STORMWATER MANAGEMENT STATEMENT

To: Borough of Dunellen Planning Board

Project: Proposed Three-Story Mixed-Use Building
Block 33, Lot 18
440 North Avenue (State Route 28)
Borough of Dunellen, Middlesex County, New Jersey

Dated: September 9, 2020

Reference: Preliminary & Final Site Major Site Plan
(prepared by Stonefield Engineering & Design, LLC, dated September 9, 2020)

Chelsea Builders is proposing the construction of a three-story mixed-use retail and residential building. The building proposes a 918 SF retail space along the frontage, and nine (9) residential units which are accessed from the rear parking area consisting of nine parking spaces. The subject property is designated as Block 33, Lot 18, commonly known as 440 North Avenue (State Route 28). The site is located within the redevelopment area of Dunellen in the Remainder Parcels – North Avenue between Madison Avenue and Lincoln Avenue district, and is bounded by residential housing on the adjacent lot to the northwest and commercial uses surrounding otherwise.

The proposed project area is 7,485 SF (0.17 AC) and currently occupied by a two-story residential building with areas of grass and asphalt. The project consists of the construction of a three-story mixed-use retail and residential building with a total building area of 10,566 SF. Additional site improvements include parking, landscaping, lighting, stormwater and utility services. The overall disturbance area associated with the project is 8,403 SF (0.19 AC), consisting of the entire subject property, the public sidewalk along the frontage, and minimal disturbances within the roadway on North Avenue for installation of utility services. The total increase of impervious surfaces associated with this development is 3,940 SF (0.09 AC).

This Stormwater Management Statement has been prepared to analyze the potential stormwater runoff impacts of the proposed project and discuss measures proposed to conform to the stormwater management requirements set forth by the Borough of Dunellen, Freehold Soil Conservation District, the New Jersey Administration Code (NJAC) and the New Jersey Department of Environmental Protection (NJDEP).

PRE-DEVELOPMENT DRAINAGE CONDITIONS

The pre-development condition of the site consists of a two-story residential building and surrounding grass and asphalt areas. All storm runoff sheet flows off-site and ultimately discharges into the NJDOT storm sewer system located within North Avenue (State Route 28), also identified as the existing point of interest. The following table summarizes Drainage Area E-1 of the stormwater analysis:

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Description</th>
<th>Area Extents</th>
<th>Impervious Area</th>
<th>Time of Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1</td>
<td>Pre-Development Drainage</td>
<td>7,485 SF</td>
<td>3,221 SF</td>
<td>6 Minutes</td>
</tr>
</tbody>
</table>
PROPOSED DRAINAGE CONDITIONS

Under proposed conditions, the site will consist of the mixed-use building with a parking area located in the rear of the site. The first drainage area consists of the majority of the property that will be discharged into the proposed underground detention basin located within the parking area. The roof will be collected via roof leaders, and the parking area and a portion of the driveway will be collected via a type ‘E’ inlet proposed within the parking area. Both areas will discharge into the proposed detention basin which ultimately discharges into the NJDOT storm system within the North Avenue. The second drainage area consists of a small portion of the driveway that drains via sheet flow into the North Avenue right-of-way where it will discharge into the NJDOT storm system. The proposed drainage design mimics existing conditions consisting of two (2) drainage areas discharged into the point of interest (NJDOT system within North Avenue). The following table summarizes Drainage Area P-1 of the stormwater analysis:

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Description</th>
<th>Area Extents</th>
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</tr>
</thead>
<tbody>
<tr>
<td>P-1A</td>
<td>Post-Development Drainage Area A to Underground Detention Basin B-1</td>
<td>7,303 SF</td>
<td>7,161 SF</td>
<td>6 Minutes</td>
</tr>
<tr>
<td>P-1B</td>
<td>Post-Development Drainage Area B Detained to North Avenue</td>
<td>182 SF</td>
<td>0 SF</td>
<td>6 Minutes</td>
</tr>
</tbody>
</table>
STORMWATER MANAGEMENT ANALYSIS

The project disturbs less than one acre of land and adds less than 0.25 AC of impervious coverage, therefore is defined as a Minor Development as indicated by the Borough Ordinance and NJDEP. As a Minor Development, water quality requirements and groundwater recharge requirements are not required. The project is designed to conform to the stormwater management requirements set forth by the Borough of Dunellen, Freehold Soil Conservation District, the NJAC and the NJDEP.

A hydrograph comparison has been performed to evaluate the pre- and post-construction runoff quantities for the 2-, 10-, 25-, and 100-year storm events. An underground detention basin is proposed in the center of the parking area to attenuate peak stormwater runoff rates to levels either the same as or less than that of the existing conditions. The tables below summarize the existing and proposed drainage areas in relation to flow rates during regulatory storm events.

