, Avg. Travel Time= 0.7 min

Peak Storage= 102 cf @ 12.35 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 128.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.64'



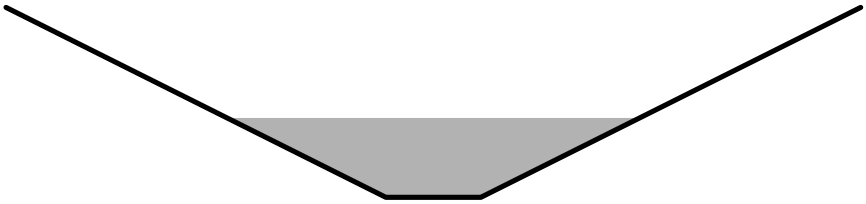
Summary for Reach 36R: SWALE

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 2.44" for 25 YEAR STORM event
Inflow = 4.74 cfs @ 12.98 hrs, Volume= 1.717 af
Outflow = 4.74 cfs @ 13.05 hrs, Volume= 1.706 af, Atten= 0%, Lag= 4.6 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.12 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 7.6 min

Peak Storage= 1,563 cf @ 13.05 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 35.16 cfs

1.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 9.00'
Length= 700.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -3.50'



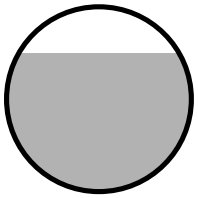
Summary for Reach 38R: CB43 YO CB44

Inflow Area = 2.870 ac, 10.10% Impervious, Inflow Depth > 3.72" for 25 YEAR STORM event
Inflow = 8.51 cfs @ 12.22 hrs, Volume= 0.891 af
Outflow = 8.50 cfs @ 12.22 hrs, Volume= 0.890 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.61 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.45 fps, Avg. Travel Time= 0.1 min

Peak Storage= 36 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.94'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 36.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.36'



Summary for Pond 2P: DETENTION POND

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 3.61" for 25 YEAR STORM event
Inflow = 24.63 cfs @ 12.15 hrs, Volume= 2.534 af
Outflow = 4.74 cfs @ 12.98 hrs, Volume= 1.717 af, Atten= 81%, Lag= 49.8 min
Primary = 4.74 cfs @ 12.98 hrs, Volume= 1.717 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 88.50' Surf.Area= 12,300 sf Storage= 55,528 cf
Peak Elev= 92.10' @ 12.98 hrs Surf.Area= 19,420 sf Storage= 115,061 cf (59,534 cf above start)

Plug-Flow detention time= 384.4 min calculated for 0.441 af (17% of inflow)
Center-of-Mass det. time= 103.6 min (898.5 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	155,028 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,900	0	0
82.00	4,300	7,200	7,200
84.00	6,020	10,320	17,520
86.00	8,050	14,070	31,590
88.00	10,250	18,300	49,890
88.50	12,300	5,638	55,528
89.00	14,520	6,705	62,233
90.00	16,150	15,335	77,568
92.00	19,240	35,390	112,958
94.00	22,830	42,070	155,028

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 88.00' / 87.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	88.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	90.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	92.50'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	92.50'	**12.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00

Coef. (English) 3.11 3.40

Primary OutFlow Max=4.74 cfs @ 12.98 hrs HW=92.10' (Free Discharge)
- **1=Culvert** (Passes 4.74 cfs of 26.63 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.78 cfs @ 8.92 fps)
  - **3=Orifice/Grate** (Orifice Controls 3.96 cfs @ 5.05 fps)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11P: CULVERT

Inflow Area = 1.460 ac, 0.00% Impervious, Inflow Depth > 3.59" for 25 YEAR STORM event
Inflow = 5.48 cfs @ 12.12 hrs, Volume= 0.437 af
Outflow = 4.73 cfs @ 12.19 hrs, Volume= 0.435 af, Atten= 14%, Lag= 4.6 min
Primary = 4.73 cfs @ 12.19 hrs, Volume= 0.435 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.27' @ 12.19 hrs Surf.Area= 1,133 sf Storage= 1,000 cf

Plug-Flow detention time= 6.5 min calculated for 0.434 af (99% of inflow)
Center-of-Mass det. time= 3.8 min (793.6 - 789.8)

Volume	Invert	Avail.Storage	Storage Description
#1	101.00'	3,600 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.00	200	0	0
102.00	1,000	600	600
104.00	2,000	3,000	3,600

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**15.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 99.10' S= 0.0190 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.70 cfs @ 12.19 hrs HW=102.26' (Free Discharge)
- **1=Culvert** (Inlet Controls 4.70 cfs @ 3.83 fps)

Summary for Pond 12P: CULVERT

Inflow Area = 0.383 ac, 33.91% Impervious, Inflow Depth > 3.76" for 25 YEAR STORM event
Inflow = 1.56 cfs @ 12.10 hrs, Volume= 0.120 af
Outflow = 1.42 cfs @ 12.15 hrs, Volume= 0.119 af, Atten= 9%, Lag= 2.9 min
Primary = 1.42 cfs @ 12.15 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.03' @ 12.15 hrs Surf.Area= 675 sf Storage= 267 cf

Plug-Flow detention time= 7.3 min calculated for 0.119 af (99% of inflow)
Center-of-Mass det. time= 4.2 min (790.6 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	101.40'	1,960 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.40	100	0	0
102.00	600	210	210
103.00	2,900	1,750	1,960

Device	Routing	Invert	Outlet Devices
#1	Primary	101.40'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 101.40' / 98.20' S= 0.1600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.37 cfs @ 12.15 hrs HW=102.02' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.37 cfs @ 2.68 fps)

Summary for Pond 16P: CULVERT

Inflow Area = 1.880 ac, 1.06% Impervious, Inflow Depth > 3.34" for 25 YEAR STORM event
Inflow = 5.81 cfs @ 12.18 hrs, Volume= 0.523 af
Outflow = 4.72 cfs @ 12.31 hrs, Volume= 0.516 af, Atten= 19%, Lag= 7.9 min
Primary = 4.72 cfs @ 12.31 hrs, Volume= 0.516 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 100.28' @ 12.31 hrs Surf.Area= 3,454 sf Storage= 2,615 cf

Plug-Flow detention time= 15.5 min calculated for 0.510 af (98% of inflow)
Center-of-Mass det. time= 9.9 min (805.9 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	5,388 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	125	0	0
100.00	2,950	1,538	1,538
101.00	4,750	3,850	5,388

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 99.00' / 98.83' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=4.70 cfs @ 12.31 hrs HW=100.28' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.70 cfs @ 3.95 fps)

Summary for Pond 18P: DETENTION POND INLET

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth > 3.59" for 25 YEAR STORM event
Inflow = 3.53 cfs @ 12.09 hrs, Volume= 0.269 af
Outflow = 3.35 cfs @ 12.13 hrs, Volume= 0.268 af, Atten= 5%, Lag= 1.9 min
Primary = 3.35 cfs @ 12.13 hrs, Volume= 0.268 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 93.05' @ 12.13 hrs Surf.Area= 657 sf Storage= 434 cf

Plug-Flow detention time= 5.4 min calculated for 0.265 af (98% of inflow)
Center-of-Mass det. time= 3.0 min (791.2 - 788.2)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	6,455 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	150	0	0
93.00	620	385	385
94.00	1,390	1,005	1,390
95.00	2,500	1,945	3,335
96.00	3,740	3,120	6,455

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**15.0" Round Culvert** L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 92.00' / 91.72' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.23 cfs @ 12.13 hrs HW=93.02' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.23 cfs @ 4.09 fps)

Summary for Subcatchment 16S: SA-16

Runoff = 4.97 cfs @ 12.30 hrs, Volume= 0.534 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	1.120	80	1/2 ACRE LOTS C
*	0.230	98	ROAD
	1.350	83	Weighted Average
	1.120		82.96% Pervious Area
	0.230		17.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	140	0.0100	0.10		**Sheet Flow,** n= 0.240 P2= 3.30"
1.4	60	0.0100	0.70		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
25.7	200	Total			

Summary for Subcatchment 17S: SA-17

Runoff = 4.40 cfs @ 12.09 hrs, Volume= 0.335 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.900	80	1/2 ACRE LOTS C
	0.900		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.7	55	0.0400	1.40		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.3	205	Total			

Summary for Subcatchment 18S: SA-18

Runoff = 8.24 cfs @ 12.09 hrs, Volume= 0.626 af, Depth> 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.230	98	Existing Pond
*	0.080	98	Existing Imprvious
*	0.040	98	Allocated Impervious
*	1.110	74	Existing Grass (C)
*	0.150	74	Proposed Grass (C)
	0.140	70	Woods, Good, HSG C
	1.750	78	Weighted Average
	1.400		80.00% Pervious Area
	0.350		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	150	0.0670	0.30		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
0.6	140	0.3000	3.83		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
8.8	290	Total			

Summary for Subcatchment 20S: SA-20

Runoff = 1.93 cfs @ 12.10 hrs, Volume= 0.148 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	3,049	98	Existing Impervious
*	11,037	74	Existing Grass
*	2,614	98	Allocated Impervious
	16,700	82	Weighted Average
	11,037		66.09% Pervious Area
	5,663		33.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	150	0.0600	0.29		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
1.3	130	0.0600	1.71		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
9.9	280	Total			

Summary for Subcatchment 21S: SA-21

Runoff = 7.34 cfs @ 12.17 hrs, Volume= 0.659 af, Depth> 4.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.210	74	Proposed Grass (C)
*	1.150	80	1/2 ACRE LOTS C
*	0.020	98	Allocated Impervious
	0.500	70	Woods, Good, HSG C
	1.880	77	Weighted Average
	1.860		98.94% Pervious Area
	0.020		1.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	150	0.0330	0.23		**Sheet Flow, Segment ID:** Grass: Short n= 0.150 P2= 3.30"
4.6	275	0.0200	0.99		**Shallow Concentrated Flow, Segment ID:** Short Grass Pasture Kv= 7.0 fps
15.5	425	Total			

Summary for Subcatchment 23S: SA-23

Runoff = 6.84 cfs @ 12.11 hrs, Volume= 0.544 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.090	74	OPEN C, GOOD CONDITION
*	1.370	80	1/2 ACRE LOTS C
	1.460	80	Weighted Average
	1.460		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	100	0.0400	0.16		**Sheet Flow, Segment ID:** n= 0.240 P2= 3.30"
0.9	60	0.0250	1.11		**Shallow Concentrated Flow, Segment ID:** Kv= 7.0 fps
11.5	160	Total			

Summary for Subcatchment 55S: SA-55

Runoff = 1.00 cfs @ 12.00 hrs, Volume= 0.064 af, Depth> 5.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.020	74	OPEN C, GOOD CONDITION
*	0.120	98	IMPERVIOUS
	0.140	95	Weighted Average
	0.020		14.29% Pervious Area
	0.120		85.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.4	50	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.6	200	Total			

Summary for Subcatchment 56S: SA-56

Runoff = 0.44 cfs @ 11.99 hrs, Volume= 0.028 af, Depth> 5.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (ac)	CN	Description
*	0.060	98	IMPERVIOUS
	0.060		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	150	0.0100	1.15		**Sheet Flow, Segment ID:** n= 0.011 P2= 3.30"
0.3	40	0.0100	2.03		**Shallow Concentrated Flow, Segment ID:** Kv= 20.3 fps
2.5	190	Total			

Summary for Subcatchment 90S: SA-90

Runoff = 0.66 cfs @ 12.08 hrs, Volume= 0.051 af, Depth> 5.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	4,657	98	Existing Impervious
*	70	98	Proposed Impervious
	4,727	98	Weighted Average
	4,727		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	75	0.0150	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
9.0	140	Total			

Summary for Subcatchment SA-19:

Runoff = 1.80 cfs @ 12.23 hrs, Volume= 0.177 af, Depth> 5.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Type III 24-hr 50 YEAR STORM Rainfall=7.30"

	Area (sf)	CN	Description
*	10,790	98	Existing Impervious
*	122	98	Proposed Impervious
*	5,696	74	Proposed Grass (C)
*	871	98	Allocated Impervious
	17,479	90	Weighted Average
	5,696		32.59% Pervious Area
	11,783		67.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.3	150	0.0080	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.30"
1.0	93	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	65	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
20.7	308	Total			

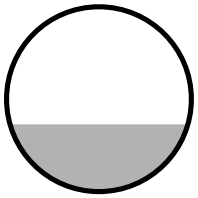
Summary for Reach 23R: CB46 TO POND

Inflow Area = 5.783 ac, 16.24% Impervious, Inflow Depth > 4.54" for 50 YEAR STORM event
Inflow = 19.08 cfs @ 12.24 hrs, Volume= 2.190 af
Outflow = 19.07 cfs @ 12.24 hrs, Volume= 2.188 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 18.50 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 9.21 fps, Avg. Travel Time= 0.1 min

Peak Storage= 68 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 67.87 cfs

24.0" Round Pipe
n= 0.013
Length= 66.0' Slope= 0.0900 '/'
Inlet Invert= 0.00', Outlet Invert= -5.94'



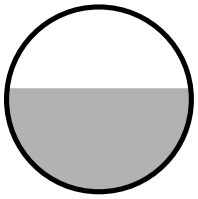
Summary for Reach 24R: CB47 TO CB46

Inflow Area = 0.492 ac, 48.49% Impervious, Inflow Depth > 4.84" for 50 YEAR STORM event
Inflow = 2.19 cfs @ 12.13 hrs, Volume= 0.199 af
Outflow = 2.19 cfs @ 12.13 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 4.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 0.2 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 24.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.12'



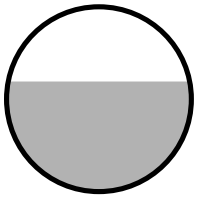
Summary for Reach 25R: CB45 TO CB46

Inflow Area = 4.890 ac, 8.79% Impervious, Inflow Depth > 4.46" for 50 YEAR STORM event
Inflow = 15.41 cfs @ 12.26 hrs, Volume= 1.816 af
Outflow = 15.34 cfs @ 12.26 hrs, Volume= 1.816 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 7.85 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 4.08 fps, Avg. Travel Time= 0.6 min

Peak Storage= 277 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 23.11 cfs

