

 REGIONAL DISTRICT OF NANAIMO	<i>Request for Proposals No. 26-034</i> GNPCC Grit & Sedimentation Tanks Refit <u>2027 Description of Work</u>	Date: July 30, 2026 Revision: 0
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In general terms, the Scope of Work is described as per the below:

1.1. Sed Tank No. 1:

- 1.1.1. Remove and replace tank collector mechanisms and drives;
- 1.1.2. Spot repair of concrete at mechanism attachment locations;
- 1.1.3. Demo and replace concrete mechanism corbels;
- 1.1.4. Grind flush two (2) obsolete T-rails that run the length of the tanks embedded in the concrete floor in accordance with the Brentwood drawings/specifications;
- 1.1.5. Demo of obsolete HSS scum line (6in x 8in) intersecting centre walkway columns, and concrete repair of void in columns;
- 1.1.6. Replacement of corroded fasteners in weir box at North end of the tank. Includes fasteners which hold the sections together as well as anchor bolts to side of tank which will require re-drill thru existing weir.
- 1.1.7. Demolition and replacement of 3in water piping running along centre walkway and along North side of tank (See Appendix M);

1.2. Grit Tank No. 1:

- 1.2.1. Remove and replace tank collector mechanisms and drives;
- 1.2.2. Demo existing carbon steel plate in the Grit Tank 1 collector trench;
- 1.2.3. Spot repair of concrete at mechanism attachment locations;
- 1.2.4. Demo and replace concrete mechanism corbels;

1.3. General Scope

- 1.3.1. Part audit of the collector mechanism Bill of Materials (BOM). Provide list of any missing parts to RDN to order for replacements. Shall be performed two months prior to commencement of the above Scope of Work.

A non-mandatory information meeting will be held on site to review site conditions and scope of work. See the front page of the RFP for more information.

2. **Work Site Location**

The site of the Work is the Regional District of Nanaimo's (RDN's) Greater Nanaimo Pollution Control Centre (GNPCC) at 4600 Hammond Bay Road, Nanaimo, BC, V9T 5A8.

3. **Definition of the Work**

The Work shall consist of supplying all materials, equipment, temporary facilities, tools, labour, supervision, overhead, and everything required to accomplish the Work described and called for in the Contract Documents. The sections following supplement, but do not alter the Definition of the Work.

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4. Included in the Work - General

The Work shall include the supply of all materials, forms, temporary facilities, labour, supervision, plant equipment, and tools necessary to complete the Work described herein and shown on the Drawings, Specifications and other Supplemental Documentation. It shall generally consist of, but not specifically be limited to the following:

- 4.1. Supply all equipment, materials and consumables required to accomplish the Work, except as indicated below.
- 4.2. Supply skilled labour and supervision with the proper qualifications to accomplish the Work in a thoroughly substantial and workpersonlike manner.
- 4.3. Receive and keep secure all RDN-supplied materials. Perform an audit of the Bill of Materials (BOM) 2 months prior to commencement of the Scope of Work to confirm all equipment is available for installation and in good condition for the intended purpose. Track handover of equipment. Promptly notify the RDN if any issues are found to allow for ordering of replacements if req'd.
- 4.4. Field-confirm any applicable prefabrication measurements for the Work, to the extent practicable, before the Work begins.
- 4.5. Prefabricate/pre-cut any raw structural, piping and other materials to be incorporated into the Work with necessary and judicious field trim and field joint allowances.
- 4.6. Conduct all work at the GNPCC site in accordance with RDN policies and procedures, City of Nanaimo bylaws, the BC Occupational Health and Safety Regulation and other applicable provincial and federal regulations, including but not limited to:
 - 4.6.1. Prime Contractor responsibilities;
 - 4.6.2. Asbestos control procedures;
 - 4.6.3. Personal protective clothing and equipment procedures;
 - 4.6.4. Confined space entry procedures to address gas and other hazards;
 - 4.6.5. Fall protection procedures;
 - 4.6.6. Ladders, scaffolds and temporary work platforms procedures;
 - 4.6.7. Cranes and hoists procedures;
 - 4.6.8. Rigging procedures;
 - 4.6.9. RDN Wastewater Services Environmental Management System contractor-supplier package;
 - 4.6.10. Canadian Electrical Code (CSA C22.1-2018) and any directives issued by Technical Safety BC.
- 4.7. Clean up all debris on a daily basis and leave the job site in a clean manner, prior to leaving the site.

