Project
Former Paper Mill Demolition - Phase 1

Site Address
427 Mowat Avenue, Fort Frances, Ontario

Client
CMI

Submittal:
Engineered Demolition Plan – Phase 1

Date
October 13th, 2020

Prepared by:

CANADIAN NATIONAL DEMOLITION

&

DST consulting engineers
a division of Englobe

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(Professional Engineer Seal is for
Demolition Methodology and Sequencing only)

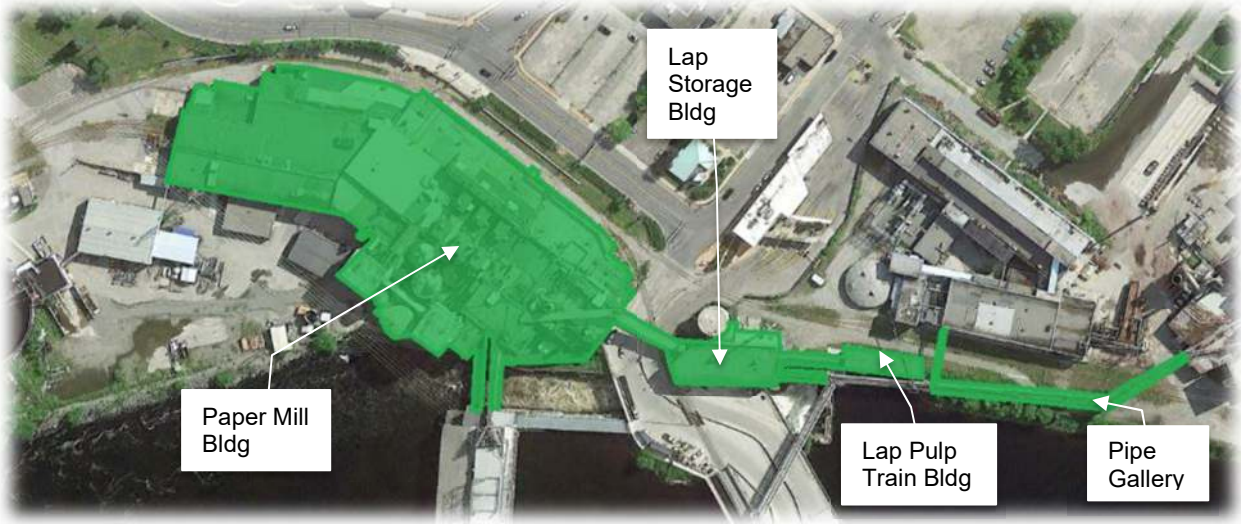
Engineered Demolition Plan

As per the Ontario Building Code, an engineered plan is required when a building meets this requirement.

- A building is greater than 3 storeys in building height or 600 m² in building area,
- If a building structure contains pre-tensioned or post-tensioned members,
- If a building being demolished extends below the footings of adjacent buildings,
- Or for a building where explosives or lasers are to be used

Overview of Buildings in Phase 1

Note: All buildings outlined below in green are to be demolished in Phase 1.



Building Descriptions

A. Kraft Mill Woodroom Building

- Building No.39 and Building No.39A (as designated on the site plan dated September 15, 2009)
- The buildings are located south of the Kraft Mill side of the property.
- The two storey buildings have an irregular layout with a footprint of approximately 19,200 ft^2. The building layout consists of offices, a lunchroom, washrooms, debarking and chipping area, and bark conveyor.
- The building structure consists of following components:
  - Frame system consisting of steel columns and beams supporting floor and roof levels.
  - Load-bearing masonry walls
  - Steel deck supported by open web steel joists spanning to load bearing masonry walls and steel beams/columns.
  - Slab on grades and reinforced concrete foundation walls.
    - All foundations, equipment bases and slab on grades to remain at present time

B. Paper Mill Building

- Building No.1, 2, 3, 3A, 3B, 4, 5, 6, 6A, 8, 9, 10, 11, 12, 12A, 14, 15, 26, 28, 53, 56, 62 & 62A (as designated on the site plan dated September 15, 2009)
- The buildings are located on the Paper Mill side of the property.
- The building height ranges between one storey and three storeys with a basement. The building has an irregular layout with a footprint of approximately 230,000 ft^2. The building layout consists of machine shops, shipping area, boiler rooms, pump rooms, offices, washrooms, holding tanks, and conveyors.
- The building structure consists of following components:
  - Frame system consisting of steel columns and beams supporting floor and roof levels.
  - Load-bearing masonry walls
  - Steel deck supported by open web steel joists spanning to load bearing masonry walls and steel beams/columns.
  - Suspended concrete slabs through out the buildings.
  - Slab on grades and reinforced concrete foundation walls.
    - All foundations, equipment bases and slab on grades to remain at present time

Pre-Demolition:

