

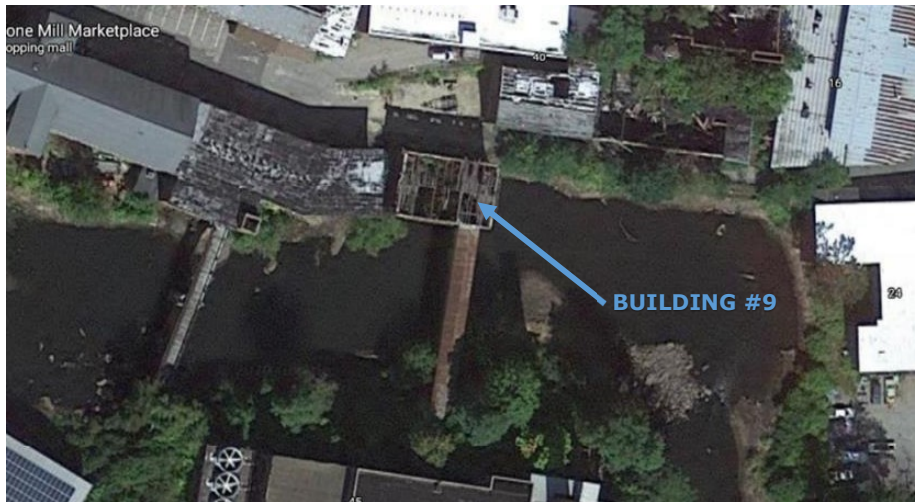
## Existing Conditions Review of Building #9

**To:** Rebekah Cornell, Town of Ware Director of Planning & Community Development  
**FROM:** Craig French, PE, Principal Structural Engineer  
**DATE:** January 11, 2021

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Tighe & Bond recently completed a review of the existing utilities on the Millyard site. During our review, we reviewed documents already compiled by the Town, and researched additional historical documents of the site. These included assessors' maps, previously completed surveys, historical design drawings of the buildings on site, and research of existing Sanborn information. In addition to reviewing existing documents, we also entered the underground tunnels to establish the extents of the tunnels and determine utilities within them.

Building #9 is situated to the south of the utility tunnel and adjacent to the northern bank of the river. The building is also referred to as the Turbine Building (see aerial view below).



Aerial View of Building #9 – The Turbine Building

Based on our previous utility review of the overall site, it appears that Building #9 does not have a water line currently providing service to the building. We were also unable to identify the location of sewer services for this building. The sanitary sewer likely discharges to the sewer main located within the penstocks below the building. From our investigations it appeared the electrical services to the abandoned buildings had been disconnected. In several locations the cut feeders were still visible exiting the building.

According to the existing mapping information, Building #9 is approximately 40'x60'. The main level of the building is at grade, and the building is two stories above grade and one story extending down to the river level (**Photo 01**).

The building is constructed of multi-wythe brick walls around the exterior with what appeared to be a wood roof deck and steel trusses for the roof structure. The entire roof deck has deteriorated and failed (**Photo 02**). Although the roof is providing no protection from the elements, the exterior brick masonry walls appear to be in fair condition below the top 2 to 3

feet (**Photo 03**). Significant efflorescence was noted throughout the walls, however, the brick units themselves and the mortar joints appeared to remain in place. We were unable to inspect the upper portion of the walls hands on; but the lower section of mortar was hard and sound.

Although the steel roof members have been exposed to the weather for an unknown period of time, only surface rust was noted on most members. We did not identify widespread advanced deterioration of the steel members or significant section loss (**Photo 04**).

The at grade floor level could not be reviewed due to the excessive amount of debris on the floor (**Photo 05**). It appeared from isolated spots reviewed the floor system is cast-in-place concrete. The exterior of the building also seems to transition to cast-in-place concrete below the ground floor level (**Photo 06**). Similar to most concrete structures of this vintage, the concrete was not air entrained, and thus shows signs of freeze thaw deterioration (**Photo 07**).

Although the exterior masonry walls and structural steel roof framing appear to be in fair overall condition, the building potentially has some significant structural issues. The deteriorating cast-in-place concrete could require substantial repairs or even partial replacement. We could not access the concrete foundation at the time of our review without a boat, but the widespread spalls are an indication of unsound concrete. The concrete pilasters are also being subjected to scour from the running water and pressure from ice at the river's water line.