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- 4.8. To the extent practicable, allowing for ongoing operation of GNPCC, secure the job site from unauthorized access by others and take precautions to prevent the Work from impacting on others in the vicinity of the job site.
- 4.9. RDN will provide a 100 amp breaker tie-in for the contractor available. It is the contractor responsibility to provide cabling and kiosk(s) as required. (RDN can only provide limited 110VAC single phase power). Any other temporary power supply shall be quiet and not require hearing protection to operate.
- 4.10. Provide all temporary crew facilities required for the Work, including but not limited to washroom, lunchroom, storage, scaffolding and tool crib.
- 4.11. Provide potable water for use by the Contractor's crew.
- 4.12. Coordinate the Work with RDN Operations and other contractors, who will be working, in parallel, sometimes in and about the job site, during the construction period.
- 4.13. Protect existing and vulnerable tank appurtenances from damage during the course of the Work. This includes, but is not limited to, the No. 1 grit tank floor pressure relief, the grit tank aeration header flapper valves, wooden tank baffles, and miscellaneous steel and plastic piping.
- 4.14. Where required by the Work, remove structural supports from the tanks and provide temporary supports for associated mechanical, piping, electrical or instrumentation items, or remove such items and set aside for later reinstallation by Contractor. Any required removal shall be communicated to the RDN.
- 4.15. Provide ongoing dewatering in the tanks, using pumps and/or other measures, to control construction water and process water leaks, and dispose of these water streams into adjacent tanks identified by RDN Operations.
- 4.16. Unless directed otherwise in detail sections below, dispose of all construction related obsolete material and debris, including but not limited to demolished concrete and old mechanism components baffles. Such disposal shall be completed quickly and in accordance with all applicable government regulations. Unless otherwise approved in writing by RDN, disposal shall only be performed at licensed facilities.
- 4.17. Provide red-lined project Drawings indicating as-built details, for preparation of record drawings by the RDN's Professional Engineer or Others.

5. Required Submittals

The following are anticipated submittals to be provided to the RDN a minimum of 4 weeks in advance of mobilization to site, unless otherwise noted below. RDN to review and approve all submittals.

- 5.1. Schedule submittals (see below)
 - 5.1.1. Project schedule with sufficient detail and breakdown of core project activities. Maintained throughout the project, and updated when work activities are shifted;

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- 5.2. Safety submittals (see below);
 - 5.2.1. Construction Safety Management Plan – outlining how hazards will be addressed to meet the requirements of the BC OH&S Regulation;
 - 5.2.2. Historically, Sed Tank 1 does not require a 9.22 Alternate Isolation Application. Grit Tank 1 should be assumed to require a 9.22 application. As part of this project it is required to notify Worksafe BC of the upcoming project, and give them the opportunity to review applicable procedures (CSEP, CSHA, 9.22 etc.), a **minimum 4 weeks in advance of mobilization to site.**
 - 5.2.3. Confined Space Entry Procedures (CSEP) and Confined Space Hazard Assessments (CSHA) as required for the work.
 - 5.2.4. Safety Data Sheets (SDS) and Material data sheets (MSDS) for all controlled products used in the Work.
 - 5.2.5. Upon request from RDN, immediately provide copies of all job-related safety documentation, including but not limited to field level hazard assessments, minutes of safety tailboard meetings, first aid/medical records and incident investigation records.
- 5.3. The following Work Procedures, shall be provided a minimum of 4 weeks days prior to commencement of said work activities:
 - 5.3.1. Center walkway column repair procedure due to removal of HSS scum line.
 - 5.3.2. All submittals specified in the Concrete Repair Specification (SP-S-0005 Rev2).
- 5.4. A drawing and/or map identifying each concrete repair patch with a unique identifier.
- 5.5. A sample concrete repair Quality Control Certificate shall be provided to the RDN 4 weeks before the start of work. The sheets shall be maintained throughout the project per repair patch. This submittal records work performed on each repair patch, including but not limited to the following information as part of the QA/QC process. See SP-S-0005 Rev2 appendices for an example (which will need to be modified based on the contractors products and methodology).
 - 5.5.1. Concrete demo depth;
 - 5.5.2. Concrete repair products;
 - 5.5.3. QA/QC undertaken and results (pH, compressive tests, tensile tests). Testing is not the responsibility of the contractor, but coordination and summarizing of results in this submittal is.
 - 5.5.4. Hold Points w/ appropriate signoffs
- 5.6. Confirmation of warranty for concrete work for a minimum of 1 year. Warranty to cover products as well as workmanship for replacement if required.

