REGIONAL DISTRICT OF NANAIMO

REQUEST FOR PROPOSALS No. 22-034

GNPCC Grit and Primary Sedimentation Tanks Mechanism Supply

Addendum 2
Issued: May 9, 2022

Closing Date & Time: on or before 3:00 PM Pacific Time on May 19, 2022

This addendum shall be read in conjunction with and considered as an integral part of the Request for Proposal. Revisions supersede the information contained in the original Proposal or previously issued Addendum. No consideration will be allowed for any extras due to any Proponent not being familiar with the contents of this Addendum. All other terms and conditions remain the same.

1. Proponents are advised that RFP 22-034 Grit and Sedimentation Tanks Mechanism Purchase Specification Revision 0 has been superseded by attached Grit and Sedimentation Tanks Mechanism Purchase Specification Revision 1. Changes are highlighted in yellow.

End of Addendum 2

Note: Revision 1 changes highlighted in yellow.

1. TECHNICAL

Technical specifications for RFP 22-034 are outlined below.

1.1. Scope of Supply

The scope of supply is the design (including field measurement), material and equipment procurement, manufacture, documentation and delivery of three complete grit tank mechanisms and three complete primary sedimentation tank mechanisms, summarized as follows.

1.1.1. Grit Tanks 1, 2 and 3 Cross Collectors

- Primary drive reducer and motor;
- Chain drive sprockets, drive chain and tensioner;
- Drive motion sensor(s);
- Torque overload sensor(s);
- Head shaft(s), bearings, sprockets and support brackets;
- Tail shaft(s), bearings, sprockets and support brackets;
- Idler shaft(s), bearings, sprockets and support brackets;
- Cross collector chains;
- Cross collector flights, filler blocks and wear shoes;
- Trough bottom wear strips;
- All required supports and attachment hardware;
- Detailed installation, operation and maintenance manuals;
- Spares, as indicated in this specification;
- Installation and commissioning monitoring by Supply Contractor's technical representative

1.1.2. Primary Sedimentation Tanks 1, 2 and 3 Longitudinal Sludge Collectors

- Primary drive reducer(s) and motor(s);
- Chain drive sprockets, drive chain and tensioner(s);
- Drive motion sensor (s);
- Torque overload sensor(s);
- Head shaft(s), bearings, sprockets and support brackets;
- Tail shaft(s), bearings, sprockets and support brackets;
- Idler shaft(s), bearings, sprockets and support brackets;
- Sludge collector chains;
- Sludge collector flights, filler blocks and wear shoes;
- Collector return rails, supports, deflector guides and wear strips;
- Tank bottom wear strips;
- All required supports and attachment hardware
- Detailed installation, operation and maintenance manuals;
- Spares, as indicated in this specification;
- Installation and commissioning monitoring by Supply Contractor's technical representative

1.1.3. Primary Sedimentation Tanks 1, 2 and 3 Cross Collectors

- Primary drive reducer and motor;
- Chain drive sprockets, drive chain and tensioner;
- Drive motion sensor(s);
- Torque overload sensor(s);
- Head shaft(s), bearings, sprockets and support brackets;
- Tail shaft(s), bearings, sprockets and support brackets;
- Idler shaft(s), bearings, sprockets and support brackets;
- Cross collector chains;
- Cross collector flights, filler blocks and wear shoes;
- Trough bottom wear strips;
- All required supports and attachment hardware;
- Detailed installation, operation and maintenance manuals;
- Spares, as indicated in this specification;
- Installation and commissioning monitoring by Supply Contractor's technical representative

1.2. Existing Plant Reference Information

The following information describes the existing plant.

1.2.1. Drawings

The following drawings, in Appendix A, depict the existing grit and primary sedimentation tanks:

Title	Reference No.	Rev	Date
Primary Sedimentation Tank 4 – G/A Plan (site)	GN-PT-C-103	A	3Dec2013
Primary Sedimentation Tank 4 – Site and Yard Piping Plan (reference markup)	GN-PT-C-403	A	3Dec2013
Aerated Grit Tanks P&ID	P-203	1	1Mar2017
Primary Sedimentation Tank 1 P&ID	P-301	1	1Mar2017
Primary Sedimentation Tank 2 P&ID	P-302	1	1Mar2017
Primary Sedimentation Tank 3 P&ID	P-303	1	1Mar2017
Primary Sedimentation Tank 4 P&ID	P-304	1	1Mar2017
Grit tanks mechanical plan and section	69-7-2 sht M21	A	1Sep1973
Sedimentation tanks mechanical plan and section	69-7-2 sht M24	A	1Sep1973
Grit & sedimentation tanks – concrete outline plan	69-7-2 sht S17	A	1Sep1973
Grit & sedimentation tanks – concrete outline plan	69-7-2 sht S18	A	1Sep1973
Sedimentation tanks – concrete outline plan	69-7-2 sht S19	A	1Sep1973
Grit & sed tanks – concrete outline sections	69-7-2 sht S20	A	1Sep1973

Title Cont'd	Reference No.	Rev	Date
Grit & sed tanks – concrete outline sections	n/a sht S21	A	1Sep1973
Grit & sed tanks – concrete outline sections	69-7 sht S22	A	1Sep1973
Grit tank 3 details – plan and sections	122-78-4 sht 3	A	4Jul1989
Grit tank 3 details – plan and sections	122-72-4 sht 4	A	4Jul1989
Grit tank 3 details – plan	122-72-4 sht 6	A	4Jul1989

1.2.2. Photos

Please refer to Appendix B for photos of the existing 1, 2 and 3 grit tanks and 1, 2, 3 and 4 primary sedimentation tanks.

1.2.3. Reference Equipment Numbers

The following equipment numbers apply to the existing and proposed new equipment. New equipment provided under this RFP shall be durably labelled/tagged with these numbers, as applicable:

Equipment	Equipment No.
No. 1 Grit Tank	T-111
No. 1 Grit Tank Cross Collector Drive	GC-111
No. 2 Grit Tank	T-112
No. 2 Grit Tank Cross Collector Drive	GC-112
No. 3 Grit Tank	T-113
No. 3 Grit Tank Cross Collector Drive	GC-113
No. 1 Primary Sedimentation Tank	T-211
No. 1 Primary Sedimentation Tank Sludge Collector Drive A	SC-211A
No. 1 Primary Sedimentation Tank Sludge Collector Drive B	SC-211B
No. 1 Primary Sedimentation Tank Cross Collector Drive	SC-211C
No. 2 Primary Sedimentation Tank	T-212
No. 2 Primary Sedimentation Tank Sludge Collector Drive A	SC-212A
No. 2 Primary Sedimentation Tank Sludge Collector Drive B	SC-212B

Equipment Cont'd	**Equipment No.**
No. 2 Primary Sedimentation Tank Cross Collector Drive	SC-212C
No. 3 Primary Sedimentation Tank	T-213
No. 3 Primary Sedimentation Tank Sludge Collector Drive A	SC-213A
No. 3 Primary Sedimentation Tank Sludge Collector Drive B	SC-213B
No. 3 Primary Sedimentation Tank Cross Collector Drive	SC-213C

1.2.4. Existing Grit Tank Drives

The existing No's 1, 2 and 3 grit tank drive specifications are as follows:

Motor (same all tanks)	
HP	0.5
RPM	1725
Frame	56C
Power	575VAC/3ph/60Hz
Reducer (same all tanks)	
MFR	Winsmith
Type	Double reduction worm
Model	9MCTD
Part numbers	B396140X0TV (#1 & #3), B396-140A-1 (#1)
Ratio	3000:1
Output torque	8864
Service factor	1

Replacement of the grit tank primary drives in kind is acceptable to RDN if there is no incentive to modernize.

1.2.5. Existing Primary Sedimentation Tank Drives

The existing primary sedimentation tank drive specifications are as follows:

No. 1 Sedimentation Tank	
Motor	
HP	1
RPM	1725
Frame	H56H
Power	575VAC/3ph/60Hz
Reducer	
MFR	Falk
Type	Enclosed gear drive
Model	3KRZ5-21A3
M.O.	7-431099
Ratio	1494.5 / 662.5:1
Output torque	22,550 lb-in
Service factor	n/a

No. 2 Sedimentation Tank	
Motor	
HP	1.5
RPM	1760
Frame	145T
Power	575VAC/3ph/60Hz
Reducer	
MFR	Falk
Type	Enclosed gear drive
Model	1050FZRK5AS
M.O.	97-039434-01
Ratio	1487 / 797.6:1
Output torque	n/a
Service factor	1

No. 3 Sedimentation Tank	
Motor	
HP	1.5
RPM	1760
Frame	145T
Power	575VAC/3ph/60Hz
Reducer	
MFR	Falk
Type	Enclosed gear drive
Model	1050FZRK5AS
M.O.	8939500
Ratio	1487 / 797.6:1
Output torque	n/a
Service factor	n/a

No. 4 Sedimentation Tank – Cross Collector (for reference only)	
Motor	
HP	1
RPM	1765
Frame	143TC
Power	575VAC/3ph/60Hz
Reducer	
MFR	SEW Eurodrive
Type	Helical bevel gear drive
Model	KA77BR37AM145
S.O.	870043534.13.13.001
Ratio	709:1
Output torque	13,717 lb-in
Service factor	1.0

No. 4 Sedimentation Tank – Longitudinal Collector (Typ – for reference only)	
Motor	
HP	1
RPM	1765
Frame	143TC
Power	575VAC/3ph/60Hz
Reducer	
MFR	SEW Eurodrive
Type	Helical bevel gear drive
Model	KA77BR37AM143
S.O.	870043533.13.13.001
Ratio	1388:1
Output torque	13,717
Service factor	1.0

1.3. Design

Mechanism components shall be designed by a Professional Engineer and, unless otherwise approved by RDN, specified to meet the following requirements.

1.3.1. Fluid Service

Screened raw municipal sewage (SRS) – please refer to more detailed fluid design criteria in Appendix C.

1.3.2. Ambient Temperature

Grit and primary sedimentation tank mechanisms shall be capable of continuous operation in ambient temperatures ranging from -20°C to 40°C.

1.3.3. Design Lifetime

The desired design lifetime for all equipment in the scope of supply is 20 years.

1.3.4. Field Measurement

Supply Contractor shall be responsible for and complete all field measurements required to design and manufacture the Goods. Proponents shall make allowance for two trips to the Greater Nanaimo Pollution Control Center (GNPCC), on pre-planned GNPCC maintenance shutdown dates between April 1, 2022 and October 15, 2022, to complete

field measurements. The Regional District of Nanaimo (RDN) will drain, flush out and implement confined space entry procedures, meeting WorkSafe BC regulations, necessary for the Supply Contractor representative(s) to enter the tanks. Supply Contractor representative(s) shall hold a valid confined space entry training certificate.

1.3.5. Collector Flight Travel Speed

Unless approved otherwise, travel speed for all primary sedimentation tank longitudinal collector flights shall be 0.6 m/min (2 ft/min).

Unless approved otherwise, travel speed for all primary sedimentation tank cross-collector flights shall be 1.2 m/min (4 ft/min).

Unless approved otherwise, travel speed for all grit tank cross collector flights shall be 0.6 m/min (2 ft/min).

1.3.6. Mechanical Loads – Longitudinal Sludge Collector – Sedimentation Tanks

Design primary sludge collector mechanisms to withstand all installation and operating live and dead loads. Design for the following live loads applied to each flight along the tank bottom:

- 25 N/m continuous operating load
- 35 N/m maximum load (frequency of occurrence once per week)
- 50 N/m peak load (frequency of occurrence once per year)
- 75 N/m momentary peak load (frequency of occurrence once in 20 years)

1.3.7. Materials

All materials used in the scope of supply shall be new and free from defects.

Materials of construction shall meet the following general specifications:

Component	**Material Description**
Collector and cross collector chain drive sprocket	Cast Nylon-6; split construction (preferred) or cast iron with polyurethane tooth segment
Collector and cross collector chain idler sprocket and take-up sprocket	UHMW or Cast Nylon-6; solid construction or polyurethane
Spindles/stub shafts	Cast Nylon-6
Cross shafts	Fibreglass reinforced plastic (preferred) or cold rolled steel
Bearings	UHMW or Vesconite
Drive chain	Reinforced nylon resin; stainless steel pins

Component Cont'd	Material Description
Longitudinal collector and cross- collector chain	Non-metallic, reinforced nylon resin; thermoplastic polyester resin (Hitachi Maxco)
Longitudinal collector and cross collector chain pins	Pultruded fibreglass reinforced plastic rod; glass reinforced nylon, glass reinforced polyester, acetal resin or stainless steel
Collector flights	Pultruded fibreglass reinforced plastic, with UV protection, resin to suit fluid service
Collector flight filler block	Moulded polypropylene
Collector flight wear shoes (sed tanks)	Cast Nylon-6 (preferred), or UHMW polyethylene
Collector flight wear shoes (grit tanks)	Cast Nylon-6
Wear strips (sedimentation tanks)	UHMW polyethylene
Wear strips (grit tanks)	UHMW polyethylene
Collector wall bracket	Cast Nylon-6 or polypropylene /CPVC
Collector return rails and anti-flotation guides	Fibreglass reinforced plastic
Drive guards	304 stainless steel
Fasteners, bolts, nuts and washers	316 stainless steel, ASTM A193

1.3.8. Coating for Corrosion Protection

All supplied carbon steel material/equipment not inherently corrosion proof shall be painted according to RDN specification SP-S-0101 "Structural Steel Coating Specification – Indoor Wastewater Service Applications" (see Appendix D), with compatible UV resistant top coat, or other RDN approved equal coating system.

1.3.9. Electrical Supply General

Unless otherwise approved, electrical components of supply shall conform to the following requirements.

All motors shall meet the following requirements:

- 575 VAC, 3 phase, 60 Hz;
- Squirrel cage, induction type, 1.15 service factor (minimum);
- F-1 assembly;
- Severe duty, corrosion resistant TEFC enclosure, meet or exceed requirements of IEEE std. 841

- Premium Efficiency;
- Designed for inverter operation;
- Shall have anti-friction bearings that are suited to their application;
- Meet area classification requirements below;
- Utilize stainless steel nameplates with stainless steel fasteners.

All electrical equipment shall be approved for use in a Zone 2, Group IIA environment, with a maximum surface temperature of 280ºC. Equipment marked for Class 1, Div 2, Group D classified area will also be suitable.

All electrical equipment shall bear a certification mark or label of a certification body accepted in British Columbia, such as CSA or cUL.

1.3.10. Instrumentation Supply General

Unless otherwise approved, instrumentation components of supply shall conform to the following requirements.

Motion switches shall be provided on all drive sprocket hubs to provide motion monitoring of the collector mechanisms. Motion sensors shall be Siemens model 7MH7146-0HA with a Siemens model 7MH7144-1AA2 MFA4p motion alarm controller. The controller will be installed by Others in a remote location. Target(s) compatible with the motion sensor elements shall be integrated into the drive sprocket hubs. Motion sensor elements shall be provided with adjustable stainless steel mounting brackets and hardware.

Drive sprocket hubs shall be provided with a trip lug that, upon torque overload, shall contact the actuator arm of a double throw limit switch which, in turn, shall shut-off the motor and energize the alarm circuit (motor control and control system alarming by Others). Limit switches shall be Square D model 9007CR61B2 with FA1 10” stainless steel rod lever arm. All limit switches shall be provided with adjustable stainless steel mounting brackets and hardware for positioning adjacent to the overload device.

All instrumentation shall be approved for use in a Zone 2, Group IIA environment, with a maximum surface temperature of 280ºC. Equipment marked for Class 1, Div 2, Group D classified area will also be suitable. The motion alarm controllers will be installed remotely, and are not required to be rated for installation in a classified area.

All instrumentation shall bear a certification mark or label of a certification body accepted in British Columbia, such as CSA or cUL.

1.3.11. Safety

All primary/secondary drive equipment shall be guarded to meet the requirements of BC Occupational Health and Safety Regulation, Part 12 “Tools, Machinery and Equipment”.

1.3.12. Primary Drive Reducers

Provide one primary drive reducer/motor for each longitudinal collector and cross collector mechanism.

Motor attachment shall be C-flange (preferred) or foot mount with Atra-Flex coupling.

Reducers shall be helical or worm gear with anti-friction bearings, fully housed in a cast iron housing and oil lubricated with an oil level sight glass.

Reducer gears shall be designed for a minimum twenty (20) year life in accordance with AGMA Standards. Bearings shall be designed for a minimum ABFMA B10 life of 200,000 hours.

1.3.13. Bearings

Unless approved otherwise, bearings shall meet the following general specifications:

- Self aligning;
- Water lubricated while operating;
- Designed to prevent accumulation of settled solids on surfaces

1.3.14. Spindles/Stub Shafts

Unless approved otherwise, wetted collector mechanism spindles/stub shafts shall meet the following general specifications:

- Minimum nominal diameter 125 mm for cantilevered shafts/spindles;
- Minimum nominal diameter 100 mm when supporting cross shafts;
- Keyways and fitted keys for securing sprockets;
- Hold shafts in alignment with mechanical means;
- Tail and idler sprockets for grit/sludge collectors may be cantilever mounted on spindles/stub shafts fastened to the structure of the tank

1.3.15. Cross Shafts

Unless approved otherwise, wetted collector mechanism cross shafts shall meet the following general specifications:

- Minimum head shaft outer diameter 85 mm (for solid carbon steel shafts);
- Minimum idler shaft outer diameter 75 mm (for solid carbon steel shafts);
- Minimum inner and outer diameter for FRP cross shafts to be sized for peak design loading condition;
- Keyways and fitted keys for securing sprockets;
- Hold shafts in alignment with mechanical means;
- Extend longitudinal sludge collector head shafts across width of the primary sedimentation tank and support on bearings mounted on the walls of the tank;
- Extend grit/sludge cross-collector head shafts across width of the collector and support on bearings mounted on the structure (wall or other) of the collector

1.3.16. Sprockets

Unless approved otherwise, sprockets shall meet the following general specifications:

- Tooth profile shall be compatible with chain; minimum 545 mm pitch diameter and twenty- three (23) teeth;
- Shall incorporate chain saver rims and hunting tooth design;
- Headshaft sprockets shall be split construction;
- Maximum 24-hour ASTM D570 water absorption rate: 1.3%;
- Drive sprockets shall be provided with keyway and set screws and be keyed firmly to headshaft;
- Drive sprockets shall be provided with a device (such as a shear-pin) to provide for protection of the drive equipment in the event of excessive loading. Where specified, shear pins shall be provided to transmit torque from the driving hub to the sprocket shear plate with a polymeric gasket located between the shear faces to prevent seizing;
- Primary drive sprocket hubs shall be provided with a trip lug that, upon torque overload, shall contact the actuator arm of the double throw limit switch which, in turn, shall shut-off the motor and energize the alarm circuit

1.3.17. Drive Chain

Unless approved otherwise, drive chain shall meet the following general specifications:

- 66.25 mm pitch links;
- 22 mm diameter rollers;
- 11 mm diameter stainless steel pins; press fitted and held in place with a locking pin;
- Capable of disassembly and assembly in the field by removing the locking pin and connecting pin

1.3.18. Longitudinal Collector and Cross Collector Chain

Unless approved otherwise, longitudinal collector and cross collector chain shall meet the following general specifications:

- Hitachi Maxco NM-720S or RDN approved alternative;
- 150 mm pitch links;
- Maximum 24-hour ASTM D570 water absorption rate: 0.9%;
- Working load not less than 1000 kg based on strength, fatigue and wear;
- Minimum diameter of non-metallic pin: 23 mm; positive lock design;
- Minimum diameter of stainless steel pin: 19 mm;
- Integrally moulded flight attachment links; extending full depth of a flight

1.3.19. Flights

Unless approved otherwise, collector flights shall meet the following general specifications:

- 75 mm wide by 200 mm high;
- Pultruded FRP construction;
- Continuous filaments running the full length of the flight;

- All exposed surfaces shall be smooth and true to form, consistent with ASTM D4385;
- All cut ends, holes and abrasions of FRP flights shall be sealed with a compatible resin coating;
- Maximum 24-hour ASTM D570 water absorption rate: 0.5%;
- "C" channel shape with scraper lip on leading edge;
- Bolted to collector chain attachment links; provide full depth attachment with four (4) bolt array; use 9 mm diameter stainless steel bolts;
- 12 mm thick, reversible (two wearing surfaces) carry and return wear shoes; lugged return wear shoes;
- Mount primary sedimentation tank longitudinal collector flights at 3 m spacing;
- Mount primary sedimentation tank cross-collector flights at 1.5 m spacing;
- Mount grit tank cross-collector flights at 3 m spacing;
- Plastic filler blocks to permit mounting to collector chain attachment links;
- Drill and notch at the factory and band together for shipment

1.3.20. Return Rail Deflector Guides

Unless approved otherwise, return rail deflector guides shall meet the following general specifications:

- Return rail deflector guides of 75 mm by 75 mm and 9.5 mm thick FRP angle;
- Support return rail deflector guides at maximum 3 m spacing;
- Wall bracket assembly constructed of Cast Nylon-6 material or FRP; all fastening hardware type 316 stainless steel

1.3.21. Wear Strips

Unless approved otherwise, wear strips shall meet the following general specifications:

- UHMW 65 mm wide and 9.5 mm thick;
- Attached to return rails and to floor rails using Type 316 stainless steel fasteners;
- Fabricated in 3 m segments: complete with one anchoring hole and at least two slotted holes to accommodate the fasteners

1.4. Required Submittals

The following documents must be submitted to RDN for review and approval in advance of manufacturing and within 12 weeks from issue of purchase order.

1.4.1. General Arrangement Shop Drawings

Supply Contractor shall electronically submit general arrangement shop drawings, including all equipment supplied and depicting as-installed plan, elevation and section views of the equipment on existing RDN plant. Key reference and installation information/dimensions shall be included on the drawings.

The RDN will review Supply Contractor drawing submittal within two weeks. Upon RDN review and return of the drawings, the Supply Contractor shall either (a) Certify the drawings (by a Professional Engineer licensed to practice in BC) as approved, (b) revise

as noted in RDN redline markups and certify the drawings (by a Professional Engineer licensed to practice in BC) as approved or (c) revise as noted in RDN redline markups and resubmit the drawings again for another RDN review, as indicated on the returned drawings.

Electronic copies of Supply Contractor Professional Engineer certified shop drawings shall be returned to RDN for record and to support Supply Contractor claim for any applicable progress payment.

1.5. Quality Assurance and Quality Control

The successful Supply Contractor shall incorporate quality assurance and quality control measures to ensure the Goods are of the highest quality. The following requirements, and Part 3 of the RDN General Conditions of contract, shall apply to supply of the Goods.

1.5.1. Inspection and Test Plan

The successful Supply Contractor shall prepare and submit, for RDN review and approval, an inspection and test plan (ITP) for design, material and equipment procurement, manufacture, documentation and delivery of the Goods. The ITP shall be diligently followed by the Supply Contractor during the supply process.

1.5.2. Quality Assurance

The successful Supply Contractor shall employ and demonstrate written evidence of a functioning, formal quality assurance system. Preference will be given to Supply Contractors that are third party certified to ISO-9001 by an internationally accredited certification body/registrar.