TABLE 3: STORMWATER PEAK DISCHARGE ANALYSIS SUMMARY

<table>
<thead>
<tr>
<th>Storm Event</th>
<th>Pre-Development Peak Discharge</th>
<th>Post-Development Peak Discharge</th>
<th>Rate of Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Year</td>
<td>0.23 CFS</td>
<td>0.22 CFS</td>
<td>4.35%</td>
</tr>
<tr>
<td>10-Year</td>
<td>0.36 CFS</td>
<td>0.29 CFS</td>
<td>19.44%</td>
</tr>
<tr>
<td>25-Year</td>
<td>0.45 CFS</td>
<td>0.33 CFS</td>
<td>26.67%</td>
</tr>
<tr>
<td>100-Year</td>
<td>0.70 CFS</td>
<td>0.68 CFS</td>
<td>2.86%</td>
</tr>
</tbody>
</table>

*A minimum concentration of 6-minutes was utilized for all drainage areas.

No adverse impacts to the municipal drainage system or adjacent properties are anticipated as a result of the project. Detailed hydrologic calculations and mapping can be found in the Appendix of this Statement.

Prepared by:

Joshua H. Kline, PE
NJ PE License No. 54347
Stonefield Engineering and Design, LLC
AERIAL MAP

SOURCE: GOOGLE EARTH PRO, DATED 2019

CHELSEA BUILDERS
PROPOSED THREE-STORY MIXED-USE BUILDING

BLOCK 33, LOT 18
440 NORTH AVENUE (STATE ROUTE 28)
BOROUGH OF DUNELLEN
MIDDLESEX COUNTY, NEW JERSEY
SOURCE: UNITED STATES GEOLOGICAL SURVEY QUADRANGLE MAP, PLAINFIELD, NEW JERSEY, 7.5 MINUTE SERIES, 2019

CHELSEA BUILDERS
PROPOSED THREE- STORY MIXED- USE BUILDING

LOCATION:
BLOCK 33, LOT 18
440 NORTH AVENUE (STATE ROUTE 28)
BOROUGH OF DUNELLEN
MIDDLESEX COUNTY, NEW JERSEY

GRAPHIC SCALE IN FEET
1" = 1000'

STONEFIELD engineering & design
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Headquarters: 92 Park Avenue, Rutherford, NJ 07070
Phone 201.340.4468 · Fax 201.340.4472
SITE

SOURCE: FLOOD INSURANCE RATE MAP, MIDDLESEX COUNTY, NEW JERSEY, MAP NUMBERS 34023C0026F, 34023C0028F, 34023C0027F & 34023C0029F, DATED JULY 6, 2010

CHECKED BY: AHM

DATE: 08/12/2020

SCALE: 1" = 1000'
APPENDIX B
NRCS SOIL REPORT
Middlesex County, New Jersey

DuuA—Dunellen-Urban land complex, 0 to 3 percent slopes

Map Unit Setting
   National map unit symbol: nc0t
   Elevation: 50 to 150 feet
   Mean annual precipitation: 30 to 64 inches
   Mean annual air temperature: 46 to 79 degrees F
   Frost-free period: 131 to 178 days
   Farmland classification: Not prime farmland

Map Unit Composition
   Dunellen and similar soils: 55 percent
   Urban land: 30 percent
   Minor components: 15 percent
   Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dunellen

Setting
   Landform: Outwash plains
   Down-slope shape: Linear
   Across-slope shape: Linear
   Parent material: Coarse-loamy outwash derived from sandstone

Typical profile
   A - 0 to 6 inches: loam
   Bt1 - 6 to 15 inches: loam
   Bt2 - 15 to 26 inches: loam
   2C - 26 to 66 inches: stratified gravelly sand to sand to loamy sand

Properties and qualities
   Slope: 0 to 3 percent
   Depth to restrictive feature: More than 80 inches
   Natural drainage class: Well drained
   Runoff class: Very low
   Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
   Depth to water table: More than 80 inches
   Frequency of flooding: None
   Frequency of ponding: None
   Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups
   Land capability classification (irrigated): None specified
   Land capability classification (nonirrigated): 1
   Hydrologic Soil Group: A
   Ecological site: Well Drained Outwash (F144AY023CT)
   Hydric soil rating: No

Description of Urban Land

Setting
   Landform: Outwash plains
   Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile
C - 0 to 60 inches: variable

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents, dunellen substratum
Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Pascack
Percent of map unit: 5 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Riverhead
Percent of map unit: 5 percent
Landform: Outwash fans
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No
APPENDIX C-1
HYDROCAD ROUTING DIAGRAM
APPENDIX C-2
2-YEAR HYDROGRAPHS
Type III 24-hr 2 - Year Storm Event Rainfall = 3.34"