The at grade floor diaphragm showed signs of numerous holes. Due to the amount of debris on the floor, we could not verify if these were framed openings or failed portions of the floor. It is likely there are a mixture of both. There appeared to be a significant amount of weight on the floor with the presence of an abandoned vehicle and a large steel member (**Photo 08**), without a collapse. This may indicate that the at grade floor is in fact cast-in-place reinforced concrete, with a high allowable load capacity.

The exterior masonry walls appeared to be in relatively fair condition. The upper 2 to 3 feet is showing signs of deterioration and isolated failures, however the remaining portions appear in tact and sound. A more detailed review of the walls will be required before knowing if they would have adequate capacity to remain in service. The roof of the building is non-existent, as the entire wood roof deck has failed. This condition, if left unchanged, will ultimately cause the rapid acceleration of the deterioration of the steel members and the masonry walls. Constant exposure to water and freeze/thaw conditions will eventually leave the steel and masonry beyond the point of repair.

If this building is to be considered for re-use, every system in the building will require some level of repair or replacement, and in some cases the systems are currently non-existent. We have developed two conceptual cost estimates; the first to repair or replace all systems in the building for re-use, and the second to repair those building systems needed to temporarily stabilize the building. Understanding that these estimates have a massive amount of variability, including the extent of actual required repairs, the level of standard that will be required of the systems or finishes, or even when the work will be completed; a contingency of 50% has been applied to the estimate. Each of the two estimates are presented in **Appendix A**.

# PHOTOS



Photo 1: Building #9 – The Turbine Building



Photo 2: Failed Roof Deck of Building #9





Photo 3: Upper Portion of Masonry Walls and Steel Roof Members



Photo 4: Surface Rust on Steel Roof Members



Photo 5: Debris Across at Grade Floor Level



Photo 6: Evidence of Cast-in-Place Concrete Floor System





Photo 7: Deteriorated and Spalled Concrete Pilaster



Photo 8: Abandoned Vehicle and Large Steel Section Supported on Floor

# APPENDIX A

## Conceptual Cost Estimates



**Estimate of Probable Construction Cost**  
**Town of Ware - East Main Street Millyard**  
**Building #9 - Turbine Building Costs to Stabilize the Building**

| ITEM      | DESCRIPTION                                    | UNITS | QTY  | UNIT PRICE                  | TOTAL             |
|-----------|------------------------------------------------|-------|------|-----------------------------|-------------------|
| <b>1.</b> | <b>General Conditions</b>                      |       |      |                             |                   |
|           | Mobilization/Demobilization                    | LS    | 5%   | \$20,600                    | <b>\$20,600</b>   |
|           | Contractors OH & P                             | LS    | 15%  | \$61,800                    | <b>\$61,800</b>   |
| <b>2.</b> | <b>Building Prep</b>                           |       |      |                             |                   |
|           | Selective Demolition                           | LS    | 1    | \$10,000                    | \$10,000          |
|           | Hazardous Materials Abatement                  | SF    | 4800 | \$8                         | \$38,400          |
|           | Clean up and Disposal of Materials             | SF    | 4800 | \$5                         | \$24,000          |
|           | Site Prep / Clean-up                           | LS    | 1    | \$5,000                     | \$5,000           |
|           |                                                |       |      |                             | <b>\$77,400</b>   |
| <b>3.</b> | <b>Structural Repairs &amp; Reconstruction</b> |       |      |                             |                   |
|           | Division 02: Site Work                         | LS    | 1    | \$10,000                    | \$10,000          |
|           | Division 03: Concrete                          | SF    | 2400 | \$30                        | \$72,000          |
|           | Division 04: Masonry                           | SF    | 2400 | \$20                        | \$48,000          |
|           | Division 05: Steel / Metals                    | SF    | 2400 | \$15                        | \$36,000          |
|           | Division 06: Wood / Plastics                   | SF    | 2400 | \$10                        | \$24,000          |
|           | Division 07: Thermal Protections               | SF    | 2400 | \$25                        | \$60,000          |
|           | Division 08: Doors & Windows                   | SF    | 2400 | \$35                        | \$84,000          |
|           |                                                |       |      |                             | <b>\$334,000</b>  |
|           |                                                |       |      | <b>SUBTOTAL</b>             | <b>\$ 493,800</b> |
|           |                                                |       |      | <b>Contingency 50%</b>      | <b>\$246,900</b>  |
|           |                                                |       |      | <b>Engineering Fees 12%</b> | <b>\$88,900</b>   |
|           |                                                |       |      | <b>TOTAL PROJECT COST</b>   | <b>\$ 830,000</b> |

This is an engineer's Opinion of probable Construction Cost (OPCC). Tighe & Bond has no control over the cost or availability of labor, equipment or materials, market conditions or the Contractor's method of pricing, and that the estimates of probable construction costs are made on the basis of the Tighe & Bond's professional judgment and experience. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the bids or the negotiated cost of the Work will not vary from this estimate of the Probable Construction Cost.