24.0" Round Pipe
n= 0.009
Length= 142.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.71'



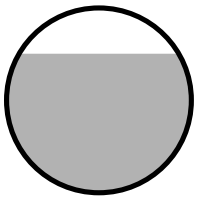
Summary for Reach 26R: CB44 TO CB45

Inflow Area = 3.010 ac, 13.62% Impervious, Inflow Depth > 4.65" for 50 YEAR STORM event
Inflow = 9.87 cfs @ 12.21 hrs, Volume= 1.165 af
Outflow = 9.81 cfs @ 12.22 hrs, Volume= 1.165 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 6.88 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.69 fps, Avg. Travel Time= 0.9 min

Peak Storage= 279 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.13'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 10.73 cfs

18.0" Round Pipe
n= 0.009
Length= 196.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.98'



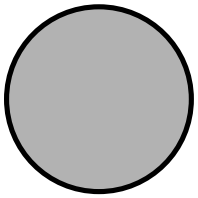
Summary for Reach 27R: CB41 TO CB43

Inflow Area = 1.350 ac, 17.04% Impervious, Inflow Depth > 4.74" for 50 YEAR STORM event
Inflow = 4.97 cfs @ 12.30 hrs, Volume= 0.534 af
Outflow = 3.64 cfs @ 12.20 hrs, Volume= 0.532 af, Atten= 27%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 5.27 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 3.02 fps, Avg. Travel Time= 0.7 min

Peak Storage= 101 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.64 cfs

12.0" Round Pipe
n= 0.009
Length= 128.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -0.64'



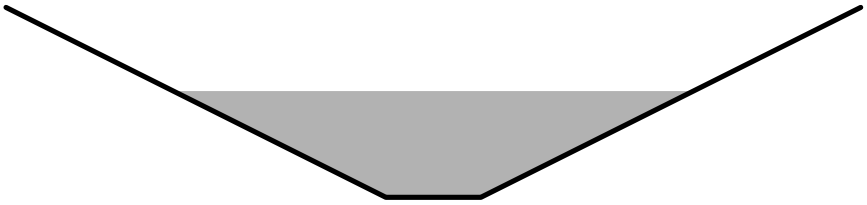
Summary for Reach 36R: SWALE

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 3.28" for 50 YEAR STORM event
Inflow = 9.38 cfs @ 12.81 hrs, Volume= 2.304 af
Outflow = 9.07 cfs @ 12.87 hrs, Volume= 2.292 af, Atten= 3%, Lag= 3.9 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Max. Velocity= 2.50 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 1.66 fps, Avg. Travel Time= 7.0 min

Peak Storage= 2,538 cf @ 12.87 hrs
Average Depth at Peak Storage= 1.12'
Bank-Full Depth= 2.00' Flow Area= 10.0 sf, Capacity= 35.16 cfs

1.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 9.00'
Length= 700.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -3.50'



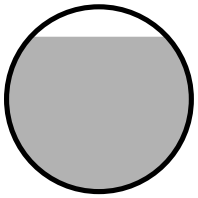
Summary for Reach 38R: CB43 YO CB44

Inflow Area = 2.870 ac, 10.10% Impervious, Inflow Depth > 4.61" for 50 YEAR STORM event
Inflow = 9.52 cfs @ 12.21 hrs, Volume= 1.102 af
Outflow = 9.51 cfs @ 12.21 hrs, Volume= 1.101 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs / 2
Max. Velocity= 8.66 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.73 fps, Avg. Travel Time= 0.1 min

Peak Storage= 40 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.05'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 9.33 cfs

15.0" Round Pipe
n= 0.009
Length= 36.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.36'



Summary for Pond 2P: DETENTION POND

Inflow Area = 8.433 ac, 15.29% Impervious, Inflow Depth > 4.48" for 50 YEAR STORM event
Inflow = 29.38 cfs @ 12.14 hrs, Volume= 3.149 af
Outflow = 9.38 cfs @ 12.81 hrs, Volume= 2.304 af, Atten= 68%, Lag= 39.8 min
Primary = 9.38 cfs @ 12.81 hrs, Volume= 2.304 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Starting Elev= 88.50' Surf.Area= 12,300 sf Storage= 55,528 cf
Peak Elev= 92.65' @ 12.81 hrs Surf.Area= 20,414 sf Storage= 126,710 cf (71,182 cf above start)

Plug-Flow detention time= 301.6 min calculated for 1.018 af (32% of inflow)
Center-of-Mass det. time= 99.8 min (892.3 - 792.6)

Volume	Invert	Avail.Storage	Storage Description
#1	80.00'	155,028 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
80.00	2,900	0	0
82.00	4,300	7,200	7,200
84.00	6,020	10,320	17,520
86.00	8,050	14,070	31,590
88.00	10,250	18,300	49,890
88.50	12,300	5,638	55,528
89.00	14,520	6,705	62,233
90.00	16,150	15,335	77,568
92.00	19,240	35,390	112,958
94.00	22,830	42,070	155,028

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**24.0" Round Culvert** L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 88.00' / 87.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Device 1	88.50'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	90.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	92.50'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 4.0' Crest Height
#5	Primary	92.50'	**12.0' long Broad-Crested Rectangular Weir** Head (feet) 0.50 1.00

Coef. (English) 3.11 3.40

Primary OutFlow Max=9.09 cfs @ 12.81 hrs HW=92.65' (Free Discharge)
- **1=Culvert** (Passes 6.87 cfs of 28.91 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.84 cfs @ 9.61 fps)
  - **3=Orifice/Grate** (Orifice Controls 4.86 cfs @ 6.19 fps)
  - **4=Sharp-Crested Rectangular Weir** (Weir Controls 1.17 cfs @ 1.28 fps)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 2.22 cfs @ 1.21 fps)

Summary for Pond 11P: CULVERT

Inflow Area = 1.460 ac, 0.00% Impervious, Inflow Depth > 4.47" for 50 YEAR STORM event
Inflow = 6.84 cfs @ 12.11 hrs, Volume= 0.544 af
Outflow = 5.70 cfs @ 12.21 hrs, Volume= 0.542 af, Atten= 17%, Lag= 5.6 min
Primary = 5.70 cfs @ 12.21 hrs, Volume= 0.542 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.56' @ 12.21 hrs Surf.Area= 1,278 sf Storage= 1,433 cf

Plug-Flow detention time= 6.3 min calculated for 0.541 af (99% of inflow)
Center-of-Mass det. time= 3.7 min (790.8 - 787.1)

Volume	Invert	Avail.Storage	Storage Description
#1	101.00'	3,600 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.00	200	0	0
102.00	1,000	600	600
104.00	2,000	3,000	3,600

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**15.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 101.00' / 99.10' S= 0.0190 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.66 cfs @ 12.21 hrs HW=102.54' (Free Discharge)
- **1=Culvert** (Inlet Controls 5.66 cfs @ 4.62 fps)

Summary for Pond 12P: CULVERT

Inflow Area = 0.383 ac, 33.91% Impervious, Inflow Depth > 4.64" for 50 YEAR STORM event
Inflow = 1.93 cfs @ 12.10 hrs, Volume= 0.148 af
Outflow = 1.61 cfs @ 12.18 hrs, Volume= 0.148 af, Atten= 16%, Lag= 4.8 min
Primary = 1.61 cfs @ 12.18 hrs, Volume= 0.148 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 102.08' @ 12.18 hrs Surf.Area= 794 sf Storage= 357 cf

Plug-Flow detention time= 7.0 min calculated for 0.147 af (99% of inflow)
Center-of-Mass det. time= 4.0 min (788.1 - 784.2)

Volume	Invert	Avail.Storage	Storage Description
#1	101.40'	1,960 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
101.40	100	0	0
102.00	600	210	210
103.00	2,900	1,750	1,960

Device	Routing	Invert	Outlet Devices
#1	Primary	101.40'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 101.40' / 98.20' S= 0.1600 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.59 cfs @ 12.18 hrs HW=102.08' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.59 cfs @ 2.80 fps)

Summary for Pond 16P: CULVERT

Inflow Area = 1.880 ac, 1.06% Impervious, Inflow Depth > 4.21" for 50 YEAR STORM event
Inflow = 7.34 cfs @ 12.17 hrs, Volume= 0.659 af
Outflow = 5.86 cfs @ 12.31 hrs, Volume= 0.652 af, Atten= 20%, Lag= 8.3 min
Primary = 5.86 cfs @ 12.31 hrs, Volume= 0.652 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 100.48' @ 12.31 hrs Surf.Area= 3,813 sf Storage= 3,383 cf

Plug-Flow detention time= 14.8 min calculated for 0.651 af (99% of inflow)
Center-of-Mass det. time= 9.4 min (802.3 - 792.9)

Volume	Invert	Avail.Storage	Storage Description
#1	99.00'	5,388 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
99.00	125	0	0
100.00	2,950	1,538	1,538
101.00	4,750	3,850	5,388

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**18.0" Round Culvert** L= 34.0' Ke= 0.500 Inlet / Outlet Invert= 99.00' / 98.83' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=5.82 cfs @ 12.31 hrs HW=100.47' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.82 cfs @ 4.18 fps)

Summary for Pond 18P: DETENTION POND INLET

Inflow Area = 0.900 ac, 0.00% Impervious, Inflow Depth > 4.47" for 50 YEAR STORM event
Inflow = 4.40 cfs @ 12.09 hrs, Volume= 0.335 af
Outflow = 3.95 cfs @ 12.14 hrs, Volume= 0.334 af, Atten= 10%, Lag= 2.7 min
Primary = 3.95 cfs @ 12.14 hrs, Volume= 0.334 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.10 hrs
Peak Elev= 93.17' @ 12.14 hrs Surf.Area= 753 sf Storage= 559 cf

Plug-Flow detention time= 5.2 min calculated for 0.334 af (99% of inflow)
Center-of-Mass det. time= 2.9 min (788.4 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1	92.00'	6,455 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.00	150	0	0
93.00	620	385	385
94.00	1,390	1,005	1,390
95.00	2,500	1,945	3,335
96.00	3,740	3,120	6,455

Device	Routing	Invert	Outlet Devices
#1	Primary	92.00'	**15.0" Round Culvert** L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 92.00' / 91.72' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.83 cfs @ 12.14 hrs HW=93.15' (Free Discharge)
1=Culvert (Barrel Controls 3.83 cfs @ 4.25 fps)

Appendix H

Sierra Woods Drainage Plans

- **Pre-Development Plan**
- **USGS Schematics (2)**
- **Post Development Plan**

SA-8 not shown
See U.S.G.S. Predevelopment Plan for additional information

Location Map
Scale: 1" = 1 Mile

N/F City of Saco
3429 / 198

N/F Earle F. Boothby
900 / 259

N/F John R. & Fleurette R. Fenderson
7145 / 258

N/F George R. & Barbara L. Wiseman
2560 / 62

N/F Rene L. & Elaine A. Cote
7771 / 001

N/F Isabelle M. Crockett
5141 / 187

N/F City of Saco
1935 / 787

SA-1
SA-2
SA-3
SA-4
SA-5
SA-6
SA-7

Sheet 150'
Shallow 1800'
Shallow 1700'
Shallow 200'
Shallow 1100'
Shallow 410'
Shallow 390'
Shallow 260'
Sheet 100'
Sheet 120'
Channel 1,000'
Reach 1* (3,400')
Reach 3* (1,800')
Reach 4
Reach 5
Reach 7
Reach 8
Reach 10
tc Route
Deep Brook
Sandy Brook
100 Year Flood Line
Analysis Point
Wooded
Open
Open House Lots
Pond 1
Pond 2
Pond 5
Pond 6
Farm Pond
Spillway
Gravel Drive
100 year flood over ex. gravel road
15" RCP Inv. 92.17
24" RCP Inv. 92.53
Inv. 92.28
12" CMP
18" CMP Inv. 90.09
Inv. 89.36
10" C.I. Inv. 86.37
12" CMP Inv. 86.99
Inv. 86.12
Inv. 86.29
60" CMP Inv. 83.26
Inv. 83.02
Ex. SMH Inv. 80.15
Inv. 95.90
UP #J103

Buxton B mwd
Buxton C mwd
Lamoine A mwd
Lamoine A spd
Scantic A pd

*Reach 1 & 3 are the same except differing lengths

Scale: 1" = 100'

Legend

- Granite Monumentation Found
- Iron Pipe Found
- Property Line
- Setback Line
- Soil Boundary
- Exist. Wetlands
- Exist. Stormdrain
- Exist. Building
- Exist. Contours
- Drainage Subarea Boundary
- Time of Concentration Path
- 100 Year Flood Line

Soils Legend

Soils	H.S.G.
Lamoine	D
Buxton, mwd	C
Scantic	D

Topography by BH2M dated 1/16/99.
Benchmark: Top of concrete foundation of pump station off Rte. 112, Elev.88.70 City of Saco datum

Wetlands & Soils Mapping:
Mark Hampton Assoc.
Portland, Maine

NO.	DATE	REVISION DESCRIPTION
1	2/22/00	preliminary plan approval
2	4/07/00	Public Hearing
3	7/18/00	Preliminary Plan Approval
4	11/14/00	Preliminary Plan Approval
5	3/02/01	for Final Plan Approval

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street
Gorham, Maine 04038
Tel. (207) 839-2771
Fax (207) 839-8250