Time span = 0.00-48.00 hrs, dt = 0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH = SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method  -  Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development
Runoff Area = 7,485 sf  43.03% Impervious  Runoff Depth = 1.34"
  Tc = 6.0 min  CN = 39/98  Runoff = 0.23 cfs  835 cf

Subcatchment P-1A: Post-Development
Runoff Area = 7,303 sf  98.06% Impervious  Runoff Depth = 3.05"
  Tc = 6.0 min  CN = 39/98  Runoff = 0.52 cfs  1,854 cf

Subcatchment P-1B: Post-Development
Runoff Area = 182 sf  0.00% Impervious  Runoff Depth = 0.00"
  Tc = 6.0 min  CN = 39/0  Runoff = 0.00 cfs  0 cf

Pond B-1: Underground Detention Basin B-1
  Peak Elev = 50.07'  Storage = 644 cf  Inflow = 0.52 cfs  1,854 cf
  Outflow = 0.22 cfs  1,551 cf

Link P-1: Post-Development Drainage
  Inflow = 0.22 cfs  1,551 cf
  Primary = 0.22 cfs  1,551 cf

Total Runoff Area = 14,970 sf  Runoff Volume = 2,689 cf  Average Runoff Depth = 2.16"
30.65% Pervious = 4,588 sf  69.35% Impervious = 10,382 sf
Summary for Subcatchment E-1: Pre-Development Drainage

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 835 cf, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 - Year Storm Event Rainfall=3.34"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 3,221</td>
<td>98</td>
<td>Impervious Areas</td>
</tr>
<tr>
<td>4,264</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>7,485</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>4,264</td>
<td>39</td>
<td>56.97% Pervious Area</td>
</tr>
<tr>
<td>3,221</td>
<td>98</td>
<td>43.03% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 6.0 min

Direct Entry,

Subcatchment E-1: Pre-Development Drainage

![Hydrograph](image-url)

Type III 24-hr 2 - Year Storm Event Rainfall=3.34"
Runoff Area=7,485 sf
Runoff Volume=835 cf
Runoff Depth=1.34"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1A: Post-Development Drainage A

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 1,854 cf, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 - Year Storm Event Rainfall=3.34"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>*</td>
<td>98</td>
<td>Impervious Area</td>
</tr>
<tr>
<td>7,303</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142</td>
<td>39</td>
<td>1.94% Pervious Area</td>
</tr>
<tr>
<td>7,161</td>
<td>98</td>
<td>98.06% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment P-1A: Post-Development Drainage A

Hydrograph

Type III 24-hr 2 - Year Storm Event Rainfall=3.34"
Runoff Area=7,303 sf
Runoff Volume=1,854 cf
Runoff Depth=3.05"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1B: Post-Development Drainage B

Runoff = 0.00 cfs @ 23.95 hrs, Volume = 0 cf, Depth = 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Type III 24-hr 2 - Year Storm Event Rainfall = 3.34"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>182</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>182</td>
<td>39</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

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

Subcatchment P-1B: Post-Development Drainage B

Hydrograph

Type III 24-hr 2 - Year Storm Event Rainfall = 3.34"
Runoff Area = 182 sf
Runoff Volume = 0 cf
Runoff Depth = 0.00"
Tc = 6.0 min
CN = 39/0
Summary for Pond B-1: Underground Detention Basin B-1

Inflow Area = 7,303 sf, 98.06% Impervious, Inflow Depth = 3.05" for 2 - Year Storm Event event
Inflow = 0.52 cfs @ 12.09 hrs, Volume= 1,854 cf
Outflow = 0.22 cfs @ 12.29 hrs, Volume= 1,551 cf, Atten= 58%, Lag= 12.2 min
Primary = 0.22 cfs @ 12.29 hrs, Volume= 1,551 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 50.07' @ 12.29 hrs Surf.Area= 646 sf Storage= 644 cf

Plug-Flow detention time= 141.6 min calculated for 1,549 cf (84% of inflow)
Center-of-Mass det. time= 74.5 min (830.0 - 755.5)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>49.09'</td>
<td>742 cf</td>
<td>36.0&quot; Round 36&quot; HDPE Pipe x 3 Inside #2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 35.0' S= 0.0020 '/'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,010 cf Overall - 3.0&quot; Wall Thickness = 742 cf</td>
</tr>
<tr>
<td>#2</td>
<td>47.84'</td>
<td>1,017 cf</td>
<td>204.0&quot; W x 66.0&quot; H Box stone storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 38.0' S= 0.0020 '/'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3,553 cf Overall - 1,010 cf Embedded = 2,543 cf x 40.0% Voids</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,759 cf Total Available Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>49.09'</td>
<td>12.0&quot; Round Culvert L= 122.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 49.09' / 48.48' S= 0.0050 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Device 1</td>
<td>52.09'</td>
<td>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
<tr>
<td>#3</td>
<td>Device 1</td>
<td>49.09'</td>
<td>3.0&quot; Vert. Orifice/Grate C= 0.600</td>
</tr>
<tr>
<td>#4</td>
<td>Device 1</td>
<td>51.30'</td>
<td>6.0&quot; W x 3.0&quot; H Vert. Slot C= 0.600</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.22 cfs @ 12.29 hrs HW=50.07' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.22 cfs of 2.27 cfs potential flow)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
3=Orifice/Grate (Orifice Controls 0.22 cfs @ 4.45 fps)
4=Slot (Controls 0.00 cfs)
Pond B-1: Underground Detention Basin B-1

