

Town of Lunenburg



**Process Equipment Pre-
Selection**

Issued for Quotation

**March 2024
Contract No. 240800.00Q**

Town of Lunenburg

Process Equipment Pre-Selection

0	Issued for Quotation	S. Ensslin	Mar 28/24	S. Ensslin
Rev.	Issue	Reviewed By:	Date	Issued By:



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1.0 PROJECT DESCRIPTION

- 1.1 This project includes the quotation for the supply of an Ultraviolet Disinfection System, a Sequencing Batch Reactor, and a fine screen system. Equipment will be pre-selected by the Owner and purchased and installed by the Contractor as part of the General Contract.

2.0 DEFINITIONS

- 2.1 **"Owner"** means the Town of Lunenburg and includes the Owner's personal representatives or successors.
- 2.2 **"Consultant"** means CBCL Limited or its duly appointed representative or such other consultant as the Owner may appoint.
- 2.3 **"Proponent"** means a person, firm or corporation who proposes to submit, or who has submitted a quotation for the supply of the equipment, or part thereof, referred to herein.
- 2.4 **"Supplier"** means the successful Proponent, whose equipment has been selected by the Owner, referred to herein, and whom guarantees delivery to the job site.
- 2.5 **"Contractor"** means the person or persons, firm or company, whose bid for the installation of the works will be accepted by the Owner pursuant to a General Contract.
- 2.6 **"General Contract"** means the Advertisement, Information to Bidders, Tender, Agreement, General Provisions, Special Provisions, Technical Specifications, Contract Drawings and all interpretations or addenda issued by the Owner, or Consultant with permission of the Owner for installation of the process equipment.
- 2.7 **"Delivery Period"** means the period commencing on the date of mailing of the Purchaser's official order to the Supplier and ending on the date when delivery to the site designated for delivery, covered by the purchase order, has been complete.
- 2.8 **"Purchase Order"** means the document prepared by the Contractor and submitted to the Supplier for the purchase and delivery of the equipment described herein within the General Contract.
- 2.9 **"Purchaser"** is the party responsible for the payment of the equipment in conformance with the General Conditions of the General Contract and the payment schedule on the Form of Quotation. The Contractor will be the Purchaser of pre-selected equipment.
- 2.10 **"Equipment Manufacturer's Representative"** means a person employed by the Supplier, who is trained and is experienced in the proper installation,
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start-up, training and maintenance of the equipment or system to be supplied.

2.11 **"Provisional"** means that the Owner may elect not to purchase the item.

3.0 QUOTATION SUBMISSION

- 3.1 Forward quotation submission to the Owner, Cali Beck, BBA, PCP Procurement Officer, via email at purchasing@townoflunenburg.ca Limit the submission email size to a maximum of 10MB or send the bid in multiple pieces. Files that are larger than 10MB may be rejected by the Consultant's email server. The Owner and Consultant will not be liable for any loss or damage of any nature whatsoever if an email submission is not received prior to the designated time and date, due to malfunctioning equipment, the inability to complete the transmission of a document, or for any other reason.
- 3.2 Quotation must be forwarded to the Consultant no later than **3:00p.m., local time on Thursday May 2, 2024**, hereinafter referred to as the Closing Date.
- 3.3 Proponents shall be solely responsible for the delivery of their submissions in the manner and time prescribed. The Owner recommends the Proponents send their submissions well ahead of the closing date and get confirmation of receipt; last hour submission is not recommended.
- 3.4 Submissions must be in English.
- 3.5 Submit quotations on the Form of Quotation provided. Completely fill out the Form of Quotation. The completed form shall be without interlineation, alterations, or erasures. Signatures must be witnessed.
- 3.6 No other Form of Quotation will be acceptable. The appending of any qualifying clauses to the Quotation or failure to comply with these instructions in the completing of any quotations renders such quotation liable to disqualification. The quotation as originally submitted shall be essentially complete to permit a full analysis without the need for additional information. No supplementary explanation is assumed or intended.
- 3.7 The quotation will be awarded within 60 days of the Closing Date. Prices submitted by Proponents must remain in effect for a minimum of six (6) months which will be counted as the time from the Closing Date until the issuance of the Purchase Order by the Contractor. Provide a price adjustment amount in the Form of Quotation should it take longer than six (6) months from the closing date to issue a Purchase Order.
- 3.8 The Owner will not defray any expenses whatsoever incurred by Proponents in the preparation and submission of their quotations.
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3.9 Proponents may submit more than one (1) quotation but must complete a separate form of quotation for each proposed equipment (UV System, SBR Equipment, fine screen system). Each form of quotation will be evaluated separately. The Owner may elect to pre-select one piece or several pieces of equipment from a single Proponent or pre-select all pieces from a single Proponent based on both cost and other factors listed in Subsection 14 herein.

4.0 QUERIES AND ADDENDA

4.1 Direct all questions relating to the terms and conditions or the technical specifications of this quotation document to the Owner, Cali Beck, BBA, PCP Procurement Officer, via email at purchasing@townoflunenburg.ca

4.2 Addenda may be issued during the quotation period. All addenda form part of the quotation documents. Include associated costs with respect to requirements of addenda in Quotation Price.

4.3 Clarifications requested by Proponents must be in writing, not less than three (3) days before date set for receipt of quotations. If Consultant considers that correction, explanation, or interpretation is necessary, a written addendum will be issued.

4.4 Proponents must sign Addenda and include a copy in their quotation submission.

4.5 It is the Proponent's responsibility to inquire about and acknowledge all the Addenda issued.

5.0 PURPOSE AND PROCEDURE

5.1 The purpose of receiving quotations in accordance with these documents is to permit examination of a variety of equipment on a comparable basis in order to select the equipment best fulfilling the Owner's requirements.

5.2 Alternative systems and/or variations other than those specified in the technical sections contained herein will be received/assessed provided they satisfy the intent/objectives of the specifications. Alternates must be complete in every aspect to ensure a fully operational system. Where name products, trade names, technologies, or characteristics particular to a specific manufacturer are mentioned, they are so mentioned to clarify the anticipated quality, operating requirements, and general physical arrangements of the system.

5.3 The procedure, in general, will be as follows:

- .1 Receive and assess quotations for equipment. Request and receive additional information as necessary.
 - .2 Select equipment.
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- .3 Notify successful Proponent of intent to specify their equipment as a sole source.
- .4 Place purchase order for shop drawings preparation and submittal.
- .5 Receive, examine, approve, and return shop drawings.
- .6 Complete contract documents, and call Tenders for General Contract (conditional upon approval of the necessary capital budget; no contract documents will be tendered/awarded prior to the Owner's approval of the capital budget).
- .7 Award a General Contract in which the Contractor becomes the Purchaser of the pre-selected equipment, and who then becomes responsible for payment for the equipment per the Payment Schedule in the Form of Quotation. The Supplier is responsible for the supply, delivery, installation support, start-up, commissioning and guarantee of the equipment in accordance with the requirements of this Quotation, the subsequent correspondence, and the General Contract.
- .8 Contractor places Purchase Order for equipment.
- .9 The Contractor will carry out or arrange for the installation of the equipment under the terms of the General Contract.
- .10 The Supplier provides an Equipment Manufacturer's Representative who assists in testing, commissioning of equipment and provides operational training to facility staff as specified in the technical sections herein.

6.0 INFORMATION WITH QUOTATION

- 6.1 Quotations to be accompanied by one (1) electronic copy of the following information:
 - .1 Descriptive literature, specifications, engineering and operating requirements and data on every item of equipment quoted.
 - .2 Dimensional drawings, plans, details of every item of equipment quoted showing general construction and assembly, principal dimensions, materials of construction, material thickness, and finishes.
 - .3 Description of assembly required at the site including equipment, manpower, and time required.
 - .4 Performance curves or data on the full range of design conditions.
 - .5 Complete materials and parts list included with the equipment quoted, with recommended spare parts lists complete with prices. Provide manufacturer's name and model numbers for equipment components and materials.
 - .6 Location of nearest qualified manufacturer's service facility and parts stock to Lunenburg, NS.
 - .7 Size, number and weight of the shipped packages containing the equipment, and method of shipment.
 - .8 Dimensioned information concerning clear space required around equipment for regular servicing and maintenance.
 - .9 Any additional information as may be identified in the technical specification for any equipment item.
 - .10 Price, delivery and site services information as requested in the Form of Quotation.
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- .11 Detailed and quantitative description of the various items of work required to be performed by the Contractor to install the equipment in the field.
 - .12 List of previous installations and contact persons for the proposed equipment.
 - .13 Description of quality assurance/control program, if applicable, employed by the fabricator for this project.
 - .14 Description of what type and quality of lubricants are required for installation, start-up and permanent operation of the pre-selected equipment.
- 6.2 The Proponent shall provide recommended spare parts, for typical use within five (5) years, within their scope of supply for pre-selected equipment. Include the cost to provide said spare parts as requested in the Form of Quotation. The Owner will elect to purchase the spare parts, or not purchase the spare parts, upon Quotation award.
- 6.3 Submit with the quotation, a written description of the system operation.
- 6.4 The Proponent agrees that submission of the foregoing data constitutes a guarantee that the units proposed conform thereto, and are in accordance with, these specifications.
- 6.5 The Proponent shall fill out a Form of Quotation for each system proposed. Supplier may submit more than one quotation and must complete a Form of Quotation for each proposed equipment component. The Section number specific to the equipment being quoted must be filled out on the Form of Quotation along with identification to allow separate quotations to be differentiated.
- 7.0 PRICES**
- 7.1 Quoted prices to include for delivery to the site of the works. Unloading at the site and equipment storage will be carried out by the Contractor.
- 7.2 Quoted prices to exclude Harmonized Sales Tax.
- 7.3 The fixed quoted prices shall be in Canadian dollars, and shall include and cover all contingencies and provisional sums; all patents and licensing fees, duties, and handling charges, transportation and all other charges.
- 7.4 The prices contained in quotations shall be fixed and open for acceptance for a period of six (6) months after the Closing Date for receipt of quotations. It is anticipated that the project timeline will result in delivery of equipment in the Winter of 2025. Provided that a written Purchase Order for the equipment is placed by the Contractor within the above-mentioned period of validity of the quotation, there shall be no increase in the quoted price of the equipment.
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- 7.5 Notwithstanding that it may be known at the time of submission of a quotation that increased or decreased foreign exchange will become chargeable on the equipment in the near future, only foreign exchange applicable on the closing date for receipt of quotations shall be included by the Supplier in the quoted price. Any increase or decrease in the foreign exchange applicable to the said equipment between the closing date and date of Purchase Order shall result in a corresponding increase or decrease in the price charged by the Supplier save that no change in price shall be made if the net amount of increase or decrease is less than \$500. Any increase or decrease in price shall be claimed by the Supplier through the Owner and debited or credited. The Proponent will state foreign exchange rate used in preparation of the quotation on the Form of Quotation.
- 7.6 The Proponent/Supplier shall notify the Purchaser and the Consultant promptly of relevant changes in rate of import duty or foreign exchange.
- 7.7 If, in the opinion of the Owner, the net increase in price as a result of any change in the rate of import duty or foreign exchange will be such as to affect the relative standing of the pre-selected equipment in relation to equipment offered by other Proponents, the Owner may at its sole discretion, and provided that a written order has not already been placed by the General Contractor for the said pre-selected equipment, reject the pre-selected equipment and direct that other equipment be ordered instead.
- 7.8 The Proponent shall submit the quotation on the Form of Quotation without any connection, comparison of figures with, or knowledge of any other corporation, firm or person making a quotation for similar equipment for this project and the quotation shall be in all respects fair and without collusion or fraud.

8.0 SHOP DRAWINGS AND PRODUCT INFORMATION MATERIAL

- 8.1 Within three (3) weeks of the Owner placing a purchase order for the equipment shop drawings, the Supplier shall submit to the Consultant for approval, detailed shop drawings and product information for the equipment to be supplied as noted in the technical specifications.
- 8.2 An allowance has been provided for the supply of certified shop drawings and product information as noted in Form of Quotation.
- 8.3 Submit one (1) electronic (preferred) or four (4) hard copies of the material in its entirety for all items of equipment being supplied. Information must be complete in every detail and show clear compliance with the specifications. Electronic copies of shop drawings must be in PDF file format. Electronic copies must be high quality and suitable for reproduction at 8.5" x 11" or 11" x 17" paper size. Submit original information in lieu of scanned copies. Illegible or low quality shop
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drawings will be rejected. For electronic submissions, the Consultant will return a scanned copy of mark-ups with shop drawing stamp.

- 8.4 The Consultant will review and mark comments as required on two (2) hard copies or a single scanned electronic copy of the material and return them to the Supplier indicating "no apparent errors", "apparent error noted", "rejected - see remarks", "revise and resubmit", and the Consultant will retain two (2) copies. Review of Supplier's shop drawings by the Consultant shall not relieve the Supplier of the responsibility for the correctness thereof nor for the results arising from any error or omission in details of the design. Resubmit all drawings marked "rejected - see remarks" or "revise and resubmit".
- 8.5 Review of shop drawings and acceptance of the equipment shall in any case be subject to final approval of the equipment and materials after they have been commissioned, all guarantees being fulfilled and the general operation of the equipment and materials having been found satisfactory by the Consultant.
- 8.6 After the drawings, information and material have been reviewed by the Consultant, no change shall be made in them without the Consultant's written permission. In the event of any alterations or changes being authorized, four (4) prints or single electronic file of each of the final drawings and specifications indicating these changes shall be immediately furnished at the Supplier's expense.
- 8.7 The Owner will not accept responsibility for cost of changes necessary if any equipment is fabricated without prior review of shop drawings. Review of shop drawings does not relieve the Supplier of responsibility to meet the requirements of the specifications.
- 8.8 The Supplier shall not ship for delivery any equipment to the job site until suitable reviewed shop drawings have been released by the Consultant and until required factory testing is completed.
- 8.9 Material and drawing information to include:
- .1 Dimensional outlines, sections and detail of all equipment, anchor bolt location plan, size of recommended concrete equipment pad and required clearances.
 - .2 General assembly drawing with weights, service requirements, points of connection, flush water flow requirements, recommended clearances, and complete parts list.
 - .3 Information concerning any proprietary components outsourced and fitted, such as electric motors and other electrical devices, drive mechanisms, valves, controls and the like.
 - .4 Control panel or junction box layout drawing including block wiring diagram and Bill of Materials. Provide complete wiring and field interconnection drawings.
 - .5 Detailed instruction for the erection of equipment.
 - .6 Recommended spare parts.
 - .7 Detailed information on equipment lubricants.
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- 8.10 Prior to final acceptance of shop drawings the Supplier shall provide digital copies of all PLC code, HMI code and associated program files necessary for the function of supplied equipment. Such files shall be retained by the Owner, for the long term operation and maintenance of the system, and may be updated by the Supplier during commissioning. Failure to provide such digital files shall result in rejection of equipment by the Owner.
- 8.11 The Supplier shall confirm what type and quantity of lubricants are required for the installation, startup and permanent operation of the pre-selected equipment. The installing Contractor will be responsible for supplying and installing such lubricants.

9.0 OPERATIONS AND MAINTENANCE MANUALS

- 9.1 The Supplier shall furnish operations and maintenance manuals containing information or specifying instructions for the following:
- .1 reviewed shop drawings;
 - .2 receiving, handling, storage;
 - .3 installation, alignment checks;
 - .4 electrical connections;
 - .5 instrumentation requirements;
 - .6 operation;
 - .7 servicing and maintenance procedures;
 - .8 relevant drawings;
 - .9 detailed spare parts list complete with current price list;
 - .10 safety instructions; and
 - .11 tests and Supplier inspection procedures.
- 9.2 Provide a complete copy of the operations, installation, and maintenance information in pdf file format via email and in hard copy. Provide three (3) hard copies.
- 9.3 Provide material not later than the date when installation of equipment will commence. Include cost of providing this material in quoted price for supply of equipment.

10.0 INSPECTION AT FACTORY/TOUR OF OPERATIONAL FACILITY

- 10.1 The Consultant or Owner may, before or after pre-selection of equipment has been made, inspect the manufacturing, assembling, and testing facilities at the Supplier's factory or at the factory of a proposed sub-supplier of the Supplier, and be satisfied of the capability and facilities to manufacture and test the required equipment.
- 10.2 The Consultant or Owner may inspect the equipment or the process of manufacture or testing of the equipment at the Supplier's factory or at the factory of a sub-supplier of the Supplier at any reasonable time. The
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Consultant may notify the Supplier at any time of unsatisfactory materials, workmanship or processes.

- 10.3 The Supplier shall provide every reasonable facility, access, and co-operation to assist the Consultant in carrying out inspection or testing at the factory or plant.
- 10.4 Alternatively, the Consultant may request inspection of an operational facility.
- 10.5 Shop tests do not constitute a waiver of requirements to meet actual field operating conditions or relieve the Supplier of their responsibility.

11.0 TESTING

- 11.1 Where witnessed testing at the factory is specified, the Supplier shall give the Consultant reasonable written notice, with copies to the Owner of the date when the equipment will be ready for such testing. Equipment is not to be delivered to the Site until such testing has been completed satisfactory, as specified.
- 11.2 Where certified factory testing of the equipment or any component part thereof is specified, the Supplier shall furnish copies of the required certified test reports, showing that the equipment complies with the specifications, to the Consultant and the Owner before the equipment is delivered to Site.

12.0 DELIVERY, STORAGE AND HANDLING

- 12.1 Ship all equipment completely assembled where possible. Ship large fabricated assemblies in sub-assemblies as large as practical from the point of view of moving them into and about the structures, and piece-marked to facilitate field erection.
- 12.2 The Supplier shall cooperate with the Contractor in the matter of packaging, time of delivery and shipping.
- 12.3 The Supplier shall quote a guaranteed delivery period from the date of the purchase order for each item of equipment for which a quotation is submitted.
- 12.4 The quoted delivery period shall allow for:
- .1 The time required by the Purchaser's official order to reach the Supplier by mail.
 - .2 A three (3) week period for Supplier to submit shop drawings.
 - .3 A four (4) week period for Consultant to review and comment on the Supplier's shop drawings for the equipment to be supplied.
 - .4 The Supplier will be entitled to an extension of the quoted delivery period on account of the following:
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- .1 The Consultant taking more than four (4) weeks to review and return to the Supplier the Supplier's shop drawings, provided that the excess time involved was not due to the shop drawings containing errors or omissions or not complying with the requirements of the specifications.
- .2 Delay attributable to acts of God or other matters which were not the fault of the Supplier and over which the Supplier had no control provided that the Supplier or manufacturer took all possible action to reduce delays and notified the Owner promptly of the occurrence of such delays.
- .5 Delivery of anchor bolts and parts to be embedded which are required in advance of taking delivery of equipment shall be made when required by the Purchaser.
- 12.5 The equipment and appurtenances shall be delivered to the Site of the work in a condition satisfactory to the Consultant and the Owner and any omissions, discrepancies, or damage evident on delivery shall be made good by the Supplier at no additional cost to the quotation.
- 12.6 The Contractor at the Site shall sign the carrier's pro bill to indicate receipt of the required number of crates, packages, and shall note any apparent shortages of or visible damage to such crates and packages. The Supplier shall furnish to the Contractor lists showing the contents of the crates and packages available at the job site when delivery of the equipment and appurtenances is made. Within seven (7) days after the date of delivery to the job site, the Contractor will notify the Supplier in writing of shortages or damage in the equipment delivered.

13.0 SERVICES REQUIRED AT SITE

- 13.1 The Supplier shall supply the services of a competent, factory-trained technical representative, defined above as the Equipment Manufacturer's Representative for the minimum period specified in the technical specification, at no additional cost to the Contract, to commission the equipment. Additional commissioning service shall be at the quoted price per day as outlined in the Form of Quotation.
- 13.2 The Equipment Manufacturer's Representative shall provide the services stated in the relevant technical sections and shall operate and demonstrate the equipment to the Owner's operating and maintenance staff.
- 13.3 The Supplier shall provide to the Consultant, a letter or certificate stating that the qualified representative has found the installation to be in accordance with the manufacturer's requirements.
- 13.4 Commissioning:
- .1 Verification of the performance will be done by means of a commissioning process. The Contractor will be required to provide a commissioning plan three (3) weeks prior to commissioning, which will include schedule of all commissioning-related activities as specified in individual sections. Work with the Contractor in
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- developing this plan.
- .2 The Commissioning Plan, developed by the Contractor, in collaboration with the Equipment Supplier is to include:
 - .1 Details regarding the roles and responsibilities of the commissioning team during all phases of commissioning.
 - .2 Documentation defining design assumptions and performance standards of proposed systems.
 - .3 Description of systems, intended operation and performance details.
 - .4 Static testing and verification procedures.
 - .5 Functional performance testing procedures.
 - .6 Documentation requirements for test results.
 - .7 Training plan for operators.
 - .8 Preparation of the Interim and Final Commissioning Reports.
 - .3 Responsibilities:
 - .1 Contractor's responsibilities:
 - .1 To work with the Equipment Supplier to prepare commissioning plan and manage the commissioning process.
 - .2 Confirms subcontractors, including pre-selected Equipment Supplier, carry out applicable tests prior to the Consultant's review.
 - .3 Arranges for walkthrough and commissioning reports, procedures and demonstration, after work has been reviewed, tested and commissioned.
 - .4 Performs and documents all preliminary tests, assembles manuals received from the Equipment Supplier as well as completed test forms and verification forms.
 - .5 Provide assistance to Equipment Supplier during start up to access installation concerns. Provide a mechanical and electrical trade for start-up assistance.
 - .6 Performs system start-up and testing.
 - .7 Is present for operation of system through tests with the Consultant and Owner.
 - .8 Obtains all code-required inspections and certifications and approvals.
 - .9 Prepares record drawings.
 - .10 Obtains and submit all warranties to Owner.
 - .11 Organizes and submits Operating and Maintenance Manual from the subcontractors, Equipment Suppliers and manufacturers to Owner.
 - .12 Assembles and delivers all spare parts and special tools to the Owner.
 - .13 Provides and disposes of water for testing pump system.
 - .2 Consultant's responsibilities:
 - .1 Inspect installation.
 - .2 Certify completion of Contractor's commissioning.
 - .3 Receive all test reports from the Contractor and verify results.
 - .4 Participate in the equipment start-up testing conducted by the Contractor and verify results.
 - .5 Review shop drawings.
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- .6 Communicate apparent deviations from the specifications.
- .7 Review the equipment operating and maintenance manuals prepared by the Contractor.
- .8 Participate in the performance testing process.
- .9 Review the Record Drawings.
- .3 Supplier responsibilities:
 - .1 Performs and documents all preliminary tests, assembles manuals of completed test forms and verification forms.
 - .2 Performs component start-up and testing with Contractors.
 - .3 Manages installation of the systems.
 - .4 Performs system start-up and testing.
 - .5 Arranges for training sessions schedule, including preparation and distribution of materials.
 - .6 Provides training and instruction and prepares Operating and Maintenance Manual for presentation to the operating and maintenance personnel.
 - .7 Is responsible for filling out the commissioning data sheets and test forms/manual.
 - .8 Assembles and delivers all spare parts and special tools to the Owner.
- .4 Owner's responsibilities:
 - .1 The Owner's specific duties include making staff available at appointed times for training by manufacturer's representatives.
- .5 The Contractor, the Consultant, Owner and Equipment Supplier will work together in a concerted effort to fully commission all systems in an organized manner and in a manner that will allow all to carry out their own obligations fully.
- .6 General:
 - .1 The Commissioning Objectives are:
 - .1 To bring the mechanical and electrical systems and components from a state of "static completion" to a state of "dynamic operation".
 - .2 To verify conformance to Contract Requirements.
 - .3 To confirm the equipment meets the design intent of the Specifications and function in accordance with defined operational requirements.
 - .4 To ensure the completed facility meets user stated requirements.
 - .5 To provide all testing documents, certification and records.
 - .6 To fully train and equip personnel to operate, maintain and trouble shoot all systems.

14.0 EVALUATION OF QUOTATIONS

- 14.1 Quotations will be evaluated based on durability and reliability of equipment construction, information submitted with the quotation, control
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methodology, infrastructure requirements, capital and installation cost, operating and maintenance cost, performance records and references, Canadian and local content, and other factors, which may affect the overall cost and performance of the final product.

15.0 NOTIFYING RESULTS

- 15.1 No information pertaining to quotations contents or number of quotations received will be provided to suppliers prior to award being made.
- 15.2 Results will be released by the Consultant within ten (10) business days of closing.
- 15.3 The Consultant, on behalf of the Owner, will notify the successful Supplier by telephone and/or e-mail that they are the successful Supplier.

16.0 AMENDMENT OR WITHDRAWAL OF QUOTATION

- 16.1 Quotations may be amended or withdrawn prior to the closing date by sending amendment to Cali Beck, BBA, PCP Procurement Officer, via email at purchasing@townoflunenburg.ca
- 16.2 Subject line of amendment or withdrawal as follows: "Amendment/Withdrawal of Quotation for Equipment, Quotation No. 240800.00Q". Sign and seal as required for Quotation, and submit prior to time of closing.
- 16.3 It is recommended that the intention to submit an amendment to the Quotation be conveyed to the Consultant prior to making the submission.
- 16.4 An amendment of Quotation shall show the amount to be added to or subtracted from the quotation price for items.

17.0 INFORMAL OR UNBALANCED QUOTATION

- 17.1 Quotations, which in the opinion of the Owner are considered to be informal or unbalanced, may be rejected.

18.0 RIGHT TO ACCEPT OR REJECT ANY QUOTATION

- 18.1 The Owner will select a Supplier based on the total technical, delivery, warranty, and commercial content of the quotation packages. The low quotation will not necessarily be selected by the Owner. The Owner reserves the right to reject any or all quotations.
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- 18.2 A quotation is binding and irrevocable on the Proponents submitting the quotation until such time as he/she receives formal notification by mail or e-mail of the acceptance or rejection of their quotation.
- 18.3 The Owner reserves the right, in the event that the successful Supplier fails to comply with the conditions as listed, to cancel any agreement in place regarding this quotation and award it to another Supplier without penalty or action against the Owner.

19.0 PROPRIETARY INFORMATION

- 19.1 The Owner may reproduce any of the Proponent's quotation and supporting documents for internal use or for any other purposes required by law.
- 19.2 If the Proponent includes proprietary information in the quotation response, it must be marked as such. The Owner will take all reasonable steps to prevent disclosure of this information, prior to the award of the contract, however, please be advised that the successful quotation may be disclosed and treated as a public document at a regular meeting of the Town of Lunenburg, if required.
- 19.3 Information about the Owner obtained by a Proponent through this quotation process must not be disclosed unless authorized by the Owner. It is agreed that this obligation of confidentiality will survive to the termination of the request for quotation process and any contract that might arise between the parties.

20.0 WARRANTY

- 20.1 Unless otherwise specified, the warranty period is one (1) year from the date that all supplied equipment has been placed into service. The date that the equipment has been placed into service shall be determined by the Consultant following the satisfactory installation, the commissioning and successful completion of all required testing and receipt of a report signed by the Equipment Manufacturer's Representative stating that the equipment is ready for permanent operation.
- 20.2 The Supplier shall be responsible for the proper performance of the equipment during the warranty period. The Supplier shall correct promptly, at the Supplier's expense, any deficiencies in the equipment or operation of the equipment which appear prior to and during the warranty period.
- 20.3 The Owner, through the Consultant, shall promptly give the Supplier written notification of observed defects and deficiencies which appear during the warranty period. Such defects and deficiencies shall not be the result of improper operation or maintenance, which are the responsibility of the Owner.
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21.0 GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

- 21.1 The General Conditions of the Construction Contract will be based on CCDC 2 - 2020 Stipulated Price Contract published by Canadian Construction Document Committee. Proponents should review CCDC 2 - 2020 prior to the Closing date.
- 21.2 The General Conditions of the Construction Contract will be amended with Supplementary General Conditions. A copy of Supplementary General Conditions typically used by the Consultant is appended to this Quotation Document as Appendix B. Proponents should review this Supplementary General Conditions section prior to Closing date.
- 21.3 The General Conditions of the Construction Contract and its Supplementary General Conditions, which will be part of the Contract between the Owner and the Contractor, govern the relationship between the Contractor and the Supplier, and where applicable, to the supply and delivery of the material, equipment and workmanship under the purchase order issued by the Contractor.
- 21.4 If differences arise between the CCDC 2 - 2020 and the actual General Conditions for the executed Construction Contract between the Owner and the Contractor and if these differences result in an increase or decrease in the price charged by the Supplier or the delivery of the equipment, then the Supplier shall notify the Contractor and the Consultant promptly. Any change in price or delivery shall be claimed by the Supplier through the Contractor. If, in the opinion of the Owner, the price or delivery change will be such as to affect the relative standing of the pre-selected equipment in relation to equipment offered by other Suppliers, the Owner may at its discretion, and provided that a written order has not already been placed for the said pre-selected equipment, reject the pre-selected equipment and direct that other equipment will be ordered instead.

1.0 SALUTATION

1.1 To: Town of Lunenburg
Attention:
119 Cumberland Street, Lunenburg, NS
B0J 2C0

1.2 For: Town of Lunenburg
Process Equipment Quotation
Quotation No. 240800.00Q

1.3 From: _____

2.0 DECLARATION

We, the undersigned, having carefully examined the Quotation Documents in respect to quotations for the equipment listed in the Form of Quotation, and Specifications herewith submit in accordance with the terms set out in the documents our quotation for the specified equipment.

We agree that, in case of any conflict between the terms and conditions set out in our accompanying quotation and the terms and conditions set out in the quotation documents, the provisions of the quotation documents shall take precedence and shall govern.

We declare that our quotation for the equipment is made without any connection, comparison of figures, or arrangements with or knowledge of any other corporation, firm or person making a quotation for similar equipment for this project and is in all respects fair, without collusion or fraud.

We undertake to keep our quotation valid and open for acceptance for a period of six (6) months after the closing date for submission of quotations, and to make the equipment quoted on hereunder, or any item thereof available for sale to the Owner during the said period at the price and delivery stated herein (see also Section 4.0 herein).

We acknowledge Addenda _____ through _____

3.0 DESCRIPTION OF EQUIPMENT AND EXPERIENCE

3.1 Particulars of Supplier's Recent Installations

(1) Owner: _____
Owner Representative (Contact Name): _____
Phone No.: _____
Brief Description: _____

Date: _____
Approx. Value: \$ _____

(2) Owner: _____
Owner Representative (Contact Name): _____
Phone No.: _____
Brief Description: _____

Date: _____
Approx. Value: \$ _____

(3) Owner: _____
Owner Representative (Contact Name): _____
Phone No.: _____
Brief Description: _____

Date: _____
Approx. Value: \$ _____

3.2 Description of Equipment Including Local Content and/or Local Manufacturing if Applicable.

4.0 QUOTATION BREAKDOWN

The prices quoted shall be in Canadian dollars and shall include and cover all provisional sums; all duties, and handling charges, transportation to the Site and all other contingencies. Prices exclude Harmonized Sales Tax.

4.1 Name of Firm Quoting _____

Section No. 43 32 63

Section Title Ultraviolet Disinfection System

Name of System _____

.1 Preparation and submission of all required shop drawings and product information: \$10,000.00

.2 Price complete as specified: \$ _____
(excluding cost of shop drawings and provisional items specified herein)

Automatic Mechanical Cleaning System and associated controls (Provisional) \$ _____

SCC with PLC processor and HMI, per Section 43 32 63, subs 2.4.4 (Provisional) \$ _____

Price for recommended spare parts. Provide separate list with your Submission (Provisional): \$ _____

Total price including provisional items \$ _____

.3 Duty chargeable at closing included above (See 00 21 14, Clause 7.5) \$ _____

.4 Foreign Exchange Rate Applicable at closing included above (See 00 21 14, Clause 7.5) \$ _____

.5 Delivery Period: _____ weeks

.6 Inspection of installation, field Testing and maintenance instruction, Including travelling and other

expenses for each 8-hour day in
excess of that specified:

\$ _____ per day

.7 Discount should the Owner elect to
purchase all of the Equipment being
offered by your firm:

_____ %

.8 Price adjustment if period of
acceptance of six (6) months is
exceeded (add'l three (3) months):

\$ _____

4.2 Name of Firm Quoting _____

Section No. 44 41 13

Section Title Screening Equipment

Name of System _____

.1 Preparation and submission of all required shop drawings and product information: \$10,000.00

.2 Price complete as specified: \$ _____
(excluding cost of shop drawings and provisional items specified herein)

Price for recommended spare parts. \$ _____
Provide separate list with your Submission (Provisional):

Total price including provisional items \$ _____

.3 Duty chargeable at closing included above (See 00 21 14, Clause 7.5) \$ _____

.4 Foreign Exchange Rate Applicable at closing included above (See 00 21 14, Clause 7.5) \$ _____

.5 Delivery Period: _____ weeks

.6 Inspection of installation, field Testing and maintenance instruction, Including travelling and other expenses for each 8-hour day in excess of that specified: \$ _____ per day

.7 Discount should the Owner elect to purchase all of the Equipment being offered by your firm: _____ %

.8 Price adjustment if period of acceptance of six (6) months is exceeded (add'l three (3) months): \$ _____

4.3 Name of Firm Quoting _____

Section No. 46 53 53

Section Title SBR Equipment

Name of System _____

.1 Preparation and submission of all required shop drawings and product information: \$10,000.00

.2 Price complete as specified: \$ _____
(excluding cost of shop drawings and provisional items specified herein)

Price for recommended spare parts. \$ _____
Provide separate list with your Submission (Provisional):

Total price including provisional items \$ _____

.3 Duty chargeable at closing included above (See 00 21 14, Clause 7.5) \$ _____

.4 Foreign Exchange Rate Applicable at closing included above (See 00 21 14, Clause 7.5) \$ _____

.5 Delivery Period: _____ weeks

.6 Inspection of installation, field Testing and maintenance instruction, Including travelling and other expenses for each 8-hour day in excess of that specified: \$ _____ per day

.7 Discount should the Owner elect to purchase all of the Equipment being offered by your firm: _____ %

.8 Price adjustment if period of acceptance of six (6) months is exceeded (add'l three (3) months): \$ _____

5.0 PAYMENT SCHEDULE

- 5.1 Payment for equipment will be through the successful Contractor and claimed by way of submission of approved progress claims.
- 5.2 Payment for shop drawings will be through the Owner. Upon approval of the shop drawings, 100% of the shop drawing total provided on the form herein will be paid by the Owner.
- 5.3 Equipment payment will be permitted at the following milestones during the execution of the General Contract:
- .1 70% due upon delivery of equipment to the construction site.
 - .2 20% due upon installation of equipment into the works of the treatment plant.
 - .3 10% due upon successful completion of trial testing, commissioning, and operator training.
- 5.4 Payments will be subject to holdback requirements in accordance with Builders' Lien Act of Nova Scotia.

Signature of Supplier

Name and Title (Printed)

6.0 SIGNATURE

DATED THIS _____ DAY OF _____, 20____.

Name of Firm Quoting

[Seal]

Address

Telephone

Address

Fax

Signature

Name and Title (Printed)

Signature

Name and Title (Printed)

Witness

Name and Title (Printed)

*NOTE: Quotations submitted by or on behalf of any Corporation must be signed in the name of such corporation by a duly authorized officer or agent, who shall also subscribe own name and office. Affix seal.

END

Part 1 GENERAL

1.1 WORK INCLUDED

- .1 This Section covers the design, supply, delivery and supervision, field testing and placement into operation of a pre-selected open channel gravity flow Ultraviolet (UV) disinfection system.
- .2 The UV disinfection system will be purchased and installed by the Contractor under a separate installation contract.

1.2 INTENT

- .1 The intent of these specifications is to provide the mechanical and electrical works fully complete in every detail for the purpose designated. Furnish any apparatus, appliance, material, or labour not herein specifically mentioned or included but requisite to the operation of the apparatus and equipment specified without additional expense to the Contract.

1.3 DESIGN CRITERIA

- .1 UV - SBR Effluent:
 - .1 Minimum Peak Flow: 132 L/s.
 - .2 Total Suspended Solids: 25 mg/L, 30 day average of grab samples.
 - .3 Annual Effluent Temperature Range: 8 to 25°C
 - .4 Ultraviolet Transmittance at 253.7 nm: 60%, minimum
 - .5 Effluent standard to be achieved (average): 200 fecal coliform/100mL, 30 day geometric mean of consecutive daily grab samples.
 - .6 Upstream process: SBR (Secondary).
 - .7 The UV system is to be installed in an existing concrete channel of following dimensions: 610 mm x 914 mm x 7900 mm / 2' x 3.00' (w x d x l).
 - .8 Coordinate peak SBR decant flow requirement as required.
 - .9 Carefully space the lamp array configuration both vertically and horizontally with all lamps parallel to each other and to the effluent flow.
 - .2 Performance Requirements:
 - .1 Effluent standard to be achieved: 200 MPN fecal coliform/100mL (based on 30 day geometric mean), with no limit on incoming fecal coliforms.
 - .2 Minimum design dosage: MS2 Reduction Equivalent Dose (RED) of 30 mJ/cm² at peak flow, in effluent with a UV transmission of 60% at end of lamp life after reductions for quartz sleeve fouling. The basis for evaluating the RED will be the independent third-party bioassay, without exception.
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1.4 QUALIFICATIONS OF EQUIPMENT SUPPLIERS

- .1 All items of equipment supplied must be produced by companies regularly engaged in manufacturing this type of equipment and who maintain service and parts departments from which service, repairs and replacements may be obtained quickly at all times.
- .2 Submit a bioassay evaluation for the proposed reactor. This bioassay must have been validated by an independent third party and have followed protocols described in USEPA Design Manual - Municipal Wastewater Disinfection (EPA/625/1-86/021), without exception. The Equipment Supplier's bioassay report must demonstrate that the proposed UV system design and number of lamps will deliver the specified dose.

1.5 WARRANTY

- .1 Provide a warranty that expressly states that all materials used in the manufacture is new and first quality. No previously used material can be incorporated in any part of this supply. Provide a guarantee all material for a period of one (1) year from the date of Ready for Takeover, as defined in the general conditions of contract, and will replace, at no cost to the Owner, faulty materials.

1.6 IDENTIFICATION OF EQUIPMENT

- .1 Fit process equipment with the manufacturer's identification nameplates indicating size, equipment model, manufacturer's name, serial number, voltage, cycle, phase and power motors, all factory supplied.

1.7 SHOP DRAWINGS

- .1 In addition to the requirements outlined herein and in Section 00 21 14, provide the following information with the quotation response to facilitate the Consultant's review of equipment performance:
 - .1 Individual bulb output (watts).
 - .2 Number of lamps per module.
 - .3 Number of modules per bank.
 - .4 Total number of lamps.
 - .5 Total unfactored output (watts).
 - .6 UVDIS intensity ($\mu\text{W}/\text{cm}^2$), as per USEPA UVDIS3.1.
 - .7 End of lamp life factor.
 - .8 Quartz sleeve loss.
 - .9 Safety factor/fouling.
 - .10 Adjusted intensity ($\mu\text{W}/\text{cm}^2$).
 - .11 Hydraulic retention time (seconds).
 - .12 Dose ($\mu\text{W}/\text{cm}^2$).
 - .2 Independent bioassay validation and dosage calculations demonstrating compliance with the specified RED requirements.
 - .3 Submit shop drawings for all process equipment to the Consultant in accordance with Section 00 21 14.
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- .4 Include details of equipment assembly, fabrication, control, and installation.

1.8 OPERATION AND MAINTENANCE MANUALS

- .1 Provide Operation and Maintenance data for inclusion in the Operations and Maintenance manuals, in accordance with Section 00 21 14.

Part 2 PRODUCTS

2.1 MANUFACTURER

- .1 To be acceptable, the UV system must operate in an open channel, be of modular design, use low intensity, low pressure UV lamps and electronic ballasts. The system will be located within the existing control building which will be a heated, ventilated, and non-hazardous environment.

2.2 DESIGN, CONSTRUCTION AND MATERIALS

- .1 General:
 - .1 All metal components in contact with effluent shall be Type 316 stainless steel or quartz.
 - .2 Material exposed to UV light to be Type 316 stainless steel, quartz glass, PTFE, Viton, or other suitable UV resistant materials.
 - .3 Provide a system designed for complete immersion of the UV lamps including both electrodes and the full length of the lamp in the effluent. Both lamp electrodes must operate at the same temperature and be cooled by effluent. Major axis of the UV lamps to be parallel to flow.
 - .2 UV Module:
 - .1 Each UV module to consist of UV lamps mounted on Type 316 stainless steel frame (Type 316 stainless steel for non-wetted parts).
 - .2 Each lamp to be enclosed in an individual quartz sleeve, one end of which will be closed and the other sealed with compressed O-rings.
 - .3 House the electronic ballasts in close proximity to each UV Module.
 - .4 Enclose all wires connecting the lamps to the main power supply inside the frame of the UV module and not exposed to the effluent.
 - .5 Independently seal each quartz sleeve within the module.
 - .6 Design the UV module such that operating personnel at the plant can change the lamps and quartz sleeves.
 - .7 Provide protection against earth leakage faults to each module through a circuit breaker and a ground fault relay.
 - .8 Supply one (1) electronic ballast per two (2) lamps.
 - .9 Provide each UV module with a standard 120 volt plug and weatherproof cable for connection to a receptacle.
 - .3 Equipment assemblies comprised of electro-mechanical components must be CSA certified or certified by an agency approved by the electrical
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inspection authority having jurisdiction and bear the appropriate label. If the equipment in question is not certified by an approved certification agency as an assembly, have the manufacturer arrange and pay for spot approval and labelling of the equipment prior to installation.

- .4 UV Lamps:
 - .1 UV lamps to be low pressure hot cathode, instant start design.
 - .2 90% of the UV output must be between the wavelengths of 233.7 to 273.7nm.
 - .3 The operating life of the lamp must be guaranteed for 12,000 hours, non-pro-rated.
- .5 UV Lamp Sleeves:
 - .1 Type 214, clear fused quartz circular tubing.
 - .2 Seal the open end of the lamp sleeve by means of a sleeve cup and compresses the sleeve O-ring.
 - .3 Sleeve nut to have a knurled surface to allow for a positive handgrip for tightening. The sleeve nut must not require tools for removal.
- .6 Level Controller Weir:
 - .1 Provide a weir to be located downstream of the UV module to maintain lamp submergence at all times.
 - .2 Constructed of Type 316 stainless steel; include a drain.
- .7 Maintenance cleaning system (Provisional):
 - .1 Provide one (1) mechanical cleaning system to automatically clean UV bulbs.

2.3 ELECTRICAL

- .1 General:
 - .1 Electrical supply to the system control center will be 120VAC, 60Hz, 1 phase.
 - .2 All local disconnect switches will be supplied by others.
 - .3 Provide UV disinfection equipment within a suitable weatherproof enclosure.

2.4 SYSTEM CONTROL CENTRE (SCC) :

- .1 The basis for system control is a microprocessor based controller, which continuously monitors and controls the UV system's functions. Custom electronics, pressure switches, water level sensors, etc., provide the SCC with the necessary indications of system parameters.
 - .1 Control panel microprocessor to have the ability to communicate to the plant SCADA network with Ethernet/IP communications to provide UV system status, monitoring and alarms.
 - .2 Provide equipment controls in a free-standing or wall mounted NEMA 4X (304 stainless steel) enclosure.
 - .3 Enclosure to include a main disconnect (moulded case circuit breaker or fused disconnect switch), for disconnection of power to the
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panel. Disconnect to be operable from the front or side without opening the enclosure door and must be complete with defeatable door interlock and provision for padlocking in the off position.

.4 Surge and lightning protection shall be included for the panel power supplies.

.5 Operator interface (HMI) to be menu driven. Control (enable/disable, setpoint adjustments, etc.), monitoring and troubleshooting (alarms, diagnostics, etc.) of the UV system is accomplished through this interface. Supply a door mounted HMI as part of the SCC assembly, installed on the UV SCC.

.1 Operator interface specifications:

.1 Multi-function graphic terminal complete with colour TFT touch screen.

.2 Minimum screen size: 10.4".

.3 Input voltage: 24 VDC or 120 VAC.

.4 NEMA 4X enclosure.

.5 Flush mounted.

.6 Ethernet/IP communications.

.7 Integral battery backup.

.8 Integral backup USB and ethernet ports.

.9 Acceptable materials: Allen Bradley Panelview Plus 7, or approved equivalent.

.6 Provide all system controller and HMI programming for a complete and functional system. Programming to be turned over to the Owner after commissioning is complete. Provide programming without password protection.

.7 SCC to be protected by an uninterruptible power system (UPS) true on line UPS to maintain power to the PLC, I/O, HMI and Ethernet communications for at least 15 minutes in the event of a loss of power. Monitor UPS status in PLC (Normal Power Failure and Low Battery/UPS Fault).

.8 Provide an 8 port DIN rail mounted Ethernet switch (managed with VLAN and IGMP snooping, 10/100 Mbits/sec) for SCADA communications.

.9 Include branch circuit breakers, 24Vdc power supplies, terminal blocks, control transformers, fusing and associated control component as required for a complete and functioning system.

.2 Provide alarms to indicate an extreme alarm condition in which the disinfection performance may be jeopardized. At a minimum, alarms to include:

.1 Bank Low UV Intensity Alarm: preset at the factory for 75% of the intensity after 100 hours burn-in of the lamps. Alarm set point to be field adjustable.

.2 Lamp Failure Alarm: Failed lamps to trigger a lamp failure alarm, which identifies the affected UV module by an address system (i.e. bank #/module #/lamp #). The failed lamp(s) are identified using the Bank Control screen lamp graphics.

.3 Multiple Lamp failure.

.4 Low UV Dose Alarm.

.5 The 70 most recent alarms recorded in an alarm history register and displayed when prompted.

- .6 Each bank must be capable of being placed in either Local On, Local Off, Auto mode.
 - .7 The UV banks will be cycled for staggered wear and timed off to minimize bank cycling.
 - .8 Elapsed time of each bank will be recorded and displayed on the display screen when prompted.
 - .9 Panel must be CSA or cUL approved, rated as per use and sized suitable for intended use.
- .3 Dose-Pacing:
- .1 Supply a dose-pacing system to modulate the lamp UV output in relationship to a 4-20mA DC signal from an effluent flow meter.
 - .2 System to be dose-paced such that as the flow and effluent quality change, the UV dose delivered is optimized while conserving power. Dose pacing shall allow for one bank operation.
 - .3 Provide an on-line UV transmittance monitor to automatically and continuously track the UV transmission of the effluent at the 254nm wavelengths. UVT monitor to measure transmittances from 25 to 100%. Provide for a shield twisted pair cable for connecting the UV transmittance (4-20ma signal) to the system control centre, operating a UV demand feedback loop. The system control centre will modulate the loop intensity in response to the effluent UV transmission.
 - .4 The dose-pacing system will allow the operator to vary the design dose setting. This feature is password protected. Provide logic and time delays to regulate the UV bank ON/OFF cycle.
- .4 Optional SCC enclosure:
- .1 Provide optional costs associated to have SSC Control panel with PLC processor, and I/O cards from the Allen-Bradley CompactLogix series and Allen Bradley Panelview Plus 7 HMI with the ability to communicate via Ethernet/IP communications network. Provide individually isolated digital I/O cards. Provide adequate digital and analog I/O for this process plus 10% spare for each I/O type (provide a minimum of 4 spare for each I/O type). Wire all I/O to an identified field wiring terminal strip.

2.5 INSTRUMENTATION

- .1 Include all instrumentation required to facilitate the automatic operation and monitoring of the proposed system equipment as indicated or implied in the Contract Documents. Instrumentation supplied to include, but are not necessarily limited to the following:
 - .1 Provide one (1) UV transmittance probe and analyzer, including all mounting hardware, and housed in a NEMA 4X enclosure. Power and signals for the UVT analyzer shall report to/from the UV system controller. Power feed to UVT analyzer is 120 VAC, 60Hz, 1 phase, 2 wire plus ground. Include wiring from the analyzer to the sensor located at the UV channel. The UVT probe shall be of the optically via infrared or fluorescent technology, as supplied by Hach UVAS or approved equivalent.
 - .2 Channel low level switch of the conductance probe type to shut off
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power to UV modules upon low level in the UV channel.

- .3 Provide a submersible UV sensor to continuously monitor the UV intensity produced within each UV bank of lamp modules. The sensor shall only measure the germicidal portion of the light emitted by the UV lamps as measured at 254nm. Sensors to be designed to provide UV intensity data for dose monitoring and control.
- .2 All supplied instrumentation must be CSA approved. The minimum acceptable instrument enclosure rating shall be NEMA 4X.

2.6 GENERAL CONTROLS

- .1 The main plant control system is PLC based, and will communicate to all vendor supplied PLC control systems via an Ethernet/IP communications network (by others). This permits the main plant control system to monitor, and relay process information to/from the various vendor supplied control systems, as required for their integration into the overall plant controls strategy. To facilitate this requirement, the Equipment Supplier must provide a control system with the ability to communicate to/from the main plant SCADA system on an Ethernet/IP communications network.

2.7 SPARE PARTS

- .1 Supply the following spare parts and safety equipment:
 - .1 Complete spare parts for two full modules (racks) of lamps including all lamps, sleeves, lamp holders and any other items required for those modules.
 - .2 One (1) Operator's Kit (including face shield, gloves and cleaning solution)

Part 3 EXECUTION

3.1 INSTALLATION

- .1 Installation will be by the Contractor as defined in Section 00 21 14. Provide full installation instructions upon receipt of the purchase order.

3.2 LUBRICATION

- .1 Supply lubrication required for operation of equipment.

3.3 FACTORY TESTING

- .1 Inspection and Testing:
 - .1 Test UV system to confirm proper operation at rated power supply and for electrical and mechanical integrity prior to shipment.
 - .2 Grant the right for inspection of the UV equipment to any authorized representative of the Owner before shipment from factory. If inspection is requested give 48 hours' notice in advance of the time
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when the equipment will be ready for inspection at the factory. The Owner will pay the costs associated with having the Consultant observe the testing. Include all cost to conduct testing in Quotation price.

.3 Test any equipment in the UV Disinfection System that will be provided by the Contractor.

- .2 Shipment: ship equipment assembled to the greatest extent possible to reduce installation and start-up costs.

3.4 RESPONSIBILITY OF TEMPORARY TRIAL USAGE

- .1 Obtain written confirmation from the Contractor that equipment is installed and ready for testing.
- .2 The guarantee period must not be affected by temporary trial use of the equipment.
- .3 Clean and renew equipment and systems used prior to acceptance. Restore to original or new working condition.
- .4 Protect equipment and system openings from dirt, dust and other foreign materials during temporary usage.

3.5 SITE INSPECTION, TESTING & START-UP

- .1 Provide the services of an Equipment Manufacturer's Representative for a minimum of two (2) trips comprised of an eight-hour day, on-site to check the complete installation and be present for start-up of the equipment. Provide as many trips and days on-site to complete the installation and put the equipment into satisfactory operation. Provide a written report to the Consultant stating the following:
- .1 That the system is operating in accordance with design specifications.
- .2 That the equipment has been satisfactorily installed by the Contractor and/or outline any modifications that have been made or are required to be made as a result of the commissioning or testing of the equipment.
- .3 That the equipment is now ready for permanent operation.
- .4 That operation, lubrication and maintenance instructions for the equipment have been presented to the Owner.
- .5 That the equipment has been properly lubricated with the correct lubricants.
- .2 Equipment Manufacturer's Representative to fully instruct permanent operator of equipment in proper operation and maintenance of equipment at the quoted price included in Section 00 41 01.
- .3 Advise Consultant and Owner in writing at least one (1) week in advance of the proposed date for testing and start-up. Provide necessary tools, materials, and equipment for carrying out tests. Installing contractor will provide water for testing. Conduct tests in the presence of the Consultant.
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- .4 Replace defective material or equipment with new material or equipment. Bear costs including re-testing and repairing.
- .5 Final acceptance of the equipment will require a field test for treating wastewater as defined in subsection 1.3 herein at design flow conditions. Performance requirements identified must be met for five (5) consecutive days. All process analytical testing will be undertaken by the Owner. The Equipment Manufacturer's Representative is not required to be present during the performance test.

3.6 IDENTIFICATION

- .1 Locate manufacturer's nameplates so that they are easily read. Do not paint over plates.

3.7 COMMISSIONING

- .1 Provide commissioning as specified in Section 00 21 14.

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 This Section specifies requirements for providing one (1) fully assembled mechanical screening system with a dedicated washer/compactor unit. The screenings from one (1) screening unit will be discharged into a compactor/washer, the washed screenings will be discharged into a receiving bin. The work generally includes the supply, delivery, inspection, testing and start-up of the complete system.

1.2 INTENT

- .1 The intent of these specifications is to provide the works fully complete in every detail for the purpose designated. Provide any apparatus, appliance material or labour not specifically mentioned or included, but requisite to the operation of the apparatus and equipment specified without additional expense to this Proposal.

1.3 REFERENCES

- .1 The work under this Section must conform to the applicable requirements of the National Building Code and National Plumbing Code of Canada, National Fire Protection Association, Underwriters Laboratories of Canada, and referenced standards throughout these Specifications of the American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Water Works Association (AWWA), American Society of Testing and Materials (ASTM), Canadian Standards Association (CSA) , and the Canadian General Standards Board (CGSB).
 - .2 Equipment assemblies comprised of electro-mechanical components shall be CSA or cUL certified or certified by an agency approved by the applicable provincial Electrical Inspection Department and bear the appropriate label. Where there is no alternative to supplying equipment that is not appropriately certified, special approval from the applicable provincial Electrical Inspection Department will be required. Pay all costs associated with obtaining such approval.
 - .3 ASTM A380/A380M-17, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
 - .4 CSA C22.2 No. 100-14 (R2019), Motors and Generators.
 - .5 IEEE 112-2017, EEE Standard Test Procedure for Polyphase Induction Motors and Generators.
 - .6 ANSI/NEMA MG 1-2021, Motors and Generators.
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1.4 DESIGN CRITERIA

- .1 Mechanical screening system: the system must be designed for continuous operation under the following design conditions:
 - .1 Maximum flow: 11,400 m³/d.
 - .2 Average flow: 2,900 m³/d.
 - .3 Number of screening units: one (1).
 - .4 Maximum unit flow: 11,400 m³/d.
 - .5 Average unit flow: 2,900 m³/d.
 - .6 Screen opening size: 6 mm in two dimensions.
 - .7 Maximum headloss at peak flow with 50% screen clogging, assuming dimension indicated in Section 2.2.
 - .8 Supply one (1) new mechanical screening system.
 - .9 The fine screening system will be installed directly into the existing concrete channel, with a width of 457 mm and a depth of 1219 mm

- .2 Washer/compactor unit: system to be designed for continuous operation under the following design conditions:
 - .1 Capacity: 2.0 m³/h.
 - .2 Screening volume reduction: 45-70%.
 - .3 Supply one (1) washer compactors.
 - .3 Supply one (1) shaftless screw conveyor.

