

**ADDENDUM 3**

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**PART 1**      **GENERAL**

The following changes are effective immediately and shall be incorporated into the Contract Documents.

**PART 2**      **INFORMATION/CLARIFICATION****2.1**      **JOB SHOWING (PART 1.4.2 SITE VISIT / PRE-BID MEETING)**

- .1 Attached is the sign-in sheet from the mandatory job showing on April 9<sup>th</sup>, 2025. As indicated in the Invitation and Submission Instructions, the job showing was mandatory for all tenderers intending on bidding the project as a General Contractor. Please be advised that we are only accepting tenders from teams of prequalified General, Mechanical and Electrical contractors.

**PART 3**      **DRAWINGS****3.1**      **CIVIL**

- .1 **Amend Drawing C0302 Details 3 & 4 to indicate:**
  - .1 “SS ~~316~~ (~~SS2~~) 304L (SS3) Stainless Steel ~~10S~~ **40S** Pipe Spool c/w Puddle Flange...”

**3.2**      **STRUCTURAL**

- .1 Drawing S0001 – General Notes - Edit Concrete Types Schedule as follows:  
**Add Mix 21 – Headworks Hollow Core Topping**  
Refer to attached Drawing S0001.

**3.3**      **PROCESS**

- .1 **Add Drawing P2207 Pump Gallery Lower Level as per the attached.**
- .2 **Amend Drawings P3000 Series Grit Drain piping specification to indicate XX-DRN-SS4SS3, sizes as indicated on the drawings.**

**PART 4**      **SPECIAL PROVISIONS****4.1**      **00 11 00 PROVISIONAL ITEMS**

- .1 **Amend 2.3 Item No. P3 – Biosolids Transfer Pumps**
  - .1 This will include the provision of the..”Are the Alum Pumps Included?”  
Review Scope of Work.

**ADDENDUM 3****4.2 DIVISION 02**

- .1 **Add Specification 02 41 19 Demolition** as per the attached.
- .2 **Add Specification 02 05 20 Temporary By-Pass Pumping** as per the attached.

**4.3 DIVISION 31**

- .1 **Delete** Section 31 32 40 – Rigid Inclusion Column Ground Improvement
- .2 **Amend** Section 31 23 19 – Dewatering
  - .1 Section 1.5 References
    - .1 **Delete** Section 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 1.5.6
    - .2 **Add** “.1 Geotechnical Investigation – Proposed Water Treatment Plant Upgrades, 14754 County Road 2 Ingleside, Ontario, Paterson Group, December 10, 2020”
  - .2 Section 1.7 Permits
    - .1 **Delete** Section 1.7.1 and 1.7.2
    - .2 **Add** “.1 An Environmental Activity and Sector Registry (EASR) will be registered for the project prior to construction”
  - .3 Section 1.8 Submittals
    - .1 **Amend** Item 1.8.1 “Submit detailed shop drawings of the proposed primary dewatering system in accordance with Section **01300 01 33 00**, including but not limited to the locations and depths of primary dewatering units, location and depth of piezometers (observation wells), details of pumping, discharge points, chemical analysis of water as it pertains to:”

**4.4 DIVISION 44**

- .1 Section 44 05 50 – Process Piping
  - .1 **Amend Item 2.2.7** “Standard of Acceptance: ~~Victaulic hot-dipped galvanized Style 07~~, **Refer to Item 2.11**”.
- .2 Section 44 07 50 – Various Process Pumps
  - .1 **Amend** Item 2.3.1.1
  - .2 “.1 Number of pumps: ~~three (3)~~ **two (2)**.”

**PART 5 QUESTIONS AND ANSWERS****5.1**

- .1 **Q: On page 20, paragraph 19 of the contract document it states: "19. Permits. The contractor shall obtain and pay for all building permits and other permits, licenses and certificates necessary for the**

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**performance of the Work." Is this paid from the \$15,000 cash allowance allocated from permits?.**

**A:** As specified in Section 01 21 00, the \$15,000 cash allowance is "only to be used to reimburse the contractor for the Building Permit fee invoices"

**.2 Q: Can you please provide a specification for the type of concrete/product to be used for the topping over the hollow-core slabs?**

**A:** Refer to Part 3 – Drawings above – Drawing S0001.

**.3 Q: Drawing E2121 for the pump gallery is referenced on the riser is not part of the drawing package, set goes from E2001 to E3101.**

**A:** Area 2000 – Pump Gallery is not included in the contract.

**.4 Q: The specification document references rigid inclusion columns. There is no indication of these on the drawings. Are these required?**

**A:** Section 31 32 40 – Rigid Inclusion Columns is not required for the project and can be removed from the contract documents. Refer to Section 4.1.1 above

**.5 Q: Please advise if Div 31 - Rigid Inclusion Column Ground Improvement is required for this project.**

**A:** Refer to Section 4.1.1 above

**.6 Q: In part 1.6.1 of spec section 31 32 40 there is a "Error! Reference source not found.." Please advise**

**A:** Refer to Section 4.1.1 above

**.7 Q: The itemized Lump Sum Breakdown appears to be missing Division 12, and includes Div 14, which is not required?**

**A:** A revised Form of Tender will be provided on Biddingo prior to the deadline for submission. The Contractor will input the bid submission to the electronic version Form of Tender provided on Biddingo.

**.8 Q: Drawing C0201 shows davit and 2 davit sockets. Is there a spec for these items? And please confirm the quantity of portable lifting davits required.**

**A:** The Davit Base and Portable Lifting Davit identified on Drawings C0201 are specified in Section 44 07 50, Item 2.1.5, all of the fall arrest equipment identified on Drawings C0201 are indicated in Section 33 05 13, Item 2.1.13 and 2.1.14.

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Contractor to supply one (1) portable lifting davit and two (2) side mounted davit lifting sockets.

.9           **Reference Section 31 23 19, Item 1.5.2 and 1.5.4. It appears previous hydrogeological reports have been done. Can you please provide the final hydrogeological report, or at the very least, the draft from July 24, 2024?**

**A:**       Section 31 23 19 has been amended. Refer to Section 4.1.2 above

.10          **Q:       Reference drawing C0100. This refers to “New Anchors” on the Sewage Outfall, but no further instructions to what is required, please confirm the scope of work.**

**A:**       Refer to Section 33 31 14 – Outfall Sewer for further information on the new concrete anchors.

.11          **Q:       No specification has been provided for demolition. Please provide.**

**A:**       Refer to Drawing C0002 – Site Removal Plan

.12          **Q:       Reference section 44 07 50, clause 2.3.1 refers to three pumps, we can only see two, please advise.**

**A:**       Section 44 07 50 has been amended to specify two pumps are required in the on-site pumping station.

.13          **Q:       Section 31 23 19 seems to be a copy and paste from the Napanee WWTP Tender. Please provide for South Stormont, if applicable.**

**A:**       Refer to Section 4.1.2 above

.14          **Q:       Reference Drawing C0006; Drawing C0006 shows a catch basin and pipe entering the sanitary pump station, however the catch basin is not labeled and the pipe diameter/material is not specified. Please provide details if the catch basin and pipe are required.**

**A:**       A 1.2m Long, 150mmØ sanitary sewer will be installed between the catch basin and sanitary pump station. Drawing C0006 will be amended to include the catch basin details.

.15          **Q:       Reference drawing C002, demo of Existing Pump Station. Are we also to remove the existing valve chamber as shown on drawing PU-21 Ingleside Sewage Treatment Plant -AS-BUILTS**

**A:**       Yes, the existing valve chamber is to be removed as part of the existing pump station removal.

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- .16    **Q:**    **Reference drawing C0201 shows 3 access hatches. Please provide technical specifications that outlines the material and live loads. a. Also drawing A3102 shows an floor access hatch ? Please advise the size, material and live loads.**
- A:**    Refer to Section 33 05 13 – Manholes, Catchbasins, and Precast Structures for the sanitary pump station access hatch specifications.
- Refer to section 05 14 10 – Exposed Structural Framing for the access floor hatch specifications and Drawing S3104 for slab opening dimensions.
- .17    **Q:**    **Reference Drawing C0005 - Detail 2; A new supernatant drain pipe, 2 new decanting pipes and 2 new drain pipes are shown entering manhole MH125 however no material has been specified. Please specify a material for each of these services.**
- A:**    All gravity fed sanitary pipes less than 450mmØ are to be PVC SDR 35 as per Section 33 31 13 Part 2.1.1
- .18    **Q:**    **Reference Drawings C0005 & C0006; Drawing C0005 shows manhole MH150 in the bottom left of the page, drawing C0006 shows the same manhole as MH170. Please confirm MH150 should be MH170 on drawing C0005.**
- A:**    This is correct, MH150 shown on Drawing C0005 should be MH170. Drawing C0005 will be amended to correct the MH labelling.
- .19    **Q:**    **Request for Clarification: Drawing C0002 bottom right of site plan shows an apron slab removal as provisional. Is this to be included in P1 of the provisional items**
- A:**    The removal of this apron slab is not provisional and is to be included in the contract. Drawing C0002 will be amended to removal “provisional” from the note.
- .20    **Q:**    **Part 3, Item 3.11: Payment to Suppliers of Pre-Selected Equipment: The current clause stipulates that payment and holdback release to suppliers of pre-selected equipment must be made in accordance with the terms set out in the quotation documents prepared by the Owner's Consulting Engineer. However, the clause does not affirm that the Owner will ensure that payment to the Contractor mirrors the amounts and timing of payment obligations the Contractor assumes with the pre-selected vendors. For example, Trojan's payment terms are: 30% upon approval of Shop Drawings 60% upon delivery of equipment to job site 5% upon 90 days after delivery or upon installation (whichever happens first) 5% upon performance testing and acceptance Net 30 days If UV System Start-up is required within 30 days of shipment, Trojan requires 95% payment**

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unless agreed upon in writing before authorizing system Start-up. It is recommended that Item 3.11 be revised to explicitly confirm that the Owner will pay the Contractor in amounts and on timelines that are fully back-to-back with the Contractor's obligations to the pre-selected vendors. This is essential to ensure cash flow alignment, mitigate financing exposure, and maintain compliance with the Construction Act timelines for prompt payment. Proposed revision: *"The Owner shall make payments to the Contractor, including applicable holdbacks, in respect of pre-selected equipment in amounts and at times that are fully aligned with the Contractor's corresponding obligations to the suppliers of pre-selected equipment, as set out in the quotation documents in Appendix H. The Contractor shall not be obligated to advance payment or release holdback to any such supplier unless and until the Owner has made corresponding payment to the Contractor."*

A: The Owner will coordinate the payment schedules with the Contractor and ensure consistency with the Construction Act.

.21 **Q: Appendix C - Submission Form, Itemized Breakdown Schedule of Lump Sum Price, Item 20 - Cost of 100% Performance and 100% Labour and Material Payment Bond, and Item 21 - Project Insurance: Please confirm that these amounts will be paid in full, less applicable holdback, upon invoicing. These costs are incurred upfront by the contractor in order to execute the contract and, as such, should not be pro-rated over the duration of the project.**

A: The Contractor shall provide a payment schedule and coordinate with the Owner the supporting documentation for the schedule. It is understood that these are upfront costs and will be paid accordingly.

.22 **Q: Request for Clarification: No Division 2 specifications for existing work.**

A: Specification 02 41 19 Demolition is attached as part of this Addendum.

.23 **Q: Request for Clarification: Provisional Items – are they to be include in our contract schedule.**

A: Yes, the Provisional Items is to be entered as Item 2 in the Schedule of Items and Prices and included in the total tendered amount.