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5.7. For general mechanism install and layout, the following hold points and respective submissions will be expected to confirm layout of mechanism and concrete repair locations:

- 5.7.1. Pre-drill redlines – Contractor to provide redline/highlight OEM/Brentwood/Polychem drawings to confirm critical tank measurements (clearances, etc.). This will coincide with physical paint marking inside the tank to mark attachment locations, and concrete repair areas.
- 5.7.2. Installed record drawings – Contractor to provide redlines for record drawings of installed mechanism.

6. **Included in the Work – Safety/Preparation**

In addition to the general safety items in section 4.0 above, the Work safety scope shall include the following significant items:

- 6.1. Assume the responsibilities of Prime Contractor.
- 6.2. Clean out wastewater, grit, sludge and all other debris remaining in the tank sumps, after general cleanout of tanks by RDN, using vacuum truck or other suitable means.
- 6.3. If required, clean-out of any minor wastewater/grit/sludge build-up not removed during RDN pre-work cleanout.
- 6.4. Provide all necessary confined space entry equipment, documentation and trained personnel, including but not limited to permits, standby watch, fall protection, gas testing and ventilation.
- 6.5. Ensure that all safety procedures employed in the Work take into account all applicable sub-tasks, and their impact on the surrounding working environment.
- 6.6. Hold daily safety tailgate meetings to ensure all personnel involved in the Work are updated with respect to all known job hazards.
- 6.7. Provide trained first aid personnel and equipment, commensurate with construction crew size.

7. **Not Included in the Work – Safety/Preparation**

- 7.1. Draining of tanks.
- 7.2. Provision and implementation of multi-point, dual sign-off lockout/isolation procedures, meeting BC OH&S Regulation section 10.9, for all tanks, including supply of all necessary blanks, blinds and gates, and all necessary electrical/MCC lockout (by RDN).
- 7.3. Provision of group lockout boxes, for Contractor use, for the above multi-point lockout/isolation procedures for all tanks (by RDN).

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8. **Not Included in the Work – Design**

- 8.1. Engineering and drafting for the new tank collector mechanisms and drives (by OEM/Brentwood/Polychem).
- 8.2. Engineering and drafting for new reinforced concrete collector shaft support corbels for the grit and sedimentation tanks, in conformance with the OEM/Brentwood/Polychem drawings (by RDN's consultant).
- 8.3. No engineering of shoring is anticipated on the concrete walls. A structural assessment was completed on the walls which limits the depth of demolition. If demolition is required or performed beyond these limitations, the contractor must hold and a new structural assessment shall be performed before any further work.

9. **Included in the Work – Mechanisms and Structural**

In addition to the general items in section 4.0 above, the mechanical and structural Work scope shall generally consist of, but not be limited to the following:

9.1. **Sedimentation Tank 1:**

- 9.1.1. Remove and dispose of existing tank collector mechanisms, rails, upper plastic wear strips and supports/anchors;
- 9.1.2. Install new collector mechanisms and wear strips, as outlined in the Contract Documents, but do not grout until OEM/Brentwood/Polychem technician completes inspection and checkout.
- 9.1.3. Remove existing drive and supports/anchors. Set aside drive reducers for RDN salvage. Dispose of all other drive components.
- 9.1.4. Repair/level and make good foundation concrete surface beneath and around new sedimentation tank drives, as outlined in the Specifications (SP-S-0005 Rev2).
- 9.1.5. Demolish any existing tank drive pads and/or grout down to foundation concrete, as indicated on the OEM/Brentwood/Polychem Drawings.
- 9.1.6. Install new tank collector drives and motors, including instrument support brackets, as outlined in the Contract Documents, but do not grout until OEM/Brentwood/Polychem technician completes mechanical inspection and checkout.
- 9.1.7. Demolish existing tank collector concrete corbels as indicated on the Drawings.
- 9.1.8. Supply/install new sedimentation tank collector concrete corbels as shown on the Drawings and indicated in the Specifications.
- 9.1.9. Grind down as required the two longitudinal and two cross collector T-rails that run the length of the tank in accordance with the OEM/Brentwood/Polychem Drawings.