1.5.3. Quality Control

The Supply Contractor's quality assurance system shall employ testing and other checks to ensure conformance of the Goods with these specifications, including but not limited to review of calculations, collection of material test certificates and performing torque or other measurements, dimensional checks and quantity checks as well as Barcol hardness, dry film thickness and other typical industry accepted tests.

1.6. Installation Manual

The successful Supply Contractor must provide the following documents, collected into an "Installation, Manual". One complete printed copy and one complete digital (pdf) copy shall be provided to the RDN no later than December 31, 2022.

1.6.1. Installation Instructions

Supply Contractor shall provide a thorough description of key equipment installation requirements using text and diagrams as appropriate.

1.6.2. General Arrangement Shop Drawings

Supply Contractor shall provide general arrangement drawings for all equipment supplied, depicting as-installed plan, elevation and section views of the equipment on existing RDN plant. Key reference and installation information/dimensions shall be included on the drawings.

1.7. Operation and Maintenance Manual

The successful Supply Contractor must provide the following documents, collected into an "Operation and Maintenance Manual". One complete printed copy and one complete digital (pdf) copy shall be provided to the RDN 2 weeks in advance of delivery of the Goods.

1.7.1. Operation Instructions

Supply Contractor shall provide a thorough description of key equipment commissioning and routine operating instructions, using text and diagrams as appropriate.

1.7.2. Maintenance Instructions

Supply Contractor shall provide a thorough description of key equipment maintenance requirements (with frequency), using text and diagrams as appropriate.

1.7.3. Parts Information

Supply Contractor shall provide a comprehensive parts list for all equipment supplied, with OEM reference numbers. A numbered parts diagram(s) shall be provided for reference.

1.7.4. Custom Parts Drawings

Supply Contractor shall provide reference drawings for any custom equipment/components in the Goods that are not off-the-shelf. These shall include key dimensions/parameters as well as material(s) of construction.

1.7.5. OEM Cut-Sheets

Supply Contractor shall provide OEM cut-sheets and/or manuals for any off-the-shelf equipment provided as part of the Goods.

1.7.6. General Arrangement Drawings

Supply Contractor shall provide general arrangement drawings for all equipment supplied, depicting as-installed plan, elevation and section views of the equipment on existing RDN plant. Key reference and installation information/dimensions shall be included on the drawings.

1.8. Spares

The following spare parts specifications apply.

1.8.1. Parts List

As outlined in section 1.7 above, Supply Contractor shall provide a comprehensive parts list for all equipment supplied, with OEM reference numbers. A numbered parts diagram(s) shall be provided for reference.

1.8.2. Spare Parts Pricing

Proposals shall include a price list for all recommended, and/or any non-standard or consumable components that are not readily available/off-the-shelf.

2. COMMERCIAL

Commercial specifications for RFP 22-034 are outlined below.

2.1. Quotation and Payment Terms

Quotation and payment terms for the Goods shall be as follows, unless agreed otherwise, in writing, by RDN.

2.1.1. Currency

All payment amounts in Supply Contractor proposals shall represent currency in Canadian dollars.

2.1.2. Taxes

Taxes, where applicable, shall be shown separately.

2.1.3. Duty

Duty, where applicable, shall be shown separately.

2.1.4. Quotation Validity

Quotations should be valid for at least 60 days from the date of RFP closing, to allow for RDN evaluation and purchase approvals.

2.1.5. Escalation

All pricing amounts quoted in proposals shall be firm for the quotation validity period, with no allowance for ***unbounded*** escalation after issue of a purchase order.

Proposals may be accepted if they contain a price adjustment clause ***bounded*** by established materials market indices (preferably government produced) substantially representing the proportion of different raw materials used in manufacture.

Where included, a price adjustment cause shall clearly lay out the price adjustment formula, including referenced indices, overall material weighting for the Goods included in the proposal and an ***evaluation date*** (e.g. return of approved shop drawings or other) for

calculation of the price adjustment, which may be positive or negative, depending on materials market fluctuations at the time of calculation.

Where a price adjustment is part of the supply contract terms, RDN reserves the right to cancel the supply contract if the price adjustment calculated at the evaluation date exceeds the project budget allowed. If the supply contract is cancelled for this reason, the RDN will pay any pre-negotiated Supply Contractor progress payments up to the evaluation date.

2.1.6. Progress Payments

The RDN accepts progress payment draws for (1) Submission of certified shop drawings, (2) Receipt of all materials required for manufacturing, (3) Shipment and (4) Delivery and acceptance at the Delivery Point. Unless alternate progress payment draws are approved in writing by RDN, these progress payment draws will be included in the Supply Agreement.

2.1.7. Payment Processing

The RDN shall pay invoices submitted to it for the Goods, within 30 days of receipt.

2.2. Delivery of Goods

Delivery of the Goods shall be as follows.

2.2.1. Incoterms

Supply Contractor pricing shall be on Incoterms 2020 delivered, duty paid (DDP) basis.

2.2.2. Delivery Schedule

Proponents shall include a draft delivery schedule with proposals, with milestone dates for key schedule items, including but not limited to issue of shop drawings, material procurement, start and end of manufacturing, shipment etc. Upon issue of a purchase order, the successful Supply Contractor shall issue a final delivery schedule to cover supply of the Goods.

2.2.3. Insurance

Supply Contractor shall provide insurance to cover the Goods as outlined in section 4.2 of the RDN General Conditions of contract.

2.2.4. Delivery Date

To meet the planned RDN installation schedule, the Goods should be delivered to the Delivery Point no later than April 30, 2023.

2.3. Shipment

The Goods shall be shipped as follows.

2.3.1. PreAssembly

Equipment shall be pre-assembled, to the degree which is practicable, with due consideration to shipping logistics.

2.3.2. Single Shipment

All of the Goods shall be delivered to RDN as a single shipment.

2.3.3. Shipping Weight

Supply Contractor shall advise RDN of the total confirmed shipping weight and weight of individual packages a minimum of 2 weeks in advance of receipt at the Delivery Point. Unless otherwise arranged with RDN, individual packages shall weigh no more than 1,850 kg.

2.3.4. Delivery Point

The Delivery Point for the Goods is as follows:

Greater Nanaimo Pollution Control Centre
4600 Hammond Bay Road (access off McGuffie Road)
Nanaimo, BC
V9T 5A8
Canada
Tel: 250-758-1157

2.3.5. Unloading at Delivery Point

The RDN shall provide a forklift to unload the Goods, suitable for the shipping weights provided by the Supply Contractor. If required, any crane unloading services must be communicated to the RDN a minimum of 4 weeks in advance of receipt at the Delivery Point.

Supply Contractor shall communicate any other critical unloading instructions to the RDN 4 weeks in advance of receipt at the Delivery Point.

2.3.6. Storage

The Supply Contractor shall provide storage instructions indicating specific requirements to ensure there is no uneven wear, distortion or weathering of components, and shall identify all other special storage requirements.

2.4. Warranty

The warranty for the Goods shall conform to section 3.4 of the RDN General Conditions of contract.

2.4.1. Warranty Period

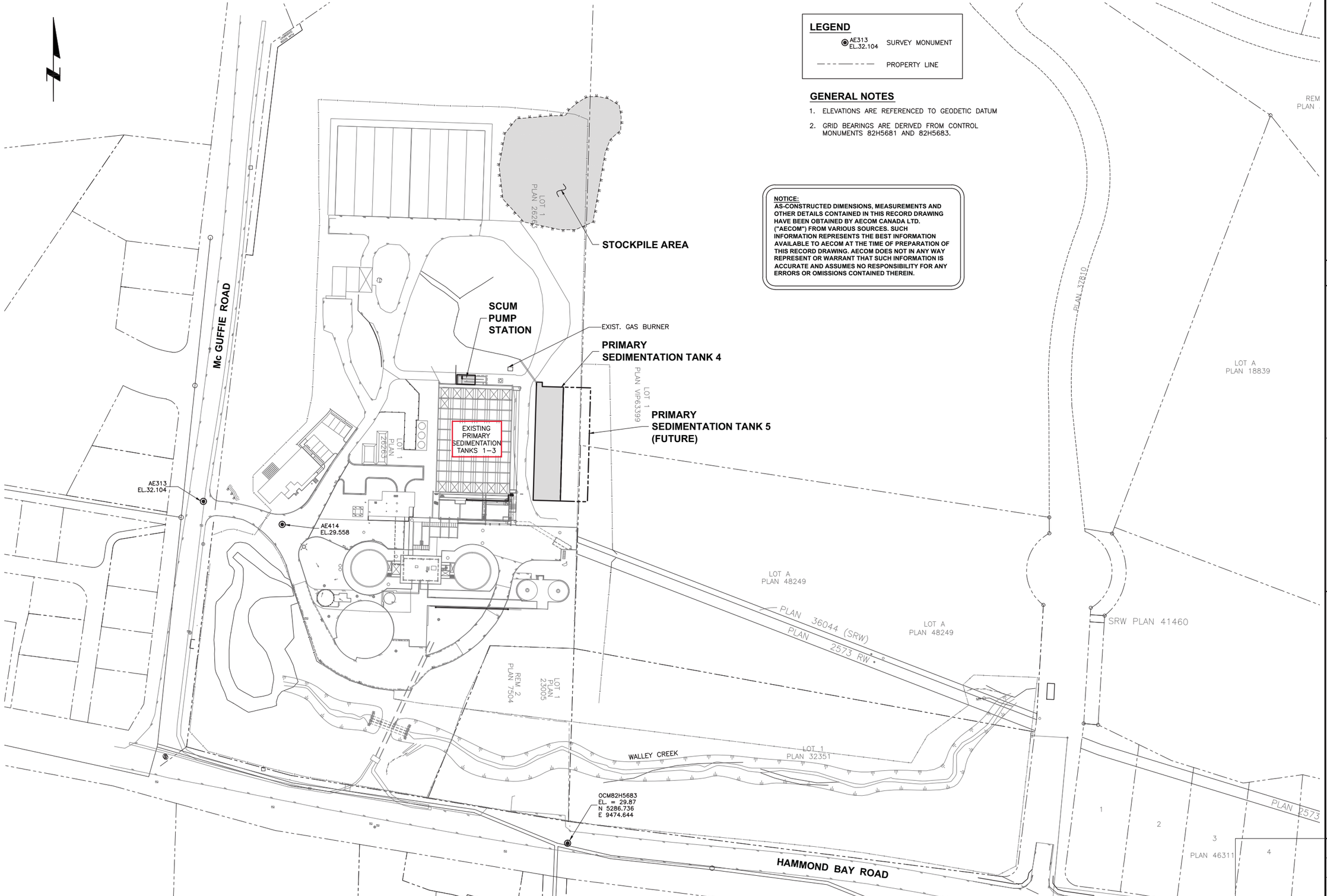
The warranty period shall be as outlined in the Supply Contractor's proposal and any subsequent clarifications.

2.4.2. Warranty Period Commencement

The warranty period shall commence when the RDN puts the Goods into operation, the operational date being no later than October 31, 2024.

APPENDIX A

EXISTING PLANT REFERENCE DRAWINGS



GENERAL ARRANGEMENT PLAN
1:750

VERIFY SCALE IF PLAN SHEET IS REDUCED — 30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
A	RECORD DRAWING	PTL	JK	2013/12/03

DRN BY: PTL | DES BY: KM | CHK BY: SS | APP BY: KM

PREPARED FOR: REGIONAL DISTRICT OF NANAIMO

PREPARED BY: AECOM
4th FLOOR, 3292 PRODUCTION WAY, BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
PRIMARY SEDIMENTATION TANK 4

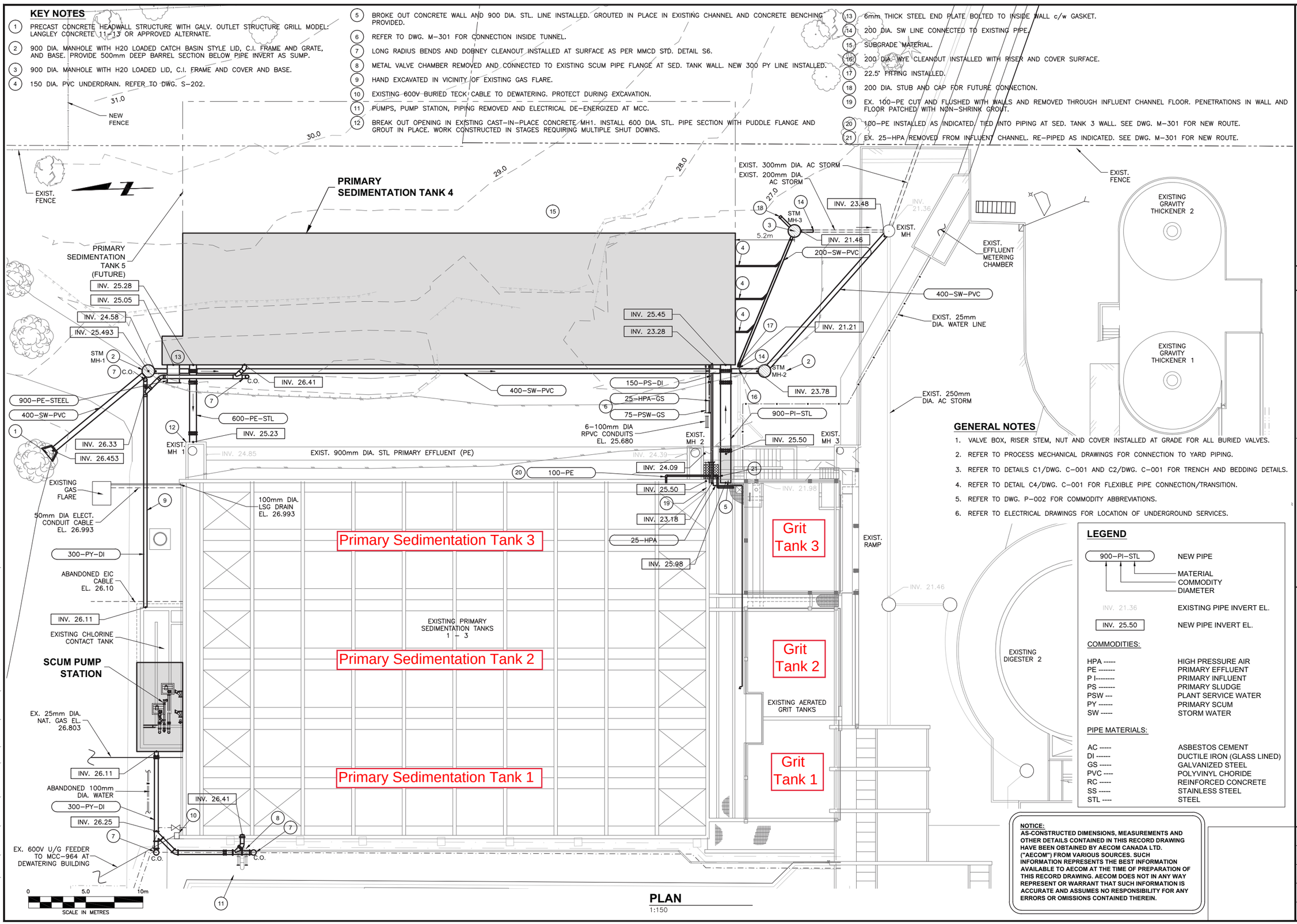
CIVIL
GENERAL ARRANGEMENT PLAN

PROJECT START DATE (M / Y)	OCT 2011
PROJECT NO.	60119790
FILENAME	C-101 to C106 114005.dwg
RDN DRAWING NO.	GN-PT-C-103
DRAWING NO.	C-101

Plotted By: leongp
Plot File Date Created: Mar/03/2014 1:11 PM
Layout-Sheet Name: C 101 OVERALL
Filename: L:\WORK\114000\114005\02A-CAD\WAT\DESIGN\2-CIVIL\AS-BUILT DRAWINGS JANUARY 2014\C-101 TO C106 114005.DWG

KEY NOTES

1. PRECAST CONCRETE HEADWALL STRUCTURE WITH GALV. OUTLET STRUCTURE GRILL MODEL: LANGLEY CONCRETE 11-13 OR APPROVED ALTERNATE.
2. 900 DIA. MANHOLE WITH H20 LOADED CATCH BASIN STYLE LID, C.I. FRAME AND GRATE, AND BASE. PROVIDE 500mm DEEP BARREL SECTION BELOW PIPE INVERT AS SUMP.
3. 900 DIA. MANHOLE WITH H20 LOADED LID, C.I. FRAME AND COVER AND BASE.
4. 150 DIA. PVC UNDERDRAIN. REFER TO DWG. S-202.
5. BROKE OUT CONCRETE WALL AND 900 DIA. STL. LINE INSTALLED. GROUTED IN PLACE IN EXISTING CHANNEL AND CONCRETE BENCHING PROVIDED.
6. REFER TO DWG. M-301 FOR CONNECTION INSIDE TUNNEL.
7. LONG RADIUS BENDS AND DOBNEY CLEANOUT INSTALLED AT SURFACE AS PER MMCD STD. DETAIL S6.
8. METAL VALVE CHAMBER REMOVED AND CONNECTED TO EXISTING SCUM PIPE FLANGE AT SED. TANK WALL. NEW 300 PY LINE INSTALLED.
9. HAND EXCAVATED IN VICINITY OF EXISTING GAS FLARE.
10. EXISTING 600V BURIED TECK CABLE TO DEWATERING. PROTECT DURING EXCAVATION.
11. PUMPS, PUMP STATION, PIPING REMOVED AND ELECTRICAL DE-ENERGIZED AT MCC.
12. BREAK OUT OPENING IN EXISTING CAST-IN-PLACE CONCRETE MH1. INSTALL 600 DIA. STL. PIPE SECTION WITH PUDDLE FLANGE AND GROUT IN PLACE. WORK CONSTRUCTED IN STAGES REQUIRING MULTIPLE SHUT DOWNS.
13. 6mm THICK STEEL END PLATE BOLTED TO INSIDE WALL c/w GASKET.
14. 200 DIA. SW LINE CONNECTED TO EXISTING PIPE.
15. SUBGRADE MATERIAL.
16. 200 DIA. WYE CLEANOUT INSTALLED WITH RISER AND COVER SURFACE.
17. 22.5° FITTING INSTALLED.
18. 200 DIA. STUB AND CAP FOR FUTURE CONNECTION.
19. EX. 100-PE CUT AND FLUSHED WITH WALLS AND REMOVED THROUGH INFLUENT CHANNEL FLOOR. PENETRATIONS IN WALL AND FLOOR PATCHED WITH NON-SHRINK GROUT.
20. 100-PE INSTALLED AS INDICATED, TIED INTO PIPING AT SED. TANK 3 WALL. SEE DWG. M-301 FOR NEW ROUTE.
21. EX. 25-HPA REMOVED FROM INFLUENT CHANNEL. RE-PIPED AS INDICATED. SEE DWG. M-301 FOR NEW ROUTE.



PLAN
1:150

GENERAL NOTES

1. VALVE BOX, RISER STEM, NUT AND COVER INSTALLED AT GRADE FOR ALL BURIED VALVES.
2. REFER TO PROCESS MECHANICAL DRAWINGS FOR CONNECTION TO YARD PIPING.
3. REFER TO DETAILS C1/DWG. C-001 AND C2/DWG. C-001 FOR TRENCH AND BEDDING DETAILS.
4. REFER TO DETAIL C4/DWG. C-001 FOR FLEXIBLE PIPE CONNECTION/TRANSITION.
5. REFER TO DWG. P-002 FOR COMMODITY ABBREVIATIONS.
6. REFER TO ELECTRICAL DRAWINGS FOR LOCATION OF UNDERGROUND SERVICES.

LEGEND

900-PI-STL — NEW PIPE
- MATERIAL
- COMMODITY
- DIAMETER

INV. 21.36 — EXISTING PIPE INVERT EL.

INV. 25.50 — NEW PIPE INVERT EL.

COMMODITIES:

HPA -----	HIGH PRESSURE AIR
PE -------	PRIMARY EFFLUENT
P I--------	PRIMARY INFLUENT
PS -------	PRIMARY SLUDGE
PSW ---	PLANT SERVICE WATER
PY -----	PRIMARY SCUM
SW -----	STORM WATER

PIPE MATERIALS:

AC -----	ASBESTOS CEMENT
DI ------	DUCTILE IRON (GLASS LINED)
GS -----	GALVANIZED STEEL
PVC ----	POLYVINYL CHORIDE
RC -----	REINFORCED CONCRETE
SS -----	STAINLESS STEEL
STL ----	STEEL

NOTICE:
AS-CONSTRUCTED DIMENSIONS, MEASUREMENTS AND OTHER DETAILS CONTAINED IN THIS RECORD DRAWING HAVE BEEN OBTAINED BY AECOM CANADA LTD. ("AECOM") FROM VARIOUS SOURCES. SUCH INFORMATION REPRESENTS THE BEST INFORMATION AVAILABLE TO AECOM AT THE TIME OF PREPARATION OF THIS RECORD DRAWING. AECOM DOES NOT IN ANY WAY REPRESENT OR WARRANT THAT SUCH INFORMATION IS ACCURATE AND ASSUMES NO RESPONSIBILITY FOR ANY ERRORS OR OMISSIONS CONTAINED THEREIN.