Sierra Woods Inc.
4 Pacer Ave.
Old Orchard Beach, Maine 04064

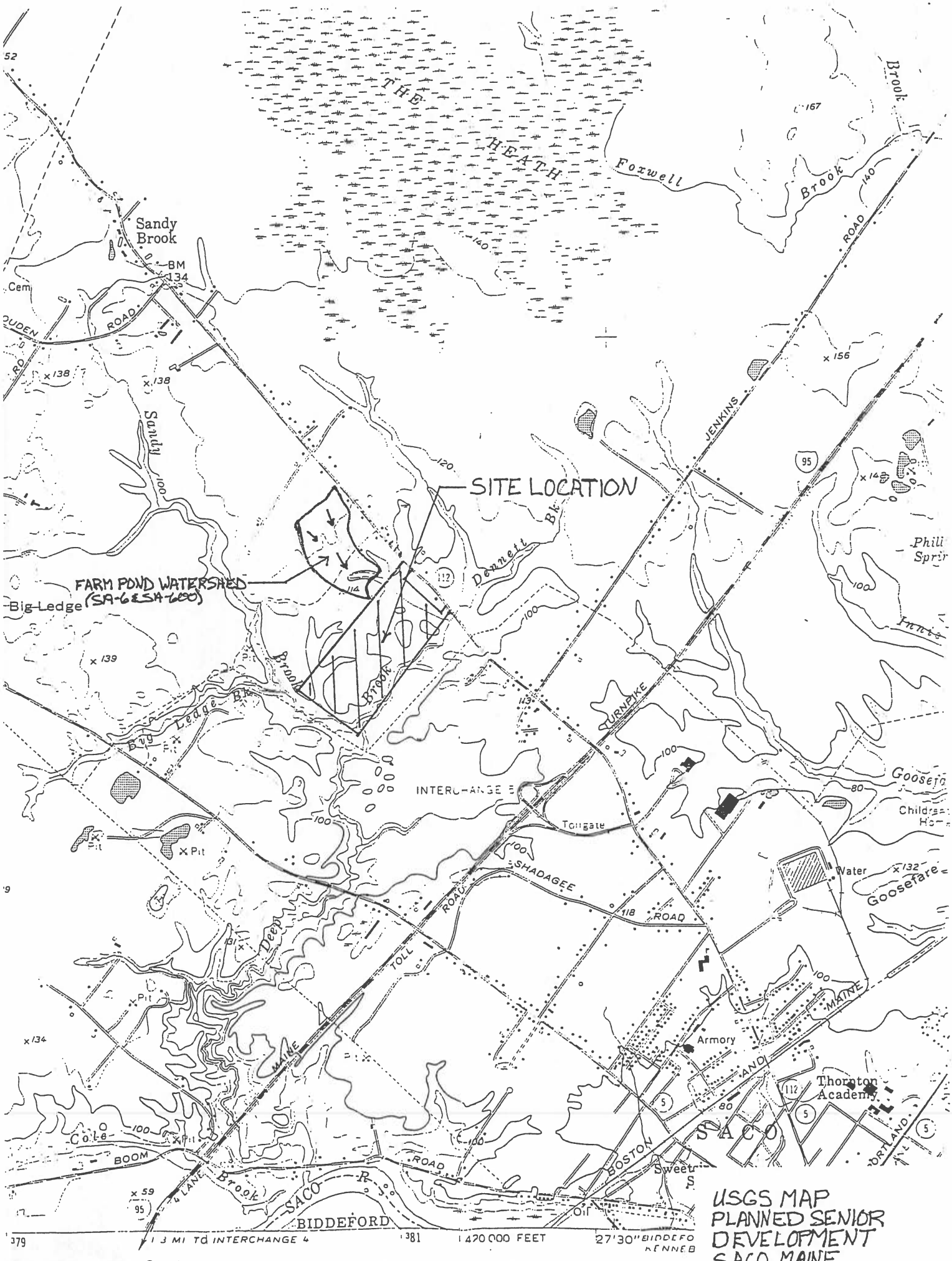
Predevelopment
Drainage Plan
Planned Senior Development
Buxton Road, Route 112
Saco, Maine 04072

DESIGNED	DATE
W. Whitten	Jan 2000
DRAWN	SCALE
W. Whitten	1" = 100'
CHECKED	JOB. NO.
B. Thompson	99-119

15

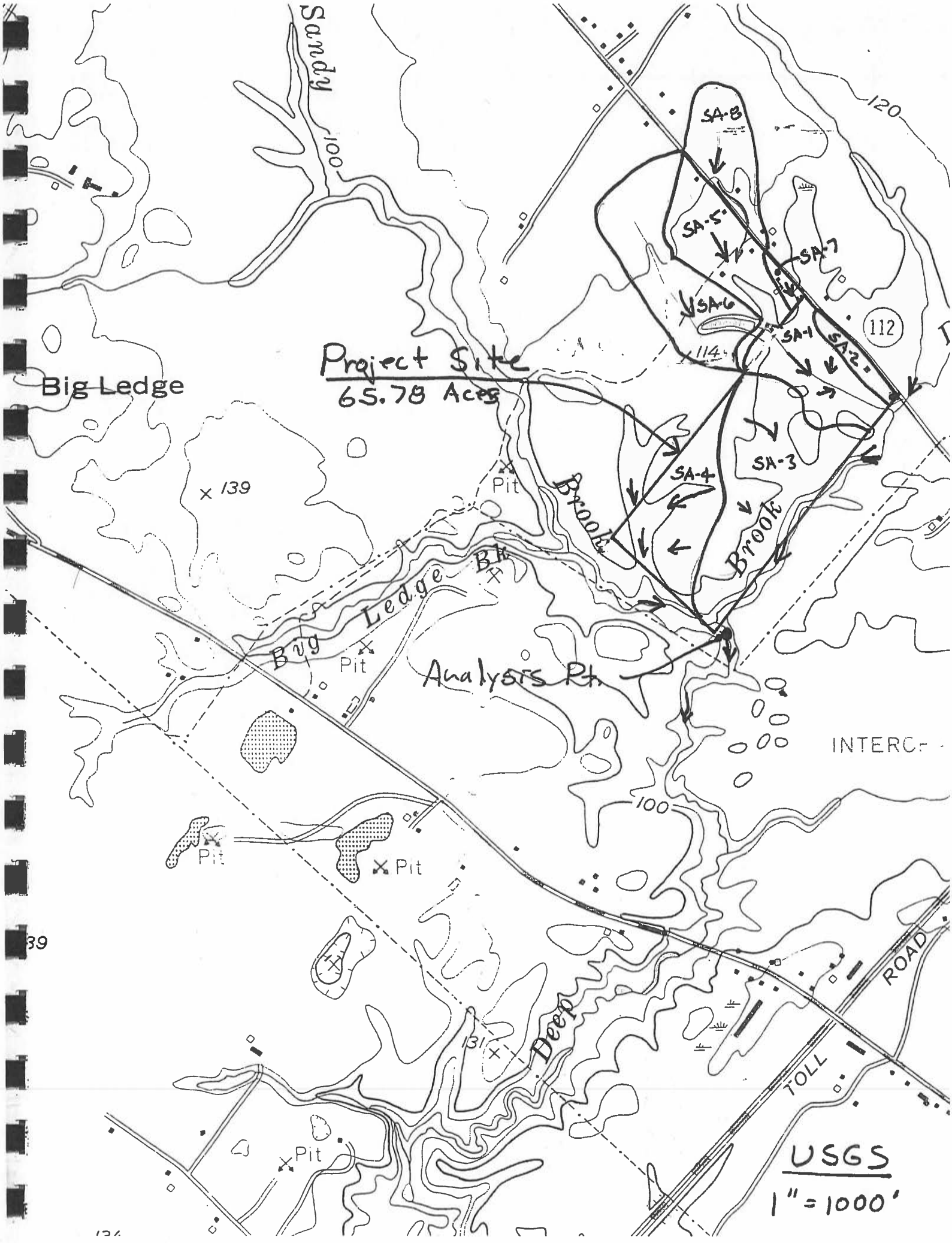
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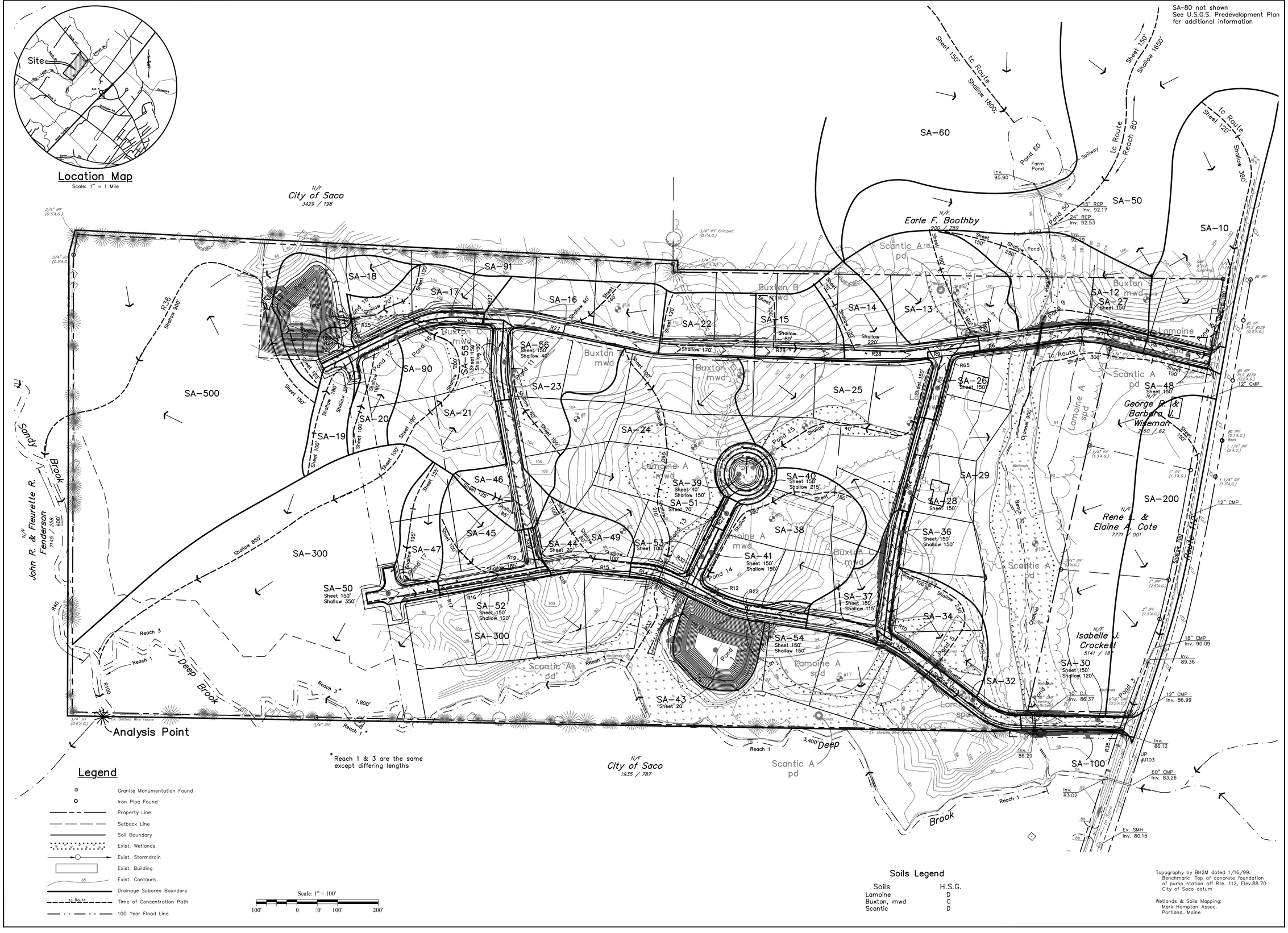
E:\1999\99JOBS\DWG\predev 12/20/2001 10:22:20 AM Adobe PDF p=5



USGS MAP
PLANNED SENIOR
DEVELOPMENT
SACO, MAINE

d by the Army Map Service


Sandy
100
120
SA-8
SA-5
SA-7
SA-6
SA-1
SA-2
112
114
Project Site
65.78 Acres
Big Ledge
SA-4
SA-3
x 139
Pit
Brook
Brook
Big Ledge Rd
Pit
Analysis Pt.
INTERC
100
Pit
Pit
39
131
Deep
ROAD
TOLL
Pit
USGS
1" = 1000'



* Reach 1 & 3 are the same except differing lengths

Legend

- Granite Monumentation Found
- Iron Pipe Found
- Property Line
- Setback Line
- Soil Boundary
- Exist. Wetlands
- Exist. Stormdrain
- Exist. Building
- Exist. Contours
- Drainage Subarea Boundary
- Time of Concentration Path
- 100 Year Flood Line

Soils Legend

Soils	H.S.G.
Lamoine	D
Buxton, mwd	C
Scantic	D

Topography by BH2M dated 1/16/99.
Benchmark: Top of concrete foundation of pump station off Rte. 112, Elev.88.70 City of Saco datum

Wetlands & Soils Mapping:
Mark Hampton Assoc.
Portland, Maine

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NO.	DATE	DESCRIPTION
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3	7/18/00	Preliminary Plan Approval
4	11/14/00	Preliminary Plan Approval
5	3/02/01	for Final Plan Approval
6	4/03/01	for Final Plan Approval

BH2M
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Sierra Woods Inc.
4 Pacer Ave.
Old Orchard Beach, Maine 04064

Postdevelopment
Drainage Plan
Planned Senior Development
Buxton Road, Route 112
Saco, Maine 04072

DESIGNED	DATE
W. Whitten	Jan 2000
DRAWN	SCALE
W. Whitten	1" = 100'
CHECKED	JOB. NO.
B. Thompson	99-119

16

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Appendix I

Sizing Calculations
- 100 Year Wet Pond 3
- 25 & 100 Year Plugged OCS
- Outlet Control Design