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- 9.1.10. Remove existing sedimentation tank collector tail shaft concrete screeds (radiused section of concrete) down to existing floor/wall. Refer to OEM/Brentwood/Polychem Drawings.
- 9.1.11. Supply/install new sedimentation tank tail shaft concrete screeds (radiused section of concrete) as shown on the OEM/Brentwood/Polychem Drawings, using suitable materials as indicated in the Specifications (SP-S-0005 Rev1).
- 9.1.12. Remove and dispose of obsolete 150 mm (6 in) x 200 mm (8 in) carbon steel HSS scum line in center of each sedimentation tank, including complete removal of the outer 75 mm (3 in) of embedded metal inside columns and walls or as approved in the column repair procedure.
- 9.1.13. Prepare and plug voids in sedimentation tank columns and walls, resulting from removal of the obsolete 150 mm (6 in) x 200 mm (8 in) carbon steel HSS scum lines, using form and pour concrete as outlined in the Specifications (SP-S-0005 Rev2).
- 9.1.14. Remove and dispose of miscellaneous small, obsolete brackets, grease nipples and unused anchors shown on the inspection photos in the Contract Documents but not mentioned above. The RDN's Engineer, or delegate, shall mark all such demolition items with high visibility paint or other means.
- 9.1.15. Perform any measures, as outlined in the Specifications (SP-S-0005 Rev2), to control moisture weeping in through the grit tank walls that may impact the work.
- 9.1.16. Once OEM/Brentwood/Polychem technician completes, and passes, mechanical inspection and checkout, grout sedimentation tank collector mechanisms, brackets and drives, as outlined in the Contract Documents.
- 9.1.17. Replace corroded fasteners and hardware for the weir box at the North end of Sedimentation Tank 1 w/ stainless equivalents. This includes the fasteners holding the weir boxes together, as well as the brackets attaching the weir box to the sides of the Sedimentation tank, which will require new brackets.
- 9.1.18. Demolition and replacement of 3in water piping running along centre walkway and along North side of tank with stainless steel. (see Appendix M);

9.2. Grit Tank 1:

- 9.2.1. Remove and dispose of existing collector mechanisms and supports/anchor;
- 9.2.2. Install new collector mechanisms and wear strips, as outlined in the Contract Documents, but do not grout until OEM/Brentwood/Polychem technician completes inspection and checkout.
- 9.2.3. Remove existing cover plate in the Grit Tank 1 trench. This was a wear plate that was installed for wear purposes and is believed to be plug welded to inserts in the concrete floor. See Appendix K.

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- 9.2.4. Remove existing drive and supports/anchors. Set aside drive reducers for RDN salvage. Dispose of all other drive components.
- 9.2.5. Repair/level and make good foundation concrete surface beneath and around new sedimentation tank drives, as outlined in the Specifications (SP-S-0005 Rev1).
- 9.2.6. Demolish any existing tank drive pads and/or grout down to foundation concrete, as indicated on the OEM/Brentwood/Polychem Drawings.
- 9.2.7. Install new tank collector drives and motors, including instrument support brackets, as outlined in the Contract Documents, but do not grout until OEM/Brentwood/Polychem technician completes mechanical inspection and checkout, as outlined in Section 19 below.
- 9.2.8. Demolish existing tank collector concrete corbels as indicated on the Drawings.
- 9.2.9. Supply/install new tank collector concrete corbels as shown on the Drawings and indicated in the Specifications.
- 9.2.10. Remove and dispose of existing metal wear strips (if present under the carbon steel plate) in the collector troughs and/or accommodate into the new wear strips (by smoothing out with weld filler or other methods) with approval by the RDN Engineer and in accordance with OEM/Brentwood/Polychem drawings and specifications.
- 9.2.11. Remove existing tank collector tail shaft concrete screeds (radiused section of concrete) down to existing floor/wall. Refer to OEM/Brentwood/Polychem Drawings.
- 9.2.12. Supply/install new tank tail shaft concrete screeds (radiused section of concrete) as shown on the OEM/Brentwood/Polychem Drawings, using suitable materials as indicated in the Specifications (SP-S-0005 Rev2).
- 9.2.13. Remove and dispose of miscellaneous small, obsolete brackets, grease nipples and unused anchors shown on the inspection photos in the Contract Documents but not mentioned above. The RDN's Engineer, or delegate, shall mark all such demolition items with high visibility paint or other means.
- 9.2.14. If required to complete other Work tasks, remove existing internal grit discharge piping and set aside for later reinstallation by Contractor.
- 9.2.15. Once OEM/Brentwood/Polychem technician completes, and passes, mechanical inspection and checkout, grout collector mechanisms, brackets and drives, as outlined in the Contract Documents.
- 9.2.16. Perform any measures, as outlined in the Specifications (SP-S-0005 Rev2), to control moisture weeping in through the grit tank walls that may impact the work.