1.5 SUBMITTALS

- .1 Provide shop drawings as specified in Section 00 21 14.
- .2 Include details of equipment assembly, fabrication, control, and installation.

1.6 QUALIFICATIONS OF EQUIPMENT SUPPLIERS

- .1 All items of equipment supplied must be produced by companies regularly engaged in manufacturing this type of equipment and who maintain service and parts departments from which service, repairs and replacements may be obtained quickly at all times. Mechanical details of the equipment offered must have been tried and tested by the actual construction and operation of mechanisms of the exact type and of comparable size and operating in similar service.

1.7 IDENTIFICATION OF EQUIPMENT

- .1 Fit process equipment with the manufacturer's identification nameplates indicating size, equipment model, manufacturer's name, serial number, voltage, cycle, phase and power motors, all factory supplied.

1.8 MAINTENANCE MANUALS

- .1 Provide operation and maintenance data for incorporation into Operation and Maintenance Manuals as specified in Section 00 21 14.
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1.9 ALTERNATES

- .1 The Owner is interested in receiving and assessing proposals for alternative systems. Where named products, trade names, technologies, or characteristics particular to a specific manufacturer are mentioned, they are so mentioned to clarify the anticipated quality, operating requirements and general physical arrangements of the system.
- .2 The mechanical screening system technical description contained herein is based upon a fine screening system comprising of a continuous band of perforated stainless-steel travelling screen panels which are fastened to perimeter drive chains that track within a guide system. Screened solids are cleaned from the screening panels by brushes and wash water. Other configurations for the mechanical screening system will be considered, but only screening methods with a screening efficiency of 70% or better.

1.10 WARRANTY/ PERFORMANCE GUARANTEE

- .1 Provide a warranty that expressly states that all materials used in the manufacture is new and first quality. No previously used material can be incorporated in any part of this supply. Supplier to warrant all equipment furnished to be free from defects in materials and workmanship under normal use and service for a period of one (1) year from Ready for Takeover as defined in the General Contract, and will replace, at no cost to the Owner, faulty materials.

PART 2 - PRODUCTS

2.1 SCREENING SYSTEM - GENERAL

- .1 Install the screening system in the facility's Headworks room. The Headworks is a Zone 1 hazardous area in accordance with the latest edition of the Canadian Electrical Code. This area may contain hydrogen sulphide (North American Gas Group C, Zone Based Gas Group IIB) and methane (North American Gas Group D, Zone based Gas Group IIA) gases. All electrical equipment located in this area must be suitable for installation in this hazardous area classification and hazardous gases. Raw sewage enters the screening building and then, under normal operating conditions, flows by gravity through a concrete channel which contains automatic screening equipment. Screen to have a pivot to lift out for maintenance. The automatic screen will remove screenable material and then discharge them to the washer/compactor provided under this scope. Dewatered material will then be discharged to a receiving bin. The screenings bin will be located at a lower elevation. Dewatered screenings will then be hauled off Site (service provided by others).
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2.2 MECHANICAL SCREEN SYSTEM

- .1 The screen must be designed to operate at maximum flow rate specified herein.
 - .2 Mechanically operated channel screen system: installed in channel of screening area, one (1) screen system shall discharge screenings into a washer/compactor, downstream from the washer/compactor will be an individual mechanical shaftless screw conveyor which empties into a receiving bin.
 - .3 Existing channel dimensions: 457 mm wide x 1219 mm deep. Channel invert bottom recess: 89 mm deep by 762 mm long. In order to make use of bottom recess, screen horizontal length in installed position from toe of screen to screenings discharge point centreline must be not greater than 1600, while maintaining at least 300 mm freeboard upstream at peak flow.
 - .1 Liquid depth directly downstream of mechanical screens to be set to 700 mm at 11,400m³/d flow.
 - .4 Screen system dimensions:
 - .1 Frame height above operating floor: less than 2400 mm.
 - .2 Overall lift height from invert of channel to discharge point: 3400 mm maximum.
 - .3 Screen horizontal length in installed position: maximum 2100 mm from toe of screen to screenings discharge point centreline.
 - .5 Screen system configuration: type 316 stainless steel perforated or punched screen, and as follows:
 - .1 Screen opening size (clear opening): 6 mm.
 - .2 Screen panels: continuous band type with removable panels, sized to meet flow requirements and channel configuration. Panels to be sealed to fixed guides and along the bottom sealing brush. Panels shaped to facilitate cleaning by brushes and wash water.
 - .3 Frame of unit to be securely anchored to channel walls with anchor bolt system.
 - .4 Minimum acceptable screening efficiency of 70%.
 - .6 Drive system: shaft mounted helical gear motor.
 - .7 Drive shafts: type 316 stainless steel top and bottom shafts.
 - .8 Drive chain and sprockets: 19 mm pitch 316 stainless steel roller chain, with hardened type 316 stainless steel drive and driver sprockets; complete with lock for driven sprocket alignment, and epoxy coated steel take-up assemblies for drive chain tension adjustment.
 - .9 Panel chain: heavy-duty 316 stainless-steel roller chain with type 316 stainless steel sprockets. Sprockets will rotate on ball bearings/bushings. Roller chain to track smoothly in ultra-high molecular weight polyethylene guides.
 - .10 Lubrication: provide non-metallic lubrication fitting extension lines to allow maintenance from operating floor.
 - .11 Carriage: type 316 stainless steel, spring loaded and adjustable.
 - .12 Cleaning system: two-stage with modular brushing system and wash water jets. Cleaning system shall keep screens free flowing and clean.
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.13 Main frame: 8 mm thick, type 316 stainless steel plate, with foot frame and crossbar supports.

.14 Dead plate and chute: 6 mm thick, type 316 stainless steel plate, welded to main frame assembly.

.15 Finishing: self-priming, chemical resistant epoxy finish on non-stainless and non-galvanized fabricated steel components.

.16 Anchor bolts: type 316 stainless steel.

.17 Confirm system does not have permanently submerged mechanical moving parts.

.18 Screen to include cold-weather protection. It will be installed in an unheated room.

2.3 WASHER/COMPACTOR

.1 This section covers the furnishing of one (1) washer/compactor shafted compacting screw. Supply the washer/compactor complete with controls, an inlet hopper and discharge tubing.

.2 System to be designed to receive, wash, positively convey and compact screenings discharged from the fine screen. The screenings shall be introduced into the inlet hopper, washed in the Wash Zone, compacted in the Press Zone, conveyed through the Transport Zone, and discharged from the Discharge Tube into a collection bin for disposal by others.

.3 Provide a washer/compactor designed to handle a minimum capacity of 2.0 m³/hr.

.4 Washer/compactor to:

.1 Reduce screenings volume by of 55-70%.

.2 Produce a dry screening content of 45-60%.

.3 Reduce organics by 60-90%

.5 The washer/compactor, exclusive of the discharge tubing, to have a length less than 2.50m.

.6 Provide each unit complete and designed to be installed level. Supply support legs as required for adequate support under operating conditions. Support legs to allow for a 100mm adjustment in height.

.7 Shafted screw assembly:

.1 Shafted Screw Assembly to consist of a spiral welded to mechanical tubing. Weld the mechanical tubing to an end shaft.

.2 Shafted Screw to be manufactured from concentric flights formed from carbon plate and welded to form a single spiral.

.3 Size the diameter of the Shafted Screw assembly to meet the design criteria or 195 mm minimum and constant over the length of the assembly.

.4 Shafted Screw to have one (1) abrasive resistant Brush Assembly or wiper blade made of leather. Brush to be Nylon and tack welded to the screw. Bolt the wiper blade to the screw.

.5 Pitch of the screw to reduce to 66% of the screw outer diameter in the Press Zone area.

.6 The final 1.5 flight sections of the Shafted Screw shall be Hard

Faced.

.8 Sieve zone:

.1 Sieve zone to be semi-cylindrical or tubular in design with an integral collection pan and an inlet chute to accept screenings from the fine screen. Provide grade 316 stainless steel intermediate chute to mate between screen discharge and hopper inlet. Coordinate dimensions with the installing contractor.

.2 Sieve zone to be manufactured from grade 316 stainless steel and perforated Grade 316 stainless steel. Perforations to be 1/8" minimum.

.3 Sieve zone to include one (1) Inlet Hopper to direct screenings from the bar screen into the washer/compactor. Inlet hopper to be constructed of Grade 316 stainless steel and bolted to the transport zone of the U-trough.

.9 Transport zone:

.1 Tubular in design and constructed of minimum 11-gauge Grade 316 stainless steel.

.2 Fit the Transport Zone with anti-rotation stainless steel bars or Wear Bars constructed of minimum 9mm thick Carbon Steel. Bolt the Wear Bars from the outside of the Transport Zone. Welded Wear Bars will not be allowed.

.10 Wash zone:

.1 Tubular in design with an integral collection pan located directly under the zone. The wash zone will wash screenings and reduce the organic content.

.2 Provide a wash zone constructed of perforated Grade 316 stainless steel plate and Grade 316 stainless steel plate. Perforations to be 3mm minimum.

.3 Wash zone to consist of a spray header fitted with minimum two (2) nozzles to provide cleaning of screenings before compacting. Wash zone supply water to be approximately 0.63 L/s @ 55psi. Wash zone to include a solenoid valve to control the flow of water into the wash zone. Wash zone to include a solenoid valve, and flow switch shipped loose to control the flow of water.

.11 Press zone:

.1 Tubular in design with an integral collection pan located directly under the zone.

.2 Provide a press zone constructed of minimum 11-gauge Grade 316 stainless-steel.

.12 Collection pan:

.1 U-Trough design located directly under the Sieve, Wash and Press Zones.

.2 Collection Pan to be constructed of Grade 316 Stainless Steel and attached to the compactor body with quick release clamps or welded with access doors.

.3 Periodically, water will be introduced into the collection pan to flush organics and other fines to the drain. The Collection Pan water supply shall be approximately 0.63 L/s @ 55psi. The flush water will be controlled by the screening system PLC by means of solenoid valve,

shipped loose for field installation. The flush water will flow down to the base of the collection pan to minimum 100mm diameter drain outlet.

- .13 Discharge tube:
 - .1 Discharge tube to be cylindrical and constructed of Grade 316 stainless steel. Discharge tube to increase in diameter over its length in order to reduce the potential for plugging.
 - .2 Discharge tube to direct and discharge screenings at a clear discharge height of 1200mm above the operating floor to allow for placement of a receptacle (provided by others) to collect the screenings.
 - .14 Wear liner: provide spiral housing with wear liner fabricated from four (4) flat steel bars. Provide channels between wear liner bars to allow liquid drainage during dewatering, where applicable.
 - .15 Drive system:
 - .1 Electric Motor: maximum 5 HP, 600V, 3 Phase, 60Hz, as per clause 2.5.
 - .2 Gear Reducer: designed to utilize a shaft mounted parallel helical type gear reducer driven by a direct coupled motor. Reducer to have a cast iron housing with an output speed of 10-14 rpm. Service factor to be minimum 1.4.
 - .16 Supports: provide type 316 stainless steel bolted floor supports on housing as required. All anchor bolts, nuts and washers must be 3/4" diameter 316 stainless steel. Supply anchor bolts.
 - .17 Spare parts:
 - .1 Package spare parts with labels bearing the description and quantity of the contents, for possible long-term storage. Furnish the required spare parts for the washer/compactor for five (5) years of operation. As a minimum, provide the following:
 - .1 One (1) Thrust Bearing
 - .2 One (1) set Shaft Seals
 - .3 Two (2) sets of Wear Bars, where applicable
 - .4 One (1) Shafted Screw
 - .18 Surface finishes and coatings: after all fabrication and welding has been completed, all stainless-steel surfaces must be glass Bead Blasted prior to equipment assembly. Remove all weld discoloration and surface contaminants and provide for Spontaneous Passivation as recognized in ASTM A380 for self-priming chemical resistant epoxy finish on non-stainless steel and non-galvanized fabricated steel components. Supply purchased components such as motors, reducers, valves, switches, etc., with the manufacturer's standard finish.
 - .19 Washer-compactor to include cold-weather protection. It will be installed in an unheated room.
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2.4 ELECTRICAL MOTORS

- .1 Drive motors to be totally enclosed, fan cooled induction motors NEMA Design B, with Class F insulation, high efficiency (inverter duty rated where motor is fed from a VFD). Motors must have a service factor of 1.15 for continuous service at 40 degree Celsius ambient. Motors must be suitable for installation in a Zone 1 hazardous area (Zone based Gas Groups IIA and IIB, North American Gas Groups C&D). Motor ratings to be such that rated nameplate values of horsepower and full load current will not be exceeded nor will the motors run into the service factor area. Motors to be nameplate rated for 575V, 3 phase, 60 Hz power supply. Motors must comply with NEMA Standard MG1 and CSA Standard C22.22, No. 100. Motor nameplates and shop drawings to indicate nominal efficiency in accordance with NEMA MG1-12.53 (a) and (b) based on IEEE-112, Method B. Motor bearings to be grease lubricated ball or spherical roller bearings. All bearings must have a life (B-10) of 100,000 hours as defined by the Anti-Friction Bearing Manufacturers Association. Motor housing to be cast iron.

2.5 GENERAL CONTROLS

- .1 Provide a complete PLC-based control system for the operation of screen and washer/compactor.
 - .2 The main plant control system will be PLC based and communicate to all equipment supplied PLC control systems via a plant wide Ethernet communications network (by others). This will permit the main plant control system to monitor, and relay process information to/from the various equipment supplied control systems, as required for their integration into the overall plant controls strategy. To facilitate this requirement, the equipment supplier shall provide a PLC based control system with the ability to communicate to/from the main plant control system on an Ethernet communications network.
 - .3 The mechanical screening system will always be in active mode and ready to screen wastewater flows. The mechanical screen will monitor differential liquid level upstream and downstream of the unit's influent channel. The screen will activate upon an operator selectable maximum differential level setpoint. As a minimum, make the following control parameters available for communication to/from the main plant control system:
 - .1 Differential liquid level status for each mechanical screen system.
 - .2 Running, fault, and H/O/A selector status for all fine screening equipment system motors to the main plant control system for monitoring.
 - .3 Fine Screening System equipment and process alarms to the main plant control system for monitoring.
 - .4 Fine Screening System equipment and process analog values to the main plant control system for monitoring.
 - .4 Equip the equipment supplied control panel with a "LOCAL/REMOTE"
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selector switch. When "LOCAL" is selected, the system can be started/stopped locally from the control panel's operator interface. When "REMOTE" is selected, the system can be started/stopped from the differential level detection system through the screen control system.

- .5 Provide HAND/OFF/AUTO (H/O/A) and Forward/Reverse (where reversing operation is required) selector switches for all equipment supplied motors. This includes all motors for the mechanical screen systems, and washer/compactor. Provide these selector switches separately as individual control stations, or a local "pony panel". The Fine Screen Equipment system's main control panel will be located remote from the equipment, due to hazardous area classification. When selected to "HAND", the associated motor will start immediately (provided no system emergency stops have been activated). Hardwire this contact to the associated motor starter (does not require system PLC to be operating) and bypass all PLC logic interlocks/permisives. This mode of operation will be used mainly for clearing equipment trips, and for maintenance purposes. When "OFF" is selected, the associated motor cannot be started, or will stop if it is running (hardwired to its associated motor starter). When "AUTO" is selected, the starting/stopping of the associated motor will be controlled via the supplied PLC control system. This will be the normal mode of operation. For all equipment supplied motors that have variable speed drives also be provided with a manual speed pot adjustment for controlling the motor speed when running in the "MANUAL" mode.
- .6 Supply an "EMERGENCY STOP" pushbutton on the individual local control stations, which upon activation, will stop equipment motor(s) for the associated piece of equipment that are running, or prevent them from being started if they are not running. Hardwire the ES pushbutton to each supplied motor starter, with one contact being wired to the PLC control system for alarming.
- .7 As the mechanical screen system operates, the unit's respective washer/compactor must also operate. The conveyor must operate with the screen and washer/compactor. Operation of the washer/compactor and conveyor will be controlled by the equipment supplied PLC system.

2.7 INSTRUMENTATION

- .1 Include all instrumentation required to facilitate the automatic operation and monitoring of the proposed system equipment. Instrumentation supplied to include, but not limited to, the following:
 - .1 Ultrasonic level detectors, upstream and downstream of screen system.
 - .2 All supplied instrumentation must be of a proven design for each application and selected to suit their applicable operating process and environmental requirements.
 - .3 Instrumentation parts subject to wear, corrosion, or other
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deterioration, or requiring adjustment, inspection or repair, must be accessible and capable of convenient field maintenance.

- .4 Supplied instrumentation to be CSA approved, and rated for their applicable hazardous area classification. The minimum acceptable instrument enclosure rating shall be NEMA 4X.
- .5 Ultrasonic type level transmitters to generally have the sensor mounted local to the basin/tank, and the transmitter located remotely. General level transmitter design and performance requirements shall be as follows:
 - .1 An isolated 4-20 mA output signal (loop powered).
 - .2 Minimum accuracy of 0.25% of calibrated range.
 - .3 Capable of local calibration/setup, with self-diagnostics.
 - .4 120 VAC power supply.
 - .5 Local display of level with engineering units.
 - .6 At least two (2) programmable relay outputs. SPDT contacts rated for a minimum of 5A at 120 VAC (continuous use).
 - .7 With temperature compensation.
 - .8 Sensor rated for applicable hazardous area classification (where applicable).
 - .9 Transmitter will be remote mounted in Electrical Room (non-hazardous area). NEMA 4X enclosure rating.

2.8 CONTROL PANEL

- .1 Control panel to be NEMA 12 rated, floor mounted type, with at least 12 inch floor stands. Control panel to include, but not limited to, the following: an incoming main power disconnect switch (600VAC, 3-phase, 60Hz single feed power supply - by others), primary and secondary fused control transformers, motor starters, PLC processor and required I/O cards, UPS, and all other control components required (relays, pushbuttons, switches, speed controls, indicating and alarm lights, etc.) for a complete control system, to operate and monitor the proposed Fine Screening Equipment system, and to integrate it with the main plant control system.
 - .2 The Fine Screening Equipment control panel will be located immediately outside of the screen equipment room, and installed next to an operator viewing window to facilitate visual inspection of the equipment. Provide a Zone 1 hazardous area rated pony-panel for locations inside the screen equipment room. The pony-panel will contain H/O/A selectors, E-stops, local speed controls, etc., for local control of each component of the Fine Screening Equipment system.
 - .3 Control panel PLC processor and I/O cards to be Allen-Bradley, ControlLogix or CompactLogix series, with the ability to communicate to the plant wide Ethernet/IP communications network. Include surge protection for the processor and field I/O power supplies. Include fuses or breakers to protect PLC I/O on a per card basis. Provide individually isolated digital I/O cards (24 VDC and 120 VAC rated) as
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- required. Provide adequate digital and analog I/O for this process plus 25% spare for each I/O type (provide a minimum of four (4) spare for each I/O type). Wire all I/O to an identified field wiring terminal strip on a per card basis.
- .4 Provide the PLC control panel with a true online UPS to maintain power to the PLC, I/O, HMI and ethernet communications for at least 15 minutes in the event of a loss of power. Size UPS with at least 50% spare load capacity and monitor UPS status in the PLC (normal power failure, low battery/UPS fault)
 - .5 Control panel to contain a door mounted local operator interface to facilitate local control (start/stop, set point adjustments, etc.), monitoring (equipment and process status), and troubleshooting (alarms, diagnostics, etc.) of the Fine Screening Equipment and controls. Operator interface to be a multifunction graphic terminal complete with colour TFT touch screen, minimum 10" screen size, ethernet communications, NEMA 12 enclosure, battery backup, integral USB/ethernet ports, 24 Vdc or 120Vac input voltage. Acceptable materials: Allen-Bradley Panelview Plus 7 or approved equivalent.
 - .6 Provide all system PLC and operator interface "as commissioned" programming (without password protection). Coordinate with the main plant control system integrator to facilitate the communication of the required equipment and process parameters to/from the main plant control system, via the plant wide Ethernet communications network.
 - .7 Required pushbuttons, selector switches, indicating and alarm lights to be Allen-Bradley 800T (non-hazardous) and 800H (hazardous) series, or approved alternate and be complete with legend plates. Manual speed pots to be as recommended by the selected VFD manufacturer. Pilot lights to be LED.
 - .8 Provide a main, heavy duty, fused disconnect switch for disconnection of power to the main control panel. Disconnect switch to be a quick-make, quick-break type of ampere rating and number of poles to match the load requirements of the control panel. Fuse holders must be suitable without adapters for the size and type of fuse installed. The disconnect switch must be operable from either the front or side without opening the enclosure door and there must be provision for padlocking the disconnect switch in the off position by a minimum of three padlocks. Disconnect switch to have a defeatable door interlock to prevent the door from opening when the operating handle is on.
 - .9 Motor starters to be single or three phase magnetic starters, sized in accordance with manufacturer's instructions for the motor being controlled. Motor starters to be NEMA design. IEC equipment or half size motor starters are not acceptable. Motor starters to have a 120V, 60hz operating coil and shall have a minimum of one (1) spare normally open and one (1) spare normally closed run contact. Overload relays to be solid state with visible trip indication, adjustable overload protection, phase loss protection and ground fault protection. Provide
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features/devices to lock out individual motors.

- .10 Control transformers to have primary and secondary fuses. Transformer VA rating to have 100VA capacity in excess of the total operating requirements. Secondary fuses to be HRC, Class CC. Primary fuses to be HRC, Class J.
- .11 Power fuses to be high rupturing capacity (HRC) type, minimum 200kA interrupting rating (momentary RMS symmetrical). Use Class J, fast acting type for the main disconnect switch and for non-motor load circuits. Use Class J, time delay type (capable of carrying 500% of its rated current for 10 seconds minimum) for motor loads. Use high speed, Class HSJ type for VFD's.
- .12 Provide an Ethernet switch in the control panel as follows: DIN rail mounting type, minimum eight (8) RJ 45 Ethernet ports, 10/100 Mbits/sec, managed with VLAN and IGMP snooping, industrial type. Acceptable manufacturers: N-Tron, Hirschman and Rockwell Automation (Stratix) or approved equivalent.
- .13 Control panel to have a minimum short circuit rating of 35KA (momentary rms symmetrical) at 600Vac, 3-phase.
- .14 Provide a master "EMERGENCY STOP" push button on the control panel front, which upon activation will stop all equipment motors that are running, or prevent them from starting if they are not running.
- .15 Provide Variable Frequency Drives in accordance with the requirements of this Section.
- .16 Provide a door mounted ethernet data outlet (Cat 6) and a 15A, 120V receptacle for connection of a laptop PC to program and troubleshoot the PLC and HMI applications.
- .17 Include an internal LED light complete with door switch.

2.9 VARIABLE FREQUENCY DRIVES

- .1 Drive to be digital, pulse width modulated, modular construction, CSA approved.
 - .2 Drive to convert incoming fixed frequency three phase ac power into variable voltage and variable frequency utilizing pulse width modulation.
 - .3 Drive to include a full wave diode bridge rectifier to convert ac to dc. SCR and other switching power devices are not acceptable.
 - .4 Drive to utilize dc capacitors to filter out bus ripple and provide smooth dc power to the transistor section.
 - .5 Drive must utilize IGBT transistors to produce a pulse width modulated output. SCR's are not acceptable. The IGBT minimum Vce rating will be 1200V.
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- .6 Drive main input power to be 600V, 3-phase, 60hz. Voltage tolerance to be -15%/+10%. Frequency tolerance shall be 48hz to 63hz.
 - .7 Drive to be rated to provide current to support motors at 1.15 service factor continuously.
 - .8 The efficiency of the drive to be a minimum of 95% at full load and full speed.
 - .9 Displacement power factor to be greater than 0.95 lagging over the entire speed range.
 - .10 Provide minimum 3% input line reactors or equivalent. Input line reactors or equivalent can be integral to the VFD.
 - .11 Drive must be able to provide full rated output current continuously. For variable torque loads, VFD must be able to provide 110% overload for up to one (1) minute and 150% overload for up to three (3) seconds. For constant torque loads, VFD must be able to provide 150% overload for up to one (1) minute and 200% overload for up to three (3) seconds.
 - .12 Provide drive complete with power line loss ride through feature for a minimum of 0.5 seconds.
 - .13 Drive to be controlled by an integral local/remote (or hand/auto) selector switch on the drive operator keypad. In the local (or hand) position, the drive will stop/stop via the drive operator keypad and the drive speed will be changed from the drive operator keypad. In the remote (or auto) position, the drive start/stop will be initiated from a remote dry contact and speed will vary from an analog signal. The drive will ramp up and down between a preset minimum base speed and the programmed motor speed (maximum 100%) over an adjustable time period.
 - .14 Provide most recent version of programming software and appropriate interface hardware to enable drive configuration from a laptop computer.
 - .15 Provide 24Vdc Digital Input points as follows: start/stop, enable, external interlock for local disconnect switch.
 - .16 Provide 4-20mA output signal for connection to the PLC to indicate motor current.
 - .17 Provide analog input point to accept a 4-20mA analog signal from PLC (Speed adjust in auto).
 - .18 Provide relay contacts (dry, rated 120V) for monitoring the following: run, VFD fault and VFD in remote (or auto).
 - .19 Protective functions:
 - .1 Drive to have built in CSA approved adjustable electronic motor overload (class 10, 20, 30) protection to protect the connected motor.
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- .2 Drive to have input metal oxide varistors (MOV's) for surge protection.
 - .3 Provide drive complete with the following protective functions:
 - .1 Over and under voltage.
 - .2 Overcurrent.
 - .3 Ground fault.
 - .4 Drive over temperature.
 - .5 Blown dc bus fuse.
 - .6 Overload.
 - .7 Input and output phase loss.
 - .8 Unbalance current fault
 - .9 Motor stall protection.
 - .4 Provide for three (3) auto restart attempts for selected fault conditions.
 - .5 Drive must permit the operator to lock out the reverse operation for applications where reverse would damage equipment.
- .20 Provide each drive complete with an operator keypad for local programming, monitoring, speed control and start/stop control. Each keypad shall be visible and accessible from the front of the enclosure with the door closed. The keypad shall be complete with the following minimum features:
- .1 LCD high resolution display.
 - .2 Keypad shall indicate the following minimum operating conditions: drive run, drive stopped, drive fault.
 - .3 As a minimum, output speed, power, frequency and current shall be displayed continuously as selected by the user.
 - .4 Fault reset button.
 - .5 Local/remote (or hand/auto) selection.
 - .6 Start/stop buttons (for local control).
 - .7 Present fault condition shall be displayed.
 - .8 Keypad entries shall be password protected.
- .21 Programming features:
- .1 Drive must have a minimum of three (3) independently adjustable acceleration and deceleration ramps. Times are to be adjustable from 0.1 to 3200 seconds (nominal).
 - .2 Drive to have an adjustable output frequency from 25-320hz (nominal).
 - .3 Control methods available to be selectable sensorless vector, selectable Volts/hz patterns, and direct torque control.
 - .4 Drive to have adjustable minimum and maximum speed settings.
 - .5 Drive to have an adjustable carrier frequency (nominal 1-15khz).
 - .6 Drive to have a minimum of three adjustable frequency reject points to prevent system operation at resonant speed.
- .22 Drive to be sized for variable torque or constant torque load to match the application load characteristics.
- .23 Provide drive electronics complete with conformal coatings for protection against dust and chemicals.
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- .24 Provide output dv/dt filtering downstream of the drive to protect the motor against high voltage spikes. Install the dv/dt filter in the control panel
- .25 Where applicable, the drive must be capable of accepting the opening of a downstream disconnect switch without causing damage to the drive. Wire an auxiliary contact from each local disconnect switch back to the drive to prevent starting the drive on an open circuit condition.
- .26 Drive to include ethernet/IP communications port.
- .27 Provide drive complete with NEMA enclosure to suit installation location.
- .28 Acceptable manufacturers: ABB ACS Series, Allen Bradley Powerflex Series or approved equivalent.

PART 3 - EXECUTION

3.1 DELIVERY

- .1 Ship equipment to the Site pre-assembled where possible.
- .2 Coordinate delivery and storage with the Contractor (selected under a later general tender call).

3.2 RESPONSIBILITY OF TEMPORARY TRIAL USAGE

- .1 Obtain written permission from the Consultant to use and test permanent equipment and systems prior to acceptance by the Owner.
- .2 The guarantee period must not be affected by temporary trial use of the equipment.
- .3 Clean and renew equipment and systems used before acceptance. Restore to original or new working condition.
- .4 Protect equipment and systems openings from dirt, dust and other foreign materials during temporary usage.

3.3 INSPECTION, TESTING AND START-UP

- .1 Provide the services of competent service personnel, mechanics or other trained personnel of the equipment supplier's or manufacturers to check the complete installation and be present for start-up of the equipment. Submit a written report signed by the equipment manufacturer's representative to the Consultant stating the following:
 - .1 That a satisfactory installation of equipment has been performed and outlining any modifications that have been made as a result of the commissioning or testing of the equipment at no additional cost to the Contract.
 - .2 That the equipment is now ready for permanent operation.
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- .2 The Equipment Supplier's representative must fully instruct the permanent operator of the equipment in the proper operation and maintenance of all equipment at the cost proposed in 00 41 01.
 - .3 Advise in writing at least one (1) week in advance of the proposed date for testing and start-up. Conduct all tests in the presence of the Consultant.
 - .4 Replace defective material or equipment with new material or equipment. Bear costs including re-testing and repairing.
 - .5 A minimum period of ten (10) days on Site for skilled supervision and instruction and a minimum of three (3) trips to the Site should be assumed by the equipment manufacturer. Provide as many trips and days on Site to complete the installation and put the equipment into satisfactory operation.

3.4 PERFORMANCE, TESTING AND COMMISSIONING

- .1 Commission equipment in accordance with Section 00 21 14, clause 13.
- .2 When the Contractor has completed the installation work and before any equipment is operated, they will instruct the Equipment Supplier to commission the equipment. The Equipment Supplier will provide the services of a skilled technical representative at the Site to carry out the following work:
 - .1 Check the installation as to its workmanship.
 - .2 Perform further tests to confirm that the equipment is in accordance with the intent of this specification.
 - .1 Ensure the equipment, including all component parts operate as intended.
- .3 Provide all necessary equipment and accessories to facilitate the testing of equipment.

PART 1 - GENERAL**1.1 WORK INCLUDED**

- .1 This specification describes the design, supply, delivery, and commissioning of a Sequencing Batch Reactor (SBR) treatment system for installation by others at the Town of Lunenburg WWTP located in Lunenburg, Nova Scotia.
- .2 The two-basin SBR treatment system includes an SBR process control system, blowers, oxygen transfer system, solids excluding effluent decanters, decanter freeze protection, automatic valves as required for the system proposed, sludge wasting mechanisms, instrumentation, controls, in-basin air piping, and supports.

1.2 INTENT

- .1 The intent of these specifications is to provide the works fully complete in every detail for the purpose designated. Provide any apparatus, appliance material or labour not specifically mentioned or included, but requisite to the operation of the apparatus and equipment specified without additional expense to this Proposal.

1.3 REFERENCES

- .1 ASTM D2241-20, Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe, SDR Series.
 - .2 ASTM D1785-21a, Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
 - .3 ASTM A126-04(2023), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 - .4 CSA C22.2 No. 100-14(R2019), Motors and Generators.
 - .5 ASTM A240/A240M-23a, Standard Specification for Chromium and Chromium - Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.
 - .6 ASTM A276/A276M-24a, Standard Specification for Stainless Steel Bars and Shapes.
 - .7 IEEE 112-2017, Standard Test Method Procedures for Polyphase Induction Motors and Generators.
 - .8 Equipment assemblies, composed of electro-mechanical components must be CSA or cUL certified or certified by an agency approved by the Electrical Inspection authority having jurisdiction and bear the appropriate label. If the Equipment is not certified by an approved certification agency, the Equipment Supplier must arrange and pay for spot approval of the Equipment prior to installation.
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1.4 DESIGN CRITERIA

- .1 The control system as a minimum must be capable of controlling/monitoring the following equipment:
 - .1 SBR Blowers.
 - .2 Sludge Blower.
 - .3 Automated influent, decant, and air control valves (as required for the system proposed).
 - .4 Submersible WAS pumps.
 - .5 SBR decanter assemblies.
 - .6 Level indicating equipment.
 - .7 Dissolved oxygen sensors.

1.5 SUBMITTALS

- .1 Provide shop drawings, installation, operating and maintenance manuals as specified in Section 00 21 14.
- .2 Shop drawings:
 - .1 As a minimum, shop drawings to include:
 - .1 Details of Equipment assembly, fabrication, control and installation.
 - .2 Detailed layout of aeration equipment and accessories.
 - .3 Detailed listing of materials of construction.
 - .4 Details of headers and lateral piping supports and joints.
 - .5 Certified Oxygen Transfer Performance Curve as per the ASCE revised method.
 - .6 Provide operating curves in accordance with Hydraulic Institute Standards.
 - .7 Headloss calculations for the aeration equipment from the lateral connection point to the farthest diffuser bubble release point.
- .3 Shop drawings are required for all products in this Section to clearly indicate roughing-in dimensions and all other physical characteristics pertinent to installation.

1.6 QUALIFICATIONS OF EQUIPMENT SUPPLIERS

- .1 All items of equipment supplied must be produced by companies regularly engaged in manufacturing this type of equipment and who maintain service and parts departments from which service, repairs and replacements may be obtained quickly at all times. Mechanical details of the equipment offered must have been tried and tested by the actual construction and operation of mechanisms of the exact type and of comparable size and operating in similar service.

1.7 IDENTIFICATION OF EQUIPMENT

- .1 Fit process equipment with the manufacturer's identification nameplates indicating size, equipment model, manufacturer's name, serial number,
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voltage, cycle, phase and power motors, all factory supplied.

- .2 Locate manufacturer's nameplates so that they are easily read. Do not paint over plates.

1.8 MAINTENANCE MANUALS

- .1 Provide operation and maintenance data for incorporation into Operation and Maintenance Manuals as specified in Section 00 21 14.
- .2 Provide one (1) complete set of special tools in the equipment supply.

1.9 WARRANTY

- .1 Provide a warranty that expressly states that all materials used in the manufacture is new and first quality. No previously used material can be incorporated in any part of this supply. Supplier shall warrant all equipment furnished to be free from defects in materials and workmanship under normal use and service for a period of one (1) year from Ready-for-Take-over, as defined in the General Contract, and will replace, at no cost to the Owner, faulty materials.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 The SBR system and associated equipment will be designed based upon the design parameters below. Raw wastewater will be transferred to the WWTP by a forcemain. Prior to entering the SBR tanks, the wastewater will be screened (6 mm) and de-gritted.
 - .2 SBR system to incorporate continuous feed activated sludge technology with intermittent systems operation. System to use a single reactor in which the activated sludge is alternately aerated and mixed over a number of pre-determined cycles. Solids liquid separation will occur during a settling phase of the cycle. After the settling phase, treated effluent shall be decanted or withdrawn from the liquid surface. Flow to the vessel is not interrupted at any time.
 - .3 The functions of flow equalization, biological oxidation and sedimentation shall all be carried out in a single reactor. Systems that require reactor bypassing during the settle and/or decant phases will not be acceptable.
 - .4 Treated effluent will be withdrawn from the upper portion of the SBR with a solids excluding decanter and be disinfected prior to being discharged to the receiving water. Sludge will be wasted automatically (periodic basis) by submersible WAS pumps to an aerated digester/sludge holding tank.
 - .5 Design the SBR system based on the following Site and raw wastewater characteristics:
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- .1 Average Flow: 2,900 m³/day (766,100 UGgpd)
 - .2 Peak Daily Flow: 11,400 m³/d (3,000,000 UGgpd)
 - .3 Average CBOD Loading: 240 kg/day
 - .4 Average TSS Loading: 400 kg/day
 - .5 Average TKN Loading: 40 kg/day
 - .6 Peak CBOD5 load: 440 kg/day
 - .7 Peak TSS load: 860 kg/day
 - .8 Peak TKN load: 90 kg/day
 - .9 Design CBOD conditions for aeration design to be Peak CBOD loading at Average Flow.
 - .10 Effluent BOD₅: 25 mg/L
 - .11 Effluent Suspended Solids: 25 mg/L
 - .12 Effluent Un-ionized Ammonia: <1.25 mg/L
 - .13 Minimum HRT at Avg. Flow: 0.83d (20hrs)
- .6 Design the digester/sludge holding tank, aeration rates, and blowers based on the following criteria:
- .1 Sludge yield: 1.0 kg/kg BOD removed.
 - .2 Waste sludge concentration: 0.85%.
 - .3 Waste sludge VSS: 70%.
 - .4 Gravity thickened sludge concentration: 2%
 - .5 Total sludge tank volume: 720 m³.
 - .6 Existing diffuser airflow capacity: 1660 scfm.
 - .7 Maximum basin side water depth: 3.66 m.
- .7 Some areas at this facility are Zone 1 or Zone 2 hazardous areas in accordance with the latest edition of the Canadian Electrical Code. These areas may contain hydrogen sulphide (north American Gas Group C, Zone based Gas Group IIB) and methane (North American Gas Group D, Zone based Gas Group IIA) gases. All electrical equipment located in these areas must be suitable for installation in the specified hazardous area classification and gases. Assume the following hazardous area classifications:
- .1 SBR Reactor tanks: Zone 2 envelope from minimum operating water level to 500mm above tank walls, extending 3000mm from tank walls.
 - .2 Digester/Sludge Holding Tank: Zone 2 envelope from minimum operating water level to 500mm above tank walls, extending 3000mm from tank walls.
 - .3 Blower Room: unclassified.

2.2 AERATION SYSTEM

- .1 The SBR aeration system contains diffusers, in-basin air and liquid piping, and all necessary supports, saddles, and fasteners within all SBR basins.
- .2 Aeration Equipment:
 - .1 The aeration equipment will be designed for easy installation and include provisions for level adjustment, rotational adjustment, and thermal expansion.
 - .2 Entire system to be designed to allow for expansion and contraction over a water temperature range of 4°C to 25°C when installed.

- .3 Aeration system piping:
- .1 Provide piping from the air supply main connection to the SBR including a drop pipe for each air grid. The drop pipe shall be 316L stainless steel, schedule 5 or schedule 10, to 300mm below low water level. At that point, a stainless steel gasketed coupling will be used to connect to a PVC drop leg which will extend to the PVC manifold or headers. The connection for the PVC manifold or diffuser header will be an EPDM or butyl rubber flexible connection with stainless steel band clamps.
- .2 Air manifold piping to be constructed of class 160 PVC conforming to ASTM D2241 or schedule 40 PVC conforming to ASTM D1785. Both classes of pipe to have a SDR rating of 26 or better. The air manifold to be perpendicular to the air headers. Fabricate air manifolds with fixed joint connections to each air header. Fabricate manifolds must not exceed 8m in length for shipping. Use manifolds designed for long-term exposure to 85°C and short-term (80 hour periods) of 100°C mean-wall temperatures. Ends of the manifolds to have solvent welded end caps.
- .3 Air headers to be constructed of class 160 PVC conforming to ASTM D2241 or schedule 40 PVC conforming to ASTM D1785. Both classes of pipe will have a SDR rating of 26 or better. Connect the headers to the air manifold as indicated above. The air headers will be perpendicular to the air manifold. Headers to be fabricated in sections up to a maximum of 8m in length. Join sections with fixed joints or expansion joints as required.
- .4 All PVC piping must contain 1.5 percent by weight titanium dioxide ultraviolet light inhibitor.
- .4 Purge system: Equip every diffuser with a liquid drainer stem to ensure the evacuation of water from the entire submerged aeration piping system or furnish each aeration zone with a PVC drain line, sump, and airlift purge system.
- .5 Diffuser connections: The connection between the air distribution header and the diffuser connector must be capable of withstanding a horizontal or vertical moment of 1,000 inch-pounds, as well as an air pressure of 50 psi, without permanent deformation. This connection must be a shock absorbent type that is unaffected by system vibration.
- .6 Supports:
- .1 All welded pipe supports and assemblies must be shop fabricated from Type 316L stainless steel with a 2D finish conforming to ASTM A240, ASTM A554, ASTM A774, and ASTM A778. Continuously weld both sides of face rings and flanges to eliminate potential for crevice corrosion. All welds and welds surfaces shall be cleaned to remove weld spatter and shall be fully immersed in a pickling solution and rinse with water to remove all carbon deposits and contaminants to regenerate a uniform corrosion resistant chromium oxide film per ASTM A380 Section 6.2.11, Table A2.1 Annex A2 and Section 8.3.
- .2 Unless specified otherwise, all non-welded pipe supports and pieces must be shop fabricated from sheets, plates, or bars of 316 stainless steel conforming to ASTM A240 or ASTM A276.
- .3 Use supports designed to provide ± 12 mm lateral and ± 25 mm
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vertical adjustment of the header. Adjustment to be continuous and possible without removing the air piping from the support. Provide all pipe ends and joints with a pipe support.

.4 Air manifold piping to have a maximum spacing between supports of 3m.

.5 Diffuser headers to have a maximum spacing between supports of 2.5m. Header supports to allow longitudinal movement of the header section to prevent stress build-up in the header due to thermal expansion/contraction forces.

.6 The supports consist of a contoured saddle and a supporting base. Anchor the base with anchor bolts and grout in place, if necessary. Provide the saddle with a Buna-N rubber pad to avoid abrasion. A contoured clamp with an accompanying Buna-N rubber pad will hold the piping to the saddle. Fastening hardware to be Type 316 stainless steel.

.7 Anchor bolts for fastening the supports to the aeration basin concrete slab and walls must be Type 316 stainless steel.

.7 Header joints:

.1 Connections between sections of the air distribution header to be special flanged joints or slip joints. Use joints designed so that individual header sections can be rotated independently of adjacent header sections for alignment purposes. Use flanged joints structurally designed to transmit the longitudinal forces caused by expansion and contraction in the air distribution header. Use slip joints designed to allow for expansion and contraction of the air distribution header.

.2 Expansion joints must be capable of handling the expansion and contraction of the air distribution system over a temperature range of 85°C.

.8 Gaskets: Provide expansion joints and couplings with gaskets forming an airtight connection at 20 psig minimum. Gaskets to be neoprene, 45 to 55 durometer.

.9 Miscellaneous: Nuts, bolts, washers, and other non-welded parts directly exposed to the wastewater to be Type 316 stainless steel. Chemically treat threaded assemblies or lubricate prior to assembling to prevent galling.

.10 Fine Bubble Aeration System (SBR basins):

.1 System to include fine bubble air diffuser system to be incorporated in the SBR tanks. The equipment includes but is not be limited to: flexible membranes, distributor piping, lateral piping, moisture purge system, pipe supports and all necessary hardware needed for installation.

.2 The design is based on the load conditions presented in section 2.1.5 and the following design parameters:

.1 Alpha= 0.50.

.2 Beta = 0.95.

.3 Residual dissolved oxygen (D.O.) = 2.0 mg/L.

.4 Site elevation = 6 m.

.5 Wastewater temperature = around 8-25°C.

- .6 Maximum side water depth of tank = 5.5 m.
 - .7 Design maximum diffuser air flux of 1.76 m³/m²/min.
 - .8 Provide sufficient air to maintain DO levels at all times should nitrification occur in the summer months.
- .11 Diffuser assemblies (SBR basins):
- .1 Air diffuser assemblies to be of the round, non-clog, fine bubble type with a flexible perforated air release membrane. Diffuser size to be nominal 225 mm diameter.
 - .2 Diffuser membrane to be constructed from injection molded EPDM rubber and be suitable for continuous or intermittent aeration. The membrane must include a UV inhibitor and compounds designed for resistance to chemical attack, weathering and aging.
 - .3 Membrane to be molded in a tapered thickness, becoming thicker in the center, in order to prevent ballooning and non-uniform bubble size. The maximum deflection of the center of the membrane under normal operating conditions must be less than 50mm.
 - .4 Diffuser assemblies to have backflow prevention to prevent liquid from passing into the aeration header.
 - .5 The diffuser assembly must have no metallic parts.
 - .6 The membrane exterior surface will be smooth as to inhibit biological film growth. The membrane will inflate during aeration and deflate when the airflow is discontinued, further restricting biological film growth. The membrane must be cleanable in place with water from a high-pressure wash. Acid or other chemical cleaning methods must not be required to restore the diffuser to like-new performance conditions.
 - .7 The fine bubble membrane disc aeration equipment will be designed for easy installation and include provisions for level adjustment, rotational adjustment, and thermal expansion.
- .12 Furnish the following spare parts at no additional cost to the Contract:
- .1 20% spare aeration diffuser assemblies and adapters where required.

2.3 POSITIVE DISPLACEMENT BLOWERS

- 1 Use aeration blowers to provide low pressure air to an existing aeration system which provides oxygen to the SBR and digester/sludge holding tanks. The SBR aeration diffusers are mounted in tanks with a maximum side water depth of 5.5 m and the sludge holding tank diffusers (existing) are mounted in tanks with a maximum side water depth of 3.66 m. Blowers, starters and controls will be housed in a heated control building in close proximity to the tankage. The blowers will draw air from outside through an intake pipe without any treatment.
 - .2 Package blower: rotary type, positive displacement blowers, package assemblies complete with drive, check valve, relief valve, inlet filter/silencers, discharge silencer, support frames, sound enclosure and all accessories as described in this Section. Under normal operations, there are blower(s) operating for the SBR, at least one (1)
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blower for the digester/sludge holding tank, and one (1) common standby or a separate standby for SBR and sludge holding tank blowers. Where practical blower sizing will be consistent such that they can sub in as required (sized for largest capacity required).

- .3 Service conditions:
 - .1 Inlet air conditions:
 - .1 Inlet pressure (within room): -1.0 kPa (absolute).
 - .2 Blowers mounted at sea level (approximate).
 - .3 Maximum inlet air temperature: +30°C.
 - .4 Minimum inlet air temperature: -30°C.
 - .2 Tolerance for air flowrate to be +5% and -0% above and below rated discharge criteria.
 - .4 Each package unit consists of a blower, sound enclosure, motor, v-belts and cover, inlet filter/silencer, discharge silencer and relief valve, flexible connections, all mounted on a steel support frame which will then be mounted on vibration isolators to be secured to a concrete base. Make discharge connections to distribution piping with flexible rubber connection.
 - .1 Blower: rotary lobe, heavy duty, positive displacement blower with vertical inlet/outlet connections and replaceable bearings having a minimum B-10 life of 100,000 hours.
 - .5 Blower accessories: Provide each blower package with the following accessories:
 - .1 Belt drive: set of cast iron multi-sheave pulleys complete with Q.D. steel hubs, self-tensioning V-belts, OSHA belt guard and having 1.4 minimum service factor. Blower assembly shall come installed with sheaves producing 100% blower speed.
 - .2 Inlet filter/silencer: sized for rated output, with synthetic cleanable filter.
 - .3 Discharge silencers: size for blower output and soft coupled to the blower with flanged ends.
 - .4 Pressure relief valve: cast aluminum body, bronze trim high capacity full-nozzle type weighted disk or spring loaded (complete with manual test lever) and having a capacity based on the full blower output, but set initially at 1 psig above normal discharge pressure at high water level.
 - .5 Dirty filter gauge installed at inlet filter and designed for continuous service. Visual gauge to indicate when filter requires changing.
 - .6 Check valve: cast iron body swing check type with Viton seats.
 - .7 Pressure gauge: flangeless black aluminum case, glycerin filled complete with shut off valve (Ashcroft series 3000) (0-15 psi).
 - .6 Acoustic enclosure: individual, integral enclosure for package blower unit capable of reducing sound pressure levels to less than 75 dB(A). Measured 1.0m from the enclosure. Confirm the compatibility of enclosure with package blower unit and accessories. Note that air will be drawn from outside through a pipe intake connection.
 - .1 Enclosure to provide means for adequate ventilation of all
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- equipment contained within enclosure. Provide additional self-powered motor, starter, and controls as required to ensure adequate cooling.
- .2 Enclosure to be of modular, prefabricated construction and designed for ease of access during maintenance and inspection.
- .7 All equipment must be primed and shop coated to manufacturer's specification and to be suitable for an industrial environment.
- .8 Drive motors: Size drive motors to suit application, totally enclosed, fan cooled (TEFC) motors NEMA Design B, with Class F insulation, high efficiency, inverter duty rated where motor is fed from a VFD. Motors shall have a service factor of 1.15 for continuous service at 40°C ambient. Motor ratings must be such that rated nameplate values of horsepower and full load current will not be exceeded nor the motors run into the service factor area. The motors must be suitable to operate from 575 Volt, 3 phase, 60 Hertz power supply. The motors must comply with NEMA Standard MG1 and CSA Standard C22.22, No. 100. Motor nameplates and shop drawings shall indicate nominal efficiency in accordance with NEMA MG1-12.53 (a) and (b) based on IEEE-112, Method B. Motor bearings to be grease lubricated ball or spherical roller bearings. All bearings must have a life (B-10) of 100,000 hours as defined by the Anti-Friction Bearing Manufacturers Association. Motor housing to be cast iron. Motor starters provided by others.
- .9 Provide the following spare parts for each blower size:
- .1 One-year supply of oil/grease (under normal operating conditions).
 - .2 One (1) set of V-belts of each size.
 - .3 One (1) filter element for each size air intake filter.
 - .4 Provide all of the above parts as spare parts and package for potential long-term dry storage.

2.4 SUBMERSIBLE PUMPS

- .1 Submersible Pumps:
- .1 Provide pumping equipment required to waste activated sludge as part of the SBR equipment scope of supply. The pumps must be submersible centrifugal sewage pumps rated to meet wasting requirements.
 - .2 Pump drives: squirrel-cage induction type design, housed in a watertight chamber of maximum efficiency and durability. Motor shall be designed for continuous duty capable of 15 starts per hour, with Class F insulation, high efficiency. Motors to have a service factor of 1.15 for continuous service at 40°C ambient. Motor ratings must be such that rated nameplate values of horsepower and full load current will not be exceeded nor shall the motors run into the service factor area. The motors must be suitable to operate from 600V, 3 phase, 60 Hz power supply. Motors to be nameplate rated for 575V, 3-phase, 60Hz power supply. The motors must comply with NEMA standard MG1 and CSA C22.2, No. 100. Motor nameplates and shop drawings shall indicate nominal efficiency in accordance with NEMA MG1-12.53(a) and (b) based on IEEE-112, Method B. Pump starters provided by others.

- .3 Pumps: bronze fitted construction, bronze impeller, cast-iron body, high grade SAE 1045 steel shaft or equal, tandem mechanical seals with Type 316 stainless steel metal parts and vertical flexible coupled.
- .4 Pumps to be suitable for installation in a Zone 2 hazardous area in accordance with the Canadian Electrical Code.
- .5 Provide each pump with a rail system for removal of pump from the SBR tanks.

2.5 DECANTER

- .1 There will be a total of two (2) solids-excluding decanters to extract final effluent from the reactor basins. The decanter must be designed to be capable of withdrawing average and peak effluent rates. Decanters must employ positive mechanical type seals for excluding solids from effluent piping, or be mechanical decanters that are clear of the water level when not in use. Decanters to be constructed of type 316 stainless steel.
- .2 Provide the SBR effluent pipe with a flanged connection for mounting the decanter system to the installed pipe through the basin wall. Provide flange connection in accordance with ANSI standard 150 pound bolt pattern. Hardware at this flanged connection interface shall be furnished with the decanter.
- .3 The solids excluding assemblies must be field replaceable.
- .4 Provide all necessary supports for the decanter mechanism. The supports will be located on the basin floor and will support the decanter mechanism when the basin is dewatered.
- .5 Provide freeze protection for decanters.

2.6 AUTOMATED VALVES

- .1 Supply any valves and actuators required for control of the process as part of the process equipment scope of supply.
- .2 All plug valves must be permanently lubricated and be of the tight-closing, rubber seat type. Valves to be suitable for sewage and wastewater application, shall have throttling capability, and rated 150 lb. WOG. Valve bodies to be cast iron. Valve plugs to be balanced type and constructed of either cast iron or ductile iron. Passage size shall be a minimum of 80% of the full port area for valves through 20" size and a minimum of 70% of the full port area for valves 24" and larger. Upper and lower bearing to be either stainless steel or bronze and permanently lubricated. Packing to be O-ring, U-cup or V-type, and shall be self adjusting or externally adjustable by means of an external packing gland. Packing gland to be visible through a standoff between the valve bonnet and actuator base. Packing shall be replaceable without removing the valve actuator or bonnet. Leak test all valves to their full rating prior to shipment. Manual plug valves

to have worm gear actuators with handwheels. Size actuators for 50 PSI reverse shut off pressure against the face of the plug. Enclose gearing in a semi-steel housing and be suitable for running in a lubricant. Provide seals on all shafts to prevent entry of dirt and water into the actuator.

- .3 Plug valves:
- .1 Rating: 1050 kPa at 37°C.
 - .2 Body: ASTM A126 Class B cast iron with nickel-welded raised seats, class 125 flanged ANSI B16.1 end connections, or grooved end connections.
 - .3 Plug: Cast iron or ductile iron construction with Buna N or Neoprene coating for resilient plug face and bubble tight shut off.
 - .4 Bearings: stainless steel and teflon permanently lubricated.
 - .5 Packing: Buna N or Teflon combination, self-adjusting or externally adjustable.
 - .6 Bolted bonnet design, repackable without removing bonnet.
 - .7 Actuator: lever actuator for 100 mm and smaller valves; worm-gear actuator for valves greater than 100 mm; actuator to be supplied by valve manufacturer. Geared actuators to indicate valve position and have permanently lubricated bearings, semi steel housing and seals against dirt and water. Size actuators for 50 PSI reverse shut off pressure against the face of the plug.
 - .8 Acceptable product: DeZurik Fig 100, Milliken figure 601, Valmatic Cam Centric, Keystone Bell Centric, Victaulic Series 365 (up to 450Ø).
- .4 Butterfly valves:
- .1 Valves to have a maximum of 345 kPa pressure rating and valves for air service shall have a temperature rating of 120°C.
 - .2 Valves to be flangeless, lug style suitable for installation between ANSI B16.1 flanges.
 - .3 Bodies of semi steel or cast iron equipped with 4 flange bolt guides, with self-lubricated bronze shaft bearings.
 - .4 Seats of EPDM, suitable for use with air or water. Shafts to be one piece of 316 stainless steel, finish ground and polished with EPDM shaft seals. Discs to be bronze. The disc to shaft connections will be type 316 stainless steel. Pins, shaft and disc of all valves shall be individually machined and completely interchangeable.
 - .5 Manual butterfly valves 100 mm and smaller shall be provided with lever actuators. Lever operated valves shall latch in the open, closed, or several intermediate positions. Equip valves 150 mm and larger with weatherproof manual rotary geared actuators of the handwheel or chainwheel type. Provide chainwheel actuated valves complete with sufficient galvanized chain to extend within 1200 mm of floor level.
 - .6 Standard of acceptance: Manufactured by DeZurik or Keystone.
- .5 Electric actuators:
- .1 Actuators for all automated valves to consist of motor, reduction gearing, position limit switches and Torque limiting switches, local open/close indicator, manual override handwheel, mounted in a NEMA 4X housing complete with internal heater. Actuators to be rated for the applicable hazardous rating. Use actuators rated for 345 kPa working
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pressure. Provide the following:

- .1 On board controls including local control switches, buttons and overload and fuse protection. (local/remote, open/close, etc.)
- .2 Valve full Open/Close status limit switches.
- .3 Valve "In remote" status limit switch.
- .4 Remote automatic valve control provided from isolated dry contacts in the SBR process PLC. Arrange the actuator for two wire control; energize to open, de-energize to close.
- .5 Declutchable manual override handwheel.
- .6 Input voltage: 600V, 3-phase.
- .2 Plug valve acceptable products: Rotork Model AQ, 1/4 turn electric actuator.
- .3 Butterfly valves acceptable product: Rotork Model Q, 1/4 turn electric actuator.