.24 **Q: Reference section 00 11 00, clause 2.3.1, please provide a copy of drawing P2207**

A: Refer to the Drawing P2207 included with this Addendum.

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- .25    **Q:**    **Reference Appendix H, System 2. The Blower is noted as an option, but we have no Blower P&ID within the documents, please advise what is required.**
- A:**    There is no Blower included in the Phase 1 scope of work.
- .26    **Q:**    **Reference Section 33 11 16-2.3.4; Section 33 11 16 requires an “approved trace wire access box” at all trace wire termination points. Please provide a manufacturer and model for the trace wire access box.**
- A:**    The tracer wire access box will consist of a 3/4” DB/2 PVC conduit and PVC and 1-Gang Weather Proof PVC Device box.
- .27    **Q:**    **Reference section 44 05 50, clause 2.13.1 all equipment with a motor is liable to provide vibration, but flexibles have not been indicated on some pumps, please confirm if they are required.**
- A:**    Flexible connections shall be provided on all pumps. Clause 2.13.1 indicates “Flexible connectors shall be provided **in all piping connections** to engines, blowers, compressors, vibrating equipment, **and where indicated.**”
- .28    **Q:**    **Reference drawing P0020, we have 50mm butterfly valves not specified in section 44 05 50, please specify what you require.**
- A:**    The 50mm butterfly valves shown on P00020 will be changed to ball valves.
- .29    **Q:**    **Reference drawing P0020, please confirm the type of plug valve as per section 44 05 50, clauses 2.7.6.2 & 6.3.**
- A:**    All plug valves shall be as per 2.7.6.2.
- .30    **Q:**    **Reference drawing P0020, we have Motorized Ball valves & Mud Drain Valves not specified in section 44 05 50, please specify what you require.**
- A:**    The motorized ball valves shall be changed to actuated plug valves.
- .31    **Q:**    **Reference section 44 05 50. Clause 2.8.1 calls for puddle flanges and sleeves to be 304L sch 40S, the P&IDs have a mix of SS1 & SS3, which are 304L, Sch 10 or 40, whereas noting its contract drawings over specification, drawing C0302 states all puddle flanges are to be 316 (SS2), please confirm the material for puddle flanges.**
- A:**    All puddle flanges and sleeves to be as per Specification 44 05 50 2.8.1. The P&IDs/arrangements and Details 3&4 /C0302 will be amended to match. The precedence for the contract is as per the Form of Contract.

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- .32    **Q:**    **Reference section 44 05 50, clause 2.2.7 calls for style 07 couplings, whereas clause 2.11 Coupling Table, page 21, calls for style 77 or 89, please clarify which takes priority.**
- A:**    Amend Item 2.2.7 to Refer to Item 2.11 for the Coupling specification.
- .33    **Q:**    **Reference drawings P0004 & P3204 etc. these shows two conveyors, whereas the scope from Claro has one common compactor/ discharge etc. please advise.**
- A:**    There are two screenings compactors/conveyors. Claro will update their scope accordingly.
- .34    **Q:**    **Reference drawing P004, this has the DRN off each Cyclone as SS3, whereas the plans have it as SS1, please confirm which is correct.**
- A:**    All grit piping will be per the SS3 specification (SCH 40S). All DRN piping will be SS3, the arrangement drawings will be amended accordingly.
- .35    **Q:**    **Reference drawings P0004 & P0011, please provide the locations of the HW-SP-3001, Raw Sewage Composite Sampler and TRW-SP-6001, Effluent Composite Sampler.**
- A:**    The Raw Sewage Composite Sampler will be located in the ground floor of the Headworks building beneath the influent channels. The Effluent Composite Sampler will be located in the UV Building.
- .36    **Q:**    **Reference drawing P0005, The Grit Drain is noted as going to the Building Drain, drawing M3201 has no connections for process drains noted in the SAN drain, please advise.**
- A:**    M3201 will be updated to include these process drains.
- .37    **Q:**    **Reference drawing P0103, which floor penetration detail applies to drawing P3205.**
- A:**    PS-122-II applies to drawing P3205

**END OF SECTION**



# JOB SHOWING ATTENDEE LIST

Project: Ingleside WWTP Upgrades

Tender No.: RFT-04-2025  
EVB Project No.: 19070




Date & Time April 9th, 2025 9:00 AM


Location: 15005 Long Sault Parkway, Ingleside ON

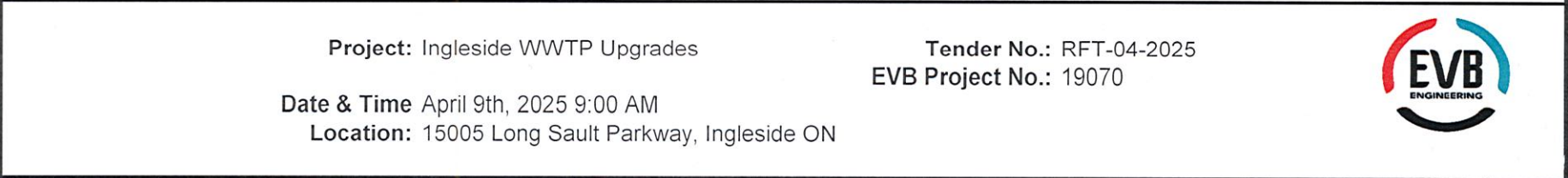
Company	Name	Phone Number	Email
EASTERN WELDING	RICH WATERTON	613 363 1013	RWATERTON@EASTERNWELDING.CA
IECBL	Ron Gray	613 342 6252	rgray@iecbl.ca
Capital Controls	Brad Lavallee	613 325-0983	brad.lavallee@capitalcontrols.ca
Rose Group	Matt Lalonde	613 577 4596	matthalonde@rosemech.com
Coleman Construction	STEWAN LAFLEUR	613-346 5594	slafleur@coleman1td.ca
SHERIDAN ELECTRIC	SANTHINATH NATHI	416-427-5814	Santhinath.nathi@SheridanElectric.ca
LOUIS W. BRAY	James Dineen	613-737-6711	admin@lwbray.com
Dalcon Constructors	Scott Fields	613-822-3500	Scott@dalcon.ca
De Gau Inc. Construction	Christian Mercier	613-363-7424	mail@dclimited.ca
Cornwall Gravel	Jamie Leger	613-551-7450	jamie@cornwallgravel.ca
SPD Sales	Daryl Stevenson	905 875 3786	daryl.stevenson@spdsales.com
TRP Ready Mix/Blair	Justin Couture	613-880-9512	justincouture@alblairconstruction.ca
NAC	MIGUEL RAMOS	289 489 8944	MRAMOS@NAESWorld.com

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JOB SHOWING ATTENDEE LIST									
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<p><b>Project:</b> Ingleside WWTP Upgrades</p> <p><b>Date &amp; Time</b> April 9th, 2025 9:00 AM</p> <p><b>Location:</b> 15005 Long Sault Parkway, Ingleside ON</p>	<p><b>Tender No.:</b> RFT-04-2025</p> <p><b>EVb Project No.:</b> 19070</p>	
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## JOB SHOWING ATTENDEE LIST

**Project:** Ingleside WWTP Upgrades

**Tender No.:** RFT-04-2025

**EVB Project No.:** 19070



**Date & Time** April 9th, 2025 9:00 AM

**Location:** 15005 Long Sault Parkway, Ingleside ON




**JOB SHOWING ATTENDEE LIST**

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**Tender No.:** RFT-04-2025  
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**Date & Time** April 9th, 2025 9:00 AM

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## JOB SHOWING ATTENDEE LIST

**Project:** Ingleside WWTP Upgrades

**Tender No.:** RFT-04-2025

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**Date & Time** April 9th, 2025 9:00 AM

**Location:** 15005 Long Sault Parkway, Ingleside ON


**DEMOLITION**

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**PART 1      GENERAL****1.1      SCOPE**

- .1      This specification covers the requirements for demolition, salvage, removal, and in-place abandonment, either completely or partially, of those materials and structures so designated on the drawings.
- .2      This Section also includes modifications of existing structures, piping, and equipment as indicated on the drawings.

**1.2      RELATED SECTIONS**

- .1      DIV 1 – General Requirements
- .2      Section 01 33 00 – Submittals

**1.3      CODE AND REGULATORY REQUIREMENTS**

- .1      Obtain and pay for demolition permits. Give required notices.
- .2      Comply with applicable requirements of CSA S350-M1980 "Code of Practice for Safety in Demolition of Structures."
- .3      Comply with applicable regulations of jurisdictional authorities governing waste management.

**1.4      REFERENCES**

- .1      CSA S350-M1980 (R2003) - Code of Practice for Safety in Demolition of Structures
- .2      OHSA O.Reg. 213/91 – Occupational Health and Safety Act for Construction
- .3      OPSS 510 - Removal

**1.5      SUBMITTALS**

- .1      Complete submittals in accordance with Specification Section 01 33 00.
- .2      Submit for approval drawings, diagrams or details showing sequence of disassembly work or supporting structures and underpinning. Drawings for structural elements shall bear seal and signature of professional Contract Administrator licensed to practice in Ontario.
- .3      Prepare and submit a waste reduction work plan. Describe management of demolition wastes. Identify materials which can be reused, recycled, and indicate method proposed for reducing, reusing recycling wastes.

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**1.6 EXAMINATION**

- .1 Visit the site and the existing building so as to fully understand all existing conditions and extent of work required. No increase in cost or extension of performance time will be considered for failure to know conditions.
- .2 Take over buildings and structures to be demolished based on their condition at time of bid submission, except where indicated otherwise.

**PART 2 PRODUCTS****2.1 NOT USED****PART 3 EXECUTION****3.1 GENERAL DEMOLITION REQUIREMENTS**

- .1 Coordinate the work with the Contract Administrator, Operator, and the Owner to minimize disruptions to operations of the existing plant. Include the sequence of removals in the project schedule for review by the Contract Administrator.
- .2 The removal drawings may not present all items to be demolished. The Contractor shall remove all items, components, system, cables, piping, supports and equipment within the contract limits shown on the contract drawings, except for those items specified to remain. The general area in which the demolition work is to be performed shall be left clean and free of debris at the end of each shift; access routes must always be kept clear. If required, the general area shall be graded as required to provide a uniform appearance.
- .3 Schedule and organize all Demolition activities to ensure that the Security of the plant and plant operations are maintained continuously throughout the construction period.
- .4 Do not begin removals except in accordance with the approved sequence of construction and until approval has been given by the Contract Administrator in writing.
- .5 At least three (3) weeks prior to commencing removal of any equipment, piping, or materials, the Contractor shall request that the Owner mark items to be salvaged. Except for items designated to be salvaged on the drawings or as indicated in the field, all removed equipment, piping, materials, fixtures, hardware, supports, etc., shall be disposed of by the Contractor.
- .6 Except for items designated to be salvaged, all removed equipment, piping, materials, fixtures, hardware, supports, etc., to be disposed of by the Contractor.