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, Dec 1 2017

<Name>

Trapezoidal

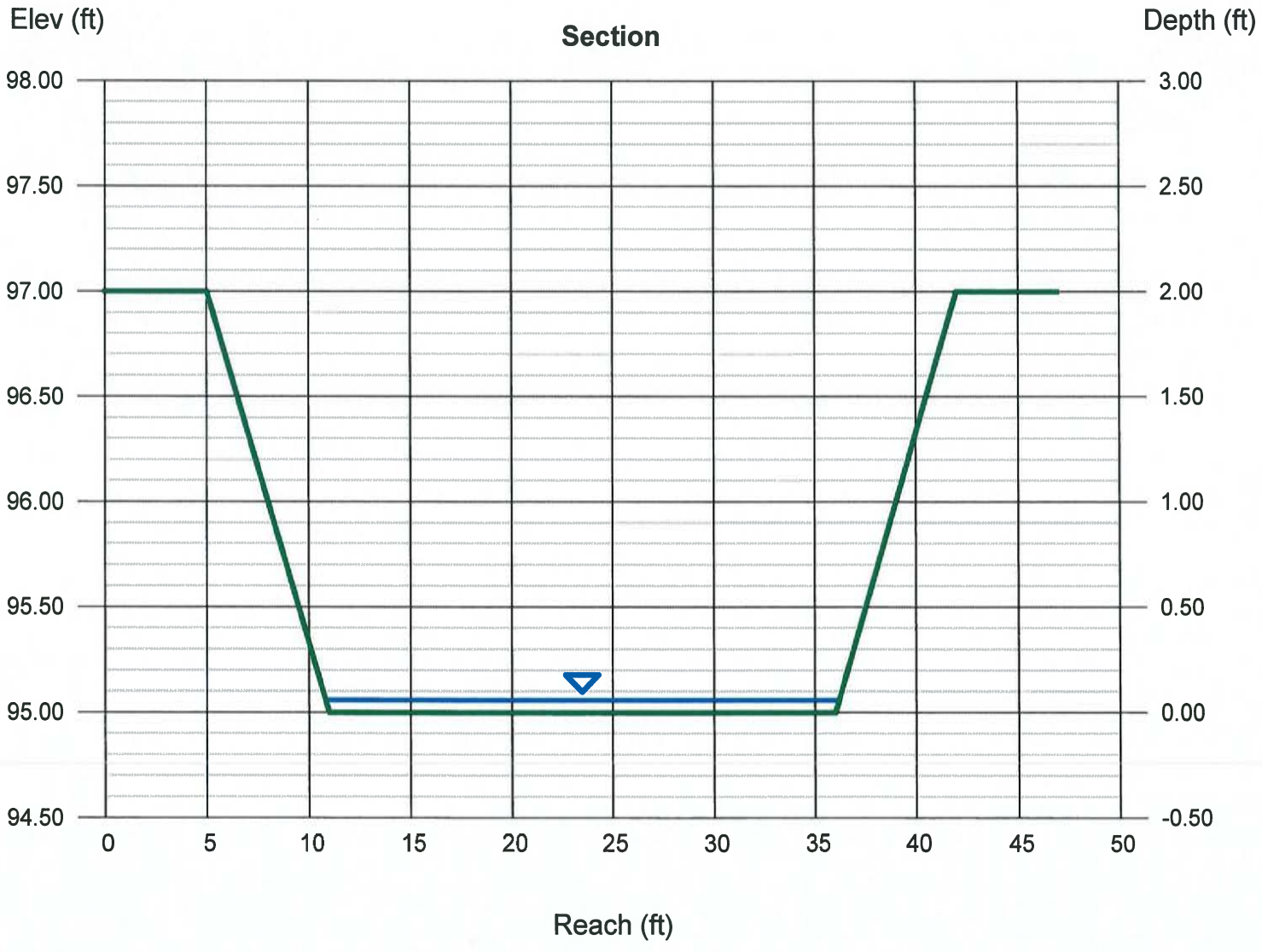
Bottom Width (ft)	= 25.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 95.00
Slope (%)	= 50.00
N-Value	= 0.035

Calculations

Compute by:	Known Q
Known Q (cfs)	= 5.83

Highlighted

Depth (ft)	= 0.06
Q (cfs)	= 5.830
Area (sqft)	= 1.51
Velocity (ft/s)	= 3.86
Wetted Perim (ft)	= 25.38
Crit Depth, Yc (ft)	= 0.12
Top Width (ft)	= 25.36
EGL (ft)	= 0.29



Summary for Pond 100P: POND 3

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 6.31" for 100 YEAR STORM event
Inflow = 33.80 cfs @ 12.20 hrs, Volume= 3.508 af
Outflow = 24.75 cfs @ 12.39 hrs, Volume= 3.085 af, Atten= 27%, Lag= 11.8 min
Primary = 18.92 cfs @ 12.39 hrs, Volume= 2.983 af
Secondary = 5.83 cfs @ 12.39 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 95.19' @ 12.39 hrs Surf.Area= 15,490 sf Storage= 77,242 cf (41,040 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= 146.2 min calculated for 2.254 af (64% of inflow)
Center-of-Mass det. time= 31.4 min (799.5 - 768.1)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	89.50'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.50' / 88.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Device 1	93.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#4	Device 1	89.50'	**1.5" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=18.91 cfs @ 12.39 hrs HW=95.19' (Free Discharge)
└**1=Culvert** (Inlet Controls 18.91 cfs @ 10.70 fps)
└**3=Sharp-Crested Vee/Trap Weir** (Passes < 43.20 cfs potential flow)
└**4=Orifice/Grate** (Passes < 0.14 cfs potential flow)

Secondary OutFlow Max=5.58 cfs @ 12.39 hrs HW=95.19' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 5.58 cfs @ 1.17 fps)

Summary for Pond 1P: PLUGGED OCS

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 4.06" for 25 YEAR STORM event
Inflow = 22.13 cfs @ 12.20 hrs, Volume= 2.257 af
Outflow = 15.75 cfs @ 12.42 hrs, Volume= 1.371 af, Atten= 29%, Lag= 13.0 min
Primary = 15.75 cfs @ 12.42 hrs, Volume= 1.371 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 95.38' @ 12.42 hrs Surf.Area= 15,798 sf Storage= 80,144 cf (43,942 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= 316.3 min calculated for 0.538 af (24% of inflow)
Center-of-Mass det. time= 68.1 min (846.5 - 778.4)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.47 cfs @ 12.42 hrs HW=95.37' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 15.47 cfs @ 1.65 fps)

Summary for Pond 1P: PLUGGED OCS

Inflow Area = 6.670 ac, 38.16% Impervious, Inflow Depth > 6.31" for 100 YEAR STORM event
Inflow = 33.80 cfs @ 12.20 hrs, Volume= 3.508 af
Outflow = 32.07 cfs @ 12.26 hrs, Volume= 2.619 af, Atten= 5%, Lag= 4.0 min
Primary = 32.07 cfs @ 12.26 hrs, Volume= 2.619 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 92.00' Surf.Area= 9,828 sf Storage= 36,203 cf
Peak Elev= 95.61' @ 12.26 hrs Surf.Area= 16,182 sf Storage= 83,845 cf (47,643 cf above start)
Flood Elev= 95.00' Surf.Area= 15,171 sf Storage= 74,294 cf (38,092 cf above start)

Plug-Flow detention time= 176.3 min calculated for 1.788 af (51% of inflow)
Center-of-Mass det. time= 50.9 min (819.0 - 768.1)

Volume	Invert	Avail.Storage	Storage Description
#1	86.00'	107,983 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
86.00	2,569	0	0
87.00	3,638	3,104	3,104
88.00	4,763	4,201	7,304
89.00	5,944	5,354	12,658
90.00	7,182	6,563	19,221
91.00	8,477	7,830	27,050
92.00	9,828	9,153	36,203
93.00	12,023	10,926	47,128
94.00	13,569	12,796	59,924
95.00	15,171	14,370	74,294
96.00	16,830	16,001	90,295
97.00	18,546	17,688	107,983

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**25.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=31.85 cfs @ 12.26 hrs HW=95.61' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 31.85 cfs @ 2.10 fps)

BH2M
28 State Street
Gorham, Maine 04038

OUTLET CONTROL STRUCTURE DESIGN
SANDY BROOK SUBDIVISION

Rim Elevation=	93.5	
Weir Perimeter (L)=	5.01 ft	Use Model # R-2560-E2
Orifice Area (a)=	2.00 sf	
# of Grates=	2	
g=	32.185	
C=	0.62	

Weir Flow ($Q=3.27*L*H^{1.5}$)				
Stage Elevation	Notes	Head (ft)	Available Capacity (cfs)	Target Capacity (cfs)*
93.67	2 Year Elevation	0.17	2.30	1.51
94.14	10 Year Elevation	0.64	16.78	10.21
94.44	25 Year Elevation	0.94	29.86	16.98

Orifice Flow ($Q=C*a*(2gH)^{0.5}$)				
Stage Elevation	Notes	Head (ft)	Available Capacity (cfs)	Target Capacity (cfs)*
93.67	2 Year Elevation	0.17	8.20	1.51
94.14	10 Year Elevation	0.64	15.92	10.21
94.44	25 Year Elevation	0.94	19.29	16.98

*Note: Target Capacity is the Primary Outflow from the Hydrocad Model

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street, Gorham, Maine 04038
207 839-2771

WILLIAM A. THOMPSON
ROBERT C. LIBBY, Jr.
WALTER E. PELKEY
ANDREW S. MORRELL
STEVEN J. BLAKE

December 20, 2017

Bob Hamblen, City Planner
City of Saco
300 Main Street
Saco, Maine 04072

RE: Preliminary Subdivision Revisions
Sandy Brook Subdivision-21 Lots (Conventional Subdivision)

Dear Bob,

Please find attached three (3) full size plan sets of the following information in support of revisions for a Preliminary Subdivision for Sandy Brook Subdivision off Chantelle Way and Blake Avenue for Star Homes (please note an electronic set has also been emailed to your office):

- Ability to Serve letter-Maine Water Company
- Revised Stormwater Report (3 copies provided)
- Revised Subdivision Plans (full size)

As you know this project was before the Planning Board on August 8, 2017 in consideration for a Preliminary Cluster Subdivision Review. At that meeting we heard from many of the abutters in the Sierra Woods subdivision. Many of these abutters were opposed to the idea of a cluster subdivision on this parcel of land. The applicant has heard their concerns as well as the direction provided by the Planning Board and has redesigned the subdivision accordingly. As you recall we had previously proposed a 25 lot cluster subdivision (10,000 sf lots). The applicant has reduced the lots to 21 and is now proposing a conventional subdivision (minimum lot sizes are 15,000 sf within the R-1d zoning district). Please note the street configurations have not been altered (horizontally) as a result of this design change.

Once the applicant had made the choice to switch the design to a Conventional Subdivision for this project, we met with your office to discuss the project (on September 21, 2017). We appreciate your input and many of your concerns and recommendations have been included within this submission.

Once the plans were about completed, the applicant met with several of the members of the Sierra Woods Subdivision to review the changes made to the plans. The modified Conventional Subdivision design with 21 lots was very well received by the abutters. The abutters did request a 30-foot no disturb buffer along the Eastern limits of the parcel (rear of Lots 9 to 11-along land of Murphy and Barnes) which the applicant was happy to provide. Please note the design has been revised to accommodate this no cut buffer and the attached plans have been revised accordingly.

Please note the stormwater design has been recalculated for the new proposed 21 lot subdivision (please see attached plans and revised stormwater report for more information). We have also made the following design changes regarding the stormwater system:

- Elimination of all curtain drains on the lots-runoff from all of the lots is now completed by sheet flow across the lots to the closed drainage system within the proposed streets (see drainage plans and stormwater reports for more information).
- The closed stormdrain system along all of the proposed streets have been modified to allow the majority of the proposed site improvements to be collected and discharged for treatment in the Proposed Wet Pond 3 (abutting Lot 1 along Chantelle Way). With this new design, limited flow is directed from this project to the abutting existing wet ponds as part of the Sierra Woods Subdivision. The design as enclosed on these plans and as summarized in the attached revised stormwater report meets all applicable Maine DEP and City of Saco standards. As you know this project is subject to an Amended Site Location Permit for the Sierra Woods Subdivision, which the City of Saco has delegated authority to review. Once the City has granted preliminary approval for the project our office will work with the Maine DEP to secure the wetland alteration permits required for this project.

One item that was also discussed with the abutters and the Planning Board at the meeting in August was water pressure within the Sierra Woods Subdivision. Our office and the applicant have reached out to the Maine Water Company and discussed this matter. The Maine Water Company feels there is adequate water pressure for this project. Please find attached an ability to serve letter from the Maine Water Company for the proposed Sandy Brook Subdivision. The Maine Water Company has determined the static water pressure to be 35 pounds per square inch.

As we discussed when we met back in September the applicant is anxious to get this project moving forward. We understand that by submitting this project this month we may be eligible to be considered for Preliminary Subdivision approval in January with the Planning Board.

Please call me if you have any questions regarding these revisions or if any additional information is needed.

Sincerely,

Andrew S. Morrell, P.E.
Project Engineer

cc: Joe Frustaci, Star Homes

13016-Revisions-12-20-2017

MaineWater

The Maine Water Company
93 Industrial Park Rd
Saco, ME 04072

T: 800.287.1643
F: 207.236.3701
www.mainewater.com

December 15, 2017

Mr. Andy Morrell, P.E.
BH2M
28 State Street
Gorham, ME 04038

Subject:

Dear Mr. Morrell:

Maine Water Company is the public water utility serving the City of Saco. We are able to serve the proposed 21-lot residential subdivision project known as Sandy Brook Subdivision at the end of Blake Avenue and Chantelle Way in Saco. The anticipated static pressure is approximately 35 psi based on the existing ground elevation.

Please forward all design plans and revisions', including the required water main and service connection sizes, as the project develops.

All work must be completed in accordance with Maine Water Company material and installation specifications. Inspection of the connections to the existing water main and proposed waterworks materials must be completed by Maine Water Company.

Water service will be provided in accordance with our standard terms and conditions as well as Maine Public Utilities Commission rules. If you have any additional questions, please do not hesitate to contact our office. We look forward to working with you throughout design and construction.

Sincerely,

Maine Water Company

Formatted: Space After: 10 pt

Ed Footer
Service Delivery Coordinator

MaineWater

The Maine Water Company
93 Industrial Park Rd
Saco, ME 04072

T: 800.287.1643
F: 207.236.3701
www.mainewater.com

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Dear Mr. Morrell:

Maine Water Company is the public water utility serving the City of Saco. We are able to serve the proposed 21-lot residential subdivision project known as Sandy Brook Subdivision at the end of Blake Avenue and Chantelle Way in Saco. The anticipated static pressure is approximately 35 psi based on the existing ground elevation.

Please forward all design plans and revisions', including the required water main and service connection sizes, as the project develops.

All work must be completed in accordance with Maine Water Company material and installation specifications. Inspection of the connections to the existing water main and proposed waterworks materials must be completed by Maine Water Company.

Water service will be provided in accordance with our standard terms and conditions as well as Maine Public Utilities Commission rules. If you have any additional questions, please do not hesitate to contact our office. We look forward to working with you throughout design and construction.