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
A	RECORD DRAWING	PTL	JK	2013/12/03

VERIFY SCALE IF PLAN SHEET IS REDUCED — 30 mm

DRN BY: PTL | DES BY: KM | CHK BY: KM | APP BY: KM

PREPARED FOR: REGIONAL DISTRICT OF NANAIMO

PREPARED BY: AECOM
4th FLOOR, 3292 PRODUCTION WAY, BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
PRIMARY SEDIMENTATION TANK 4
CIVIL
SITE AND YARD PIPING PLAN

PROJECT START DATE (M / Y): OCT 2011
PROJECT NO.: 60119790
FILENAME: C-101 to C106 114005.dwg
RDN DRAWING NO.: GN-PT-C-403
DRAWING NO.: C-103

Plotted By: leongp
Plot File Date Created: Mar/03/2014 1:11 PM
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Filename: L:\WORK\114000\114005\02A-CAD\WAT\DESIGN\2-CIVIL\AS-BUILT DRAWINGS JANUARY 2014\C-101 TO C106 114005.DWG

PA
P-207
FROM
GRIT BLOWER 1/2
150-PA

PA
P-207
FROM
GRIT BLOWER 1/2
150-PA

PA
P-207
FROM
GRIT BLOWER 1/2
150-PA

PA
P-207
FROM
GRIT BLOWER 1/2
150-PA

PA
P-207
FROM
GRIT BLOWER 1/2
150-PA

PA
P-207
FROM
GRIT BLOWER 1/2
150-PA

PS
P-305
FROM
PRIMARY SLUDGE
PUMP 1/2
150-PS

SRS
P-201
FROM
RS SCREEN 1
RS SCREEN 2
RS SCREEN 3 (FUTURE)
RS SCREEN 4

Screened raw sewage

PWD
P-908
FROM CENTRATE
PUMP STATION
150-PWD

GR
P-204
FROM
GRIT CYCLONE 1
OVERFLOW
150-GR

GR
P-204
FROM
GRIT CYCLONE 1
ORGANICS
100-GR

PY
P-205
FROM
PRIMARY SCUM
ROTOSTRAINER
UNDERFLOW
150-PY

GR (DRAIN)
P-205
FROM
GRIT SCUM
CONVEYORS
75-GR
(DRAIN)

GR
P-204
FROM
GRIT CYCLONE 2
OVERFLOW
150-GR

GR
P-204
FROM
GRIT CYCLONE 2
ORGANICS
100-GR

250-FOA
150-FOA
250-FOA
150-FOA
250-FOA
350-FOA

FOA
G-104
TO FOA
COLLECTION
HEADER

200-FOA
200-FOA

FOA
P-204
TO
ODOUR
CONTROL

1
SG-1101

T-111
AERATED GRIT TANK 1

CELL 1
CELL 2

SRS
P-301
TO PST 1

1
SG-1102

2
HPG-1103

T-112
AERATED GRIT TANK 2

CELL 1
CELL 2

200-FOA

SRS
P-302
TO PST 2

FOA
P-303
TO ODOUR
CONTROL

200-FOA

SRS
P-303
TO PST 3

900-SRS
BULKHEAD

SRS
P-304
TO PST 4

T-113
AERATED GRIT TANK 3

CELL 1
CELL 2

M
M
M

SRS
TO PST 5
(FUTURE)

GR
P-204
TO
GRIT PUMP 1
GRIT PUMP 2

GR
P-204
TO
GRIT PUMP 1
GRIT PUMP 2

KEY NOTE

1. SEGMENTED VERTICAL BAFFLE GATE
2. NEW SLIDE GATE TO REPLACE EXISTING

AERATED GRIT TANK 1		GRIT TANK 1 CELL 1/2 DIFFUSERS	
EQUIP. NO.:	T-111	TYPE:	COARSE BUBBLE
VOLUME:	577 m3	SPEC:	11529
		QUANTITY:	22

AERATED GRIT TANK 2		GRIT TANK 2 CELL 1/2 DIFFUSERS	
EQUIP. NO.:	T-112	TYPE:	COARSE BUBBLE
VOLUME:	577 m3	SPEC:	11529
		QUANTITY:	24

AERATED GRIT TANK 3		GRIT TANK 3 CELL 1/2 DIFFUSERS	
EQUIP. NO.:	T-113	TYPE:	COARSE BUBBLE
VOLUME:	577 m3	SPEC:	11529
		QUANTITY:	24

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
1	ISSUED FOR CONSTRUCTION	KSB	LN	2017/03/01
0	ISSUED FOR TENDER	KSB	LN	2016/11/28

DRN BY: KSB
DES BY: MC
CHK BY: LN
APP BY: KM

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

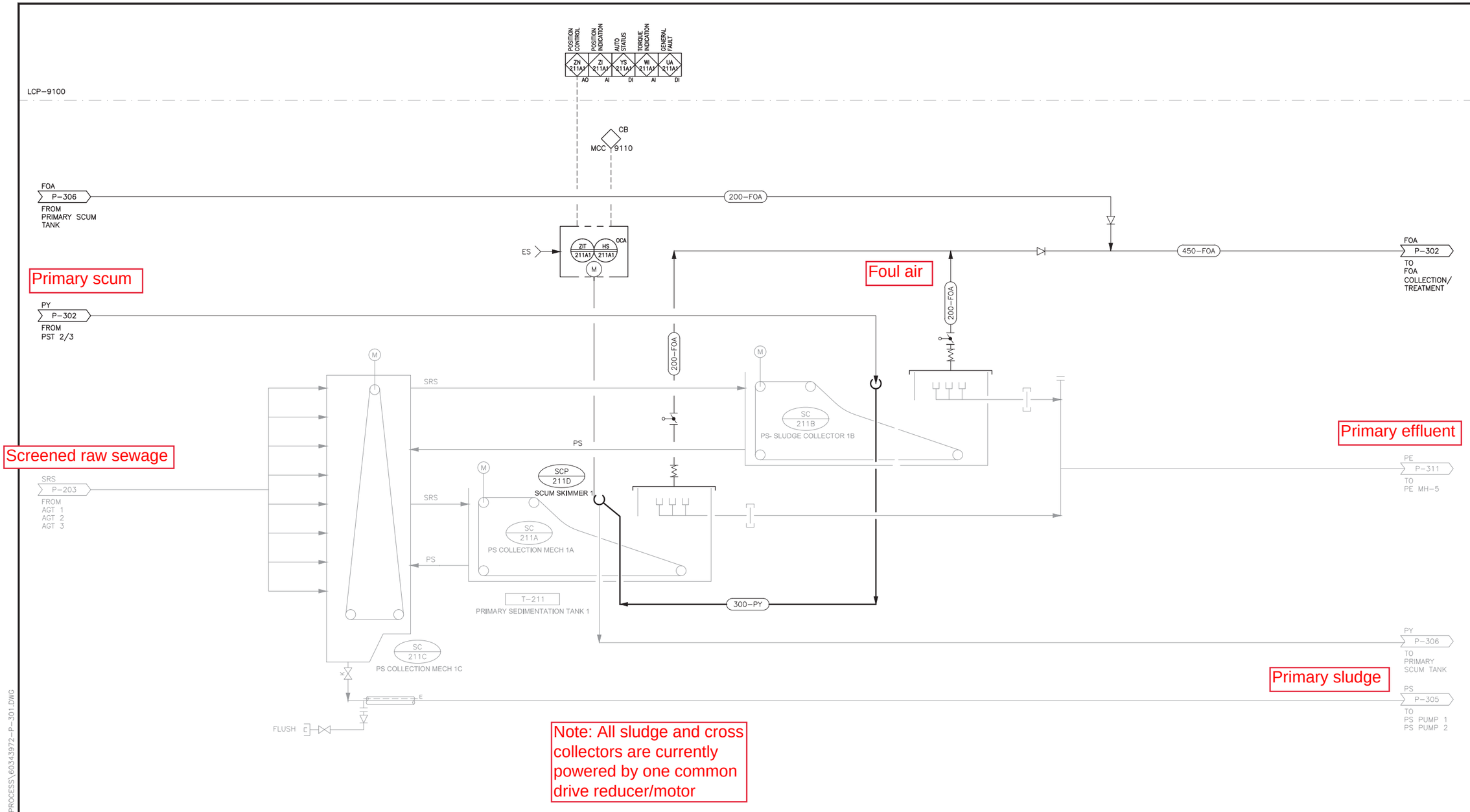
PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
SECONDARY TREATMENT UPGRADE

PROCESS
AERATED GRIT TANKS
PROCESS AND INSTRUMENTATION DIAGRAM

PROJECT START DATE (M / Y)
APR./2015
PROJECT NO.
60343972
FILENAME
60343972-P-203.dwg
RDN DRAWING No.
DRAWING No.
P-203

Plotted By: leongp
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Filename: P:\60343972\900-WORK\910 CAD\20-SHEETS\PROCESS\60343972-P-203.DWG



PRIMARY SEDIMENTATION TANK 1
PS COLLECTION MECHANISM 1C

EQUIP. NO.: SC-211C
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER:

PRIMARY SEDIMENTATION TANK 1
PS COLLECTION MECHANISM 1A & 1B

EQUIP. NO.: SC-211A & SC-211B
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER: 1 hp

PRIMARY SEDIMENTATION
SCUM SKIMMER 1

EQUIP. NO.: SCP-211D
SPEC: 11161
TYPE: TILTING/SLOTTED PIPE
SIZE: 300mm
POWER: 0.5 hp

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
1	ISSUED FOR CONSTRUCTION	KSB	LN	2017/03/01
0	ISSUED FOR TENDER	KSB	LN	2016/11/28

DRN BY: KSB
DES BY: MC
CHK BY: LN
APP BY: KM

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

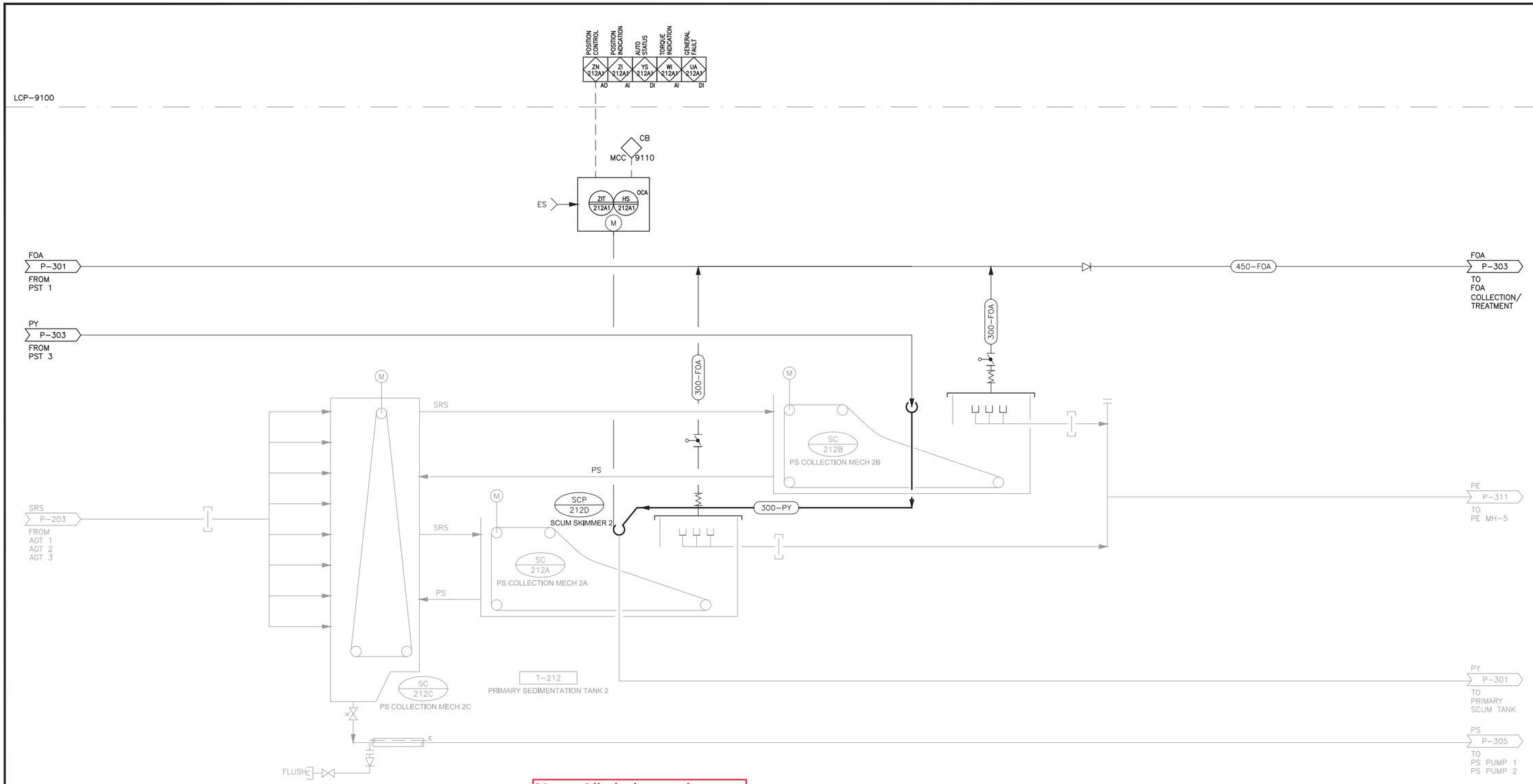
PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
SECONDARY TREATMENT UPGRADE

PROCESS
PRIMARY SEDIMENTATION TANK 1
PROCESS AND INSTRUMENTATION DIAGRAM

PROJECT START DATE (M / Y): APR./2015
PROJECT NO.: 60343972
FILENAME: 60343972-P-301.dwg
RDN DRAWING No.:
DRAWING No.: **P-301**

Plotted By: leongp
Plot File Date Created: Mar/01/2017 2:43 PM
Layout-Sheet Name: P-301
Filename: P:\60343972\900-WORK\910 CAD\20-SHEETS\PROCESS\60343972-P-301.DWG



Note: All sludge and cross collectors are currently powered by one common drive reducer/motor

PRIMARY SEDIMENTATION TANK 2
PS COLLECTION MECHANISM 2C

EQUIP. NO.: SC-212C
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER:

PRIMARY SEDIMENTATION TANK 2
PS COLLECTION MECHANISM 2A & 2B

EQUIP. NO.: SC-212A & SC-212B
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER: 1.5 hp

PRIMARY SEDIMENTATION TANK 2
SCUM SKIMMER 2

EQUIP. NO.: SCP-212D
SPEC: 11161
TYPE: TILTING SLOTTED PIPE
SIZE: 300mm
POWER: 0.5 hp

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
1	ISSUED FOR CONSTRUCTION	KSB	LN	2017/03/01
0	ISSUED FOR TENDER	KSB	LN	2016/11/28

DRN BY: KSB
DES BY: MC
CHK BY: LN
APP BY: KM

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

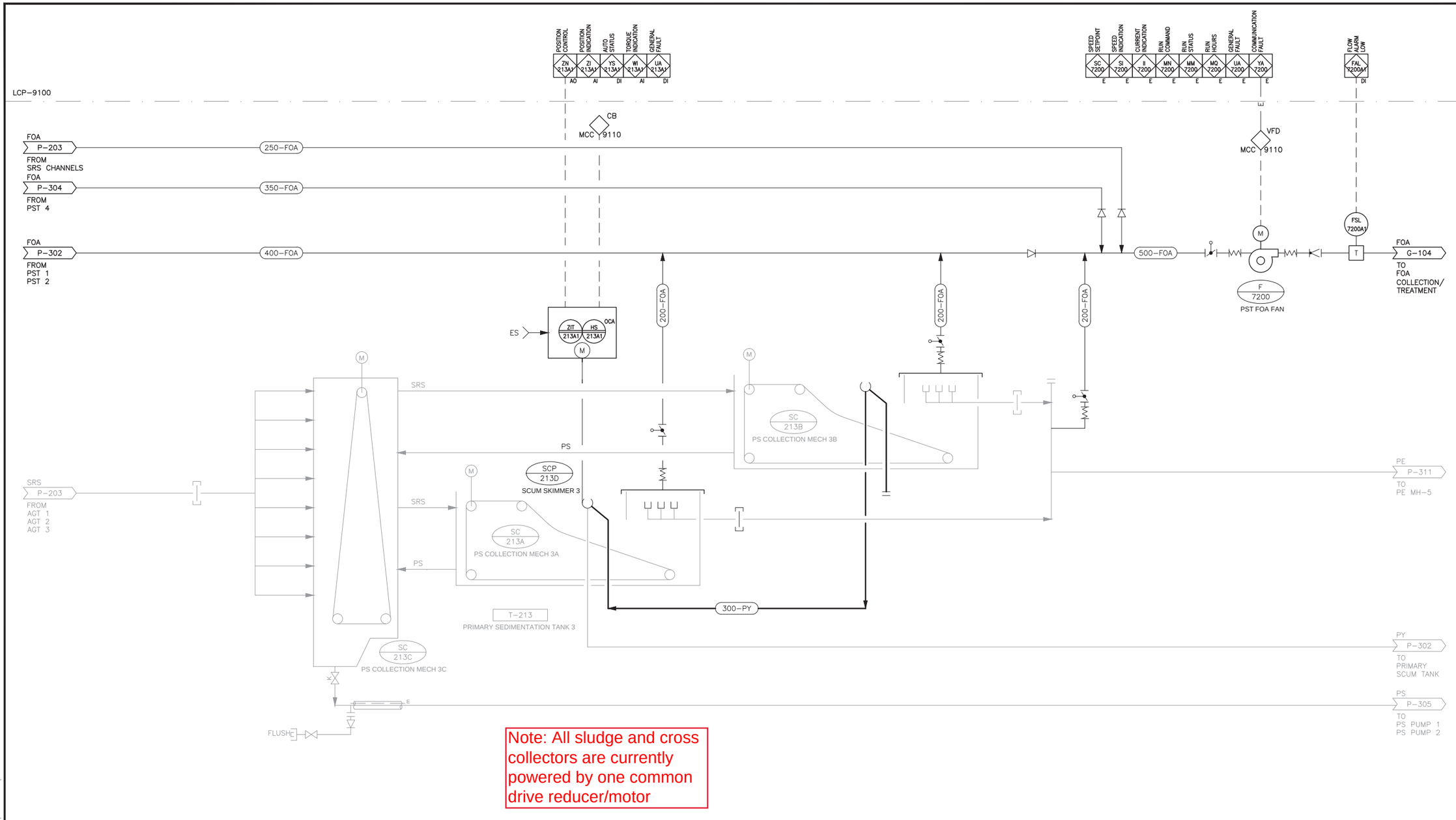
PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
SECONDARY TREATMENT UPGRADE

PROCESS
PRIMARY SEDIMENTATION TANK 2
PROCESS AND INSTRUMENTATION DIAGRAM

PROJECT START DATE (M / Y)
APR./2015
PROJECT NO.
60343972
FILENAME
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RDN DRAWING No.
DRAWING No.
P-302

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PRIMARY SEDIMENTATION TANK 3
PS COLLECTION MECHANISM 3C

EQUIP. NO.: SC-213C
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER:

PRIMARY SEDIMENTATION TANK 3
PS COLLECTION MECHANISM 3A & 3B

EQUIP. NO.: SC-213A & SC-213B
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER: 1 hp

PRIMARY SEDIMENTATION TANK 3
SCUM SKIMMER 3

EQUIP. NO.: SCP-213D
SPEC: 11161
TYPE: TILTING/SLOTTED PIPE
SIZE: 300mm
POWER: 0.5 hp

PRIMARY SEDIMENTATION
TANKS FOA FAN

EQUIP. NO.: F-7200
SPEC: 15821
TYPE: INLINE CENTRIFUGAL
CAPACITY: 2800 CFM
POWER: 3 hp

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
1	ISSUED FOR CONSTRUCTION	KSB	LN	2017/03/01
0	ISSUED FOR TENDER	KSB	LN	2016/11/28

DRN BY: KSB
DES BY: MC
CHK BY: LN
APP BY: KM

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

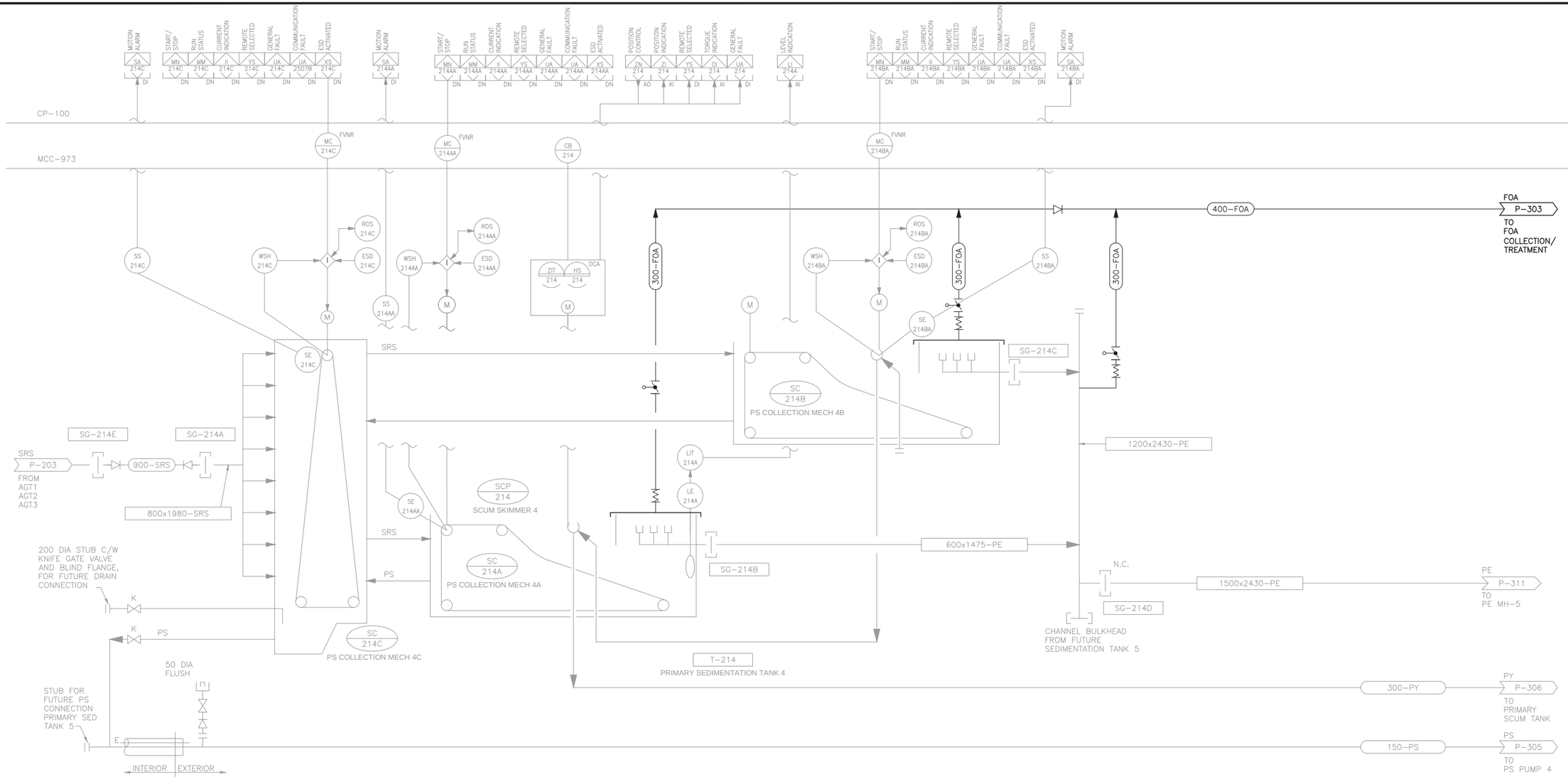
PREPARED BY:
AECOM
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BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
SECONDARY TREATMENT UPGRADE

PROCESS
PRIMARY SEDIMENTATION TANK 3
PROCESS AND INSTRUMENTATION DIAGRAM

PROJECT START DATE (M / Y)
APR./2015
PROJECT NO.
60343972
FILENAME
60343972-P-303.dwg
RDN DRAWING No.
DRAWING No.
P-303

Plotted By: leongp
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Filename: P:\60343972\900-WORK\910 CAD\20-SHEETS\PROCESS\60343972-P-303.DWG



Note: Each sludge and cross collector is powered by a separate drive reducer/motor

PRIMARY SEDIMENTATION TANK 4
PS COLLECTION MECHANISM 4C

EQUIP. NO.: SC-214C
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER: 0.5 hp

PRIMARY SEDIMENTATION TANK 4
PS COLLECTION MECHANISM 4A AND 4B

EQUIP. NO.: SC-214A / SC-214B
SPEC: N/A
TYPE: FLIGHT CONVEYOR CHAIN
POWER: 0.5 hp

PRIMARY SEDIMENTATION TANK 4
SCUM SKIMMER 4

EQUIP. NO.: SCP-214
SPEC: N/A
TYPE: TILTING / SLOTTED PIPE
SIZE: 300mm

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	CHK	DATE (YMD)
1	ISSUED FOR CONSTRUCTION	KSB	2017/03/01
0	ISSUED FOR TENDER	KSB	2016/11/28