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9.3. General:

- 9.3.1. Notify RDN Engineer when Mechanisms are ready for inspection by OEM 4 weeks in advance for planning purposes. This inspection is after install but before final grouting.
- 9.3.2. Notify RDN Engineer when drives are ready for instrumentation installation and cable terminations (terminations by Others).
- 9.3.3. Provide commissioning standby services as outlined in detail Section 20 below.

10. Not Included in the Work – Mechanisms and Structural

- 10.1. Supply of new collector mechanisms c/w rails/supports and new drives/motors for No's 1, 2 and 3 grit and sedimentation tanks, including fasteners, anchor bolts and adhesive, as outlined in the OEM/Brentwood/Polychem Equipment Submittal (by RDN).
- 10.2. Supply of a trained OEM/Brentwood/Polychem field technician to perform inspection, checkout and commissioning assistance, as outlined in Section 19 below (by RDN).

11. Included in the Work – Electrical and Instrumentation

Electrical and instrumentation work scope for this project, including but not limited to disconnection and reconnection of drives, is by Others, except as noted below. The Contractor shall cooperate and coordinate with the RDN's electrical and instrumentation contractor to accomplish the complete equipment installation outlined in the Contract Documents.

- 11.1. Mount electric motors (pre-attached to gear reducers) as indicated on the OEM/Brentwood/Polychem Drawings.
- 11.2. Install drive limit switch mounting brackets as noted in this Description of Work and as shown on the OEM/Brentwood/Polychem Drawings.

12. Not Included in the Work – Electrical and Instrumentation

- 12.1. Supply of new drive motors (by RDN; pre-attached to gear reducers).
- 12.2. Supply of drive limit switches and mounting brackets (by RDN/mechanism OEM).
- 12.3. Supply/installation of all electrical scope of the Work not listed in Section 12 above (by Others).
- 12.4. Supply/installation of all instrumentation scope of the Work not listed in Section 12 above (by Others).

13. Project Schedule and Progress Monitoring

- 13.1. Within 14 days from RDN Notice of Intention to Award, the Contractor shall submit, for RDN for review and approval, a detailed project schedule, covering both off-site preparation and on-site work. The schedule resolution shall be 1 day or less, with each materially separable task broken out, with granularity as in this Description of Work, or finer.

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- 13.2. Please refer to the RDN 2027 Overview Project Schedule provided in the RFP documents for general schedule information to be observed in the Contractor's detailed Work schedule.
- 13.3. The Grit Tanks are the bottleneck in terms of the equipment in the Scope of Work. It is preferred to prioritize completion of work in Grit Tank 1 in case the project incurs delays.
- 13.4. All Owner-supplied materials for the Work are expected to be available to the Contractor for examination and use, at the GNPCC, following project award.
- 13.5. In general, all shutdown Work must be completed in the window between early May, 2027 and early Sept, 2027. RDN reserves the right to adjust this window, if required due to environmental conditions (unusual rain, etc.).
- 13.6. Requests for extension of the project schedule shall only be granted by RDN if the weather is expected to remain dry and wastewater flows to GNPCC are expected to remain low.
- 13.7. Contractor shall allow for the following progress update meetings while the site Work is underway:
 - 13.7.1. Daily field meetings – up to 30 minutes – Between Contractor site supervisor, sub-contractor foremen, RDN Engineer (or delegate) and any other applicable site personnel;
 - 13.7.2. Biweekly site meetings– up to 1 hour – Between Contractor site supervisor, sub-contractor foremen, RDN Project Engineer, RDN Engineer (or delegate), RDN Operations/Maintenance personnel and any other applicable site personnel.

14. **Safety Planning Information**

- 14.1. No's 1, 2 and 3 grit and primary sedimentation tanks are listed confined spaces in RDN GNPCC's safety procedures, and the RDN maintains formal multi-point LOTO (lockout/tagout) procedures for all of these tanks.
- 14.2. Constant ventilation shall be a requirement for the work and shall be reflected in the generated procedures by the contractor.
- 14.3. The RDN maintains current engineering certifications for all slide gates used to isolate the GNPCC grit and primary sedimentation tanks.
- 14.4. The RDN maintains current engineering certifications for any valves that must be relied on for isolation purposes.
- 14.5. The following extraordinary job site hazards are known to exist at RDN's GNPCC and/or the Work area:
 - 14.5.1. *Municipal wastewater/septage* – This is a biohazard with potential risk of exposure to pathogens and other toxic materials, including but not limited to bacteria, viruses, parasites and funguses, as well as "sharps" (needles) and other sharp debris;