Sincerely,

Maine Water Company

Ed Footer
Service Delivery Coordinator

Formatted: Space After: 10 pt

PRELIMINARY SUBDIVISION PACKET

SANDY BROOK SUBDIVISION
CHANTELLE WAY AND BLAKE AVENUE
SACO, MAINE

25 Lot Cluster Residential Project
For
Star Homes Inc.
8 Rosewood Drive
Cape Elizabeth, Maine

February, 2017
June, 2017

Prepared By:

Berry Huff McDonald Milligan, Inc.
Engineers Surveyors
28 State Street
Gorham, ME 04038
207-839-2771
FAX 207-839-8250
wthompson@bh2m.com

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COVER LETTER

BH2M
Berry, Huff, McDonald, Milligan Inc.
Engineers, Surveyors
28 State Street, Gorham, Maine 04038
207 839-2771

WILLIAM A. THOMPSON
ROBERT C. LIBBY, Jr.
WALTER E. PELKEY
ANDREW S. MORRELL
STEVEN J. BLAKE

June 28, 2017

Bob Hamblen
Saco City Planner
300 Main Street
Saco, Maine 04072

Re: Preliminary Application
Sandy Brook Subdivision

Dear Bob;

On behalf of the applicant, Joe Frustaci, Star Homes, Inc., we are submitting a Preliminary application and supporting plans and documents for this 25 lot cluster subdivision.

Since we were last before the planning board in February 2016 we have reviewed the planning boards' comments and continued on the design for this cluster subdivision.

This project is a continuation of the previously approved and constructed Sierra Woods. This final phase will include 1600 feet of roadway and utilities constructed to City public road standards. Public water, sewer and underground electric, telephone & cable will be connected to the previous phase of Sierra Woods.

Stormwater design will include collection of surface water in a catchbasin system. This site will direct stormwater to a detention basin located between lot 1 & 2.

As with a cluster subdivision we will have Open Space areas totaling 9.66 acres.

Permitting will include City of Saco subdivision and stormwater design and a NRPA permit for wetland alteration.

We look forward to presenting this design and continue to receive comments from the planning board and City staff.

Enclosed please find 12 copies of the project plans and application. Also attached are three copies of the Stormwater Management Report.

Sincerely,

William A. Thompson
Project Manager

encl.
cc: J. Frustaci

APPLICATION

Account Number_____

Fee_____

Received by_____

Date_____

SACO PLANNING BOARD
300 Main Street
Saco, Maine 04072

APPLICATION FORM FOR:

( ) Sketch Plan, Subdivision

(X) Preliminary Plan Subdivision

( ) Final Plan Subdivision

This application shall conform in all respects to the City of Saco Subdivision Regulations. It shall be accompanied by fourteen (12) copies of the Plan and all submissions.

A. INFORMATION ON SUBDIVISION

1. Proposed name of subdivision Sandy Brook Subdivision.
2. Number of lots/units 25
3. Does the applicant propose to dedicate to the public all streets and open space shown on the plan? Yes - See plans.
4. State number of acres which applicant proposes to dedicate to public usage for recreational or open space: Open space proposed is 9.66 Acres.
5. Does owner intend to request any waivers of the requirements of the Subdivision Regulations of this Board upon the submission of the Final Plan for approval? N/A
6. If any waivers of requirements are to be requested, list them and give reasons why such requirements should be waived: N/A

B. APPLICANT INFORMATION

OWNER'S NAME Star Homes Inc.

Address 8 Rosewood Drive, Cape Elizabeth, Maine 04107

Telephone and Fax Numbers (207) 409-6755

E-mail Address joefru @ yahoo.com

APPLICANT'S NAME Star Homes Inc.

Address 8 Rosewood Drive, Cape Elizabeth, Maine 04107

Telephone and Fax Numbers (207) 409-6755

E-mail Address joefru @ yahoo.com

ARCHITECT/ENGINEER'S NAME Andrew S. Morrell

Address BH2M, 28 State Street, Gorham, Maine 04038

Telephone and Fax Numbers 207-839-2771 x 206

E-mail Address amorrell @ bh2m.com

1. If Applicant is a Corporation, state whether the Corporation is licensed to do business in Maine X YES NO and attach a copy of Secretary of State's Registration.
2. What interest does the Applicant have in the parcel to be subdivided (Option, land purchase contract, record ownership, etc.)? Ownership

C. INFORMATION ON PARCEL TO BE SUBDIVIDED

1. Location of property: Book 16382 Lot 537
   (from York County Register of Deeds)
2. Location of property: Map 88 Lot 12
   (from Assessor's Office)
3. Street Address: Chantelle Way & Blake Ave
4. Present use of land: Undeveloped Land
5. Current zoning of property: R-10 Low Densiy & Resource Protection
6. Acreage of parcel to be subdivided: 19.45 Acres

7. Indicate the nature of any restrictive covenants to be placed on the deeds:_____
To be determined

8. A complete statement of any easements relating to the property is attached. If none, please state. Easement to construct roadway to connect Chantelle Way & Blake Ave.

9. Does applicant have an interest in abutting property? If none, please state.
None

10. Does the Preliminary Plan cover the entire contiguous holdings of the Applicant?_
Yes

NOTE:All plans submitted for review should contain all required information outlined in the City of Saco Subdivision Regulations, or a waiver request for specific items and reasons why specific items should be waived.

NOTE: Complete this form and return it with the required documents and fourteen (12) drawings of the plan.

To the best of my knowledge, all information submitted on this application is true and correct.

Signed_____
APPLICANT

Date FEB 28, 2017

The Planning Board normally meets the first and third Tuesdays of the month. Applicants must submit materials THREE WEEKS prior to the scheduled meeting for placement on the Board's agenda. If application and submission materials are not complete, placement on an agenda may be delayed. Applications are placed on the Planning Board's agenda at the conclusion of staff review only.

FEE: A $25.00 non-refundable fee must be deposited with all applications. The required deposit is $1000 on an existing street, or $1500 if on a proposed street, as determined by the City Planner. A copy of the Cost Recovery Ordinance is attached. $1525.00

LETTER OF CORPORATE STANDING

Interactive Corporate Services

MAINE
Department of the Secretary of State
Bureau of Corporations, Elections and Commissions

Corporate Name Search

Information Summary

Subscriber activity report

This record contains information from the CEC database and is accurate as of: Mon Feb 27 2017 13:34:30. Please print or save for your records.

Legal Name	Charter Number	Filing Type	Status
STAR HOMES, INC.	20031119 D	BUSINESS CORPORATION	GOOD STANDING

Filing Date	Expiration Date	Jurisdiction
01/09/2003	N/A	MAINE

Other Names **(A=Assumed ; F=Former)**

NONE

Clerk/Registered Agent

THOMAS F JEWELL
477 CONGRESS STREET

PORTLAND, ME 04101

Back to previous screen | New Search

Click on a link to obtain additional information.

List of Filings	View list of filings	
Obtain additional information:		
Additional Addresses	Plain Copy	Certified copy
Certificate of Existence (more info)	Short Form without amendments ($30.00)	Long Form with amendments ($30.00)

You will need Adobe Acrobat version 3.0 or higher in order to view PDF files.
If you encounter problems, visit the troubleshooting page.

Get Acrobat Reader

PARCEL DEED

Doc# 2012035302
Bk 16382 Pg 537
Received York SS
08/06/2012 9:46AM
Debra L. Anderson
Register of Deeds

QUITCLAIM DEED WITHOUT COVENANT

MAINE R.E. TRANSFER TAX PAID

THE BANK OF MAINE, formerly known as Savings Bank of Maine successor in interest to Gardiner Savings Institution, FSB ("Grantor"), FOR CONSIDERATION PAID, releases to **STAR HOMES, INC.**, a Maine corporation, with a mailing address of P.O. Box 2357, South Portland, Maine "Grantee"), certain real property, together with any improvements thereon, located off Blake Avenue, in the City of Saco, County of York, State of Maine, described in Warranty Deed from Laurel Hill Cemetery Association to **Sierra Gardens, LLC** dated April 22, 2004 and recorded at York County Registry of Deeds in Book 14055, Page 780 to which reference is hereby made for a more particular description of the premises herein conveyed (the "Premises").

Subject to all municipal liens and encumbrances, including but not limited to real property, sewer and water district taxes, whether or not of record in the York County Registry of Deeds. Further subject to all real estate transfer taxes.

Meaning and intending to convey the same premises conveyed to Grantor by deed in lieu of foreclosure from Sierra Gardens, LLC dated August 9, 2011, and recorded on May 17, 2012 in the York County Registry of Deeds in Book 16324, Page 681.

IN WITNESS WHEREOF, The Bank of Maine has caused this instrument to be executed by Alvin W. Butler, Senior Vice President, thereunto duly authorized, this 30th day of July, 2012.

WITNESS:

Print Name:

THE BANK OF MAINE

By: _____
Alvin W. Butler
Senior Vice President

State of Maine
County of Kennebec, SS.

Date: 7-30, 2012

Personally appeared the above-named Alvin W. Butler, Senior Vice President of The Bank of Maine, and acknowledged the foregoing to be his free act and deed in his said capacity and the free act and deed of The Bank of Maine

SEAL

Before me,

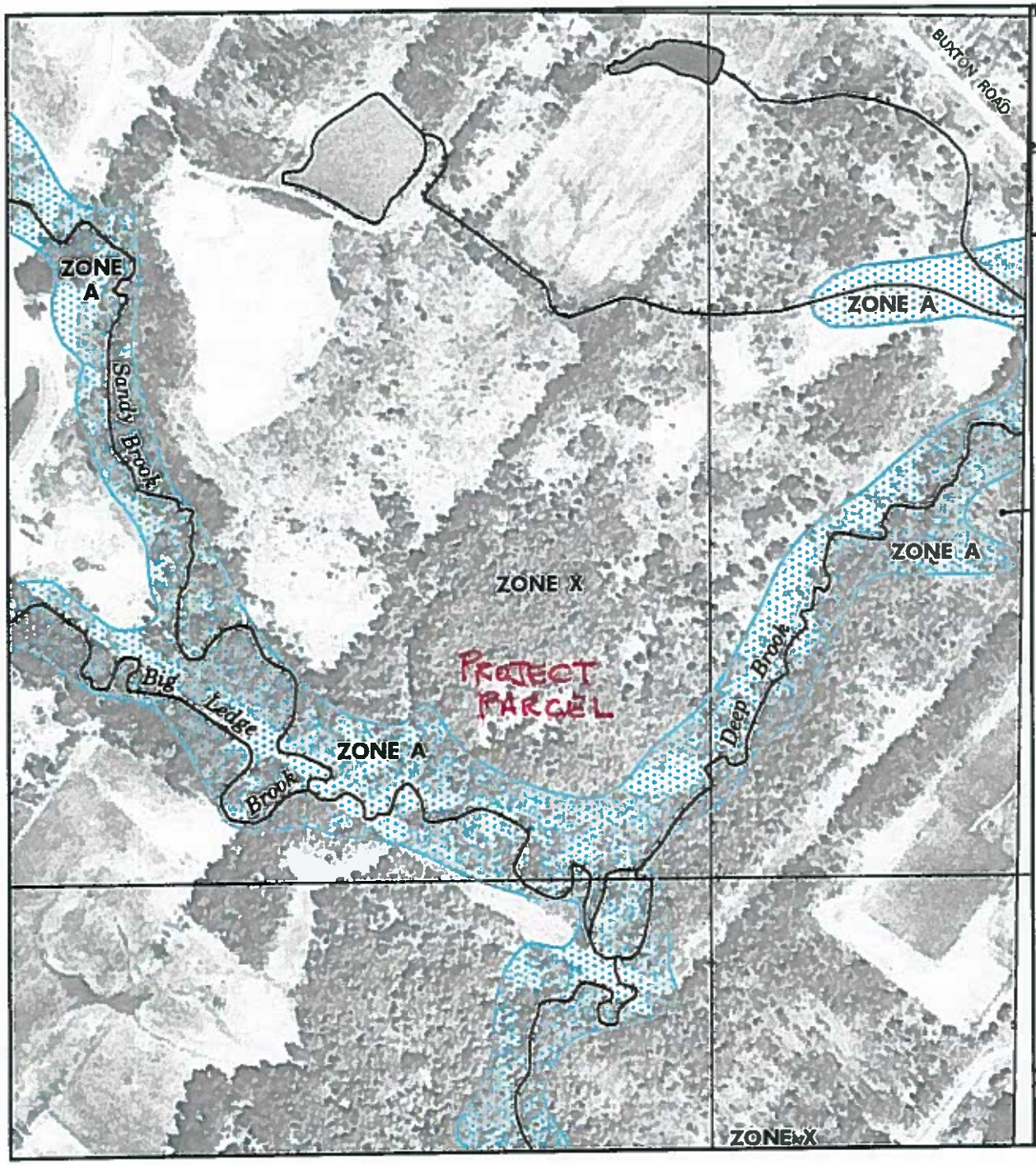
_____
~~Attorney-at-Law~~/Notary Public
Print Name: Jennifer M. Cummings
Notary Commission Expires:

JENNIFER M. CUMMINGS
Notary Public, Maine
My Commission Expires November 1 2014

(2) 1pg

Preferred Title
152 US Rte 1
Ste 11
Scarborough Me 04074

FEMA FLOOD MAP



...onal Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0038D

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
SACO,
MAINE
YORK COUNTY

PANEL 38 OF 135

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SACO, CITY OF	230155	0038	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
23015500 38D

MAP REVISED
JANUARY 5, 2006

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

COUNTY SOIL MAP

Soil Map—York County, Maine



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: York County, Maine
Survey Area Data: Version 15, Sep 15, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