2.7 INSTRUMENTATION

- .1 SBR system Equipment Supplier to include all instrumentation required to facilitate the fully automatic operation and monitoring of the proposed system equipment. Instrumentation to include, but not be limited to, in each SBR tank: liquid level regulation to control the operation of the SBR and digester/sludge holding tanks, mechanical switches for back-up level control, dissolved oxygen sensor and analyzer, Suspended Solids sensors (TSS), and all associated mounting brackets as required to facilitate installation.
 - .1 Suspended solids sensor, dissolved oxygen to be displayed at the SBR control panel. The SBR PLC will control the operation of the blower and automated valves to maintain the dissolved oxygen set point (i.e. DO control).
- .2 All supplied instrumentation must be of a proven design for each application and must be selected to suit their applicable operating process and environmental requirements.
- .3 Instrumentation parts subject to wear corrosion, or other deterioration, or requiring adjustment, inspection or repair must be accessible and capable of convenient field maintenance.
- .4 All supplied instrumentation must be CSA approved and rated for their applicable hazardous area classification. The minimum acceptable instrument enclosure rating will be NEMA 4X.

2.8 CONTROLS

- .1 SBR system Equipment Supplier to furnish a complete SBR control system. System to include a master control panel with graphic operator interface (HMI), programmable logic controller, control switches, and pilot lights. Provide local control stations for the decanters. Operator interface to consist of an integral colour touch screen with HMI software (graphical interface), Ethernet switch, software, etc., required for a complete operating plant control system.
- .2 Equip the supplied control panel with the switches, pushbuttons,

timers, etc., required to facilitate manual control of the plant equipment in the event that the PLC control system is not functioning. Local field mounted HAND/OFF/AUTO (H/O/A) selector switches will be installed (by others) for all controlled motors to enable manual plant operation in the event of a PLC failure. When selected to "HAND", the associated motor must start immediately (provided no system emergency stops have been activated). This contact will be hardwired to the associated motor starter (does not require system PLC to be operating) and shall bypass all PLC logic interlocks/permisives. When "OFF" is selected, the associated motor cannot be started, or will stop if it is running (hardwired to its associated motor starter). When "AUTO" is selected, the starting/stopping of the associated motor will be controlled via the supplied PLC control system. This will be the normal mode of operation. Provide all equipment-supplied motors that have variable speed drives with a manual speed pot adjustment for controlling the motor speed when running in the "HAND".

- .3 Provide all system PLC and HMI "as-commissioned" programming. Coordinate with the main plant control system integrator throughout the commissioning/ testing process, making adjustments as necessary to ensure a fully automated treatment system. All PLC programming to be open (not password protected), and configured to communicate to the Owner's control system.
- .4 Supply a control systems operations manual, which will include, but not be limited to the following: panel layouts, panel material lists, equipment specifications and manuals, copies of software, programming code, logic flow diagrams, control narratives, etc., required for the operation and maintenance of the controls equipment provided.

2.9 CONTROL PANEL

- .1 Control panel to be NEMA 12 rated, floor mounted type, with at least 12-inch floor stands. The control panel includes, but is not limited to the following: an incoming main power disconnect switch, (120V, 1 phase, 60 Hz single feed power supply - by others), primary and secondary fused control transformers, PLC processor and required I/O cards, UPS and all other control components required (relays, contactors, surge suppressers, pushbuttons, switches, speed controls, indicating and alarm lights, etc.) for a complete control system, to operate and monitor the proposed SBR equipment, and to integrate it with the main plant control system.
- .2 Control panel PLC processor and I/O cards to be Allen-Bradley ControLogix or CompactLogix, with the ability to communicate to the Plant wide Ethernet/IP communications network. Include surge protection for the processor and field I/O power supplies. I/O card field power supplies to be fused or protected by breaker on a card basis. Provide a 24vdc loop power supply for field instruments (size as required plus 50% spare). Provide adequate digital and analog I/O for the plant equipment plus 25% spare for each I/O type (provide a minimum of 4 spare for each I/O type). Also allow for at least 25% spare I/O rack

- space. Wire all I/O to an identified field wiring terminal strip on a per card basis. Field I/O terminal blocks to be rated for at least 600V, 36A, minimum 6.5mm wide, and capable of accepting a 10 AWG conductor size (supply 20% spare terminals).
- .3 Provide the PLC control panel with a true online UPS to maintain power to the PLC, I/O, HMI and ethernet communications for at least 15 minutes in the event of a loss of power. Size UPS with at least 50% spare load capacity and monitor UPS status by the PLC (Normal power failure, low battery/UPS fault).
 - .4 Required pushbuttons, selector switches, indicating and alarm lights to be Allen-Bradley 800T (non-hazardous) or 800H (hazardous) series, or approved alternate, and be complete with legend plates (white lettering on black background). Provide manual speed pots (if required) as recommended by the selected VFD manufacturer. Pilot lights to be LED.
 - .5 Equipment Supplier to provide spare PLC parts as follows: power supply module, one (1) spare I/O card of each type used.
 - .6 Provide a main, heavy duty, fused disconnect switch for disconnection of power to the main control panel. Disconnect switch to be a quick-make, quick-break type of ampere rating and number of poles to match the load requirements of the control panel. Fuse holders must be suitable without adapters for the size and type of fuse installed. The disconnect switch must be operable from either the front or side without opening the enclosure door and there must be provision for padlocking the disconnect switch in the off position by a minimum of three padlocks. Disconnect switch to have a defeatable door interlock to prevent the door from opening when the operating handle is on.
 - .7 Motor starters and variable frequency drives will be included in a separate motor control center (by others).
 - .8 Control transformers to have primary and secondary fuses. Transformer VA rating to have 100VA capacity in excess of the total operating requirements. Secondary fuses must be HRC, Class CC. Primary fuses must be HRC, class J
 - .9 Power fuses to be high rupturing capacity (HRC) type, minimum 200kA interrupting rating (momentary RMS symmetrical). Use Class J, fast acting type for the main disconnect switch and for non- motor load circuits. Use Class J, time delay type (capable of carrying 500% of its rated current for 10 seconds minimum) for motor loads. Use high speed, Class HSJ type for VFD's.
 - .10 Ethernet switch to be managed with VLAN and IGMP snooping, din-rail mounted, minimum eight (8) ethernet ports (RJ45), 10/100 Mbits/sec, 24Vdc input power, industrial type. Acceptable manufacturer's: N-tron, Hirschmann, Rockwell Automation (Stratix) or approved equivalent.
 - .11 Include a door mounted Cat 6 Ethernet data outlet (NEMA4) for programming and setup.
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- .12 Provide a master "Emergency Stop" pushbutton on the control panel front, which upon activation will stop all equipment motors that are running, or prevent them from starting if they are not running.
- .13 Include an internal LED light complete with door switch.

2.10 HMI

- .1 Operator interface (HMI) to include all necessary hardware and software to provide a complete and operational system, located on the door of the control panel. HMI to facilitate local control (start/stop, setpoint adjustments, etc.), monitoring (equipment and process status), and troubleshooting (alarms, diagnostics, etc.) and include, but not be limited to, the following features:
 - .1 Multi-function graphic terminal with colour TFT touchscreen.
 - .2 120VAC 24VDC input voltage.
 - .3 Integral battery back-up.
 - .4 Minimum display size: 300mm.
 - .5 NEMA 12 enclosure.
 - .6 Communication ports: Ethernet and USB.
 - .7 Screen graphics to illustrate the complete process.
 - .8 Operator access to process setpoints, motor start/stop, etc., as required.
 - .9 Acceptable Manufacturer: Allen Bradley PanelView Plus 7 or approved equivalent.

PART 3 - EXECUTION

3.1 DELIVERY

- .1 Ship equipment to the Site pre-assembled where possible.
- .2 Coordinate delivery and storage with the installing General Contractor.
- .3 Provide packing to protect the shipment against breakage or injury, or loss of components during transit to its destination and which is acceptable to the transportation companies.
- .4 If an open crate on skids is used for the drive assemble, provide heavy plastic sheet weather protection.
- .5 Provide grease (anti-rust) protection on unpainted machined parts.
- .6 Do not ship the equipment from the plant except by prior agreement with the Consultant and/or the Owner.
- .7 Specify the maximum dimensions and weights of each unit or sub-assembly shipped to the Site.
- .8 Specify if special storage at the Site is required prior to the installation of the material or equipment.

3.2 RESPONSIBILITY OF TEMPORARY TRIAL USAGE

- .1 Obtain written permission from the Consultant to use and test permanent equipment and systems prior to acceptance by the Owner.
- .2 The guarantee period will not be affected by temporary trial use of the equipment.
- .3 Clean and renew equipment and systems used before acceptance. Restore to original or new working condition.
- .4 Protect equipment and systems openings from dirt, dust and other foreign materials during temporary usage.

3.3 INSPECTION, TESTING & START-UP

- .1 Provide the services of qualified service personnel, mechanics, or other trained personnel for a minimum of three (3) trips; twelve (12) eight (8) hour days on-Site to check the complete installation and be present for start-up of the equipment. Provide a written report to the Consultant stating the following:
 - .1 That the system is operating in accordance with design specifications.
 - .2 That the equipment has been satisfactorily installed by the Contractor and/or outline any modifications that have been made or are required to be made as a result of the commissioning or testing of the equipment.
 - .3 That the equipment is now ready for permanent operation.
 - .4 That operation, lubrication and maintenance instructions for the equipment have been presented to the Owner.
 - .5 That the equipment has been properly lubricated with the correct lubricants.
- .2 Equipment Supplier's representative to fully instruct permanent operator of equipment in proper operation and maintenance of equipment.
- .3 Advise Consultant and Owner in writing at least one (1) week in advance of the proposed date for testing and start-up. Provide necessary tools, materials and equipment for carrying out tests. Installing contractor will provide water for testing. Conduct tests in the presence of the Consultant and Owner.
- .4 Replace defective material or equipment with new material or equipment. Bear costs including re-testing and repairing.
- .5 Final acceptance of the Equipment will require a field test for treating wastewater as defined in subsection 2.1 herein at design flow conditions. Performance requirements identified must be met for five (5) consecutive days.

3.4 PERFORMANCE TESTING AND COMMISSIONING

- .1 Commission equipment in accordance with Section 00 21 14, clause 13.
- .2 Inspection and Testing:
 - .1 Test SBR process equipment to confirm proper operation at rated power supply and for electrical and mechanical integrity prior to shipment.
- .3 Provide all necessary equipment and accessories to facilitate the testing of equipment.
- .4 The Equipment Supplier grants the right to inspect the SBR process equipment to any authorized representative of the purchaser or Owner's representative before shipment from factory. If is requested give 48 hours' notice in advance of the time when the equipment will be ready for inspection at the factory. The Owner will pay the costs associated with having the Consultant observe the testing. Include all cost to conduct testing in Quotation price.
 - .1 Have any equipment in the SBR Process Equipment that may have been provided by the installing contractor tested by the equipment supplier.
- .5 Shipment: ship equipment assembled to the greatest extent possible to reduce installation and start-up costs.

APPENDIX A

CCDC 2 -2020 and Supplementary General
Conditions (For information)

CCDC 2

Stipulated Price Contract

2 0 2 0

[Name of Project]

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CCDC 2 STIPULATED PRICE CONTRACT

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AGREEMENT BETWEEN OWNER AND CONTRACTOR

For use when a stipulated price is the basis of payment.

This Agreement made on _____ day of _____ in the year _____
by and between the parties

hereinafter called the "Owner"

and

hereinafter called the "Contractor"

The Owner and the Contractor agree as follows:

ARTICLE A-1 THE WORK

The Contractor shall:

1.1 perform the Work required by the Contract Documents for (insert below the description or title of the Work)

located at (insert below the Place of the Work)

for which the Agreement has been signed by the parties, and for which (insert below the name of the Consultant)

is acting as and is hereinafter called the "Consultant" and

1.2 do and fulfill everything indicated by the Contract Documents, and

1.3 commence the Work by the _____ day of _____ in the year _____ and, subject to adjustment in Contract Time as provided for in the Contract Documents, attain Ready-for-Takeover, by the _____ day of _____ in the year _____.

ARTICLE A-2 AGREEMENTS AND AMENDMENTS

2.1 The Contract supersedes all prior negotiations, representations or agreements, either written or oral, relating in any manner to the Work, including the bid documents that are not expressly listed in Article A-3 of the Agreement – CONTRACT DOCUMENTS.

2.2 The Contract may be amended only as provided in the Contract Documents.

ARTICLE A-3 CONTRACT DOCUMENTS

3.1 The following are the *Contract Documents* referred to in Article A-1 of the Agreement – THE WORK:

- Agreement between *Owner* and *Contractor*
- Definitions
- General Conditions
-

** (Insert here, attaching additional pages if required, a list identifying all other Contract Documents e.g. supplementary conditions; Division 01 of the Specifications – GENERAL REQUIREMENTS; Project information that the Contractor may rely upon: technical Specifications, giving a list of contents with section numbers and titles, number of pages and date, material finishing schedules; Drawings, giving drawing number, title, date, revision date or mark; addenda, giving title, number, date; time schedule)*

ARTICLE A-4 CONTRACT PRICE

4.1 The *Contract Price*, which excludes *Value Added Taxes*, is:

/100 dollars \$

4.2 *Value Added Taxes* (of _____ %) payable by the *Owner* to the *Contractor* are:

/100 dollars \$

4.3 Total amount payable by the *Owner* to the *Contractor* for the *Work* is:

/100 dollars \$

4.4 These amounts shall be subject to adjustments as provided in the *Contract Documents*.

4.5 All amounts are in Canadian funds.

ARTICLE A-5 PAYMENT

5.1 Subject to the provisions of the *Contract Documents* and *Payment Legislation*, and in accordance with legislation and statutory regulations respecting holdback percentages, the *Owner* shall:

- .1 make progress payments to the *Contractor* on account of the *Contract Price* when due in the amount certified by the *Consultant* unless otherwise prescribed by *Payment Legislation* together with such *Value Added Taxes* as may be applicable to such payments,
- .2 upon *Substantial Performance of the Work*, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such *Value Added Taxes* as may be applicable to such payment, and
- .3 upon the issuance of the final certificate for payment, pay to the *Contractor* the unpaid balance of the *Contract Price* when due together with such *Value Added Taxes* as may be applicable to such payment.

5.2 Interest

.1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by adjudication, arbitration or court, interest at the following rates on such unpaid amounts shall also become due and payable until payment:

- (1) 2% per annum above the prime rate for the first 60 days.
- (2) 4% per annum above the prime rate after the first 60 days.

Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interest quoted by
(Insert name of chartered lending institution whose prime rate is to be used)

for prime business loans as it may change from time to time.

.2 Interest shall apply at the rate and in the manner prescribed by paragraph 5.2.1 of this Article on the settlement amount of any claim in dispute that is resolved either pursuant to Part 8 of the General Conditions – DISPUTE RESOLUTION or otherwise, from the date the amount would have been due and payable under the *Contract*, had it not been in dispute, until the date it is paid.

ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

6.1 *Notices in Writing* will be addressed to the recipient at the address set out below.

6.2 The delivery of a *Notice in Writing* will be by hand, by courier, by prepaid first class mail, or by other form of electronic communication during the transmission of which no indication of failure of receipt is communicated to the sender.

6.3 A *Notice in Writing* delivered by one party in accordance with this *Contract* will be deemed to have been received by the other party on the date of delivery if delivered by hand or courier, or if sent by mail it will be deemed to have been received five calendar days after the date on which it was mailed, provided that if either such day is not a *Working Day*, then the *Notice in Writing* will be deemed to have been received on the *Working Day* next following such day.

6.4 A *Notice in Writing* sent by any form of electronic communication will be deemed to have been received on the date of its transmission provided that if such day is not a *Working Day* or if it is received after the end of normal business hours on the date of its transmission at the place of receipt, then it will be deemed to have been received at the opening of business at the place of receipt on the first *Working Day* next following the transmission thereof.

6.5 An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this Article.

Owner

*name of Owner**

address

email address

Contractor

*name of Contractor**

address

email address

Consultant

*name of Consultant**

address

email address

** If it is intended that a specific individual must receive the notice, that individual's name shall be indicated.*

ARTICLE A-7 LANGUAGE OF THE CONTRACT

- 7.1 When the *Contract Documents* are prepared in both the English and French languages, it is agreed that in the event of any apparent discrepancy between the English and French versions, the English / French # language shall prevail.
Complete this statement by striking out inapplicable term.
- 7.2 This Agreement is drawn in English at the request of the parties hereto. La présente convention est rédigée en anglais à la demande des parties.

ARTICLE A-8 SUCCESSION

- 8.1 The *Contract* shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors, and assigns.

In witness whereof the parties hereto have executed this Agreement by the hands of their duly authorized representatives.

SIGNED AND DELIVERED
in the presence of:

WITNESS

OWNER

signature

name of Owner

name of person signing

signature

name and title of person signing

WITNESS

CONTRACTOR

signature

name of Contractor

name of person signing

signature

name and title of person signing

- N.B. Where legal jurisdiction, local practice or Owner or Contractor requirement calls for:
- (a) proof of authority to execute this document, attach such proof of authority in the form of a certified copy of a resolution naming the representative(s) authorized to sign the Agreement for and on behalf of the corporation or partnership; or
 - (b) the affixing of a corporate seal, this Agreement should be properly sealed.

DEFINITIONS

The following Definitions shall apply to all *Contract Documents*.

Change Directive

A *Change Directive* is a written instruction prepared by the *Consultant* and signed by the *Owner* directing the *Contractor* to proceed with a change in the *Work* within the general scope of the *Contract Documents* prior to the *Owner* and the *Contractor* agreeing upon adjustments in the *Contract Price* and the *Contract Time*.

Change Order

A *Change Order* is a written amendment to the *Contract* prepared by the *Consultant* and signed by the *Owner* and the *Contractor* stating their agreement upon:

- a change in the *Work*;
- the method of adjustment or the amount of the adjustment in the *Contract Price*, if any; and
- the extent of the adjustment in the *Contract Time*, if any.

Construction Equipment

Construction Equipment means all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting, or otherwise performing the *Work* but is not incorporated into the *Work*.

Consultant

The *Consultant* is the person or entity engaged by the *Owner* and identified as such in the Agreement. The *Consultant* is the Architect, the Engineer or entity licensed to practise in the province or territory of the *Place of the Work*.

Contract

The *Contract* is the undertaking by the parties to perform their respective duties, responsibilities and obligations as prescribed in the *Contract Documents* and represents the entire agreement between the parties.

Contract Documents

The *Contract Documents* consist of those documents listed in Article A-3 of the Agreement – CONTRACT DOCUMENTS and amendments agreed upon between the parties.

Contract Price

The *Contract Price* is the amount stipulated in Article A-4 of the Agreement – CONTRACT PRICE.

Contract Time

The *Contract Time* is the time from commencement of the *Work* to the date of *Ready-for-Takeover* as stipulated in paragraph 1.3 of Article A-1 of the Agreement – THE WORK.

Contractor

The *Contractor* is the person or entity identified as such in the Agreement.

Drawings

The *Drawings* are the graphic and pictorial portions of the *Contract Documents*, wherever located and whenever issued, showing the design, location and dimensions of the *Work*, generally including plans, elevations, sections, details, and diagrams.

Notice in Writing

A *Notice in Writing*, where identified in the *Contract Documents*, is a written communication between the parties or between them and the *Consultant* that is transmitted in accordance with the provisions of Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

Owner

The *Owner* is the person or entity identified as such in the Agreement.

Other Contractor

Other Contractor means a contractor, other than the *Contractor* or a *Subcontractor*, engaged by the *Owner* for the *Project*.

Payment Legislation

Payment Legislation means such legislation in effect at the *Place of the Work* which governs payment under construction contracts.

Place of the Work

The *Place of the Work* is the designated site or location of the *Work* identified in the *Contract Documents*.

Product

Product or Products means material, machinery, equipment, and fixtures forming part of the *Work*, but does not include *Construction Equipment*.

Project

The *Project* means the total construction contemplated of which the *Work* may be the whole or a part.

Ready-for-Takeover

Ready-for-Takeover shall have been attained when the conditions set out in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER have been met, as verified by the *Consultant* pursuant to paragraph 12.1.4.2 of GC 12.1 – READY-FOR-TAKEOVER.

Shop Drawings

Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, *Product* data, and other data which the *Contractor* provides to illustrate details of portions of the *Work*.

Specifications

The *Specifications* are that portion of the *Contract Documents*, wherever located and whenever issued, consisting of the written requirements and standards for *Products*, systems, workmanship, quality, and the services necessary for the performance of the *Work*.

Subcontractor

A *Subcontractor* is a person or entity having a direct contract with the *Contractor* to perform a part or parts of the *Work* at the *Place of the Work*.

Substantial Performance of the Work

Substantial Performance of the Work is as defined in the lien legislation applicable to the *Place of the Work*.

Supplemental Instruction

A *Supplemental Instruction* is an instruction, not involving adjustment in the *Contract Price* or *Contract Time*, in the form of *Specifications*, *Drawings*, schedules, samples, models, or written instructions, consistent with the intent of the *Contract Documents*. It is to be issued by the *Consultant* to supplement the *Contract Documents* as required for the performance of the *Work*.

Supplier

A *Supplier* is a person or entity having a direct contract with the *Contractor* to supply *Products*.

Temporary Work

Temporary Work means temporary supports, structures, facilities, services, and other temporary items, excluding *Construction Equipment*, required for the execution of the *Work* but not incorporated into the *Work*.

Value Added Taxes

Value Added Taxes means such sum as shall be levied upon the *Contract Price* by the Federal or any Provincial or Territorial Government and is computed as a percentage of the *Contract Price* and includes the Goods and Services Tax, the Quebec Sales Tax, the Harmonized Sales Tax, and any similar tax, the collection and payment of which have been imposed on the *Contractor* by tax legislation.

Work

The *Work* means the total construction and related services required by the *Contract Documents*.

Working Day

Working Day means a day other than a Saturday, Sunday, statutory holiday, or statutory vacation day that is observed by the construction industry in the area of the *Place of the Work*.

GENERAL CONDITIONS

PART 1 GENERAL PROVISIONS

GC 1.1 CONTRACT DOCUMENTS

- 1.1.1 The intent of the *Contract Documents* is to include the labour, *Products* and services necessary for the performance of the *Work* by the *Contractor* in accordance with these documents. It is not intended, however, that the *Contractor* shall supply products or perform work not consistent with, not covered by, or not properly inferable from the *Contract Documents*.
- 1.1.2 The *Contract Documents* are complementary, and what is required by one shall be as binding as if required by all. Performance by the *Contractor* shall be required only to the extent consistent with the *Contract Documents*.
- 1.1.3 The *Contractor* shall review the *Contract Documents* for the purpose of facilitating co-ordination and execution of the *Work* by the *Contractor*.
- 1.1.4 The *Contractor* is not responsible for errors, omissions or inconsistencies in the *Contract Documents*. If there are perceived errors, omissions or inconsistencies discovered by or made known to the *Contractor*, the *Contractor* shall promptly report to the *Consultant* and shall not proceed with the work affected until the *Contractor* has received corrected or additional information from the *Consultant*.
- 1.1.5 If there is a conflict within the *Contract Documents*:
- .1 the order of priority of documents, from highest to lowest, shall be
 - the Agreement between *Owner* and *Contractor*,
 - the Definitions,
 - Supplementary Conditions,
 - the General Conditions,
 - Division 01 of the *Specifications*,
 - technical *Specifications*,
 - material and finishing schedules,
 - the *Drawings*.
 - .2 *Drawings* of larger scale shall govern over those of smaller scale of the same date.
 - .3 dimensions shown on *Drawings* shall govern over dimensions scaled from *Drawings*.
 - .4 amended or later dated documents shall govern over earlier documents of the same type.
 - .5 noted materials and annotations shall govern over graphic indications.
- 1.1.6 Nothing contained in the *Contract Documents* shall create any contractual relationship between:
- .1 the *Owner* and a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.
 - .2 the *Consultant* and the *Contractor*, a *Subcontractor*, a *Supplier*, or their agent, employee, or other person performing any portion of the *Work*.
- 1.1.7 Words and abbreviations which have well known technical or trade meanings are used in the *Contract Documents* in accordance with such recognized meanings.
- 1.1.8 References in the *Contract Documents* to the singular shall be considered to include the plural as the context requires.
- 1.1.9 Neither the organization of the *Specifications* nor the arrangement of *Drawings* shall control the *Contractor* in dividing the work among *Subcontractors* and *Suppliers*.
- 1.1.10 *Specifications*, *Drawings*, models, and copies thereof furnished by the *Consultant* are and shall remain the *Consultant's* property, with the exception of the signed *Contract* sets, which shall belong to each party to the *Contract*. All *Specifications*, *Drawings* and models furnished by the *Consultant* are to be used only with respect to the *Work* and are not to be used on other work. These *Specifications*, *Drawings* and models are not to be copied or altered in any manner without the written authorization of the *Consultant*.
- 1.1.11 Physical models furnished by the *Contractor* at the *Owner's* expense are the property of the *Owner*.

GC 1.2 LAW OF THE CONTRACT

- 1.2.1 The law of the *Place of the Work* shall govern the interpretation of the *Contract*.

GC 1.3 RIGHTS AND REMEDIES

- 1.3.1 Except as expressly provided in the *Contract Documents*, the duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

- 1.3.2 No action or failure to act by the *Owner*, the *Consultant* or the *Contractor* shall constitute a waiver of any right or duty afforded any of them under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

GC 1.4 ASSIGNMENT

- 1.4.1 Neither party to the *Contract* shall assign the *Contract* or a portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

PART 2 ADMINISTRATION OF THE CONTRACT

GC 2.1 AUTHORITY OF THE CONSULTANT

- 2.1.1 The *Consultant* will have authority to act on behalf of the *Owner* only to the extent provided in the *Contract Documents*, unless otherwise modified by written agreement as provided in paragraph 2.1.2.
- 2.1.2 The duties, responsibilities and limitations of authority of the *Consultant* as set forth in the *Contract Documents* shall be modified or extended only with the written consent of the *Owner*, the *Consultant* and the *Contractor*.

GC 2.2 ROLE OF THE CONSULTANT

- 2.2.1 The *Consultant* will provide administration of the *Contract* as described in the *Contract Documents*.
- 2.2.2 The *Consultant* will visit the *Place of the Work* at intervals appropriate to the progress of construction to become familiar with the progress and quality of the work and to determine if the *Work* is proceeding in general conformity with the *Contract Documents*.
- 2.2.3 If the *Owner* and the *Consultant* agree, the *Consultant* will provide at the *Place of the Work*, one or more project representatives to assist in carrying out the *Consultant's* responsibilities. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in writing to the *Contractor*.
- 2.2.4 Based on the *Consultant's* observations and evaluation of the *Contractor's* applications for payment, the *Consultant* will determine the amounts owing to the *Contractor* under the *Contract* and will issue certificates for payment as provided in Article A-5 of the Agreement – PAYMENT, GC 5.3 – PAYMENT and GC 5.5 – FINAL PAYMENT.
- 2.2.5 The *Consultant* will not be responsible for and will not have control, charge or supervision of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs required in connection with the *Work* in accordance with the applicable construction safety legislation, other regulations or general construction practice. The *Consultant* will not be responsible for the *Contractor's* failure to perform the *Work* in accordance with the *Contract Documents*.
- 2.2.6 Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER, the *Consultant* will be, in the first instance, the interpreter of the requirements of the *Contract Documents*.
- 2.2.7 Matters in question relating to the performance of the *Work* or the interpretation of the *Contract Documents* shall be initially referred in writing to the *Consultant* by the party raising the question for interpretations and findings and copied to the other party.
- 2.2.8 Interpretations and findings of the *Consultant* shall be consistent with the intent of the *Contract Documents*. In making such interpretations and findings the *Consultant* will not show partiality to either the *Owner* or the *Contractor*.
- 2.2.9 The *Consultant's* interpretations and findings will be given in writing to the parties within a reasonable time.
- 2.2.10 With respect to claims for a change in *Contract Price*, the *Consultant* will make findings as set out in GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.
- 2.2.11 The *Consultant* will have authority to reject work which in the *Consultant's* opinion does not conform to the requirements of the *Contract Documents*. Whenever the *Consultant* considers it necessary or advisable, the *Consultant* will have authority to require inspection or testing of work, whether or not such work is fabricated, installed or completed. However, neither the authority of the *Consultant* to act nor any decision either to exercise or not to exercise such authority shall give rise to any duty or responsibility of the *Consultant* to the *Contractor*, *Subcontractors*, *Suppliers*, or their agents, employees, or other persons performing any of the *Work*.
- 2.2.12 During the progress of the *Work* the *Consultant* will furnish *Supplemental Instructions* to the *Contractor* with reasonable promptness or in accordance with a schedule for such instructions agreed to by the *Consultant* and the *Contractor*.
- 2.2.13 The *Consultant* will review and take appropriate action upon *Shop Drawings*, samples and other submittals by the *Contractor*, in accordance with the *Contract Documents*.

- 2.2.14 The *Consultant* will prepare *Change Orders* and *Change Directives* as provided in GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.
- 2.2.15 The *Consultant* will conduct reviews of the *Work* to determine the date of *Substantial Performance of the Work* and verify that *Ready-for-Takeover* has been attained.
- 2.2.16 All certificates issued by the *Consultant* will be to the best of the *Consultant's* knowledge, information and belief. By issuing any certificate, the *Consultant* does not guarantee the *Work* is correct or complete.
- 2.2.17 The *Consultant* will receive and review written warranties and related documents required by the *Contract* and provided by the *Contractor* and will forward such warranties and documents to the *Owner* for the *Owner's* acceptance.
- 2.2.18 If the *Consultant's* engagement is terminated, the *Owner* shall immediately engage a *Consultant* against whom the *Contractor* makes no reasonable objection and whose duties and responsibilities under the *Contract Documents* will be that of the former *Consultant*.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

- 2.3.1 The *Owner* and the *Consultant* shall have access to the *Work* at all times. The *Contractor* shall provide sufficient, safe and proper facilities at all times for the review of the *Work* by the *Consultant* and the inspection of the *Work* by authorized agencies. If parts of the *Work* are in preparation at locations other than the *Place of the Work*, the *Owner* and the *Consultant* shall be given access to such work whenever it is in progress.
- 2.3.2 If work is designated for tests, inspections or approvals in the *Contract Documents*, by the *Consultant's* instructions, or by the laws or ordinances of the *Place of the Work*, the *Contractor* shall give the *Consultant* reasonable notification of when the work will be ready for review and inspection. The *Contractor* shall arrange for and shall give the *Consultant* reasonable notification of the date and time of inspections by other authorities.
- 2.3.3 The *Contractor* shall furnish promptly to the *Consultant* two copies of certificates and inspection reports relating to the *Work*.
- 2.3.4 If the *Contractor* covers, or permits to be covered, work that has been designated for special tests, inspections or approvals before such special tests, inspections or approvals are made, given or completed, the *Contractor* shall, if so directed, uncover such work, have the inspections or tests satisfactorily completed, and make good covering work at the *Contractor's* expense.
- 2.3.5 The *Consultant* may order any portion or portions of the *Work* to be examined to confirm that such work is in accordance with the requirements of the *Contract Documents*. If the work is not in accordance with the requirements of the *Contract Documents*, the *Contractor* shall correct the work and pay the cost of examination and correction. If the work is in accordance with the requirements of the *Contract Documents*, the *Owner* shall pay the cost of examination and restoration.
- 2.3.6 The *Contractor* shall pay the cost of making any test or inspection, including the cost of samples required for such test or inspection, if such test or inspection is designated in the *Contract Documents* to be performed by the *Contractor* or is required by the laws or ordinances applicable to the *Place of the Work*.
- 2.3.7 The *Contractor* shall pay the cost of samples required for any test or inspection to be performed by others if such test or inspection is designated in the *Contract Documents*.

GC 2.4 DEFECTIVE WORK

- 2.4.1 The *Contractor* shall promptly correct defective work that has been rejected by the *Consultant* as failing to conform to the *Contract Documents* whether or not the defective work was incorporated in the *Work* or the defect is the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the *Contractor*.
- 2.4.2 The *Contractor* shall make good promptly *Other Contractors'* work destroyed or damaged by such corrections at the *Contractor's* expense.
- 2.4.3 If in the opinion of the *Consultant* it is not expedient to correct defective work or work not performed as provided in the *Contract Documents*, the *Owner* may deduct from the amount otherwise due to the *Contractor* the difference in value between the work as performed and that called for by the *Contract Documents*. If the *Owner* and the *Contractor* do not agree on the difference in value, they shall refer the matter to the *Consultant* for a finding.

PART 3 EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

- 3.1.1 The *Contractor* shall have total control of the *Work* and shall effectively direct and supervise the *Work* so as to ensure conformity with the *Contract Documents*.

- 3.1.2 The *Contractor* shall be solely responsible for construction means, methods, techniques, sequences, and procedures and for co-ordinating the various parts of the *Work* under the *Contract*.

GC 3.2 CONSTRUCTION BY THE OWNER OR OTHER CONTRACTORS

- 3.2.1 The *Owner* reserves the right to award separate contracts in connection with other parts of the *Project* to *Other Contractors* and to perform work with own forces.

- 3.2.2 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner's* own forces, the *Owner* shall:

- .1 provide for the co-ordination of the activities and work of *Other Contractors* and the *Owner's* own forces with the *Work* of the *Contract*;
- .2 enter into separate contracts with *Other Contractors* under conditions of contract which are compatible with the conditions of the *Contract*;
- .3 ensure that insurance coverage is provided to the same requirements as are called for in GC 11.1 – INSURANCE and co-ordinate such insurance with the insurance coverage of the *Contractor* as it affects the *Work*; and
- .4 take all reasonable precautions to avoid labour disputes or other disputes on the *Project* arising from the work of *Other Contractors* or the *Owner's* own forces.

- 3.2.3 When separate contracts are awarded for other parts of the *Project*, or when work is performed by the *Owner's* own forces, the *Contractor* shall:

- .1 afford the *Owner* and *Other Contractors* reasonable opportunity to store their products and execute their work;
- .2 co-ordinate and schedule the *Work* with the work of *Other Contractors* or the *Owner's* own forces that are identified in the *Contract Documents*;
- .3 participate with *Other Contractors* and the *Owner* in reviewing their construction schedules when directed to do so; and
- .4 report promptly to the *Consultant* in writing any apparent deficiencies in the work of *Other Contractors* or of the *Owner's* own forces, where such work affects the proper execution of any portion of the *Work*, prior to proceeding with that portion of the *Work*.

- 3.2.4 Where a change in the *Work* is required as a result of the co-ordination and integration of the work of *Other Contractors* or *Owner's* own forces with the *Work*, the changes shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

- 3.2.5 Disputes and other matters in question between the *Contractor* and *Other Contractors* shall be dealt with as provided in Part 8 of the General Conditions – DISPUTE RESOLUTION provided the *Other Contractors* have reciprocal obligations. The *Contractor* shall be deemed to have consented to arbitration of any dispute with any *Other Contractor* whose contract with the *Owner* contains a similar agreement to arbitrate. In the absence of *Other Contractors* having reciprocal obligations, disputes and other matters in question initiated by the *Contractor* against *Other Contractors* will be considered disputes and other matters in question between the *Contractor* and the *Owner*.

- 3.2.6 Should the *Owner*, the *Consultant*, *Other Contractors*, or anyone employed by them directly or indirectly be responsible for ill-timed work necessitating cutting or remedial work to be performed, the cost of such cutting or remedial work shall be valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

GC 3.3 TEMPORARY WORK

- 3.3.1 The *Contractor* shall have the sole responsibility for the design, erection, operation, maintenance, and removal of *Temporary Work* unless otherwise specified in the *Contract Documents*.

- 3.3.2 The *Contractor* shall engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform those functions referred to in paragraph 3.3.1 where required by law or by the *Contract Documents* and in all cases where such *Temporary Work* is of such a nature that professional engineering skill is required to produce safe and satisfactory results.

- 3.3.3 Notwithstanding the provisions of GC 3.1 – CONTROL OF THE WORK, paragraphs 3.3.1 and 3.3.2 or provisions to the contrary elsewhere in the *Contract Documents* where such *Contract Documents* include designs for *Temporary Work* or specify a method of construction in whole or in part, such designs or methods of construction shall be considered to be part of the design of the *Work* and the *Contractor* shall not be held responsible for that part of the design or the specified method of construction. The *Contractor* shall, however, be responsible for the execution of such design or specified method of construction in the same manner as for the execution of the *Work*.

GC 3.4 CONSTRUCTION SCHEDULE

- 3.4.1 The *Contractor* shall:
- .1 prepare and submit to the *Owner* and the *Consultant* prior to the first application for payment, a construction schedule that indicates the timing of the major activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time*;
 - .2 monitor the progress of the *Work* relative to the construction schedule and update the schedule on a monthly basis or as stipulated by the *Contract Documents*; and
 - .3 advise the *Consultant* of any revisions required to the schedule as the result of extensions of the *Contract Time* as provided in Part 6 of the General Conditions – CHANGES IN THE WORK.

GC 3.5 SUPERVISION

- 3.5.1 The *Contractor* shall provide all necessary supervision and appoint a competent representative who shall be in attendance at the *Place of the Work* while the *Work* is being performed. The appointed representative shall not be changed except for valid reason.
- 3.5.2 The appointed representative shall represent the *Contractor* at the *Place of the Work*. Information and instructions provided by the *Consultant* to the *Contractor's* appointed representative shall be deemed to have been received by the *Contractor*, except with respect to Article A-6 of the Agreement – RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING.

GC 3.6 SUBCONTRACTORS AND SUPPLIERS

- 3.6.1 The *Contractor* shall preserve and protect the rights of the parties under the *Contract* with respect to work to be performed under subcontract, and shall:
- .1 enter into contracts or written agreements with *Subcontractors* and *Suppliers* to require them to perform their work as provided in the *Contract Documents*;
 - .2 incorporate the applicable terms and conditions of the *Contract Documents* into all contracts or written agreements with *Subcontractors* and *Suppliers*; and
 - .3 be as fully responsible to the *Owner* for acts and omissions of *Subcontractors*, *Suppliers* and any persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the *Contractor*.
- 3.6.2 The *Contractor* shall indicate in writing, if requested by the *Owner*, those *Subcontractors* or *Suppliers* whose bids have been received by the *Contractor* which the *Contractor* would be prepared to accept for the performance of a portion of the *Work*. Should the *Owner* not object before signing the *Contract*, the *Contractor* shall employ those *Subcontractors* or *Suppliers* so identified by the *Contractor* in writing for the performance of that portion of the *Work* to which their bid applies.
- 3.6.3 The *Owner* may, for reasonable cause, at any time before the *Owner* has signed the *Contract*, object to the use of a proposed *Subcontractor* or *Supplier* and require the *Contractor* to employ one of the other subcontract bidders.
- 3.6.4 If the *Owner* requires the *Contractor* to change a proposed *Subcontractor* or *Supplier*, the *Contract Price* and *Contract Time* shall be adjusted by the difference occasioned by such required change.
- 3.6.5 The *Contractor* shall not be required to employ as a *Subcontractor* or *Supplier*, a person or firm to which the *Contractor* may reasonably object.
- 3.6.6 The *Owner*, through the *Consultant*, may provide to a *Subcontractor* or *Supplier* information as to the percentage of the *Subcontractor's* or *Supplier's* work which has been certified for payment.

GC 3.7 LABOUR AND PRODUCTS

- 3.7.1 The *Contractor* shall maintain good order and discipline among the *Contractor's* employees engaged on the *Work* and employ only workers that are skilled in the tasks assigned.
- 3.7.2 The *Contractor* shall provide and pay for labour, *Products*, tools, *Construction Equipment*, water, heat, light, power, transportation, and other facilities and services necessary for the performance of the *Work* in accordance with the *Contract*.
- 3.7.3 Unless otherwise specified in the *Contract Documents*, *Products* provided shall be new. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*.

GC 3.8 SHOP DRAWINGS

- 3.8.1 The *Contractor* shall provide *Shop Drawings* as required in the *Contract Documents*.
- 3.8.2 The *Contractor* shall provide *Shop Drawings* to the *Consultant* to review in accordance with an agreed schedule, or in the absence of an agreed schedule, in orderly sequence and sufficiently in advance so as to cause no delay in the *Work* or in the work of *Other Contractors* or the *Owner's* own forces.

- 3.8.3 The *Contractor* shall review all *Shop Drawings* before providing them to the *Consultant*. The *Contractor* represents by this review that:
- .1 the *Contractor* has determined and verified all applicable field measurements, field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so, and
 - .2 the *Contractor* has checked and co-ordinated each *Shop Drawing* with the requirements of the *Work* and of the *Contract Documents*.
- 3.8.4 The *Consultant's* review is for conformity to the design concept and for general arrangement only.
- 3.8.5 At the time of providing *Shop Drawings*, the *Contractor* shall expressly advise the *Consultant* in writing of any deviations in a *Shop Drawing* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance or rejection of such deviation expressly in writing.
- 3.8.6 The *Consultant's* review shall not relieve the *Contractor* of responsibility for errors or omissions in the *Shop Drawings* or for meeting all requirements of the *Contract Documents*.
- 3.8.7 The *Consultant* will review and return *Shop Drawings* in accordance with the schedule agreed upon, or, in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*.

PART 4 ALLOWANCES

GC 4.1 CASH ALLOWANCES

- 4.1.1 The *Contract Price* includes the cash allowances, if any, stated in the *Contract Documents*. The scope of the *Work* or costs included in such cash allowances shall be as described in the *Contract Documents*.
- 4.1.2 The *Contract Price*, and not the cash allowances, includes the *Contractor's* overhead and profit in connection with such cash allowances.
- 4.1.3 Expenditures under cash allowances shall be authorized by the *Owner* through the *Consultant*.
- 4.1.4 Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the *Consultant's* direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the *Contract Price* for overhead and profit. Only where the actual cost of the *Work* under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*.
- 4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.
- 4.1.6 The value of the *Work* performed under a cash allowance is eligible to be included in progress payments.
- 4.1.7 The *Contractor* and the *Consultant* shall jointly prepare a schedule that shows when the items called for under cash allowances must be ordered to avoid delaying the progress of the *Work*.

GC 4.2 CONTINGENCY ALLOWANCE

- 4.2.1 The *Contract Price* includes the contingency allowance, if any, stated in the *Contract Documents*.
- 4.2.2 The contingency allowance includes the *Contractor's* overhead and profit in connection with such contingency allowance.
- 4.2.3 Expenditures under the contingency allowance shall be authorized and valued as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.
- 4.2.4 The *Contract Price* shall be adjusted by *Change Order* to provide for any difference between the expenditures authorized under paragraph 4.2.3 and the contingency allowance.

PART 5 PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

- 5.1.1 The *Owner* shall, at the request of the *Contractor*, before signing the *Contract*, and promptly from time to time thereafter, furnish to the *Contractor* reasonable evidence that financial arrangements have been made to fulfill the *Owner's* obligations under the *Contract*.
- 5.1.2 The *Owner* shall give the *Contractor Notice in Writing* of any material change in the *Owner's* financial arrangements to fulfill the *Owner's* obligations under the *Contract* during the performance of the *Contract*.

GC 5.2 APPLICATIONS FOR PAYMENT

- 5.2.1 Applications for payment on account as provided in Article A-5 of the Agreement – PAYMENT shall be submitted monthly to the *Owner* and the *Consultant* simultaneously as the *Work* progresses.
- 5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties.
- 5.2.3 The amount claimed shall be for the value, proportionate to the amount of the *Contract*, of *Work* performed and *Products* delivered to the *Place of the Work* as of the last day of the payment period.
- 5.2.4 The *Contractor* shall submit to the *Consultant*, at least 15 calendar days before the first application for payment, a schedule of values for the parts of the *Work*, aggregating the total amount of the *Contract Price*, so as to facilitate evaluation of applications for payment.
- 5.2.5 The schedule of values shall be made out in such form as specified in the *Contract* and supported by such evidence as the *Consultant* may reasonably require.
- 5.2.6 Applications for payment shall be based on the schedule of values accepted by the *Consultant* and shall comply with the provisions of *Payment Legislation*.
- 5.2.7 Each application for payment shall include evidence of compliance with workers' compensation legislation at the *Place of the Work* and after the first payment, a declaration by the *Contractor* as to the distribution made of the amounts previously received using document CCDC 9A 'Statutory Declaration'.
- 5.2.8 Applications for payment for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall be supported by such evidence as the *Consultant* may reasonably require to establish the value and delivery of the *Products*.

GC 5.3 PAYMENT

- 5.3.1 After receipt by the *Consultant* and the *Owner* of an application for payment submitted by the *Contractor* in accordance with GC 5.2 – APPLICATIONS FOR PAYMENT:
 - .1 The *Consultant* will issue to the *Owner* and copy to the *Contractor*, no later than 10 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the *Consultant* determines to be properly due. If the *Consultant* certifies a different amount, or rejects the application or part thereof, the *Owner* shall promptly issue a written notice to the *Contractor* giving reasons for the revision or rejection, such written notice to be in compliance with *Payment Legislation*.
 - .2 The *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT on or before 28 calendar days after the receipt by the *Owner* and the *Consultant* of the application for payment, and in any event, in compliance with *Payment Legislation*.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

- 5.4.1 The *Consultant* will review the *Work* to certify or verify the validity of the application for *Substantial Performance of the Work* and will promptly, and in any event, no later than 20 calendar days after receipt of the *Contractors* application:
 - .1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or
 - .2 state the date of *Substantial Performance of the Work* or a designated portion of the *Work* in a certificate and issue a copy of that certificate to each of the *Owner* and the *Contractor*.
- 5.4.2 Where the holdback amount required by the applicable lien legislation has not been placed in a separate lien holdback account, the *Owner* shall, no later than 10 calendar days prior to the expiry of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*, place the holdback amount in a bank account in the joint names of the *Owner* and the *Contractor*.
- 5.4.3 Subject to the requirements of any *Payment Legislation*, all holdback amount prescribed by the applicable lien legislation for the *Work* shall become due and payable to the *Contractor* no later than 10 *Working Days* following the expiration of the holdback period stipulated in the lien legislation applicable to the *Place of the Work*.
- 5.4.4 The *Contractor* shall submit an application for payment of the lien holdback amount in accordance with GC 5.3 – PAYMENT.
- 5.4.5 Where legislation permits progressive release of the holdback for a portion of the *Work* and the *Consultant* has certified or verified that the part of the *Work* has been performed prior to *Substantial Performance of the Work*, the *Owner* hereby agrees to release, and shall release, such portion to the *Contractor* in accordance with such legislation.

- 5.4.6 Notwithstanding any progressive release of the holdback, the *Contractor* shall ensure that such parts of the *Work* are protected pending the issuance of a final certificate for payment and be responsible for the correction of defects or work not performed regardless of whether or not such was apparent when the holdback was released.

GC 5.5 FINAL PAYMENT

- 5.5.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment.
- 5.5.2 The *Consultant* will, no later than 10 calendar days after the receipt of an application from the *Contractor* for final payment, review the *Work* to verify the validity of the application and when the *Consultant* finds the *Contractor's* application for final payment valid, the *Consultant* will promptly issue a final certificate for payment to the *Owner*, with a copy to the *Contractor*.
- 5.5.3 If the *Consultant* rejects the application or part thereof, the *Owner* will promptly issue a written notice to the *Contractor* giving reasons for the revision or rejection, such written notice to be in compliance with *Payment Legislation*.
- 5.5.4 Subject to the provision of paragraph 10.4.1 of GC 10.4 – WORKERS' COMPENSATION, and any legislation applicable to the *Place of the Work*, the *Owner* shall, no later than 5 calendar days after the issuance of a final certificate for payment, pay the *Contractor* as provided in Article A-5 of the Agreement – PAYMENT and in any event, in compliance with *Payment Legislation*.

GC 5.6 DEFERRED WORK

- 5.6.1 If because of climatic or other conditions reasonably beyond the control of the *Contractor*, or if the *Owner* and the *Contractor* agree that, there are items of work that must be deferred, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such deferred *Work*.

GC 5.7 NON-CONFORMING WORK

- 5.7.1 No payment by the *Owner* under the *Contract* nor partial or entire use or occupancy of the *Work* by the *Owner* shall constitute an acceptance of any portion of the *Work* or *Products* which are not in accordance with the requirements of the *Contract Documents*.

PART 6 CHANGES IN THE WORK

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

- 6.1.1 The *Owner*, through the *Consultant*, without invalidating the *Contract*, may make:
- .1 changes in the *Work* consisting of additions, deletions or other revisions to the *Work* by *Change Order* or *Change Directive*, and
 - .2 changes to the *Contract Time* for the *Work*, or any part thereof, by *Change Order*.
- 6.1.2 The *Contractor* shall not perform a change in the *Work* without a *Change Order* or a *Change Directive*.

GC 6.2 CHANGE ORDER

- 6.2.1 When a change in the *Work* is proposed or required, the *Consultant* will provide the *Contractor* with a written description of the proposed change in the *Work*. The *Contractor* shall promptly present to the *Consultant*, in a form that can be reasonably evaluated, a method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, if any, for the proposed change in the *Work*.
- 6.2.2 When the *Owner* and the *Contractor* agree to the adjustments in the *Contract Price* and *Contract Time* or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a *Change Order*. The value of the work performed as the result of a *Change Order* shall be included in the applications for progress payment.

GC 6.3 CHANGE DIRECTIVE

- 6.3.1 If the *Owner* requires the *Contractor* to proceed with a change in the *Work* prior to the *Owner* and the *Contractor* agreeing upon the corresponding adjustment in *Contract Price* and *Contract Time*, the *Owner*, through the *Consultant*, shall issue a *Change Directive*.
- 6.3.2 A *Change Directive* shall only be used to direct a change in the *Work* which is within the general scope of the *Contract Documents*.
- 6.3.3 A *Change Directive* shall not be used to direct a change in the *Contract Time* only.

- 6.3.4 Upon receipt of a *Change Directive*, the *Contractor* shall proceed promptly with the change in the *Work*.
- 6.3.5 For the purpose of valuing *Change Directives*, changes in the *Work* that are not substitutions or otherwise related to each other shall not be grouped together in the same *Change Directive*.
- 6.3.6 The adjustment in the *Contract Price* for a change carried out by way of a *Change Directive* shall be determined on the basis of the cost of the *Contractor's* actual expenditures and savings attributable to the *Change Directive*, valued in accordance with paragraph 6.3.7 and as follows:
- .1 If the change results in a net increase in the *Contractor's* cost, the *Contract Price* shall be increased by the amount of the net increase in the *Contractor's* cost, plus the *Contractor's* percentage fee on such net increase.
 - .2 If the change results in a net decrease in the *Contractor's* cost, the *Contract Price* shall be decreased by the amount of the net decrease in the *Contractor's* cost, without adjustment for the *Contractor's* percentage fee.
 - .3 The *Contractor's* fee shall be as specified in the *Contract Documents* or as otherwise agreed by the parties.
- 6.3.7 The cost of performing the work attributable to the *Change Directive* shall be limited to the actual cost of the following in as much as it contributes directly to the implementation of the *Change Directive*:

Labour

- .1 rates that are listed in the schedule or as agreed by the *Owner* and the *Contractor* including wages, benefits, compensation, contributions, assessments, or taxes incurred for such items as employment insurance, provincial or territorial health insurance, workers' compensation, and Canada or Quebec Pension Plan for:
 - (1) trade labour in the direct employ of the *Contractor*;
 - (2) the *Contractor's* personnel when stationed at the field office;
 - (3) the *Contractor's* personnel engaged at shops or on the road, in expediting the production or transportation of materials or equipment; and
 - (4) the *Contractor's* office personnel engaged in a technical capacity, or other personnel identified in Article A-3 of the Agreement – CONTRACT DOCUMENTS for the time spent in the performance of the *Work*;

Products, Construction Equipment and Temporary Work

- .2 cost of all *Products* including cost of transportation thereof;
- .3 in the absence of agreed rates, cost less salvage value of *Construction Equipment*, *Temporary Work* and tools, exclusive of hand tools under \$1,000 owned by the *Contractor*;
- .4 rental cost of *Construction Equipment*, *Temporary Work* and tools, exclusive of hand tools under \$1,000;
- .5 cost of all equipment and services required for the *Contractor's* field office;

Subcontract

- .6 subcontract amounts of Subcontractor with pricing mechanism approved by the *Owner*;

Others

- .7 travel and subsistence expenses of the *Contractor's* personnel described in paragraph 6.3.7.1;
- .8 deposits lost provided that they are not caused by negligent acts or omissions of the *Contractor*;
- .9 cost of quality assurance such as independent inspection and testing services;
- .10 charges levied by authorities having jurisdiction at the *Place of the Work*;
- .11 royalties, patent license fees, and damages for infringement of patents and cost of defending suits therefor subject always to the *Contractor's* obligations to indemnify the *Owner* as provided in paragraph 10.3.1 of GC 10.3 – PATENT FEES;
- .12 premium for all contract securities and insurance for which the *Contractor* is required, by the *Contract Documents*, to provide, maintain and pay in relation to the performance of the *Work*;
- .13 losses and expenses sustained by the *Contractor* for matters which are the subject of insurance under the policies prescribed in GC 11.1 – INSURANCE when such losses and expenses are not recoverable because the amounts are in excess of collectible amounts or within the deductible amounts;
- .14 taxes and duties, other than *Value Added Taxes*, income, capital, or property taxes, relating to the *Work* for which the *Contractor* is liable;
- .15 charges for voice and data communications, courier services, expressage, transmittal and reproduction of documents, and petty cash items;
- .16 cost for removal and disposal of waste products and debris;
- .17 legal costs, incurred by the *Contractor*, in relation to the performance of the *Work* provided that they are not:
 - (1) relating to a dispute between the *Owner* and the *Contractor* unless such costs are part of a settlement or awarded by arbitration or court,
 - (2) the result of the negligent acts or omissions of the *Contractor*, or
 - (3) the result of a breach of this *Contract* by the *Contractor*;
- .18 cost of auditing when requested by the *Owner*; and
- .19 cost of *Project* specific information technology in accordance with the method determined by the parties.