**Estimate of Probable Construction Cost**  
**Town of Ware - East Main Street Millyard**  
**Building #9 - Turbine Building Conceptual Renovation Costs**

| ITEM      | DESCRIPTION                                       | UNITS | QTY  | UNIT PRICE                   | TOTAL            |
|-----------|---------------------------------------------------|-------|------|------------------------------|------------------|
| <b>1.</b> | <b>General Conditions</b>                         |       |      |                              |                  |
|           | Mobilization/Demobilization                       | LS    | 5%   | \$66,500                     | <b>\$66,500</b>  |
|           | Contractors OH & P                                | LS    | 15%  | \$199,500                    | <b>\$199,500</b> |
| <b>2.</b> | <b>Building Prep</b>                              |       |      |                              |                  |
|           | Selective Demolition                              | LS    | 1    | \$10,000                     | \$10,000         |
|           | Hazardous Materials Abatement                     | SF    | 4800 | \$8                          | \$38,400         |
|           | Clean up and Disposal of Materials                | SF    | 4800 | \$5                          | \$24,000         |
|           | Site Prep / Clean-up                              | LS    | 1    | \$10,000                     | \$10,000         |
|           | Utility Connections                               | LS    | 1    | \$50,000                     | \$50,000         |
|           |                                                   |       |      |                              | <b>\$132,400</b> |
| <b>3.</b> | <b>Structural Repairs &amp; Reconstruction</b>    |       |      |                              |                  |
|           | Division 02: Site Work                            | LS    | 1    | \$45,000                     | \$45,000         |
|           | Division 03: Concrete                             | SF    | 2400 | \$50                         | \$120,000        |
|           | Division 04: Masonry                              | SF    | 2400 | \$45                         | \$108,000        |
|           | Division 05: Steel / Metals                       | SF    | 2400 | \$40                         | \$96,000         |
|           | Division 06: Wood / Plastics                      | SF    | 2400 | \$10                         | \$24,000         |
|           |                                                   |       |      |                              | <b>\$393,000</b> |
| <b>4.</b> | <b>Architectural Repairs &amp; Reconstruction</b> |       |      |                              |                  |
|           | Division 07: Thermal Protections                  | SF    | 2400 | \$35                         | \$84,000         |
|           | Division 08: Doors & Windows                      | SF    | 2400 | \$35                         | \$84,000         |
|           | Division 09: Finishes                             | SF    | 2400 | \$10                         | \$24,000         |
|           | Division 10: Specialties                          | SF    | 2400 | \$5                          | \$12,000         |
|           | Division 12: Furnishings                          | SF    | 2400 | \$10                         | \$24,000         |
|           |                                                   |       |      |                              | <b>\$228,000</b> |
| <b>5.</b> | <b>Mechanical</b>                                 |       |      |                              |                  |
|           | Division 11: Equipment                            | SF    | 2400 | \$10                         | \$24,000         |
|           | Division 21: Fire Protection                      | SF    | 4800 | \$15                         | \$72,000         |
|           | Division 22: Plumbing                             | SF    | 4800 | \$20                         | \$96,000         |
|           | Division 23: HVAC                                 | SF    | 4800 | \$30                         | \$144,000        |
|           | Division 26: Electrical                           | SF    | 4800 | \$50                         | \$240,000        |
|           |                                                   |       |      |                              | <b>\$576,000</b> |
|           |                                                   |       |      | <b>SUBTOTAL \$</b>           | <b>1,595,400</b> |
|           |                                                   |       |      | <b>Contingency 50%</b>       | <b>\$797,700</b> |
|           |                                                   |       |      | <b>Engineering Fees 12%</b>  | <b>\$287,200</b> |
|           |                                                   |       |      | <b>TOTAL PROJECT COST \$</b> | <b>2,690,000</b> |

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