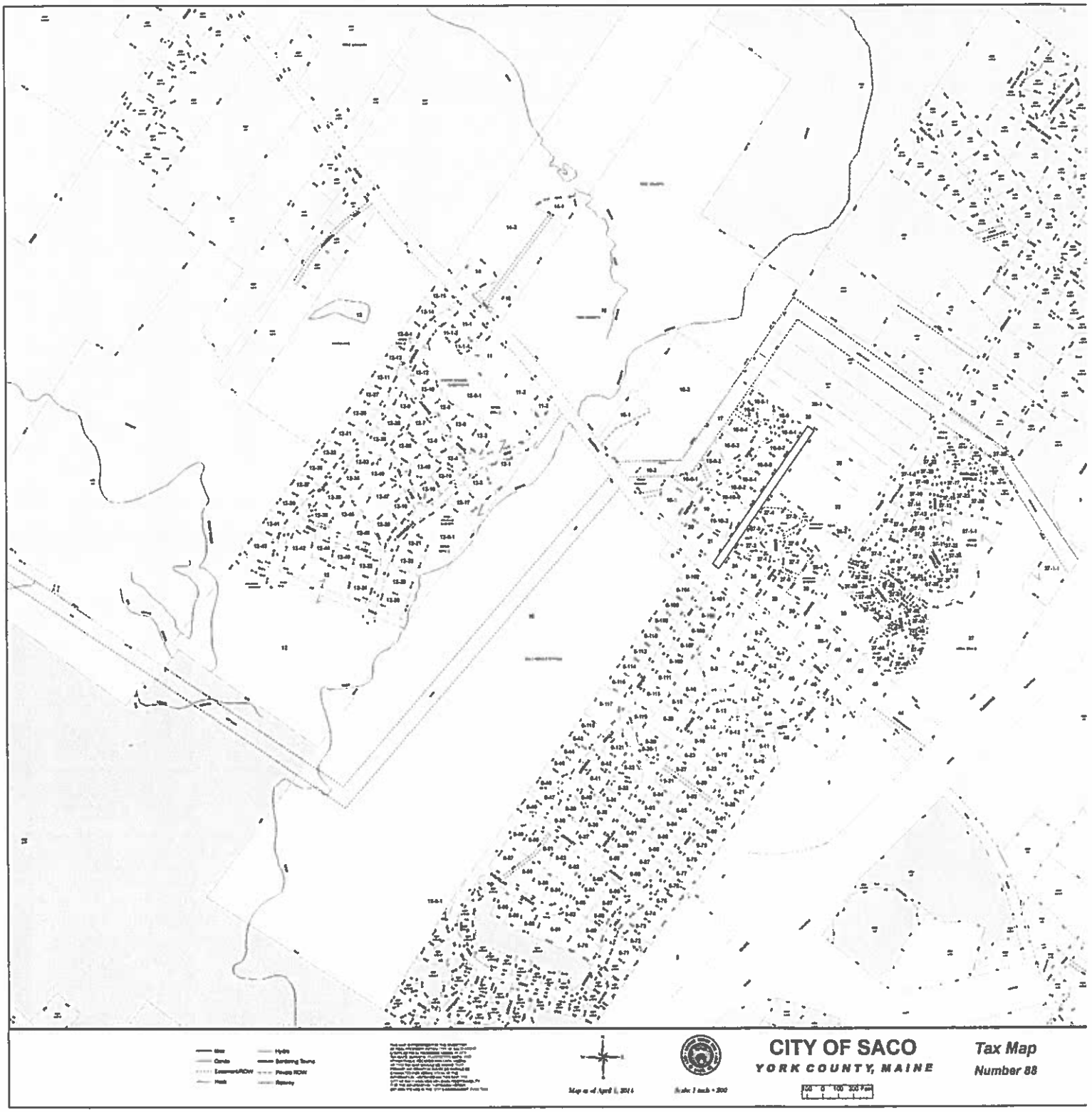
Date(s) aerial images were photographed: Jun 20, 2010—Jul 18, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

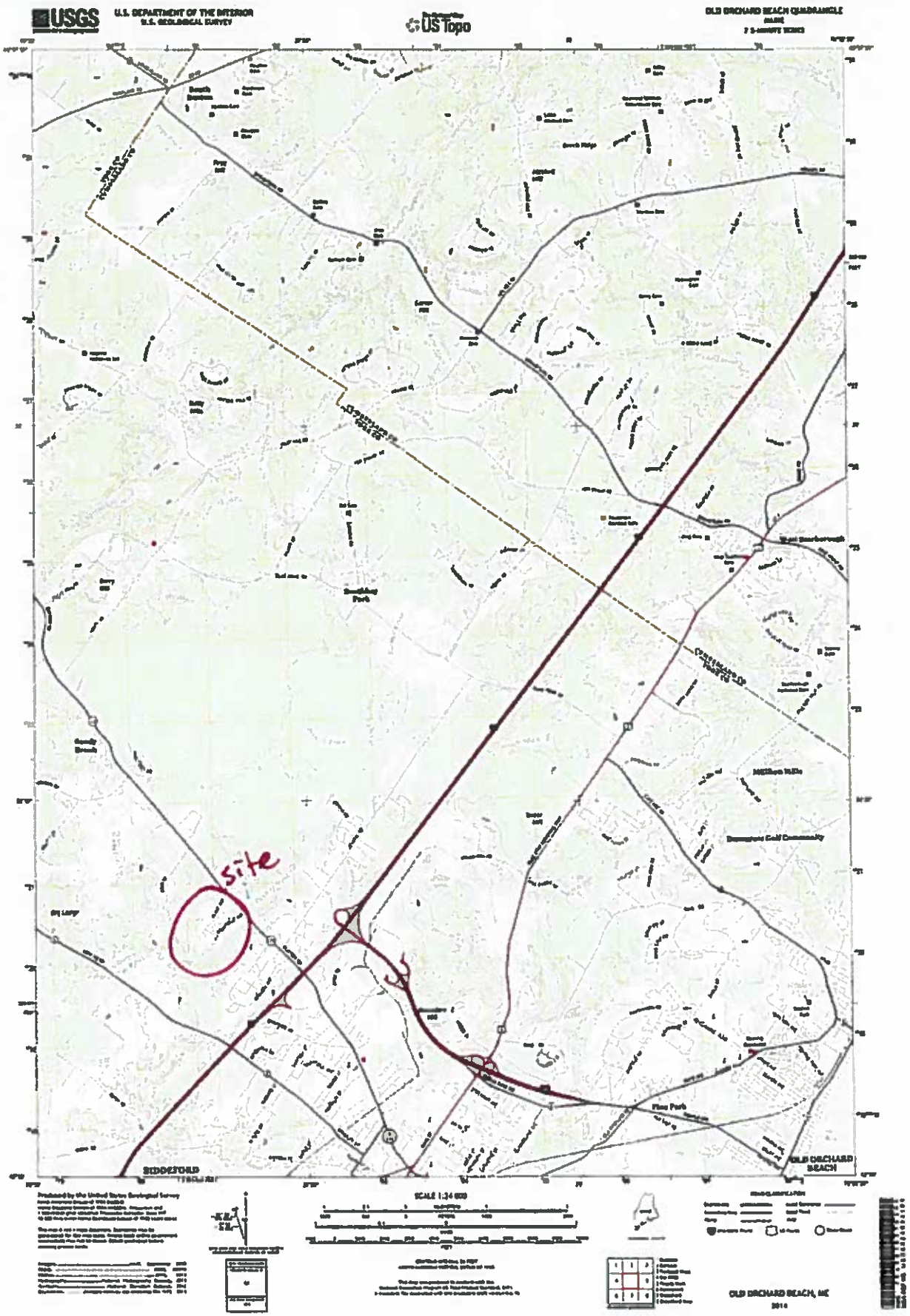
Map Unit Legend

York County, Maine (ME031)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuB	Buxton silt loam, 3 to 8 percent slopes	2.2	2.7%
BuD	Buxton silt loam, 15 to 25 percent slopes	0.9	1.1%
MaB	Madawaska fine sandy loam, 0 to 8 percent slopes	17.7	21.3%
Ra	Raynham silt loam	0.7	0.8%
Ru	Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded	14.9	17.9%
Sc	Scantic silt loam, 0 to 3 percent slopes	25.1	30.2%
SeB	Scio silt loam, 3 to 8 percent slopes	0.0	0.0%
SeC	Scio silt loam, 8 to 15 percent slopes	21.6	26.0%
Totals for Area of Interest		83.0	100.0%

CITY TAX MAP


CITY OF SACO
YORK COUNTY, MAINE
Tax Map
Number 88

USGS MAP


USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
US Topo
OLD ORCHARD BEACH QUADRANGLE
MAINE
7.5-MINUTE SERIES
site
SCALE 1:24 000
OLD ORCHARD BEACH, ME
2014

department. In exchange for their assistance with various tasks, the volunteer earns tax abatement credits toward their property tax bill. In fiscal year 2016/2017, we had 40 participants in the program.

We are requesting the approval for up to 40 participants for fiscal year 2017/2018. Upon completion of 100 hours of service, each participant is eligible for a tax abatement of $750.

Councilor Minthorn Moved, Councilor Doyle Seconded and Be it ordered that the Saco City Council authorizes up to forty (40) Senior Abatements pursuant to City code, Chapter 220, Article I Volunteer Citizen Work off Program for fiscal year 2017-2018. The Motion Passed with seven (7) Yea's.

Exhibit Item 1

City Code - Chapter 220, Article I, Volunteer Citizen Work off Program

A. Participant must be age 60 on April 1 of the first year of eligibility.
B. Participant must be a legal resident of the City of Saco.
C. Participant must be the owner of record as of April 1 and reside in the dwelling the abatement will be applied to.
D. Limited to one abatement per household, with respect to this program.
E. Participant's household income cannot exceed the average median income for the State of Maine as published by the Federal Department of Housing and Urban Development.
F. On or about April 1, the City Council will approve to the Assessor the amount of abatement funds to be drawn from the tax commitment overlay for the ensuing fiscal year.
G. Volunteers are responsible for all federal or state tax reporting of tax abatement benefits that accrue to them from the program.

C. Request to Improve a Portion of a City-Owned Right of Way: Sierra Woods Subdivision

The Sierra Woods subdivision was approved by the Planning Board on April 1, 2001. A condition of the approval required that a strip of land measuring roughly 50' x 1,125' be conveyed by the developer to the City. This took place in May of 2001. The owner of the 19 acre parcel to the west side of the strip of land, seeks permission to cross and improve a portion of the City-owned property in order to move forward with the proposed subdivision.

Councilor Precourt Moved, Councilor Gay Seconded, and Be it Ordered that the City Council authorize the City Attorney to draft a right-of-way easement, and permit Applicant Joseph Frustaci dba Start Home, Inc., to improve a portion of the right-of -way owned by the City of Saco, located off Chantelle Way and Blake Avenue in the Sierra Woods subdivision, to City street standards, conditional upon payment of the outstanding city Construction fees of $57,920.50 for improvements to Chantelle Way. The Motion Passed with seven(7) Yea's.

AGENDA ITEM: C
Date: May 22, 2017

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS,

THAT SIERRA WOODS, INC., a Maine corporation with a principal place of business in Old Orchard Beach, in the County of York and State of Maine, and LAUREL HILL CEMETERY ASSOCIATION, a not-for-profit cemetery association organized and existing under the laws of the State of Maine, with a principal place of business in Saco, York County, Maine, do hereby remise, release, bargain, sell and convey, and forever quitclaim unto the CITY OF SACO, a municipal corporation organized and existing under the laws of the State of Maine, in York County, Maine, with a mailing address of 300 Main Street, Saco, Maine 04072, its successors and assigns forever,

A certain lot or parcel of land situated southwesterly of Route 112 in the City of Saco, in the County of York and State of Maine, being bounded and described as follows:

Beginning at a point on the northwesterly sideline of the lot herein described and the southeasterly sideline of land now or formerly of the Grantee herein described in a deed recorded in the York Registry of Deeds in Book 3429, Page 198, which starting point is S 52° 54' 32" W a distance of 801.87 feet from the northeasterly corner of said land now or formerly of the City of Saco; thence S 52° 54' 32" W by said City of Saco land a distance of 50.00 feet to a point; thence S 37° 05' 28" E a distance of 66.60 feet to a point; thence S 50° 06' 01" E a distance of 1125.00 feet, more or less, to land now or formerly of the City of Saco described in a deed recorded in the York Registry of Deeds in Book 1935, Page 787; thence N 51° 13' 48" E by said land now or formerly of the Grantee herein a distance of 50.00 feet to a point; thence N 50° 06' 01" W a distance of 1125.00 feet, more or less, to a point which is 60.90 feet S 37° 05' 28" E from the point of beginning above set forth; thence N 37° 05' 28" W a distance of 60.90 feet to point and place of beginning.

Being a portion of the same premises conveyed to Laurel Hill Cemetery Association by deed of Saco & Biddeford Savings Institution dated October 22, 1951, recorded in the York registry of Deeds in Book 1200, Page 156. Reference is also made to the deed from Laurel Hill Cemetery Association to Sierra Woods, Inc. of near or even date to be recorded in the York Registry of Deeds,

Excepting and reserving unto the Grantors herein, their successors and assigns, a perpetual right of way and easement over, along, under and across the strip of land above described for ingress and egress on foot or by motor vehicle, including heavy equipment, and for the installation and maintenance, above or below ground, of utilities, including electrical, telephone, and cable television wires, sewer and drainage lines, water pipes, and similar improvements. The easement for the installation and maintenance of utilities shall be subject to the condition that the Grantors, their successors and assigns shall restore to its former condition such areas or features of the easement that may be damaged by such installation or maintenance.

By acceptance of this deed, the City of Saco agrees that so long as the disturbed area is restored to its former condition, the Grantors, their successors and assigns, shall not be prevented from opening any pavement over the easement and right of way notwithstanding any policy or rule of the City regarding street openings.

TO HAVE AND TO HOLD the same, together with all the privileges and appurtenances thereunto belonging, to the said CITY OF SACO, its successors and assigns forever.

IN WITNESS WHEREOF, SIERRA WOODS, INC. has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Gary Salamacha, its President thereunto authorized, and LAUREL HILL CEMETERY ASSOCIATION has caused this instrument to be signed it its corporate name by Dennis A. Levasseur, its President, duly authorized, this 8th day of the month of May, 2001.