DRN BY: KSB
DES BY: MC
CHK BY: LN
APP BY: KM

PREPARED FOR: REGIONAL DISTRICT OF NANAIMO

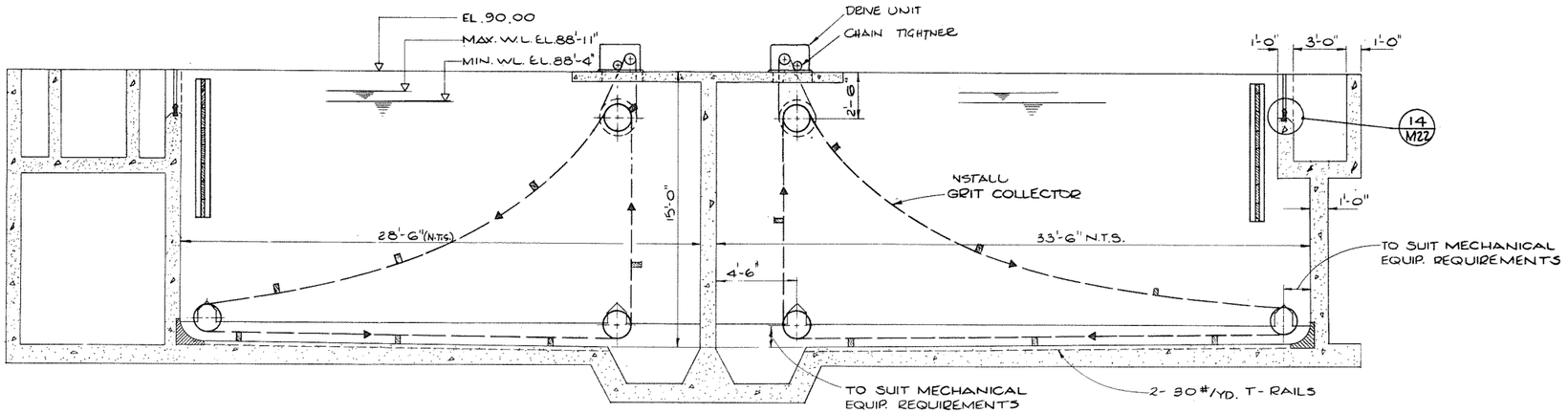
PREPARED BY: AECOM
4th FLOOR, 3292 PRODUCTION WAY, BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO POLLUTION CONTROL CENTRE
SECONDARY TREATMENT UPGRADE

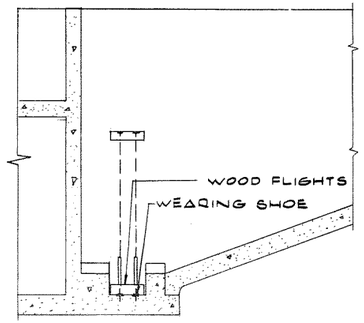
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PRIMARY SEDIMENTATION TANK 4
PROCESS AND INSTRUMENTATION DIAGRAM

PROJECT START DATE (M / Y): APR./2015
PROJECT NO.: 60343972
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RDN DRAWING No.: GN-GEN-P-202
DRAWING No.: **P-304**

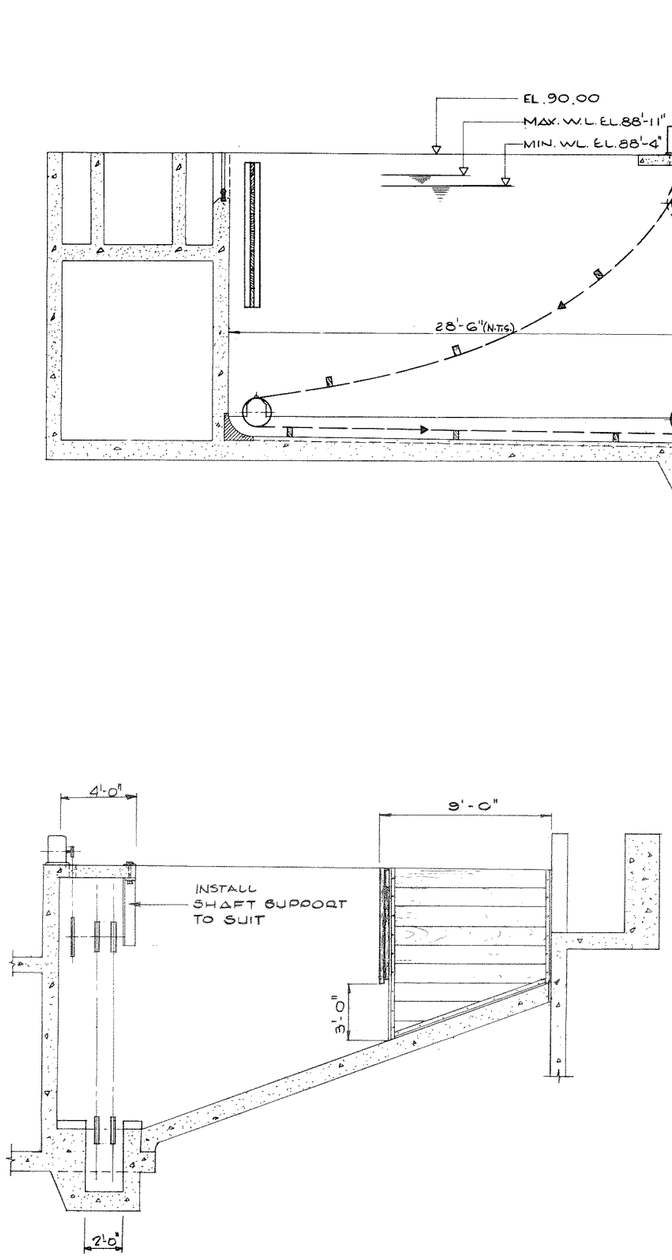
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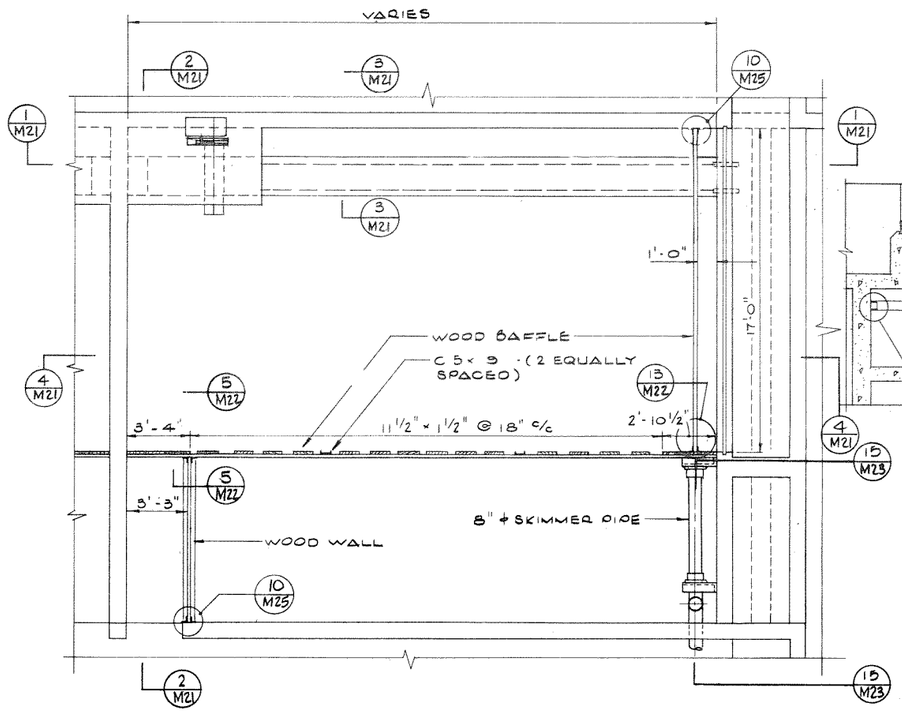
SECTION 1/M21



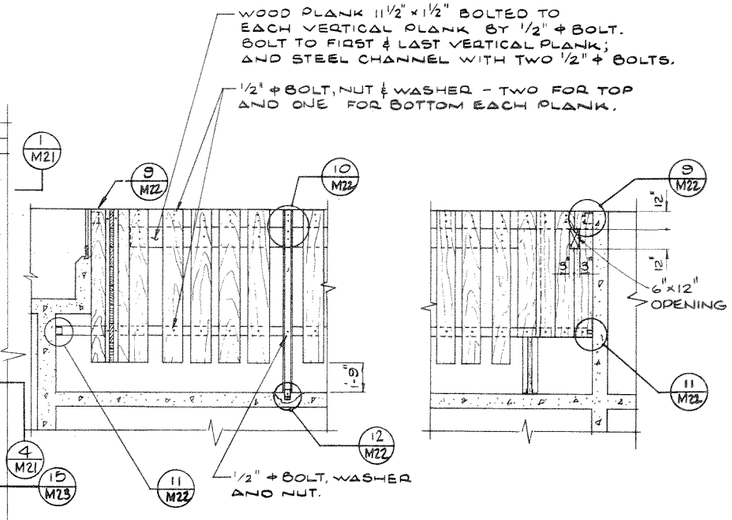
SECTION 3/M21



SECTION 2/M21



TYPICAL PLAN



SECTION 4/M21

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
B. L. WALKER

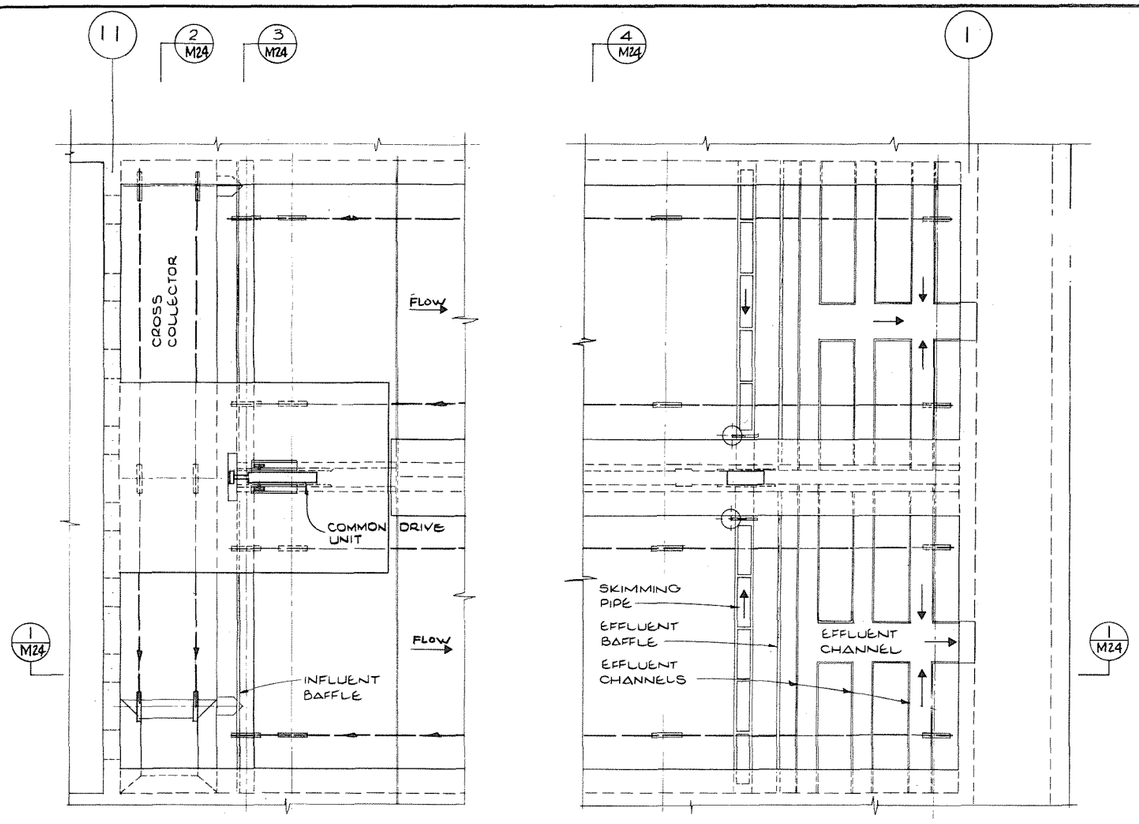
REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED J.S. B.W.
DRAWN T.T.F. & D.B.C.
CHECKED B.W. W.M.

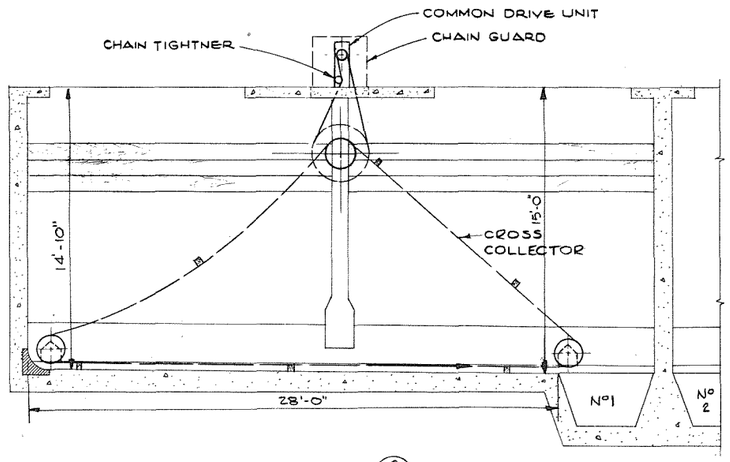
DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
Sept/ 1923

NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
GRIT TANKS - PLAN VIEW, GRIT COLLECTORS

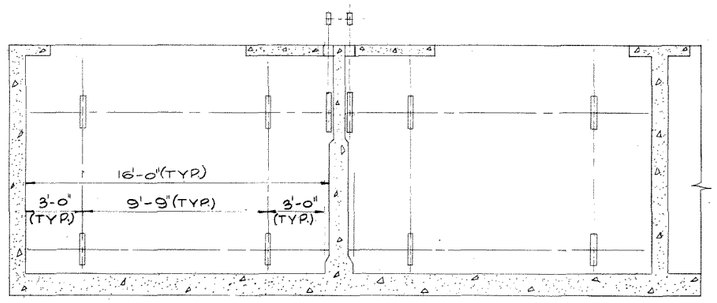
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DRAWING No. 69.7.2
SHEET M 21 OF 31 ISSUE A
THIS DRAWING REDUCED TO HALF SCALE



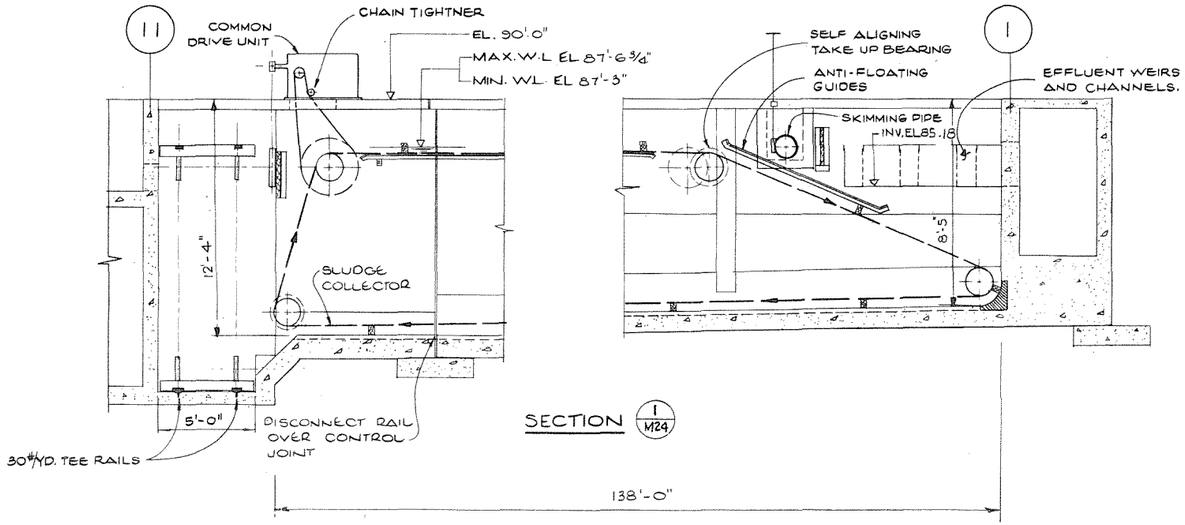
TYPICAL PLAN
SEDIMENTATION TANK No 1



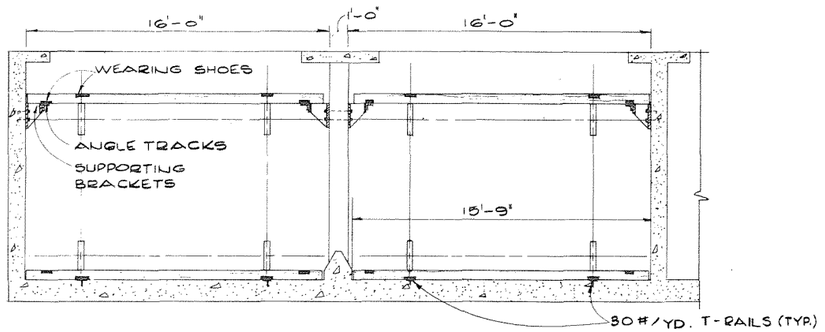
SECTION 2 M24



SECTION 3 M24



SECTION 1 M24



SECTION 4 M24

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
B. L. WALKER

REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED J. S. B.W.
DRAWN T.T.F.
CHECKED B.W. MJ

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
MJ Dayton Sept 1 1972

NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
SEDIMENTATION TANKS - PLAN VIEW, SLUDGE COLLECTORS

SCALE: 1/4"=1'-0"
DRAWING No. 69.7.2
SHEET M 24 OF 31 ISSUE A
THIS DRAWING REDUCED TO HALF SCALE

B D E F H K L

10 11 12 13 14 15

CONTROL JOINT

4'-6" (TYP.)

6" 6"

TEMPORARY 6"ø HOLE, INV. FLUSH WITH CHANNEL SLAB

TO SUIT MECHANICAL EQUIP. REQUIREMENTS (TYP.) *

OPENINGS TO SUIT MECHANICAL EQUIP. REQUIREMENTS (TYP.)*

1/4" / FOOT (TYP.)

WALL TO WALL 144'-0"

14'-6"

11'-0"

16'-4"

7'-6"

6'-0"

GATE No. 4 GATE No. 13 GATE No. 14 GATE No. 5 GATE No. 6

TYPICAL FOR CHLORINE CONTACT TANK ONLY

1'-0" 8" 12" 8"

1/8" / FT.

GR. EL. 85'-2½" (TYP.)

GRATING (TYP.)

10" OPENING

2'-0" TYP.

7'-0"

OPENING TO SUIT* MECH. EQUIPMENT

CONTROL JOINT

GATE No. 25 GATE No. 26

GATE No. 23 GATE No. 24

FOR STAIRWAY SEE DETAIL E M30

GR. EL. 85'-2½"

CONTROL JOINT

GATE No. 3 GATE No. 2 GATE No. 1

KEY, BITUMINUS PAINT AND IGAS JOINT FILLER ALL AROUND (TYP.)

CONTROL JOINT

1" JOINT FILLER

12" x 18" COLUMNS

COLUMN 12" x 18"

SEE DETAIL D M30

FOR STAIRWAY SEE DETAIL F M30

GR. EL. 85'-2½"

43'-10"

31'-4"

10'-11"

1'-0" 2'-0"

6" 6" 8'-0" 6" 6" 28'-6" 6" 6" 31'-0" 6" 6" 31'-0" 6" 6"

4'-6" 4'-6" 29'-6" 10'-4" 12'-10" 8'-10" 6" 2'-0" 2'-0" 6" 32'-0"

A B C 6 7 8 E E' F' G H J L

NOTES:

1. FOR GRIT AND SEDIMENTATION TANK ROOF CONCRETE OUTLINE SEE ARCHITECTURAL DWG'S.
2. ALL ROOF COLUMNS SHALL BE 12" x 12" UNLESS OTHERWISE NOTED.
3. FOR OPENING AT CONCRETE STRUCTURE SEE H&V, M, E DWG'S.

LEGEND

- TEMPORARY CONC. WALLS.
- * - VERIFY DIMENSIONS WITH CORPORATION PRIOR TO POURING CONCRETE.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. SKLENAR

REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED J. S.
DRAWN T.T.F. & A.S.
CHECKED N.B.

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
Dayton Sept/1973

NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
GRIT AND SEDIMENTATION TANKS - CONCRETE OUTLINE

SCALE: 1/4" = 1'-0"
DRAWING No. 69.7.2.
SHEET SL7 OF 68 ISSUE A
THIS DRAWING REDUCED TO HALF SCALE

B D E F H K L

3'-6" 8'-6"(TYP.) 17'-0"(TYP.) 8'-6"(TYP.) 3'-6"

INV. EL. 72-5
8"ϕ A.C. CAP
4"
CLEANOUT
EL. 74'-9½"
EL. 74'-11½" (TYP.)
EL. 74'-9½" (TYP.)
8"ϕ A.C. CL. 3300 (TYP.)
4"ϕ N.C.P. PERFORATED PIPE (TYP.)
4"ϕ N.C.P. 45° BEND (TYP.)
8"×4" A.C. 45° WYE (TYP.)
CLEANOUT
INV. EL. 72'-1"
11'-0"
2" 10" 6"
BITUMINOUS PAINT & IGAS JOINT SEALER ALL AROUND
EL. 75'-0"
EL. 74'-9½"
EL. 74'-11½" (TYP.)
EL. 74'-9½" (TYP.)
IGAS JOINT SEALER ALL AROUND
BITUMINUS PAINT ALL AROUND
11 12

3'-0" 11'-6" 15'-6" 7'-0" 11'-6" 17'-0" 5'-6" 5'-6"

EL. 75'-0"
EL. 74'-11½"
EL. 74'-9½"
8'-0"
1'-0"
1'-0"
CONTROL JOINT
4'-4"
6" 6"
42"ϕ R.C. PIPE
2'-2"
8" 1'-10" 1'-10" 8"
CLEANOUT (TYP.)
C.O. C.O. C.O.
A 15
A C

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. SKLENAR

REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED J.S.
DRAWN A.S.
CHECKED MD

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
MD Dayton Sept/ 1973

NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
GRIT AND SEDIMENTATION TANKS - CONCRETE OUTLINE

SCALE: 1/4" = 1'-0"
DRAWING No. 69.7.2
SHEET 518 OF 68 ISSUE A
THIS DRAWING REDUCED TO HALF SCALE

CLEANOUT (TYP)

B D E F H K L

17'-0" 16'-1" (TYP)

6" 6" 5" 5" 6" 6" 5" 5" 6" 6" 5" 5" 6" 6"

CONCRETE FOR FUTURE REMOVAL UNDERNEATH SLAB.

18/S22

CONCRETE FOR FUTURE REMOVAL UNDERNEATH SLAB

GALV. IRON RUNGS (TYP).

F.S.

2'x2' SQ OPENINGS

SUPPORTS FOR MIXER

1'-0"

1'-0"

SLUICE GATE H/M30

7/S22

10"

5'-2"

4'-10"

6"

1 2 8 9 10

GATE No 7

GATE No 8

GATE No 9

GATE No 10

GATE No 11

GATE No 12

GRATING (TYP.)

36" ϕ SLUICE GATE

12"x18" COLUMN (TYP.)