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- .7 All equipment to be salvaged by the Contractor is to remain in good working order. Salvaged materials to be delivered and off loaded into storage anywhere within the plant boundaries.
- .8 All facilities in the work area which are not to be removed must remain in continuous use during the work, unless otherwise approved by the Owner or Owner's representative.
- .9 Demolition and salvage work shall create a minimum of interference with the Owner's operation and inconvenience to the Owner. Work shall be scheduled and coordinated to allow continuous, uninterrupted operation of the existing facility.
- .10 Coordinate work and disposal requirements in accordance with the Designated Substance Survey (DSS) and applicable regulations.
- .11 All backfilling required in the demolition area shall conform to the governing requirements of the Earthwork Section.
- .12 Demolish existing work as indicated on the drawings and as required to accommodate new work.
- .13 Demolish work in a safe and systematic manner, from top to bottom.
- .14 Do not throw or drop demolished materials from heights. Use chutes, conveyors or hoisting equipment to lower materials.
- .15 Demolish in a manner to minimize dust generation. Keep dusty materials wetted but prevent flooding or contaminated runoff.
- .16 Carefully remove and lower structural framing and other heavy and large objects as needed.
- .17 At all times leave work in safe condition, so that no part is in danger of uncontrolled toppling or falling.
- .18 Install temporary supports as required to prevent uncontrolled collapse of structures. Design of support to be completed by Professional Contract Administrator licensed to practice in Ontario. Submit certified drawings for review.
- .19 Blasting will not be permitted.

**3.2 COORDINATION**

- .1 Coordinate all demolition and modification work with any new work to be performed to facilitate completion. Demolition work cannot start until approved by Contract Administrator. Coordination is required with the Contract Administrator and the Owner's operation staff.

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- .2 Coordinate modification work and demolition to allow continuous, uninterrupted operation of the existing facility.

**3.3 PROTECTION**

- .1 Prevent uncontrolled movement, any part of building being demolished; provide temporary shoring and bracing required.
- .2 Take steps to positively prevent uncontrolled falling of demolished materials.
- .3 Ensure that no part of existing structure is overloaded due to work carried out under this Section.
- .4 Prevent debris from blocking drainage systems.
- .5 Ensure the temporary guards, hoardings are provided during and upon completion of work in accordance with applicable safety regulations.

**3.4 PREPARATION**

- .1 Ensure that affected building areas are unoccupied and discontinued in use and that required screens, partitions, hoardings are in place prior to start of demolition work.
- .2 Verify that existing services in areas affected by demolition are disconnected, capped, or removed, prior to start of work. Perform scans as necessary to ensure any pipes, electrical or communication cables have been properly terminated prior to demolition.
- .3 Ensure that all process equipment within demolition areas, either to be removed or retained, is appropriately protected from damage, dust, or anything else which may cause damage during the demolition works.
- .4 Coordinate work and disposal requirements in accordance with the Designated Substance Survey (DSS) and applicable regulations.

**3.5 CONCRETE STRUCTURES DEMOLITION**

- .1 Existing concrete structures, as noted, shall be removed to the limits indicated.
- .2 Existing concrete to be removed shall be cut into fragments and reduced in size as required to facilitate removal and disposal.
- .3 Disassembly, removal of all structural elements shall be carried out under the supervision of a professional structural Contract Administrator licensed to practice in Ontario hired by the Contractor.

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**3.6 PIPING AND EQUIPMENT DEMOLITION**

- .1 The Contractor shall be responsible for the removal of process equipment, pumps and associated motors, piping, valves, and all other appurtenances associated with the item being removed as presented on the Contract Drawings.
- .2 Before piping removal, the Contractor shall completely drain the corresponding pipeline. The Contractor shall pay for all temporary pumps, piping and its operation required to drain the existing pipeline to be removed.
- .3 Piping and equipment shall be disconnected, dismantled and removed as required and in such a manner as to minimize disturbance or damage to adjacent construction.
- .4 At any point or location where new work is to be connected or installed, the removal of existing work shall be done so as to facilitate the new installation work to the maximum possible extent.
- .5 All hazardous chemical waste shall be disposed of by a company who is licensed in Ontario and trained to handle and remove them. The hazardous chemical waste, pipe and valves shall be disposed of off-site with approval and permit.

**3.7 SITE WORK DEMOLITION**

- .1 The demolition of existing drives, curbs, walks, dikes, and similar items shall be scheduled and performed so as to minimize inconvenience to the Owner.
- .2 The demolition of existing inground services including piping and chambers shall be coordinated to ensure the continual unhindered operation of the plant, allow for efficient changeovers from existing to new inground services and to minimize inconvenience to the Owner.

**3.8 REPAIR OF EXISTING CONSTRUCTION**

- .1 Where structures to be demolished are connected to structures to remain, remove the existing construction in a careful manner so that adjacent construction, piping, or facilities to be left in place are not cracked or otherwise damaged.
- .2 The Contractor will be held responsible for any damage thereto because of their operations.
- .3 Use temporary supports designed by a Professional Contract Administrator, where and as required for the support of existing facilities.
- .4 Holes and damage resulting from removal operations shall be filled, reconstructed, repaired, and finished to match and conform to adjacent surfaces and construction as determined by the Contract Administrator.

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**3.9 ELECTRICAL REMOVAL**

- .1 The control stations, control panels, conduits, and other devices associated with the removed equipment may not be shown on the drawings.
- .2 Contractor to ensure that plant operation is not affected due to loss of power to any part of the wastewater treatment process.
- .3 The electrical sub-contractor shall be responsible for the following items:
  - .1 Disconnecting electrical power sources from all equipment and devices to be moved or removed.
  - .2 Removing electrical conductors from the conduits serving the equipment to be moved or removed.
  - .3 Removing local starters, control stations, control panels and other local control devices not an integral part of the associated equipment to be moved or removed.
  - .4 Disconnecting and removing abandoned motor control centres, and motor control line-ups.
  - .5 Removing exposed conduit connecting equipment and devices to be moved or removed and the power sources.
  - .6 Where abandoned conduit not indicated to be retained for future use enters a structural surface above the operating floor, it shall be undercut 25 mm with edges dovetailed and the structure tightly and neatly repaired to resemble the remaining surface.
  - .7 Where such a conduit enters a structural surface below the operating floor, it shall be cut flush with the floor or within 25 mm of other surfaces, and those in floors and walls filled with expanding grout to a depth of one diameter, but 50 mm minimum.
  - .8 On any equipment to be reapplied or abandoned in place, unused conduit openings shall be plugged and original identity nameplate shall be reversed or removed. Circuit lists and nameplates at sources of power shall be neatly corrected for changes in loads. Electrical items in motor control centres, control panels, panel boards, etc., separate from abandoned equipment shall be left as spares, unless indicated otherwise.
  - .9 Existing status and control panels shall be disconnected, removed, and returned to the Owner.
- .4 Remove abandoned power cable, electrical control panels, and power distribution equipment as required. Coordinate this work with the Owner and the Contract Administrator.
- .5 Abandoned conduits in good condition and at least as large as indicated for new circuits may be used as part of contract installation.
- .6 Salvaged items to be reinstalled or delivered to the Owner's on-site storage shall be handled carefully.

**DEMOLITION**

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- .7 Removed electrical equipment shall first be offered to the Owner and if the Owner refuses right to Ownership, the equipment shall be disposed of off site by the Contractor.

**3.10 ITEMS TO BE SALVAGED BY CONTRACTOR**

- .1 Removal and salvage of any item of equipment or facility includes removal and salvage of all accessories, piping, wiring, supports, associated electrical starters and devices, base plates, and frames, and all other appurtenances, unless otherwise directed.
- .2 Existing materials and equipment removed, and not reused as a part of the work, shall become the Contractor's property, except for the items indicated by the Owner shall remain the Owner's property and shall be delivered to the Owner to a designated area by the Contractor in good condition.
- .3 Existing materials and equipment to be removed by the Contractor and reused as a part of the work shall remain the property of the Owner.
- .4 The Contractor shall carefully remove, in a manner to prevent damage, all materials and equipment specified herein or indicated to be salvaged and reused or to remain the property of the Owner.
- .5 The Contractor shall store and protect salvaged items specified or indicated to be reused in the work.
- .6 Any items damaged in removal, storage, or handling through carelessness or improper procedures shall be replaced by the Contractor in kind or with new items.
- .7 The Contractor may, at their option, furnish and install new items in lieu of those specified or indicated to be salvaged and reused, in which case such removed items will become the Contractor's property.
- .8 All other existing materials and equipment removed by the Contractor shall not be reused in the work, shall become the property of the Contractor, and shall be removed from the jobsite.

**3.11 CONCRETE MODIFICATIONS**

- .1 Remove existing concrete where such removal is indicated on the drawings or directed by the Contract Administrator.
- .2 Remove all dust, grease, curing compounds, impregnations, waxes, foreign particles, and disintegrated material.
- .3 If chipping is necessary, the edges shall be perpendicular to the surface or slightly undercut. Feather edges will not be permitted.

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**DEMOLITION**

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- .4 Remove all defective existing concrete down to sound concrete where indicated on the drawings or as directed by the Contract Administrator.
- .5 Where existing concrete is to be removed, fill, repair, and finish the surfaces smooth and flush with adjacent undisturbed surfaces.
- .6 All exposed cut ends of reinforcement are to be drilled out to a depth of 40mm from concrete surface, and repaired with non shrink, non-metallic grout.
- .7 Unless otherwise indicated on the drawings or directed by the Contract Administrator, clean and leave in place existing reinforcing exposed during concrete removal operations.
- .8 Where indicated on the drawings, extend existing reinforcing into the new construction by mechanical connection to the existing reinforcement. Mechanical connections shall be as specified on the drawings.
- .9 Any reinforcement bars the Contract Administrator allows to be cut shall be cut off not less than 40 mm inside the finished and repaired surface. All anchor bolts, piping, and other hardware projecting from concrete surfaces after piping and equipment have been removed shall be cut 40mm inside the finished or repaired surface. Reinforcement bars and other steel construction to be removed may be flame-cut.
- .10 Remove concrete bases of existing equipment that have been relocated or removed, down to the reinforcing steel of the supporting slab. Initiate removal of curb base with a concrete saw, cutting around the perimeter, taking care not to chip or spall the surface of remaining structure. After existing materials have been removed, exposed reinforcing steel and structural slab shall be cleaned and filled with new concrete, finished to match the surrounding surface.
- .11 Where coring of concrete or masonry elements are necessary for installation of pipes or conduit;
  - .1 Scan the floor or wall for electrical or process services prior to coring.
  - .2 Coring of holes shall be at 90 degrees to the concrete surface, and made so that the cored hole is neat and clean on both sides of the element.
  - .3 Core holes must be at minimum 3 hole diameters from any other opening.
  - .4 Core holes must be a minimum of 150mm from any concrete edge.
  - .5 Core holes should not be oversized.
  - .6 Core holes must not be made in any beams, columns or lintels without prior written approval of the Contract Administrator.
  - .7 Core holes must be sealed in accordance with the general mechanical and electrical specifications.
- .12 Concrete materials and placement shall be in accordance with the cast-in-place concrete section. Grouting shall be in accordance with the grouting section.

**DEMOLITION**

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- .13 Provide dust control by water systems or vacuum system and tarping to limit any dust migration during any concrete demolition works.

**3.12 DISPOSAL AND CLEAN-UP**

- .1 With the exception of items designated for salvage or reuse, all materials, rubbish and debris resulting from demolition work shall become the Contractor's property and shall be removed from site and legally disposed of unless specifically indicated otherwise.
- .2 Do not allow demolished materials to accumulate on site. Promptly, as work progresses, remove and legally dispose of materials away from site.
- .3 Separate and salvage materials suitable for reuse and/or recycling from general waste stream or non-salvageable items. Transport and dispose of non-salvageable items to licensed disposal facility.
- .4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.
- .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .6 Collect, handle, store on-site and transport off-site, salvaged materials, salvaged for reuse and/or recycling in separate condition. Transport to authorized reuse/recycling location.
- .7 Burying, burning, selling waste materials on site is prohibited.
- .8 Disposal of liquid wastes into waterways, sewers is prohibited.
- .9 Clean-up work, storage and waste collection areas as work progresses.
- .10 Contractor shall be responsible for all cleaning of existing piping, equipment, and structures that is required to properly remove and dispose of items to be demolished.