Signed, Sealed and Delivered

SIERRA WOODS, INC.

by: _____
its President

LAUREL HILL CEMETERY ASSOCIATION

by: Dennis A. Levasseur
its President

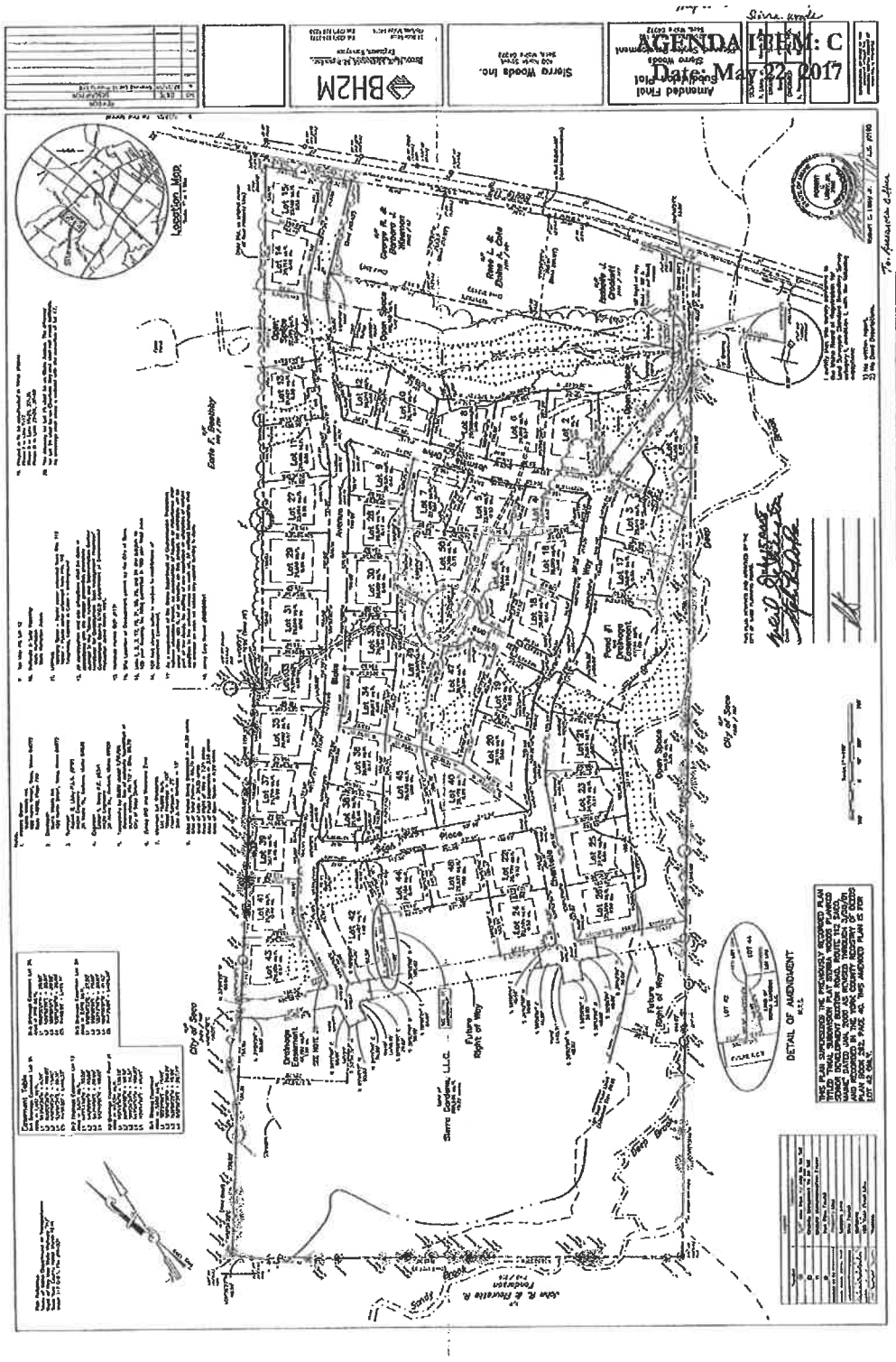
STATE OF MAINE
YORK, ss.

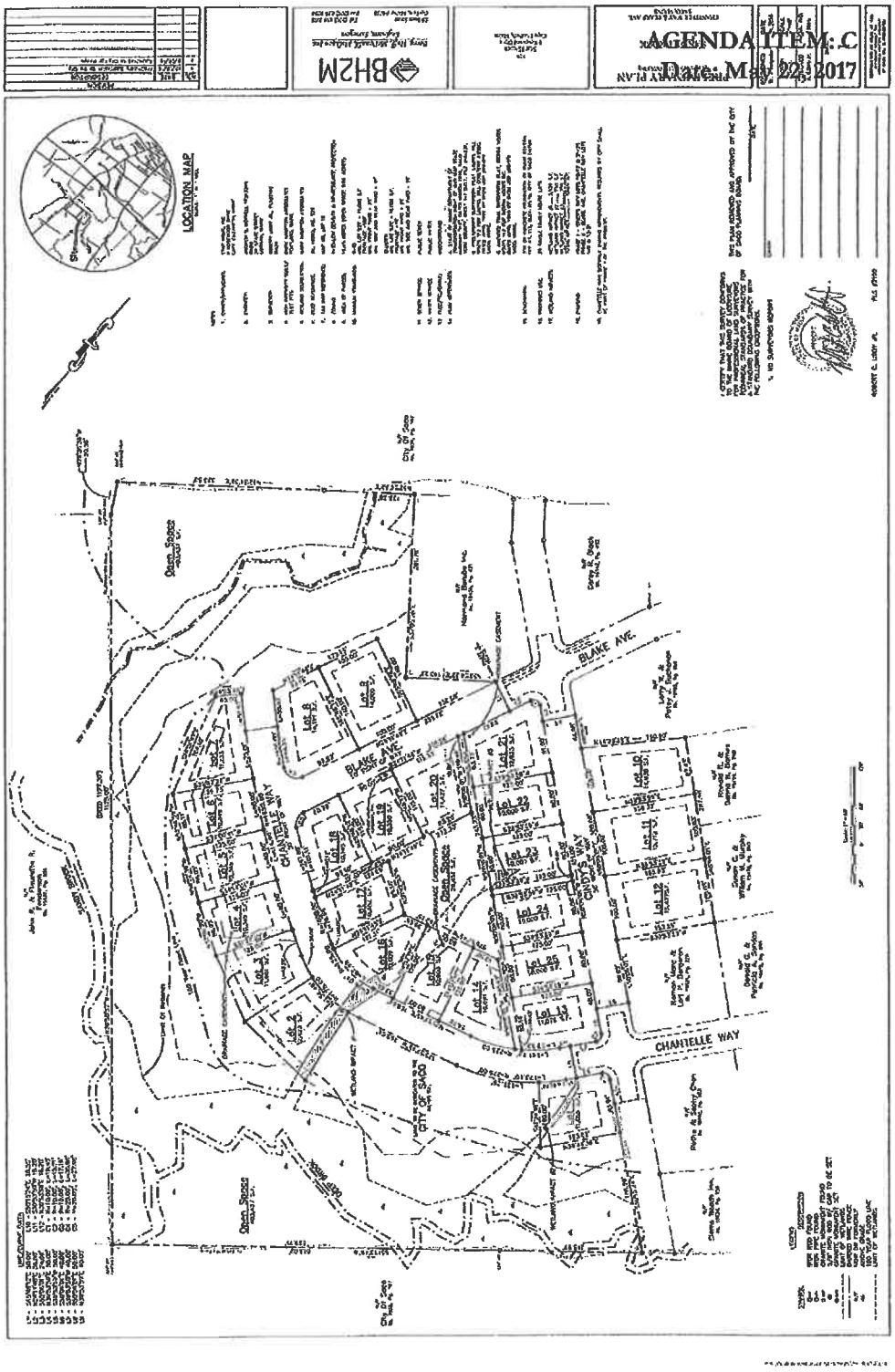
May 8, 2001

Personally appeared the above named Gary Salamacha, President of said Grantor corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said corporation.

Notary Public/Attorney at Law

Printed Name: David R. Ordway


AGENDA ITEM: C
Date: May 22, 2017
BH2M
Sierra Woods Inc.
Amended Final
Location Map
DETAIL OF AMENDMENT


AGENDA ITEM: C
Date: May 22, 2017
BH2M
LOCATION MAP
BLAKE AVE.
CHANTELLE WAY
CITY OF SAAB

AGENDA ITEM: C
Date: May 22, 2017

Saco Public Works
300 Main Street
Saco, ME 04072
(207) 284-6641
Fax: (207) 282-8212
E-mail: ablanchette@sacomaine.org

Memo

To: Bob Hamblen, City Planner

From: Angela Blanchette, P.E., City Engineer

Date: July 30, 2014

Re: Sierra Woods – Final Phase
Improvements on Chantelle Way

As you are aware City staff met with the developer who purchased the remaining land behind the Sierra Woods Subdivision, Joe Frustaci. In attendance at the meeting was: Mayor Pilon, Peter Morelli, Pat Fox, Bill Thompson (BH2M), Joe Frustaci, and myself. We reviewed where we had last left our discussions from May of 2013 and the cost estimate that was created after the site walk with Pat, Bill, Joe, and myself. Based upon the site walk some of the items that were depicted on the Sierra Woods Construction Plans were not appropriate to be constructed and we were able to eliminate these items.

It is clear that there are two separate items that need to be addressed with offsite improvements:

1) Surface Paving the proposed haul route for this future development (Chantelle Way), and
2) A sidewalk to connect the proposed development sidewalk to the pedestrian bridge at the end of Chantelle Way near Route 112.

The Developer agreed that surface paving of Chantelle Way could be done on a per lot basis fee to be paid prior to the issuance of a building permit for each individual lot, similarly to what the City has done with the paving of the Richards Way haul route for Juniper Knoll Subdivision. This would be the recommendation of the Department of Public Works to the Planning Board as a Condition of Approval.

The sidewalk along the existing section of Chantelle Way was discussed as being done as part of the infrastructure work within the new development. The developer can schedule this work as necessary to maximize cost savings and allow for one mobilization cost of items such as concrete curbing. The offsite curb, esplanade and sidewalk would be part of the Letter of Credit that the City would hold for the entire project, which could be released incrementally over the duration of the project as items are completed.

Thank you,

AJ Blanchette

Angela J. Blanchette, P.E.
City Engineer

Page 1 of 1

Sale Prohibition.

Mayor Michaud asked the Council if they would like to table or postpone this Item in light of the testimony that they had just heard during the workshop.

Councilor Gay said that he would like the wording in Chapter 165-120 cleaned up, or at least find out the facts. He said that the issue is controversial and that he would like to see the item modified. Mayor Michaud asked if that should be done before the First Reading, and Councilor Gay said yes.

Councilor Doyle moved, Councilor Johnston Seconded, that in light of the testimony heard earlier, the item be tabled until the next workshop, when some of the language can be changed and some sourcing for the facts be established.

Councilor Roche suggested that the City Administrator write up the Item the way that they had talked about it, and how the Administrator had addressed it earlier, as a matter of state and enforcement concerns, and waiting for the state. He said that it should be very simple and then the Council could move forward from there.

Motion To Table and discuss at the Workshop on June 12 Passed with seven (7) Yea's.

E. (First Reading) City Code Amendment, Chapter 147: Multi Family Dwelling Unit Inspections.

Mayor Michaud suggested that the Council might consider postponing Item E. and discussing that at the next workshop.

Councilor Johnston Moved, Councilor Doyle Seconded to Postpone Item E. until the next Workshop.

Motion to Table and discuss at the Workshop on June 12 Passed with seven(7) Yea's.

F. (Second and Final) Amendments to City Code Chapter 4: Administrative Code

As part of the municipal budget for the 2018 fiscal year it has been proposed that the funding for the annual operational budget of the City's Economic Development Department be taken from revenues generated in the City's approved Development Districts which allow such use vs. the historic and current practice of funding these operations from an allocation from the City's General Fund. For purposes of transparency and tracking we are suggesting that any funds utilized from the City's Approved Development Districts all pass thru the City's Economic Development Fund. In order to allow this, the City Administrative Code would require an amendment. The Code should be further amended to allow for this fund to support other economic development related expenses.

NOTE: For Auditing purposes all of the City's operational expenditures are required to pass thru the General Fund.

City Staff Comments

&

Documentation from Original File

1-22-19 mailed to Andy M.

CITY OF SACO, MAINE

Saco Public Works Department
300 Main Street
Saco, Maine 04072

Joseph A. Laverriere, P.E. – City Engineer
Telephone: (207) 284-6641
Email: jlaverriere@sacomaine.org

MEMORANDUM

TO: Denise Clavette, Interim Planner **Planning Account No.: 300152**

DATE: January 22, 2019

RE: Sandy Brook Subdivision – Preliminary Plan
Tax Map 88, Lot 12

The Department of Public Works (DPW) has reviewed the revised preliminary subdivision plan application materials for the above referenced project prepared by BH2M, dated November 30, 2018. The following comments have been prepared based upon our review:

1. As commented previously, provide conversion information for project bench mark stated in Note 14 on Sheet 1 to NAVD 1988.
2. As commented previously, in accordance with Section 5.2.2 of the Subdivision Regulations, the Subdivision Plan needs to contain coordinates (**Maine State Coordinate System**) on at least four corners of the parcel for geo-referencing purposes.
3. As commented previously, any public stormwater management system, not within the public right-of-way, shall be located on a separate parcel of land deeded to the City. If the City determines a willingness to accept the open space area, then the current configuration is acceptable. If the City is not willing to accept the open space area, then the current limits of the drainage easement around the pond will need to be an actual lot to be conveyed to the City at the time of acceptance.
4. The sidewalk extension on Chantelle Way should be offset at the end of the existing sidewalk, to construct an esplanade opposite Sandy Brook Lane. The intersection of Sandy Brook Lane at Chantelle Way needs revisions to locate catch basins at the low point and to comply with maximum grades at intersections. A crosswalk with ADA ramps should be provided at this intersection.
5. On Blake Avenue, the sidewalk should be extended beyond what is shown on the plans to connect with the existing sidewalk on opposite side of the driveway at 27 Blake Avenue. A twenty (20) foot wide paved apron should be provided opposite Sandy Brook Lane to access the existing storm water pond. A crosswalk should be provided at this intersection with an ADA ramps on both sides of the road. The locations of catch basins 7 and 8 may need to be adjusted slightly to ensure the catch basins are outside of the pedestrian crosswalk.
6. As commented previously, DPW is not supportive of the deep culvert crossing at Sta 3+55 as designed. One alternative to consider is to connect the culvert on the downstream side of the outlet control structure and provide additional drop manhole structures is necessary. DPW is requesting to eliminate the deep cross culvert with outlet behind private property that will be difficult for the City to access and maintain in the future.
7. As commented previously, all sanitary sewer laterals shall be 6" diameter in size and be provided with a clean out at the right-of-way line at all lots. The plans should include invert elevations for the ends of the sewer service laterals to each lot. A detail for the sewer service lateral and cleanout should be provided in the plan set.
8. As commented previously, the final hydrant spacing shall be reviewed and approved by the Saco Fire Department (SFD). It should be noted however, that hydrants need to be installed within the 5' esplanade

area and not behind the back of sidewalk. The hydrants shall be located with face of hydrant setback 1.5' behind face of curb.