14'-6"

3/S21

12"x18" COLUMN (TYPICAL)

12"x12" COLUMN (TYPICAL)

12"x12" COLUMN (TYPICAL)

4" ϕ NCR PERFORATED PIPE (TYP.)

12" SQ. (TYP.)

3/S21

1/S20

CONTROL JOINT

9"

14'-6"

14'-1"

7@ 14'-6" = WALL TO WALL 144'-0"

LEGEND

→ - FINISHED FLOOR SLOPE 1/4"/FOOT.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. SKLENAR

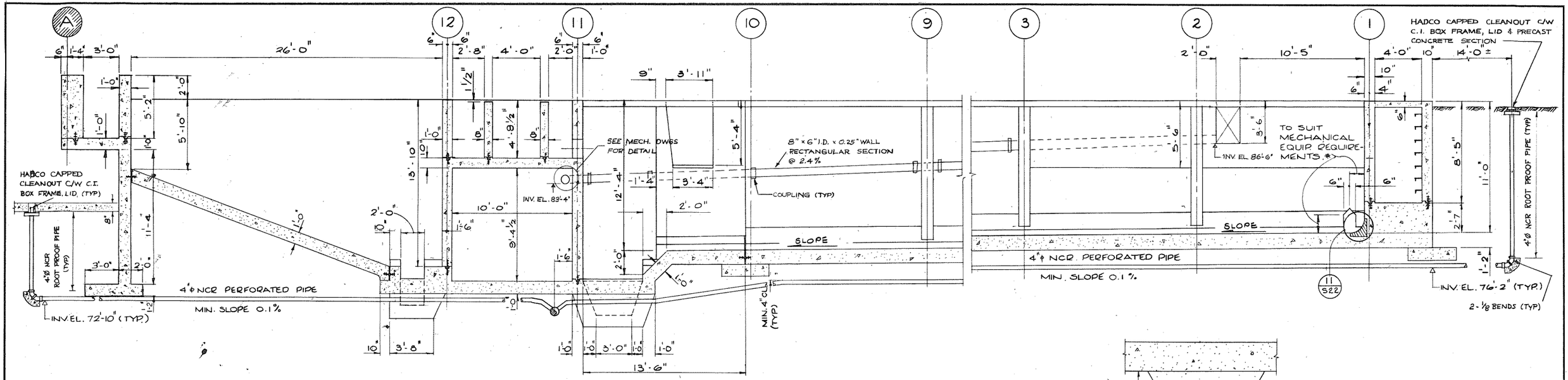
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DESIGNED U.S.
DRAWN D.B.C & A.S.
CHECKED MD

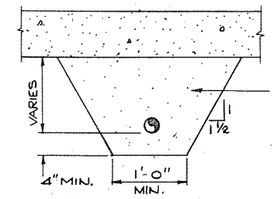
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CONSULTING ENGINEERS
Sept/ 1973

NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
SEDIMENTATION TANKS - CONCRETE OUTLINE

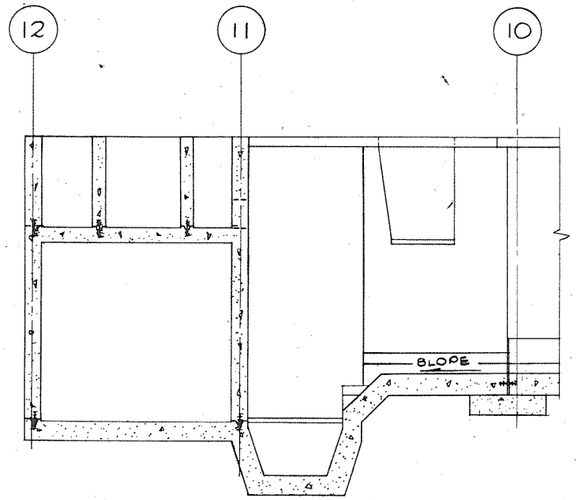
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DRAWING No. 69 7.2
SHEET 519 OF 68 ISSUE A
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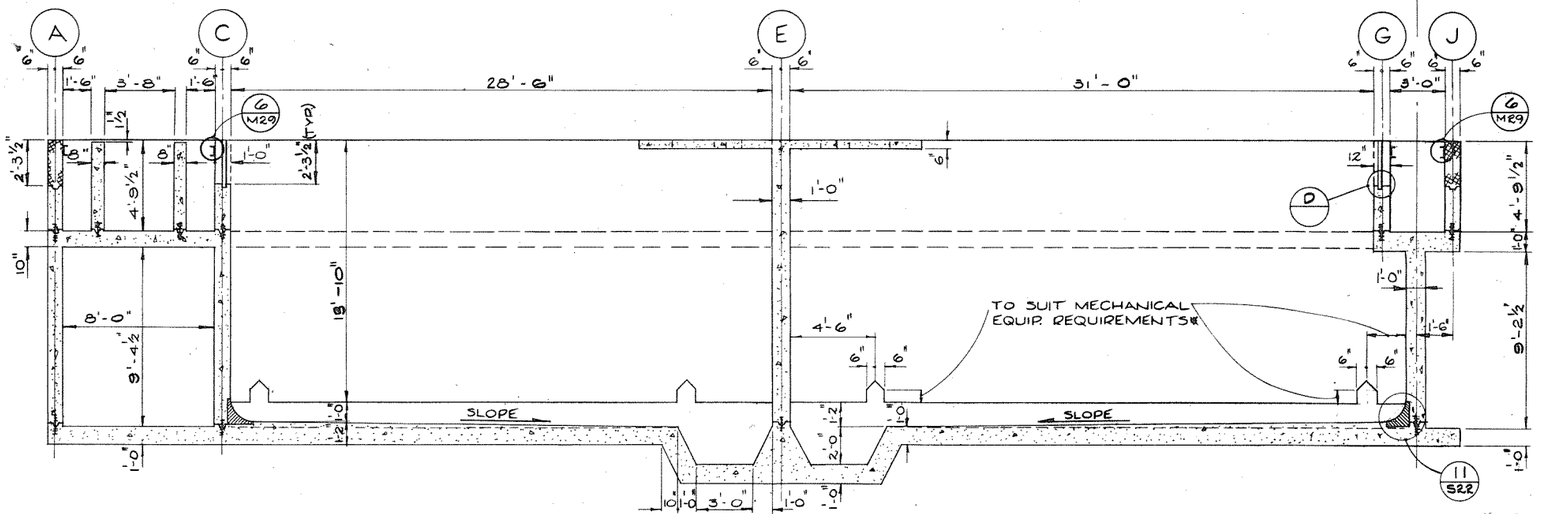
SECTION (1/S19)



FOUNDATION DRAIN DETAIL
N.T.S.



SECTION (5/S17)



SECTION (4/S17)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. SKLENAR

* VERIFY DIMENSIONS WITH CORPORATION PRIOR TO POURING CONCRETE

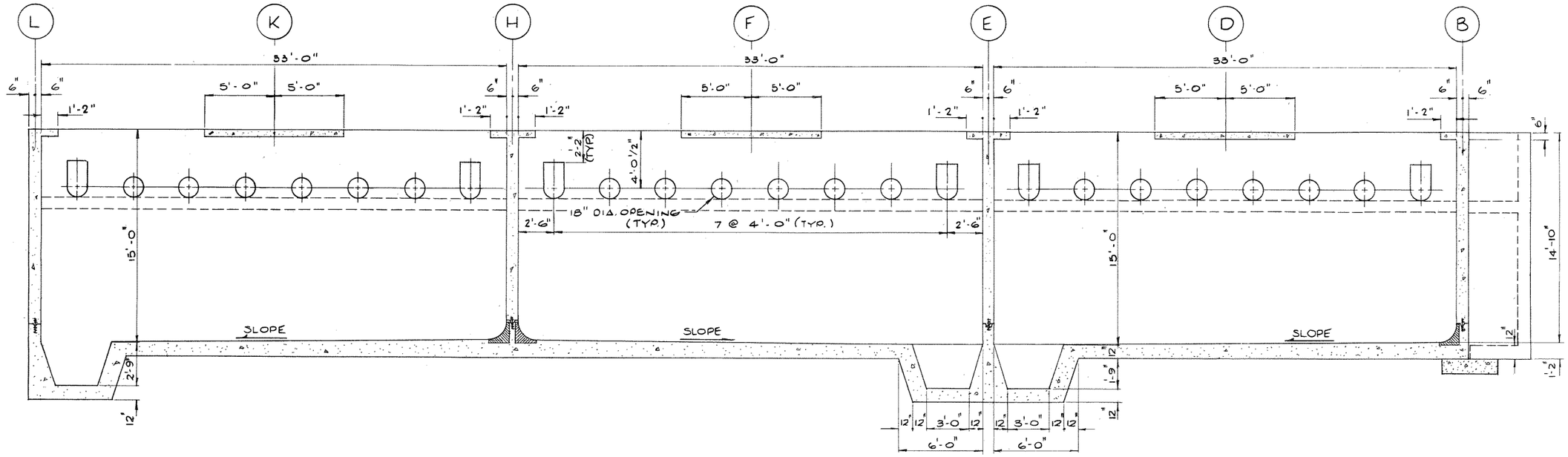
REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

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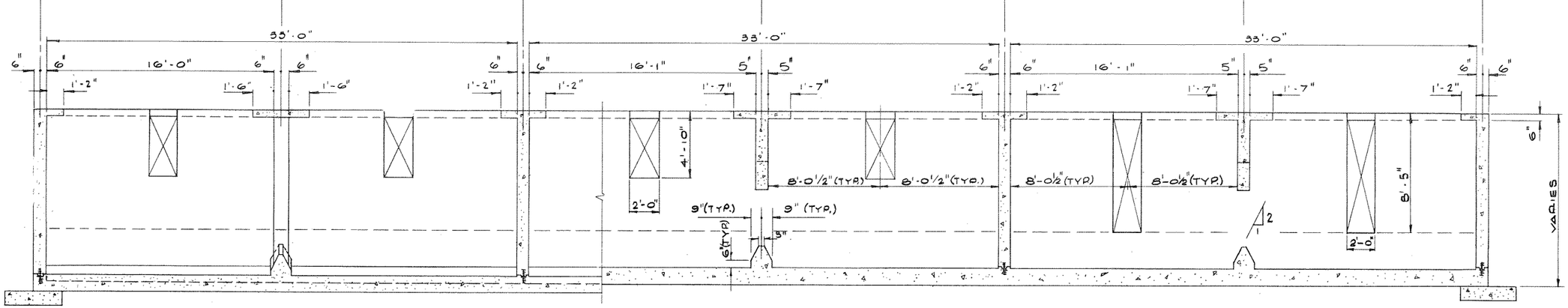
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NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
GRIT AND SEDIMENTATION TANKS - CONCRETE OUTLINE

SCALE: 1/2" = 1'-0"
DRAWING No. 69.7.2
SHEET S20 OF 68 ISSUE A
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SECTION (2/S17)



SECTION (3/S19)

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — J. SKLENAR

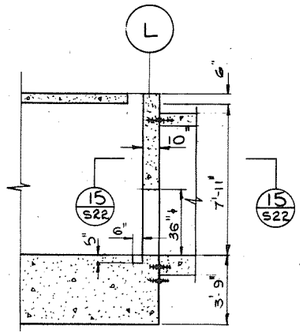
REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED J.S.
DRAWN O.CURTISS & A.S
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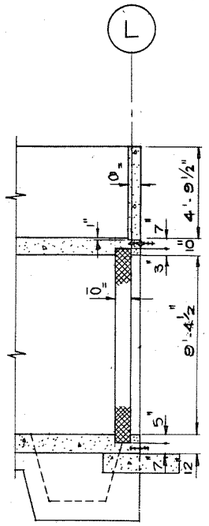
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CONSULTING ENGINEERS
Sept 1 1973

NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
GRIT AND SEDIMENTATION TANKS - CONCRETE OUTLINE

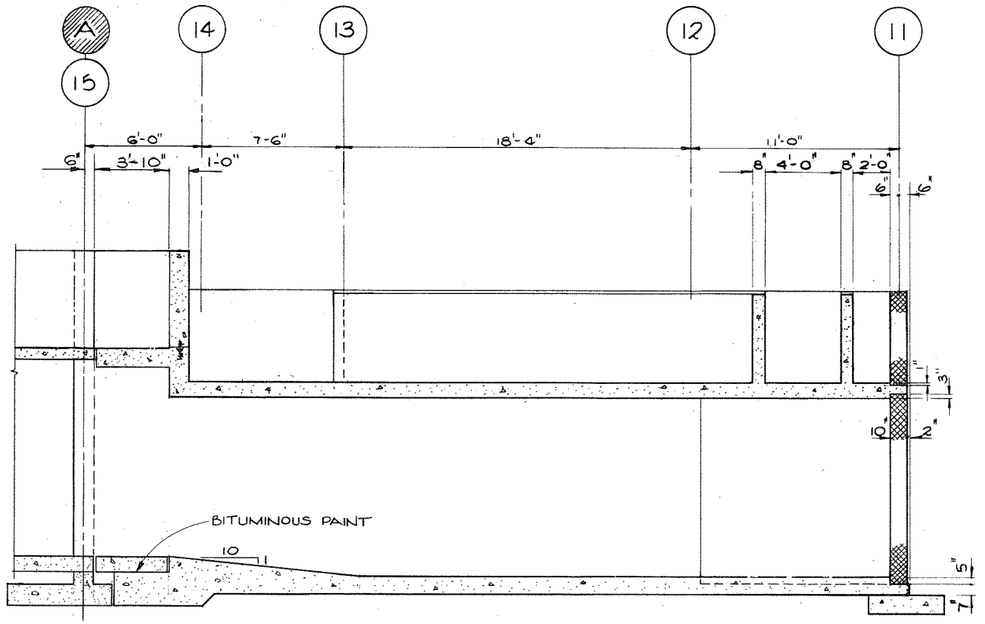
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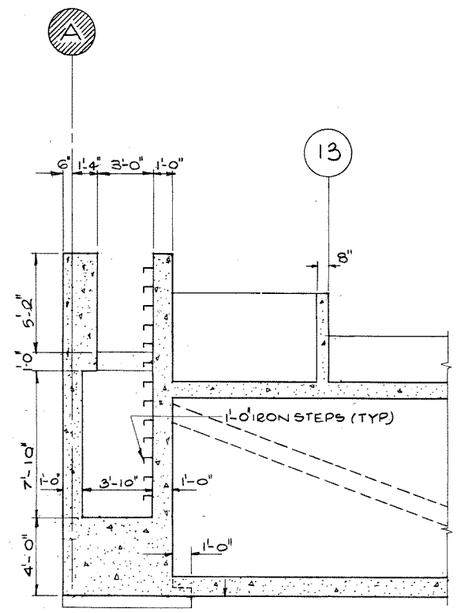
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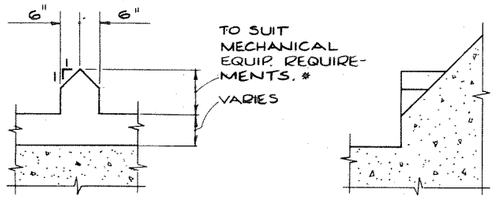
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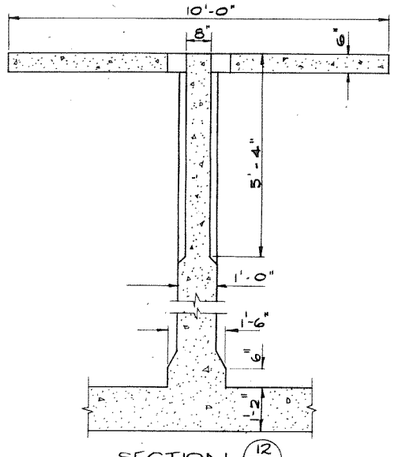
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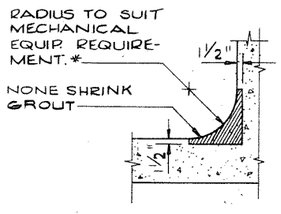
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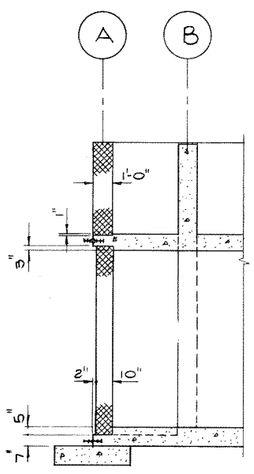
DETAIL (10/517)
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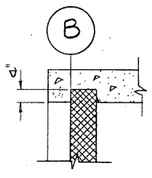
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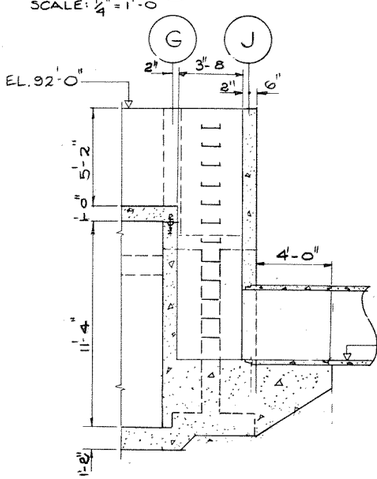
DETAIL (11/520)
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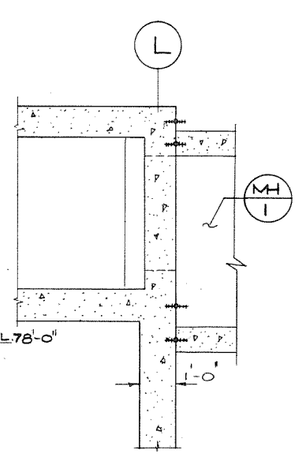
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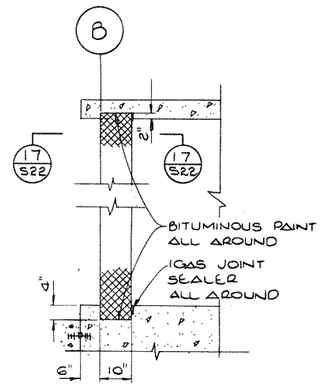
SECTION (17/522)
SCALE 1/2" = 1'-0"



SECTION (14/517)
SCALE: 1/4" = 1'-0"



SECTION (15/522)
SCALE: 1/2" = 1'-0"



SECTION (18/519)
SCALE 1/2" = 1'-0"

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. SKLENAR

* VERIFY DIMENSIONS WITH CORPORATION PRIOR TO POURING CONCRETE.

REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

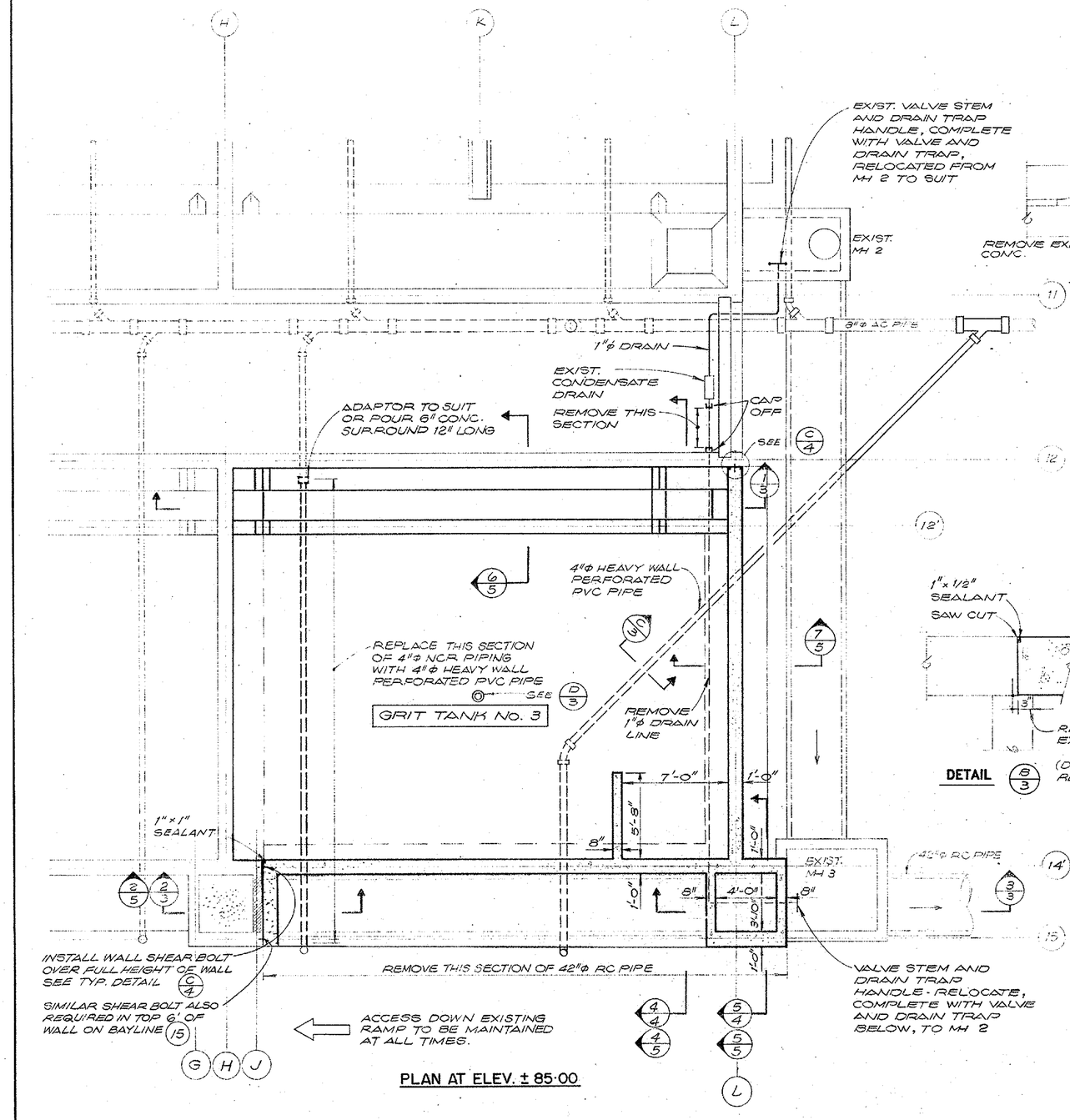
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DRAWN D. CURTISS & AS
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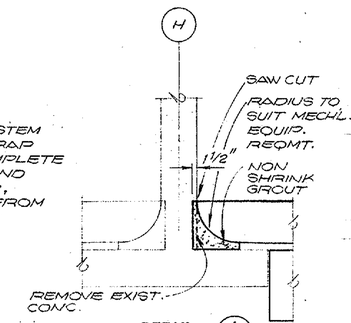
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CONSULTING ENGINEERS
Dayton Sept. 1973