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- 14.5.2. *Hydrogen Sulphide* – This is a combustible and toxic gas that results from the decomposition of organic matter in wastewater, and smells like rotten eggs;
- 14.5.3. *Methane* – This is an odorless, combustible gas that also results from the decomposition of organic matter in wastewater can act as an asphyxiant. At GNPCC methane is typically found around the sludge handling, digestion, power generation and flaring equipment;
- 14.5.4. *Carbon dioxide* – This is a substantially odorless, non-combustible gas that also results from the decomposition of organic matter in wastewater can act as an asphyxiant;
- 14.5.5. *Asbestos* – The sealant in the grit and sedimentation tank concrete expansion joints is known to contain asbestos, which can cause asbestosis, among other conditions, and is a known carcinogen;
- 14.5.6. *Lead* – The paint on the sedimentation tank effluent discharge channels (weir boxes) is known to contain lead, a known toxin.

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15. Tank Concrete Spot Repair

15.1. The locations of spot repair are:

15.1.1. **Sed Tank 1 and Grit Tank 1** - Concrete at each and every collector mechanism attachment point. The spot repair area shall extend 300 mm (12 in) from the perimeter of the attachment fixture (bracket, bearing, spindle or other). Unless otherwise approved by the Engineer, the repair depth shall be 25 mm (1 in) +/- 6 mm (0.25 in). The collector trench in Grit Tank 1 will also require repair throughout the bottom of the tank underneath the carbon steel plate.

15.1.2. **Sed Tank 1** - The voids created by the removal of the T-rails. depth of concrete repair from the rails varies, but is typically 1" deep, and 2-1/2" wide, with localized deeper areas.

15.1.3. **Obsolete attachment locations** – Where old anchor hardware is removed (hilti's, etc.) it shall be required to repair a 4inx4in area, with repair requirements described below and in the specification.

15.2. All locations for spot repair shall be laid out on the tank walls with paint or other means prior to concrete demolition. **Spot repair locations require coordination with mechanism install contractor for consideration of location, and size of appurtenance.**

15.3. In general, the concrete repair depth shall be 25 mm (1 in.) +/- 6 mm (0.25 in.). Concrete repair depth shall be sufficient to reach sound concrete to apply new concrete products. If required repair depth exceeds the values specified in the Herold Engineering Report (Appendix N), work must be paused until shoring design is complete (by others) or with approval by the RDN. Typically, these limits are 1 – ¼" for the lower 16" of the tank, and 2" for the remainder. It is not expected to require deeper depth.

15.4. Contractor shall create a map of all repair locations with identifying tags for each repair patch. See submittal section.

15.5. Where the repair area meets unrepaired concrete, the repair shall be terminated by a reglet (for flat surfaces) and/or by a cove/fabric overlap (for corners). Terminations at corners require full concrete repair to the extents of the fabric overlap (refer to the specification below for details)

15.6. A Pre-Work Concrete Assessment (per SP-S-0005 Rev.2) has already been completed by Metro Testing for all tanks, and is not required to be completed by the Contractor.

15.7. Contractor shall deliver submittals to RDN for review and approval/acceptance, *well in advance of construction*, as indicated in SP-S-0005 Rev.2.

15.8. Contractor shall create sufficient measurement datum points in and/or around the tank to facilitate the accurate recreation of the original tank inside dimensions and features. In general, the recreated features must be within a total point to point dimensional tolerance of 6 mm (0.25 in"), or an absolute location tolerance of +/- 3 mm (0.125 in). Details of the

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Contractor's plan for dimensional control shall be included on the Work procedures submittal.

- 15.9. Contractor shall employ formwork or other means to recreate critical hard faces, columns, corbels, edges, joints, slots or other features required to mate to equipment, ports, troughs, gates or other structural or mechanical items and in general maintain design functionality of the tank. Details of the Contractor's plan for recreation of critical hard faces shall be included on the Work procedures submittal.
- 15.10. For the benefit of RDN and the Contractor, RDN will retain a testing firm to complete testing and field inspections as outlined in SP-S-0005 Rev.2. Unless otherwise specified, these tests and inspections shall be arranged and coordinated by the Contractor. The contractor shall summarize these tests in a tabulated document, see submittal section.
- 15.11. The Contractor shall closely monitor the Work, follow the approved Inspection and Testing Plan (ITP) and prepare/submit quality control certificates as indicated in SP-S-0005 Rev.2.
- 15.12. Sed Tank 1 may require temporary removal of the flights to properly access the T-rail concrete repair. This and the reconnection of the flights in the same location will be the responsibility of the contractor. Reconnection shall be as per the OEM/Brentwood/Polychem installation requirements.
- 15.13. It is not anticipated to require to replace asbestos joints when performing concrete repair. If joints are disturbed by the contractor, asbestos safety measures must be taken by the contractor.