- Obtain utility Locates (Ontario One-Call and Private)
- Electrical utilities shall be disconnected and removed (H_2O Power)
- Gas utilities shall be disconnected and removed (Enbridge/Centra)
- Water meters shall be disconnected at the foundation and protected from damage
- Sanitary and storm lines will be capped at the property line
- Work area shall be fenced off from public with a minimum 6' tall modular fence.
- Proper construction signage shall be posted in visible areas indicating demolition in process
- A demolition permit shall be obtained from the municipality having jurisdiction
- All hazardous and designated substances shall be removed prior to commencing the demolition proceedings.
- Dust control will be maintained at all times, as required.
- Install erosion control measure as necessary
- Localised water and process lines shall be relocated
- All equipment and buildings shall be de-energized

Hazardous Substance Removal Checklist

- As per O.Reg 278 and DSS report

Utility Disconnection Contacts

Natural Gas – Enbridge – 1-866-763-5427
Centra Gas Pipelines – 807-482-1039
Electricity – H_2O Power – 807-274-0174
Water and Sewer – Fort Frances - 807-274-9893

Demolition Methodology:

I. All machine room equipment, raised roofing and signs on the roof shall be removed prior to removing any structural elements.
II. Use established control measures to control the disbursement of dust. Water shall be used for any dust suppression (if required).
III. Demolish all non-structural components prior to demolishing structural elements (i.e. Wall cladding & roof assemblies).
IV. Ensure that all debris falls into the building and that no person is in the building during this time.
V. Demolition shall be performed in the reverse order of construction. Structural demolition to start at the roof level and proceed downwards. All buildings will be demolished using a mix of 35-, 45- and 80-Ton Shovels with Second or third member shears and attachment shear to pick apart the building in sequence. This shovel is followed with a 25-Ton equipped with a bucket and thumb, grapple or magnet for onsite sorting of material.
VI. The structures will be demolished in reverse order to that of construction (roof deck, secondary beams/joists, beams, columns). All buildings will be completed on a grid basis completing one (1) bay at a time. The demolition of a bay will be completed prior to workers leaving at end of day. The machinery will be limited to the slabs-on-grade and the building perimeter only (no equipment on the structural floors).
VII. Structural Demolition:
    a. Direction of demolition is to start in the middle and work east and west carried out section by section
    b. The area north of the buildings is to be used as staging area.
    c. Start demolition of roof structure perpendicular to the joist direction. The structural members should be demolished one bay at a time from top to bottom.
    d. Lateral force resisting systems (bracing, shear wall, etc.), staircase frame shall be removed one bay at a time.
    e. Demolish and remove from site roof deck between the open web steel joists at the bay.
    f. Demolish and remove from site open web steel joists at the bay.
    g. Demolish and remove from site all beam parallel to the open web steel joists at the bay.
    h. Demolish and remove from site all beams perpendicular to the open web steel joists at the bay.
    i. Remove from site all exterior walls at the bay.
    j. Demolish and remove from site all load bearing walls at the bay.
    k. Demolish and remove from site all steel columns at the bay.
VIII. Remove all concrete/steel beams when only after it is confirmed that they are no longer bearing any loads from the floor/roof above. Building walls can be left provided they are properly supported after the floor structure and beams have been removed.
IX. Remove any columns and drop panels only one level above the floor level being demolished and as long as the floor loads above have been removed.
X. Remove floors and continue demolition in the same manner as noted above.

XI. Material shall be sorted on site and disposed frequently using trailers or bins and hauled as necessary to limit stockpiling. End users and hauling to follow waste management plan (WMP).
XII. All C&D and non-hazardous waste to be transported and disposed of at the former Resolute Landfill Site as per O.Reg. 347.
XIII. Rubble is to be used as backfill material. All rubble to be pulverized to less than 1ft minus. Prior to backfilling and grading area to top of foundation walls and/or slab on grade, areas to be backfilled are to be free from debris, snow, ice, water and frozen ground.