**3.13 FIELD QUALITY CONTROL**

- .1 Disassembly, removal of structural elements shall be carried out under the supervision of a professional Contract Administrator licensed to practice in Ontario.

**END OF SECTION**

**DEWATERING**

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**PART 1      GENERAL****1.1          SUMMARY**

- .1      Comply with Division 1 – General Requirements.
- .2      Section Includes:
  - .1      Control of groundwater and surface water.
  - .2      Monitoring of groundwater levels at the site.
  - .3      Monitoring water levels in existing neighbouring domestic water wells located within one kilometre of the site. Where required, supply water to affected wells at the City's expense.
  - .4      Monitoring for movement of existing structures.
  - .5      Discharge of drainage water from the site.
  - .6      Coordinating dewatering work with requirements of other trades and units of work affected by dewatering operations.

**1.2          DESCRIPTION**

- .1      This section specifies requirements for dewatering procedures to stabilize ground and/or keep excavations dry during the construction of the works.

**1.3          RELATED SECTIONS**

- .1      Section 01 33 00 - Submittals
- .2      Section 31 23 33 – Excavating, Trenching and Backfilling
- .3      Section 31 32 25 – Erosion and Sedimentation Control
- .4      Section 31 62 16 – Shoring
- .5      Section 33 05 13 – Manholes, Catchbasins, and Precast Structures
- .6      Section 33 31 13 – Sanitary Sewers and Force mains

**1.4          DEFINITIONS**

- .1      Subgrade: Surface to which excavations are made for the purpose of construction of the Work in accordance with the Contract Documents. Subgrade as defined does not include additional depths of excavation that may be required or ordered to obtain suitable foundation conditions.
- .2      Dewatering: Removal of water, groundwater as well as surface water, to facilitate construction of the specified works under dry conditions on a stable subgrade.

**1.5          REFERENCES**



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**DEWATERING**

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**.1 Geotechnical Investigation – Proposed Wastewater Treatment Plant Upgrades, 14754 County Road 2, Ingleside ON. Paterson Group. December 10, 2020**

- ~~.1 Geotechnical Design Report – Revision 1, Napanee Water Pollution Control Plant Expansion & Upgrade, 300 Water Street West, Napanee, ON, Thurber Engineering Ltd., June 5, 2024~~
- ~~.2 Draft Hydrogeological Report – Revision 1, Napanee Water Pollution Control Plant Expansion & Upgrade, 300 Water Street West, Napanee, ON, Thurber Engineering Ltd., July 24, 2024~~
- ~~.3 Draft Preliminary Geotechnical Design Report, Napanee Water Pollution Control Plant Expansion & Upgrade, Napanee, ON, Thurber Engineering Ltd., July 16, 2024~~
- ~~.4 Interim Draft, Hydrogeological Report, Napanee Water Pollution Control Plant Upgrades, Napanee, ON, Thurber Engineering Ltd., August 18, 2024~~
- ~~.5 Geotechnical Investigation, Upgrades to Wastewater Treatment Plant, 300 Water Street West, Napanee, ON, GHD, June 21, 2018~~
- ~~.6 Stage 2 Contract Soil Investigation, Town of Napanee Water Pollution Control Plant, J.D. Lee Engineering Ltd., October 1977~~

**1.6 DEFINITIONS**

- .1 Dewatering: Removal of water, groundwater as well as surface water, to facilitate construction of the specified works under dry conditions on a stable subgrade.

**1.7 PERMITS**

- .1 An Environmental Activity and Sector Registry (EASR) will be registered for the project prior to construction
- ~~.1 An application for a Permit To Take Water (PTTW) from the Ministry of the Environment, Conservation and Parks (MECP) has been submitted. The anticipated groundwater conditions and pumping rates are identified in the Hydrogeological Report (2025) the volumes are expected to exceed 400,000 L/day.~~
- ~~.2 The submitted Permit to Take Water application has been included in the Appendix to the Contract Documents for reference.~~

**1.8 SUBMITTALS**

- .1 Submit detailed shop drawings of the proposed primary dewatering system in accordance with Section ~~01300~~ **01 33 00**, including but not limited to the locations and depths of the primary dewatering units, location and depth of piezometers (observation wells), details of pumping, discharge points, chemical analysis of the water as it pertains to:
  - .1 Relationship between dewatering equipment, new and existing structures, the excavation plan and excavation shoring systems.

**DEWATERING**

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- .2 Location and dimensions of siltation ponds.
  - .3 Details of screens and filter media.
  - .4 Details of the recharge system.
  - .5 Location of monitoring points, frequency, data to be recorded, volumes pumped, etc.
  - .6 Shop drawings are to bear the seal and signature of a professional engineer licensed in the Province of Ontario.
- .2 The Contractor cannot change the proposed dewatering system without the approval of the Contract Administrator.
  - .3 All design and shop drawings shall bear the signature and stamp of a Licensed Professional Engineer in the Province of Ontario with a demonstrated competence in this type of work.

**1.9 PROTECTION AND DAMAGES**

- .1 Geotechnical investigations have been completed for the site and are attached to the Contract Documents. The Owner and Contract Administrator accept no responsibility for the accuracy of this information. Claims arising from the interpretation of available information will not be considered.
- .2 The Contractor shall take full responsibility for the interpretation of available soils information for planning and execution of the dewatering work.
- .3 Prevent damage to pipes, maintenance holes, other structures, ground cover and grades within and in the immediate vicinity of the area of work. Make good any damage.
- .4 Rectify any and all damage caused to the excavated base and/or pipe bedding and other adjacent structures and slopes due to improper and/or inadequate dewatering to the satisfaction of the Contract Administrator and at no cost to the Owner.
- .5 Prior to commencing the Work, the Contractor shall provide a precondition survey report using a specialized firm to checking adjacent structures and basements of residents, and provide a chemical analysis of nearby private wells. A report shall be submitted in accordance with Submittals 01 33 00.
- .6 The Contractor shall submit a Dewatering contingency plan, which includes the supply of nearby residents with water wells potentially impacted by the Work with water, as well as any other mitigation measures.

**1.10 QUALITY ASSURANCE**

- .1 Qualifications
  - .1 Due to the quantity of dewatering on site, the Contractor shall engage the services of a specialist dewatering subcontractor who has a minimum of 10 years experience in the design and construction of dewatering systems for projects of similar size and complexity.

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**DEWATERING**

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**1.11 SYSTEM DESCRIPTION**

- .1 Design and Performance Requirements
  - .1 The Contractor shall review the recommendations of the hydrogeologist's report and Permit to Take Water application in the Appendix to the Contract Documents for developing the Work of this Section.
  - .2 Engage a professional engineer with demonstrated competence to design, and to supervise construction, operation and maintenance of a dewatering system.
  - .3 Design, construct, operate, and maintain a dewatering system, to control groundwater. Consider also the lateral tracking of groundwater underneath existing structures.
  - .4 Co-ordinate with design and construction of excavation shoring systems, excavation and backfilling operations.
  - .5 Prevent surface run-off from entering excavations. Construct ditches, berms, and similar items as required to lead water away from excavation as shown on the drawings or as necessary. Do not allow silt laden run-off water to enter watercourses. Direct run-off flows to existing storm sewers, siltation ponds or catchment areas.
  - .6 Maintain groundwater level a minimum of 300 mm below subgrade level, or lower as may be required to permit placing geotextiles, subdrains, granular construction working surface, concrete, underground services and similar items on a firm dry undisturbed subgrade.
  - .7 Maintain groundwater at required level until:
    - .1 Structure/pipes are completely built where designed self-weight of structure resists the buoyancy forces.
    - .2 Backfilling to final grade is complete.
  - .8 Prevent destabilization, heaving, or shear failure of the sides and bottom of excavation.
  - .9 Prevent damage to, or displacement of, structures from groundwater pressures.
  - .10 Obtain the Contract Administrator's written consent prior to allowing a rise in groundwater level or prior to shutting down the dewatering operation.
  - .11 Repair or replace any structure or Works damaged due to dewatering at no expense to the Owner.
- .2 Dewatering Discharge Requirements
  - .1 Provide appropriate filter screens so that no soil or foundation material is removed, and solids concentration of less than 5 ppm in the discharge water is achieved. Do not exceed solids concentration of 10 ppm at any time.
  - .2 Provide siltation controls at discharge locations to prevent excess sediment from leaving the construction site.

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**DEWATERING**

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- .3 Maintain siltation controls during construction period by removing silt build up from time to time to keep siltation controls functional.
- .4 The Owner will carry out physical analysis of drainage water to establish conformance with local by-laws and provincial regulations. If directed by the Contract Administrator, treat the drainage water before discharging into existing storm sewer systems or watercourses.
- .5 Provide discharge siltation ponds of the required size to allow for sufficient detention time so that the decanted water will meet all applicable Provincial regulations. Discharge all water from surface water collection and dewatering operations to the siltation ponds as required. This shall include all trench sump pump discharge water.
- .6 Maintain the siltation ponds including the removal of sediment during the construction period, as necessary.
- .7 Discharge drainage water to existing drainage outlet(s)/swale(s). Prevent erosion of existing outlets/swales by energy absorption devices, such as rock check dams.

**1.12 SYSTEM REQUIREMENTS**

- .1 The Contractor is to determine, based on the geotechnical/hydrogeological report, the design of a primary dewatering system (wellpoints or eductors). The primary dewatering system must maintain the groundwater level at least 300 mm below the invert of the excavation or trench so that the excavation, pipe laying, construction of foundations, placement and compaction of bedding and backfill, etc. can be performed in the dry and in such a way as not to disturb or soften the foundation, native soils or fills already placed, and prevent uplift of any structure or underground service during, and after, construction.
- .2 Maintain dewatering systems of sufficient capacity to keep the bottom of the excavation or trench dry and free of water at all times until the installation of the services has been completed.
- .3 Install a secondary dewatering system consisting of perimeter ditches and/or ground contouring to prevent flow of surface runoff water into the excavation. As part of secondary dewatering system, provide also for pumping from sumps located within excavations to handle any surface run off or subsurface water entering the excavation, in spite of the primary and secondary dewatering systems in place.
- .4 In all cases maintain a duplicate system of equal or greater capacity as emergency equipment, in case of breakdown of the dewatering systems in place.
- .5 The dewatering system design will be the responsibility of the Contractor based on the soil information contained in their geotechnical/hydrogeological reports as well as the results of test pits.

**PART 2      PRODUCTS****2.1      DEWATERING EQUIPMENT**

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**DEWATERING**

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- .1 Pipes, wells, deep wells, well-points, pumps, electrical generators and other equipment as required.
- .2 Standby pumps and generator with effective muffling devices to keep noise levels at or below background noise levels. In any event, do not exceed a noise level of 55 dB at adjacent structures at property lines.

**PART 3**      **EXECUTION****3.1**            **FIELD PUMP TEST**

- .1 Perform a field pumping test prior to any excavation to ensure the adequacy of the primary dewatering system as proposed and as installed, to establish the rate of pumping to be used during various construction activities, and the rate of recharge when the primary dewatering system is shut off.