- 6.3.8 Notwithstanding any other provisions contained in the General Conditions of the *Contract*, it is the intention of the parties that the cost of any item under any cost element referred to in paragraph 6.3.7 shall cover and include any and all costs or liabilities attributable to the *Change Directive* other than those which are the result of or occasioned by any failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor's* attention to the *Work*. Any cost due to failure on the part of the *Contractor* to exercise reasonable care and diligence in the *Contractor's* performance of the *Work* attributable to the *Change Directive* shall be borne by the *Contractor*.
- 6.3.9 The *Contractor* shall keep full and detailed accounts and records necessary for the documentation of the cost of performing the *Work* attributable to the *Change Directive* and shall provide the *Consultant* with copies thereof.
- 6.3.10 For the purpose of valuing *Change Directives*, the *Owner* shall be afforded reasonable access to all of the *Contractor's* pertinent documents related to the cost of performing the *Work* attributable to the *Change Directive*.
- 6.3.11 Pending determination of the final amount of a *Change Directive*, the undisputed value of the *Work* performed as the result of a *Change Directive* is eligible to be included in progress payments.
- 6.3.12 If the *Owner* and the *Contractor* do not agree on the proposed adjustment in the *Contract Time* attributable to the change in the *Work*, or the method of determining it, the adjustment shall be referred to the *Consultant* for a finding.
- 6.3.13 When the *Owner* and the *Contractor* reach agreement on the adjustment to the *Contract Price* and to the *Contract Time*, this agreement shall be recorded in a *Change Order*.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

- 6.4.1 If the *Owner* or the *Contractor* discover conditions at the *Place of the Work* which are:
- .1 subsurface or otherwise concealed physical conditions which existed before the commencement of the *Work* and differ materially from those indicated in the *Contract Documents*; or
 - .2 physical conditions, other than conditions due to weather, that are of a nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the *Contract Documents*,
- then the observing party shall give *Notice in Writing* to the other party of such conditions before they are disturbed and in no event later than 5 *Working Days* after first observance of the conditions.
- 6.4.2 The *Consultant* will promptly investigate such conditions and make a finding. If the finding is that the conditions differ materially and this would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Owner*, through the *Consultant*, shall issue appropriate instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.
- 6.4.3 If the *Consultant* finds that the conditions at the *Place of the Work* are not materially different or that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* will promptly inform the *Owner* and the *Contractor* in writing.
- 6.4.4 If such concealed or unknown conditions relate to toxic and hazardous substances and materials, artifacts and fossils, or mould, the parties will be governed by the provisions of GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES, GC 9.3 – ARTIFACTS AND FOSSILS and GC 9.5 – MOULD.

GC 6.5 DELAYS

- 6.5.1 If the *Contractor* is delayed in the performance of the *Work* by the *Owner*, the *Consultant*, or anyone employed or engaged by them directly or indirectly, contrary to the provisions of the *Contract Documents*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.
- 6.5.2 If the *Contractor* is delayed in the performance of the *Work* by a stop work order issued by a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or any person employed or engaged by the *Contractor* directly or indirectly, resulting in the failure of the *Contractor* to attain *Ready-for-Takeover* by the date stipulated in Article A-1 of the Agreement – THE WORK, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for reasonable costs incurred by the *Contractor* as the result of such delay.
- 6.5.3 If the *Contractor* is delayed in the performance of the *Work* by:
- .1 labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized contractors' association, of which the *Contractor* is a member or to which the *Contractor* is otherwise bound),
 - .2 fire, unusual delay by common carriers or unavoidable casualties,
 - .3 abnormally adverse weather conditions, or

.4 any cause beyond the *Contractor's* control other than one resulting from a default or breach of *Contract* by the *Contractor*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the *Owner*, the *Consultant* or anyone employed or engaged by them directly or indirectly.

6.5.4 No extension shall be made for delay unless *Notice in Writing* of the cause of delay is given to the *Consultant* not later than 10 *Working Days* after the commencement of the delay. In the case of a continuing cause of delay only one *Notice in Writing* shall be necessary.

6.5.5 If no schedule is made under paragraph 2.2.12 of GC 2.2 – ROLE OF THE CONSULTANT, then no request for extension shall be made because of failure of the *Consultant* to furnish instructions until 10 *Working Days* after demand for such instructions has been made.

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

6.6.1 If the *Contractor* intends to make a claim for an increase to the *Contract Price*, or if the *Owner* intends to make a claim against the *Contractor* for a credit to the *Contract Price*, the party that intends to make the claim shall give timely *Notice in Writing* of intent to claim to the other party and to the *Consultant*.

6.6.2 Upon commencement of the event or series of events giving rise to a claim, the party intending to make the claim shall:

- .1 take all reasonable measures to mitigate any loss or expense which may be incurred as a result of such event or series of events, and
- .2 keep such records as may be necessary to support the claim.

6.6.3 The party making the claim shall submit within a reasonable time to the *Consultant* a detailed account of the amount claimed and the grounds upon which the claim is based and the *Consultant* will make a finding upon such claim.

6.6.4 Where the event or series of events giving rise to the claim has a continuing effect, the detailed account submitted under paragraph 6.6.3 shall be considered to be an interim account and the party making the claim shall, at such intervals as the *Consultant* may reasonably require, submit further interim accounts giving the accumulated amount of the claim and any further grounds upon which it is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.

6.6.5 The *Consultant's* findings, with respect to a claim made by either party, will be given by *Notice in Writing* to both parties within 30 *Working Days* after receipt of the claim by the *Consultant*, or within such other time period as may be agreed by the parties.

6.6.6 If such finding is not acceptable to either party, the claim shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION.

PART 7 DEFAULT NOTICE

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

7.1.1 If the *Contractor* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Contractor's* insolvency, or if a receiver is appointed because of the *Contractor's* insolvency, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, terminate the *Contractor's* right to continue with the *Work*, by giving the *Contractor* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.

7.1.2 If the *Contractor* neglects to perform the *Work* properly or otherwise fails to comply with the requirements of the *Contract* to a substantial degree and if the *Consultant* has given a written statement to the *Owner* and *Contractor* which provides the detail of such neglect to perform the *Work* properly or such failure to comply with the requirements of the *Contract* to a substantial degree, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, give the *Contractor* *Notice in Writing*, containing particulars of the default including references to applicable provisions of the *Contract*, that the *Contractor* is in default of the *Contractor's* contractual obligations and instruct the *Contractor* to correct the default in the 5 *Working Days* immediately following the receipt of such *Notice in Writing*.

7.1.3 If the default cannot be corrected in the 5 *Working Days* specified or in such other time period as may be subsequently agreed in writing by the parties, the *Contractor* shall be in compliance with the *Owner's* instructions if the *Contractor*:

- .1 commences the correction of the default within the specified time,
- .2 provides the *Owner* with an acceptable schedule for such correction, and
- .3 corrects the default in accordance with the *Contract* terms and with such schedule.

- 7.1.4 If the *Contractor* fails to correct the default in the time specified or in such other time period as may be subsequently agreed in writing by the parties, without prejudice to any other right or remedy the *Owner* may have, the *Owner* may by giving *Notice in Writing*:
- .1 correct such default and deduct the cost thereof from any payment then or thereafter due the *Contractor* for the *Work* provided the *Consultant* has certified such cost to the *Owner* and the *Contractor*, or
 - .2 terminate the *Contractor*'s right to continue with the *Work* in whole or in part or terminate the *Contract*.
- 7.1.5 If the *Owner* terminates the *Contractor*'s right to continue with the *Work* as provided in paragraphs 7.1.1 and 7.1.4, the *Owner* shall be entitled to:
- .1 take possession of the *Work* and *Products* at the *Place of the Work*; subject to the rights of third parties, utilize the *Construction Equipment* at the *Place of the Work*; finish the *Work* by whatever method the *Owner* may consider expedient, but without undue delay or expense,
 - .2 withhold further payment to the *Contractor* until a final certificate for payment is issued,
 - .3 charge the *Contractor* the amount by which the full cost of finishing the *Work* as certified by the *Consultant*, including compensation to the *Consultant* for the *Consultant*'s additional services and a reasonable allowance as determined by the *Consultant* to cover the cost of corrections to work performed by the *Contractor* that may be required under GC 12.3 – WARRANTY, exceeds the unpaid balance of the *Contract Price*; however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference, and
 - .4 on expiry of the warranty period, charge the *Contractor* the amount by which the cost of corrections to the *Contractor*'s work under GC 12.3 – WARRANTY exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the allowance, pay the *Contractor* the difference.
- 7.1.6 The *Contractor*'s obligation under the *Contract* as to quality, correction and warranty of the work performed by the *Contractor* up to the time of termination shall continue in force after such termination of the *Contract*.

GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

- 7.2.1 If the *Owner* is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of the *Owner*'s insolvency, or if a receiver is appointed because of the *Owner*'s insolvency, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* or receiver or trustee in bankruptcy *Notice in Writing* to that effect.
- 7.2.2 If the *Work* is suspended or otherwise delayed for a period of 20 *Working Days* or more under an order of a court or other public authority and providing that such order was not issued as the result of an act or fault of the *Contractor* or of anyone directly or indirectly employed or engaged by the *Contractor*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, terminate the *Contract* by giving the *Owner* *Notice in Writing* to that effect.
- 7.2.3 The *Contractor* may give *Notice in Writing* to the *Owner*, with a copy to the *Consultant*, that the *Owner* is in default of the *Owner*'s contractual obligations if:
- .1 the *Owner* fails to furnish, when so requested by the *Contractor*, reasonable evidence that financial arrangements have been made to fulfill the *Owner*'s obligations under the *Contract*,
 - .2 the *Consultant* fails to issue a certificate as provided in Part 5 of the General Conditions – PAYMENT,
 - .3 the *Owner* fails to pay the *Contractor* when due the amounts certified by the *Consultant* or awarded by adjudication, arbitration or court, or
 - .4 the *Owner* fails to comply with the requirements of the *Contract* to a substantial degree and the *Consultant*, except for GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER, gives a written statement to the *Owner* and the *Contractor* that provides detail of such failure to comply with the requirements of the *Contract* to a substantial degree.
- 7.2.4 The *Contractor*'s *Notice in Writing* to the *Owner* provided under paragraph 7.2.3 shall advise that if the default is not corrected within 5 *Working Days* following the receipt of the *Notice in Writing*, the *Contractor* may, without prejudice to any other right or remedy the *Contractor* may have, suspend the *Work* or terminate the *Contract*.
- 7.2.5 If the *Contractor* terminates the *Contract* by giving a *Notice in Writing* to the *Owner* under the conditions set out above, the *Contractor* shall be entitled to be paid for all work performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*.

PART 8 DISPUTE RESOLUTION

GC 8.1 AUTHORITY OF THE CONSULTANT

- 8.1.1 Differences between the parties to the *Contract* as to the interpretation, application or administration of the *Contract* or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved

in the first instance by findings of the *Consultant* as provided in GC 2.2 – ROLE OF THE CONSULTANT, shall be settled in accordance with the requirements of Part 8 of the General Conditions – DISPUTE RESOLUTION.

- 8.1.2 If a dispute arises under the *Contract* in respect of a matter in which the *Consultant* has no authority under the *Contract* to make a finding, the procedures set out in paragraph 8.1.3 and paragraphs 8.3.3 to 8.3.8 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION, and in GC 8.4 – RETENTION OF RIGHTS apply to that dispute with the necessary changes to detail as may be required.
- 8.1.3 If a dispute is not resolved promptly, the *Consultant* will give such instructions as in the *Consultant's* opinion are necessary for the proper performance of the *Work* and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim the party may have. If it is subsequently determined that such instructions were in error or at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond what the *Contract Documents* correctly understood and interpreted would have required, including costs resulting from interruption of the *Work*.

GC 8.2 ADJUDICATION

- 8.2.1 Nothing in this *Contract* shall be deemed to affect the rights of the parties to resolve any dispute by adjudication as may be prescribed by applicable legislation.

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

- 8.3.1 In accordance with the rules for mediation as provided in CCDC 40 'Rules for Mediation and Arbitration of Construction Industry Disputes' in effect at the time of bid closing, the parties shall appoint a Project Mediator
- .1 within 20 *Working Days* after the *Contract* was awarded, or
 - .2 if the parties neglected to make an appointment within the 20 *Working Days*, within 10 *Working Days* after either party by *Notice in Writing* requests that the Project Mediator be appointed.
- 8.3.2 A party shall be conclusively deemed to have accepted a finding of the *Consultant* under GC 2.2 – ROLE OF THE CONSULTANT and to have expressly waived and released the other party from any claims in respect of the particular matter dealt with in that finding unless, within 15 *Working Days* after receipt of that finding, the party sends a *Notice in Writing* of dispute to the other party and to the *Consultant*, which contains the particulars of the matter in dispute and the relevant provisions of the *Contract Documents*. The responding party shall send a *Notice in Writing* of reply to the dispute within 10 *Working Days* after receipt of such *Notice in Writing* setting out particulars of this response and any relevant provisions of the *Contract Documents*.
- 8.3.3 The parties shall make all reasonable efforts to resolve their dispute by amicable negotiations and agree to provide, without prejudice, frank, candid, and timely disclosure of relevant facts, information and documents to facilitate these negotiations.
- 8.3.4 After a period of 10 *Working Days* following receipt of a responding party's *Notice in Writing* of reply under paragraph 8.3.2, the parties shall request the Project Mediator to assist the parties to reach agreement on any unresolved dispute. The mediated negotiations shall be conducted in accordance with the rules for mediation as provided in CCDC 40 in effect at the time of bid closing.
- 8.3.5 If the dispute has not been resolved at the mediation or within such further period as is agreed by the parties, the Project Mediator will terminate the mediated negotiations by giving *Notice in Writing* to the *Owner*, the *Contractor* and the *Consultant*.
- 8.3.6 By giving a *Notice in Writing* to the other party and the *Consultant*, not later than 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.3.5, either party may refer the dispute to be finally resolved by arbitration under the rules of arbitration as provided in CCDC 40 in effect at the time of bid closing. The arbitration shall be conducted in the jurisdiction of the *Place of the Work*.
- 8.3.7 On expiration of the 10 *Working Days*, the arbitration agreement under paragraph 8.3.6 is not binding on the parties and, if a *Notice in Writing* is not given under paragraph 8.3.6 within the required time, the parties may refer the unresolved dispute to the courts or to any other form of dispute resolution, including arbitration, which they have agreed to use.
- 8.3.8 If neither party, by *Notice in Writing*, given within 10 *Working Days* of the date of *Notice in Writing* requesting arbitration in paragraph 8.3.6, requires that a dispute be arbitrated immediately, all disputes referred to arbitration as provided in paragraph 8.3.6 shall be:
- .1 held in abeyance until:
 - (1) *Ready-for-Takeover*,
 - (2) the *Contract* has been terminated, or
 - (3) the *Contractor* has abandoned the *Work*,whichever is earlier; and

.2 consolidated into a single arbitration under the rules governing the arbitration under paragraph 8.3.6.

GC 8.4 RETENTION OF RIGHTS

- 8.4.1 It is agreed that no act by either party shall be construed as a renunciation or waiver of any rights or recourses, provided the party has given the *Notice in Writing* required under Part 8 of the General Conditions – DISPUTE RESOLUTION and has carried out the instructions as provided in paragraph 8.1.3 of GC 8.1 – AUTHORITY OF THE CONSULTANT.
- 8.4.2 Nothing in Part 8 of the General Conditions – DISPUTE RESOLUTION shall be construed in any way to limit a party from asserting any statutory right to a lien under applicable lien legislation of the jurisdiction of the *Place of the Work* and the assertion of such right by initiating judicial proceedings is not to be construed as a waiver of any right that party may have under paragraph 8.3.6 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION to proceed by way of arbitration to adjudicate the merits of the claim upon which such a lien is based.

PART 9 PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

- 9.1.1 The *Contractor* shall protect the *Work*, the *Owner's* property and property adjacent to the *Place of the Work* from damage which may arise as the result of the *Contractor's* operations under the *Contract*, and shall be responsible for such damage, except damage which occurs as the result of:
- .1 errors or omissions in the *Contract Documents*; or
 - .2 acts or omissions by the *Owner*, the *Consultant*, *Other Contractors*, or their agents and employees.
- 9.1.2 Before commencing any work, the *Contractor* shall determine the location of all underground utilities and structures indicated in the *Contract Documents* or that are reasonably apparent in an inspection of the *Place of the Work*.
- 9.1.3 Should the *Contractor* in the performance of the *Contract* damage the *Work*, the *Owner's* property or property adjacent to the *Place of the Work*, the *Contractor* shall be responsible for making good such damage at the *Contractor's* expense.
- 9.1.4 Should damage occur to the *Work* or the *Owner's* property for which the *Contractor* is not responsible, as provided in paragraph 9.1.1, the *Contractor* shall make good such damage to the *Work* and, if the *Owner* so directs, to the *Owner's* property. The *Contract Price* and *Contract Time* shall be adjusted as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

- 9.2.1 For the purposes of applicable legislation related to toxic and hazardous substances, the *Owner* shall be deemed to have control and management of the *Place of the Work* with respect to existing conditions.
- 9.2.2 Prior to the *Contractor* commencing the *Work*, the *Owner* shall,
- .1 take all reasonable steps to determine whether any toxic or hazardous substances are present at the *Place of the Work*, and
 - .2 provide the *Consultant* and the *Contractor* with a written list of any such substances that are known to exist and their locations.
- 9.2.3 The *Owner* shall take all reasonable steps to ensure that no person's exposure to any toxic or hazardous substance exceeds the time weighted levels prescribed by applicable legislation at the *Place of the Work* and that no property is damaged or destroyed as a result of exposure to, or the presence of, toxic or hazardous substances which were at the *Place of the Work* prior to the *Contractor* commencing the *Work*.
- 9.2.4 Unless the *Contract* expressly provides otherwise, the *Owner* shall be responsible for taking all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to dispose of, store or otherwise render harmless any toxic or hazardous substance which was present at the *Place of the Work* prior to the *Contractor* commencing the *Work*.
- 9.2.5 If the *Contractor*
- .1 encounters toxic or hazardous substances at the *Place of the Work*, or
 - .2 has reasonable grounds to believe that toxic or hazardous substances are present at the *Place of the Work*, which were not brought to the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible and which were not disclosed by the *Owner* or which were disclosed but have not been dealt with as required under paragraph 9.2.4, the *Contractor* shall
 - .3 take all reasonable steps, including stopping the *Work*, to ensure that no person's exposure to any toxic or hazardous substance exceeds any applicable time weighted levels prescribed by applicable legislation at the *Place of the Work*, and
 - .4 immediately report the circumstances to the *Consultant* and the *Owner* in writing.

- 9.2.6 If the *Owner* and the *Contractor* do not agree on the existence, significance of, or whether the toxic or hazardous substances were brought onto the *Place of the Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.
- 9.2.7 If the *Owner* and the *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were not brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Owner* shall promptly at the *Owner's* own expense:
- .1 take all steps as required under paragraph 9.2.4;
 - .2 reimburse the *Contractor* for the costs of all steps taken pursuant to paragraph 9.2.5;
 - .3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in 9.2.6 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay; and
 - .4 indemnify the *Contractor* as required by GC 13.1 – INDEMNIFICATION.
- 9.2.8 If the *Owner* and the *Contractor* agree or if the expert referred to in paragraph 9.2.6 determines that the toxic or hazardous substances were brought onto the place of the *Work* by the *Contractor* or anyone for whom the *Contractor* is responsible, the *Contractor* shall promptly at the *Contractor's* own expense:
- .1 take all necessary steps, in accordance with applicable legislation in force at the *Place of the Work*, to safely remove and dispose the toxic or hazardous substances;
 - .2 make good any damage to the *Work*, the *Owner's* property or property adjacent to the place of the *Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY;
 - .3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.2.6; and
 - .4 indemnify the *Owner* as required by GC 13.1 – INDEMNIFICATION.
- 9.2.9 If either party does not accept the expert's findings under paragraph 9.2.6, the disagreement shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraph 9.2.7 or 9.2.8 it being understood that by so doing, neither party will jeopardize any claim that party may have to be reimbursed as provided by GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.

GC 9.3 ARTIFACTS AND FOSSILS

- 9.3.1 Fossils, coins, articles of value or antiquity, structures and other remains or things of scientific or historic interest discovered at the *Place or Work* shall, as between the *Owner* and the *Contractor*, be deemed to be the absolute property of the *Owner*.
- 9.3.2 The *Contractor* shall take all reasonable precautions to prevent removal or damage to discoveries as identified in paragraph 9.3.1, and shall advise the *Consultant* upon discovery of such items.
- 9.3.3 The *Consultant* will investigate the impact on the *Work* of the discoveries identified in paragraph 9.3.1. If conditions are found that would cause an increase or decrease in the *Contractor's* cost or time to perform the *Work*, the *Owner*, through the *Consultant*, shall issue appropriate instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE.

GC 9.4 CONSTRUCTION SAFETY

- 9.4.1 The *Contractor* shall be responsible for establishing, initiating, maintaining, and supervising all health and safety precautions and programs in connection with the performance of the *Work* in accordance with the applicable health and safety legislation.
- 9.4.2 The *Owner* and the *Contractor* shall comply with all health and safety precautions and programs established at the *Place of the Work*.
- 9.4.3 The *Owner* and the *Contractor* shall comply with the rules, regulations and practices required by the applicable health and safety legislation.
- 9.4.4 The *Owner* shall cause the *Consultant*, *Other Contractors* and the *Owner's* own forces to comply with all health and safety precautions and programs established by the *Contractor* at the *Place of the Work*.
- 9.4.5 Nothing in this *Contract* shall affect the determination of liability under the applicable health and safety legislation.

GC 9.5 MOULD

- 9.5.1 If the *Contractor* or the *Owner* observes or reasonably suspects the presence of mould at the *Place of the Work*, the remediation of which is not expressly part of the *Work*,
- .1 the observing party shall promptly report the circumstances to the other party in writing,
 - .2 the *Contractor* shall promptly take all reasonable steps, including stopping the *Work* if necessary, to ensure that no person suffers injury, sickness or death and that no property is damaged as a result of exposure to or the presence of the mould, and

- .3 if the *Owner* and the *Contractor* do not agree on the existence, significance or cause of the mould or as to what steps need be taken to deal with it, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine such matters. The expert's report shall be delivered to the *Owner* and the *Contractor*.
- 9.5.2 If the *Owner* and the *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was caused by the *Contractor*'s operations under the *Contract*, the *Contractor* shall promptly, at the *Contractor*'s own expense:
- .1 take all reasonable and necessary steps to safely remediate or dispose of the mould,
 - .2 make good any damage to the *Work*, the *Owner*'s property or property adjacent to the *Place of the Work* as provided in paragraph 9.1.3 of GC 9.1 – PROTECTION OF WORK AND PROPERTY,
 - .3 reimburse the *Owner* for reasonable costs incurred under paragraph 9.5.1.3, and
 - .4 indemnify the *Owner* as required by GC 13.1 – INDEMNIFICATION.
- 9.5.3 If the *Owner* and the *Contractor* agree, or if the expert referred to in paragraph 9.5.1.3 determines that the presence of mould was not caused by the *Contractor*'s operations under the *Contract*, the *Owner* shall promptly, at the *Owner*'s own expense:
- .1 take all reasonable and necessary steps to safely remediate or dispose of the mould,
 - .2 reimburse the *Contractor* for the cost of taking the steps under paragraph 9.5.1.2 and making good any damage to the *Work* as provided in paragraph 9.1.4 of GC 9.1 – PROTECTION OF WORK AND PROPERTY,
 - .3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the expert referred to in paragraph 9.5.1.3 and reimburse the *Contractor* for reasonable costs incurred as a result of the delay, and
 - .4 indemnify the *Contractor* as required by GC 13.1 – INDEMNIFICATION.
- 9.5.4 If either party does not accept the expert's finding under paragraph 9.5.1.3, the disagreement shall be settled in accordance with Part 8 of the General Conditions – DISPUTE RESOLUTION. If such disagreement is not resolved promptly, the parties shall act immediately in accordance with the expert's determination and take the steps required by paragraphs 9.5.2 or 9.5.3, it being understood that by so doing neither party will jeopardize any claim the party may have to be reimbursed as provided by GC 9.5 – MOULD.

PART 10 GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

- 10.1.1 The *Contract Price* shall include all taxes and customs duties in effect at the time of the bid closing except for *Value Added Taxes* payable by the *Owner* to the *Contractor* as stipulated in Article A-4 of the Agreement – CONTRACT PRICE.
- 10.1.2 Any increase or decrease in costs to the *Contractor* due to changes in taxes and duties after the time of the bid closing shall increase or decrease the *Contract Price* accordingly.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

- 10.2.1 The laws of the *Place of the Work* shall govern the *Work*.
- 10.2.2 The *Owner* shall obtain and pay for development approvals, building permit, permanent easements, rights of servitude, and all other necessary approvals and permits, except for the permits and fees referred to in paragraph 10.2.3 or for which the *Contract Documents* specify as the responsibility of the *Contractor*.
- 10.2.3 The *Contractor* shall be responsible for the procurement of permits, licences, inspections, and certificates, which are necessary for the performance of the *Work* and customarily obtained by contractors in the jurisdiction of the *Place of the Work* after the issuance of the building permit. The *Contract Price* includes the cost of these permits, licences, inspections, and certificates, and their procurement.
- 10.2.4 The *Contractor* shall give the required notices and comply with the laws, ordinances, rules, regulations, or codes which are or become in force during the performance of the *Work* and which relate to the *Work*, to the preservation of the public health, and to construction safety.
- 10.2.5 The *Contractor* shall not be responsible for verifying that the *Contract Documents* are in compliance with the applicable laws, ordinances, rules, regulations, or codes relating to the *Work*. If the *Contract Documents* are at variance therewith, or if, subsequent to the time of bid closing, changes are made to the applicable laws, ordinances, rules, regulations, or codes which require modification to the *Contract Documents*, the *Contractor* shall advise the *Consultant* in writing requesting direction immediately upon such variance or change becoming known. The *Consultant* will issue the changes required to the *Contract Documents* as provided in GC 6.1 – OWNER'S RIGHT TO MAKE CHANGES, GC 6.2 – CHANGE ORDER and GC 6.3 – CHANGE DIRECTIVE.

- 10.2.6 If the *Contractor* fails to advise the *Consultant* in writing; fails to obtain direction as required in paragraph 10.2.5; and performs work knowing it to be contrary to any laws, ordinances, rules, regulations, or codes; the *Contractor* shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations, or codes.
- 10.2.7 If, subsequent to the time of bid closing, changes are made to applicable laws, ordinances, rules, regulations, or codes of authorities having jurisdiction which affect the cost of the *Work*, either party may submit a claim in accordance with the requirements of GC 6.6 – CLAIMS FOR A CHANGE IN CONTRACT PRICE.

GC 10.3 PATENT FEES

- 10.3.1 The *Contractor* shall pay the royalties and patent licence fees required for the performance of the *Contract*. The *Contractor* shall hold the *Owner* harmless from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention by the *Contractor* or anyone for whose acts the *Contractor* may be liable.
- 10.3.2 The *Owner* shall hold the *Contractor* harmless against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *Contractor*'s performance of the *Contract* which are attributable to an infringement or an alleged infringement of a patent of invention in executing anything for the purpose of the *Contract*, the physical model, plan or design of which was supplied to the *Contractor* as part of the *Contract*.

GC 10.4 WORKERS' COMPENSATION

- 10.4.1 Prior to commencing the *Work*, and again with the *Contractor*'s applications for payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation at the *Place of the Work*.

PART 11 INSURANCE

GC 11.1 INSURANCE

- 11.1.1 Without restricting the generality of GC 13.1 – INDEMNIFICATION, the *Contractor* shall provide, maintain and pay for the following insurance coverages, the requirements of which are specified in CCDC 41 'CCDC Insurance Requirements' in effect at the time of bid closing except as hereinafter provided:
- .1 General liability insurance in the name of the *Contractor* and include, or in the case of a single, blanket policy, be endorsed to name, the *Owner* and the *Consultant* as insureds but only with respect to liability, other than legal liability arising out of their sole negligence, arising out of the operations of the *Contractor* with regard to the *Work*. General liability insurance shall be maintained from the date of commencement of the *Work* until one year from the date of *Ready-for-Takeover*. Liability coverage shall be provided for completed operations hazards from the date of *Ready-for-Takeover* on an ongoing basis for a period of 6 years following *Ready-for-Takeover*.
 - .2 Automobile Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.
 - .3 Unmanned aerial vehicle aircraft, manned aircraft or watercraft Liability Insurance when owned or non-owned manned or unmanned aircraft or watercraft are used directly or indirectly in the performance of the *Work*.
 - .4 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The "Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:
 - (1) 10 calendar days after the date of *Ready-for-Takeover*;
 - (2) on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square metres in area, or parking purposes, or for the installation, testing and commissioning of equipment forming part of the *Work*; and
 - (3) when left unattended for more than 30 consecutive calendar days or when construction activity has ceased for more than 30 consecutive calendar days.
 - .5 Boiler and machinery insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The coverage shall be maintained continuously from commencement of use or operation of the boiler and machinery objects insured by the policy and until 10 calendar days after the date of *Ready-for-Takeover*.
 - .6 The "Broad form" property and boiler and machinery policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. In the event of loss or damage:
 - (1) the *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except

that the *Contractor* shall be entitled to such reasonable extension of *Contract Time* relative to the extent of the loss or damage as the *Consultant* may recommend in consultation with the *Contractor*;

(2) the *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount which the *Owner's* interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds in accordance with the progress payment provisions. In addition the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor's* interest in the restoration of the *Work*; and

(3) to the *Work* arising from the work of the *Owner*, the *Owner's* own forces or *Other Contractors*, the *Owner* shall, in accordance with the *Owner's* obligations under the provisions relating to construction by the *Owner* or *Other Contractors*, pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as in accordance with the progress payment provisions.

.7 Contractors' Equipment Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

.8 Contractors' Pollution Liability Insurance from the date of commencement of the *Work* until one year after the date of *Ready-for-Takeover*.

11.1.2 Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.

11.1.3 The parties shall pay their share of the deductible amounts in direct proportion to their responsibility in regards to any loss for which the above policies are required to pay, except where such amounts may be excluded by the terms of the *Contract*.

11.1.4 If the *Contractor* fails to provide or maintain insurance as required by the *Contract Documents*, then the *Owner* shall have the right to provide and maintain such insurance and give evidence to the *Contractor* and the *Consultant*. The *Contractor* shall pay the cost thereof to the *Owner* on demand or the *Owner* may deduct the cost from the amount which is due or may become due to the *Contractor*.

11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the *Place of the Work*.

11.1.6 If a revised version of CCDC 41 is published, which specifies reduced insurance requirements, the parties shall address such reduction, prior to the *Contractor's* insurance policy becoming due for renewal, and record any agreement in a *Change Order*.

11.1.7 If a revised version of CCDC 41 is published, which specifies increased insurance requirements, the *Owner* may request the increased coverage from the *Contractor* by way of a *Change Order*.

11.1.8 A *Change Directive* shall not be used to direct a change in the insurance requirements in response to the revision of CCDC 41.

PART 12 OWNER TAKEOVER

GC 12.1 READY-FOR-TAKEOVER

12.1.1 The prerequisites to attaining *Ready-for-Takeover* of the *Work* are limited to the following:

.1 The *Consultant* has certified or verified the *Substantial Performance of the Work*.

.2 Evidence of compliance with the requirements for occupancy or occupancy permit as prescribed by the authorities having jurisdiction.

.3 Final cleaning and waste removal at the time of applying for *Ready-for-Takeover*, as required by the *Contract Documents*.

.4 The delivery to the *Owner* of such operations and maintenance documents reasonably necessary for immediate operation and maintenance, as required by the *Contract Documents*.

.5 Make available a copy of the as-built drawings completed to date on site.

.6 Startup, testing required for immediate occupancy, as required by the *Contract Documents*.

.7 Ability to secure access to the *Work* has been provided to the *Owner*, if required by the *Contract Documents*.

.8 Demonstration and training, as required by the *Contract Documents*, is scheduled by the *Contractor* acting reasonably.

12.1.2 If any prerequisites set forth in paragraphs 12.1.1.3 to 12.1.1.6 must be deferred because of conditions reasonably beyond the control of the *Contractor*, or by agreement between the *Owner* and the *Contractor* to do so, *Ready-for-Takeover* shall not be delayed.

12.1.3 When the *Contractor* considers that the *Work* is *Ready-for-Takeover*, the *Contractor* shall deliver to the *Consultant* and to the *Owner* a comprehensive list of items to be completed or corrected, together with a written application for *Ready-for-Takeover* for review. Failure to include an item on the list does not alter the responsibility of the *Contractor* to complete the *Contract*.

12.1.4 The *Consultant* will review the *Work* to verify the validity of the application and will promptly, and in any event, no later than 10 calendar days after receipt of the *Contractor's* list and application:

- .1 advise the *Contractor* in writing that the *Work* is not *Ready-for-Takeover* and give reasons why, or
- .2 confirm the date of *Ready-for-Takeover* in writing to each of the *Owner* and the *Contractor*.

12.1.5 Immediately following the confirmation of the date of *Ready-for-Takeover*, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable date for finishing the *Work*.

12.1.6 The provision of GC 12.1 – READY-FOR-TAKEOVER shall be subject to GC 12.2 – EARLY OCCUPANCY BY THE OWNER.

GC 12.2 EARLY OCCUPANCY BY THE OWNER

12.2.1 The *Owner* may take occupancy of a part or the entirety of the *Work* before *Ready-for-Takeover* has been attained only as agreed by the *Contractor* which agreement shall not be unreasonably withheld.

12.2.2 The *Owner* shall not occupy a part or the entirety of the *Work* without prior approval by authorities having jurisdiction.

12.2.3 If the *Owner* takes occupancy of a part of the *Work* before *Ready-for-Takeover* has been attained:

- .1 The part of the *Work* which is occupied shall be deemed to have been taken over by the *Owner* as from the date on which it is occupied.
- .2 The *Contractor* shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the *Owner*.
- .3 The warranty period specified in paragraph 12.3.1 of GC 12.3 – WARRANTY for that part of the *Work* shall start from the date on which it is occupied.

12.2.4 If the *Owner* takes occupancy of the entirety of the *Work* before all the prerequisites are met as described in paragraph 12.1.1 of GC 12.1 – READY-FOR-TAKEOVER, the *Work* shall, subject to the requirements of the applicable lien legislation, be deemed to achieve *Ready-for-Takeover*. This shall not relieve the *Contractor*'s responsibility to complete the *Work* in a timely manner.

GC 12.3 WARRANTY

12.3.1 Except for extended warranties as described in paragraph 12.3.6, the warranty period under the *Contract* is one year from the date when *Ready-for-Takeover* has been attained.

12.3.2 The *Contractor* shall be responsible for the proper performance of the *Work* to the extent that the design and *Contract Documents* permit such performance.

12.3.3 The *Owner*, through the *Consultant*, shall promptly give the *Contractor* *Notice in Writing* of observed defects and deficiencies which occur during the one year warranty period.

12.3.4 Subject to paragraph 12.3.2, the *Contractor* shall correct promptly, at the *Contractor*'s expense, defects or deficiencies in the *Work* which appear prior to and during the one year warranty period.

12.3.5 The *Contractor* shall correct or pay for damage resulting from corrections made under the requirements of paragraph 12.3.4.

12.3.6 Any extended warranties required beyond the one year warranty period as described in paragraph 12.3.1, shall be as specified in the *Contract Documents*. Extended warranties shall be issued by the warrantor to the benefit of the *Owner*. The *Contractor*'s responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.

PART 13 INDEMNIFICATION AND WAIVER

GC 13.1 INDEMNIFICATION

13.1.1 Without restricting the parties' obligation to indemnify respecting toxic and hazardous substances, patent fees and defect in title claims all as described in paragraphs 13.1.4 and 13.1.5, the *Owner* and the *Contractor* shall each indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by them or in respect to claims by third parties that arise out of, or are attributable in any respect to their involvement as parties to this *Contract*, provided such claims are:

- .1 caused by:
 - (1) the negligent acts or omissions of the party from whom indemnification is sought or anyone for whose negligent acts or omissions that party is liable, or
 - (2) a failure of the party to the *Contract* from whom indemnification is sought to fulfill its terms or conditions; and
- .2 made by *Notice in Writing* within a period of 6 years from the *Ready-for-Takeover* date or within such shorter period as may be prescribed by any limitation statute of the Province or Territory of the *Place of the Work*.

The parties expressly waive the right to indemnity for claims other than those provided for in this *Contract*.

- 13.1.2 The obligation of either party to indemnify as set forth in paragraph 13.1.1 shall be limited as follows:
- .1 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is to be provided by either party pursuant to GC 11.1 – INSURANCE, the minimum liability insurance limit for one occurrence, of the applicable insurance policy, as referred to in CCDC 41 in effect at the time of bid closing.
 - .2 In respect to losses suffered by the *Owner* and the *Contractor* for which insurance is not required to be provided by either party in accordance with GC 11.1 – INSURANCE, the greater of the *Contract Price* as recorded in Article A-4 – CONTRACT PRICE or \$2,000,000, but in no event shall the sum be greater than \$20,000,000.
 - .3 In respect to indemnification by a party against the other with respect to losses suffered by them, such obligation shall be restricted to direct loss and damage, and neither party shall have any liability to the other for indirect, consequential, punitive or exemplary damages.
 - .4 In respect to indemnification respecting claims by third parties, the obligation to indemnify is without limit.
- 13.1.3 The obligation of either party to indemnify the other as set forth in paragraphs 13.1.1 and 13.1.2 shall be inclusive of interest and all legal costs.
- 13.1.4 The *Owner* and the *Contractor* shall indemnify and hold harmless the other from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of their obligations described in GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES.
- 13.1.5 The *Owner* shall indemnify and hold harmless the *Contractor* from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings:
- .1 as described in paragraph 10.3.2 of GC 10.3 – PATENT FEES, and
 - .2 arising out of the *Contractor's* performance of the *Contract* which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the *Place of the Work*.
- 13.1.6 In respect to any claim for indemnity or to be held harmless by the *Owner* or the *Contractor*:
- .1 *Notice in Writing* of such claim shall be given within a reasonable time after the facts upon which such claim is based become known; and
 - .2 should any party be required as a result of its obligation to indemnify another to pay or satisfy a final order, judgment or award made against the party entitled by this contract to be indemnified, then the indemnifying party upon assuming all liability for any costs that might result shall have the right to appeal in the name of the party against whom such final order or judgment has been made until such rights of appeal have been exhausted.

GC 13.2 WAIVER OF CLAIMS

- 13.2.1 Subject to any lien legislation applicable to the *Place of the Work*, the *Contractor* waives and releases the *Owner* from all claims which the *Contractor* has or reasonably ought to have knowledge of that could be advanced by the *Contractor* against the *Owner* under the *Contract*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the *Ready-for-Takeover* date, except as follows:
- .1 claims arising prior to or on the *Ready-for-Takeover* date for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* no later than 5 calendar days before the expiry of the lien period provided by the lien legislation applicable at the *Place of the Work* or 20 calendar days following the *Ready-for-Takeover* date, whichever is later;
 - .2 indemnification for claims advanced against the *Contractor* by third parties for which a right of indemnification may be asserted by the *Contractor* against the *Owner* pursuant to the provisions of this *Contract*;
 - .3 claims respecting toxic and hazardous substances, patent fees and defect in title matters for which a right of indemnity could be asserted by the *Contractor* pursuant to the provisions of paragraphs 13.1.4 or 13.1.5 of GC 13.1 – INDEMNIFICATION; and
 - .4 claims resulting from acts or omissions which occur after the *Ready-for-Takeover* date.
- 13.2.2 The *Contractor* waives and releases the *Owner* from all claims resulting from acts or omissions which occurred after the *Ready-for-Takeover* date except for:
- .1 indemnification respecting third party claims, and claims respecting toxic and hazardous substances, patent fees and defect in title matters, all as referred in paragraphs 13.2.1.2 and 13.2.1.3; and
 - .2 claims for which *Notice in Writing* of claim has been received by the *Owner* from the *Contractor* within 395 calendar days following the *Ready-for-Takeover* date.
- 13.2.3 Subject to any lien legislation applicable to the *Place of the Work*, the *Owner* waives and releases the *Contractor* from all claims which the *Owner* has or reasonably ought to have knowledge of that could be advanced by the *Owner* against the *Contractor* under the *Contract*, including, without limitation, those arising from negligence or breach of contract in respect to which the cause of action is based upon acts or omissions which occurred prior to or on the *Ready-for-Takeover* date, except as follows:
- .1 claims arising prior to or on the *Ready-for-Takeover* date for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* no later than 20 calendar days following the *Ready-for-Takeover* date;

- .2 indemnification for claims advanced against the *Owner* by third parties for which a right of indemnification may be asserted by the *Owner* against the *Contractor* pursuant to the provisions of this *Contract*;
 - .3 claims respecting toxic and hazardous substances for which a right of indemnity could be asserted by the *Owner* against the *Contractor* pursuant to the provisions of paragraph 13.1.4 of GC 13.1 – INDEMNIFICATION;
 - .4 damages arising from the *Contractor*'s actions which result in substantial defects or deficiencies in the *Work*. "Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*;
 - .5 claims arising pursuant to GC 12.3 – WARRANTY; and
 - .6 claims arising from acts or omissions which occur after the *Ready-for-Takeover* date.
- 13.2.4 Respecting claims arising upon substantial defects and deficiencies in the *Work*, as referenced in paragraph 13.2.3.4, and notwithstanding paragraph 13.2.3.5, the *Owner* waives and releases the *Contractor* from all claims except claims for which *Notice in Writing* of claim has been received by the *Contractor* from the *Owner* within a period of six years from the *Ready-for-Takeover* date, provided that any limitation statute of the Province or Territory of the *Place of the Work* permit such agreement. If the applicable limitation statute does not permit such agreement, the time within which any such claim may be brought shall be such shorter period as may be prescribed by any limitation statute of the Province or Territory of the *Place of the Work*.
- 13.2.5 The *Owner* waives and releases the *Contractor* from all claims arising from acts or omissions which occur after the *Ready-for-Takeover* date, except for:
- .1 indemnification for claims advanced against the *Owner* by third parties, as referenced in paragraph 13.2.3.2;
 - .2 claims respecting toxic and hazardous substances for which a right of indemnity could be asserted by the *Owner* against the *Contractor*, as referenced in paragraph 13.2.3.3;
 - .3 claims arising under GC 12.3 – WARRANTY; and
 - .4 claims for which *Notice in Writing* has been received by the *Contractor* from the *Owner* within 395 calendar days following the *Ready-for-Takeover* date.
- 13.2.6 "Notice in Writing of claim" as provided for in GC 13.2 – WAIVER OF CLAIMS to preserve a claim or right of action which would otherwise, by the provisions of GC 13.2 – WAIVER OF CLAIMS, be deemed to be waived, must include the following:
- .1 a clear and unequivocal statement of an intention to claim;
 - .2 a statement as to the nature of the claim and the grounds upon which the claim is based; and
 - .3 a statement of the estimated quantum of the claim.
- 13.2.7 A claim for lien asserted under the lien legislation prevailing at the *Place of the Work* shall qualify as notice of claim for the purposes of this *Contract*.
- 13.2.8 The party giving the *Notice in Writing* of claim as provided for in GC 13.2 – WAIVER OF CLAIMS shall submit within a reasonable time a detailed account of the amount claimed.
- 13.2.9 Where the event or series of events giving rise to a claim made under paragraphs 13.2.1 or 13.2.3 has a continuing effect, the detailed account submitted under paragraph 13.2.8 shall be considered to be an interim account and the party making the claim shall submit further interim accounts, at reasonable intervals, giving the accumulated amount of the claim and any further grounds upon which such claim is based. The party making the claim shall submit a final account after the end of the effects resulting from the event or series of events.
- 13.2.10 Nothing in GC 13.2 – WAIVER OF CLAIMS shall be deemed to affect the rights of the parties under any lien legislation or limitations legislation prevailing at the *Place of the Work*.

These Supplementary Conditions amend the Stipulated Price Contract - CCDC 2 - 2020. Where a portion of the Contract is modified or deleted by these Supplementary General Conditions, the unaltered portions of the Contract shall remain in effect.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

Page 4, after Article A-8 insert the following new Articles A-9 and A-10:

"ARTICLE A-9 SEVERABILITY

9.1 Each and every paragraph, section, clause, sub-clause or other component of the *Contract* is severable one from the other. Should it be found by a court of competent jurisdiction that any one or more paragraphs or parts thereof are null and void, the validity of the remaining paragraphs or parts thereof shall not be affected.

ARTICLE A-10 TIME OF THE ESSENCE

10.1 Time shall be deemed to be of the essence of the *Contract*."

DEFINITIONS

Page 6, Add the following new Definitions:

Approved or Approval

Approved or Approval means acceptance by the *Consultant* in accordance with the *Consultant's* responsibilities described in Clause GC 2.2 ROLE OF THE *CONSULTANT*.

Period of Delay

The period of time from *Ready-for-Takeover* date specified in Article A-1, subclause 1.3, and the actual *Ready-for-Takeover* date; if any.

Pre-Selected Equipment Supplier

A *Pre-Selected Equipment Supplier* means a firm or corporation with whom the Contractor shall enter into a contract with and place a purchase order to supply the equipment as *Pre-Selected* by the *Owner*, for incorporation into the *Work*.

Site

The *Site* means the geographical location of the *Work* identified in the *Contract Documents*

Total Amount Payable

Total Amount Payable means the sum of the Contract Price as stipulated in Article A-4, subclause 4.3 subject to adjustments made in accordance with the provisions of the Contract Documents plus the amount of *Value Added Taxes*.

PART 2 - ADMINISTRATION OF THE CONTRACT

Page 10, delete clause 2.3.3 and replace with the following:

- 2.3.3 The *Contractor* shall furnish promptly to the *Consultant* one (1) electronic file, in pdf file format, of certificates and inspection reports related to the *Work*. The *Contractor* will provide hard copies, in the quantity required, only upon request of the *Consultant* or *Owner*.

PART 3 - EXECUTION OF THE WORK

GC 3.4 CONSTRUCTION SCHEDULE

Page 12, in Clause 3.4.1.1, delete "prior to the first application for payment" and replace with "not later than two (2) weeks after receipt of the notice of award".

Page 12, add new clause 3.4.2 as follows:

- "3.4.2 If, at any time, it should appear to the Owner or the Consultant that the actual progress of the Work is behind schedule or is likely to become behind schedule, or if the Contractor has given notice of such to the Owner or the Consultant pursuant to clause 3.4.1.3, the Contractor shall take appropriate steps to cause the actual progress of the Work to conform to the schedule or minimize the resulting delay and shall produce and present to the Owner and the Consultant a recovery plan demonstrating how the Contractor will achieve the recovery of the schedule. If the Contractor intends to apply for a change in the Contract Price in relation to a schedule recovery plan, then the Contractor shall proceed in accordance with General Condition 6.6 - CLAIMS FOR A CHANGE IN CONTRACT PRICE."

GC 3.5 SUPERVISION

Page 12, add new clause 3.5.3 as follows:

- "3.5.3 The Owner may, at any time during the course of the Work, request the replacement of the appointed representative(s), where the grounds for the request involve conduct which jeopardizes the safety and security of the Site or the Owner's operations. Immediately upon receipt of the request, the Contractor shall make arrangements to appoint a replacement acceptable to the Owner and Consultant."

GC 3.8 SHOP DRAWINGS

Page 12, delete Clause 3.8.2 and replace with the following:

- "3.8.2 Prepare and submit to the Consultant for review, a schedule of the dates for provision, review and return of Shop Drawings. Provide this submission a minimum of two (2) working days prior to the project start-up meeting."

PART 4 - ALLOWANCES

GC 4.1 CASH ALLOWANCES

Page 13, delete Clause 4.1.7 and replace with the following:

"4.1.7 The Contractor shall prepare a schedule, acceptable to the Consultant that shows when the Consultant and Owner must authorize ordering of items called for under cash allowances to avoid delaying the progress of the Work."

Page 13, add the following new Clause:

"4.1.8 The Owner reserves the right to call, or to have the Contractor call, for competitive bids for portions of the Work, to be paid for from cash allowances."

PART 5 - PAYMENT

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

Page 14, after Clause 5.4.1.2, add the following:

"5.4.1.3 Submit a certificate by lien search to the Owner by a solicitor licensed to practice law in the Province of the Place of Work, certifying that no lien associated with the Work exists against the Owner's property or Work;

5.4.1.4 Submit a clearance letter from the Workers' Compensation Board or provincially equivalent regulatory body; and

5.4.1.5 All such documents shall be dated not earlier than the expiry of the lien period as stipulated by the lien legislation in the Place of Work."

"5.4.1.6 The *Consultant* will provide an electronic copy of the Certificate of *Substantial Performance* and instruct the *Contractor* to post the certificate at the Site and to website indicated by the lien legislation of the place of *Work*. "

Page 14, delete Clause 5.4.3 in its entirety.

Page 14, after Clause 5.4.4, add the following:

"5.4.4.1 If, within sixty (60) calendar days after the issue of the certificate of Substantial Performance of Work, the Contractor has not corrected all the documented deficiencies, the Owner shall retain sufficient monies, as determined by the Consultant, to cover the cost of completing said deficiencies. These monies shall be held in addition to holdback monies retained in accordance with the provisions of the Contract and subject to the terms of the lien legislation in the Place of Work."

Page 15, Clause 5.5.4, in line 2, change "5 calendar days" to "20 calendar days".

PART 6 - CHANGES IN THE WORK

Page 15, add new clause 6.1.1.3 as follows:

- 6.1.1.3 Changes that do not affect the Contract Price and time by Supplemental Instruction.

GC 6.2 CHANGE ORDER

Page 15, after Clause 6.2.2, add the following:

- 6.2.3 The mark-up on agreed upon changes are as follows:
- .1 Work performed by the Contractor's own forces will be the cost of the Work plus ten (10%) percent overhead and profit.
 - .2 Work performed by the subcontractor's force will be the cost of Work plus 15% overhead and profit. Where the Work can be done by the Contractor's forces, as solely determined by the Consultant, but is done by the Subcontractor's forces, the mark-up for overhead and profit will be limited to ten (10%) percent.
- 6.2.4 Before the approval of any change order over \$1,000 in value the Consultant is entitled to receive, upon request, at a minimum, the following breakdown of cost associated with such change order:
- .1 Labour rates, excluding operators.
 - .2 Equipment rates including operators.
 - .3 Supervisory staff rates.
 - .4 Subcontractor and material or equipment invoices where applicable.
 - .5 Overhead costs including worker's compensation, site trailer cost as applicable, insurance, bonding, small tool expenses, CPP, and EI contributions.
- 6.2.5 No compensation for extra Work or material shall be allowed unless the Consultant issues a Notice in Writing authorizing such Work or material to be ordered in the form of a Change Order, Change Directive or Supplemental Instruction.
- 6.2.6 No compensation will be allowed for the cost of repairs to equipment or in respect of construction equipment of any kind idle on the Site except as directed by the Consultant in writing or for damage to anything used in performing any such extra Work or making any such alteration.
- 6.2.7 The price applicable to any Work deleted from the Contract, shall be deducted from the Contract Price and shall be mutually agreed upon by the Contractor and the Consultant. The price shall be comparable to prices quoted on Work of similar nature.

GC 6.4 - CONCEALED OR UNKNOWN CONDITIONS

Page 17, add a new clause 6.4.5 as follows:

- 6.4.5 If the Contractor was given access to the Place of Work and/or professional reports relating thereto (including, without limitation, environmental, geotechnical, and structural reports) prior to the submission of the bid on which the Contract was awarded, then the Contractor confirms that they have investigated the Place of Work and, in doing so, applied to that investigation the degree of care and skill required. In those circumstances, notwithstanding the provisions of clause 6.4.1, the Contractor is

not entitled to an adjustment to the Contract Price or to an extension of the Contract Time for conditions which could reasonably have been ascertained by the Contractor by such investigation, or which could have been reasonably inferred from the material provided with the Contract Documents. In those circumstances, should a claim arise, the Contractor will have the burden of establishing that it could not have discovered the materially different conditions from an investigation because of restrictions placed on its access or inferred the existence of the conditions from the material provided with the Contract Documents."

GC 6.5 DELAYS

Page 18, after Clause 6.5.5, add the following new Clauses:

"6.5.6 Should the Contractor fail to attain Ready-for-Takeover for the Work by the date indicated in Article A-1, Clause 1.3 in the AGREEMENT BETWEEN OWNER AND CONTRACTOR, the period of time from this agreed date to the actual date when the Consultant confirms the Work is Ready-for-Takeover, shall be termed the Period of Delay.

6.5.7 In the event there is a Period of Delay, the Contractor shall be liable for and shall pay to the Owner the cost of continuance of supervision during the Period of Delay, and all additional fees, disbursements and costs incurred by the Owner as a result of the Period of Delay, such charges hereby termed as Delay Charges. The Owner may deduct the amount of such Delay Charges from further progress payments."

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

Page 18, add the following new Clause as 6.6.6 and renumber the last and subsequent clause:

"6.6.6 The Owner may make claims arising out of the costs incurred for additional services provided by the Consultant resulting from the Contractor's failure to reasonably perform the Work in accordance with the terms and conditions of the Contract, including the Contractor's issuance of unnecessary Requests for Information (RFI's). The Consultant will notify the Owner and Contractor where it has been determined that additional services will be required or have been provided in order not to cause a delay. The Owner shall make claims based on the Consultant's invoices."

PART 9 - PROTECTION OF PERSONS AND PROPERTY

GC 9.4 - CONSTRUCTION SAFETY

Page 22, after GC 9.4.5, add the following:

"9.4.6 The Contractor shall indemnify and save harmless the Owner, its agents, officers, directors, employees, Consultants, successors, appointees and assigns from and against the consequences of any and all safety infractions committed by the Contractor under the applicable occupational health and safety legislation in the Place of Work, including the payment of legal fees and

disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the Owner is not covered by insurance, provided that the indemnity contained in this clause shall be limited to costs and damages resulting directly from such infractions and shall not extend to any consequential, indirect or special damages."