9. As commented previously, the Saco Fire Department should confirm the available water pressure will be adequate for fire protection and\or whether any additional measures should be considered in the design and construction of the development.
10. As commented previously, the final design of the water distribution system shall be reviewed and approved by the Maine Water Company prior to Final Subdivision Approval. Specifically, the required horizontal and vertical clearance between the water system and other utilities is particularly important.
11. There is a detail included for "Snouts", but not identified where they are to be installed or if they are to be installed on all catch basin outlets.
12. The storm drain line serving Sandy Brook Lane cuts across the corner of lot 12. This alignment should be revised to maintain stormdrain within the public right-of-way and eliminate the easement across lot 12 as currently shown.
13. What is the purpose for the 10' utility easement on the inside loop of the streets as shown?
14. The details for the pond drain line are still confusing and not shown clearly on the plan view. The details for the pond drain line need to be clarified further.
15. Label outlet invert elevation on the 24" stormdrain discharging into the stormwater pond. As commented previously, the 24" inlet pipe to the stormwater pond shall discharge into the riprap forebay without tailwater. In addition, the limits of riprap as shown on the inlet forebay need to be revised to coincide with current design.
16. Sewer manhole castings shall provide for a 24" diameter clear opening. The Neenah casting specified on the plans does not meet that requirement. Provide catalogue cut prior to construction to verify acceptability with DPW.
17. Many of the dimensions shown on the handicap ramp detail on Sheet 10 of the plan set do not coincide with the proposed sidewalk and esplanade widths for this project. This detail should be revised accordingly.
18. Phase of the project needs to be expanded to include the stormdrain extension from Sandy Brook Lane and construction of the stormwater pond. Additional plans should be submitted to clarify Phase 1 construction work. For example, temporary provisions for grading and construction access to the stormwater pond; sidewalk connection at either end of Sandy Brook Lane, etc. In addition, the applicant should confirm with Saco Fire Department whether any additional hydrants are required to serve Phase 1 of the project.
19. Plans show foundation drains from Lots 9, 10, 11 and 15 as connecting to underdrains. These should connect to stormdrain lines and not underdrains.
20. Underdrains should be provided along both sides of the roadways. DPW will review subgrade during construction and determine final extent of underdrains. The underdrain on the east side of the Chantelle / Blake intersection should connect to the catch basin for access, and not tee into another underdrain.
21. Sidewalk pavement section should be 1 ½" base and 1" surface.
22. Drain manholes should be provided with precast concrete inverts.
23. Proposed contours appear incomplete in the R.O.W., specifically the frontage of Lots 16 & 17, and between Lots 19 & 20.

As part of any subsequent subdivision approval, we recommend the following conditions be included:

1. The applicant shall be required to reimburse the City's construction cost associated with the recent improvements along Chantelle Way in the amount of $57,920.50.
2. As part of the building permit process, the applicant shall submit a plot plan for each lot that shall include the location and footprint for the house, location of driveway and proposed grading. Any site constraints (i.e. wetlands, buffers, easements, etc.) shall be shown on the plot plan. DPW shall approve all driveway locations as part of the building permit process.
3. Prior to the start of construction, the applicant shall be required to execute Form 1 contained in Section 805 of the zoning ordinance and provide a recorded copy to the City.
4. Until such time that the stormwater facilities are offered and accepted by the City, the applicant shall be required to perform routine inspection and maintenance of the stormwater facilities as outlined in the operations and maintenance manual development specifically for the site. A copy of the annual inspection and maintenance report including inspection log(s) shall be submitted annually (by July 15th of each year) to the City Public Works Department.
5. Prior to the start of construction, the stream buffer areas shall be marked in the field and copies of the recorded buffer deed restrictions shall be provided to the Planning Department.
6. The design engineer should be required to inspect the construction and stabilization of the stormwater management pond to be built on the site. Inspections shall consist of weekly visits to the site to inspect the construction (from initial ground disturbance to final stabilization of the pond) of the pond's embankment, stormwater inlet, underdrained gravel outlet, gravel outlet filter material makeup and placement, outlet control structure, clay liner and cover material, and emergency spillway. If necessary, the inspecting engineer shall interpret the pond's construction plan for the contractor. Once the pond is constructed and stabilized, the inspecting engineer will notify the City within 14 days to state the pond has been completed. Accompanying the engineer's notification shall be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of the gravel filter media. An inspection of the underdrained gravel outlet shall also be performed by a professional engineer one year after the final stabilization of the pond. The engineer shall notify the City as to the outlet's effectiveness and determine any maintenance items that are needed.
7. As part of the project's as-built certification for roadway and utility infrastructure, the applicant shall provide a Stormwater Basin As-Built Certification. Prior to the issuance of a Certificate of Occupancy for any lot, the Applicant shall submit evidence in the form of a letter with as-built survey plan prepared and stamped by a Professional Engineer who either prepared the Post-Construction Stormwater Management Plan and its associated Facilities or supervised the Plan and Facilities construction and implementation. The letter or plan shall certify that the Stormwater Management Facilities have been installed in accordance with the approved Post-Construction Stormwater Management Plan and that they will function as intended by said Plan. The as-built survey plan shall be performed for all post-construction stormwater facilities to document general conformance with the approved plan.

We look forward to discussing this project further and would be happy to clarify any of our comments made within this review memo.

City of Saco

Planning Office
Saco City Hall
300 Main Street
Saco, ME 04072-1538

Robert Hamblen, A.I.C.P., City Planner
Telephone: (207) 282-3487
Fax: (207) 282-8202
E-mail: bhamblen@sacomaine.org

TO: Site Plan Review Committee **Comments Due:** _____

FROM: Robert Hamblen **Meeting Date:** _____

DATE: 6/4/18 **Review Type:** Revised Preliminary Subdivision

RE: Sandy Brook 21-lot subdivision

Department: Joe L.,D.Lambert; D.Pendleton; H. Newman; C.Huntress

Reviewer: Deputy chief Huntress

Time: 20 min

Comments: No further Traffic Safety concerns at this time.

Please add additional sheets – Attachments as appropriate.

CITY OF SACO, MAINE

Planning
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

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Twitter: @sacomaine

January 26, 2018

Mr. Andrew Morrell
BH2M
28 State Street
Gorham ME 04038

Re: Preliminary Plan Review, Sandy Brook Subdivision

Dear Mr. Morrell:

The Planning Board reviewed the preliminary plan submittal for the proposed Sandy Brook subdivision at its meeting of January 23, 2018. The Board heard from you and applicant Joseph Frustaci regarding the proposal to create 21 lots on a 19.44 acre parcel at the rear (southwesterly side) of the Sierra Woods subdivision. You propose to extend Chantelle Way and Blake Avenue, create the new Sandy Brook Lane, and install public water and sewer, electricity, cable and phone service for each of the lots.

The Board voted to find the application sufficiently presented for the purposes of discussion, but agreed to table review at the end of this evening's consideration without taking action. A public hearing was held, with residents of the abutting Sierra Woods subdivision commenting on a variety of issues.

After discussion, the Board voted to table further preliminary plan review until a complete application has been submitted. Feel free to contact me with any questions.

Sincerely,

Bob Hamblen

cc: J. Frustaci

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City of Saco

1-16-18 emailed to Andy Morrell

Planning Office
Saco City Hall
300 Main Street
Saco, ME 04072-1538

Robert Hamblen, A.I.C.P., City Planner
Telephone: (207) 282-3487
Fax: (207) 282-8202
E-mail: bhamblen@sacomaine.org

TO: Site Plan Review Committee **Comments Due:** _____

FROM: Robert Hamblen **Meeting Date:** _____

DATE: 1-16-18 **Review Type:** Rev.Prelim Subdivision

RE: Sandy Brook 21 lot subdivision

Department: Joe L.; D.Lambert; H.Carter; D.Pendleton; C.Huntress; H.Newman; K.Kern

Reviewer: Ed Footer, Helen Newman, Maine Water

Time:

Comments: The anticipated static pressure is approximately 35 psi at ground level.

As far as plan changes there are only a few concerns;

1.) Specify a plan, including material and location, to disinfect, flush and sample the new water main.

2.) Clarify the crossings of sewer and water, will there be elevation issues? with out adding multiple offsets.

3.) Please coordinate a meeting with Maine Water Company to review existing and proposed water system infrastructure. We have identified several discrepancies between the existing water system and the design drawings.

Please add additional sheets – Attachments as appropriate.

City of Saco

1-11-18 emailed to Andy M

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Planning Office
Saco City Hall
300 Main Street
Saco, ME 04072-1538

Robert Hamblen, A.I.C.P., City Planner
Telephone: (207) 282-3487
Fax: (207) 282-8202
E-mail: bhamblen@sacomaine.org

TO: Site Plan Review Committee **Comments Due:** _____

FROM: Robert Hamblen **Meeting Date:** _____

DATE: 1/11/2018 **Review Type:** Rev.Prelim Subdivision

RE: Sandy Brook 21 lot subdivision

Department: Fire

Reviewer: David Pendleton

Time: 20 minutes

Comments: The Fire Department appreciates that an additional hydrant has been added since our comments of 6/29/2017. We would like consideration to move the hydrant near the wet pond closer to the intersection of Chantelle Way and Sandy Brook Lane.

Please add additional sheets – Attachments as appropriate.

City of Saco

Planning Office
Saco City Hall
300 Main Street
Saco, ME 04072-1538

Robert Hamblen, A.I.C.P., City Planner
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E-mail: bhamblen@sacomaine.org

TO: Site Plan Review Committee **Comments Due:** _____

FROM: Robert Hamblen **Meeting Date:** _____

DATE: 12/20/17 **Review Type:** Rev.Prelim Subdivision

RE: Sandy Brook 21 lot subdivision

Department: Joe L.; D.Lambert; H.Carter; D.Pendleton; C.Huntress; H.Newman; K.Kern

Reviewer: Kate Kern, Deputy Assessor

Time: 01092018

Comments: this parcel is not in any land use program

Please add additional sheets – Attachments as appropriate.

CITY OF SACO, MAINE

Planning
Saco City Hall
300 Main Street
Saco, Maine 04072-1538

Robert Hamblen, City Planner
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August 22, 2017

Mr. Andrew Morrell
BH2M
28 State Street
Gorham ME 04038

Re: Preliminary Cluster Residential Development Review, Sandy Brook Subdivision

Dear Mr. Morrell:

The Planning Board reviewed the submittal for the proposed Sandy Brook clustered subdivision at its meeting of August 8, 2017. The Board heard from you and applicant Joseph Frustaci regarding the proposal to create 25 lots on a 19.44 acre parcel at the rear (southwesterly side) of the Sierra Woods subdivision. You propose to extend Chantelle Way and Blake Avenue, and install public water and sewer, electricity, cable and phone service for each of the lots.

The Board voted to find the application complete for the purposes of discussion, but agreed to table review at the end of this evening's consideration without taking action. A public hearing was held, with a number of residents of the abutting Sierra Woods subdivision commenting on a variety of issues.

After discussion, the Board voted to table further preliminary cluster residential development review, and asked that written responses to the standards found in Section 606-1 of the Zoning Ordinance be submitted. Also, as outlined in Section 607-2, that a registered landscape architect be retained to provide a site plan for the project.

Further Board review will be scheduled pending submission of the requested items. Feel free to contact me with any questions.

Sincerely,

Bob Hamblen

cc: J. Frustaci

NORMANDEAU ASSOCIATES
Environmental Consultants

Memorandum

Sunday, July 23, 2017

TO: Bob Hamblen
FROM: Erik Lema, Senior Wetland Scientist, Normandeau Associates, Inc.
SUBJECT: Sandy Brook Subdivision, Wetland Delineation Peer Review
PROJECT #: 23906.003

Normandeau Associates conducted a review on Friday July 7th, 2017 of the wetland delineation at the proposed location of the Sandy Brook Subdivision in Saco, Maine. The review of the delineated wetland boundaries included an examination of the vegetation, soils, and hydrology to determine accuracy. The site is has been cleared and some excavation/spoil is present, likely from the nearby subdivision. The wetland review performed on March 8th noted three areas of concern and requested the delineator, Mark Hampton of Hampton Associates, Inc. to review the areas in question. One of the areas had previously been flagged but did not appear on plans, and required no further delineation. Mark Hampton reevaluated the other two areas and determined that some small emergent wetland areas warranted additional investigation. The revised plans accurately depict these new areas, as well as the former area that had been initially missed by the GPS survey.

Normandeau finds that the latest iteration of the wetland delineation accurately depicts the current conditions at the site, and is reflected on current plans. No further alteration of the wetland boundaries is warranted.

Please contact me at (207) 518-6769 or elema@normandeau.com if you have any questions.

Regards,

Erik Lema, Senior Wetland Scientist
Normandeau Associates, Inc.

City of Saco

3-3-17 emailed to Bill T

Planning Office
Saco City Hall
300 Main Street
Saco, ME 04072-1538

Robert Hamblen, A.I.C.P., City Planner
Telephone: (207) 282-3487
Fax: (207) 282-8202
E-mail: bhamblen@sacomaine.org

TO: Site Plan Review Committee

FROM: Robert Hamblen

DATE: March 2, 2017

RE: Sandy Brook

Comments Due: _____

Meeting Date: _____

Review Type: _____

Department: Fire

Reviewer: David Pendleton

Time: 30 minutes

Comments:

The proposed location of the only new fire hydrant at the end of Blake Ave does not seem to be in keeping with existing fire hydrant spacing. Please provide the distance from the existing fire hydrant on Sean Pl to the proposed new fire hydrant in both directions in order to allow consideration of an additional fire hydrant.