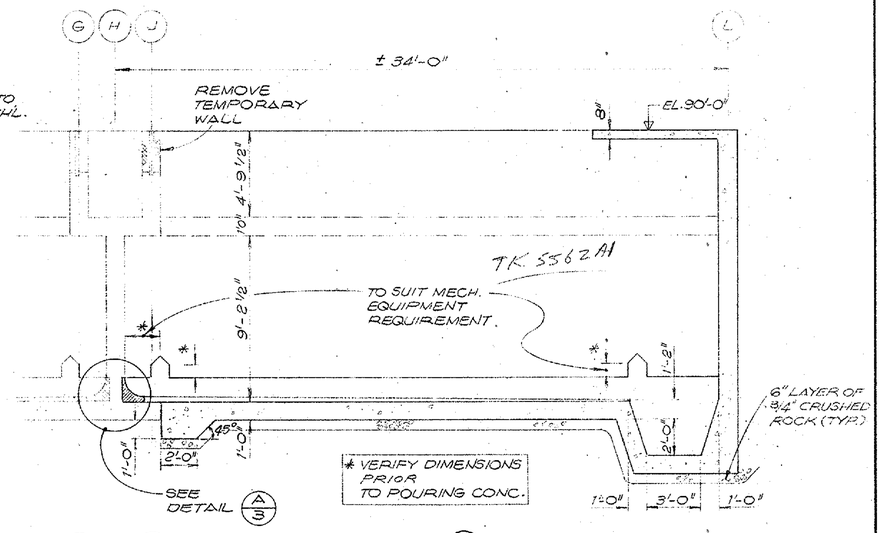
NANAIMO REGIONAL SEWER AUTHORITY
GREATER NANAIMO WATER POLLUTION CONTROL CENTRE
GRIT AND SEDIMENTATION TANKS - CONCRETE OUTLINE

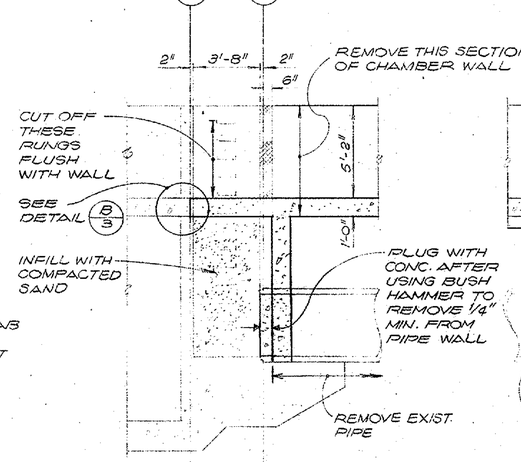
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SHEET 522 OF 68 ISSUE A
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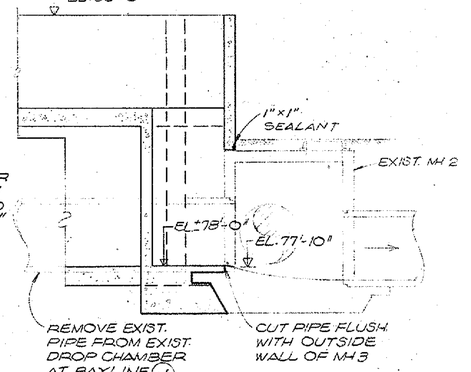
N-INT-211

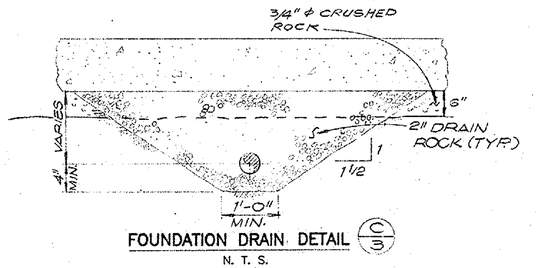


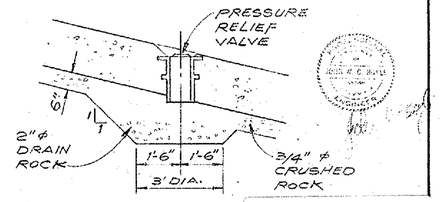












N-INT-211

REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

W.S.I. 112205

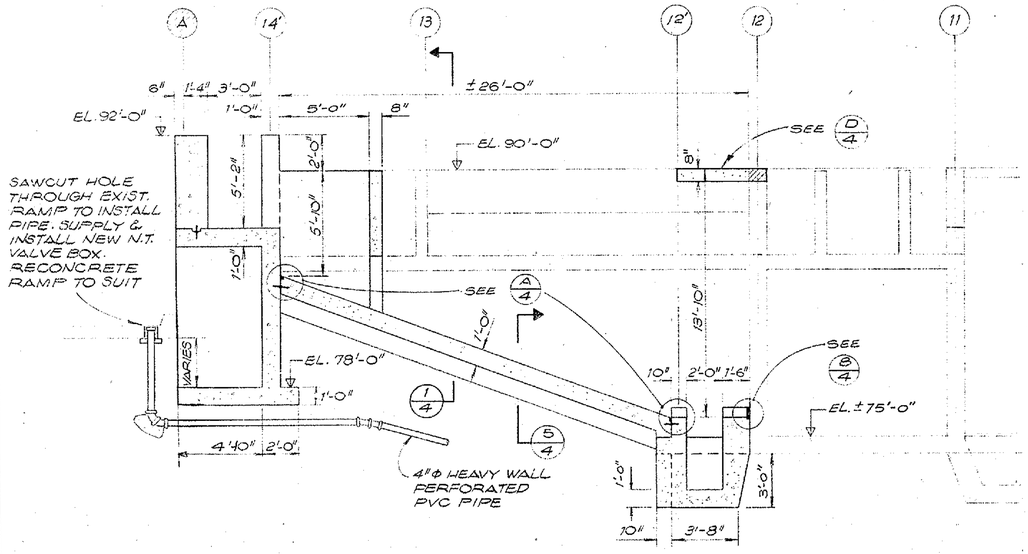
DESIGNED JWCB
DRAWN VB
CHECKED BW BW

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
B Welkin 4 July 89

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO W.P.C.C.
CONSTRUCTION OF STAGE II EXPANSION – PHASE II
GRIT TANK No.3 DETAILS

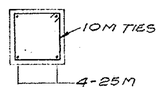
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DRAWING No. 92.72.4
SHEET 3 OF 21 ISSUE A

N-INT-212



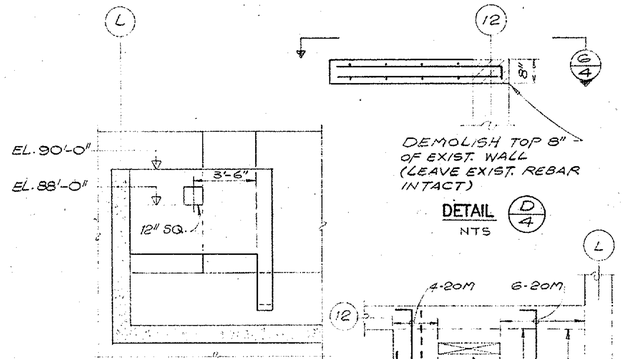
SECTION 4/3

1/4" = 1'-0"

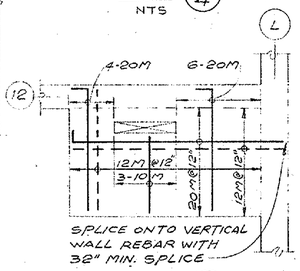


SECTION 2/4

3/4" = 1'-0"

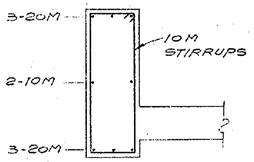


SECTION 1/4



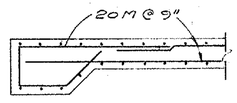
SECTION 6/4

NTS



SECTION 3/4

3/4" = 1'-0"



SECTION 5/4

GENERAL STRUCTURAL NOTES

CONCRETE

1. APPLICABLE SPECIFICATIONS AND CODES: CONCRETE CONSTRUCTION SHALL CONFORM TO CSA, CAN.3-A23.1-M77 AND CAN.3-A23.2-M77.

2. REINFORCING STEEL DETAILS: ALL DETAILING, FABRICATING AND ERECTION OF STEEL REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH THE "METRIC SUPPLEMENT" IN CONJUNCTION WITH THE "REINFORCING STEEL MANUAL OF STANDARD PRACTICE" AS AVAILABLE FROM THE WESTERN REINFORCING CONTRACTORS ASSOCIATION.

3. MINIMUM REINFORCEMENT: CONCRETE CONSTRUCTION SHALL BE REINFORCED CONCRETE EXCEPT WHERE PLAIN CONCRETE (P/C) IS SPECIFIED ON THE DRAWINGS, IN WHICH CASE NO REINFORCEMENT SHALL BE USED. CONCRETE THAT IS NOT DESIGNATED P/C AND HAS NO REINFORCEMENT INDICATED SHALL BE REINFORCED ACCORDING TO THE FOLLOWING SCHEDULES:

A) STEEL FOR WALLS AND SLABS

REINFORCEMENT EACH WAY

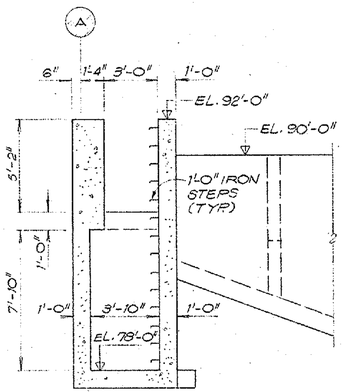
THICKNESS	SIZE	SPACING	POSITION
6	10M	12 C/C	ON ℄
8	15M	12 C/C	ON ℄
10	15M	12 C/C	EF
12	15M	12 C/C	EF
14	15M	12 C/C	EF
16	20M	12 C/C	EF
18	20M	12 C/C	EF
20	20M	12 C/C	EF

MASS CONCRETE SHALL BE REINFORCED WITH 15M BARS AT 12" MINIMUM IN ALL FACES.

B) 10M @ 18" SHALL BE USED AS TRANSVERSE TIES IF NO OTHER REINFORCING IS NOTED.

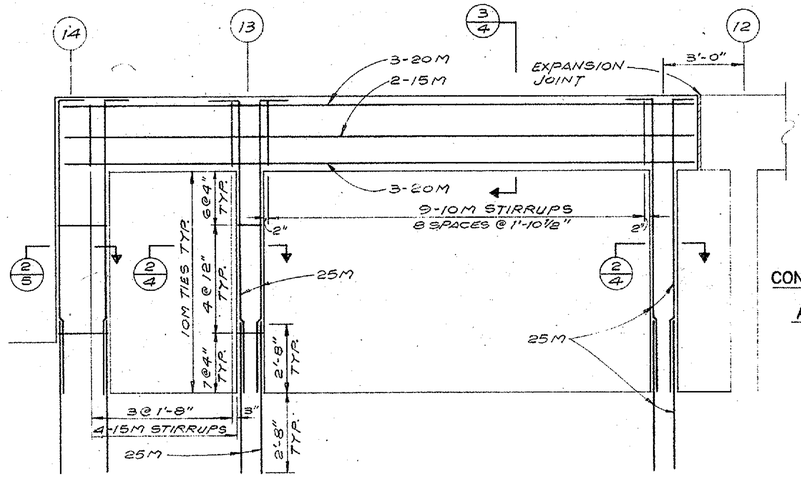
4. CONCRETE COVER: CONCRETE COVER OF REINFORCING BARS, IF NOT SPECIFIED ON THE DRAWINGS, SHALL BE AS FOLLOWS OR SHALL BE EQUAL TO THE DIAMETER OF THE MAIN REINFORCING BAR IT COVERS, WHICHEVER IS LARGER:

	CONDITION	SPECIFIED COVER (inches)
A)	CONCRETE CAST AGAINST GROUND	3
B)	CONCRETE EXPOSED TO EARTH, LIQUIDS OR WEATHER	
	i 20M BARS OR LARGER	2
	ii 10M AND 15M BARS	1½
C)	CONCRETE SLABS OR WALLS NOT EXPOSED TO EARTH, LIQUIDS OR WEATHER	¾
D)	CONCRETE BEAMS OR COLUMNS	2



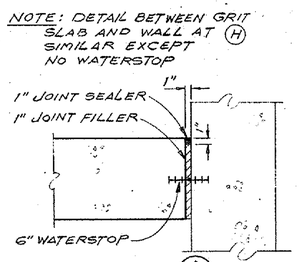
SECTION 5/3

1/4" = 1'-0"



BEAM AND COLUMNS AT LINE (L)

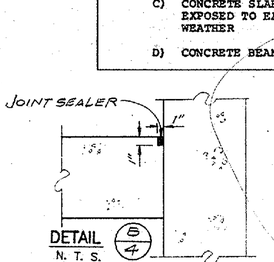
3/8" = 1'-0"



DETAIL A/4

N. T. S.

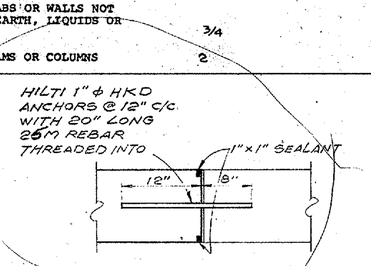
CONTROL JOINT BETWEEN GRIT TANK BOTTOM SLAB AND WALLS AT BAYLINE 14' 12' & L



DETAIL B/4

N. T. S.

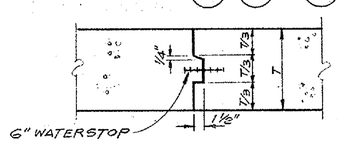
CONSTRUCTION JOINT BETWEEN GRIT TANK COLLECTOR TROUGH AND WALLS AT 12 & J



WALL SHEAR BOLT

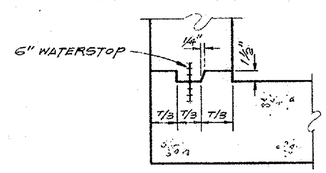
DETAIL C/3 C/5

N. T. S.



VERTICAL CONSTRUCTION JOINT FOR WALLS

N. T. S.



HORIZONTAL CONSTRUCTION JOINT FOR WALL ON SLAB

N. T. S.

N-INT-212

W.S.B. 112225 REVISIONS	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION	ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED JWCB
DRAWN VB/R.S.
CHECKED JWK BW

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
B Walker 4 July 89

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO W.P.C.C.
CONSTRUCTION OF STAGE II EXPANSION – PHASE II
GRIT TANK No.3 DETAILS

SCALE: AS SHOWN S
DRAWING No. 122.72.4
SHEET 4 OF 21 ISSUE A

N-INT-214

CONTROL JOINT

PRIMARY SEDIMENTATION TANK NO.1

PRIMARY SEDIMENTATION TANK NO.2

4'-6" (TYP.)

TO SUIT MECHANICAL EQUIP REQUIREMENTS (TYP) *

EXIST. CHLORINE CONTACT TANK

(NEW PRIMARY SEDIMENTATION TANK NO. 3)

WALL TO WALL 144'-0"

TEMPORARY 6"Ø HOLE, INV. FLUSH WITH CHANNEL SLAB

OPENINGS TO SUIT MECHANICAL EQUIP. REQUIREMENTS (TYP)*

1/8" / FOOT (TYP)

CONC. WALL SEE TYP. DETAIL 4/12

EXIST. MH 2

GATE No 4 — GATE No 13 — GATE No 14 — GATE No 5

GATE NO. C

REMOVE EXIST. TEMPORARY WALL

GATE No 6

PLUG EXIST. DRAIN PIPE WITH CONC.

CORE HOLE THROUGH WALL AND GROUT WITH QUICK SETTING GROUT

1/8" / FT.

GR. EL. 85'-2 1/2" (TYP)

GRATING (TYP.)

10'4 OPENING

12"x12" COLUMN

10"Ø OPENING FOR CLEANOUT - SEE 3/8

OPENING TO SUIT* MECH. EQUIPMENT

EXIST. WEIR WALL

REMOVE THIS TEMPORARY CONC. WALL. LEAVE STEEL BEAM INTACT

GRIT TANK NO. 1

GRIT TANK NO. 2

GRIT TANK NO.3

GATE No25
GATE No26

GATE No.23
GATE No.24

1/8" FT.

GR. EL. 85'-2 1/2

CONTROL JOINT

KEY, BITUMINUS PAINT AND IGAS JOINT FILLER ALL AROUND (TYP.)

CONTROL JOINT

1" JOINT FILLER

GATE No 2
GATE No 1

UTILITY STATION (TYP FOR 2) MOUNTED ON HANDRAIL - SEE DETAIL J/14

REMOVE EXIST. TIMBER FLAP GATE AND RELOCATE TO EAST END OF CHANNEL

2" PROCESS WATER (LOCATE 12" BELOW TOP OF WALL AND SECURE TO WALL WITH PIPE BRACKETS TO SUIT)

NEW GRATING, SEE F/14

2" RWL

REMOVE THIS SECTION OF WALL

12"x12" COLUMNS FOR STEEL STEPS THIS AREA SEE SHEET 14

GATE NO. A
GATE NO. B

EXIST. MH 3

12"x18" COLUMNS

12"x18" COLUMNS

WALKWAY CLADDING AND HANDRAIL DETAILS OMITTED TO PRESERVE CLARITY - SEE SHEET 14

LEGEND

▨ - TEMPORARY CONC. WALLS.

* - VERIFY DIMENSIONS PRIOR TO POURING CONCRETE.

PLAN

ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

ISSUE	DATE	DR'N	CH'D	APP'D	DESCRIPTION

DESIGNED JWCB
DRAWN VB
CHECKED TWB PW

DAYTON & KNIGHT LTD.
CONSULTING ENGINEERS
RWalton 4 July 93

REGIONAL DISTRICT OF NANAIMO
GREATER NANAIMO W.P.C.C.
CONSTRUCTION OF STAGE II EXPANSION – PHASE II
GRIT TANK No.3 DETAILS

SCALE: 1/4" = 1'-0" M
DRAWING No. 122.72.4
SHEET 6 OF 21 ISSUE A

N-INT-214

APPENDIX B

EXISTING PLANT REFERENCE PHOTOS



1. GNPCC grit tanks, looking southeast – No. 1 Grit Tank in foreground.



2.GNPCC grit tanks, looking east – No. 1 Grit Tank in foreground.



3. GNPCC grit tanks, looking northeast – No. 1 Grit Tank in foreground.



4. GNPCC No. 3 Grit Tank, looking northwest.



5. GNPCC grit tanks, looking northwest – No. 3 Grit Tank in foreground.



6. GNPCC grit tanks, looking southwest – No. 3 Grit Tank in foreground



7. No. 1 Grit Tank primary drive.



8. No. 2 Grit Tank primary drive.



9. No. 3 Grit Tank primary drive.



10. No. 3 Grit Tank primary drive - closeup.



11. No. 2 Grit Tank open for inspection – view looking southeast.



12. No. 2 Grit Tank open for inspection – view looking southwest.



13. No. 2 Grit Tank cross collector, looking west.



14. No. 2 Grit Tank cross collector closeup, east (tailshaft) end.



15. No. 2 Grit Tank cross collector closeup, looking west.



16. No. 2 Grit Tank cross collector closeup, looking west.



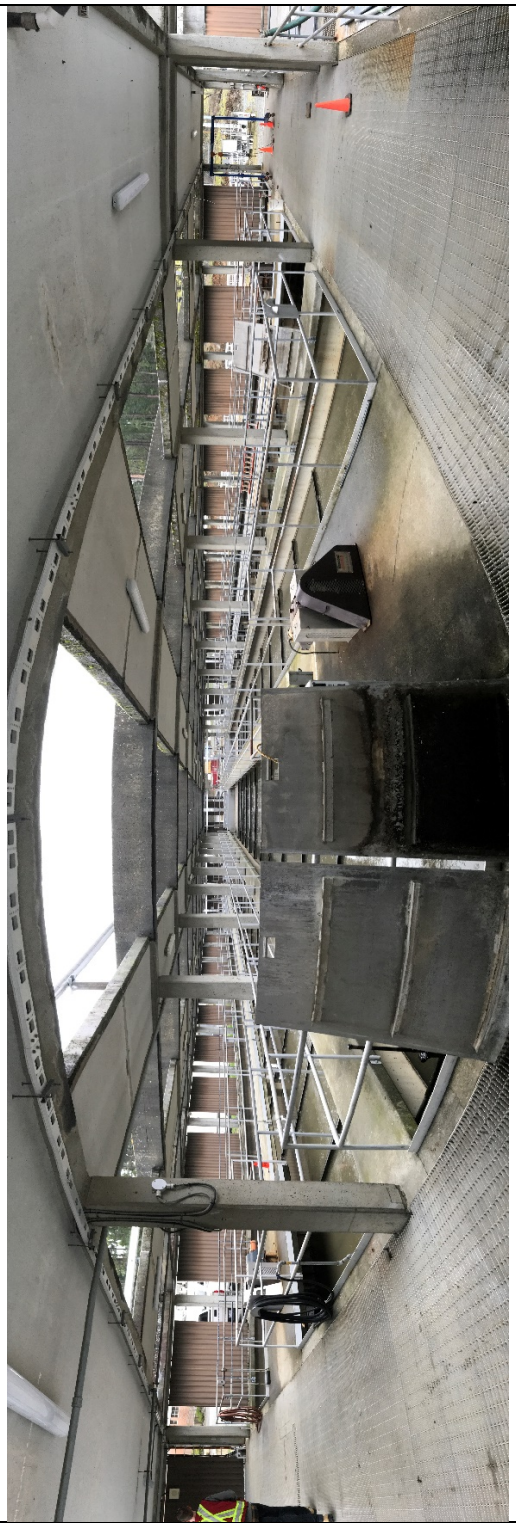
17. No. 2 Grit Tank cross collector closeup, west (headshaft) end.



18. No. 2 Grit Tank cross collector, looking east from headshaft end.



19. No. 2 Grit Tank cross collector, looking east.



1. Panorama view over inlet end of No's 1, 2 & 3 Primary Sedimentation Tanks, looking north (No. 1 at far left, No. 3 at far right).



2. Panorama view over discharge end of No's 1, 2 & 3 Primary Sedimentation Tanks, looking south (No. 1 at far right, No. 3 at far left).



3. View over discharge end of No. 1 Primary Sedimentation Tank looking southeast.



4. View over discharge end of No. 3 Primary Sedimentation Tank looking southwest.



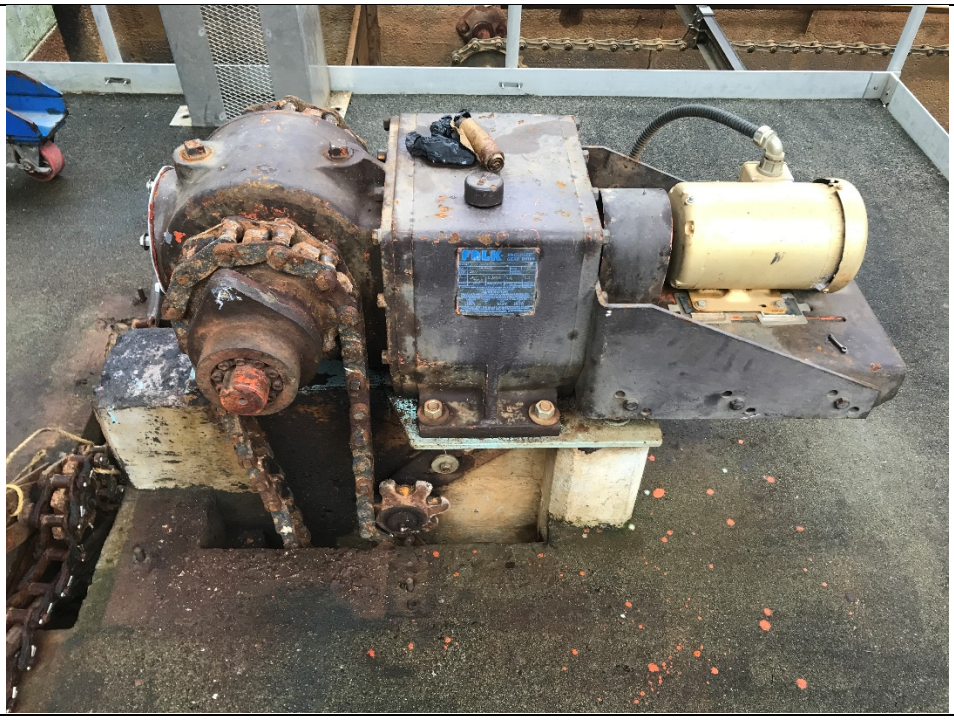
5. No. 1 Primary Sedimentation Tank drive.