PART 10 - GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

Page 23, after Clause 10.1.2, add new Clause 10.1.3 as follows:

"10.1.3 Indicate on each application for payment as a separate amount, the appropriate value added tax the Owner is legally obliged to pay. This amount will be paid to the Contractor in addition to the amount certified for payment under the Contract."

PART 12 - OWNER TAKEOVER

Page 25, add new clause 12.1.1.9 and 12.1.1.10 as follows:

.9 Commissioning reports as in Section 01 91 13.

.10 Any other documentation identified as a closeout or Ready-for-Takeover document as specified in Section 01 78 00.

GC 12.3 WARRANTY

Page 26, add new clause 12.3.5 as follows and renumber subsequent clauses:

"All *Work* of repair or replacement carried out during the Warranty Period shall be maintained for a period of one (1) year from the date of the *Consultant's* acceptance of the *Work* of repair or replacement notwithstanding that the Warranty Period expires before the expiration of the said year. This clause shall not apply to normal operation maintenance, which shall be carried out by the *Owner*."

PART 13 - INDEMNIFICATION AND WAIVER

GC 13.1 INDEMNIFICATION

Page 26, Clause 13.1.1, in line 2, after "hold harmless the other" replace with "hold harmless the other and the *Consultant*."

END OF SECTION

APPENDIX B

Existing Conditions Drawings

Date: Friday, Apr. 13, 2012 2:54pm Drawing: Model File: C:\98001 - Lunenburg STP 2002 Drawings\98001-A1.dwg User: mullison

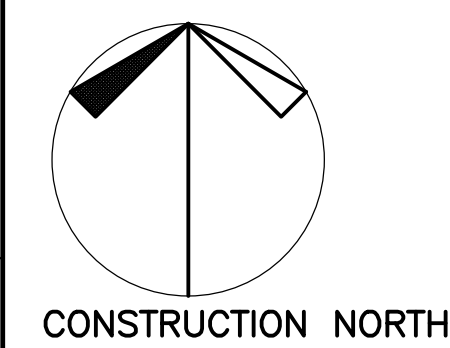
PLANT LIST

LEGEND	COMMON NAME	BOTANICAL NAME	SIZE/ROOT CONDITION	QUANTITY
AAA	NORWAY MAPLE	ACER PLATANOIDES	3" CAL - WIRE BASKET	5
BBB	GREEN ASH	FRAXINUS PENSYLVANICA LANCEOLATA	3" CAL - WIRE BASKET	8
CCC	RUGOSA ROSE	ROSA RUGOSA	2 GAL POT/3YR	47
DDD	GOLD DROP CINQUEFOIL	POTENTILLA FRUTICOSA GOLD DROP	3 GAL POT/60CM	60

ALL TREES DOUBLE STAKED TREE SUPPORTS - MULCH PLANTING SAUCER
ALL SHRUBS IN PLANTING BEDS - MULCH MINIMUM 3" DEPTH - EDGE BED WITH SPADE
CAL = CALIPER ; GAL = GALLON

- GENERAL NOTES:**
- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.
 - FOR LOCATIONS, ELEVATIONS AND DETAILS OF PIPES SEE MECHANICAL AND PROCESS DRAWINGS.
 - ALL CONSTRUCTION SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NATIONAL BUILDING CODE LATEST EDITION.
 - ALL GRADE ELEVATION FOR ROUGH GRADE ONLY. FINAL GRADING DETERMINED IN FIELD BY ENGINEER.
 - EXCESS AND WASTE EXCAVATED MATERIAL TO BE DISPOSED ON OR WITHIN 10 KM OF SITE AT LOCATION APPROVED BY ENGINEER. SEE SPEC.
 - ALL OFFSET POINTS ARE IRON BARS AND ARE TO FOUNDATION CORNERS. OFFSET POINTS ARE TO BE PROTECTED DURING ALL PHASES OF CONSTRUCTION AND ONLY MOVED WITH THE APPROVAL OF THE ENGINEER.
 - ALL BENCHMARKS ARE BASED ON NSCM #27112 HAVING AN ELEVATION OF 54.96'.

- LEGEND**
- 12.89 EXISTING SPOT ELEVATIONS
 - 12.88 NEW SPOT ELEVATION
 - (12.88) EXISTING SPOT ELEV. TO REMAIN
 - (01) CONTROL POINT FOR LAYOUT
 - OP IRON BAR OFFSET POINTS
 - TBM TEMPORARY BENCHMARK
 - PIPE BOLLARD



No.	Description	Date	By
02	TRANSFORMER RELOCATED	MAY 14/02	JH
03	ISSUED FOR TENDER	APR/02	JH
01	ISSUED FOR REVIEW	DEC/98	JCL

Revision or Issue

TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

SITE & ROOF PLANS

ABL ENVIRONMENTAL
consultants limited

102 Portland Street
Dartmouth, Nova Scotia
B2Y 1B8

Tel: (902) 466-0050
Fax: (902) 466-4399
Email: ablenvironmental.com

INNOVATIVE SOLUTIONS

SPERRY & PARTNERS LTD.

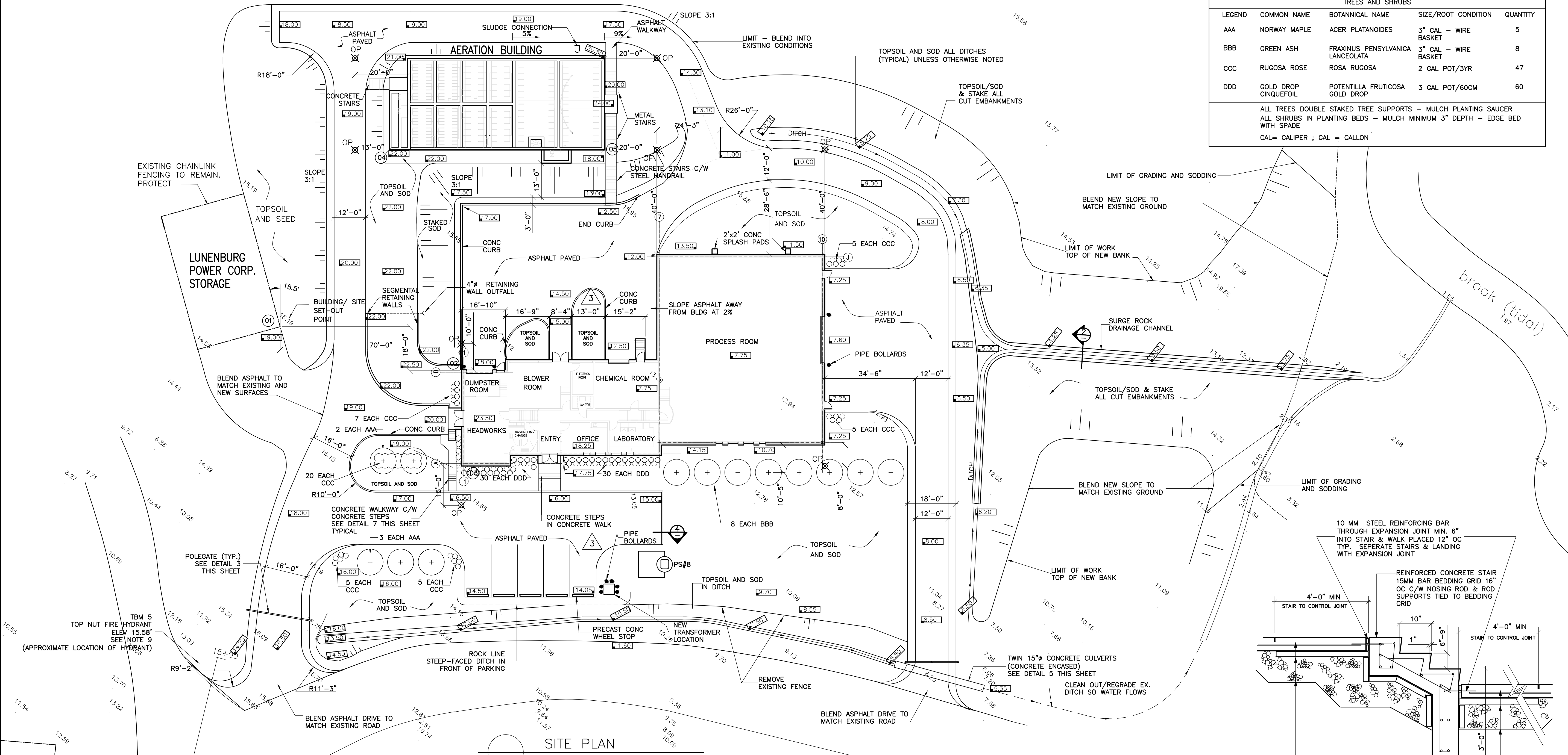
102 Portland Street
Dartmouth, Nova Scotia
B2Y 1B8

Tel: (902) 469-9000
Fax: (902) 469-4399

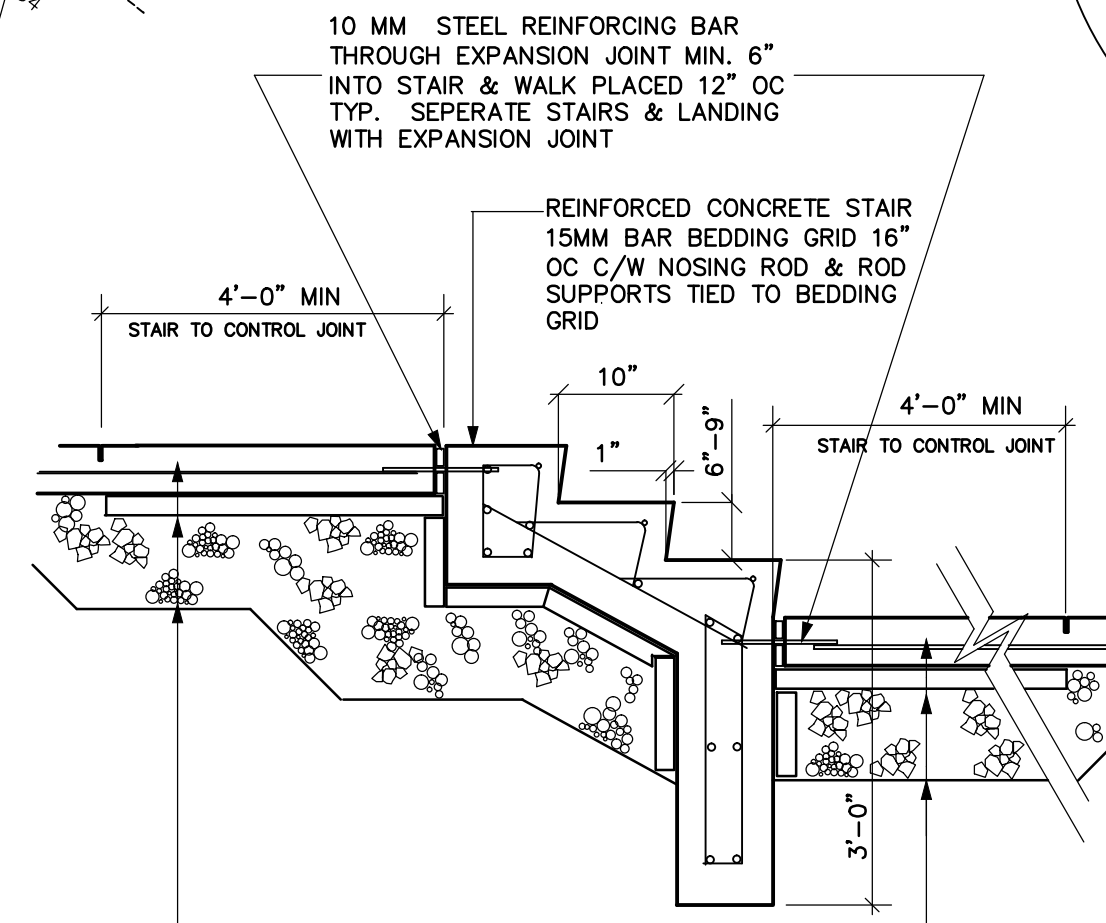
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	Approved	MB	GB

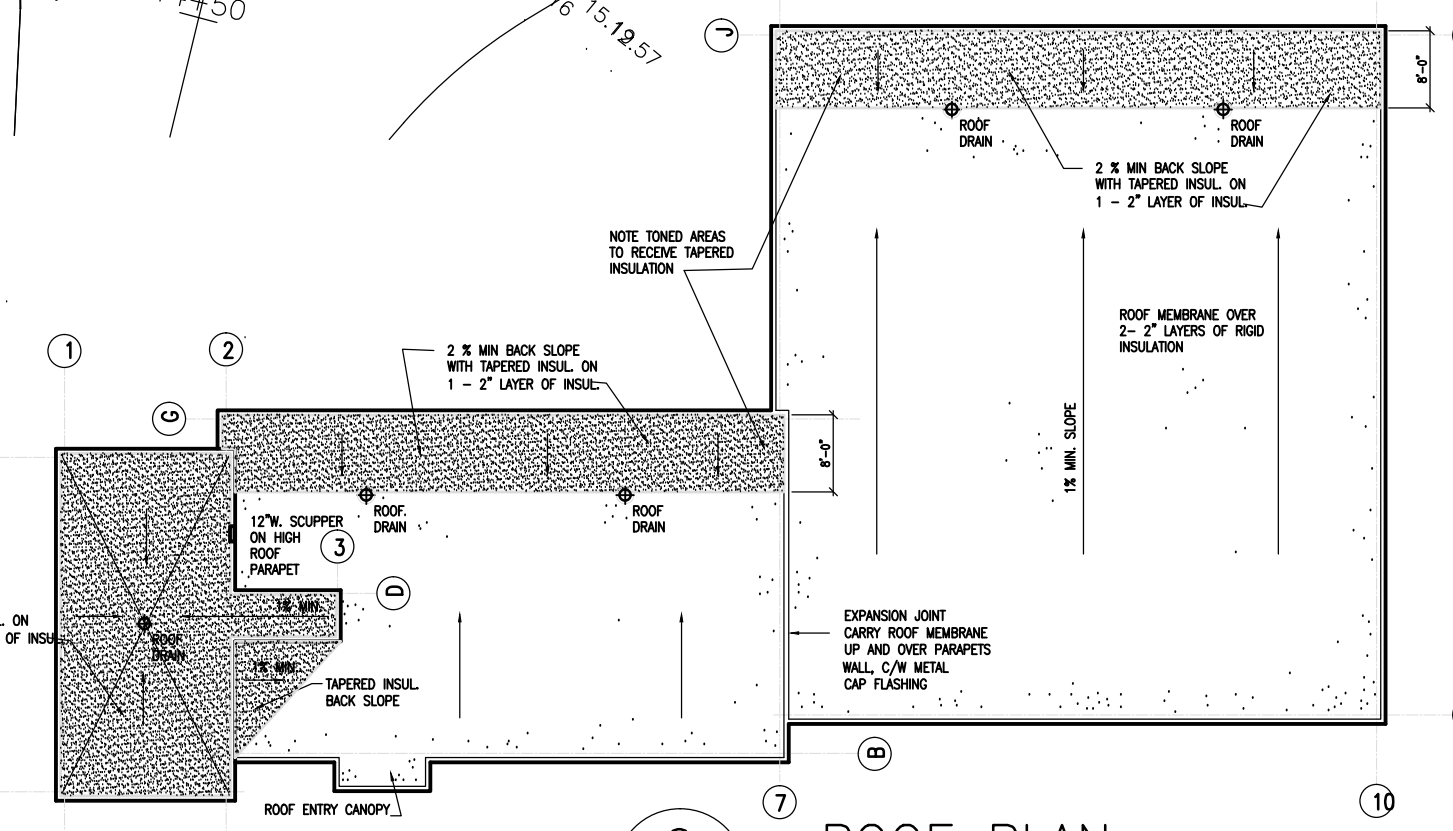
Contract No. 98001
Sheet of 1 / 43
Drawing No. A1



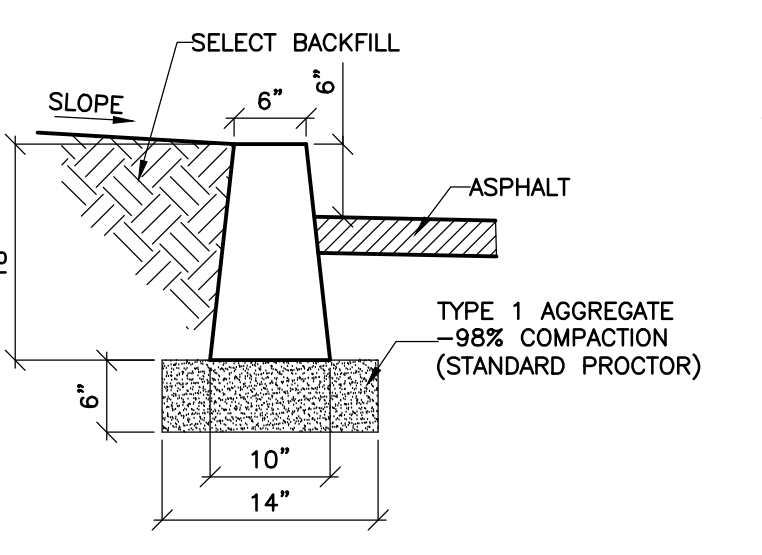
SITE PLAN
1" = 20'-0"



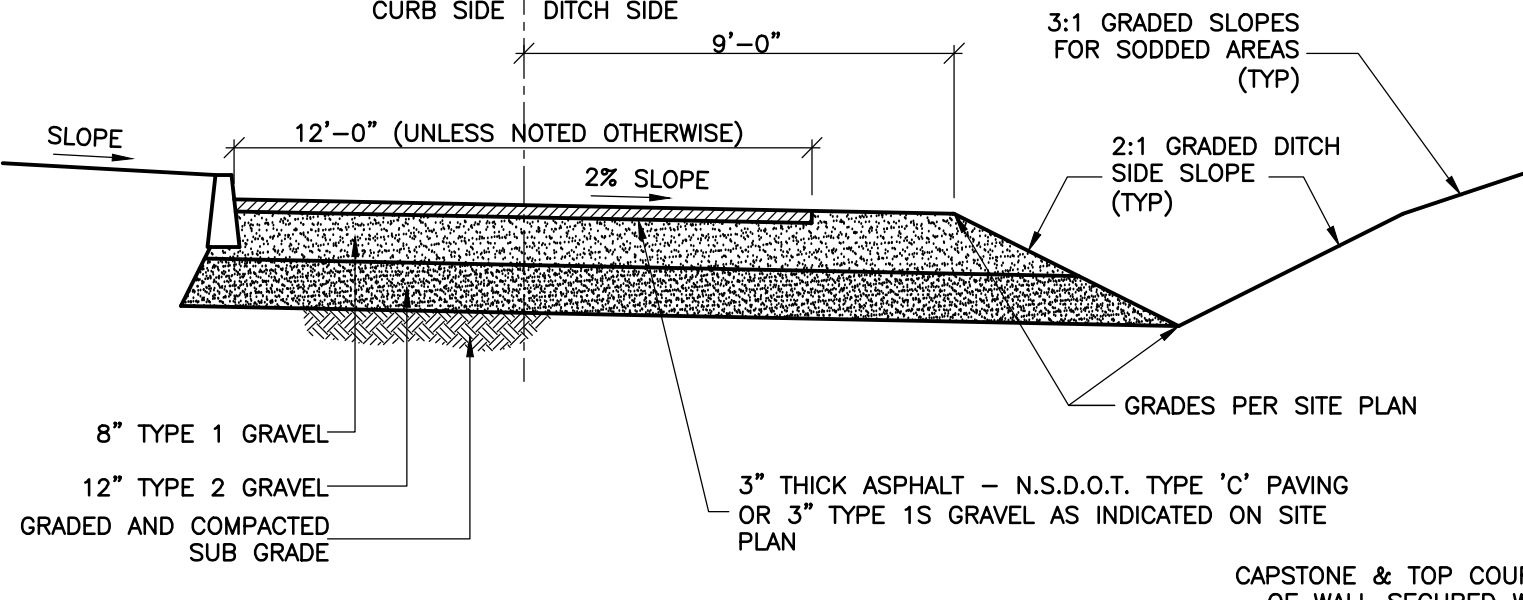
7 CONCRETE STEPS - TYPICAL
A-1 NOT TO SCALE



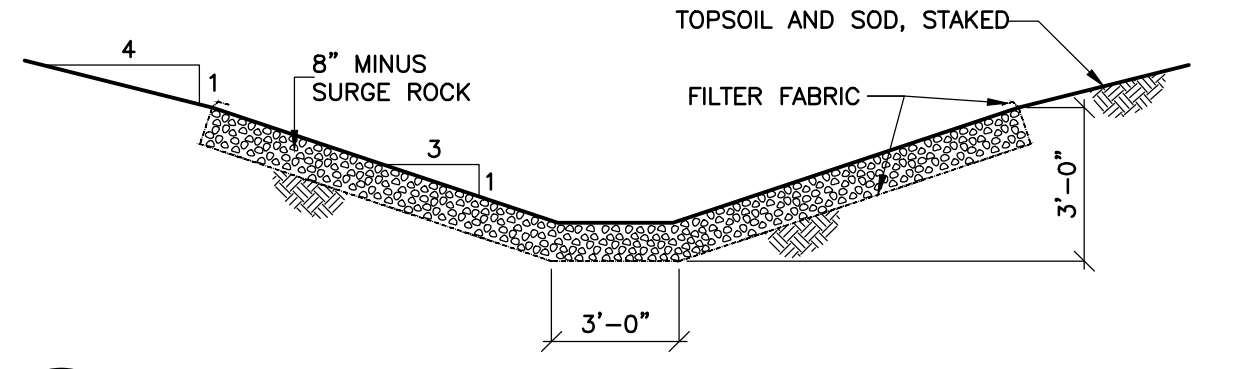
6 ROOF PLAN
A-1 1" = 20'-0"



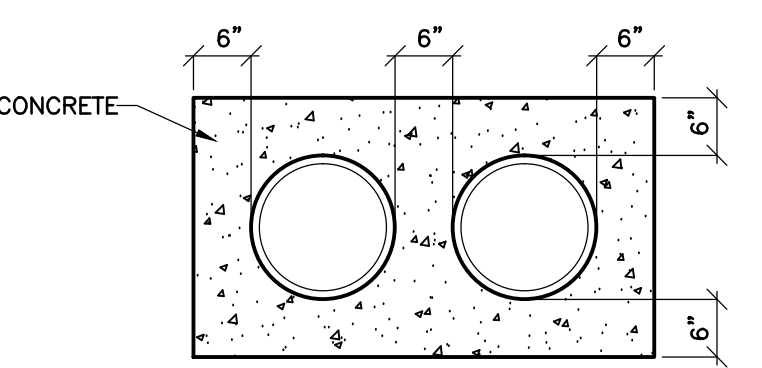
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A-1 NOT TO SCALE



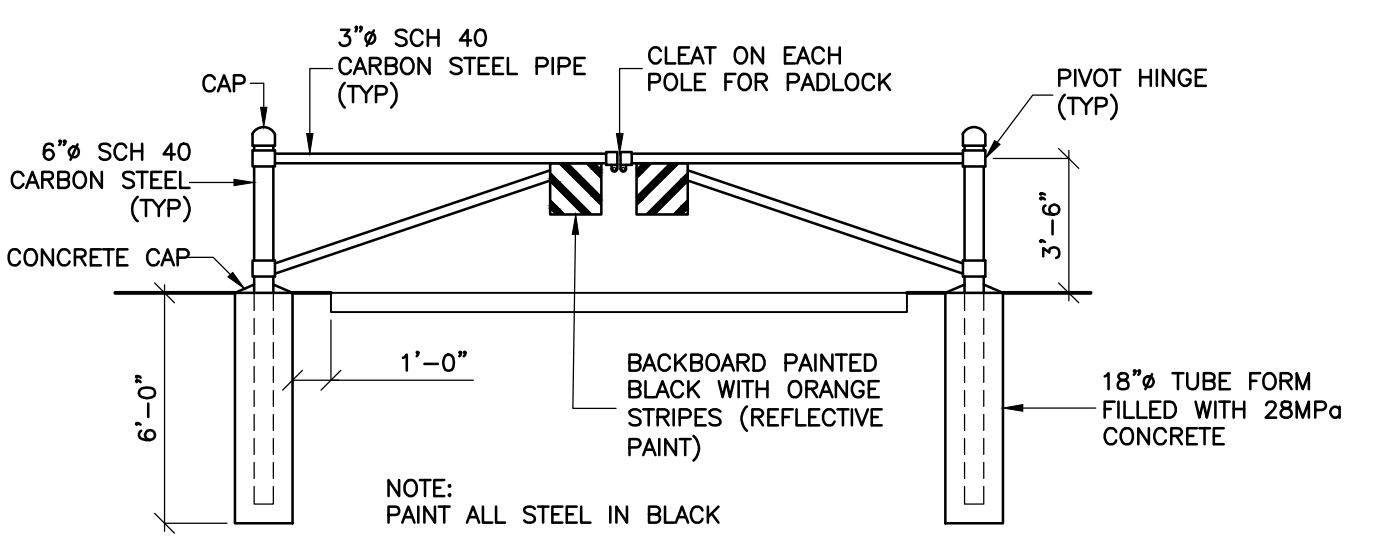
1 TYPICAL ROAD SECTION
A-1 NOT TO SCALE



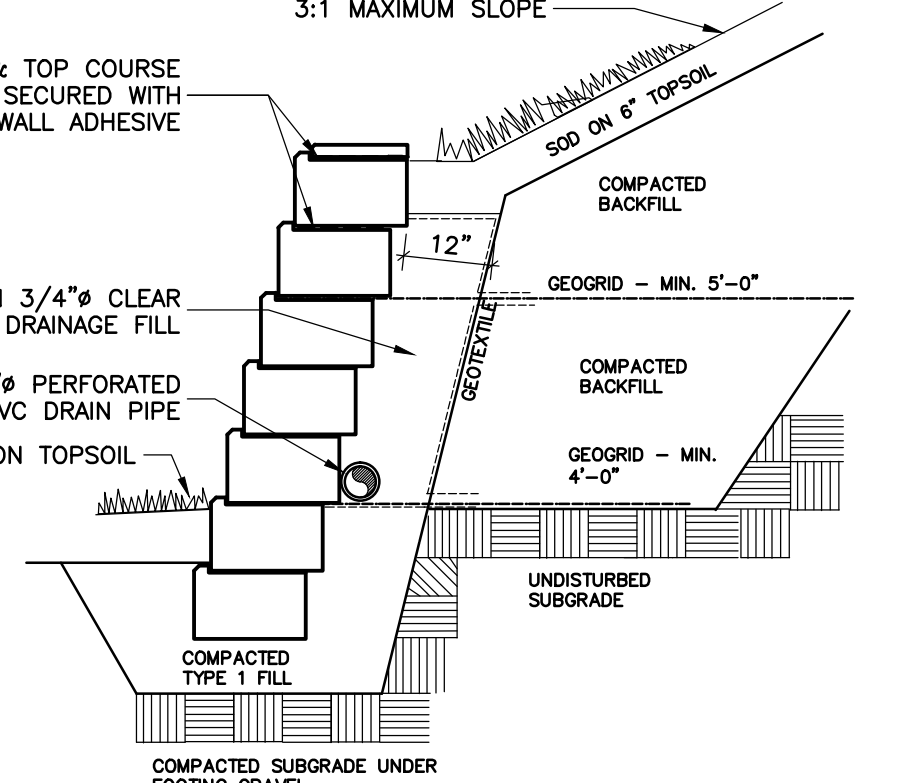
2 SURGE ROCK DRAINAGE CHANNEL
A-1 NOT TO SCALE



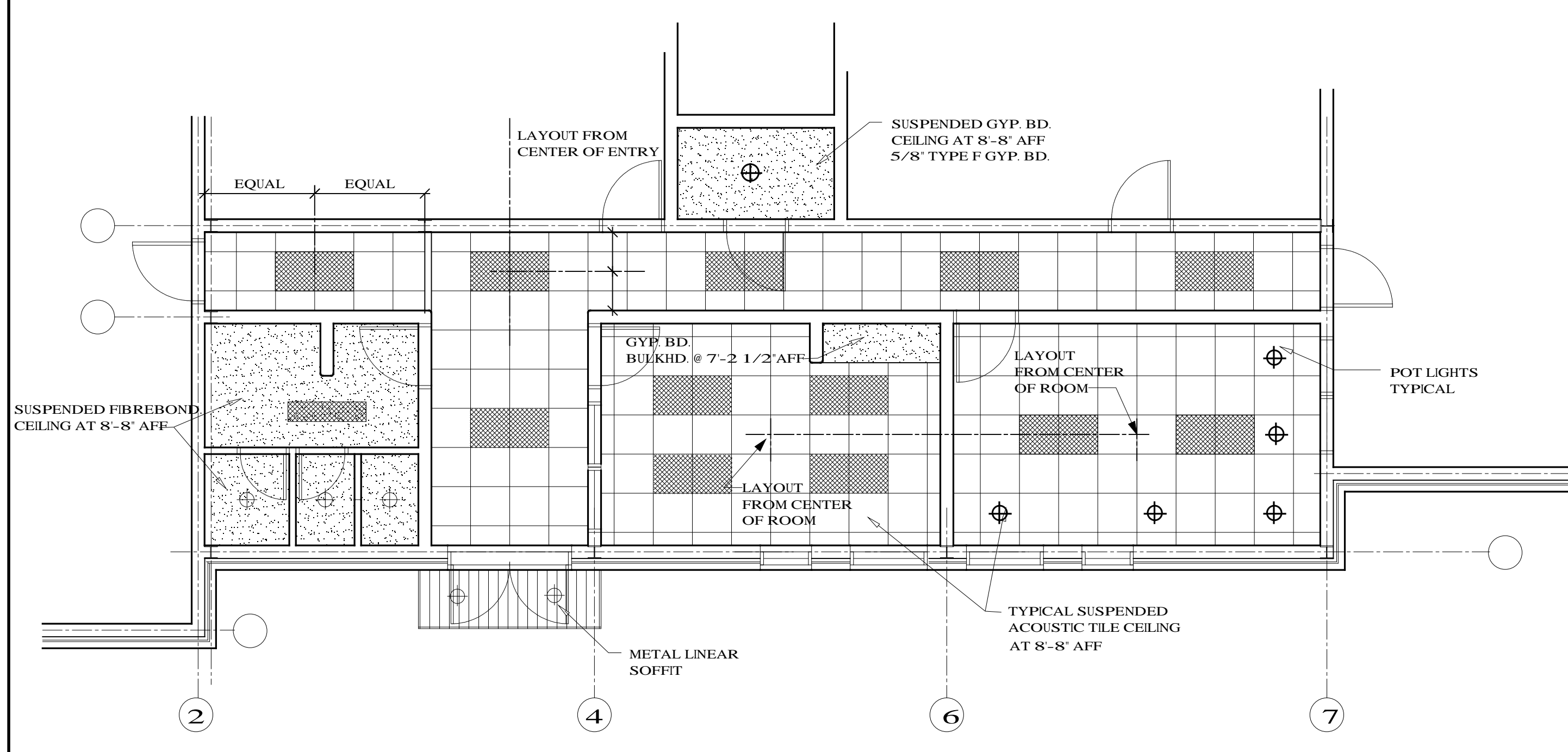
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A-1 NOT TO SCALE



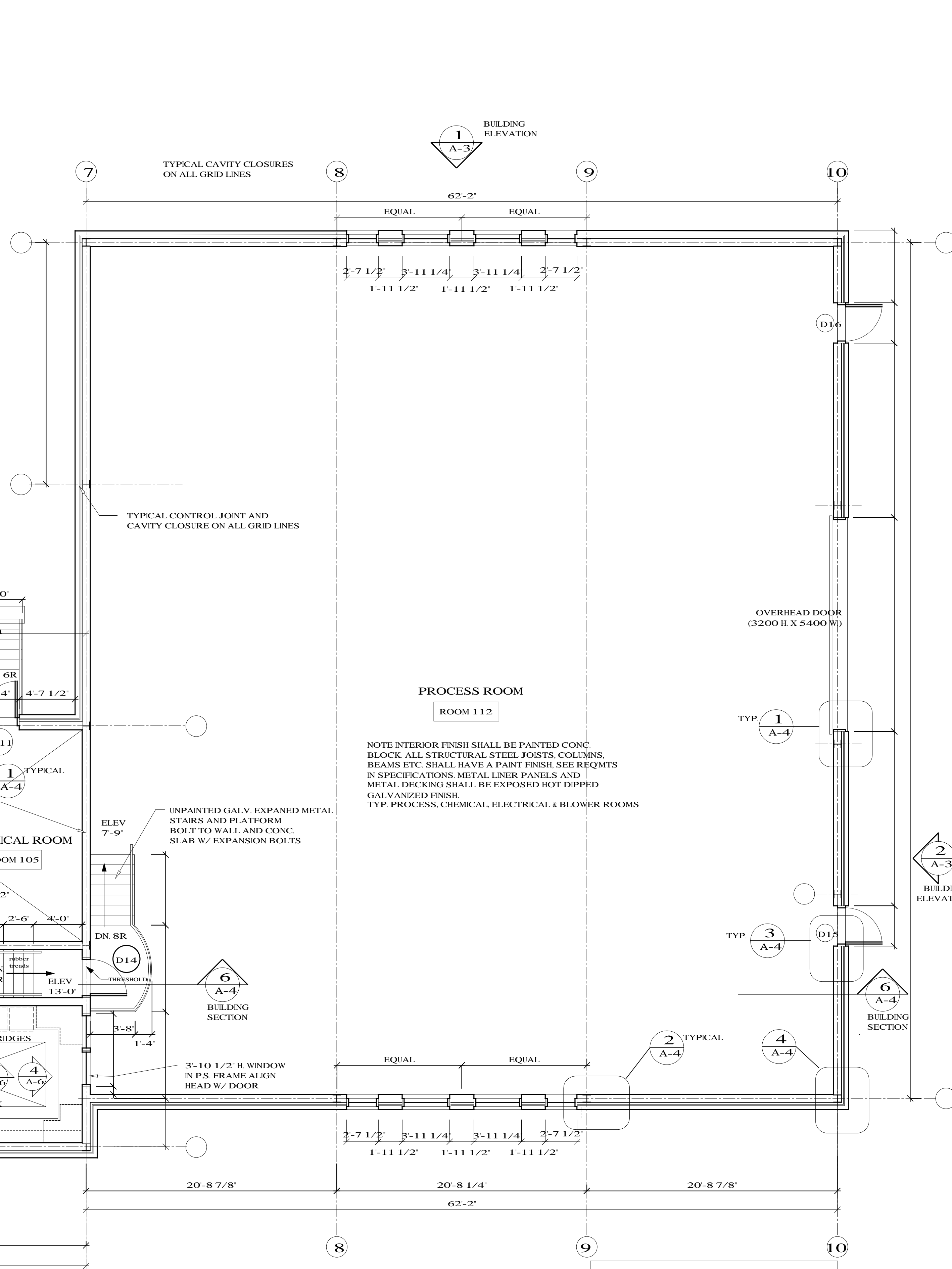
3 POLEGATE DETAIL
A-1 NOT TO SCALE



8 RETAINING WALL DETAIL
A-1 NOT TO SCALE



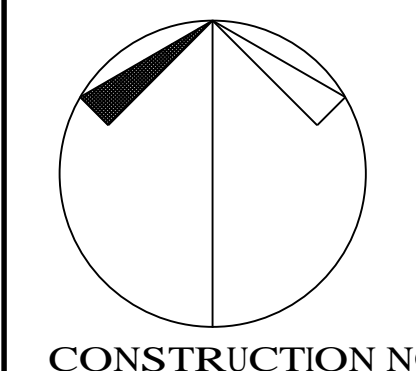
1 REFLECTED CEILING PLAN
A-2 3/16"=1'-0"



2 MAIN FLOOR PLAN
A-2 3/16"=1'-0"

NOTE COORDINATE PLACEMENT OF DOORS AND WINDOWS WITH EXT. MASONRY (METRIC) UNITS ADJUST TO SUIT. COORDINATE WITH ALL TRADES EFFECTED

- GENERAL NOTES:
1. DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
 2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.
 3. FOR LOCATIONS, ELEVATIONS AND DETAILS OF PIPES SEE MECHANICAL DRAWINGS.
 4. FOR LOCATIONS AND DETAILS INCLUDING ANCHORAGE REQUIREMENTS OF EQUIPMENT SEE MECHANICAL DRAWINGS.
 5. ALL CONSTRUCTION SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NATIONAL BUILDING CODE LATEST EDITION.



No.	Description	Date	By
01	ISSUED FOR TENDER	FEB/02	JGM

Revision or Issue

TOWN OF LUNenburg
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

FLOOR PLAN AND
REFLECTED CEILING PLAN

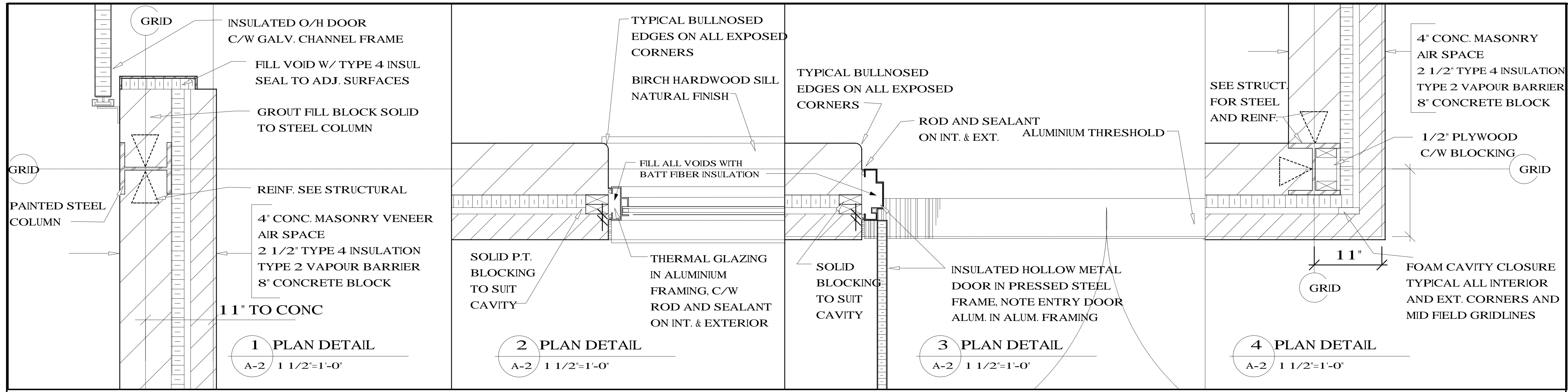
ABL Environmental
Consultants Ltd.

102 PORTLAND STREET, P.O. BOX 501
DARTMOUTH, NS, B2Y 2T6 TEL: (902) 466-0200
FAX: (902) 466-4399

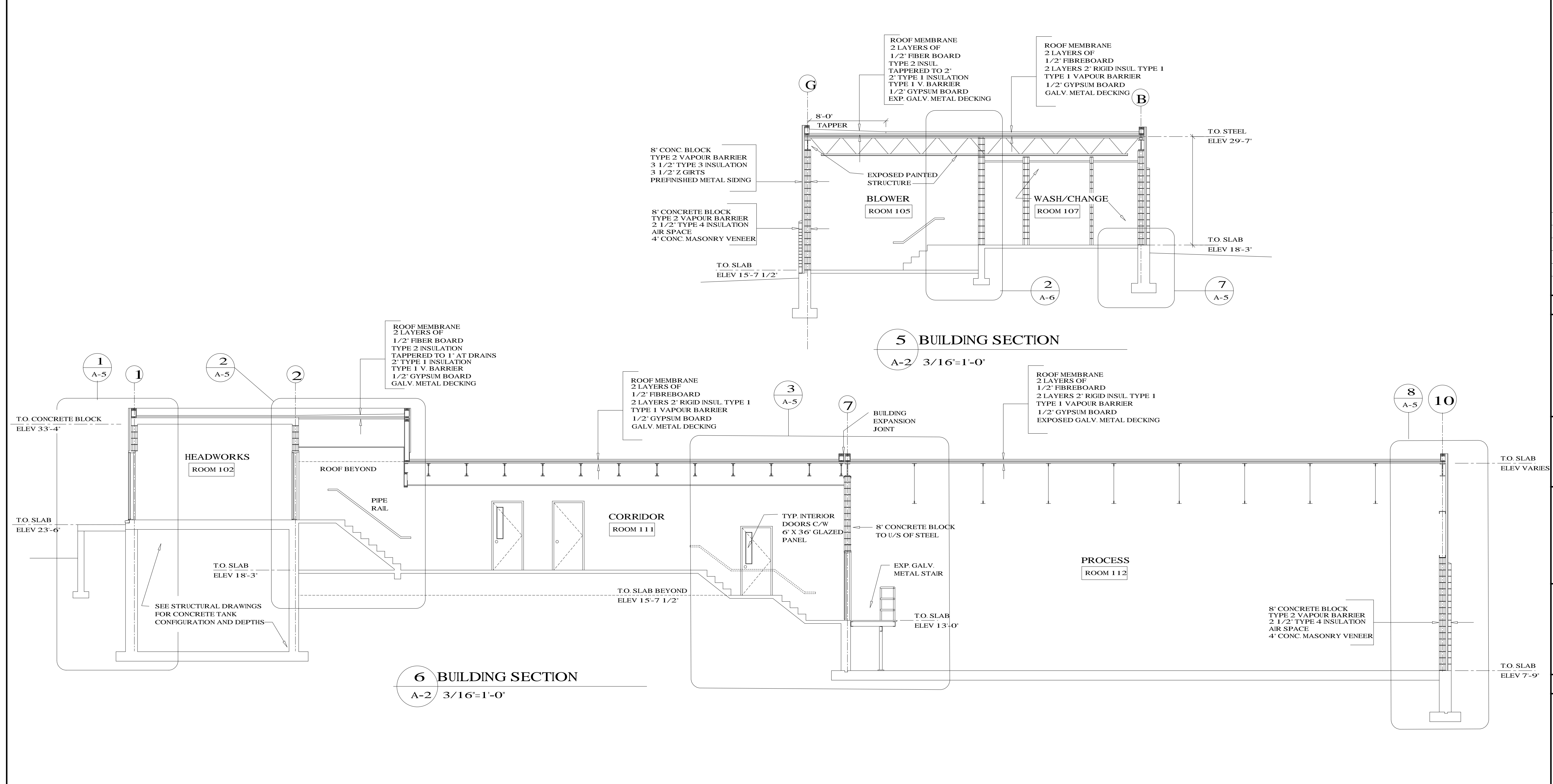
INNOVATIVE SOLUTIONS
SPERRY & PARTNERS LTD.

Scale 3/16" = 1'-0"

Date	DEC. 1998	Drawn	JGM
Designed	JGM	Approved	GB
Checked	J.C.R.	Sheet of	
Contract No.	98001	Revision	
Drawing No.	A2		



- GENERAL NOTES:
1. DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
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 3. FOR LOCATIONS, ELEVATIONS AND DETAILS OF PIPES SEE MECHANICAL DRAWINGS.
 4. FOR LOCATIONS AND DETAILS INCLUDING ANCHORAGE REQUIREMENTS OF EQUIPMENT SEE MECHANICAL DRAWINGS.
 5. ALL CONSTRUCTION SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NATIONAL BUILDING CODE LATEST EDITION.



No.	Description	Date	By
01	ISSUED FOR TENDER	FEB/02	JGM

Revision or Issue

TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

BUILDING SECTIONS

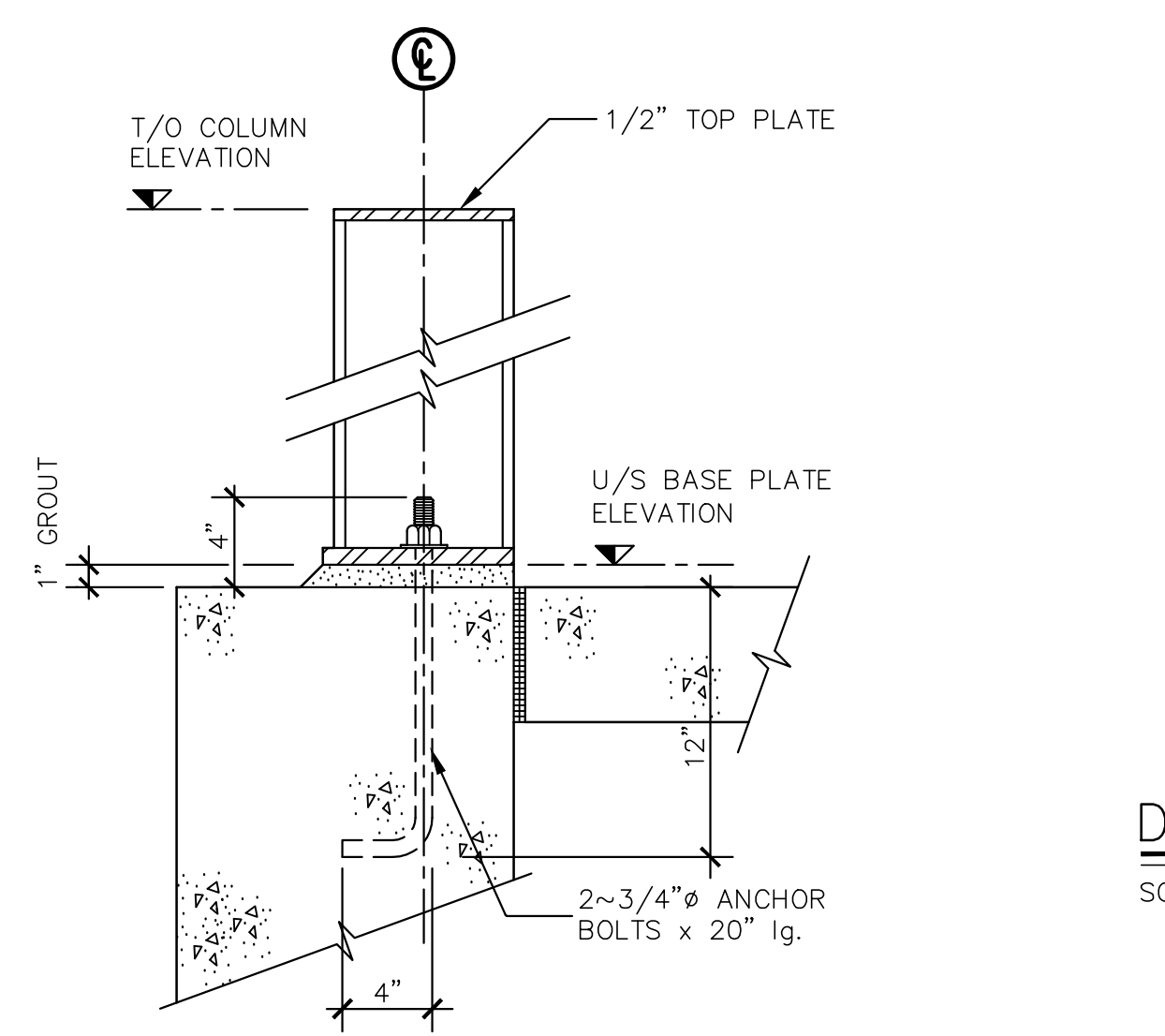
ABL Environmental
Consultants Ltd.