16. **Collector Mechanism and Drive Installation**

- 16.1. Install tank collector mechanisms and drives in accordance with OEM/Brentwood/Polychem Standard Installation Guidelines.
- 16.2. Contractor shall pay special attention/adhere to the pre-installation layout procedure indicated in the OEM/Brentwood/Polychem Standard Installation Guidelines. *For risk management purposes, the Contractor is encouraged to retain the services of an OEM/Brentwood/Polychem field technician to supervise the layout step of installation and, unless personnel with previous applicable experience are employed by the Contractor, provide equipment installation training. To set this up, the Contractor may contact Bryan Schuster, Brentwood Project Planning Manager tel: 610-347-8868 or email: bryan.schuster@brentwoodindustries.com (refer to Brentwood job WGZ0067000).*
- 16.3. As part of the pre-installation procedure, contractor to confirm critical tank dimensions. Examples of such are tank floor level (East/West and North/South), flight clearance tolerance, etc.
- 16.4. Contractor shall establish maximum water level reference elevation marks at a number of locations around the tanks, for use by installation crews during layout and installation of equipment. Reference dimensions, to top of deck (TOD) or other existing features, noted

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on the OEM/Brentwood/Polychem Drawings, shall not be relied on for accurate location of equipment.

- 16.5. After concrete repairs (if applicable) have sufficiently cured, install anchor bolts supplied by the OEM/Brentwood/Polychem, using a percussion drill and taking precautions to prevent damage to concrete as indicated on the Drawings. If reinforcing steel is encountered during drilling, use alternate equipment mounting holes where provided or otherwise field adjust as directed by the RDN's Engineer – *do not core drill or otherwise cut reinforcing steel without prior written approval from the RDN's Engineer.*
- 16.6. If reinforcing steel is encountered during drilling for anchor bolts, the resulting vacant holes must be filled, using an appropriate concrete repair product as indicated in the Specifications. Carefully insert and tamp repair product to ensure complete filling of holes.
- 16.7. Take measures to avoid *excess wastage* of anchor bolt adhesive provided by the OEM/Brentwood/Polychem, including but not limited to careful installation sequencing and supplying additional adhesive mixing nozzles. Unless approved in writing by the RDN's Engineer, supply of extra adhesive, beyond what is provided in the OEM/Brentwood/Polychem equipment package, is the responsibility of the Contractor.
- 16.8. Where specified in the Contract Documents, Contractor supplied shims used for mounting bearings or other drive components shall be made from 316 stainless steel.
- 16.9. Equipment shall not be grouted until inspected, checked out and passed by the OEM/Brentwood/Polychem field technician.

17. **Grouting**

- 17.1. Equipment baseplates, supports and bearing blocks shall be grouted as indicated on the Drawings, using non-shrink hydraulic cement grout. Grout shall be formed and poured or dry-packed, to best suit the installation circumstance.
- 17.2. Unless otherwise approved in writing by the RDN's Engineer, BASF Masterflow 928 grout shall be used for the Work.
- 17.3. Where approved by the RDN's Engineer, alternate grout with the following minimum strengths may be used for the Work:
 - 17.3.1. 25 MPa at one day;
 - 17.3.2. 30 MPa at three days;
 - 17.3.3. 52 MPa at 28 days.
- 17.4. Submission of the following grout related submittals to RDN, for acceptance, is required well in advance of any field Work:
 - 17.4.1. Manufacturer's product data sheets;
 - 17.4.2. Grout placement plan, including forming method if applicable, for each individual grout placement, or group of similar placements;