Inflow Area=7,303 sf
Peak Elev=50.07'
Storage=644 cf
Summary for Link P-1: Post-Development Drainage

Inflow Area = 7,485 sf, 95.67% Impervious, Inflow Depth = 2.49" for 2 - Year Storm Event event
Inflow = 0.22 cfs @ 12.29 hrs, Volume= 1,551 cf
Primary = 0.22 cfs @ 12.29 hrs, Volume= 1,551 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link P-1: Post-Development Drainage
APPENDIX C-3
10-YEAR HYDROGRAPHS
Type III 24-hr 10 - Year Storm Event Rainfall=5.07"

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development
Runoff Area=7,485 sf  43.03% Impervious  Runoff Depth=2.20"
Tc=6.0 min   CN=39/98   Runoff=0.36 cfs  1,373 cf

Subcatchment P-1A: Post-Development
Runoff Area=7,303 sf  98.06% Impervious  Runoff Depth=4.74"
Tc=6.0 min   CN=39/98   Runoff=0.80 cfs  2,887 cf

Subcatchment P-1B: Post-Development
Runoff Area=182 sf  0.00% Impervious  Runoff Depth=0.21"
Tc=6.0 min   CN=39/0   Runoff=0.00 cfs  3 cf

Pond B-1: Underground Detention Basin B-1
Peak Elev=50.67’  Storage=899 cf  Inflow=0.80 cfs  2,887 cf
Outflow=0.29 cfs  2,584 cf

Link P-1: Post-Development Drainage
Inflow=0.29 cfs  2,587 cf
Primary=0.29 cfs  2,587 cf

Total Runoff Area = 14,970 sf  Runoff Volume = 4,263 cf  Average Runoff Depth = 3.42"
30.65% Pervious = 4,588 sf  69.35% Impervious = 10,382 sf
Summary for Subcatchment E-1: Pre-Development Drainage

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 1,373 cf, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 - Year Storm Event Rainfall=5.07"

<table>
<thead>
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<tr>
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<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
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<td>39</td>
<td>56.97% Pervious Area</td>
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<td>3,221</td>
<td>98</td>
<td>43.03% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>min</td>
<td>feet</td>
<td>(ft/ft)</td>
<td>(ft/sec)</td>
<td>(cfs)</td>
</tr>
</tbody>
</table>

Subcatchment E-1: Pre-Development Drainage

Hydrograph

Type III 24-hr 10 - Year Storm Event Rainfall=5.07"
Runoff Area=7,485 sf
Runoff Volume=1,373 cf
Runoff Depth=2.20"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1A: Post-Development Drainage A

Runoff = 0.80 cfs @ 12.09 hrs, Volume = 2,887 cf, Depth = 4.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Type III 24-hr 10 - Year Storm Event Rainfall = 5.07"

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<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>*</td>
<td>7,161</td>
<td>Impervious Area</td>
</tr>
<tr>
<td>7,303</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142</td>
<td>39</td>
<td>1.94% Pervious Area</td>
</tr>
<tr>
<td>7,161</td>
<td>98</td>
<td>98.06% Impervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
6.0

Direct Entry,

Subcatchment P-1A: Post-Development Drainage A

Hydrograph

Type III 24-hr 10 - Year Storm Event Rainfall = 5.07"
Runoff Area = 7,303 sf
Runoff Volume = 2,887 cf
Runoff Depth = 4.74"
Tc = 6.0 min
CN = 39/98
Summary for Subcatchment P-1B: Post-Development Drainage B

Runoff = 0.00 cfs @ 12.46 hrs, Volume = 3 cf, Depth = 0.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Type III 24-hr 10 - Year Storm Event Rainfall=5.07"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>182</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>182</td>
<td>39</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

Tc Length Slope Velocity Capacity Description
(min) (feet) (ft/ft) (ft/sec) (cfs)
6.0