**3.2**            **INSTALLATION AND MAINTENANCE**

- .1 Install and maintain the primary and secondary dewatering systems, and piezometers (observation wells).
- .2 Install dewatering equipment and continuously dewater to the required level before proceeding to excavate.
- .3 Take corrective measures as required to maintain groundwater at a sufficiently low level to meet the performance requirements.
- .4 Flotation of Structures
  - .1 Maintain groundwater at a sufficiently low level to prevent damage to, or displacement of, structures by groundwater pressures.
  - .2 Protect completed structures or parts of completed structures that could suffer displacement or other damage as a result of dewatering equipment failure by providing:
    - .1 Standby dewatering equipment, connected directly to electrical generators, engaging automatically in the case of a power failure.
    - .2 A positive means by which the structures may be flooded with water to neutralize exterior hydraulic pressures.
    - .3 A combination of the two alternatives above.
- .5 Design and Operate Dewatering Systems:
  - .1 To prevent the loss of ground as water is removed.
  - .2 To avoid inducing settlement or damage to existing facilities, completed Work, or adjacent property.
  - .3 To relieve artesian pressures and any resultant uplift of the bottom of the excavation.
- .6 Standby power and equipment:
  - .1 Provide sufficient redundancy in each system to keep excavations free of water in the event of component failure.

**DEWATERING**

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- .2 Provide 100 percent emergency power backup with automatic start-up and switchover in the event of electrical power failure.
- .7 Maintain the dewatering systems in operation until a written authorization is given by the Engineer that the dewatering systems could be shut off.
- .8 During the entire work, observe and record the elevation of the water levels in all observation wells daily. Submit the water level records to the Engineer each day.
- .9 Do not remove any observation well except on written permission of the Engineer. Replace observation wells, which were damaged or destroyed within 24 hours.
- .10 Conduct an assessment of the potential for dewatering induced settlement. Provide and operate devices or systems, including, but not limited to, reinjection wells, infiltration trenches and cut-off walls, as necessary in order to prevent damage to existing facilities, completed Work, and adjacent property.
- .11 Securely support existing facilities, completed Work, and adjacent property which may be vulnerable to settlement due to dewatering operations. Support shall include, but not be limited to, bracing, underpinning, or compaction grouting.
- .12 Install dewatering equipment and continuously dewater to allow for work.
- .13 Take corrective measures as required to maintain groundwater at a sufficiently low level to allow for work.

**3.3 DISPOSAL OF WATER**

- .1 Dispose of water from the excavation into a temporary sediment trap either in portable container and/or as per OPSD 219.180.
- .2 Dispose of water removed from the excavation in such a way so that it will not be injurious to public health, private property or to any operation of the work completed or under construction under this contract or by others.
- .3 Water from the dewatering system is not to be discharged to the sanitary sewer.
- .4 Flow of water shall not be directed across or over pavements or sidewalks, except through approved pipes or properly designed and constructed methods.
- .5 Water from the dewatering system may also be discharged directly to the existing Napanee WPCP provided all measures indicated in the Permit to take Water application have been implemented, and approval from the Owner has been received.

**3.4 REMOVAL OF PRIMARY DEWATERING SYSTEM**

- .1 Maintain the primary dewatering system until the excavation has been completely backfilled and compacted. Remove the primary dewatering system only on receipt of written authorization from the Contract Administrator to do so.
- .2 Remove the primary dewatering system in stages to allow the groundwater level to rise at a controlled rate.

**3.5 FIELD QUALITY CONTROL**

**DEWATERING**

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- .1 Monitor Groundwater Level
  - .1 Take readings of groundwater level twice a day for the duration of the dewatering period. Keep a written record of groundwater levels.
  - .2 Dewatering Discharge Volumes
  - .3 Take readings of daily flow rates due to dewatering for the duration of the dewatering period. Keep a written record of flow rates on site. Provide recorded flow rates to the Contract Administrator on a weekly basis.
- .2 The Contractor shall be responsible to maintain all records as required by the Permit to Take Water.

**END OF SECTION**

**VARIOUS PROCESS PUMPS**

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**PART 1      GENERAL****1.1          SUMMARY**

- .1      This section includes design, supply, fabrication, installation, testing and placing into operation submersible sewage pumps and associated appurtenances.

**1.2          RELATED SECTIONS**

- .1      Section 01 33 00 - Submittals
- .2      Division 26 – Electrical
- .3      Section 26 29 20 – Variable Frequency Drives
- .4      Section 44 00 10 – Process General Requirements
- .5      Section 44 05 50 – Process Piping
- .6      Section 25 05 01 – Control Panels

**1.3          SUBMITTALS**

- .1      Submit shop drawings and product data in accordance with Section 01 33 00 – Submittals.
- .2      Indicate:
  - .1      Manufacturer's data, including materials of construction, equipment weight, connections, fittings, control assemblies and ancillaries. Identify whether factory or field assembled.
  - .2      Wiring and schematic diagrams.
  - .3      Dimensions and recommended installation.
  - .4      Data regarding pump and motor characteristics and performance inclusive of guaranteed performance curves showing that the equipment meets the specified requirements of head, capacity and horsepower for the specific application.
  - .5      Motor data.
  - .6      Provide characteristic curves for variable speed pumps for both actual maximum pump speed and for speed required to obtain minimum pump flow specified.
  - .7      Use Tag numbers for all equipment as indicated and specified.
  - .8      A copy of this specification with addenda updates, and all referenced sections with addenda updates, with each paragraph check marked to show specification compliance or marked to show deviations.



**VARIOUS PROCESS PUMPS**

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- .3 The pump supplier shall review the contract drawings and specifications to ensure the pump application and sizing is acceptable and notify the Contract Administrator immediately regarding any concerns.

**1.4 MAINTENANCE DATA**

- .1 Provide maintenance data for incorporation into manual specified in Section 01 33 00 – Submittals.
- .2 Data to include:
  - .1 Manufacturers name, type, model, capacity, head, serial number and performance curves.
  - .2 Mill certifications confirming hardness of rotor.
  - .3 Applicable operation and maintenance information as specified in section 01 33 00.
  - .4 Installation certification form.
  - .5 Training Certification form.

**PART 2 PRODUCTS****2.1 GENERAL**

- .1 All pumping equipment furnished under this Section shall be of a design and manufacture that has been used in similar applications, and it shall be demonstrated to the satisfaction of the Owner that the quality is equal to equipment made by that manufacturer specifically named herein.
- .2 Pumps, complete with motor, V-belt or couplings, necessary guards and all other specified accessories and appurtenances shall be furnished by the pump manufacturer to ensure compatibility and integrity of the individual components and provide the specified warranty for all components.
- .3 The process piping arrangements have been designed using the pumps listed as “approved manufacturer”. Pumps listed as “alternates” may require modifications to the piping arrangements, connections or concrete bases currently shown on the contract drawings. The contractor assumes all responsibility for said adjustments or extension of the work necessary for the accommodation of the alternate suppliers named.
- .4 All submersible pumps shall be supplied with a thermal overload and leak detection relay (110V). Relay is to be provided loose to the contractor for installation as detailed on the contract drawings.
- .5 Pump supplier to provide all accessories for pump installation including upper guide bar holders (316SS), cable hook (304SS), horizontal regulator hanger (304SS), holder clamp for lifting cable (316SS) and lifting cable assembly. For the

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**VARIOUS PROCESS PUMPS**

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onsite pumping station the supplier shall also include the side mount lifting davit base and lifting davit.

**2.2 PUMP LIFTING SYSTEM**

- .1 All pumps to be complete with sliding guide and brackets, stainless steel cable and quick leak-proof disconnect to discharge piping, allowing for withdrawal of pumps.
- .2 Provide stainless steel cable or galvanized chain for each pump accessible from roof access hatches along with associated chain/cable hook.
- .3 Provide 50mm (RPS/SP) and 80mm (IPS) diameter schedule 40 stainless steel pipes to act as guide rails for pumps.

**2.3 RAW SEWAGE SUBMERSIBLE PUMPS RSP-RSP-1151 AND RSP-RSP-1251 (ON-SITE PUMPING STATION)**

- .1 Pumps:
  - .1 Number of pumps: ~~three (3)~~ **two (2)**.
  - .2 Function: to pump sewage variable rate, to the influent pre-screening channel.
  - .3 Pump shall be vertical, single stage, bottom suction, non-clog, heavy duty, dry pit, centrifugal pumps, direct connected to motor by solid stainless steel shaft and fitted with thrust bearings.
  - .4 Pumps shall be submersible non-clog wastewater pumps designed to handle raw, unscreened sanitary sewage.
  - .5 Each pump shall be equipped with a submersible electric motor, Nema-B design induction type with squirrel cage rotor, shell type design and be housed in an air filled, watertight chamber. The motor shall be capable to withstand at least 15 evenly spaced starts per hour and also be designed for continuous duty while handling pump media up to 40°C. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. The motor shall be:
    - .1 Maximum speed = 1175 RPM
    - .2 Maximum horse power = 33.5 kW (45hp)
    - .3 Power: 600 V/60 HZ/3 Phase
    - .4 Suitable for VFD use.
  - .6 Major pump components shall be grey cast iron. ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts shall be of ANSI Type 316 stainless steel. An approved sewage resistant coating shall protect all metal surfaces coming into contact with the pumpage other than stainless steel or brass.
  - .7 Impeller shall be of hard iron, ASTM A-48 Class 35B, dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The screw shaped leading edges of the impeller shall be hardened to RC 45 and shall be capable of handling solids, fibrous materials, heavy

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**VARIOUS PROCESS PUMPS**


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sludge and other matter normally found in wastewater. The impeller shall be capable of momentarily moving axially upwards a distance of 15mm to allow larger debris to pass through and immediately return to normal operating position.

- .8 The pump/motor assembly shall have CSA approval as one unit, per CSA Standard C22.2-108. The pump/motor unit must also be approved by CSA for service in Class 1, Division I, groups A, B, C or D hazardous locations.
- .9 The pumps shall meet the following characteristics:
  - .1 Discharge connection: 200 mm.
  - .2 Design duty point: 100 L/s at 18.5 m TDH.
  - .3 Minimum shut-off head: 29.8 m.
  - .4 Minimum overall efficiency at duty point: 68.9%
  - .5 One of the two pumps specified shall be supplied with a mix flush valve.
- .10 The pump system shall be Flygt model NP-3202.095 MT Impeller code 641 354 mm Adaptive c/w 2 mini CAS II relays to be delivered to Division 25/26.

## **2.4 [ITEM P1] BIOSOLIDS MIXER PUMPS (BI-DSP-7120 AND BI-DSP-7220)**

- .1 Pumps:
  - .1 Number of pumps: Two
  - .2 Function: to mix the biosolids storage tanks.
  - .3 The pumps shall be dry well horizontal chopper pump specifically designed to pump and agitate waste solids at heavy consistencies. Materials shall be macerated and conditioned by the pump as an integral part of the pumping action. The pump must have demonstrated the ability to chop through, mix and pump high concentrations of solids such as plastics, heavy rags, grease and hair balls, wood, paper products and stringy materials without plugging, both in tests and field applications.
  - .4 Motors shall be in accordance with NEMA MG 1 and shall be of explosion-proof design for operation near digester gas. Motor shall be sized for and shall not overload under the intended conditions. The motor shall be:
    - .1 Maximum speed = 1200 RPM
    - .2 Maximum horsepower = 44.7 kW (60 hp)
    - .3 Power: 575 V/60 HZ/3 Phase
    - .4 Suitable for VFD use.
  - .5 The pump casing shall be of semi-concentric design, with the first half of the circumference being cylindrical beginning after the pump outlet, and the remaining circumference spiraling outward to the 150 lb. flanged centerline discharge. Back pull-out adapter plate shall allow removal of pump components from above the casing and allow external adjustment of impeller-to-cutter bar clearance. Wear plate shall be integral to the back pull-out plate and shall include an internal cutter for stringy materials caught between the wear plate and the pump-out vanes on the back of the impeller. Casing and adapter plate shall be ductile cast iron with all water

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**VARIOUS PROCESS PUMPS**


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passages to be smooth, and free of blowholes and imperfections for good flow characteristics. Wear plate shall be heat treated steel plate.