102 PORTLAND STREET, P.O. BOX 501
DARTMOUTH, NS B2Y 2T8

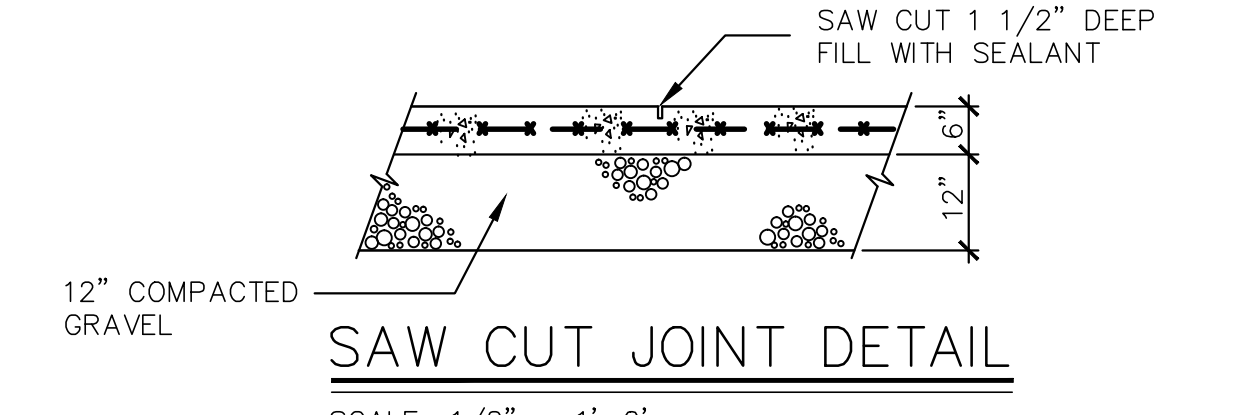
102 Portland Street
Dartmouth, Nova Scotia
B2Y 1H8
Tel: (902) 469-9000
Fax: (902) 469-4399

Scale AS NOTED

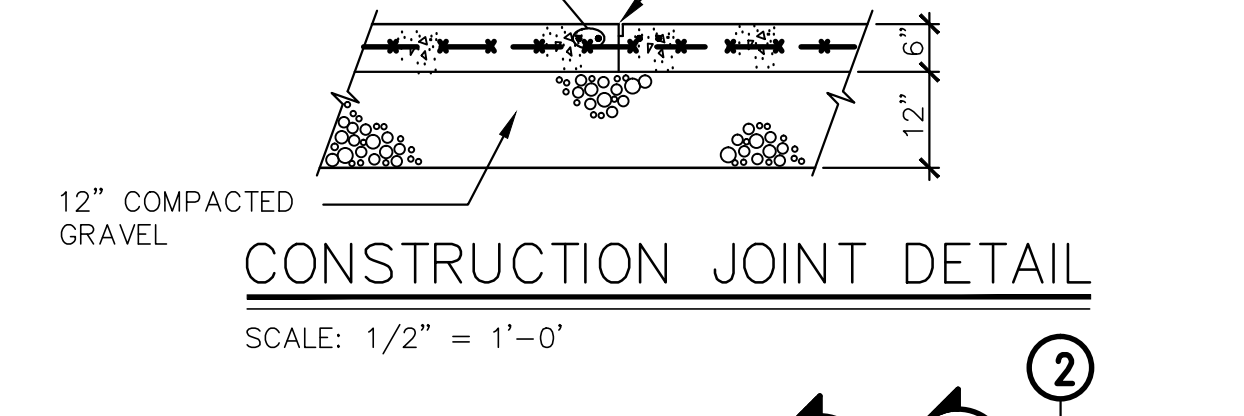
	Date DEC. 1998 Drawn JGM Designed JGM Checked JCR Approved GB Contract No. 98001 Drawing No. A4	Sheet of 1 Revision
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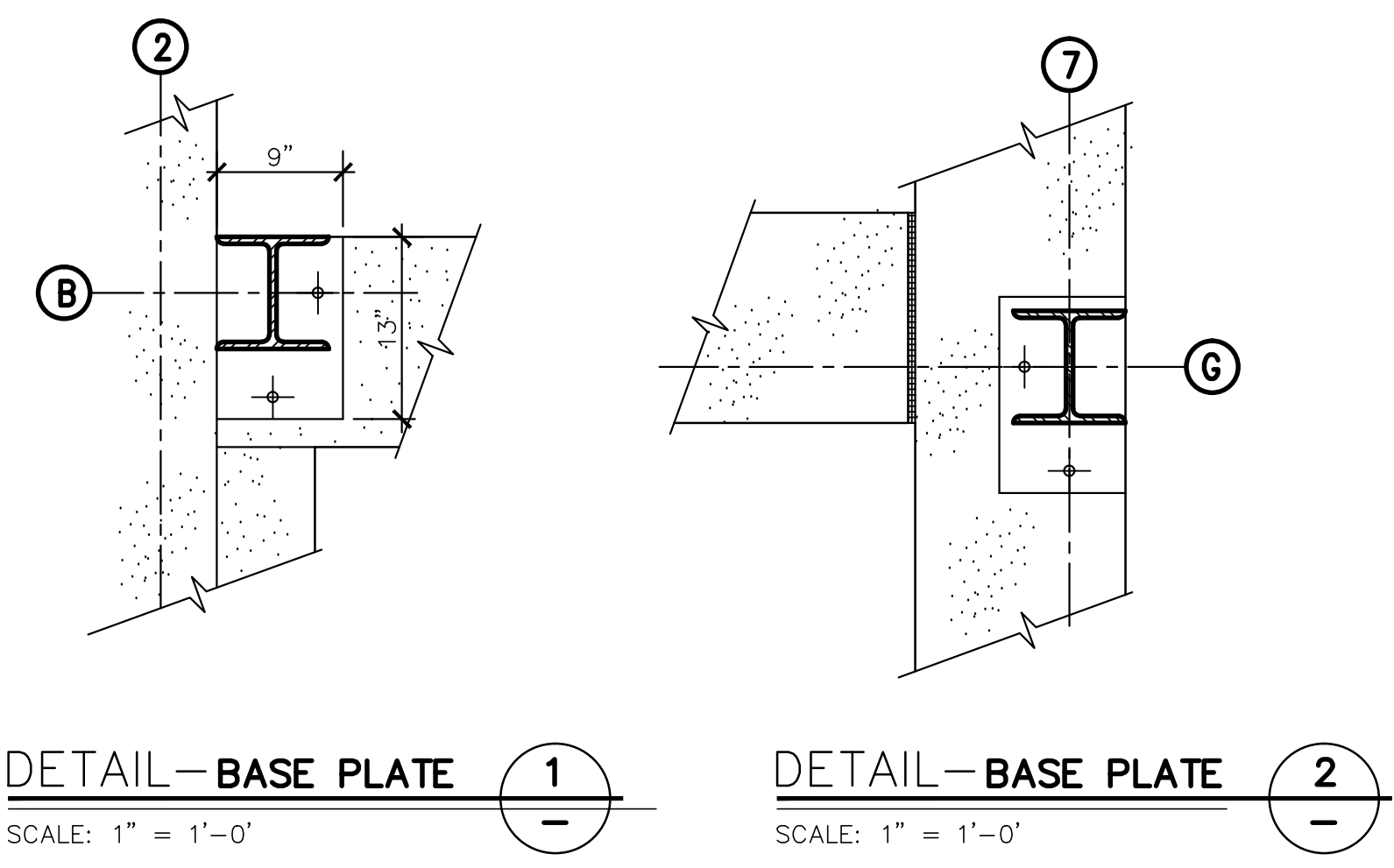
TYP. STEEL COL. AND BASEPLATE DETAIL
SCALE: 1/2" = 1'-0"



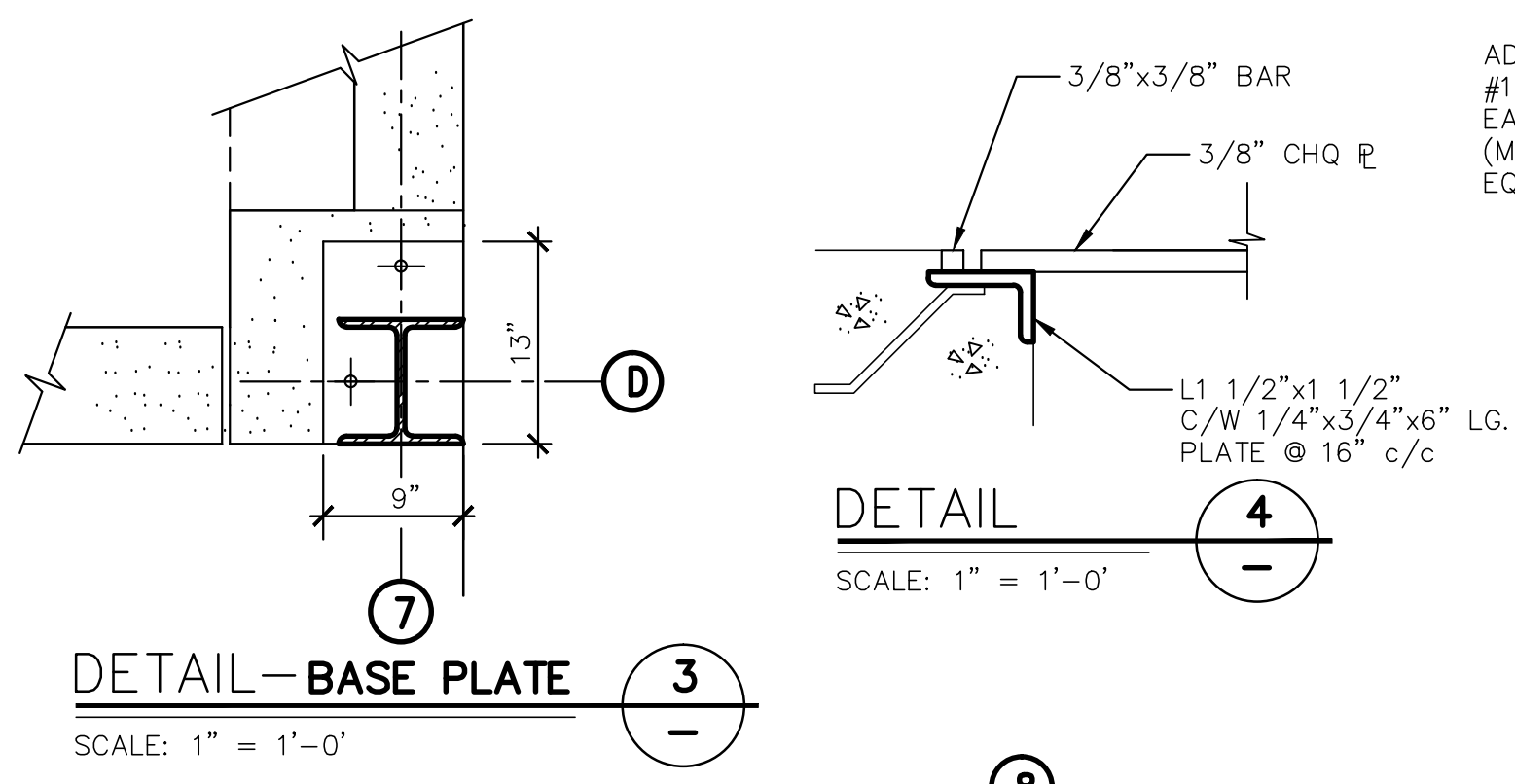
SAW CUT JOINT DETAIL
SCALE: 1/2" = 1'-0"



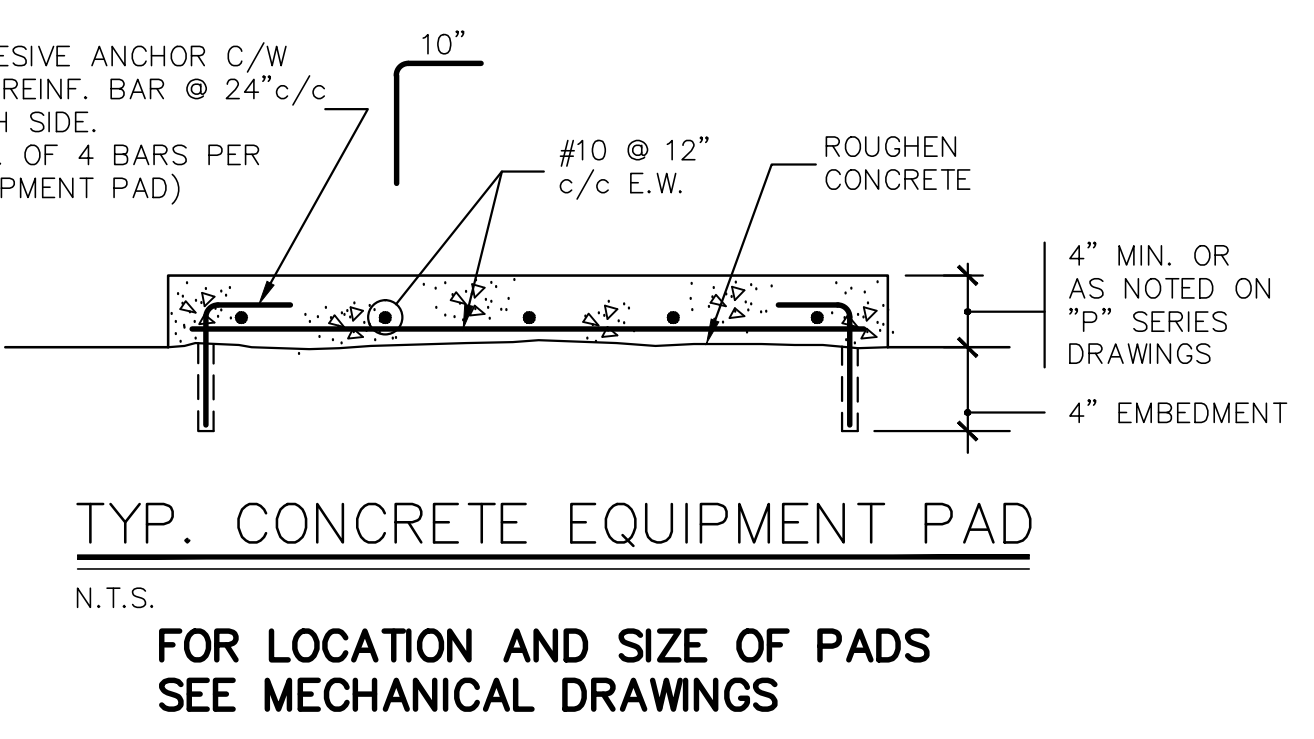
CONSTRUCTION JOINT DETAIL
SCALE: 1/2" = 1'-0"



DETAIL-BASE PLATE 1, 2, 3
SCALE: 1" = 1'-0"

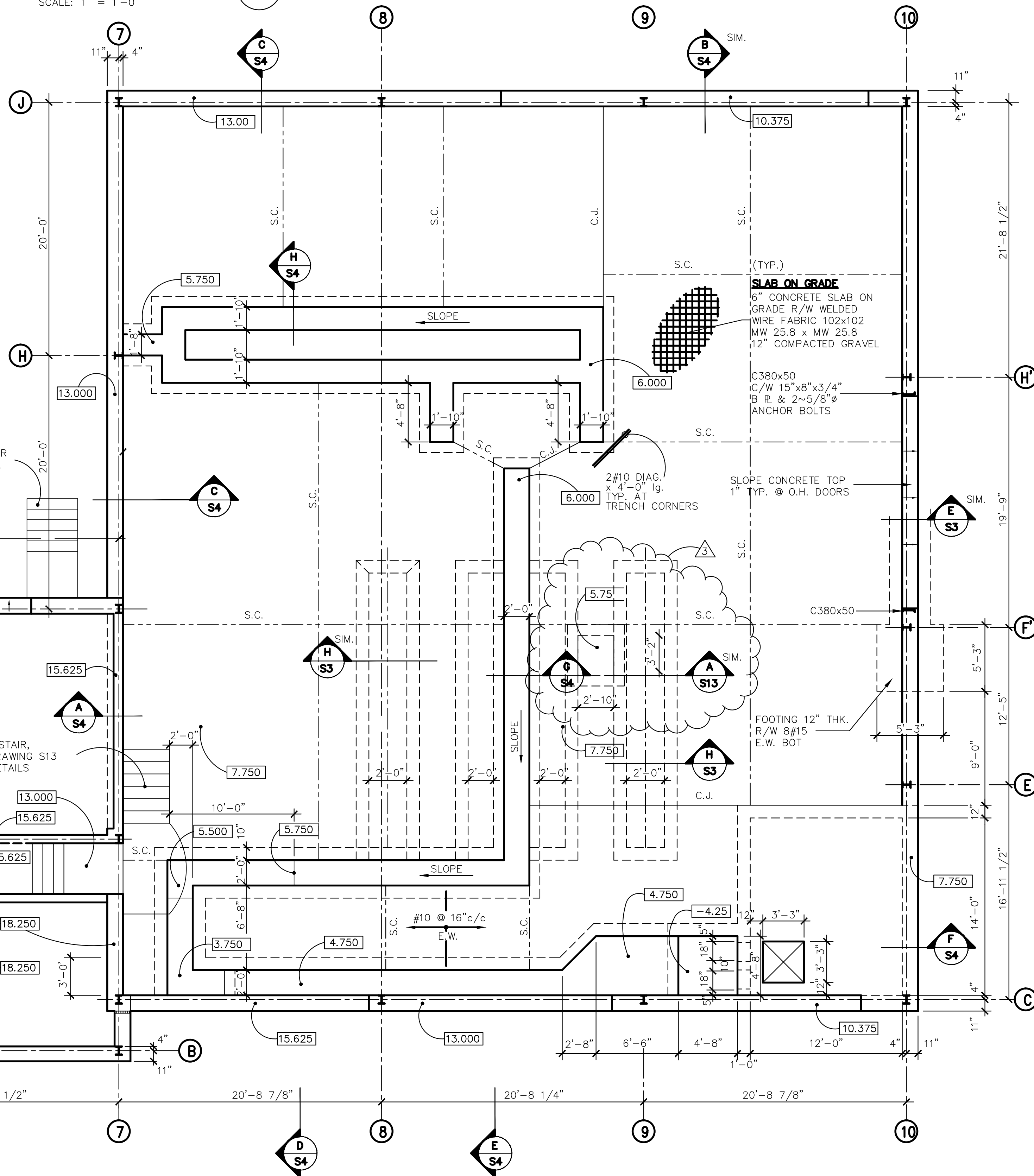


DETAIL-BASE PLATE 4
SCALE: 1" = 1'-0"



TYP. CONCRETE EQUIPMENT PAD
FOR LOCATION AND SIZE OF PADS SEE MECHANICAL DRAWINGS

COLUMN LOCATION	U/S BASE PLATE ELEV.	T/O COLUMN ELEV.	COLUMN SIZE	BASE PLATE SIZE
B7	18.333	29.624	W200x46	8 1/2"x12"x3/4"
B4, B6	18.333	29.291	W200x46	8 1/2"x12"x3/4"
G2	18.333	29.275	W200x46	8 1/2"x12"x3/4"
B2	18.333	29.624	W200x46	13"x9"x3/4" DET. 1
G3	18.333	28.942	W200x46	8 1/2"x12"x3/4"
G5	15.708	28.942	W200x46	8 1/2"x12"x3/4"
G7	15.708	29.275	W200x46	13 1/2"x9"x3/4" DET. 2
H7	13.083	29.075	W200x46	8 1/2"x12"x3/4"
J7	13.083	28.875	W200x46	8 1/2"x12"x3/4"
J8	13.083	28.375	W200x46	8 1/2"x12"x3/4"
J9	10.458	28.375	W200x46	8 1/2"x12"x3/4"
J10	7.833	28.875	W200x46	8 1/2"x12"x3/4"
H10	7.833	29.092	W200x46	8 1/2"x12"x3/4"
G10	7.833	29.289	W200x46	8 1/2"x12"x3/4"
E10	7.833	29.413	W200x46	8 1/2"x12"x3/4"
C10	7.833	29.583	W200x46	8 1/2"x12"x3/4"
C9	10.458	29.083	W200x46	8 1/2"x12"x3/4"
C8	13.083	29.083	W200x46	8 1/2"x12"x3/4"
C7	18.333	29.583	W200x46	8 1/2"x12"x3/4"
D2	23.583	33.875	W200x46	8 1/2"x12"x3/4"
D3	18.333	33.875	W200x46	8 1/2"x12"x3/4"
D7	15.708	29.457	W200x46	13"x9"x3/4" DET. 3
D'2	23.583	33.875	W200x46	8 1/2"x12"x3/4"



MAIN FLOOR PLAN
3/16" = 1'-0"

NOTE:
SLIDE GATE CHANNELS TO BE CAST INTO CONCRETE

GENERAL NOTES:
1. FOR GENERAL NOTES SEE DRAWING S7.
2. LOCATE TRENCHES TO SUIT FINAL EQUIPMENT LOCATIONS.

LEGEND:
4.750 FINISHED CONCRETE ELEVATIONS
C.J. CONSTRUCTION JOINT IN SLAB ON GRADE
S.C. SAW CUT JOINT IN SLAB ON GRADE

No.	Description	Date	By
04	ISSUED FOR CONSTRUCTION	JUNE/02	
03	DAF SUMP ADDED	MAY/02	
02	ISSUED FOR TENDER	APR./02	SWP
01	ISSUED FOR REVIEW	AUG./98	C.T.

Revision or Issue

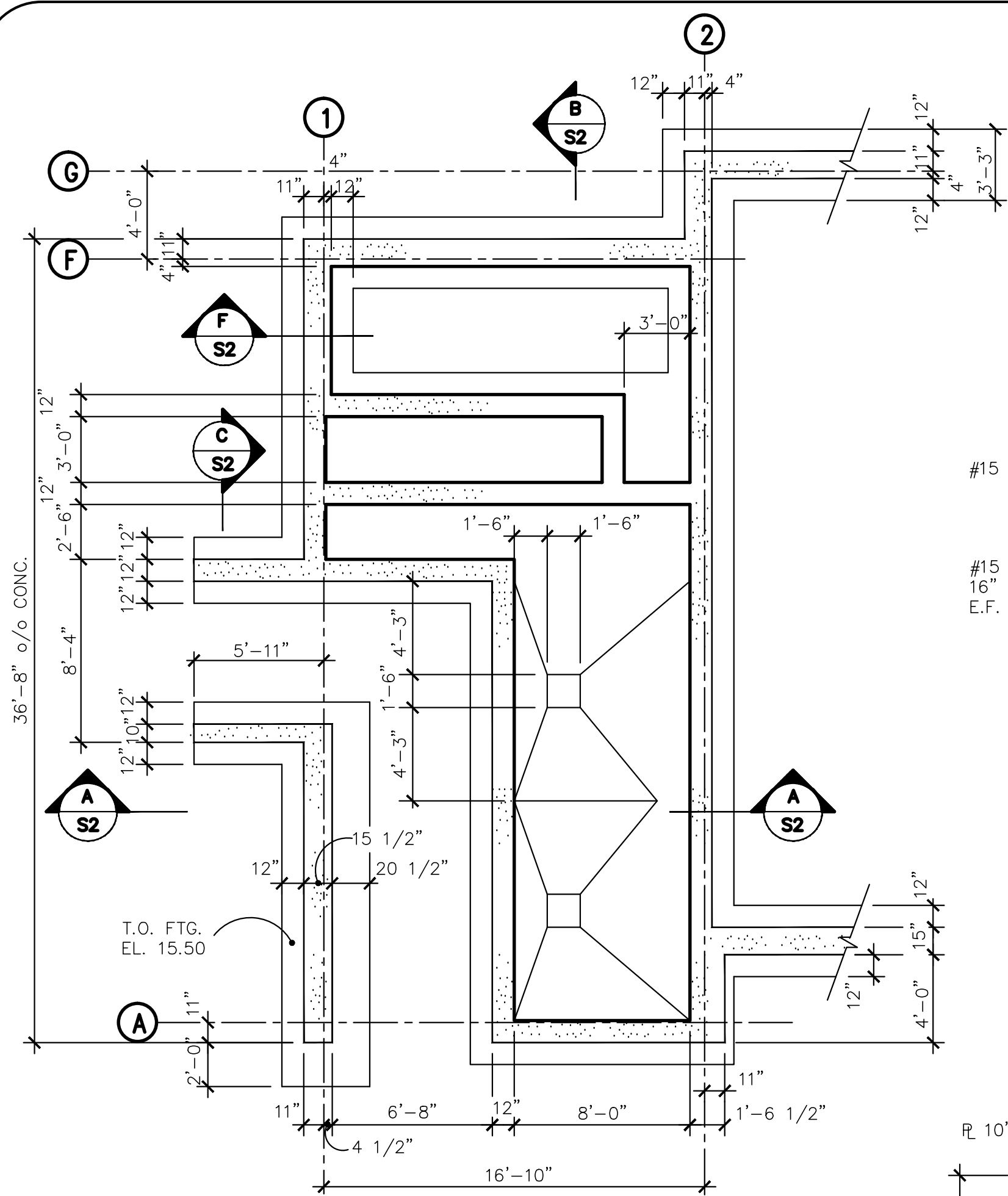
TOWN OF LUNEBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT
SEWAGE TREATMENT PLANT
CONCRETE PLAN

ABL Environmental
Consultants Ltd.

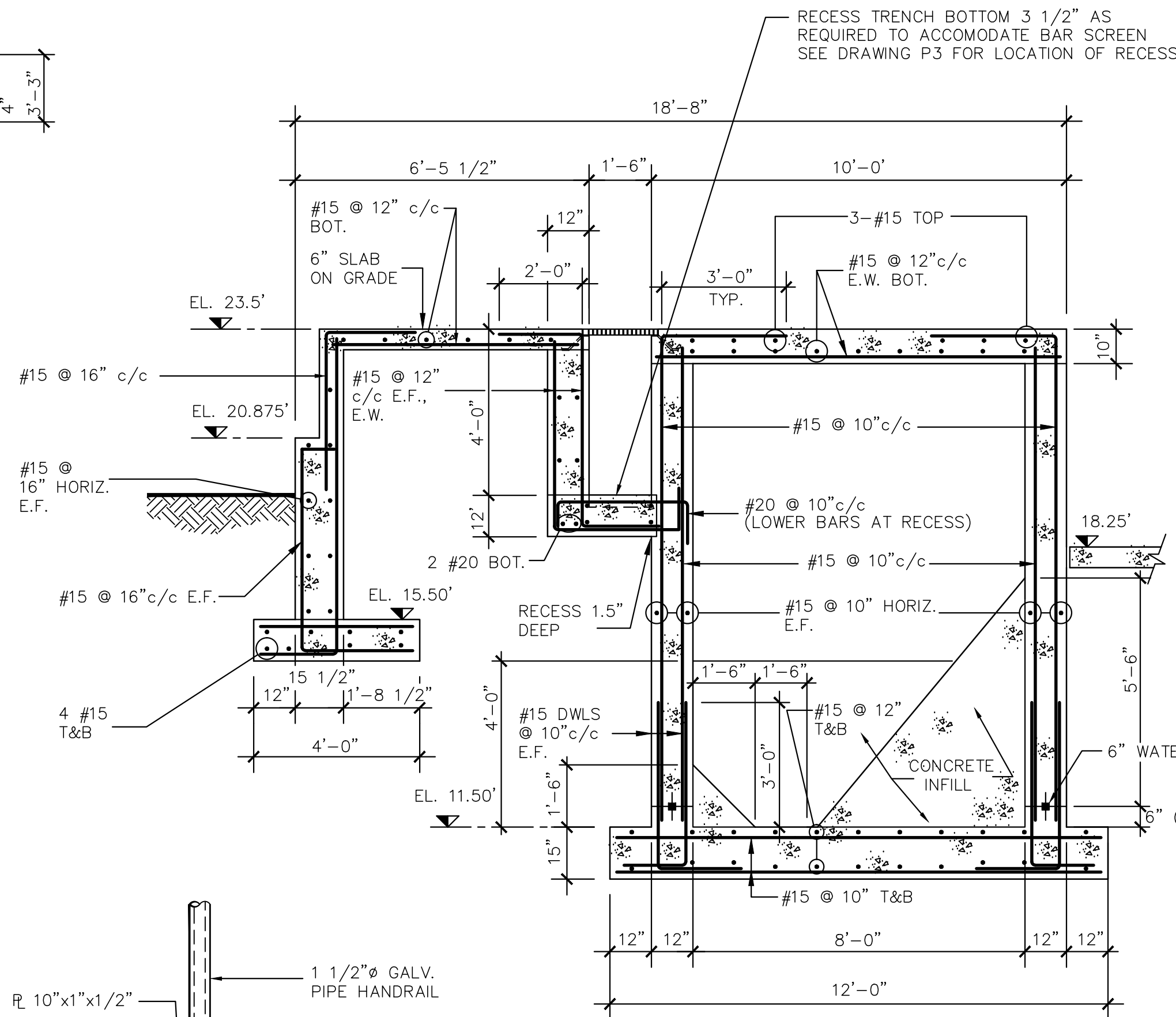
YMCL
Engineering Limited

Scale AS SHOWN

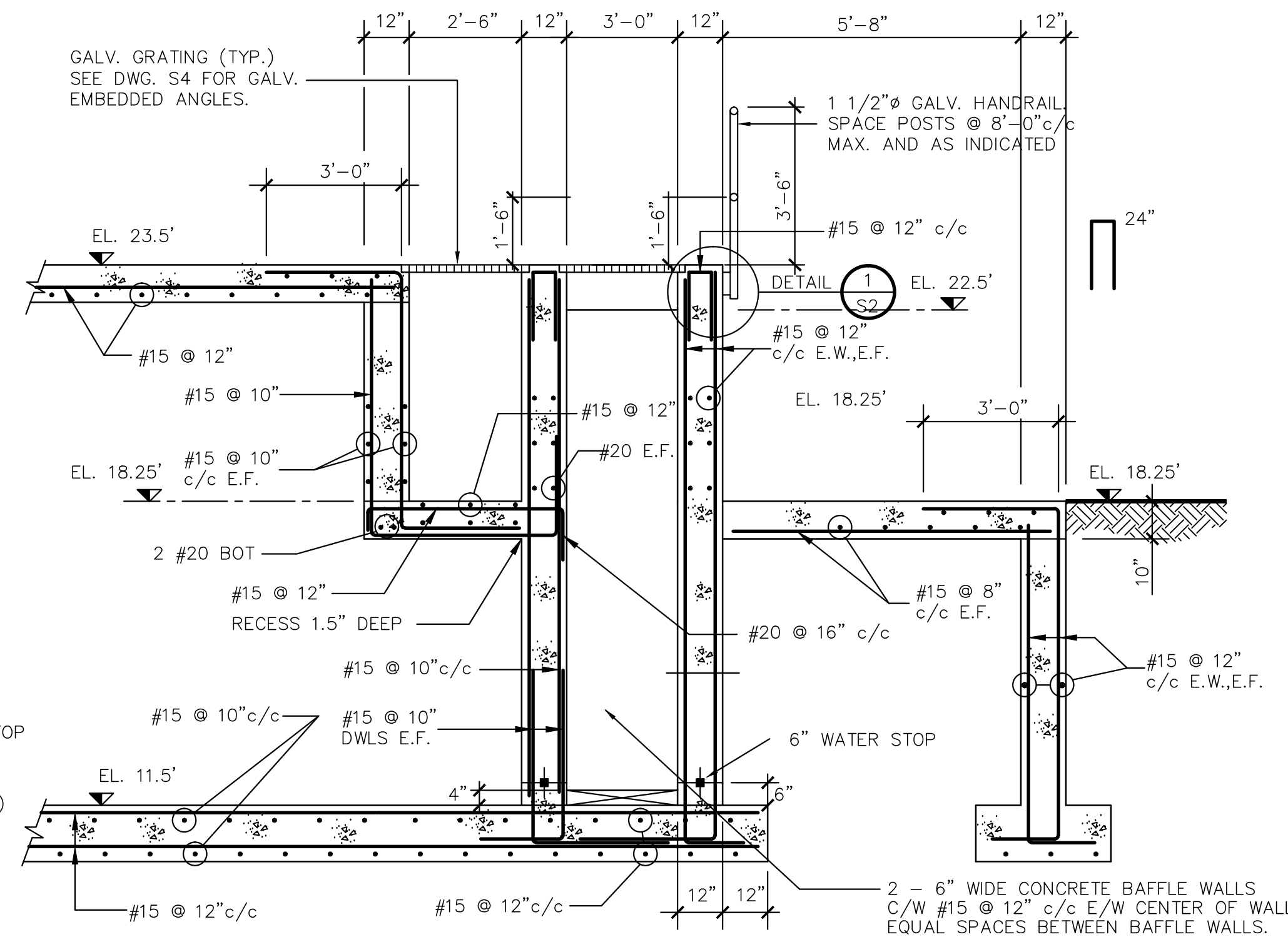
Date	AUG., 1998	Drawn	CT
Designed	TAM	Checked	TAM
Contract No.		Sheet	X OF X
Drawing No.	S1	Revision	



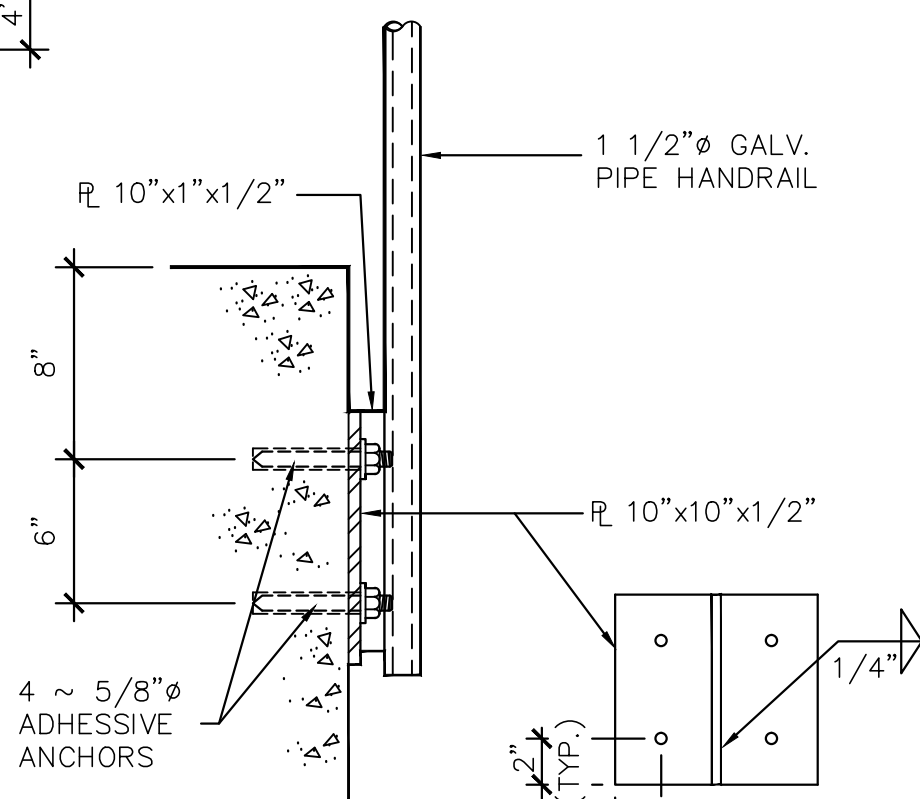
FOUNDATION PLAN HEADWORKS AREA
SCALE: 3/16" = 1'-0" T.O. SLAB ELEV. 11.5' U/N



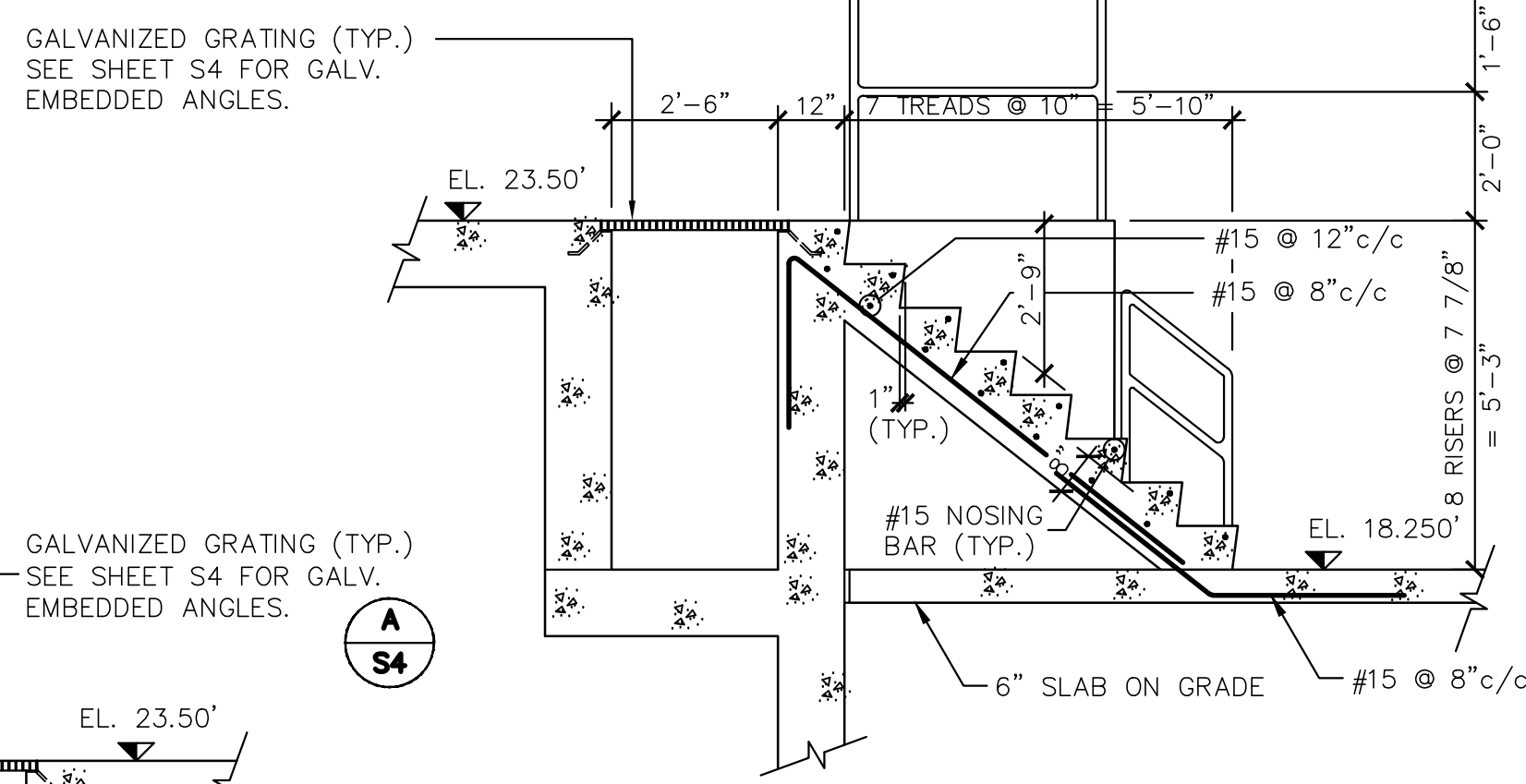
SECTION A-A
SCALE: 3/8" = 1'-0"



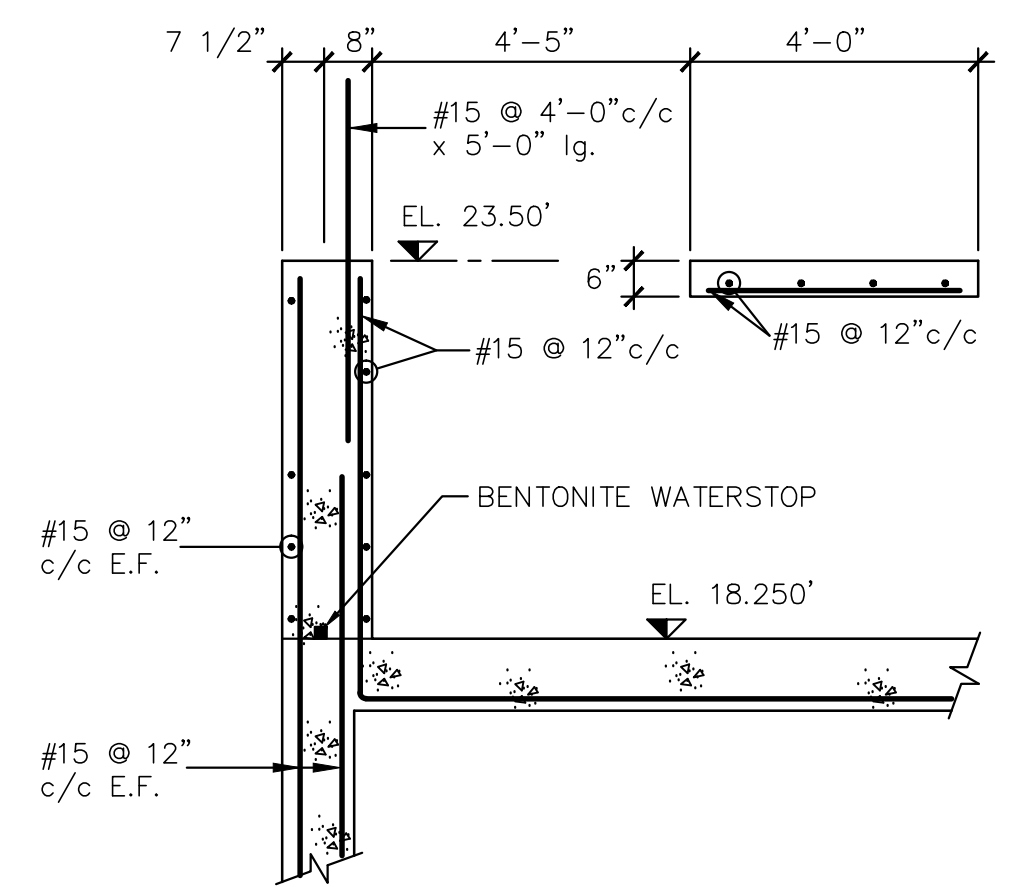
SECTION B-B
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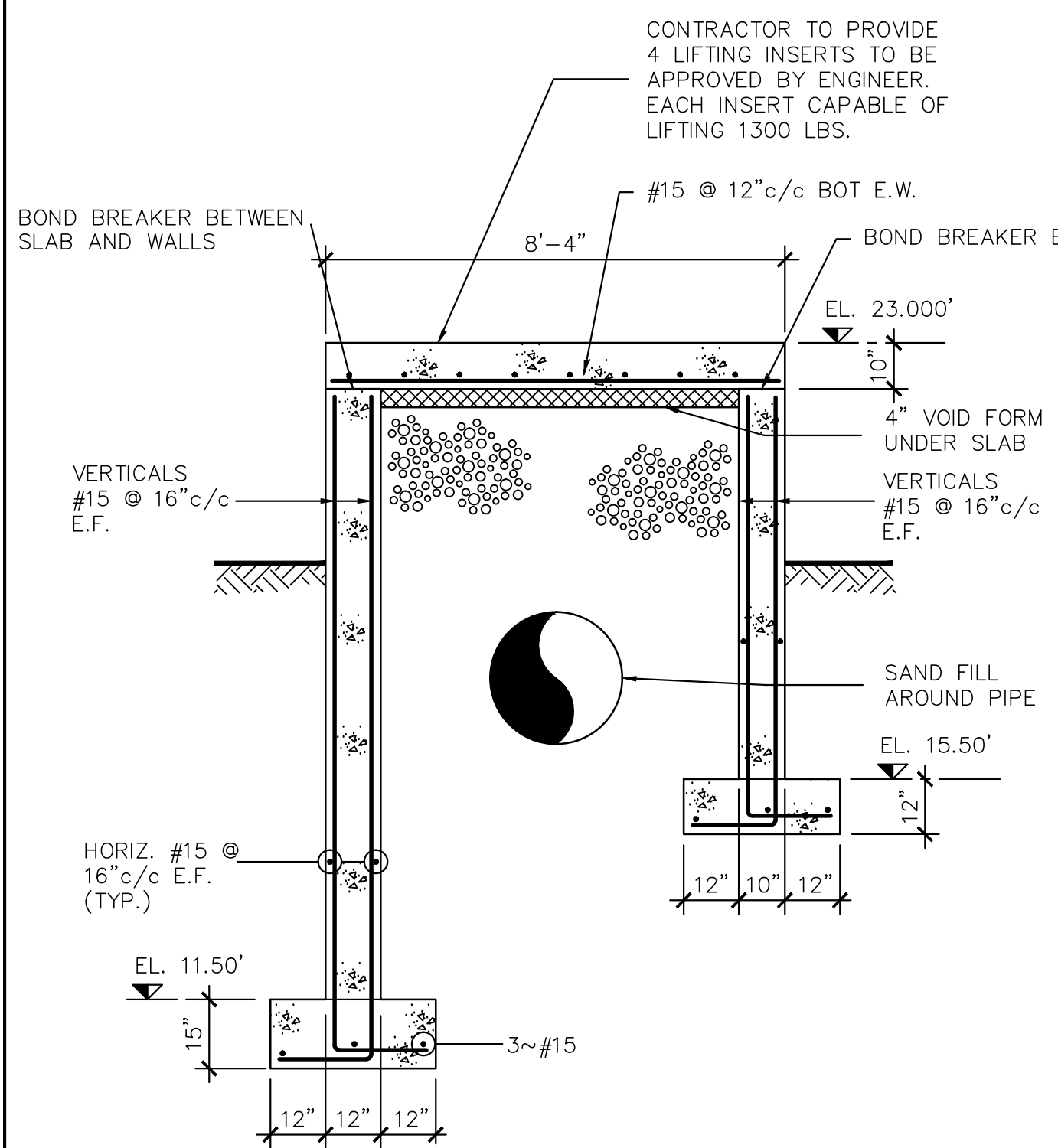
DETAIL 1
N.T.S.



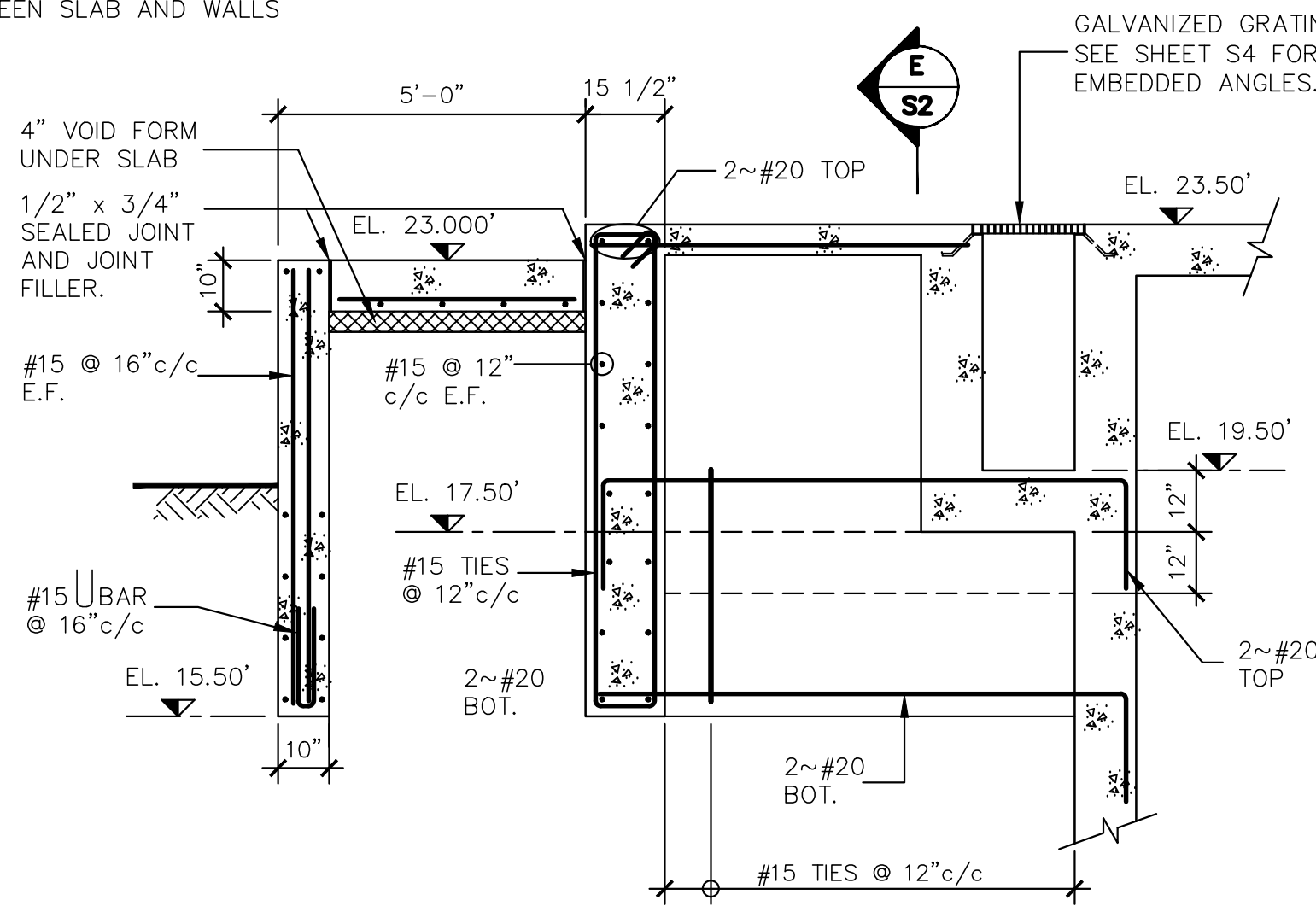
SECTION G-G
SCALE: 3/8" = 1'-0"



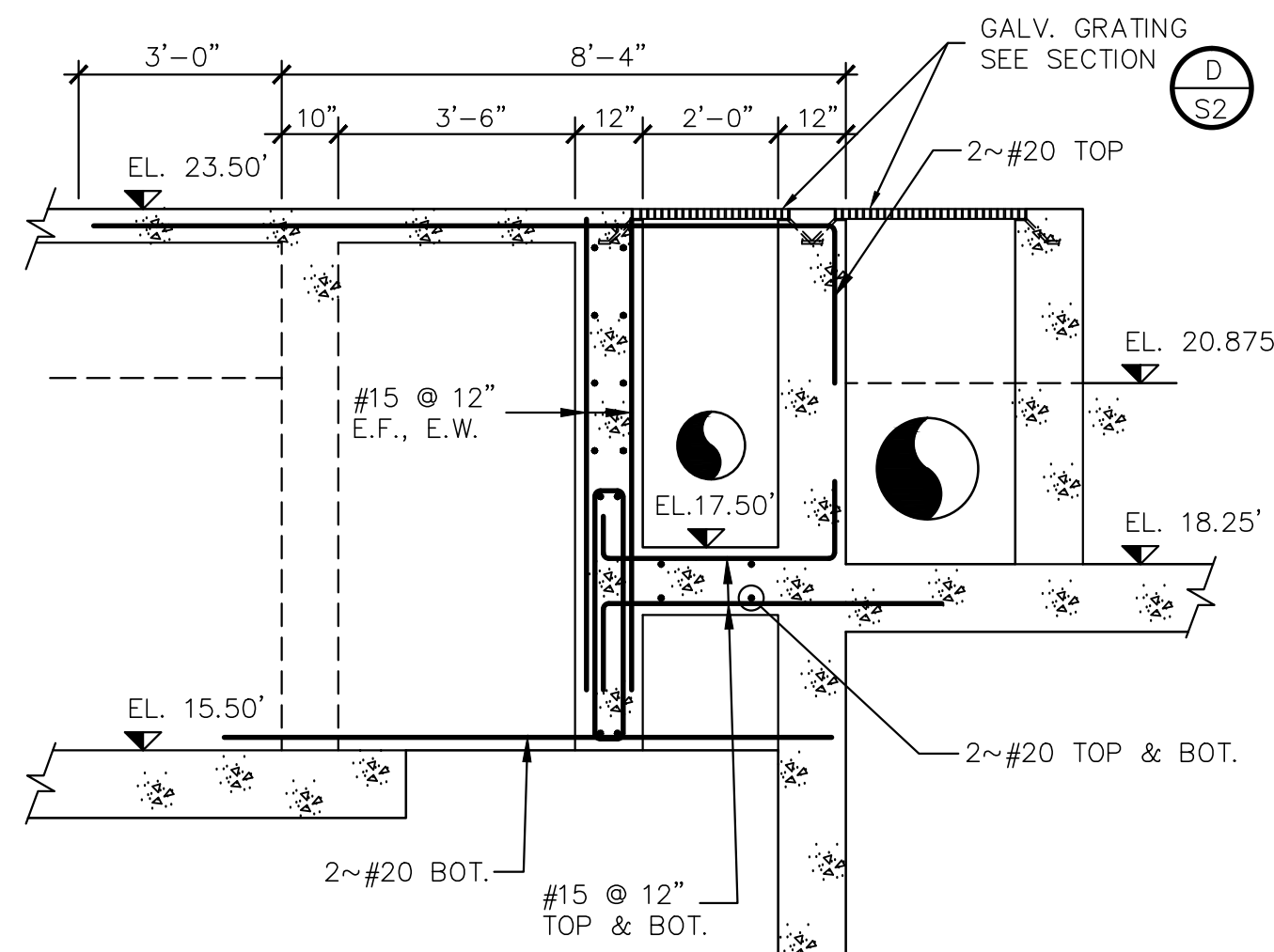
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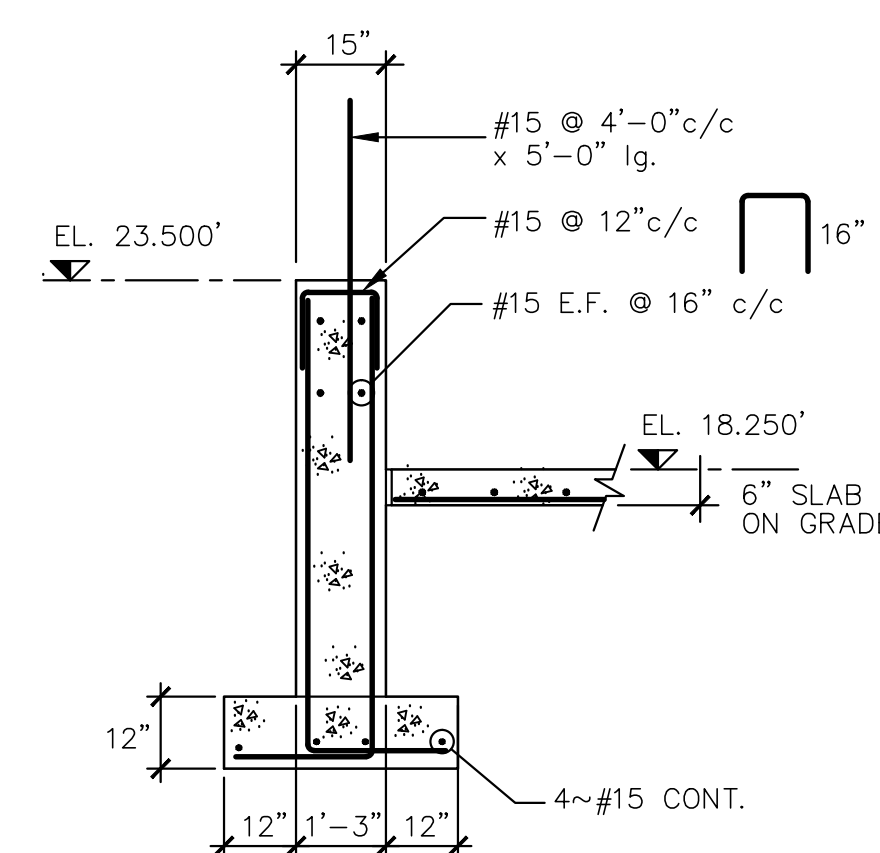
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SCALE: 3/8" = 1'-0"



SECTION D-D
SCALE: 3/8" = 1'-0"



SECTION E-E
SCALE: 3/8" = 1'-0"



SECTION F-F
SCALE: 3/8" = 1'-0"

GENERAL NOTES:
1. FOR NOTES SEE DRAWING S7.

No.	Description	Date	By
02	ISSUED FOR TENDER	APR./02	SWP
01	ISSUED FOR REVIEW	AUG./98	C.T.