Direct Entry, Direct Entry

Subcatchment P-1B: Post-Development Drainage B

Hydrograph

Type III 24-hr 10 - Year Storm Event Rainfall=5.07"
Runoff Area=182 sf
Runoff Volume=3 cf
Runoff Depth=0.21"
Tc=6.0 min
CN=39/0
Summary for Pond B-1: Underground Detention Basin B-1

Inflow Area = 7,303 sf, 98.06% Impervious, Inflow Depth = 4.74" for 10 - Year Storm Event event
Inflow = 0.80 cfs @ 12.09 hrs, Volume= 2,887 cf
Outflow = 0.29 cfs @ 12.34 hrs, Volume= 2,584 cf, Atten= 64%, Lag= 15.5 min
Primary = 0.29 cfs @ 12.34 hrs, Volume= 2,584 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 50.67' @ 12.34 hrs  Surf.Area= 646 sf  Storage= 899 cf

Plug-Flow detention time= 117.7 min calculated for 2,584 cf (89% of inflow)
Center-of-Mass det. time= 65.6 min (813.6 - 748.0 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 49.09'</td>
<td>742 cf</td>
<td>36.0&quot; Round 36&quot; HDPE Pipe x 3 Inside #2</td>
<td>L= 35.0' S= 0.0020 '/'</td>
</tr>
<tr>
<td>#2 47.84'</td>
<td>1,017 cf</td>
<td>204.0&quot; W x 66.0&quot; H Box stone storage</td>
<td>L= 38.0' S= 0.0020 '/'</td>
</tr>
</tbody>
</table>

1,759 cf Total Available Storage

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Primary</td>
<td>49.09'</td>
<td>12.0&quot; Round Culvert L= 122.0' Ke= 0.500</td>
<td></td>
</tr>
<tr>
<td>#2 Device 1</td>
<td>52.09'</td>
<td>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
<td></td>
</tr>
<tr>
<td>#3 Device 1</td>
<td>49.09'</td>
<td>3.0&quot; Vert. Orifice/Grate C= 0.600</td>
<td></td>
</tr>
<tr>
<td>#4 Device 1</td>
<td>51.30'</td>
<td>6.0&quot; W x 3.0&quot; H Vert. Slot C= 0.600</td>
<td></td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.29 cfs @ 12.34 hrs HW=50.67’ TW=0.00’ (Dynamic Tailwater)
1=Culvert (Passes 0.29 cfs of 3.15 cfs potential flow)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
3=Orifice/Grate (Orifice Controls 0.29 cfs @ 5.81 fps)
4=Slot (Controls 0.00 cfs)
Pond B-1: Underground Detention Basin B-1

Inflow Area=7,303 sf
Peak Elev=50.67'
Storage=899 cf
Summary for Link P-1: Post-Development Drainage

Inflow Area = 7,485 sf, 95.67% Impervious, Inflow Depth = 4.15" for 10 - Year Storm Event event
Inflow = 0.29 cfs @ 12.35 hrs, Volume= 2,587 cf
Primary = 0.29 cfs @ 12.35 hrs, Volume= 2,587 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link P-1: Post-Development Drainage

Hydrograph
APPENDIX C-4
25-YEAR HYDROGRAPHS
**Type III 24-hr 25 - Year Storm Event Rainfall=6.28”**

- **Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2**
- **Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.**
- **Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method**

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Pre-Development</th>
<th>Post-Development</th>
<th>Post-Development</th>
<th>Underground Detention Basin</th>
<th>Drainage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runoff Area</td>
<td>7,485 sf</td>
<td>7,303 sf</td>
<td>182 sf</td>
<td>1,095 cf</td>
<td>3,316 cf</td>
</tr>
<tr>
<td>Impervious</td>
<td>43.03%</td>
<td>98.06%</td>
<td>0.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runoff Depth</td>
<td>2.90”</td>
<td>5.93”</td>
<td>0.53”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tc</td>
<td>6.0 min</td>
<td>6.0 min</td>
<td>6.0 min</td>
<td>Peak Elev=51.14’</td>
<td></td>
</tr>
<tr>
<td>CN</td>
<td>39/98</td>
<td>39/98</td>
<td>39/0</td>
<td>Storage=1,095 cf</td>
<td></td>
</tr>
<tr>
<td>Runoff</td>
<td>0.45 cfs</td>
<td>0.99 cfs</td>
<td>0.00 cfs</td>
<td>Inflow=0.99 cfs 3,612 cf</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,809 cf</td>
<td>3,612 cf</td>
<td>8 cf</td>
<td>Outflow=0.33 cfs 3,308 cf</td>
<td></td>
</tr>
</tbody>
</table>