- .6 The impeller shall be semi-open type with pump out vanes to reduce seal area pressure. Chopping/maceration of materials shall be accomplished by the action of the cupped and sharpened leading edges of the impeller blades moving across the cutter bar at the intake openings, with a maximum set clearance between the impeller and cutter bar of .020"-.030" cold. Impeller shall be cast steel, heat treated to minimum Rockwell C 60 and dynamically balanced. The impeller shall be threaded to the shaft and shall have no axial adjustments and no set screws.
- .7 The pump/motor assembly shall have CSA approval as one unit, per CSA Standard C22.2-108. The pump/motor unit must also be approved by CSA for service in Class 1, Division I, groups A, B, C or D hazardous locations.
- .8 The pumps shall meet the following characteristics:
  - .1 Discharge connection: 250 mm.
  - .2 Design duty point: 230 L/s at 12.5 m TDH.
- .2 The pump system shall be Vaughan Model HE10R12CS-130 Horizontal Chopper Pump, Hayward Gordon CHOPX10B Chopper Pump, or approved equivalent

## **2.5 [ITEM P3] BIOSOLIDS TRANSFER PUMPS (BI-PMP-2142 AND BI-PMP-2242)**

- .1 Pumps:
  - .1 Number of pumps: Two
  - .2 Function: to pump biosolids from digesters to biosolids storage tanks.
  - .3 The pumps shall be dry well horizontal chopper pump specifically designed to pump and agitate waste solids at heavy consistencies. Materials shall be macerated and conditioned by the pump as an integral part of the pumping action. The pump must have demonstrated the ability to chop through, mix and pump high concentrations of solids such as plastics, heavy rags, grease and hair balls, wood, paper products and stringy materials without plugging, both in tests and field applications.
  - .4 Motors shall be in accordance with NEMA MG 1 and shall be of explosion-proof design for operation near digester gas. Motor shall be sized for and shall not overload under the intended conditions. The motor shall be:
    - .1 Maximum speed = 1200 RPM
    - .2 Maximum horsepower = 22.3 kW (30 hp)
    - .3 Power: 575 V/60 HZ/3 Phase
    - .4 Suitable for VFD use.
  - .5 The pump casing shall be of semi-concentric design, with the first half of the circumference being cylindrical beginning after the pump outlet, and the remaining circumference spiraling outward to the 150 lb. flanged centerline discharge. Back pull-out adapter plate shall allow removal of pump components from above the casing and allow external adjustment of impeller-to-cutter bar clearance. Wear plate shall be integral to the back

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**VARIOUS PROCESS PUMPS**

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pull-out plate and shall include an internal cutter for stringy materials caught between the wear plate and the pump-out vanes on the back of the impeller. Casing and adapter plate shall be ductile cast iron with all water passages to be smooth, and free of blowholes and imperfections for good flow characteristics. Wear plate shall be heat treated steel plate.

- .6 The impeller shall be semi-open type with pump out vanes to reduce seal area pressure. Chopping/maceration of materials shall be accomplished by the action of the cupped and sharpened leading edges of the impeller blades moving across the cutter bar at the intake openings, with a maximum set clearance between the impeller and cutter bar of .020"-.030" cold. Impeller shall be cast steel, heat treated to minimum Rockwell C 60 and dynamically balanced. The impeller shall be threaded to the shaft and shall have no axial adjustments and no set screws.
- .7 The pump/motor assembly shall have CSA approval as one unit, per CSA Standard C22.2-108. The pump/motor unit must also be approved by CSA for service in Class 1, Division I, groups A, B, C or D hazardous locations.
- .8 The pumps shall meet the following characteristics:
  - .1 Discharge connection: 200 mm.
  - .2 Design duty point:
    - .1 Transfer: 16.5 L/s at 7.05 m TDH.
    - .2 Transfer: 70 L/s at 12.5 m TDH.
- .2 The pump system shall be Vaughan Model HE8K10CSEC2-120 Horizontal Chopper Pump.

**PART 3**      **EXECUTION****3.1**            **INSTALLATION**

- .1 Follow the manufacturer's recommended installation details and procedures supplemented by details on the drawings.
- .2 Install in a neat, workmanlike manner so that connections and disconnections can be easily made with parts accessible for inspections, maintenance and repairs.
- .3 Install at correct elevations, true, square, plumb and level and provide all shims required.
- .4 Apply protection so that anchor bolts, shims and miscellaneous metals are fully corrosion protected.
- .5 Contractor shall prove the pump's discharge port connection to process lines are made in a free supported state without need to apply vertical or horizontal pressure to align piping with pump nozzle.

**VARIOUS PROCESS PUMPS**

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- .6 The installation and initial operation of all components shall be certified in accordance with 01 91 23 Equipment Installation and Start Up and shall be subject to the complete commissioning process.

**3.2 TESTING**

- .1 After completion of installation, the pumps shall be completely tested to demonstrate compliance with operating requirements as specified. Testing and final acceptance shall be completed by pump manufacturer.

**3.3 FIELD QUALITY CONTROL**

- .1 After completion of installation, representative of pump manufacturer shall complete inspection and supervise startup of the equipment and provide to contract administrator a written startup and commissioning report confirming that the equipment is installed and operating in accordance with manufacturers standards, and that the warranty is in effect until one year following the date of substantial completion.
- .2 Provide materials, labour, liquid and ancillary equipment necessary to fulfil tests.
- .3 Test to demonstrate that:
  - .1 Pumps and equipment run free from heating, or vibration.
  - .2 Operation meets requirements of these specifications.
  - .3 Pumps and pumping are free and clear of debris and obstructions.
- .4 Replace equipment found defective.
  - .1 Repeat test until equipment is accepted by contract administrator.

**END OF SECTION**



## GENERAL

- DESIGN WORK IN ACCORDANCE WITH THE 2012 ONTARIO BUILDING CODE, CONSTRUCT IN ACCORDANCE WITH THE 2012 ONTARIO BUILDING CODE AND THE APPLICABLE REQUIREMENTS OR BY-LAWS OF THE AUTHORITY HAVING JURISDICTION.
- SITE VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS. REPORT DISCREPANCIES TO THE CONSULTANT.
- THE GENERAL CONTRACTOR IS RESPONSIBLE TO REVIEW ARCHITECTURAL AND STRUCTURAL DRAWINGS TO ENSURE DIMENSIONS CONFORM BETWEEN THE TWO. REPORT DISCREPANCIES TO THE CONSULTANT.
- REVIEW AND APPLY CONTRACT SPECIFICATIONS IN ADDITION TO ALL OTHER DISCIPLINE DRAWINGS AND SPECIFICATIONS. SHOULD DISCREPANCIES EXIST WITH DETAILS SHOWN BY OTHER DISCIPLINES, ASSUME THE MORE STRINGENT DETAIL APPLIES UNLESS DIRECTED OTHERWISE BY THE CONTRACT ADMINISTRATOR.
- ALL LABOUR AND MATERIALS IN ACCORDANCE WITH THE LATEST EDITION OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND THE 2012 ONTARIO BUILDING CODE.
- THE STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE ACTING AS A WHOLE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE TEMPORARY SHORING, BRACING ETC. AS REQUIRED TO ENSURE STABILITY AND SAFETY OF THE WORKERS DURING CONSTRUCTION.
- THE GENERAL CONTRACTOR IS RESPONSIBLE TO ENSURE THE CONSTRUCTION METHODS WILL NOT CAUSE DAMAGE TO SURROUNDING BUILDINGS, STRUCTURES OR UTILITIES. DOCUMENT AND PREPARE A PRE-CONSTRUCTION SURVEY AND SUBMIT TO THE CONSULTANT PRIOR TO COMMENCING CONSTRUCTION WHERE APPLICABLE.
- THE GENERAL CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH OTHER DISCIPLINES FOR REQUIRED EMBEDDED OR ANCHORED ITEMS OR OPENINGS. NOT ALL ITEMS OR OPENINGS ARE NECESSARILY SHOWN ON THE STRUCTURAL DRAWINGS.
- THE STRUCTURE HAS BEEN DESIGNED FOR THE SERVICE LOADING INDICATED. CONTRACTOR RESPONSIBLE TO ENSURE THIS LOADING IS NOT EXCEEDED DURING CONSTRUCTION.
- REVIEW OF SHOP DRAWINGS IS FOR GENERAL CONFORMITY ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE ALL COORDINATION IS COMPLETE.
- ANCHOR EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S DRAWINGS AND SPECIFICATIONS AND IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.

## REINFORCING STEEL

- ALL REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA G30.18 (CURRENT EDITION).
- ALL REINFORCING STEEL DETAILING SHALL BE IN ACCORDANCE WITH CAN/CSA A23.1 (CURRENT EDITION) AND REINFORCING MANUAL OF STANDARD PRACTICE - LATEST EDITION.
- REINFORCING STEEL: GRADE 60 (400MPa). REINFORCING SHALL HAVE THE GREATER OF CLASS 'B' LAPS OR 40 BAR DIAMETERS. REBAR TO BE LAPPED AT SPLICES AND CORNERS AS REQUIRED BY CSA A23.3. LAP CONTINUOUS TOP BARS AT CENTER BETWEEN SUPPORTS AND BOTTOM BARS AT SUPPORTS AS REQUIRED. TERMINATE CONTINUOUS BARS AT NON-CONTINUOUS ENDS WITH STANDARD HOOKS. CONTRACTOR RESPONSIBLE FOR PROVIDING ADDITIONAL BARS AS REQUIRED TO SUPPORT SPECIFIED BARS.
- REINFORCING SHALL BE SUPPORTED AND HELD FIRMLY IN PLACE SO AS NOT TO MOVE DURING POURING OPERATIONS. DOWELS SHALL BE HELD FIRMLY IN PLACE AND SHOULD NOT BE SET IN PLACE DURING POURING OPERATIONS.
- MINIMUM REINFORCING CLEAR COVER UNLESS NOTED OTHERWISE ON DRAWINGS:  
BEAMS, COLUMNS AND PIERS: 40mm TO TIES OR STIRRUPS  
WALLS: 50mm / 60mm WHEN SURFACE IS ADJACENT TO LIQUID FOOTINGS: 75mm CLR. BOTTOM / 50mm CLR. TOP AND SIDES  
SLABS ON GRADE: 75mm BOTTOM / 50mm TOP  
STRUCTURAL SLABS: 25mm TOP / 25mm BOTTOM (EXCEPT 60mm WHEN SURFACE IS ADJACENT TO LIQUID)
- THE CONTRACTOR SHALL SUBMIT REINFORCEMENT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION (REFER TO SPECIFICATIONS).
- PROVIDE REINFORCEMENT SUPPORT CHAIRS, SPACER BARS AND OTHER MATERIALS IN ACCORDANCE WITH CSA A23.1 AND A23.3 (LATEST EDITION). CHAIRS TO BE PLASTIC.