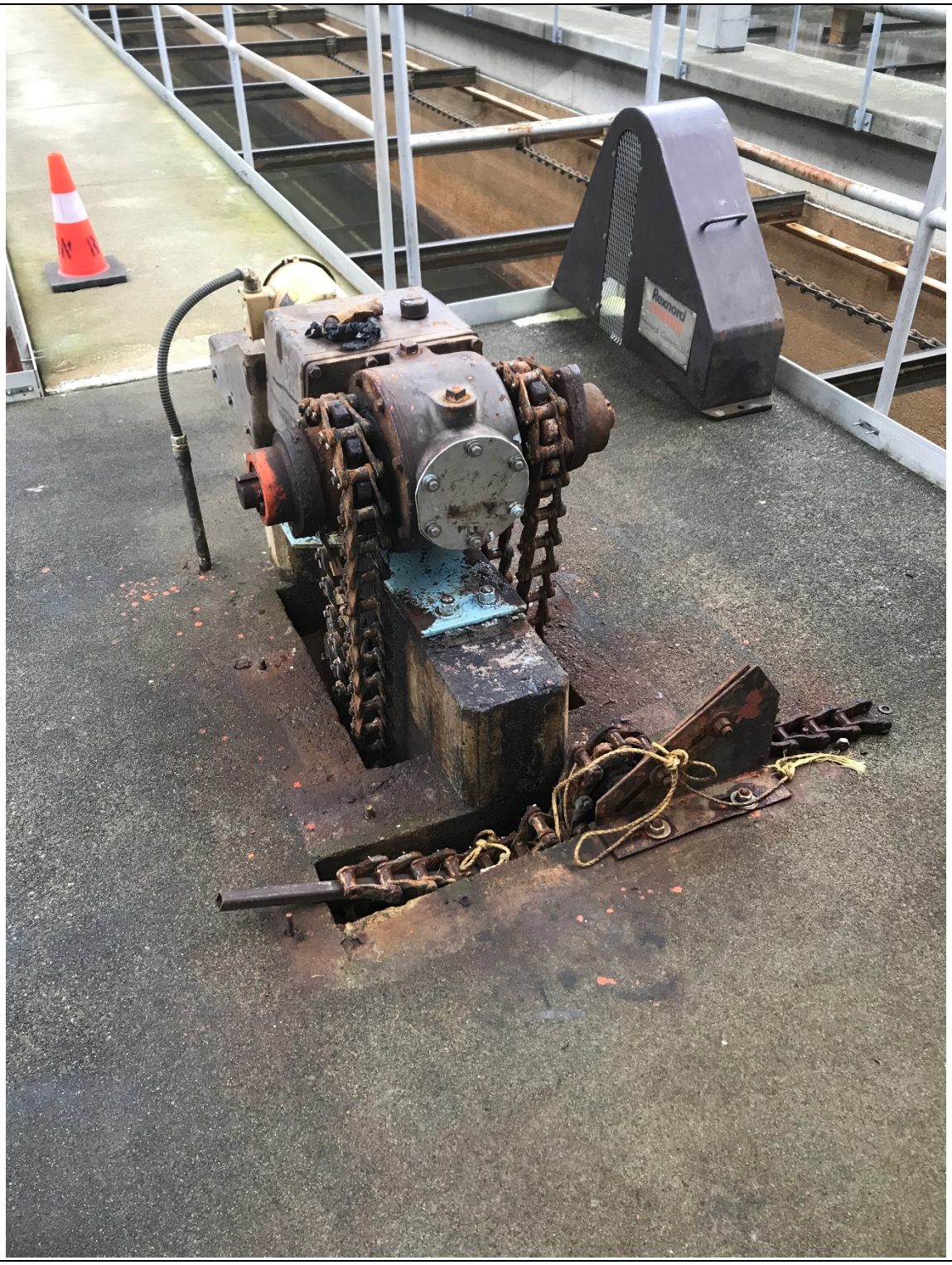
6. No. 1 Primary Sedimentation Tank drive closeup.



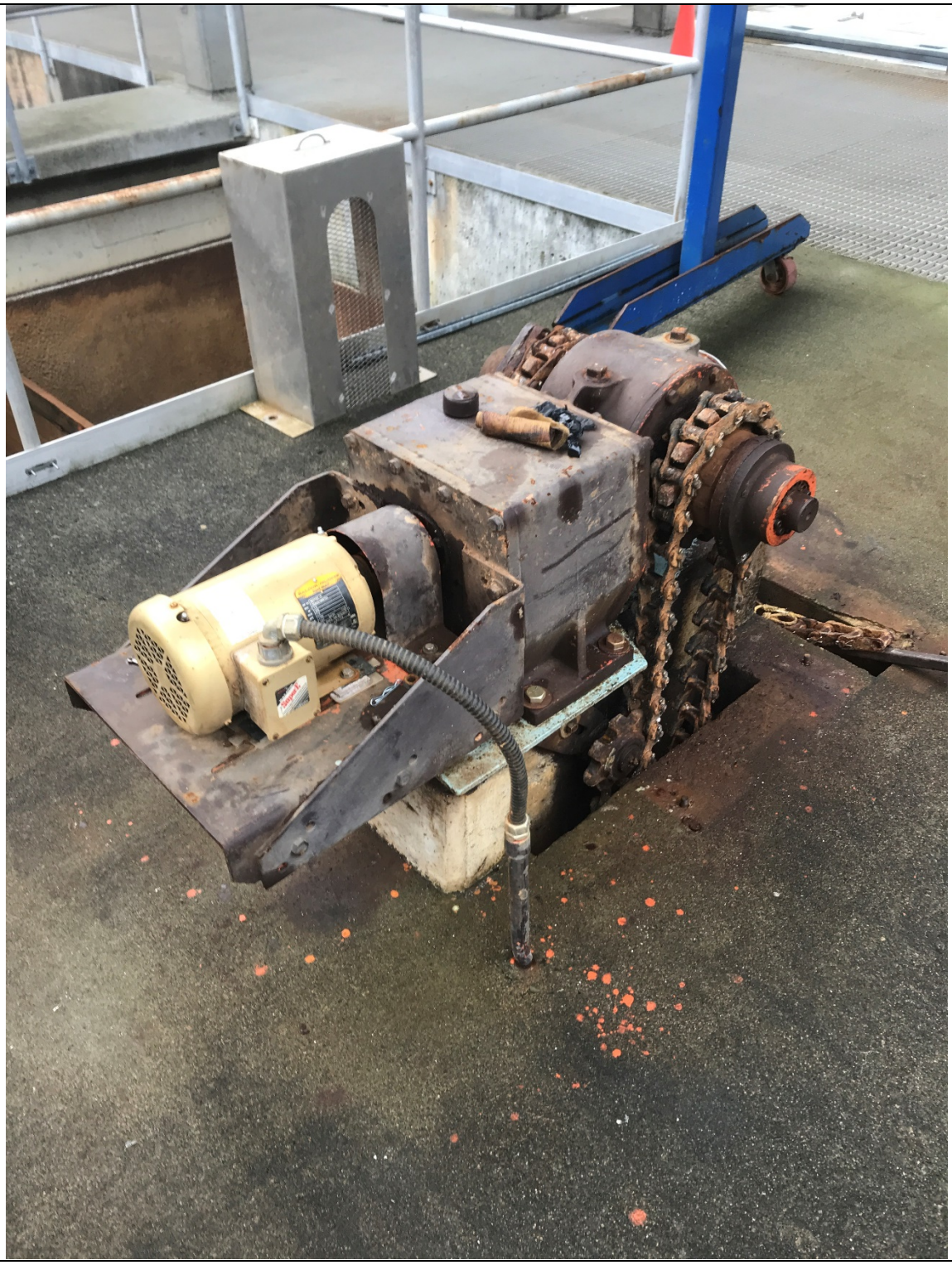
7. No. 2 Primary Sedimentation Tank drive



8. No. 2 Primary Sedimentation Tank drive closeup, looking west (cross collector drive shaft/sprocket removed for maintenance).



9. No. 2 Primary Sedimentation Tank drive closeup, looking northeast (cross collector drive shaft/sprocket removed for maintenance).



10. No. 2 Primary Sedimentation Tank drive closeup, looking southeast (cross collector drive shaft/sprocket removed for maintenance).



11. No. 3 Primary Sedimentation Tank drive.



12. No. 3 Primary Sedimentation Tank drive closeup



13. No. 2 Primary Sedimentation Tank cross collector (east end).



14. No. 2 Primary Sedimentation Tank cross collector (east end).



15. No. 2 Primary Sedimentation Tank cross collector (west end).



16. No. 2 Primary Sedimentation Tank cross collector (west end).



17. No. 2 Primary Sedimentation Tank east longitudinal sludge collector.



18. No. 2 Primary Sedimentation Tank west longitudinal sludge collector.



19. No. 2 Primary Sedimentation Tank east longitudinal sludge collector headshaft end.



20. No. 2 Primary Sedimentation Tank west longitudinal sludge collector headshaft end.



21. No. 2 Primary Sedimentation Tank east longitudinal sludge collector tailshaft end.



22. No. 2 Primary Sedimentation Tank west longitudinal sludge collector tailshaft end.



23. No. 2 Primary Sedimentation Tank east longitudinal sludge collector - tailshaft visible below discharge weir box.



24. No. 2 Primary Sedimentation Tank west longitudinal sludge collector - tailshaft visible below discharge weir box.



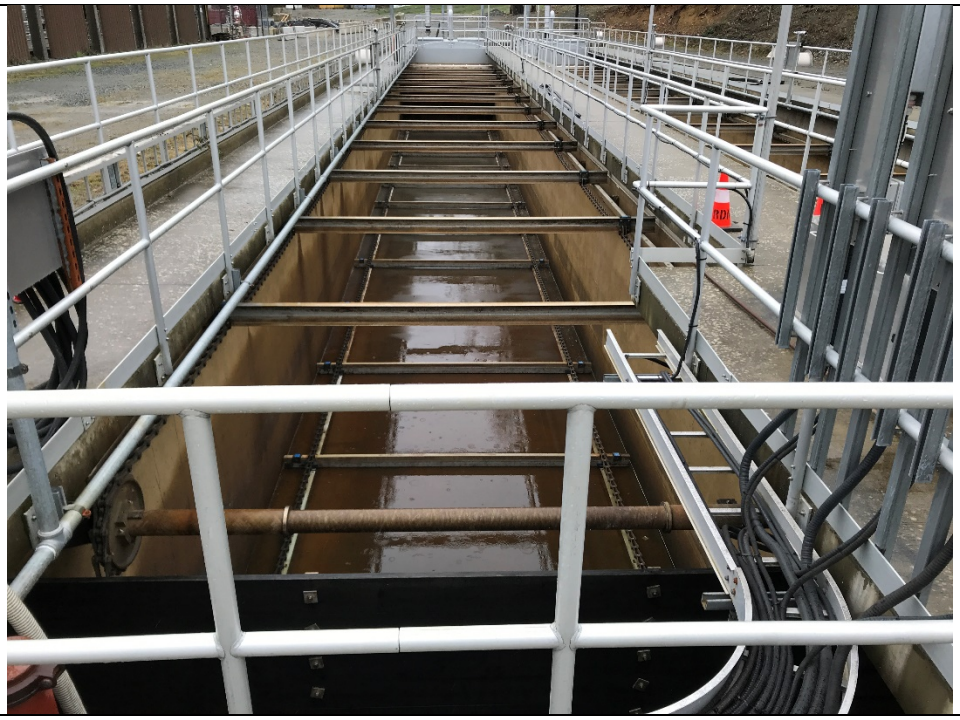
25. No. 4 Primary Sedimentation Tank east longitudinal sludge collector.



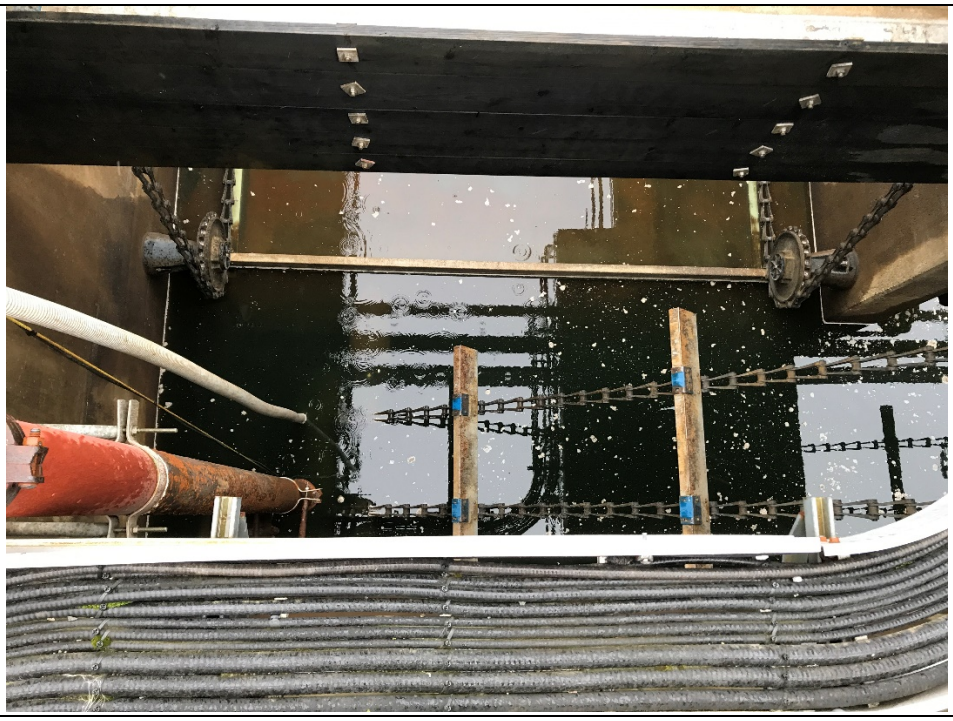
26. No. 4 Primary Sedimentation Tank cross collector (east end).



27. No. 4 Primary Sedimentation Tank east longitudinal sludge collector headshaft end.



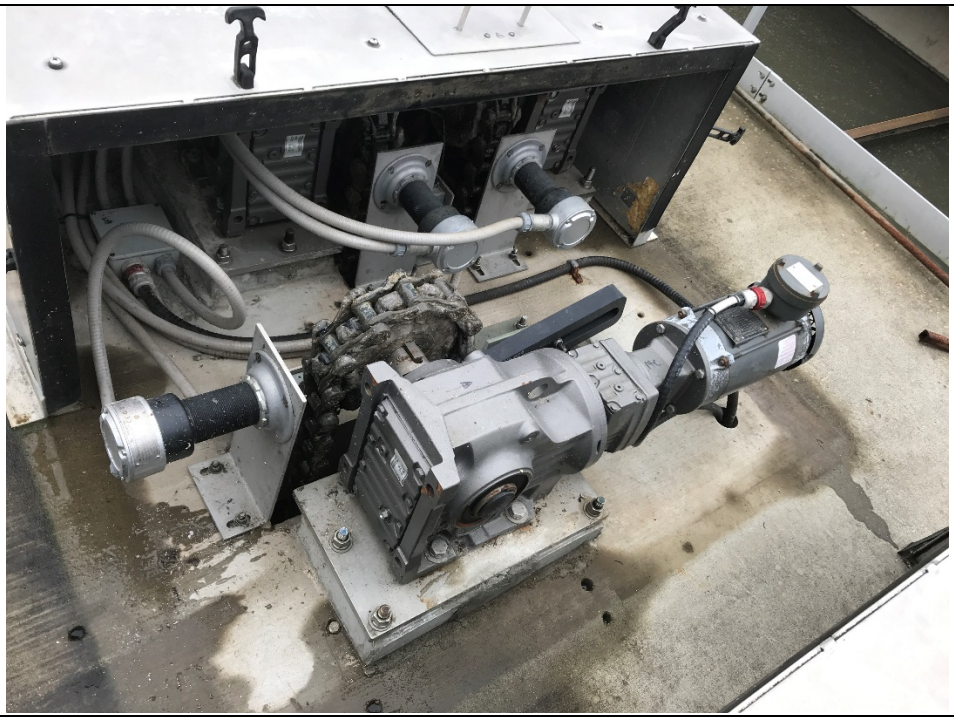
28. No. 4 Primary Sedimentation Tank west longitudinal sludge collector.



29. No. 4 Primary Sedimentation Tank cross collector (west end).



30. No. 4 Primary Sedimentation Tank west longitudinal sludge collector headshaft end.



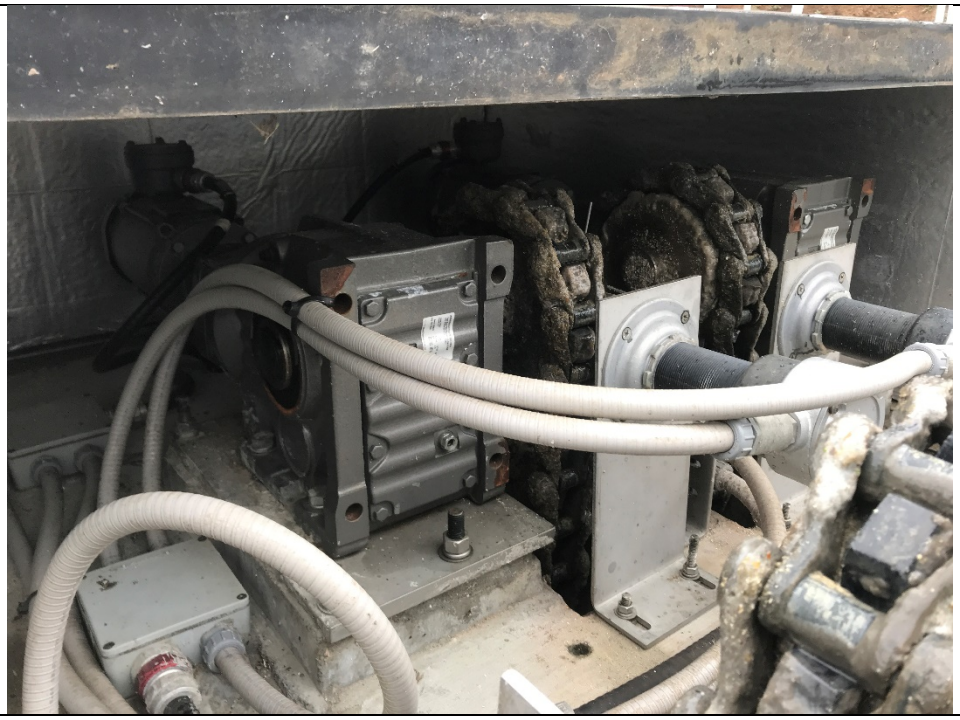
31. No. 4 Primary Sedimentation Tank collector drives (1 crossflow and 2 longitudinal = 3 total).



32. No. 4 Primary Sedimentation Tank cross collector drive gearmotor.



33. No. 4 Primary Sedimentation Tank cross collector drive gearmotor name plate.



34. No. 4 Primary Sedimentation Tank longitudinal collector drive gearmotors.



35. No. 4 Primary Sedimentation Tank east longitudinal collector drive gearmotor name plate.

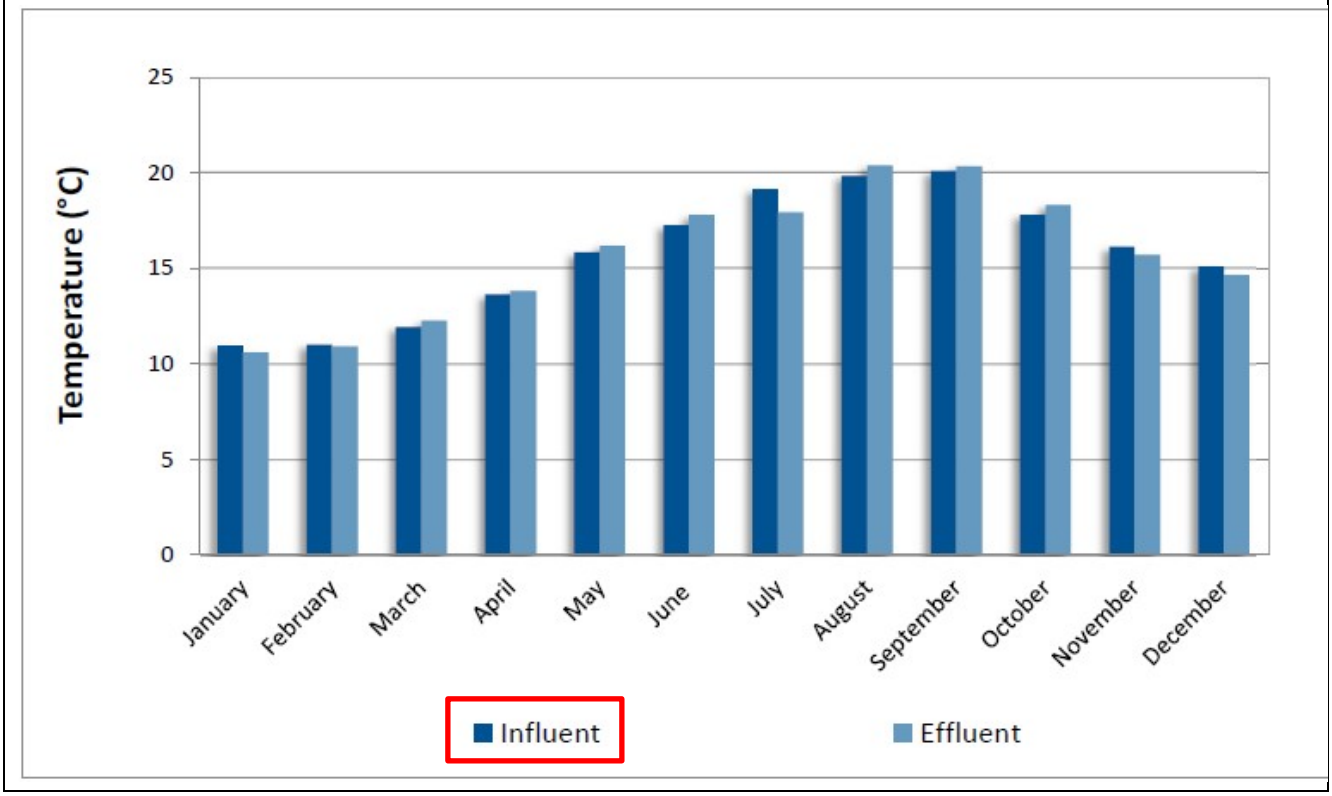
APPENDIX C

FLUID DESIGN CRITERIA

GNPCC Maintenance Job: Grit & Sedimentation Tanks Refurbishment

Screened Raw Sewage Design Criteria – January 27, 2022 – Rev1

General Criteria			
Fluid description	Screened raw sewage - influent (SRS)		
Primary chemical parameters:	See list page 2		
Trace elements/compounds:	See list page 3		
Process chemicals:	Ferrous chloride, 0.022 millilitre/litre SRS (added to influent flow before screens)		
Detailed Criteria	**Design Average**	**Minimum**	**Maximum**
Fluid flow rate (m3 per day)	29,500	21,100	92,200
Fluid specific gravity	1.01	1.0	1.02
Fluid pH	7.4	6.2	7.5
cBOD5 (mg/litre)	250	100	400
Ammonia Nitrogen (mg/litre)	42	15	60
Fluid solids* (mg/litre)	405	100	1,400
* Total suspended solids (“soft” and “hard”)			
Fluid temperature* (deg. C)	16.5	10	23
* See monthly averages below			