**TOWN OF LUNEBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT**

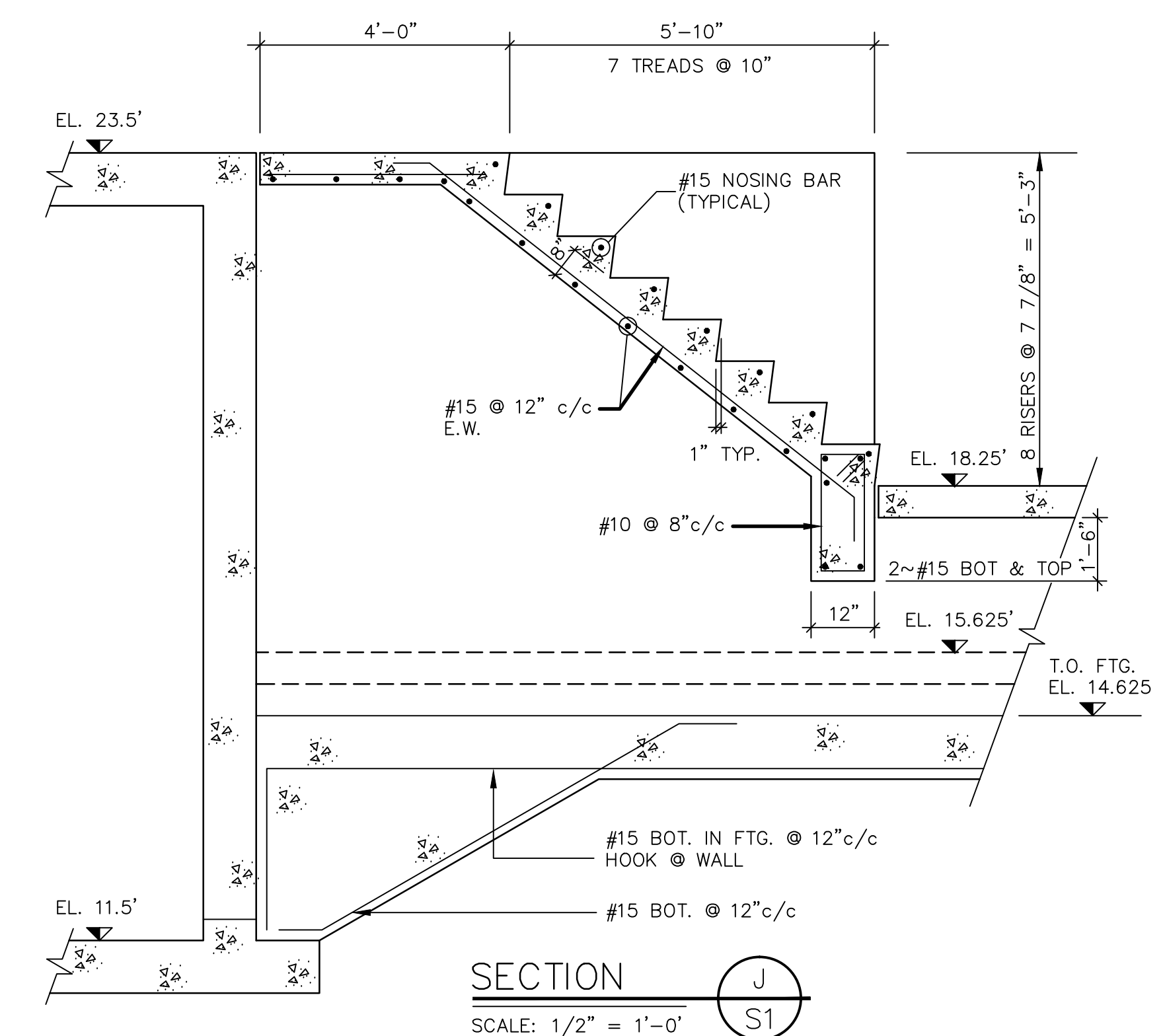
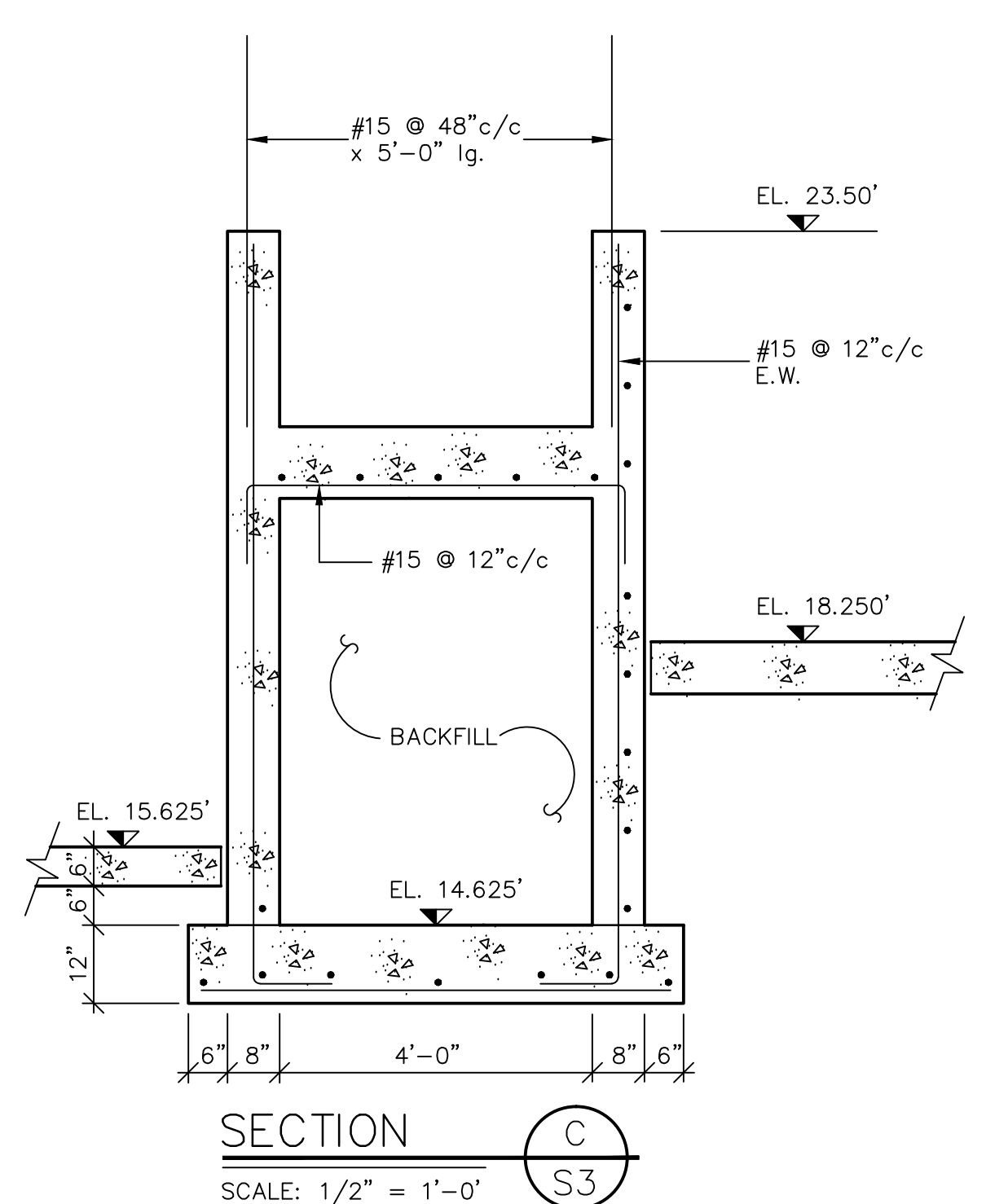
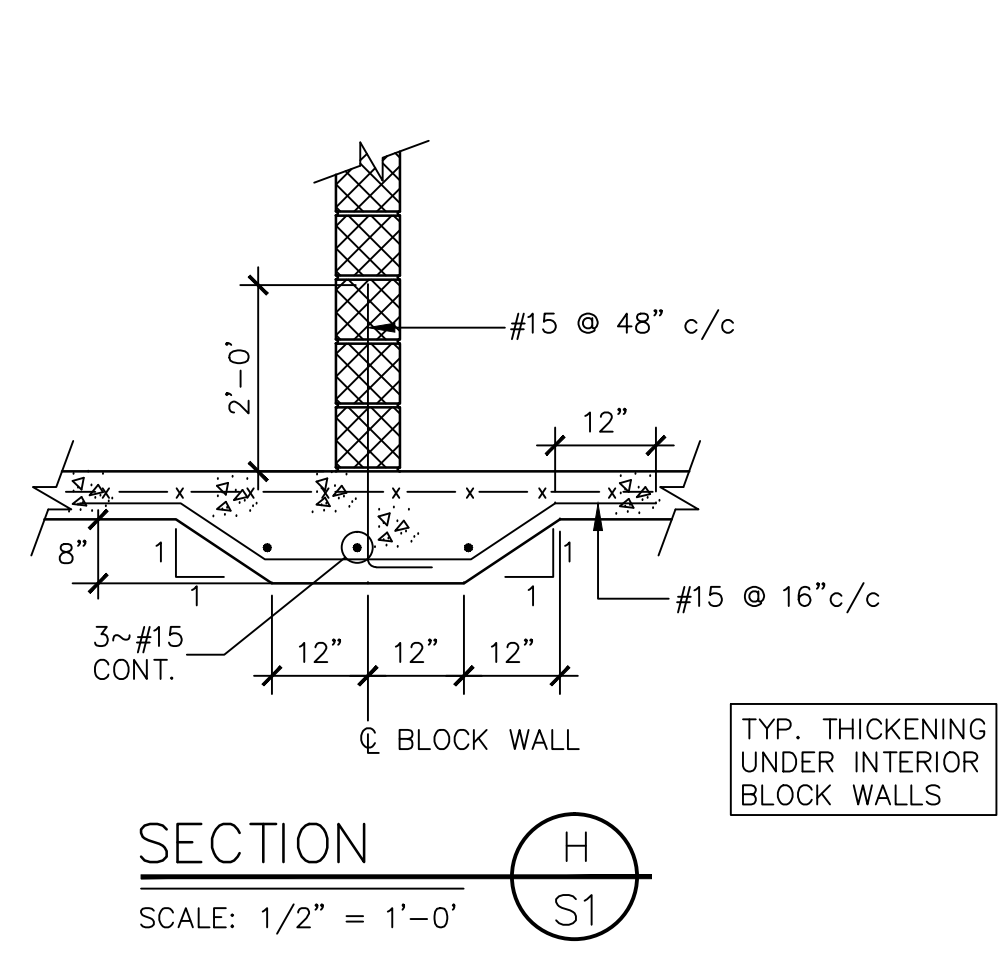
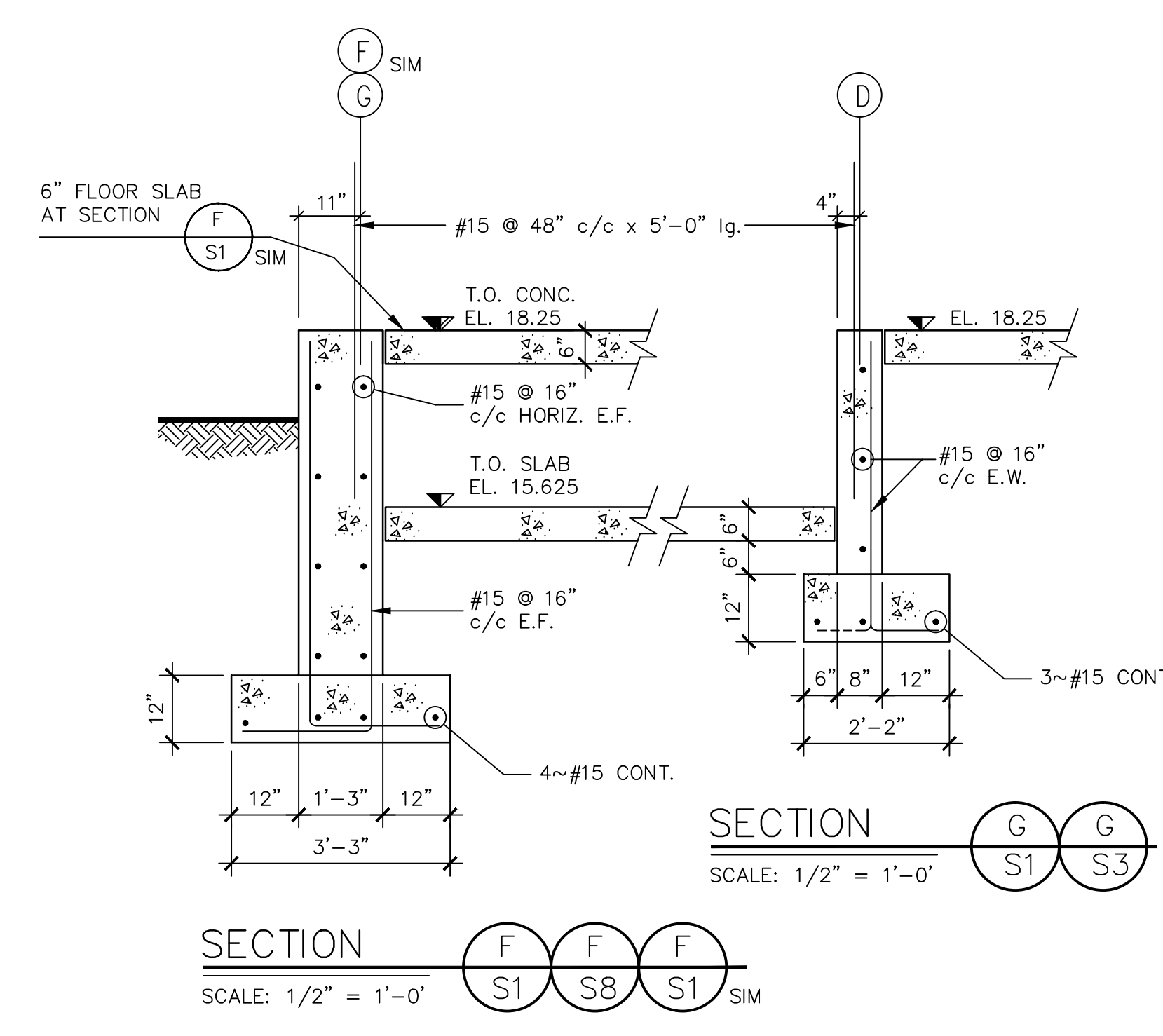
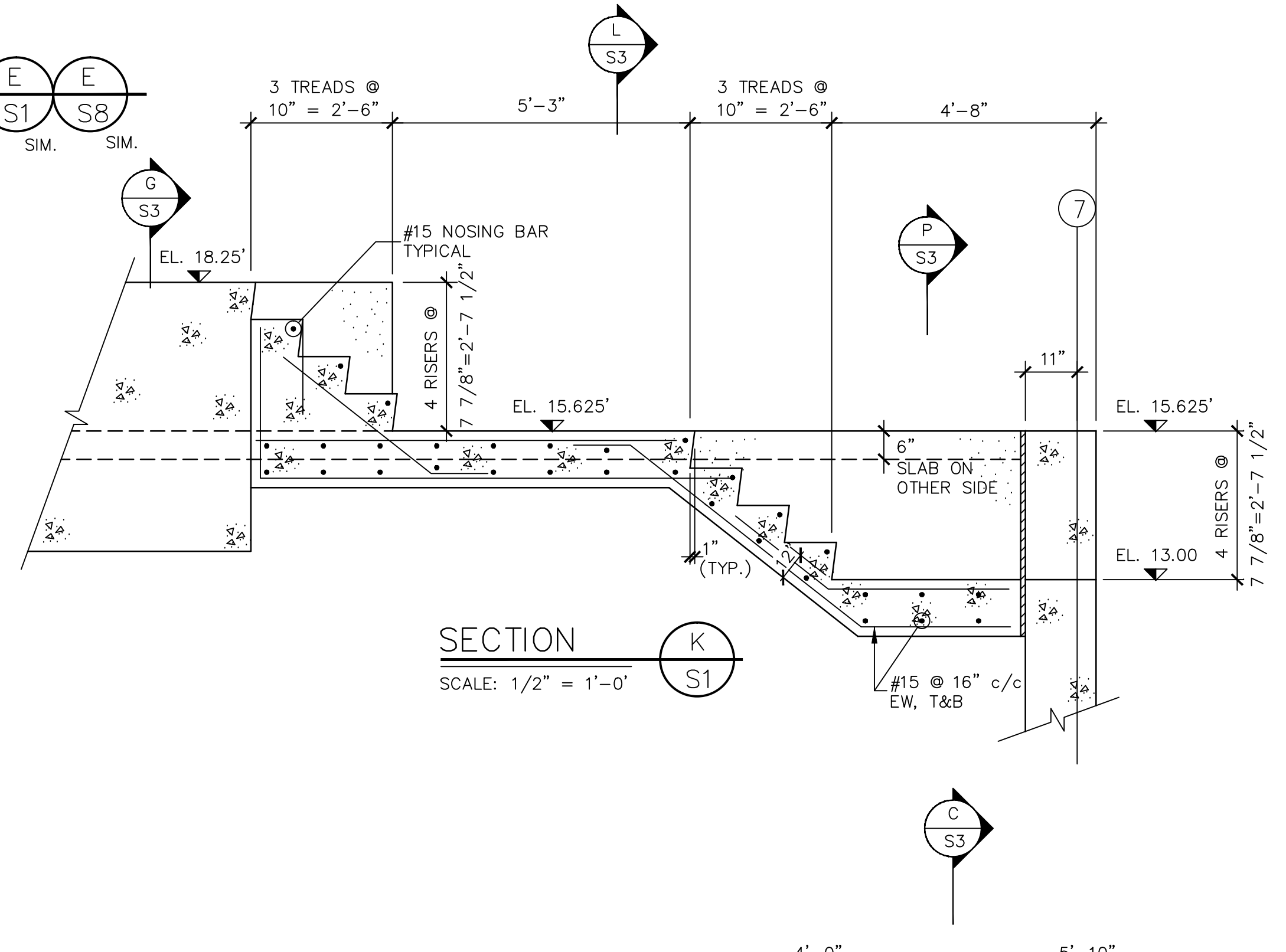
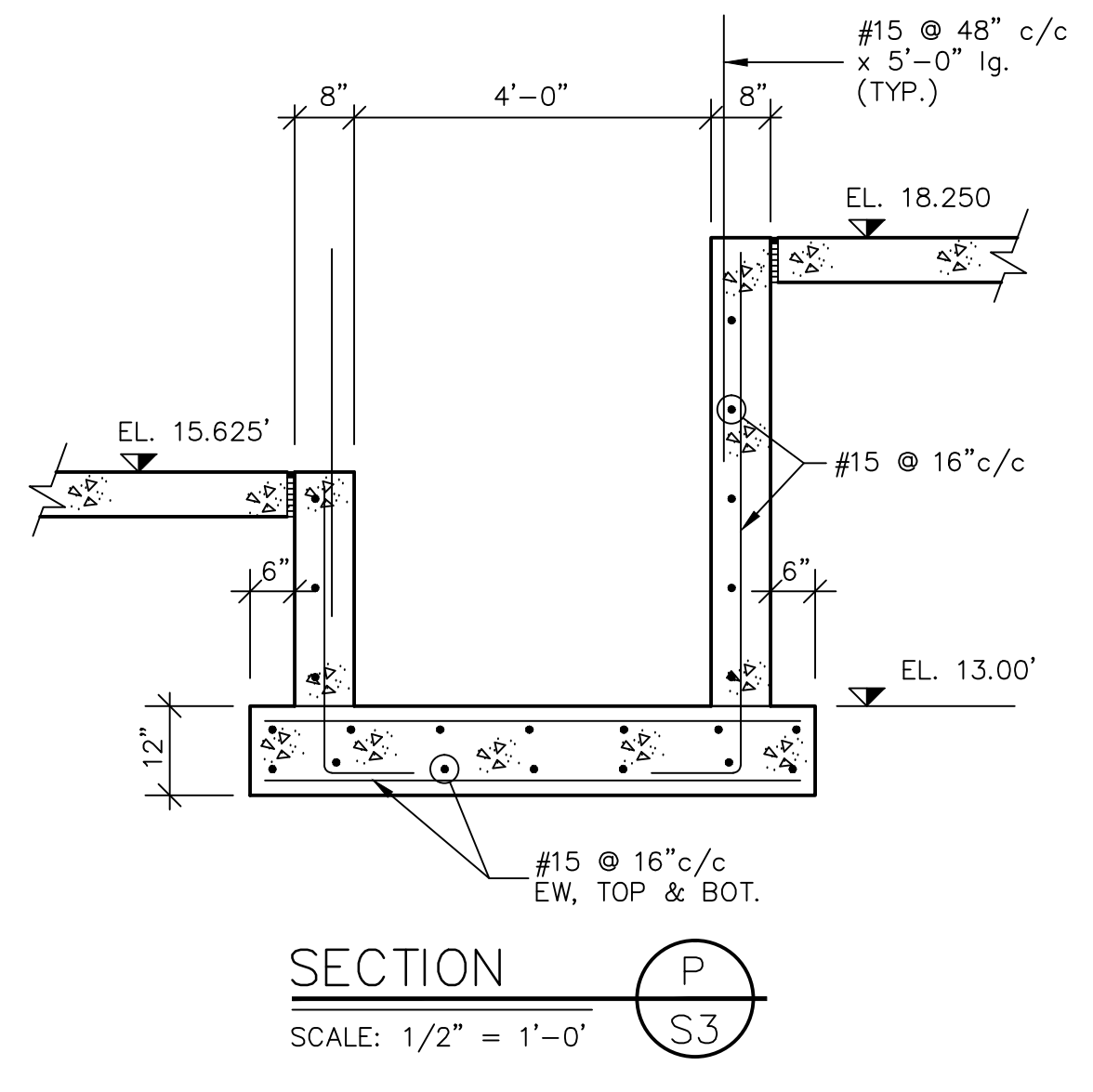
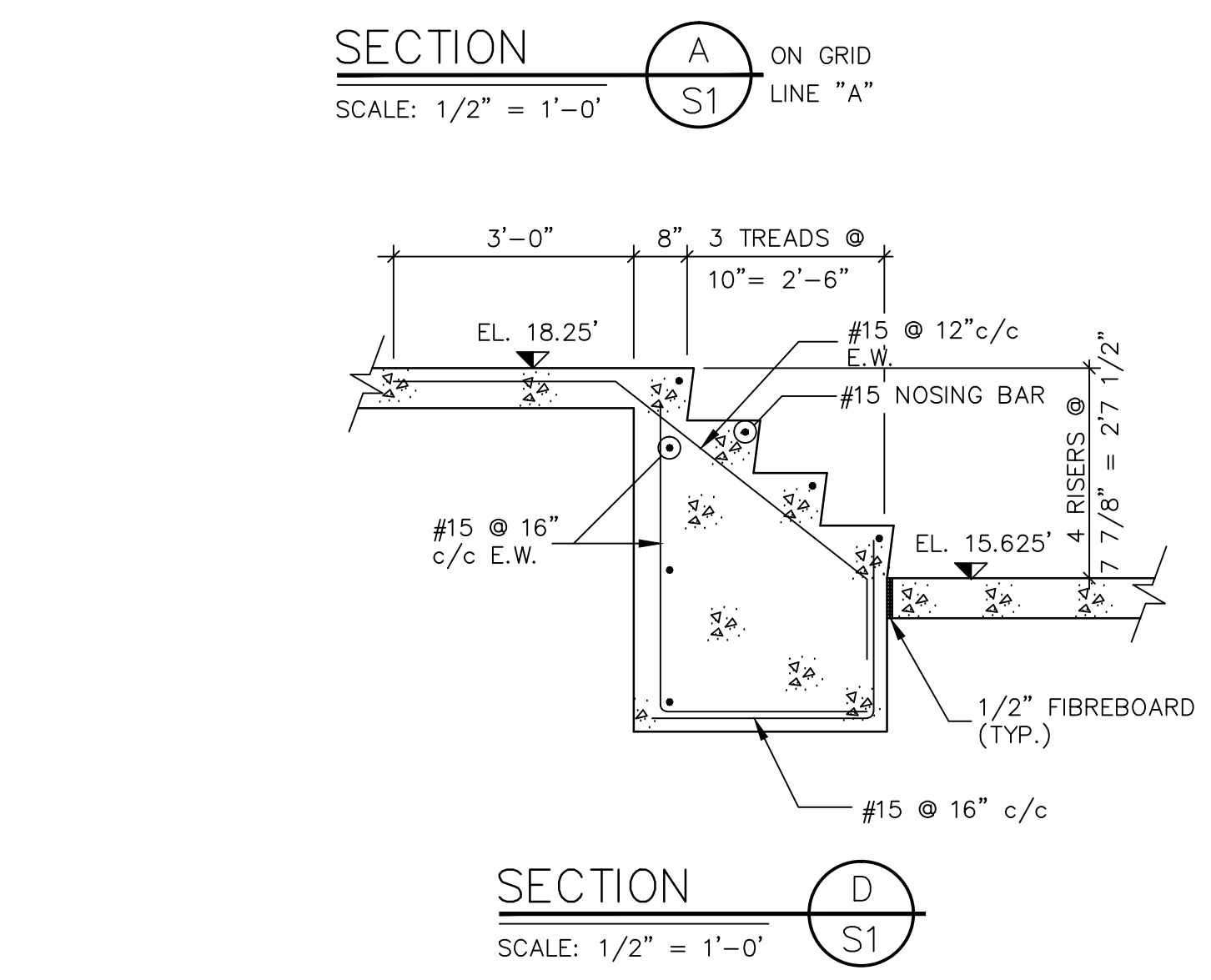
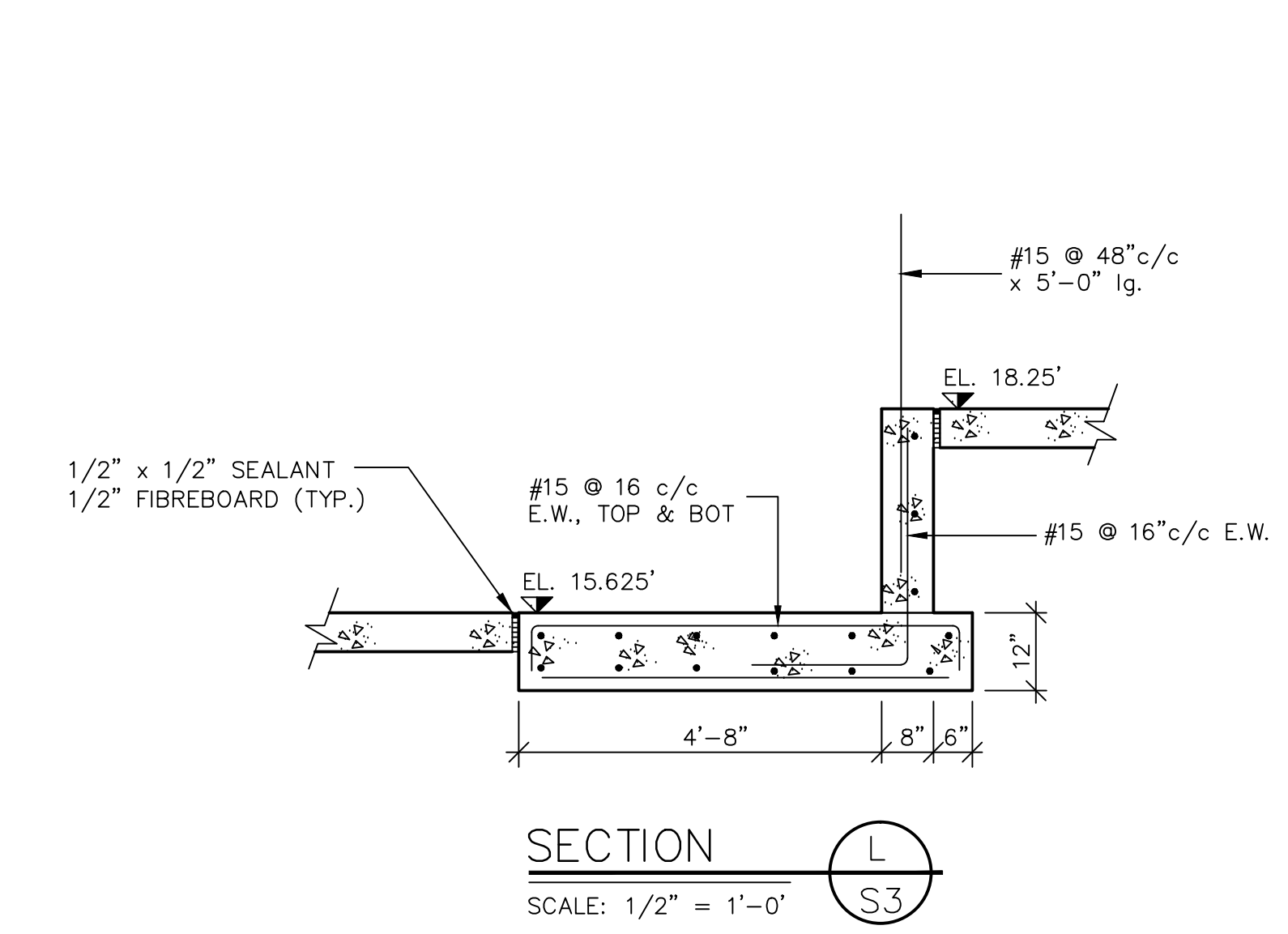
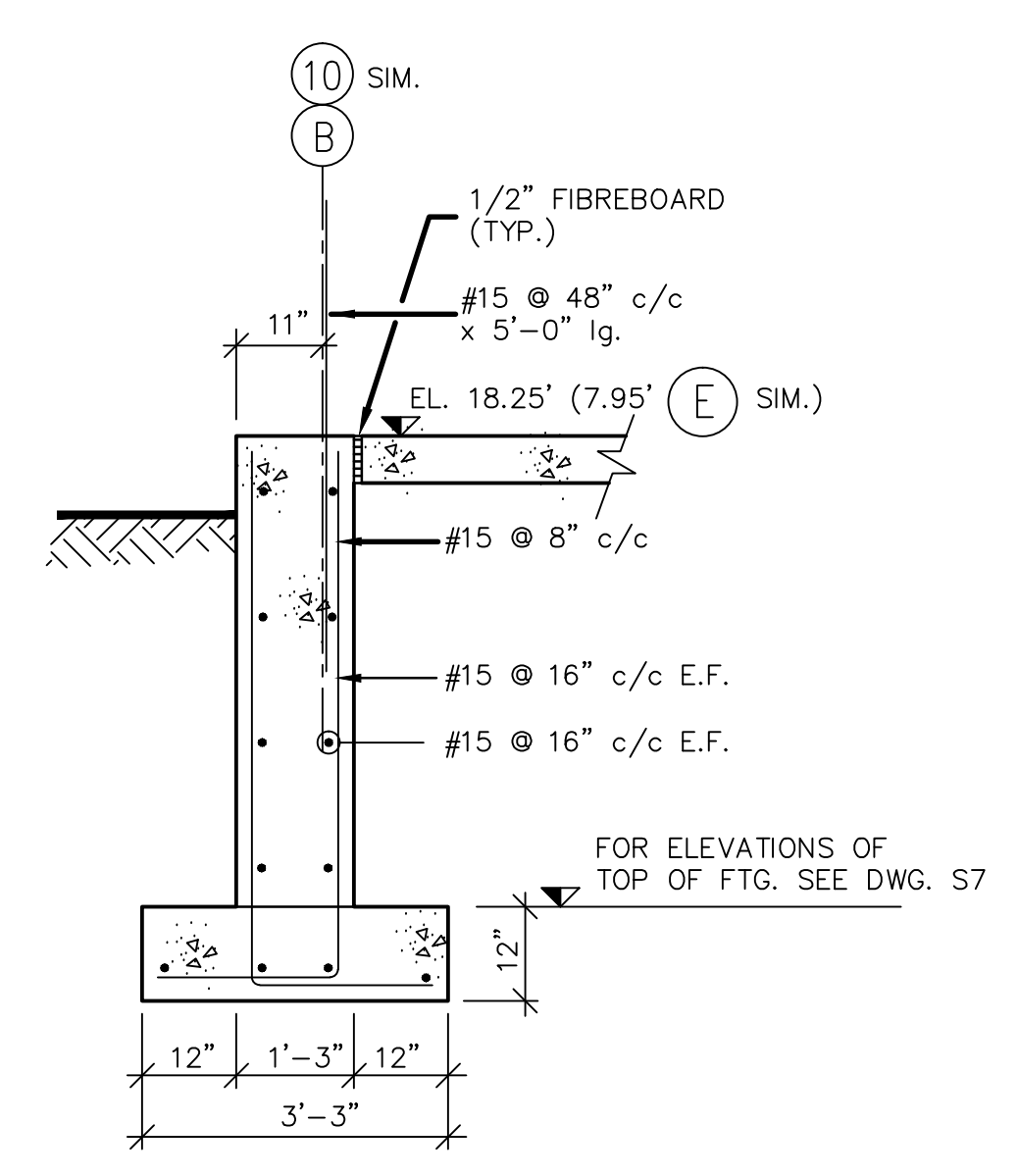
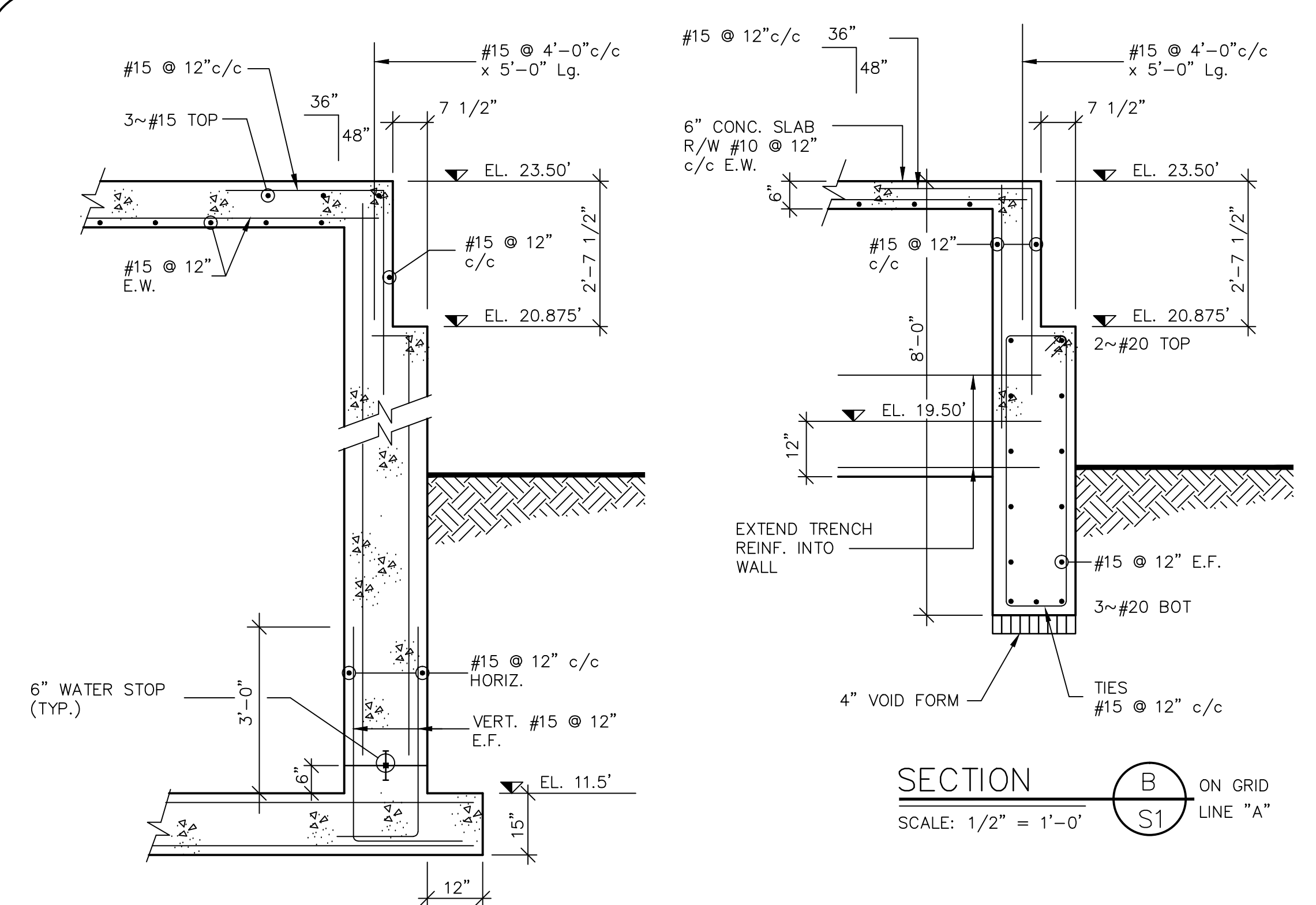
**SEWAGE TREATMENT PLANT
CONCRETE SECTIONS
SHEET 1**

**ABL Environmental
Consultants Ltd.**

**YMCL
Engineering Limited**

Scale AS SHOWN			
Date	Drawn	CT	
AUG. 1998	TAM	Checked	Approved
		TAM	TAM
Contract No	Sheet of	X OF X	
Drawing No	Revision		
		S2	

Date: Tuesday, Apr. 17, 2012 12:26pm Drawing Model File: C:\98001 - Lunenburg STP 2002\Drawings\98001-S3.dwg User: mclison



GENERAL NOTES:
1. FOR NOTES SEE DRAWING S7.

No.	Description	Date	By
02	ISSUED FOR TENDER	APR/02	SWP
01	ISSUED FOR REVIEW	AUG./98	C.T.

Revision or Issue

TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

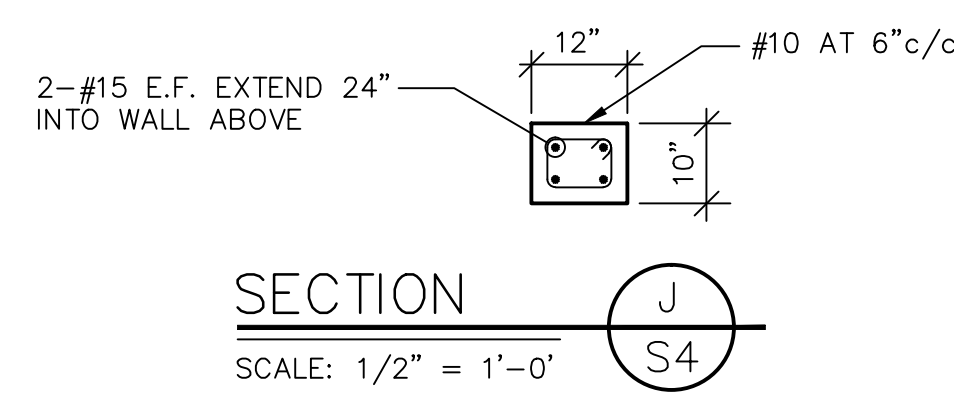
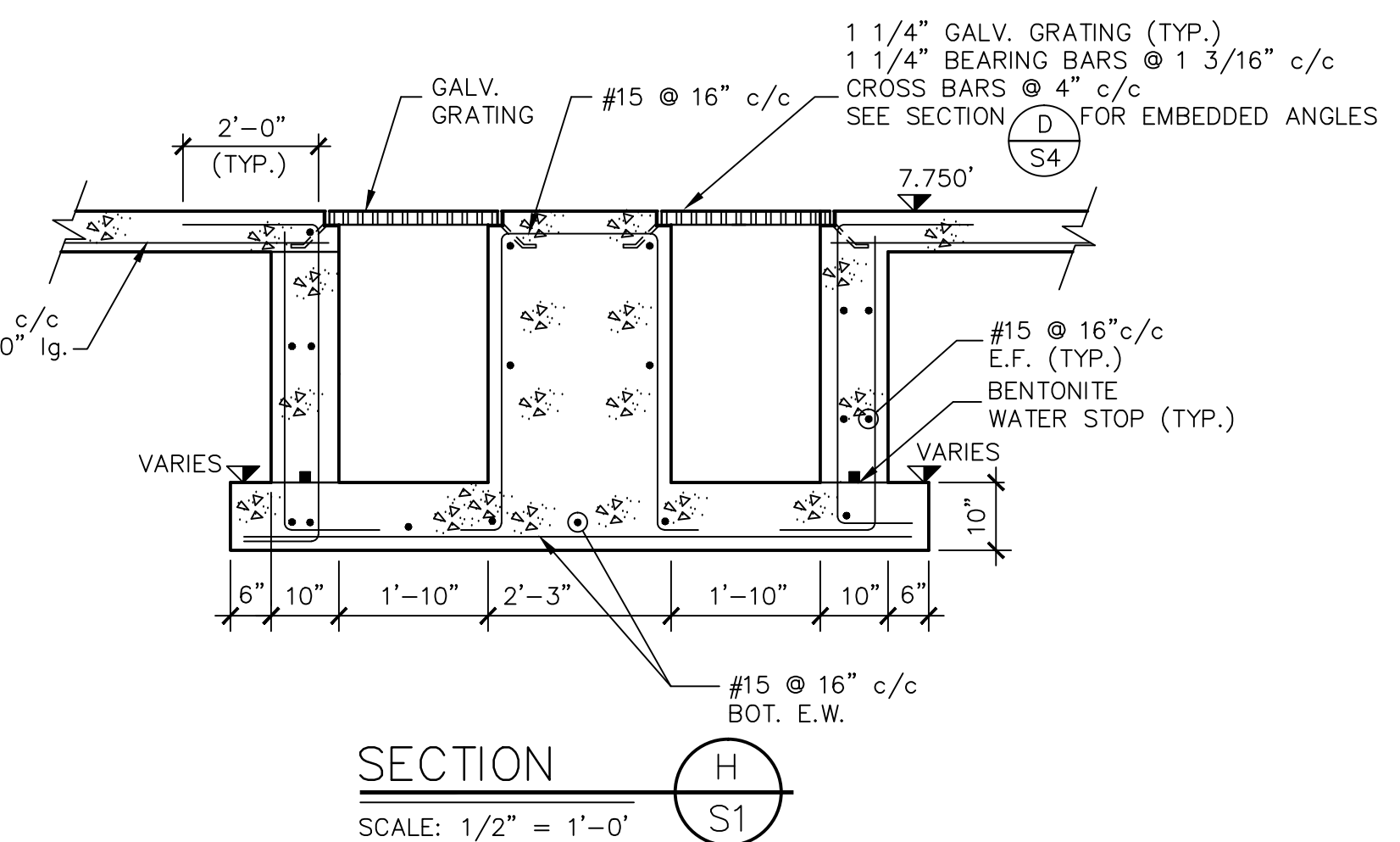
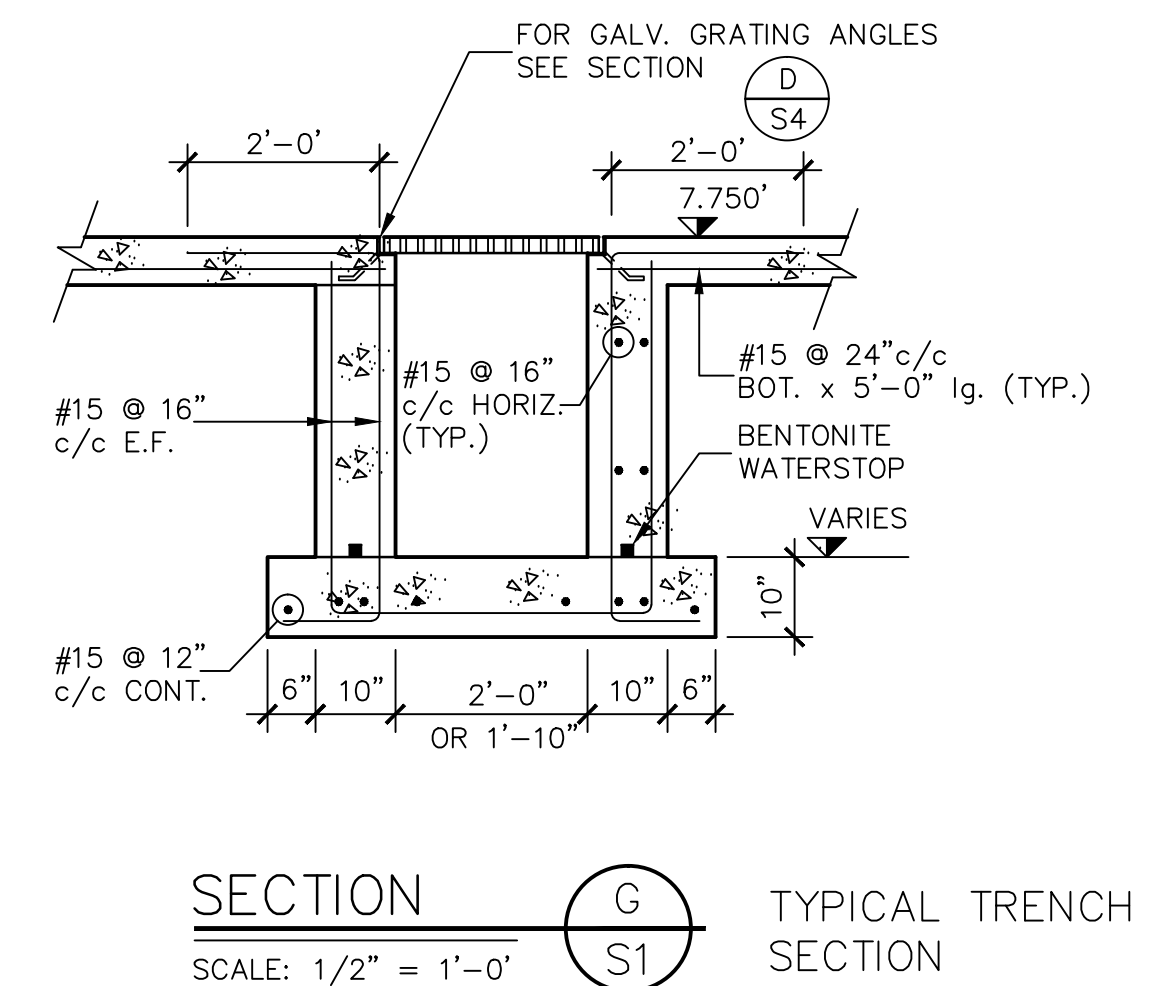
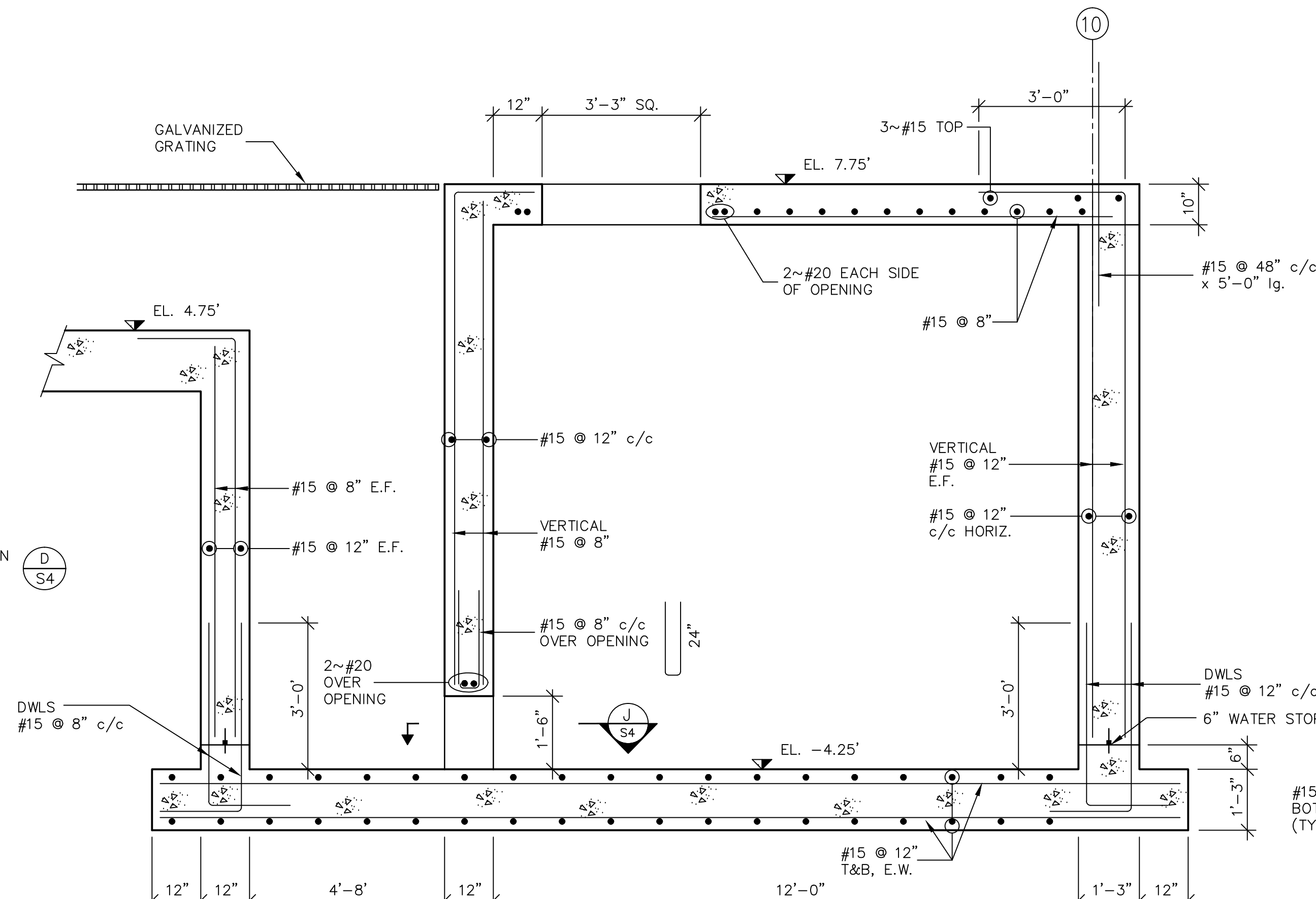
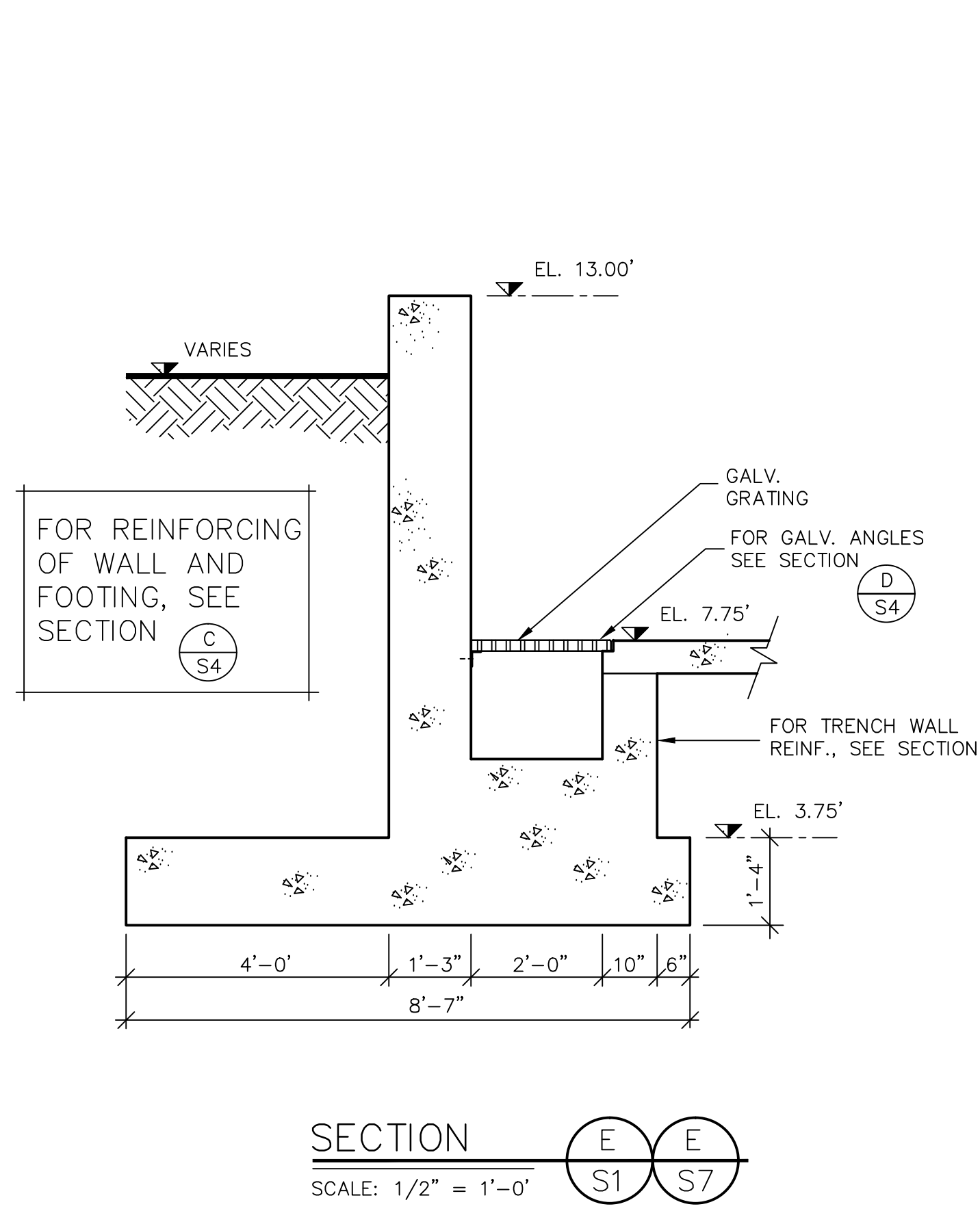
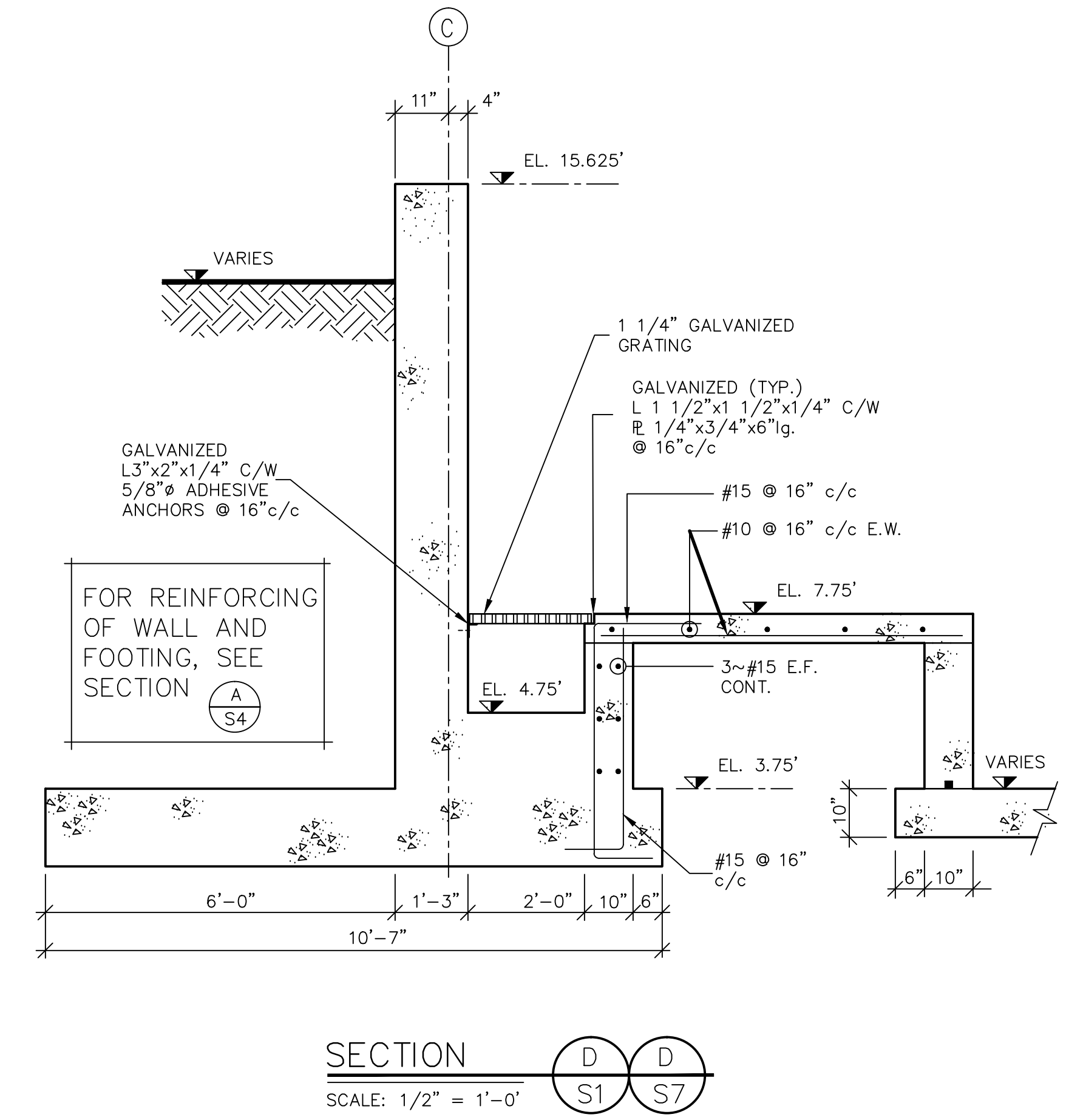
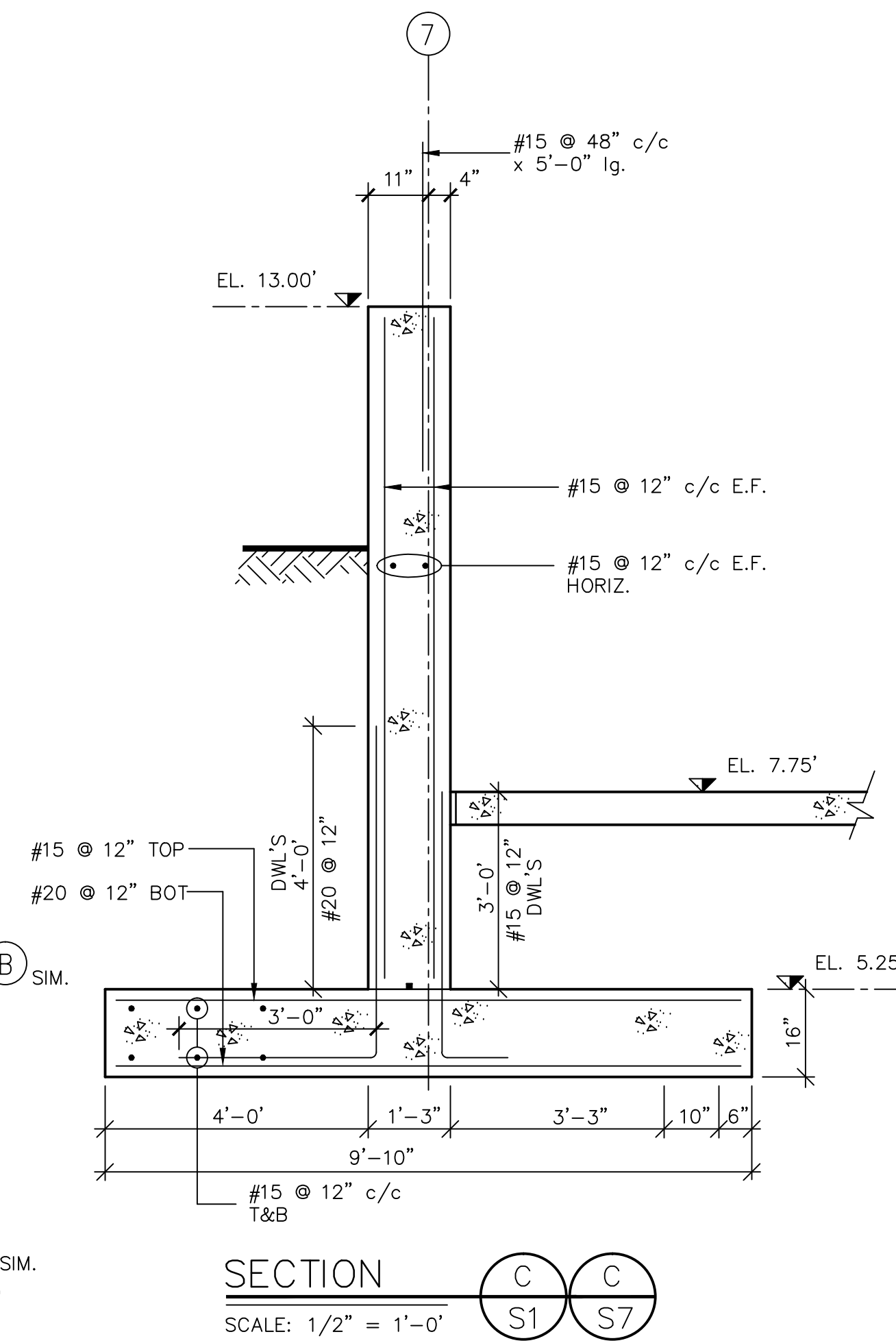
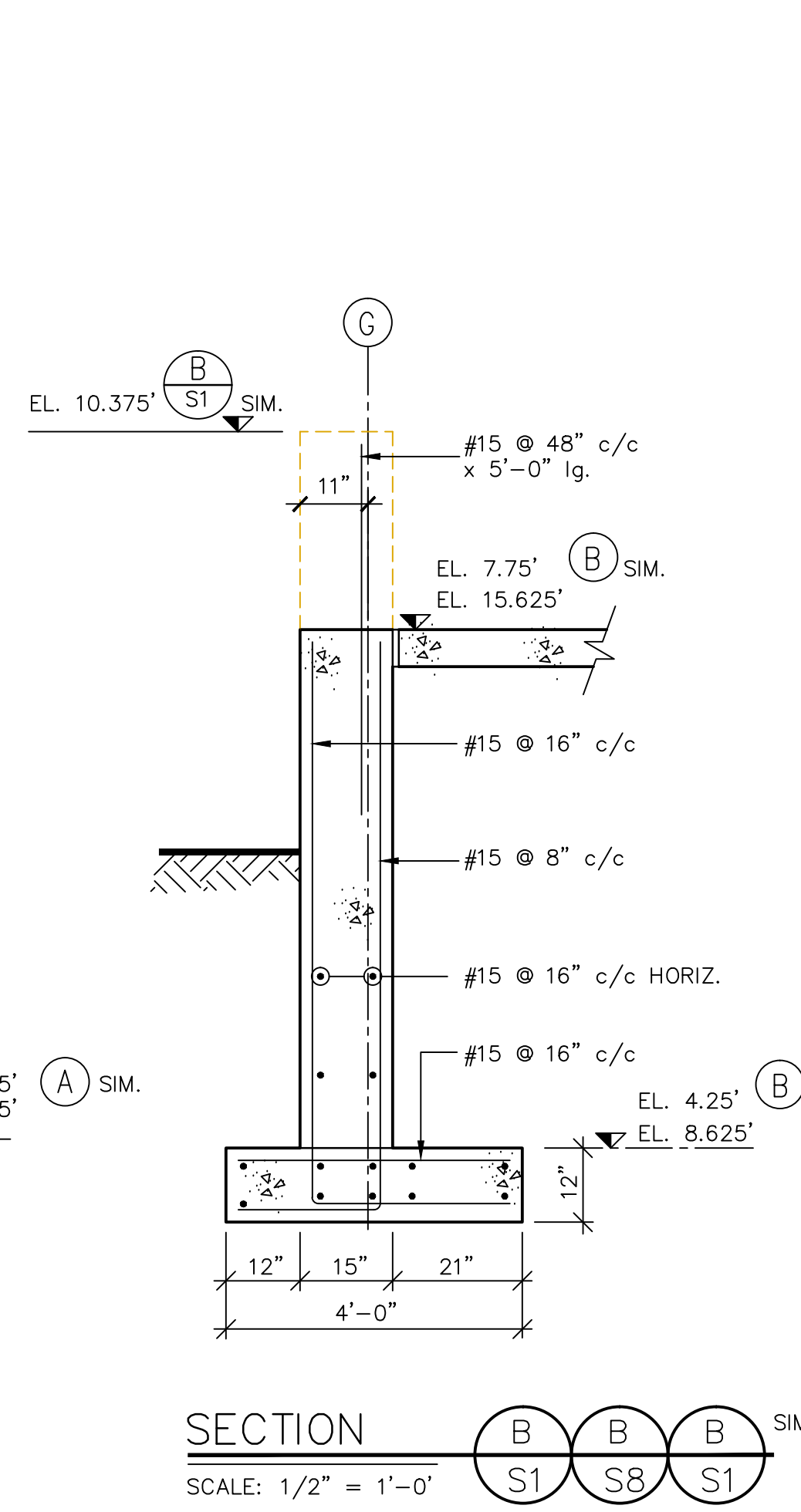
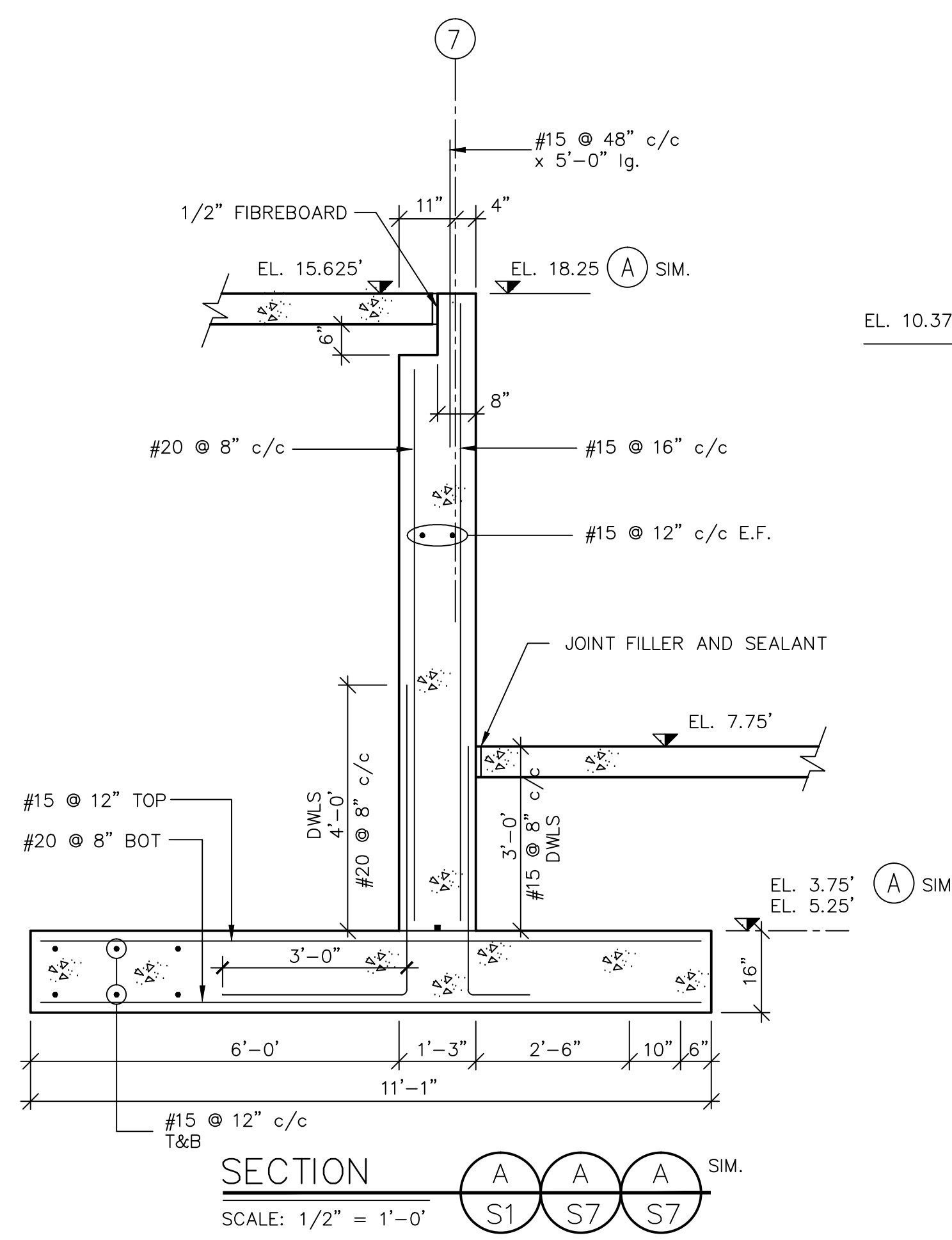
SEWAGE TREATMENT PLANT
CONCRETE SECTIONS
SHEET 2