## FOUNDATIONS

- REFERENCE GEOTECHNICAL REPORT PGS299-1 PREPARED BY PATTERSON GROUP INC DATED JUNE 8, 2020.  
SLS = 200 kPa  
ULS = 300 kPa  
GEOTECHNICAL CONSULTANT TO VERIFY BEARING CAPACITY IN WRITING PRIOR TO POURING CONCRETE.
- PROVIDE A MINIMUM 75mm MUDSLAB ABOVE GEOTECH APPROVED NATIVE MATERIAL. INSTALL MUDSLAB IMMEDIATELY AFTER NATIVE MATERIAL IS EXPOSED TO PROTECT AGAINST DISTURBANCE.

## CONCRETE FORMWORK

- ALL FORMWORK SHALL BE DESIGNED, ERECTED, SUPPORTED, BRACED AND MAINTAINED IN ACCORDANCE WITH CSA S269.1-16 FALSEWORK AND FORMWORK.
- PLYWOOD FOR EXPOSED CONCRETE TO BE NEW FACTORY RESIN COATED MEDIUM DENSITY OVERLAD DOUGLAS FIR PLYWOOD, 19mm THICK. REFER TO SPECIFICATIONS FOR CONTROLLED PERMEABILITY FORMLINER (CPF) TO BE USED ON ALL WALLS, PIERS, COLUMNS, AND BEAMS.
- PENETRATIONS SHALL NOT BE PERMITTED IN ANY STRUCTURAL MEMBERS OTHER THAN THOSE INDICATED ON THE STRUCTURAL DRAWINGS WITHOUT WRITTEN PERMISSION FROM THE ENGINEER OF RECORD.
- ALL SHORING WORK FOR SUSPENDED SLABS AND BEAMS SHALL REMAIN IN PLACE FOR A MINIMUM 7 DAYS OR UNTIL THE CONCRETE HAS REACHED 75% OF THE SPECIFIED CONCRETE STRENGTH, WHICHEVER IS LONGER.

## CONCRETE

- ALL CONCRETE SHALL BE NORMAL WEIGHT DESIGNED TO MEET THE PERFORMANCE CRITERIA INDICATED IN THE CONCRETE TYPES SCHEDULE ON THIS DRAWING.
- PROVIDE CERTIFICATION THAT THE PLANT, EQUIPMENT, AND MATERIALS TO BE USED IN CONCRETE COMPLY WITH THE REQUIREMENTS OF CAN/CSA-A23.1/A23.2 AND THAT THE MIX IS ADJUSTED TO PREVENT ALKALI AGGREGATE REACTIVITY PROBLEMS.
- THE AGGREGATE SOURCE MUST BE LISTED ON THE APPROVED LIST PUBLISHED BY THE MINISTRY OF TRANSPORTATION ONTARIO.
- WET CURE CONCRETE COMMENCING IMMEDIATELY AFTER CONCRETE HARDENS. USE NON-STAINING GEOTEXTILE COVERING. ALL SURFACES SHALL BE MAINTAINED CONTINUOUSLY WET FOR THE DURATION OF THE CURING PERIOD IN ACCORDANCE WITH CSA A23.1/A23.2 (LATEST EDITION).
- CONCRETE HAULING TIME: MAXIMUM ALLOWABLE TIME FOR CONCRETE TO BE DELIVERED TO SITE AND DISCHARGED NOT TO EXCEED 120 MINUTES AFTER BATCHING (UNLESS NOTED AS LESS BY CONCRETE SUPPLIER).
- COORDINATE CONCRETE EMBEDDED ITEMS AND CONCRETE OPENINGS WITH ALL OTHER DISCIPLINES. ALL OPENINGS AND EMBEDDED ITEMS ARE NOT NECESSARILY SHOWN ON STRUCTURAL DRAWINGS.
- COMPLETE COLD AND HOT WEATHER CONCRETING IN STRICT ACCORDANCE WITH CSA A23.1/A23.2 (LATEST EDITION).
- CONCRETE SHALL NOT BE PLACED UNTIL THE CONTRACT ADMINISTRATOR HAS REVIEWED AND APPROVED THE WORK.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR WORKING WITH THE CONCRETE SUPPLIER TO ENSURE THAT THE PLASTIC AND HARDENED MIX PROPERTIES MEET SITE REQUIREMENTS FOR PLACING, FINISHING, AND THE OWNERS SPECIFIED PERFORMANCE REQUIREMENTS. THE GENERAL CONTRACTOR SHALL MEET THE DOCUMENTATION AND QUALITY CONTROL REQUIREMENTS OUTLINED UNDER THE PERFORMANCE ALTERNATE OF TABLE 5 OF CAN/CSA-A23.
- SLUMP AND AGGREGATE SIZE TO BE REVIEWED BY THE GENERAL CONTRACTOR AND SUPPLIER TO MEET PLACEMENT AND FINISHING REQUIREMENTS WITHOUT SEGREGATION WHILE MEETING ALL SPECIFICATIONS. REPORT DISCREPANCIES TO ENGINEER.
- CHLORIDE ION PENETRABILITY FOR EXPOSER CLASS C-1 AND C-XL SHALL MEET THE REQUIREMENTS OF CAN/CSA-A23.
- ALL BOTTOM EDGES OF EXPOSED SLABS AND BEAMS, AS WELL AS EDGES OF WALLS AND COLUMNS, TO BE CHAMFERED 20mm x 20mm. ALL TOP EDGES OF EXPOSED SLABS, BEAMS, UPSTAIRS AND STAIRS TO BE TOOLED UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL FINISHING REQUIREMENTS.
- NO CALCIUM CHLORIDE IS PERMITTED, IN ANY FORM, IN ANY CONCRETE MIX.
- ALL INTERIOR CONCRETE SLABS SHALL RECEIVE CONCRETE DENSIFIER (REFER TO SPECIFICATIONS).

### CONCRETE TYPES SCHEDULE

MINIMUM 28 DAY SLUMP COMPRESSIVE STRENGTH	EXPOSURE CLASS	W/C RATIO	AIR CONTENT
MIX 1 - PRIMARY AND SECONDARY CLARIFIER CONCRETE			
35 MPa *	SEE NOTE 2	A-1	0.40
MIX 2 - HEADWORKS FOOTINGS			
25 MPa	80±30	F-2	0.50
MIX 3 - HEADWORKS FOUNDATION AND EXTERIOR ABOVE GRADE WALLS			
30 MPa	SEE NOTE 2	C-3	0.45
MIX 4 - HEADWORKS INTERIOR BEAMS AND COLUMNS			
35 MPa *	SEE NOTE 2	N	0.45
MIX 5 - HEADWORKS 2ND LEVEL STRUCTURAL SLABS			
35 MPa *	SEE NOTE 2	N	0.45
MIX 6 - HEADWORKS SLAB ON GRADE			
28 MPa	SEE NOTE 2	N	0.45
MIX 7 - HEADWORKS CHANNELS AND VORTEX (IN CONTACT WITH LIQUID)			
35 MPa *	SEE NOTES 2 & 3	A-1	0.40
MIX 8 - UV FOOTINGS			
25 MPa	80±30	F-2	0.50
MIX 9 - UV FOUNDATION WALLS			
30 MPa	SEE NOTE 2	C-3	0.45
MIX 10 - UV INTERIOR SLABS			
28 MPa	SEE NOTE 2	N	0.45
MIX 11 - UV CHANNELS, WALLS, AND SLABS (IN CONTACT WITH LIQUID)			
35 MPa *	SEE NOTES 2 & 3	A-1	0.40
MIX 12 - BIOLIDS STORAGE TANK CONCRETE			
35 MPa *	SEE NOTE 2	A-1	0.40
MIX 13 - BIOLIDS STORAGE BUILDING SLAB ON GRADE			
28 MPa	SEE NOTE 2	N	0.45
MIX 14 - AERATION TANK CONCRETE			
35 MPa *	SEE NOTE 2	A-1	0.40
MIX 15 - CONCRETE BENCHING			
35 MPa *	SEE NOTE 2	A-1	0.40
MIX 16 - EXTERIOR LIGHT STANDARDS			
32 MPa	80±30	C-2	0.45
MIX 17 - LEAN CONCRETE FILL			
20 MPa	AS REQUIRED	N	-
MIX 18 - GENERATOR AND HVAC UNIT SLAB			
35 MPa *	SEE NOTE 2	C-1	0.40
MIX 19 - EXTERIOR SIDEWALKS AND CURBS			
32 MPa	80±30	C-2	0.45
MIX 20 - OTHER CONCRETE NOT NOTED ABOVE			
35 MPa *	SEE NOTE 2	C-1	0.40
MIX 21 - HEADWORKS HOLLOW CORE TOPPING			
25 MPa	125±25	N	0.50
NOTES: 1. MAXIMUM AGGREGATE SIZE OF ALL CONCRETE TO BE 20mm (MIX 21 TO HAVE MAXIMUM AGGREGATE SIZE OF 10mm). 2. PROVIDE A CONCRETE MIX DESIGN WITH A SLUMP OF 50mm. ADD SUPER PLASTICIZER TO PRODUCE A CONCRETE SLUMP OF 125±25mm. 3. PROVIDE CAPILLARY WATERPROOFING AD MIXTURE XYPEX ADMIX C-500 (REFER TO SPECIFICATIONS). 4. WHERE NOTED *, COMPRESSIVE STRENGTH IS MEASURED AT 56 DAYS.			