Primary Chemical Parameters of SRS Influent to GNPCC (historical trends)											
Parameter	**Units**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
pH	-	7.38	7.56	7.36	7.16	7.17	7.63	7.29	7.22	7.22	7.51
Total Alkalinity	mg/L	181.5	133	172	176	133	153	153	128	214	157
Dissolved Chloride	mg/L	135	131	183	277	158	165	150	133	220	104
Total Kjeldahl Nitrogen	mg/L	37.5	34.5	48.0	28.6	36.5	45.6	37.3	40.4	45.7	35.7
Total Oil and Grease	mg/L	8	7.5	16.2	35.0	19.5	8.1	7.9	4.9	14.8	<9.6
Dissolved Sulphate	mg/L	35.8	43.4	60.0	67.0	45.7	51.7	48.3	52.8	69.7	42
Dissolved Sulphide (total)	mg/L	0.062	0.0447	0.1528	<0.05	0.08	0.059	0.082	0.064	0.100	0.053
Total Cyanide	mg/L	0.0036	0.0092	0.0080	0.0060	0.0040	0.0017	0.0015	<0.0050	0.0058	<1.86
Dissolved Fluoride	mg/L	0.05	0.044	0.094	0.100	0.105	0.051	0.043	0.037	0.109	<0.085
Total Organic Carbon	mg/L	36	41	52	63	64	33	47	33	35	25
Total Phosphorus	µg/L	3,075	2,745	2,140	3,500	2,415	2,845	3,125	2,770	2,680	2,510

Trace Elements/Compounds in SRS Influent to GNPCC cont'd (at June 2, 2020)

2020 GNPCC INFLUENT		
Parameter	Unit	02-Jun-20
pH	pH Units	6.20
Chloride	mg/L	136
Total Kjeldahl Nitrogen / TKN	mg/L	61.7
Oil and Grease (total)	mg/L	49.7
Sulphate	mg/L	26.6
Fluoride	mg/L	0.10
Nirate (as N)	mg/L	<0.010
Nitrite (as N)	mg/L	0.164
Total Organic Carbon / TOC	mg/L	39.8
Phosphorus (total)	mg/L	8.86
Sulphide (total)	mg/L	0.15
Cyanide (total)	mg/L	0.0234
Polychlorinated Biphenyls / PCBs	ug/L	<0.210
Total Phenols (tested June 16, 2020)	mg/L	0.23
METALS Scan by ICP		
Aluminum (total)	ug/L	467
Arsenic (total)	ug/L	0.83
Barium (dissolved)	ug/L	<5.0
Boron (dissolved)	ug/L	181
Cadmium (dissolved)	ug/L	0.023
Chromium (total)	ug/L	6.65
Cobalt (dissolved)	ug/L	0.67
Copper (dissolved)	ug/L	17.4
Iron (dissolved)	ug/L	1,090
Lead (total)	ug/L	4.43
Manganese (dissolved)	ug/L	59.7
Mercury (total)	ug/L	<0.010
Molybdenum (total)	ug/L	2.95
Nickel (dissolved)	ug/L	3.05
Selenium (total)	ug/L	0.67
Silver (total)	ug/L	0.395
Tin (total)	ug/L	1.26
Zinc (total)	ug/L	181
VOC Scan		
Chloroform	ug/L	2.6
Dichloromethane	ug/L	<3.0
Chloromethane	ug/L	<6.0
Tetrachloroethylene	ug/L	<1.0
1,1,1-Trichloroethane	ug/L	<1.0
1,1,2-Trichloroethane	ug/L	<1.0
Trichloroethylene	ug/L	<1.0
Benzene	ug/L	<0.5
Toluene	ug/L	<1.1
Ethylbenzene	ug/L	<1.-0
Naphthalene	ug/L	<5.0
Phthalate Esters		
Di(2-ethylhexyl)phthalate	ug/L	NT
Di-n-Butylphthalate	ug/L	NT

APPENDIX D

STRUCTURAL STEEL COATING SPECIFICATION

REGIONAL DISTRICT OF NANAIMO

STRUCTURAL STEEL COATING SPECIFICATION

Indoor Wastewater Service Applications

Revision 0

December 30, 2021

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1. Part One - General

1.1. Summary

This document serves as the governing specification for the surface preparation, shop coating application and field touch up repair for indoor carbon steel structures in immersed, semi-immersed and intermittently immersed wastewater service.

1.1.1. All material product data sheets and manufacturers' recommended procedures and application specifications shall also form part of the requirements of this specification.

1.1.2. Approved coating system alternatives are summarized in Appendix 1. The work will generally include the following:

- Performing initial surface preparation operations.
- Performing surface finishing to welds, edges, and appurtenances.
- Performing final surface preparation operations
- Removal of spent abrasive media & debris from surfaces prior to coating application.
- Application of coating materials, including touch-up where necessary.
- Performing and documenting all Quality Control Inspections.

1.2. References

The latest approved editions of the following codes and standards shall form an integral part of this specification. It is the responsibility of the Vendor to obtain the most recent revisions of the documents listed below, unless specified otherwise.

American Society for Testing and Materials

- ASTM D4285: Standard Test Method for Indicating Oil or Water in Compressed Air
- ASTM D4414: Standard Test Method for Measurement of Wet Film Thickness using Notch Gages
- ASTM D4417: Standard Test Method for Field Measurement of Surface Profile of Blast Cleaned Steel

Association for Materials Protection and Performance (AAMP)

Note: AAMP is formerly Steel Structural Painting Council / Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) / NACE International, The Corrosion Society)

- NACE SP0178: Standard Practice Fabrication Details, Surface Finish Requirements, and Proper Design Considerations for Tanks and Vessels to Be Lined for Immersion Service
- NACE SP0188: Standard Practice Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates
- SSPC-AB 1: Abrasive Standard No. 1 - Mineral and Slag Abrasives
- SSPC-AB 2: Abrasive Standard No. 2 - Cleanliness of Recycled Ferrous Metallic Abrasives
- SSPC-AB 3: Abrasive Standard No. 3 - Ferrous Metallic Abrasive
- SSPC-VIS 1: Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
- SSPC-SP 1: Surface Preparation Specification No. 1 - Solvent Cleaning

- SSPC-SP 2: Surface Preparation Specification No. 2 - Hand Tool Cleaning
- SSPC-SP 3: Surface Preparation Specification No. 3 - Power Tool Cleaning
- SSPC-SP 10/NACE No. 2: Joint Surface Preparation Standard - Near-White Metal Blast Cleaning
- SSPC-SP 11: Surface Preparation Specification No. 11 - Power Tool Cleaning to Bare Metal
- SSPC-PA 1: Paint Application Specification No. 1 - Shop, Field and Maintenance Coating of Metals
- SSPC-PA 2: Paint Application Specification No. 2 - Procedure for Determining Conformance to Dry Coating Thickness Requirements
- SSPC-PA 11: Paint Application Guide No. 11 - Protecting Corners, Edges, Crevices, and Irregular Steel Geometries by Stripe Coating
- SSPC-PA Guide 10: Paint Application Guide No. 10 - Guide to Safety and Health Requirements for Industrial Painting Projects

1.3. Definitions

1.3.1. The term Coating is used in this specification to mean the material provided by the coating manufacturer, to be applied to the service outlined in Part 1 above.

1.3.2. Coating Manufacturer shall mean the Manufacturer of the Coating (preferred) or their authorized technical representatives (Coating Supplier and or Distributor).

1.3.3. Quality Assurance Inspector shall mean a NACE Certified Coating Inspector Level 3 retained by RDN.

1.3.4. Quality Control Inspector shall mean a NACE Certified Coating Inspector Level 1 or 2 retained by the Vendor.

1.3.5. RDN shall mean the representative or agent of the Regional District of Nanaimo authorized with responsibility for the work being performed under the project named in the contract documents.

1.3.6. Vendor shall mean a company or individual contracted to perform specific work or services for RDN.

1.4. Submittals

1.4.1. The selected Vendor must supply the following submittals within 14 calendar days after contract award:

1.4.1.1. An Inspection and Testing Plan (ITP) indicating the quality control measures to be performed, the test methods used, frequency at which the testing will be performed and acceptance criteria. Refer to the quality control requirements in this specification outlined below.

1.4.2. The Vendor shall not commence work until the ITP has been developed, approved the RDN, and reviewed with the Vendor by the Quality Assurance Inspector.

1.4.3. Prior to receiving payment, the Vendor shall provide RDN with completed, signed and dated set of Quality Control Reports. Section 1.5 describes Quality Control Reporting requirements.

1.5. Quality Control

1.5.1. The Vendor is responsible for the quality of all work performed and for assuring compliance with these specifications. Vendor is responsible to stop operations and promptly notify RDN when conditions develop which could adversely affect the quality of the work.

1.5.2. The Vendor shall follow the project-specific Inspection and Test Plan (ITP) as described in Section 1.4.1.1.

1.5.3. The Vendor shall maintain Quality Control Reports and allow RDN to view any such documentation at any time during the project, as well as provide copies to RDN on a weekly basis at a minimum.

1.5.4. The Vendor will perform and document the following Quality Control Inspections at a minimum. Additional testing may be requested at the discretion of RDN.

1.5.4.1. Prior to commencement of abrasive blast cleaning, all areas to receive coating shall be inspected and if necessary, be prepared in accordance with NACE SP0178 Condition D. Sharp edges shall have a smooth radius of at least 3.2 mm (1/8 in).

1.5.4.2. Prior to commencement of abrasive blast cleaning, all areas to receive coating shall be prepared in accordance with SSPC-SP 1. Solvent in this definition is inclusive of water as well as chemical-based products.

1.5.4.3. The steel surface temperature, ambient air temperature, humidity and dew point shall be verified at a minimum of every 4 hours and always immediately before coating application.

1.5.4.4. Compressor air supply shall be tested for cleanliness daily in accordance with ASTM D4285.

1.5.4.5. Surface cleanliness shall be evaluated prior to coating application. SSPC-VIS 1 may be used to assist in evaluation of the prepared surfaces; however, the written surface preparation standards shall prevail.

1.5.4.6. Surface profile depth shall be verified prior to the application of coating in accordance with ASTM D4417, Method C.

1.5.4.7. The Vendor shall monitor and record coating material batch numbers and material temperatures immediately prior to mixing any coating materials. Any induction times required by the coating products shall be documented, including length of time mixing and quantity of material mixed.

1.5.4.8. Wet Film Thickness (WFT) shall be performed during application in accordance with ASTM D4414 as required to achieve acceptable Dry Film Thickness.

1.5.4.9. Dry Film Thickness (DFT) verification shall be performed accordance with SSPC-PA 2. The Vendor shall make adjustment accordingly to ensure the final DFT meets SSPC-PA 2 restriction level 2. DFT shall not exceed the maximum limits as per the Coating Manufacturer's recommendations.

1.5.4.10. Discontinuity (holiday) testing shall be performed after cure of the topcoat in accordance with NACE SP0188 (High-Voltage), Voltage Selection per Section 4, Table 1. Any holidays shall be repaired and re-tested.

1.6. Quality Assurance

1.6.1. In addition to the Vendor's inspections, RDN or their designated representative(s) may perform any inspection necessary to verify compliance with this specification.

1.6.1.1. Inspection may include all work, equipment, inspection equipment, materials, or procedures and may be conducted at the discretion of RDN.

1.6.2. The Vendor shall provide RDN or their designated representative(s) safe access to all work areas for purpose of inspection.

1.6.3. The Vendor shall provide RDN or their designated representative(s) sufficient time within the work schedule to perform inspections identified on the ITP as described in Section 1.4.1.1.

1.6.4. The Vendor shall correct any work that RDN has determined to be in non-compliance with the requirements of this specification. Corrections shall be made without additional cost to RDN.

1.6.5. The failure of RDN or the Quality Assurance Inspector to discover or reject defective work or materials does not constitute acceptance of such work or materials by RDN.

1.6.6. The provisions of this specification shall also apply to any work performed by subcontractors to the Vendor.

1.7. Delivery, Storage and Handling

1.7.1. Coating materials shall be delivered in the original, sealed and undamaged containers bearing the product name, date of manufacture, date of expiration and batch numbers.

1.7.2. Store all project materials in their original containers with their original labels visible and readable. All coating materials shall be stored in a clean, dry, well-ventilated area, protected from sparks, flame, direct rays of the sun and heat or cold. If stored on a concrete floor the material shall be elevated (e.g. on a pallet) while being stored. Storage conditions shall be as specified by the Coating Manufacturer's recommendations.

1.7.3. Do not use materials which have exceeded their shelf life or which have deteriorated in storage.

1.7.4. The Vendor shall have latest copies of the Coating Manufacturer's product data sheet and SDS for all materials on-site. In accordance with WHMIS regulations, suitable labelling of coating and solvent containers must be provided.

1.8. Sequencing and Scheduling

1.8.1. The Vendor shall complete all work within the schedule as provided by RDN.

2 Part Two - Products

2.1. Cleaning Materials

2.1.1. Supply all abrasive and any abrasive additives required.

2.1.2. Provide RDN with certificates indicating compliance with SSPC-AB 1 or AB 3 for the abrasive media prior to project start.

2.1.3. The abrasive selected shall be capable of imparting a sharp and angular profile.

2.1.4. The abrasive supplied shall be of sufficient size to achieve the cleanliness and surface profile requirements of the surface preparation specification.

2.1.5. All abrasives selected shall have <1% free silica (Class A) and shall not contain any hazardous toxic materials, or foreign matter.

2.1.6. Any recycling of ferrous abrasives shall satisfy the requirements of SSPC-AB 2.

2.2. Coating and Materials

2.2.1. The Vendor shall supply all cleaning materials, coating materials, curing agents and thinners.

2.2.2. Coating systems or products from one manufacturer shall not be mixed with coating systems or products from another manufacturer.

2.2.3. Substitution of materials is not permitted. All coating materials shall be as specified by Coating Manufacturer's Recommendations for the coating system, including equipment wash, tool cleaner and any internal storage lubricants that may be required.

2.2.4. Each coat in a multi-coat system shall be of a different colour when supported by manufacturer's product line.

2.2.5. Final finish colour must be approved by RDN prior to application.

2.3. Labour, Supervision and Equipment

2.3.1. The Vendor shall furnish all labour, materials, supervision and equipment necessary to complete the work. This includes but is not limited to providing safe access to all work areas, containment, pre cleaning; surface preparation, coating application, heating, dehumidification, ventilation, and curing of applied materials.

2.3.2. It is the responsibility of the Vendor to meet the requirements of this specification in its entirety, to use equipment capable of meeting these requirements, supply adequately trained and experienced staff to perform the requirements, and to perform all inspections necessary to ensure compliance prior to inspection by RDN.

2.3.3. It is the responsibility of the Vendor to perform all work in a manner meeting the requirements of all local, provincial and federal regulations applicable to each activity.

3 Part Three - Execution

3.1 Pre-Job Conference

3.1.1. A Pre-Job conference shall be held prior to commencing any work on the project. Mandatory attendance is required of the Vendor, the Quality Assurance Inspector, the Quality Control Inspector and RDN's representative or agent.

3.1.1.1. The Pre-Job conference, location, date & time shall be established by RDN after receipt of Vendor submittals as required in Section 1.4.

3.2 Field Work

3.2.1. The Vendor shall notify RDN immediately if there are any as-found defects or if the configuration of the application area will prevent the requirements of this specification from being satisfied.

3.2.2. The Vendor is responsible for preventing damage to the local application area, surrounding structure and environment while conducting operations as required under the specification.

3.2.2.1. Areas within or outside of the work scope that receive damage from the Vendor's installation, or field repair activities shall be repaired at the Vendor's expense.

3.3 Conflicting Information

3.3.1. In the event of conflict between the Specification, purchase order, Coating Manufacturer's product data sheets, or any other supplemental specifications or standards, the Vendor shall notify RDN in writing of the basis of the conflict.

The Vendor shall follow the more stringent requirements of the conflict until clarification is provided by RDN.

3.4 Coating Manufacturer Requirements

3.4.1. The Coating Manufacturer is required to provide on-site evaluations of the work being done, at RDN's request. The Coating Manufacturer may be required to provide the following technical assistance:

3.4.1.1. Be on site when coating application begins and visit the site periodically during application.

3.4.1.2. Respond to any technical requests or application problems, in writing, as requested by RDN.

3.5 Pre-Surface Preparation

3.5.1. Prior to surface preparation, the Vendor shall perform surface finishing of welds, edges, and surface irregularities to ensure all welds meet or exceed NACE SP0178 Condition D surface finish. Sharp edges shall be ground to a smooth radius of at least 3.2 mm ($^1/_8$ in).

3.6 Surface Preparation – General

3.6.1. All foreign material and debris generated during or deposited after completion of surface preparation and cleaning shall be removed prior to applying any coating materials.

3.6.2. All air supply used during surface preparation activities or in the cleaning of surfaces of debris and spent abrasive prior to coating must be clean, dry and free from oil per ASTM D4285. The Vendor is responsible to provide all necessary equipment to ensure air quality meets this requirement.

3.6.3. All areas cleaned to the surface preparation requirements shall be coated within 8 hours or the prepared surface deteriorates.

3.6.3.1. Regardless of any time limits, all surfaces to receive coating are meet the requirements of Section 3.7.2 immediately prior to coating application.

3.7 Surface Preparation – Specific, Shop Work

3.7.1. The surface profile shall be dense, sharp and angular, with a depth as specified on the Coating Manufacturer's product data sheet.

3.7.1.1. The Vendor shall correct any surface profile found to be in non-compliance with the requirements of this specification. Corrections shall be made without additional cost to RDN.

3.7.2. The degree of surface cleanliness shall be SSPC-SP 10/NACE No. 2 or as specified on the Coating Manufacturer's product data sheet. The more-stringent surface cleanliness requirement shall apply.

3.8 Surface Preparation – Specific, Field Work

3.8.1. All existing coating surrounding a repair area shall be abraded to roughen and de-gloss using SSPC-SP 2 or SSPC-SP 3 methods. The transition overlap area shall extend for a nominal radius of 50 mm (2 in.) beyond the repair.

3.8.2. Shop coated areas that have become damaged shall be prepared in accordance with SSPC-SP 11 with a surface profile depth as specified on the Coating Manufacturer's product data sheet.

3.8.3. Threaded fasteners shall be prepared in accordance with SSPC-SP 2 or SSPC-SP 3 as a minimum. SSPC-SP 11 shall be performed whenever practicable.

3.9 Temperature, Humidity, and Moisture Limitations

3.9.1. Coating application shall not be permitted to proceed when the air temperature, surface temperature, material temperature, or relative humidity is below or above that specifically permitted in the Coating Manufacturer's instructions.

3.9.1.1. At a minimum, surface preparation or coating application shall not be performed when the substrate temperature is less than 3°C above the dew point or when the relative humidity is greater than 85%.

3.9.1.2. The Vendor shall maintain the specified ambient conditions and ventilation after application to ensure cure of the coating system. The cure period shall be as recommended by the Coating Manufacturer, based on time and temperature.

3.10 Mixing

3.10.1. All mixing shall be performed in strict accordance with the Coating Manufacturer's instructions.

3.10.2. Induction times shall comply with the Coating Manufacturer's instructions.

3.10.3. Do not use any material which has reached its pot life as specified by the Coating Manufacturer's product data sheet.

3.11 Application - General

3.11.1. All surfaces not to receive coating are to be adequately protected against drips, spatter, spills and over-spray. The Vendor will be responsible for removing any over-spray at his own expense.

3.11.2. Coatings shall be applied as specified in Appendix 1, in accordance with SSPC-PA 1, the Coating Manufacturer's instructions and including, but is not limited to: application methods, application equipment, and minimum/maximum recoat times.

3.11.3. Coated surfaces that have become contaminated and are to receive additional coating materials shall have the coated surface cleaned using a procedure that is compliant with SSPC-SP 1 and in accordance with the Coating Manufacturer's instructions.

3.11.4. All coating materials shall be applied to achieve a smooth, uniform appearing, continuous film that is free of visual defects. Defects include, but are not limited to; debris inclusions, runs, drips, sags, blisters, pinholes, blushing, craters, hazing, lack of opacity, dry spray, overspray, discontinuities, crazing, bubbling and lack of adhesion.

3.11.5. Edge and weld Stripe coat: The Vendor shall apply a stripe coat via brush and brushed in in accordance with SSPC-PA 11 prior to the application of the primer coat.

3.11.6. Allow each coat to cure as specified on the Coating Manufacturer's printed instructions prior to application of successive coats.

3.11.7. Materials shall not be applied if it is anticipated that environmental conditions will not meet the Coating Manufacturer's minimum criteria during cure.

3.11.8. The Vendor shall repair damage to any coat before application of additional coats.

3.11.9. The Vendor shall repair all deficiencies identified in Section 3.11.4 in accordance with the Coating Manufacturer's written repair procedure.

3.12 Environmental

3.12.1. The Vendor shall ensure that all surface preparation and application is performed in a manner that prevents the release of cleaning materials, coatings or other potentially deleterious substances into the aquatic or terrestrial environments.

3.12.2. The Vendor shall provide any containment required for cleaning, surface preparation and coating application operations.

3.12.3. All waste abrasive, coating materials, solvents, containment materials, filters, containers, packaging and all other debris generated during the cleaning, surface preparation and coating operation shall be disposed of by the Vendor in accordance with all local, provincial and federal regulations.

3.13 Safety

3.13.1. The Vendor shall provide all safe work procedures, personal protective equipment, personal hygiene requirements and workspace ventilation necessary to comply with local, provincial and federal regulations.

3.13.2. All cleaning, surface preparation and coating operations shall be performed in accordance with, SSPC-PA Guide 10 and WorkSafeBC requirements.

APPENDIX 1 - APPROVED COATING SYSTEM ALTERNATIVES

Manufacturer	Product	Chemistry	Volume Solids	# Coats	Total DFT (mils)
1. Sherwin-Williams	Sher-Glass FF	Reinforced Amine Epoxy	76% ± 2%	2	16-24
2. SPC	SP-9888 Stripe Coating	Novolac Epoxy	100%	2+	16-20
3. Tnemec	Perma-Glaze Series G435	Modified Polyamine Epoxy	100%	1+	15-25

Note: The above systems are single product systems (e.g. same coating material for primer coat, stripe coat and topcoat)