**Pond B-1:**
- Peak Elev=51.14’
- Storage=1,095 cf
- Inflow=0.99 cfs 3,612 cf
- Outflow=0.33 cfs 3,308 cf

**Link P-1:**
- Inflow=0.33 cfs 3,316 cf
- Primary=0.33 cfs 3,316 cf

**Total Runoff Area = 14,970 sf**
- Runoff Volume = 5,429 cf
- Average Runoff Depth = 4.35”
- 30.65% Pervious = 4,588 sf
- 69.35% Impervious = 10,382 sf
Summary for Subcatchment E-1: Pre-Development Drainage

Runoff = 0.45 cfs @ 12.09 hrs, Volume = 1,809 cf, Depth = 2.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 - Year Storm Event Rainfall=6.28"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,221</td>
<td>98</td>
<td>Impervious Areas</td>
</tr>
<tr>
<td>4,264</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>7,485</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>4,264</td>
<td>39</td>
<td>56.97% Pervious Area</td>
</tr>
<tr>
<td>3,221</td>
<td>98</td>
<td>43.03% Impervious Area</td>
</tr>
</tbody>
</table>

Tc=6.0 min

Subcatchment E-1: Pre-Development Drainage

Hydrograph

Type III 24-hr 25 - Year Storm Event Rainfall=6.28"
Runoff Area=7,485 sf
Runoff Volume=1,809 cf
Runoff Depth=2.90"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1A: Post-Development Drainage A

Runoff = 0.99 cfs @ 12.09 hrs, Volume= 3,612 cf, Depth= 5.93"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 - Year Storm Event Rainfall=6.28"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>*</td>
<td>98</td>
<td>Impervious Area</td>
</tr>
<tr>
<td>7,303</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142</td>
<td>39</td>
<td>1.94% Pervious Area</td>
</tr>
<tr>
<td>7,161</td>
<td>98</td>
<td>98.06% Impervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry,</td>
</tr>
</tbody>
</table>

Subcatchment P-1A: Post-Development Drainage A

Hydrograph

Type III 24-hr 25 - Year Storm Event Rainfall=6.28"
Runoff Area=7,303 sf
Runoff Volume=3,612 cf
Runoff Depth=5.93"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1B: Post-Development Drainage B

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 8 cf, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 - Year Storm Event Rainfall=6.28"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>182</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>182</td>
<td>39</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

Tc = 6.0 min

Subcatchment P-1B: Post-Development Drainage B

Hydrograph

Type III 24-hr 25 - Year Storm Event Rainfall=6.28"
Runoff Area=182 sf
Runoff Volume=8 cf
Runoff Depth=0.53"
Tc=6.0 min
CN=39/0
Summary for Pond B-1: Underground Detention Basin B-1

Inflow Area = 7,303 sf, 98.06% Impervious, Inflow Depth = 5.93" for 25 - Year Storm Event

Inflow = 0.99 cfs @ 12.09 hrs, Volume= 3,612 cf
Outflow = 0.33 cfs @ 12.37 hrs, Volume= 3,308 cf, Atten= 67%, Lag= 17.1 min
Primary = 0.33 cfs @ 12.37 hrs, Volume= 3,308 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 51.14' @ 12.37 hrs Surf.Area= 646 sf Storage= 1,095 cf

Plug-Flow detention time= 106.8 min calculated for 3,308 cf (92% of inflow)
Center-of-Mass det. time= 62.2 min ( 807.0 - 744.8 )

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>49.09'</td>
<td>742 cf</td>
<td>36.0&quot; Round 36&quot; HDPE Pipe x 3 Inside #2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 35.0' S= 0.0020 '/'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,010 cf Overall - 3.0&quot; Wall Thickness = 742 cf</td>
</tr>
<tr>
<td>#2</td>
<td>47.84'</td>
<td>1,017 cf</td>
<td>204.0&quot; W x 66.0&quot; H Box stone storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 38.0' S= 0.0020 '/'</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3,553 cf Overall - 1,010 cf Embedded = 2,543 cf x 40.0% Voids</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,759 cf Total Available Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>49.09'</td>
<td>12.0&quot; Round Culvert L= 122.0' Ke= 0.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 49.09' / 48.48' S= 0.0050 '/' Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#2</td>
<td>Device 1</td>
<td>52.09'</td>
<td>4.0' long x 0.5' breadth Broad-Crested Rectangular Weir</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.20 0.40 0.60 0.80 1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coef. (English) 2.80 2.92 3.08 3.30 3.32</td>
</tr>
<tr>
<td>#3</td>
<td>Device 1</td>
<td>49.09'</td>
<td>3.0&quot; Vert. Orifice/Grate C= 0.600</td>
</tr>
<tr>
<td>#4</td>
<td>Device 1</td>
<td>51.30'</td>
<td>6.0&quot; W x 3.0&quot; H Vert. Slot C= 0.600</td>
</tr>
</tbody>
</table>