## STRUCTURAL STEEL

- FABRICATION, ERECTION AND STRUCTURAL DESIGN AND DETAILING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CSA S16 (CURRENT EDITION).
- ALL CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR UNLESS NOTED OTHERWISE.
- WELDING SHALL CONFORM TO CSA W59 (CURRENT EDITION) AND SHALL BE PERFORMED BY CERTIFIED WELDERS. THE FABRICATION SHOP SHALL BE APPROVED BY THE CANADIAN WELDING BUREAU TO THE REQUIREMENTS OF CSA W47 (CURRENT EDITION).
- THE STEEL ERECTOR IS RESPONSIBLE FOR SUPPLYING AND ERECTING ALL TEMPORARY BRACING TO PROVIDE STABILITY FOR THE STRUCTURE DURING CONSTRUCTION.
- SUBMIT FOR REVIEW SHOP DRAWINGS OF STEEL DETAILING PRIOR TO FABRICATION OF STRUCTURAL STEEL. ALL DRAWINGS SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
- ALL STRUCTURAL STEEL NOTED ON PLANS AS HOT DIPPED GALVANIZED SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH CSA G164 (CURRENT EDITION). ALL CONNECTIONS SHALL BE BOLTED, AND ALL NUTS, WASHERS AND ANCHOR BOLTS GALVANIZED IN ACCORDANCE WITH CSA G164 (CURRENT EDITION).
- BOLTS SHALL BE IN ACCORDANCE WITH ASTM A325 (CURRENT EDITION). DESIGN AS BEARING CONNECTIONS, AND HAVE A MINIMUM OF TWO 20mm DIAMETER BOLTS IN EACH CONNECTED PIECE.
- GROUT SHALL BE NON-SHRINK, NON-METALLIC TYPE GROUT WITH A 28-DAY COMPRESSIVE STRENGTH OF 56MPa.
- UNLESS NOTED OTHERWISE AS HOT DIPPED GALVANIZED, STAINLESS STEEL, OR ALUMINUM PROVIDE THE FOLLOWING:  
A. PRIMER COAT: MACROPOXY 646, FAST CURE EPOXY, MIN. OF 8 (WET) MILS, BY SHERWIN WILLIAMS.  
B. TOP COAT: ACRYLON 218 HS, ACRYLIC POLYURETHANE, MIN. OF 6 (WET) MILS, BY SHERWIN WILLIAMS.  
a. BEFORE PRIME AND PAINT, PREPARE ALL EXPOSED STEEL AS PER PAINT MANUFACTURERS WRITTEN INSTRUCTIONS.  
b. PREPARE STRUCTURAL STEEL BY CREATING A PROFILE OF A MINIMUM OF 2 MILS AND NO MORE THAN 3 MILS BEFORE PRIMER IS APPLIED. STEEL TO BE FREE OF RUST, SCALE, AND CONTAMINATIONS.
- UNLESS NOTED OTHERWISE, COLUMN CAP PLATES SHALL BE 16mm THICK AND COLUMN BASE PLATES SHALL BE 20mm THICK.
- PROVIDE 6mm CAP PLATES FOR ALL HSS MEMBERS U.N.O.
- ALL STRUCTURAL STEEL TO BE HOT DIPPED GALVANIZED UNLESS NOTED OTHERWISE.
- UNLESS NOTED OTHERWISE, DO NOT OVERSIZE HOLES IN STEEL TO FIT ANY ANCHOR LOCATIONS. FOR COLUMN BASE PLATE HOLES, UNLESS NOTED OTHERWISE ON DRAWINGS, FOLLOW STANDARD PRACTICE WHICH IS TO USE SLIGHTLY OVERSIZED HOLES. USE 6mm OVERSIZED HOLE DIAMETER FOR COLUMN ANCHOR RODS UP TO AND INCLUDING 27mm DIAMETER AND 12mm OVERSIZED HOLE DIAMETER FOR COLUMN ANCHOR RODS GREATER THAN 27mm DIAMETER.
- STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS:  
HSS SHAPES - CSA G40.21-350W CLASS C  
W AND S SHAPES - CSA G40.21-350W, ASTM A992, OR ASTM A572 GRADE 50  
ANGLES AND STANDARD CHANNELS - CSA G40.21-350W PLATES - CSA G40.21-300W  
ROLLED PLATES - CSA G40.21 300W  
BOLTS - ASTM A325 OR ASTM A490  
STRUCTURAL STEEL ANCHOR RODS - ASTM F1554 GRADE 36  
MINIMUM REINFORCING BAR ANCHOR BOLTS - CAN/CSA-G30.18R GRADE 400 (FILLET WELDS SHALL BE 5mm MIN.)  
BOLTS SHALL BE A325 19mm DIA. U.N.O.
- ALL WELDS SHALL BE GROUND SMOOTH PRIOR TO PAINTING.

## STEEL STUDS

- SUBMIT SHOP DRAWINGS OF ALL STEEL STUD DETAILS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO.
- MATERIAL FOR COLD FORMED STEEL STUDS, BRACING, BRIDGING CHANNELS, AND CLIPS, ETC., SHALL MEET THE REQUIREMENTS OF CAN/CSA-S136-16. FOR MATERIAL, 1.5mm AND THINNER GRADE A, YIELD STRENGTH 228 MPa (33 Ksi). FOR MATERIAL 1.52mm AND THICKER GRADE D, 345 MPa (50ksi).
- FOR STUDS & TRACKS: HOT DIPPED GALVANIZED COATING TO BE Z275 MINIMUM.
- UNLESS INDICATED, ALL TRACKS ARE TO BE THE SAME GAUGE AS STUDS, WITH A WIDTH TO MATCH STUD AND STANDARD LEGS. MATERIAL AS PER NOTE 2.
- ALL FASTENERS BETWEEN STUDS, STUDS AND TRACK TO BE #8-18 WAFER HEAD SCREWS CORROSION RESISTANT ZINC OR DACUMIUM COATING (0.008mm) THICK. FASTENERS FROM STUDS OR TRACKS TO CONCRETE OR STRUCTURAL STEEL TO BE POWDER ACTUATED PINS.
- BRIDGING REQUIRED AT MAXIMUM 1200 o.c. (LOAD BEARING) OR 1500 o.c. (NON-LOAD BEARING) MAXIMUM TO BE 38x13x1.15mm (U) CHANNEL.
- BRIDGING CLIPS TO BE 38mm x 1.15mm (75 LG. FOR 92mm STUDS, 125 LG. FOR 152 STUDS, 175 LG. FOR 203 STUDS) CONNECT WITH 2-#8-18 SCREWS TO BOTH STUD & BRIDGING CHANNEL MATERIAL AS PER NOTE 1.
- AT NON-LOAD BEARING STUDS, PROVIDE BAILEY MULTI-SLOT TRACK (OR EQUIVALENT) TO PROVIDE LATERAL SUPPORT AND PERMIT 25mm VERTICAL DEFLECTION (38mm AT U/s OF PRE-ENG. STRUCTURE ROOF). FASTEN STUDS TO EACH SIDE OF TRACK WITH #8 WAFER HEAD SCREWS. MAINTAIN A DEFLECTION GAP OF 25mm BETWEEN TOP OF STUD AND TOP OF SLOTTED TRACK.

## MASONRY

- ALL MASONRY WORK IN ACCORDANCE WITH CSA-A371 - LATEST EDITION.
- CONCRETE BLOCK REINFORCING AS FOLLOWS:  
240 BLOCK, 2-15M @ 1200 VERT, 2-3.66 @ 200 LADDER TYPE HORIZ. JOINT REINF. + SINGLE COURSE BOND BEAM C/W 2-15M CONT. AT 2400 o.c.  
PROVIDE SINGLE COURSE BOND BEAM c/w 2-15M CONTINUOUS AT BASE OF WALL. PROVIDE MINIMUM FULL TWO COURSE BOND BEAM c/w 2-15M CONTINUOUS AT TOP OF WALL. REFER TO PLANS AND SECTIONS FOR ADDITIONAL WALL REINFORCING, GROUTING LOCATIONS, LINTELS, AND INTERMEDIATE BOND BEAMS.  
190 BLOCK:  
1.20M @ 1000 o.c. VERT., 2-3.66 DIA. @ 200 LADDER TYPE HORIZONTAL JOINT REINFORCING. PROVIDE SINGLE COURSE BOND BEAM c/w 1-15M CONTINUOUS AT BASE OF WALL. PROVIDE MINIMUM FULL TWO COURSE BOND BEAM c/w 1-15M CONTINUOUS AT TOP OF WALL.  
AT UV BUILDING 190 MASONRY PROVIDE SINGLE COURSE BOND BEAM c/w 1-15M CONTINUOUS AT ELEVATION 2200 ABOVE FINISHED FLOOR.
- BUILD MASONRY PLUMB, LEVEL, AND TRUE TO LINE, WITH VERTICAL JOINTS IN ALIGNMENT RESPECTING CONSTRUCTION TOLERANCES PERMITTED BY CSA-A371.
- GROUT TO CSA A179, COARSE GROUT 20 MPa, 225mm +/- 25mm SLUMP, READY MIX ONLY.
- MAINTAIN MATERIALS AND SURROUNDING AIR TEMPERATURE AT A MINIMUM OF 5°C (MAXIMUM OF 32°C), PRIOR TO, DURING, AND 48 HOURS AFTER COMPLETION OF MASONRY WORK.
- MORTAR TO CSA A179, TYPE S BASED ON PROPERTY SPECIFICATIONS. MORTAR SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 8.5 MPa.
- SUPPLY AND INSTALL MASONRY CONNECTORS AND REINFORCEMENT IN ACCORDANCE WITH CSA-A370, CSA-A371, CSA-A23.1/A23.2, AND CSA-S304.1, UNLESS INDICATED OTHERWISE.
- CONCRETE MASONRY UNITS IN ACCORDANCE WITH CSA A165. STANDARD CONCRETE BLOCK MASONRY UNIT CLASSIFICATION H/15/A/M UNLESS NOTED OTHERWISE.
- PROVIDE TYPICAL VERTICAL REINFORCING BARS AT EACH SIDE OF OPENINGS, AT CORNERS, AT EACH SIDE OF MOVABLE JOINTS, AND AT ENDS OF WALLS. REFER TO SECTIONS FOR LOCATION OF ADDITIONAL GROUTED CORES.
- CONCRETE MASONRY REBAR LAPS:  
WIRE REINF.: 400mm (USE PRE-FABRICATED WALL CORNER AND INTERSECTION PIECES)  
10M = 425mm  
15M = 600mm  
20M = 760mm  
25M = 950mm
- NO WALL PENETRATIONS THROUGH BLOCK LINTELS OR BOND BEAMS ARE PERMITTED.
- BLOCK WALLS SHALL BE INTERLOCKED AT WALL INTERSECTION UNLESS OTHERWISE NOTED.
- PROVIDE CLEANOUTS AT BOTTOM OF ALL REINFORCED BLOCK CELLS. REPEAT CLEANOUTS ABOVE BOND BEAMS.
- LOW LIFT GROUTING ONLY. HIGH LIFT GROUTING WILL NOT BE ACCEPTED. FILL CELLS IN MAXIMUM 1500mm LIFTS. GROUT BASE COURSE INDEPENDENT FROM REMAINING WALL.
- NO MASONRY WORK SHALL BE PERMITTED WITH THE TEMPERATURE BELOW 5 DEGREES CELSIUS, UNLESS PROVISIONS ARE MADE FOR HEATING THE MATERIALS AND THE WORK.
- PROVIDE 400 DEEP X 800 WIDE FULLY GROUTED WALL BELOW BEAM BEARING LOCATIONS + FULL HEIGHT TYPICAL WALL VERTICAL BELOW. UNLESS NOTED OTHERWISE ON PLAN.
- GROUT MASONRY WALL SEGMENTS 800 OR LESS IN LENGTH SOLID.
- COORDINATE AND PROVIDE BLOCK LINTELS AT MECHANICAL OPENING LOCATIONS. INCLUDE OPENINGS THAT WILL BE CUT OR CORED AFTER BLOCK CONSTRUCTION.
- GROUT CORES SOLID AT ANCHOR LOCATIONS. (EG. LADDER ANCHORS, EQUIPMENT SUPPORTS, VANITIES, ETC.)

## TEMPORARY WORKS

- THE CONTRACTOR SHALL DESIGN, PROVIDE, ERECT, MAINTAIN, REMOVE, AND ASSUME FULL AND SOLE RESPONSIBILITY FOR ALL TEMPORARY WORKS REQUIRED FOR THE SAFE AND COMPLETE EXECUTION OF THE WORKS.
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- C





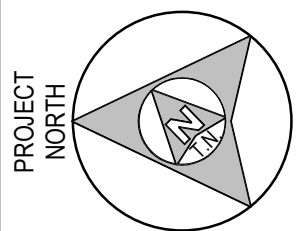
PHASE 1

## KEY PLAN

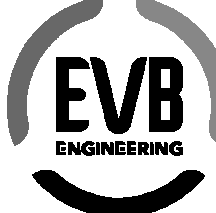
SCALE: N.T.S.

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PHONE: 613-727-5111 | FAX: 613-727-5115

CLIENT



PROJECT:

# INGLESIDE WWTP UPGRADES PHASE 1

TITLE:

PUMP GALLERY  
LOWER LEVEL

SCALE:	JOB NO:
AS NOTED	19070
DESIGNED BY:	DATE:
J.B.	2025/03/13
DRAWN BY:	DRAWING NO.
K.B.W.	P2207
CHECKED BY:	
J.E.	