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- 17.4.3. Foundation concrete moistening plan;
- 17.4.4. Grout curing plan.
- 17.5. Store and handle grout in accordance with manufacturer's instructions, taking special care to avoid contact with water/humidity before use.
- 17.6. Mix, place and cure non-shrink grout in exact accordance with manufacturer's instructions, maintaining a detailed log to demonstrate compliance. Present log to RDN for inspection, if requested, at any time during the Work.
- 17.7. Where the specified grout thickness exceeds the manufacturer's limit for neat product, extend grout with clean aggregate, as per manufacturer's instructions.
- 17.8. Thoroughly clean foundation concrete surface and metal surfaces to be in contact with grout to remove all paint, oil, grease, loose rust, and all other foreign matter.
- 17.9. Before placing grout, prepare foundation concrete surface using abrasive blasting, chipping, or by other mechanical means to roughen concrete and remove any soft material.
- 17.10. Set machinery in position and wedge to elevation with steel wedges, use stainless steel shims or use cast-in leveling bolts, as indicated on the Drawings. Where applicable, remove any wedges after grout is set and pack void with grout.
- 17.11. Any forms used shall be substantially watertight, and at least 50 mm higher than bottom of plate, to ensure penetration of grout beneath the plate.
- 17.12. Chamfer all exposed corners of grout pads.
- 17.13. Ensure the surface of the foundation concrete is moist, but with no standing water (saturated, surface dry), immediately in advance of grout placement. Contractor shall soak foundation concrete with water for a minimum of 24 hours before grout placement.
- 17.14. Fill space between bottom of machinery base and foundation concrete with grout, in accordance with the Drawings.
- 17.15. If grout cannot be easily placed from one edge and flowed to the opposite edge, due to the large size of the machinery baseplate, air vents shall be provided through the plate to prevent air entrapment. Where not provided by the OEM, the Contractor is responsible for providing any required air vents.
- 17.16. For the benefit of the RDN, and the Contractor, the RDN will retain a testing firm to complete compressive testing of the grout used in the Work, to CSA A23.2. The Contractor shall coordinate this testing in parallel with the Work, directing the testing firm to cast 9 grout cubes, for testing at 3, 7 and 28 days, for each cubic meter of grout used.
- 17.17. Failure of any 7 or 28 day grout compressive tests shall require the Contractor to replace all grout placed for the Work, at no cost to the RDN.
- 17.18. Submission of the following, dated/timed Contractor field logs to RDN, for record, is required upon completion of the Work:

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- 17.18.1. Grout batch number/expiry date for each bag of grout used;
- 17.18.2. Water/grout mixing proportions for every batch mixed;
- 17.18.3. Aggregate extension details, if applicable;
- 17.18.4. Mixing/setting times for every batch mixed;
- 17.18.5. Identify placement location for all above log items.

18. Miscellaneous Carbon Steel Painting

- 18.1. Not applicable.

19. Equipment Inspection/Checkout and Commissioning

- 19.1. RDN shall retain, for its own benefit and the benefit of the Contractor, an OEM/Brentwood/Polychem technical representative to:
 - 19.1.1. Complete mechanical inspection/checkout of collector mechanisms and drives installation before/after final Contractor bolting/grouting of anchored mechanism and drive components. The OEM technical representative will be on site for 3 days, starting on a Monday, immediately in advance of commissioning, to complete the equipment inspection/checkout. The technical representative will provide a punch-list of installation items to resolve and/or a certificate of proper installation. All grouting must be completed by end of the last day of installation/checkout (forms may be placed in advance of inspection/checkout);
 - 19.1.2. Supervise commissioning of the equipment. The OEM technical representative will be on site for 1 day, starting on the Friday immediately following inspection/checkout, to ensure the equipment is functioning according to its design criteria.
- 19.2. Electrical and instrumentation equipment inspection and checkout shall be completed by Others, upon/near substantial completion of the Work. The Contractor shall allow these Others free and clear access to perform EI inspection and checkout as needed.
- 19.3. The Contractor shall take all measures required to substantially complete the Work tasks and allow all inspection/checkout to proceed without delay. Costs for inspection/checkout and commissioning delay, due to Contractor's failure to substantially complete the Work, in accordance with the Drawings, Specifications and Supplemental Documentation, shall be borne by the Contractor.
- 19.4. Work tasks to be completed before inspection/checkout include, but are not limited to:
 - 19.4.1. Completion of all refit repair/preparation work and equipment installation outlined in this Description of Work, except for equipment grouting;
 - 19.4.2. Cleanout and removal of all construction related debris from inside the tank(s);
 - 19.4.3. Removal of all Contractor's equipment and any surplus material from inside the tank(s);

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- 19.4.4. Removal of work platforms and scaffolds not required for final equipment grouting.
- 19.5. Removal of all tank access ladders, stairs or scaffolds shall be completed after inspection/checkout and before commissioning.
- 19.6. During inspection/checkout, the Contractor shall provide all resources required to complete all remaining, incomplete Work tasks required to commission the equipment.
- 19.7. Commissioning shall not begin unless the equipment grout has cured for at least 24 hours.
- 19.8. During commissioning, the Contractor shall provide 1 millwright, 1 welder and 1 foreman on dayshift standby, to resolve any equipment commissioning issues that may come up.
- 19.9. Commissioning shall be led by RDN and supported by the Contractor, and the RDN's electrical and instrumentation contractor, as required.