Primary OutFlow Max=0.33 cfs @ 12.37 hrs HW=51.13’ TW=0.00’ (Dynamic Tailwater)

1=Culvert (Passes 0.33 cfs of 3.71 cfs potential flow)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
3=Orifice/Grate (Orifice Controls 0.33 cfs @ 6.67 fps)
4=Slot (Controls 0.00 cfs)
Pond B-1: Underground Detention Basin B-1

Inflow Area = 7,303 sf
Peak Elev = 51.14'
Storage = 1,095 cf

Hydrograph
Summary for Link P-1: Post-Development Drainage

Inflow Area = 7,485 sf, 95.67% Impervious, Inflow Depth = 5.32" for 25 - Year Storm Event event
Inflow = 0.33 cfs @ 12.37 hrs, Volume= 3,316 cf
Primary = 0.33 cfs @ 12.37 hrs, Volume= 3,316 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link P-1: Post-Development Drainage
APPENDIX C-5
100-YEAR HYDROGRAPH
Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E-1: Pre-Development
Runoff Area=7,485 sf  43.03% Impervious  Runoff Depth=4.32"
Tc=6.0 min  CN=39/98  Runoff=0.70 cfs  2,692 cf

Subcatchment P-1A: Post-Development
Runoff Area=7,303 sf  98.06% Impervious  Runoff Depth=8.10"
Tc=6.0 min  CN=39/98  Runoff=1.34 cfs  4,927 cf

Subcatchment P-1B: Post-Development
Runoff Area=182 sf  0.00% Impervious  Runoff Depth=1.36"
Tc=6.0 min  CN=39/0  Runoff=0.00 cfs  21 cf

Pond B-1: Underground Detention Basin B-1
Peak Elev=51.68’  Storage=1,309 cf  Inflow=1.34 cfs  4,927 cf
Outflow=0.67 cfs  4,624 cf

Link P-1: Post-Development Drainage
Inflow=0.68 cfs  4,645 cf
Primary=0.68 cfs  4,645 cf

Total Runoff Area = 14,970 sf  Runoff Volume = 7,640 cf  Average Runoff Depth = 6.12"
30.65% Pervious = 4,588 sf  69.35% Impervious = 10,382 sf
Summary for Subcatchment E-1: Pre-Development Drainage

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 2,692 cf, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 - Year Storm Event Rainfall=8.47"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 3,221</td>
<td>98</td>
<td>Impervious Areas</td>
</tr>
<tr>
<td>4,264</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>7,485</td>
<td>64</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>4,264</td>
<td>39</td>
<td>56.97% Pervious Area</td>
</tr>
<tr>
<td>3,221</td>
<td>98</td>
<td>43.03% Impervious Area</td>
</tr>
</tbody>
</table>

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

Subcatchment E-1: Pre-Development Drainage

Type III 24-hr
100 - Year Storm Event Rainfall=8.47"
Runoff Area=7,485 sf
Runoff Volume=2,692 cf
Runoff Depth=4.32"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1A: Post-Development Drainage A

Runoff = 1.34 cfs @ 12.09 hrs, Volume = 4,927 cf, Depth = 8.10"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Type III 24-hr 100 - Year Storm Event Rainfall=8.47"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>*</td>
<td>7,161</td>
<td>Impervious Area</td>
</tr>
<tr>
<td>7,303</td>
<td>97</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>142</td>
<td>39</td>
<td>1.94% Pervious Area</td>
</tr>
<tr>
<td>7,161</td>
<td>98</td>
<td>98.06% Impervious Area</td>
</tr>
</tbody>
</table>

Tc = 6.0 min

Subcatchment P-1A: Post-Development Drainage A

Hydrograph

Type III 24-hr
100 - Year Storm Event Rainfall=8.47"
Runoff Area=7,303 sf
Runoff Volume=4,927 cf
Runoff Depth=8.10"
Tc=6.0 min
CN=39/98
Summary for Subcatchment P-1B: Post-Development Drainage B

Runoff = 0.00 cfs @ 12.12 hrs, Volume= 21 cf, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 - Year Storm Event Rainfall=8.47"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>182</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>182</td>
<td>39</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Entry, Direct Entry</td>
</tr>
</tbody>
</table>

Subcatchment P-1B: Post-Development Drainage B

Hydrograph

Type III 24-hr 100 - Year Storm Event Rainfall=8.47"
Runoff Area=182 sf
Runoff Volume=21 cf
Runoff Depth=1.36"
Tc=6.0 min
CN=39/0
Summary for Pond B-1: Underground Detention Basin B-1