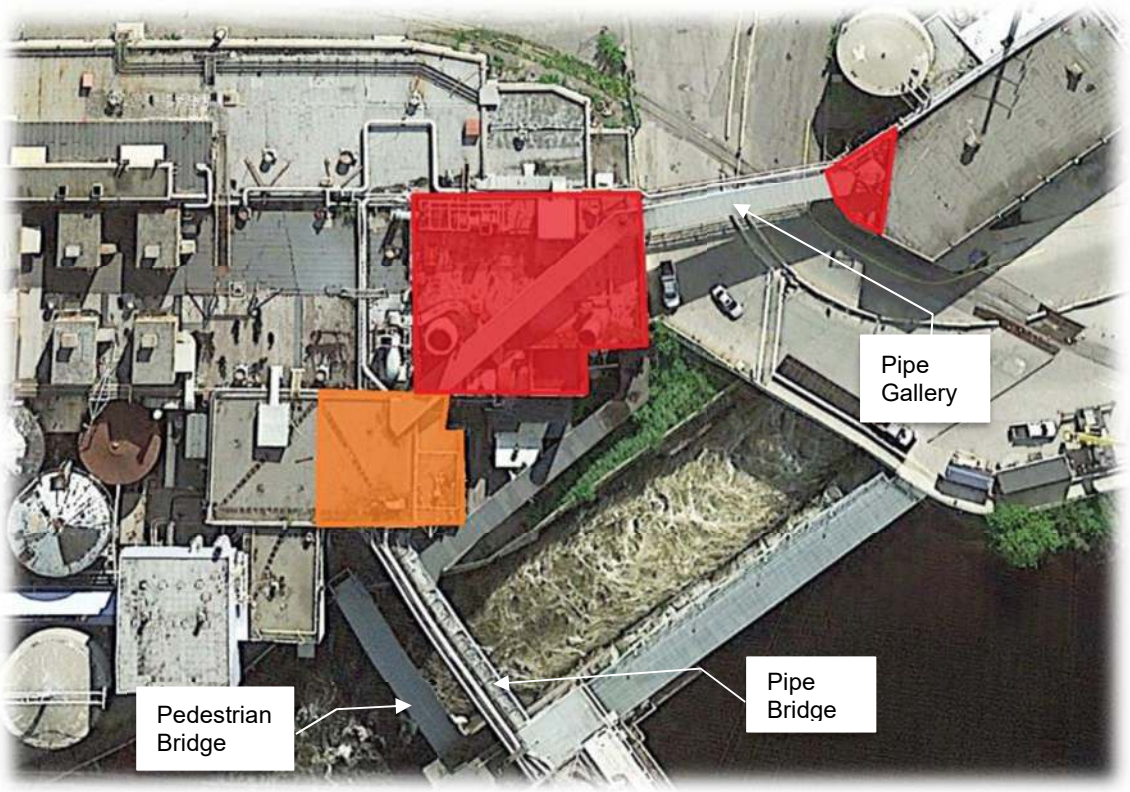
Foundation Removal

All foundations, equipment bases and slab on grades shall remain in place.

Bridges or Galleries Connected to Building:

For the removal of the pipe gallery that crosses over the International Bridge Road, the pipe bridge and the pedestrian bridge that crosses over the dam spillway, Canadian National Demolition Services (CND) is to follow the detailed engineered plan that will be provided by DST Consulting Engineers, a Division of Englobe (DST) at a later date.

Therefore, at this time, the demolition activities should be stopped at the following point in the building structure in order to ensure that the pipe gallery continues to be properly supported (see red area in Figure below). As for the bridges, the demolition activities should be stopped at the following point in the building structure in order to ensure that the bridges continues to be properly supported (see orange area in Figure below).



Risk Management Strategy- Site Specific Health and Safety Plan

CND will ensure that all work is performed in accordance with the OSHA and O.Reg 278. Our Health and Safety representative will review the onsite characteristics and site conditions prior to commencing issues related to the structure. Identifying potential risks with the site and roof structure and briefing the staff prior to starting. Job briefing on daily basis and trips, falls and any other hazard discussions and inspection daily. All demolition will be completed with machine thus reducing the chance of falls etc. Noise, vibration and dust risks are identified furthermore any hazards uncovered during the work identified and handled accordingly.

Site boundaries and exclusion zones need to be identified prior to starting. Demolition activities resulting in falling concrete or flying debris or with potential to affect structural will be monitored as per the plan.

Maps to the nearest health care facility will be onsite. All our vehicles and equipment are outfitted with first aid kits and fire extinguishers. Our site job box will have a spill kit supplies in them. Our safety board also outlines key contacts in case of an emergency and key personnel.

All manual worked faces above 2 meters in heights will be completed with the use of Hydraulic platform.

The structure will be progressively worked from one common face. Care will be taken so as not to destabilize the main structure. At the end of each shift, inspections by the site supervisor in charge will determine as to what temporary measures, if any, will be implemented until the commencement of the next shift.

All personnel must always wear safety helmets within the site. Those involved in the use of flame cutting equipment or straight sided cutting wheels must wear eye protection. Those involved in the use of or working proximity to, equipment such as pneumatic hammers and cutting wheels must wear hearing protection. Breaking out operations will produce high levels of nuisance dust and all involved in breaking out removal of rubble are to wear dust mask.

Entire site perimeter to be fully enclosed with enclosed with suitable security fencing/scaffold gantry as considered necessary by the site supervisor as mentioned above.

All utilities to be disconnected (i.e. isolated) & air gapped. Identify underground services lines and mark clearly prior to completing any digging. Map and safety protocol to be posted on job board prior to starting work. In the event of work close to live service lines, all work modes to be undertaken by hand techniques. Exercise common sense and good housekeeping always. Areas beneath demolition to be cordoned off. Constant evaluation of site safety on a consistent basis.

Implement an effective practicable fire drill for use in the event of an emergency. Comply with the latest edition of the following statutes codes and standards and all amendments thereto.

1. CSA S350-M – “Code of practice for safety in Demolition of Structures.”
2. NFPA 241 Standard for safeguarding Construction, Alteration, and Demolition Operations
3. Canadian Environmental Protection Act
4. Transportation of Dangerous Goods Act

We trust that this information meets your technical requirements at this time. Should you have any questions, or require additional information, please don't hesitate to contact us.