Inflow Area = 7,303 sf, 98.06% Impervious, Inflow Depth = 8.10" for 100-Year Storm Event event
Inflow = 1.34 cfs @ 12.09 hrs, Volume= 4,927 cf
Outflow = 0.67 cfs @ 12.24 hrs, Volume= 4,624 cf, Attenuation 50%, Lag= 9.2 min
Primary = 0.67 cfs @ 12.24 hrs, Volume= 4,624 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 51.68' @ 12.24 hrs  Surf.Area= 646 sf  Storage= 1,309 cf

Plug-Flow detention time= 89.3 min calculated for 4,619 cf (94% of inflow)
Center-of-Mass det. time= 54.8 min (795.8 - 741.1)

Volume Invert Avail.Storage Storage Description
#1 49.09' 742 cf 36.0" Round 36" HDPE Pipe x 3 Inside #2 L= 35.0'  S= 0.0020 '/'
1,010 cf Overall - 3.0" Wall Thickness = 742 cf
#2 47.84' 1,017 cf 204.0" W x 66.0" H Box stone storage L= 38.0'  S= 0.0020 '/'
3,553 cf Overall - 1,010 cf Embedded = 2,543 cf x 40.0% Voids

1,759 cf Total Available Storage

Device Routing Invert Outlet Devices
#1 Primary 49.09' 12.0" Round Culvert L= 122.0'  Ke= 0.500
Inlet / Outlet Invert= 49.09'/ 48.48'  S= 0.0050 '/'  Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#2 Device 1 52.09' 4.0' long x 0.5' breadth Broad-Crested Rectangular Weir
Head (feet) 0.20 0.40 0.60 0.80 1.00
Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3 Device 1 49.09' 3.0" Vert. Orifice/Grate C= 0.600
#4 Device 1 51.30' 6.0" W x 3.0" H Vert. Slot C= 0.600

Primary OutFlow Max=0.67 cfs @ 12.24 hrs HW=51.68' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.67 cfs of 4.28 cfs potential flow)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
3=Orifice/Grate (Orifice Controls 0.37 cfs @ 7.55 fps)
4=Slot (Orifice Controls 0.30 cfs @ 2.39 fps)
Pond B-1: Underground Detention Basin B-1

Hydrograph

Inflow Area=7,303 sf
Peak Elev=51.68'
Storage=1,309 cf
Summary for Link P-1: Post-Development Drainage

Inflow Area = 7,485 sf, 95.67% Impervious, Inflow Depth = 7.45" for 100 - Year Storm Event event
Inflow = 0.68 cfs @ 12.24 hrs, Volume= 4,645 cf
Primary = 0.68 cfs @ 12.24 hrs, Volume= 4,645 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link P-1: Post-Development Drainage
APPENDIX D
DRAINAGE AREA MAPS
AREAS:

- **AREA P-1A**
  - Proposed pervious areas
  - 7,161 SF
  - Open space (HSG A)
  - 7,303 SF = Total area

- **AREA P-1B**
  - 182 SF = Open space (HSG A)
  - 182 SF = Total area

**TITLE:**
MH 30" RCCP

**PROJECT ID:**
PRI-200114

**SCALE:**
1" = 20'

**DRAWN BY:**
JOSHUA H. KLINE, P.E.

**LICENSED PROFESSIONAL ENGINEER:**
NEW JERSEY LICENSE No. 54347

**DATE:**
09/09/2020

**NOT APPROVED FOR CONSTRUCTION**

**DESCRIPTION:**
- Proposed pervious area
- Proposed site drainage area
- Property line
- Municipal road
- 12' Wide mutual driveway
- 10' Wide storage area
- 10' Wide mutual driveway

**SYMBOLS:**
- White line
- Double yellow line
- Concrete curb
- Wire guy
- Light 14" pa"ers
- Construction
d- Wire cover
- Steps
- Porch
- Parking paved
- Parking

**NOTES:**
- Open space (HSG A)
- Total area = 7,303 SF
- Proposed pervious area = 7,161 SF
- Proposed site drainage area = 7,303 SF

**MAP:**
- North Avenue
- 20' = 1" GRAPHIC SCALE IN FEET
- 0' 10' 20' 30' 40'

**FILED MAP:**
- DB. 5177 PG. 276
- N/F LANDS OF HACKETTSTOWN PROPERTIES, INC.
- MH
- TAX LOT 17

**DEVELOPMENT:**
- PROPOSED THREE-STORY MIXED-USE BUILDING
- BLOCK 33, LOT 18
- MIDDLESEX COUNTY, NEW JERSEY

**SPECIFICATIONS:**
- 2 STORY FRAME BUILDING
- PAVED PARKING
- PERVIOUS AREAS
- IMPERVIOUS AREAS
- TOTAL AREA

**SITE:**
- CHELSEA BUILDERS
- 440 NORTH AVENUE
- DUNELLEN, NJ