ABL Environmental
Consultants Ltd.

YMCL
Engineering Limited

Scale AS SHOWN		Date	Drawn
		AUG., 1998	CT
Designed	Checked	Approved	
TAM	TAM		
Contract No.	Sheet of	X OF X	
Drawing No.	Revision		
		S3	

Date: Tuesday, Apr. 17, 2012-12:25pm Drawing Model File: C:\98001 - Lunenburg STP 2002\Drawings\98001-S4.dwg User: molisson



GENERAL NOTES:
1. FOR NOTES SEE DRAWING S7.

No.	Description	Date	By
02	ISSUED FOR TENDER	APR./02	T.M.
01	ISSUED FOR REVIEW	AUG./98	C.T.

Revision or Issue

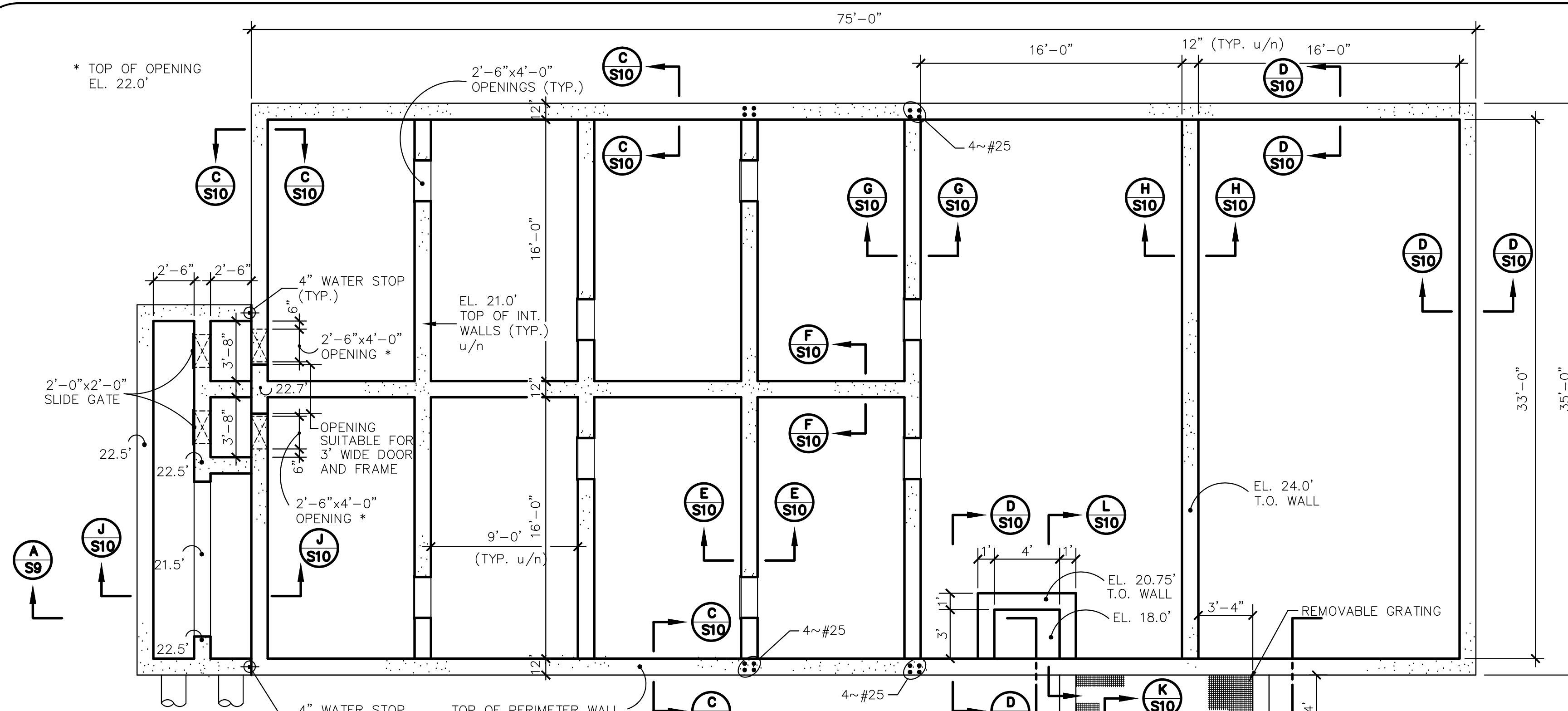
TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
CONCRETE SECTIONS
SHEET 3

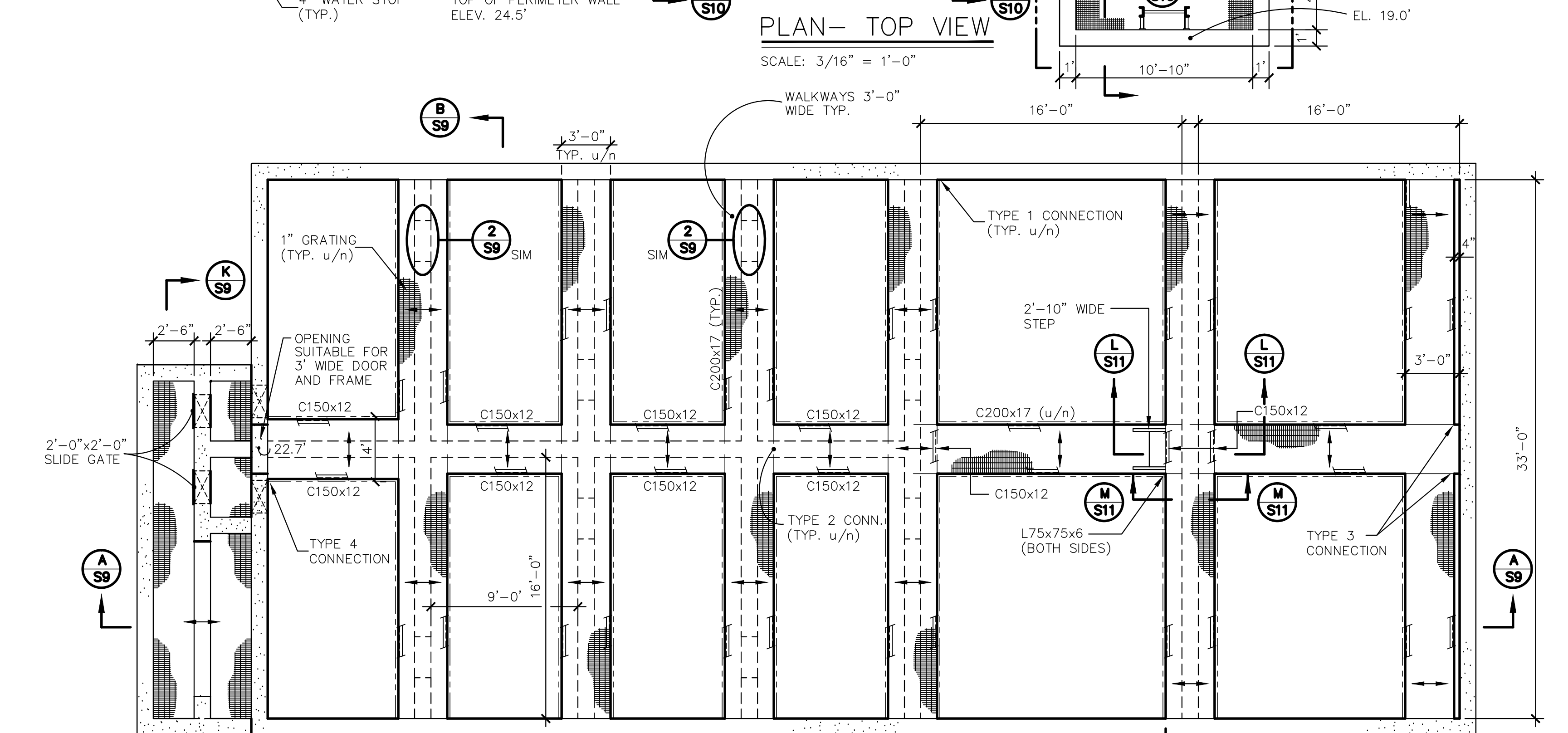
ABL Environmental
Consultants Ltd.

YMCL
Engineering Limited

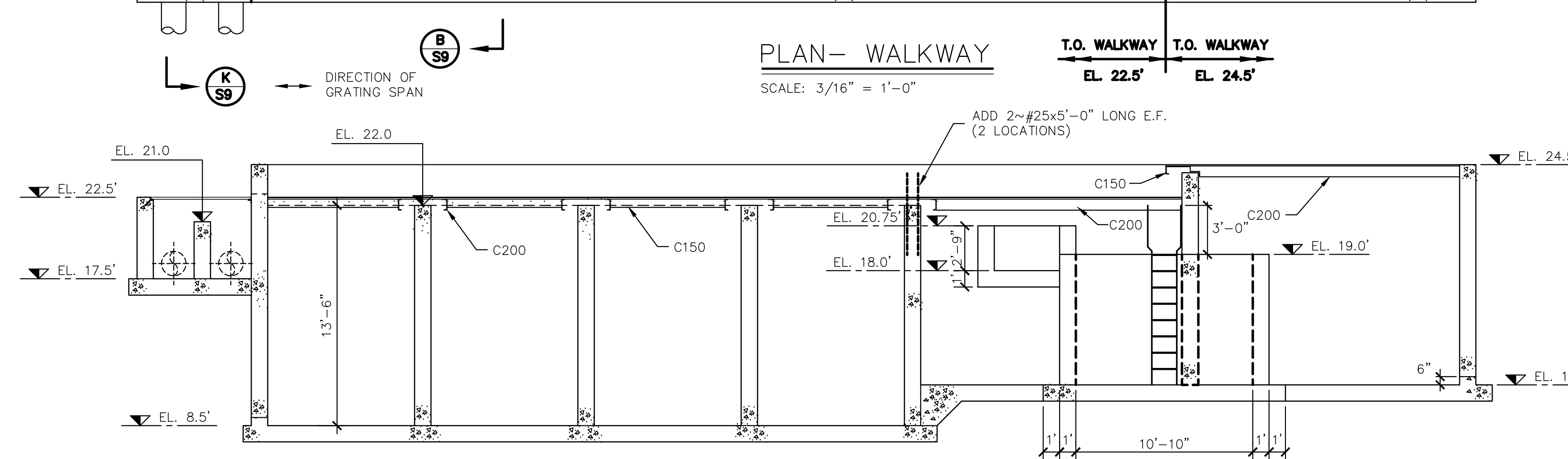
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Date	Drawn	Checked	Approved
AUG., 1998	CT	TAM	TAM
Contract No.	Sheet of	X OF X	
Drawing No.	Revision		
S4			



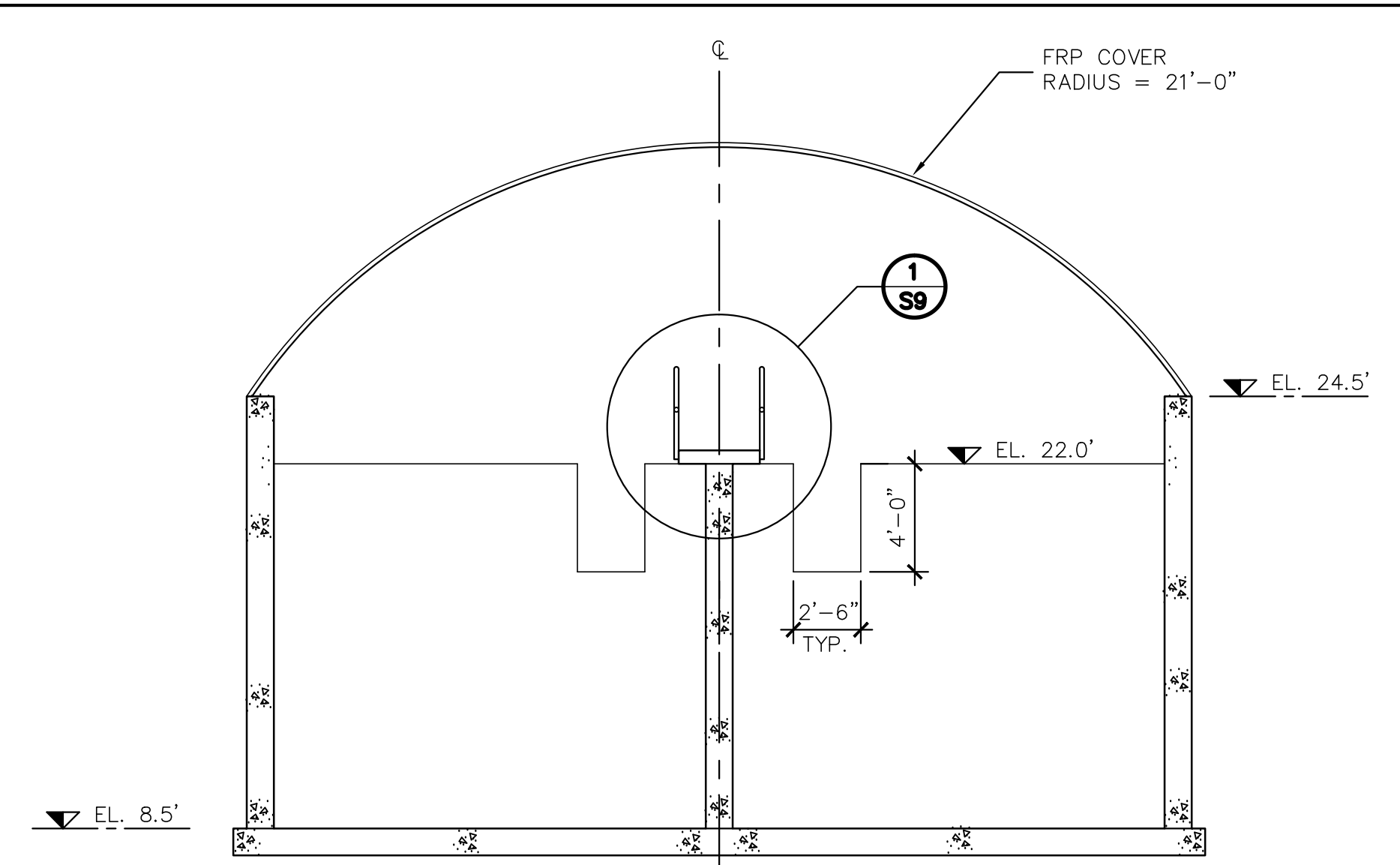
PLAN - TOP VIEW
SCALE: 3/16" = 1'-0"



PLAN - WALKWAY
SCALE: 3/16" = 1'-0"

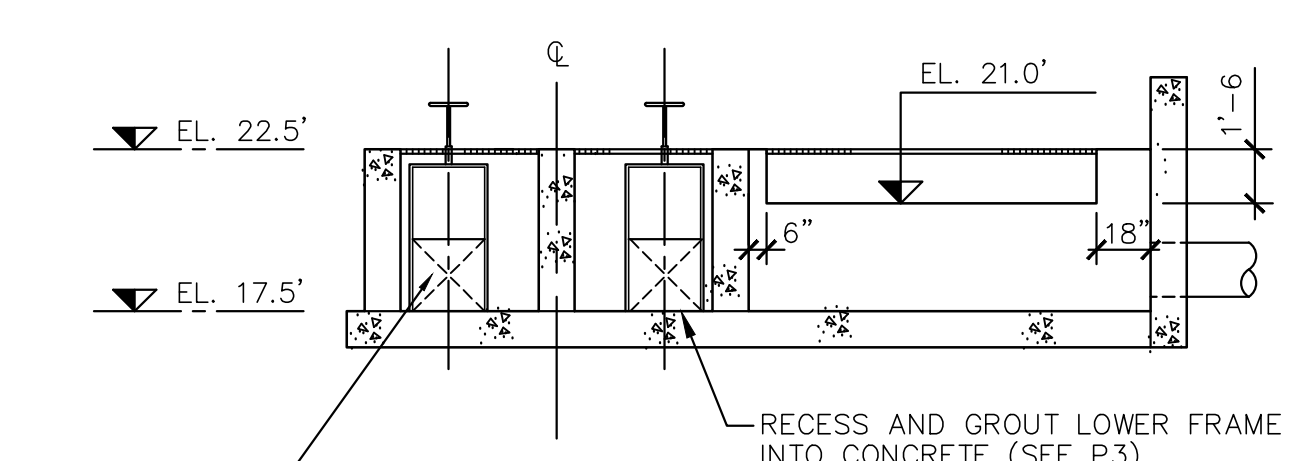


SECTION A-S9
SCALE: 3/16" = 1'-0"

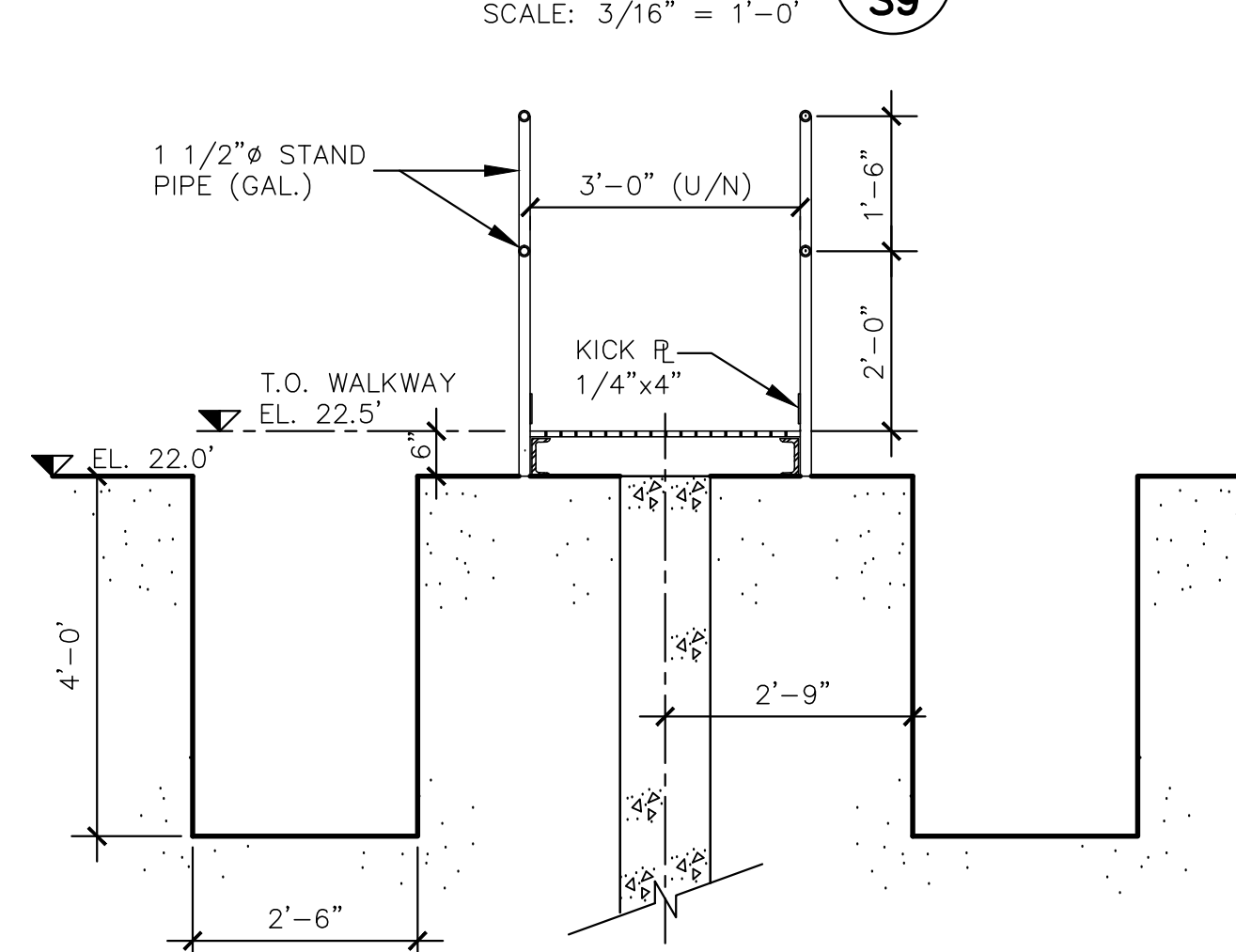


SECTION B-S9
SCALE: 3/16" = 1'-0"

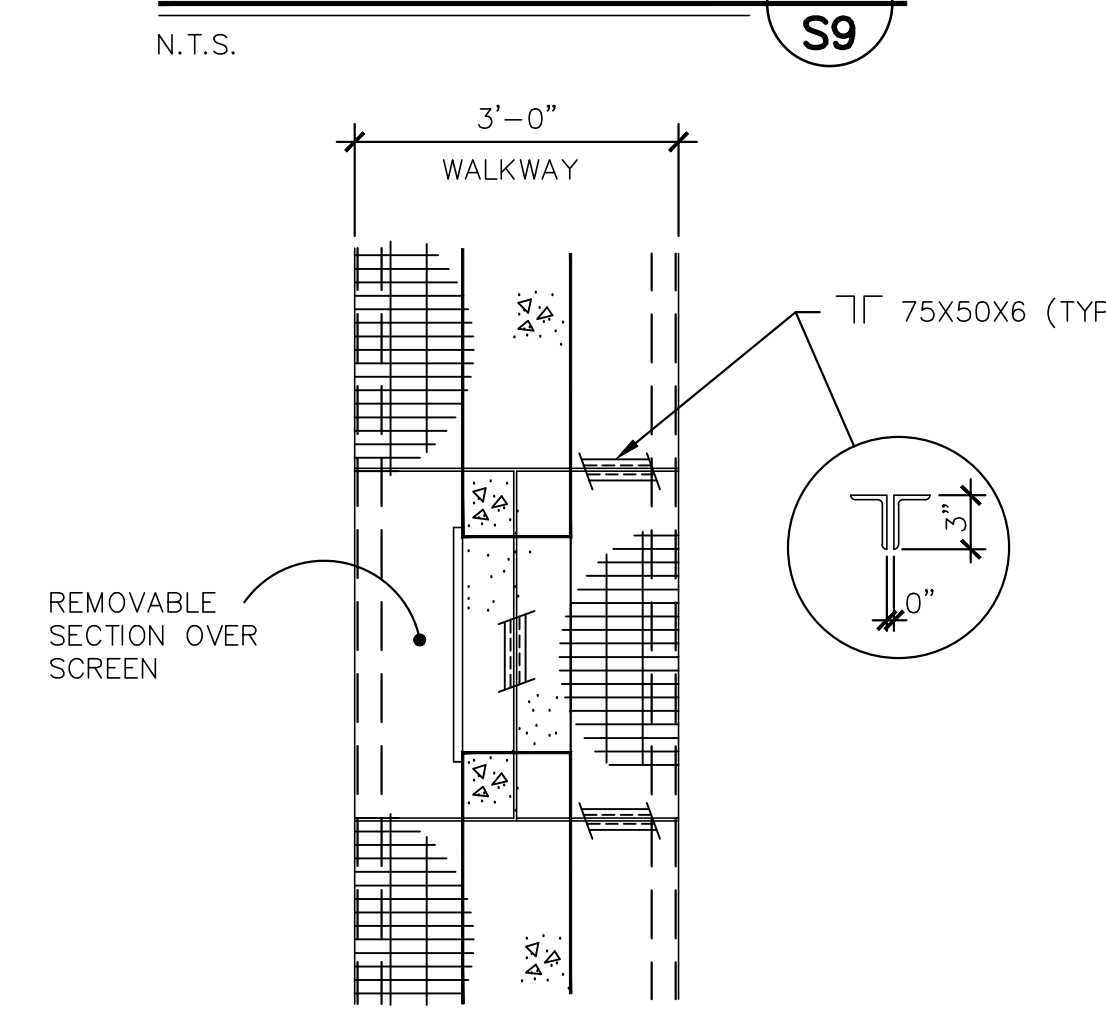
FRP COVER NOTES:
1. SUPPLY & INSTALL 75' LONG FRP COVER AS SPECIFIED.
2. FRP COVER TO HAVE DOUBLE DOOR EACH END & VENTILATION LOUVRES.



SECTION K-S9
SCALE: 3/16" = 1'-0"



DETAIL - TYP. WALKWAY 1-S9
N.T.S.



DETAIL - TYP. WALKWAY OPENING 2-S9
N.T.S.

GENERAL NOTES:
1. FOR NOTES SEE DRAWING S7.

No.	Description	Date	By
02	ISSUED FOR TENDER	APR./02	SWP
01	ISSUED FOR REVIEW	AUG./98	C.T.

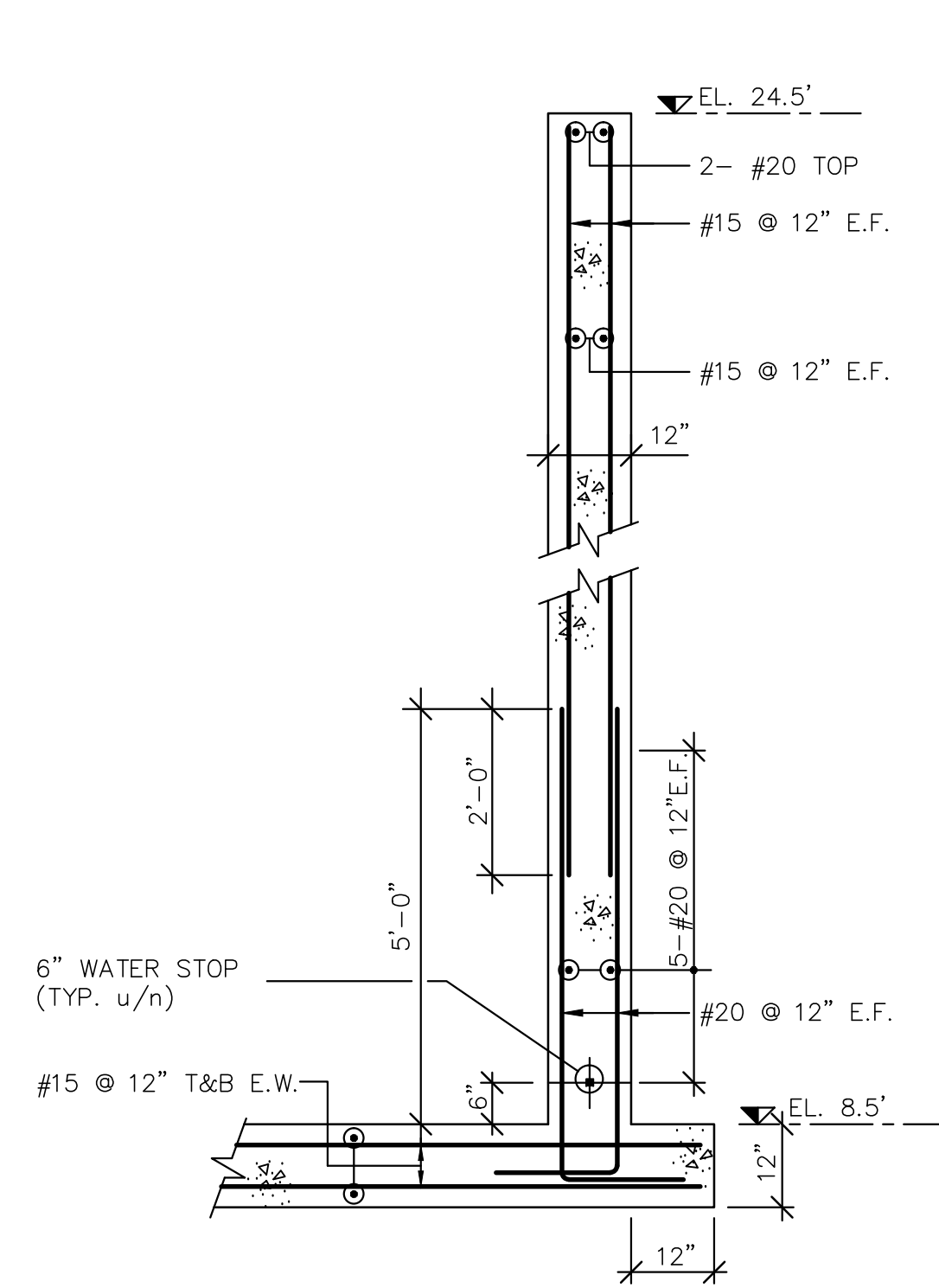
TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
AERATION BASIN PLANS,
SECTIONS AND DETAILS

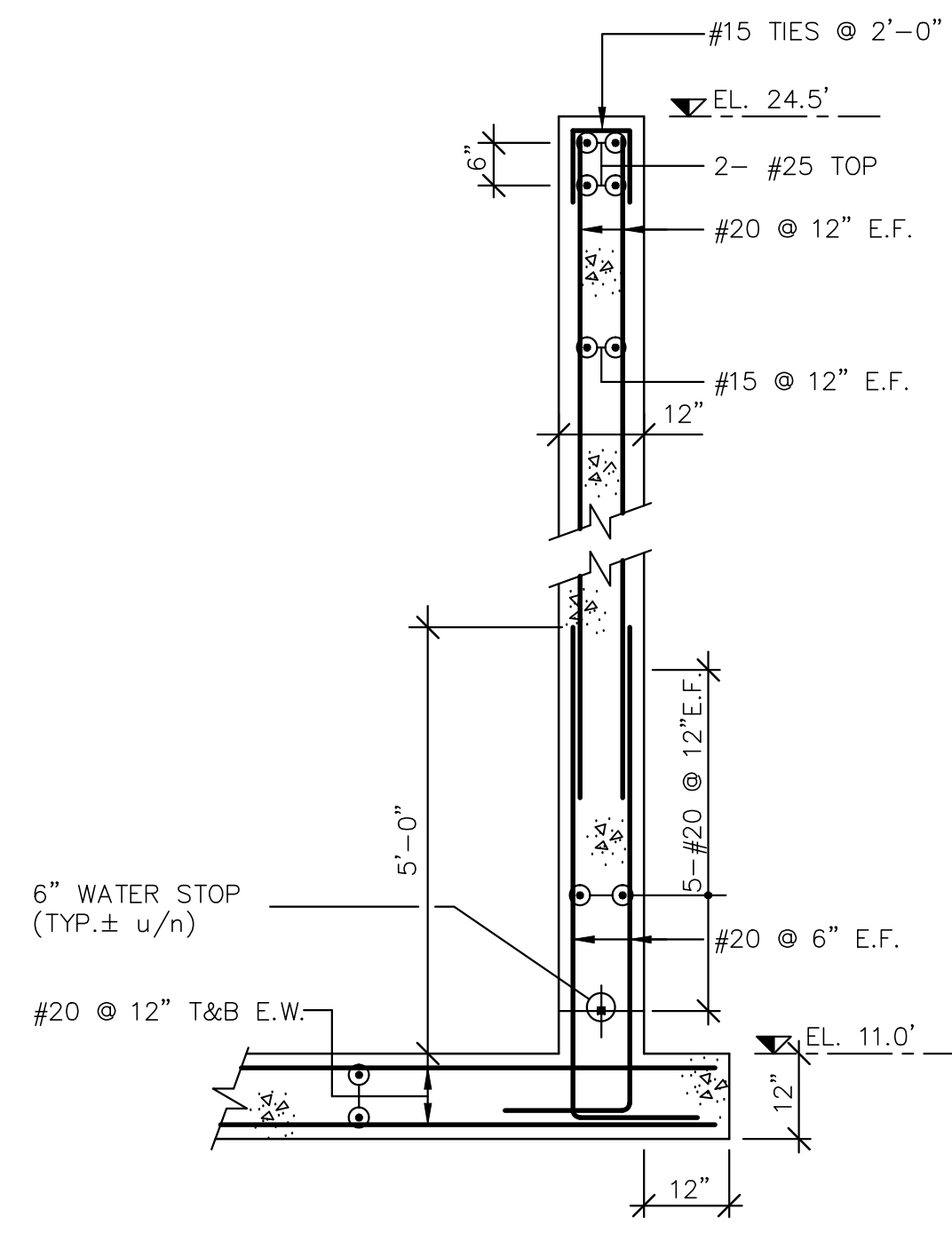
ABL Environmental Consultants Ltd.

YMCL Engineering Limited

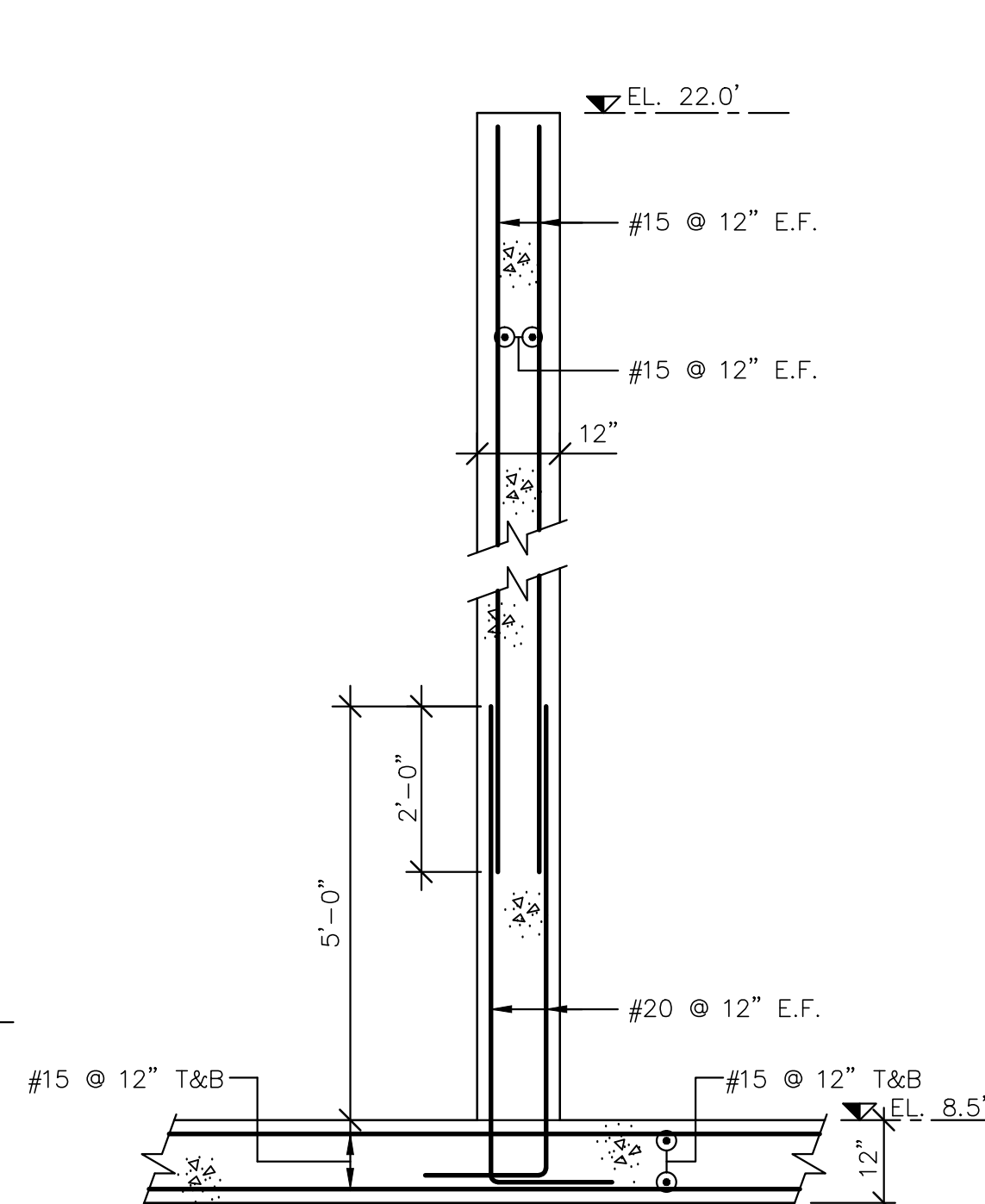
Scale AS SHOWN			
Date	Drawn		
AUG., 1998	CT	Designed	Approved
		TM/CTC	TM/CTC
Contract No.	Sheet of		
	X OF X		
Drawing No.	Revision		
S9			



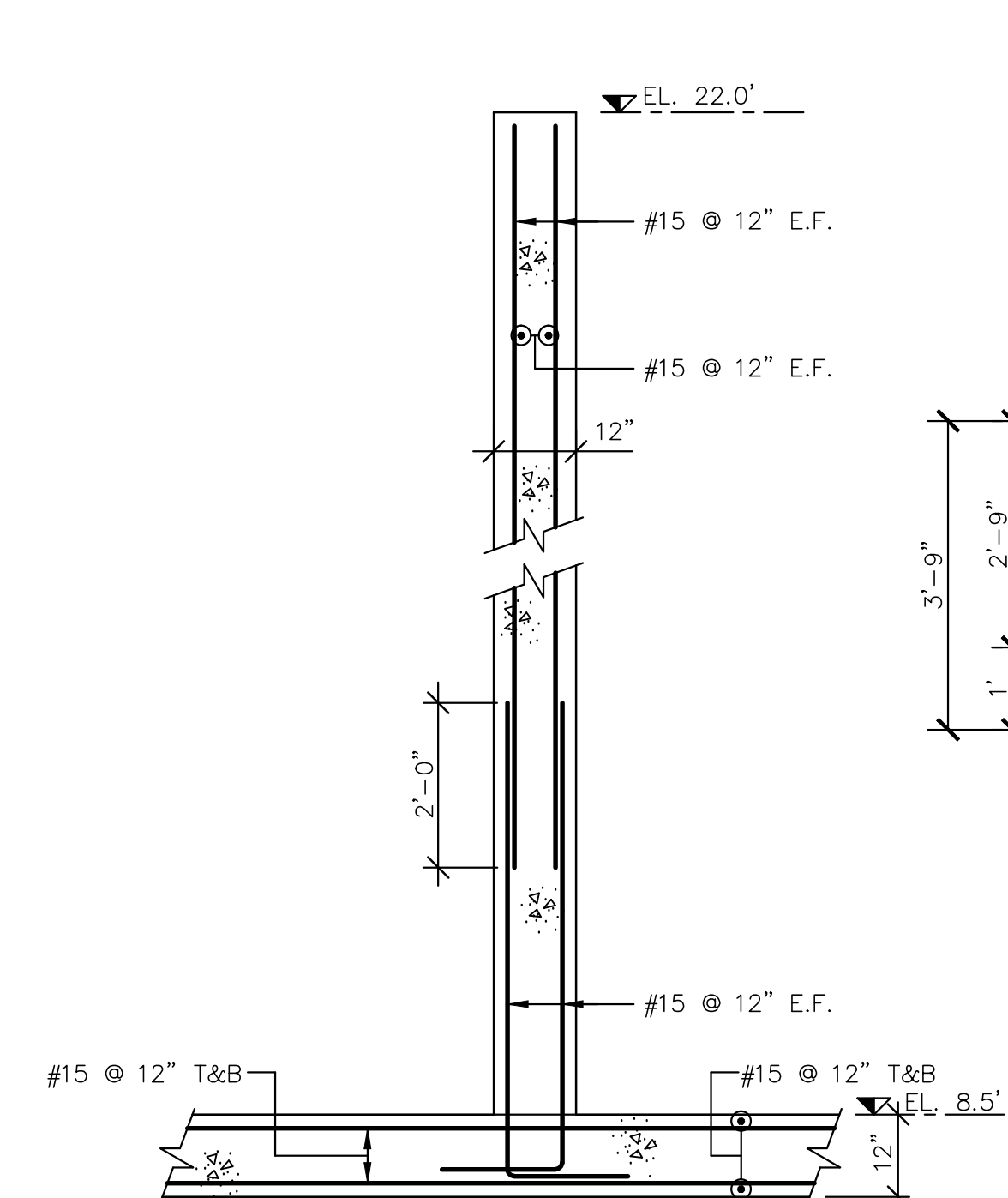
SECTION **C**
SCALE: 1/2" = 1'-0"



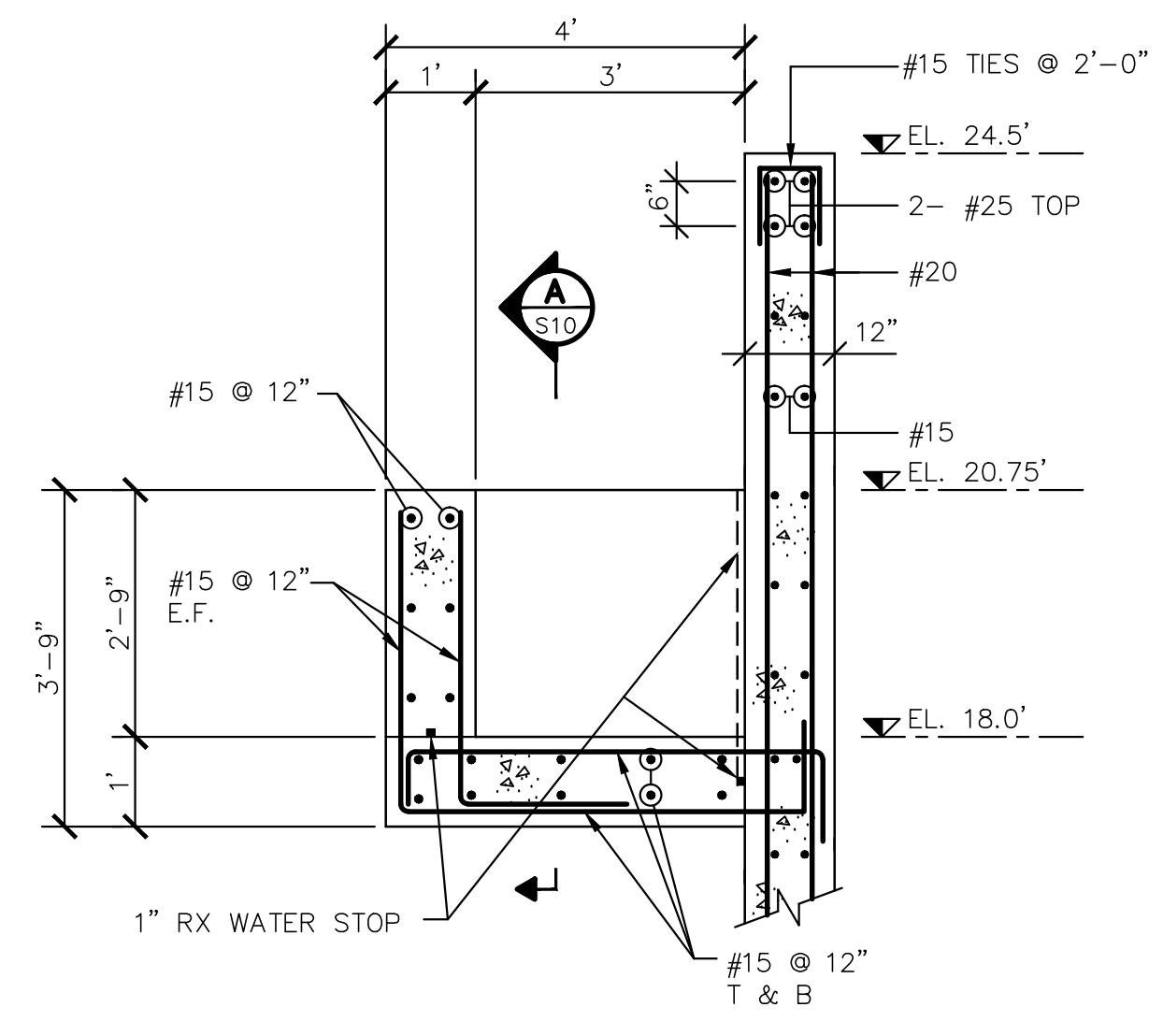
SECTION **D**
SCALE: 1/2" = 1'-0"



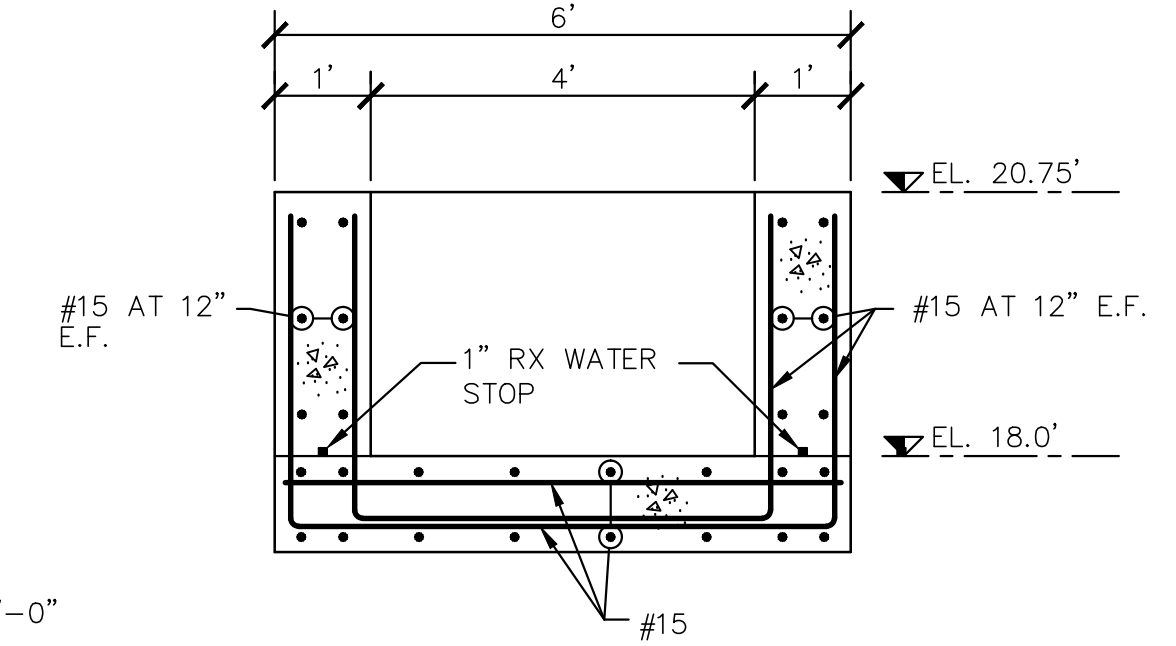
SECTION **E**
SCALE: 1/2" = 1'-0"



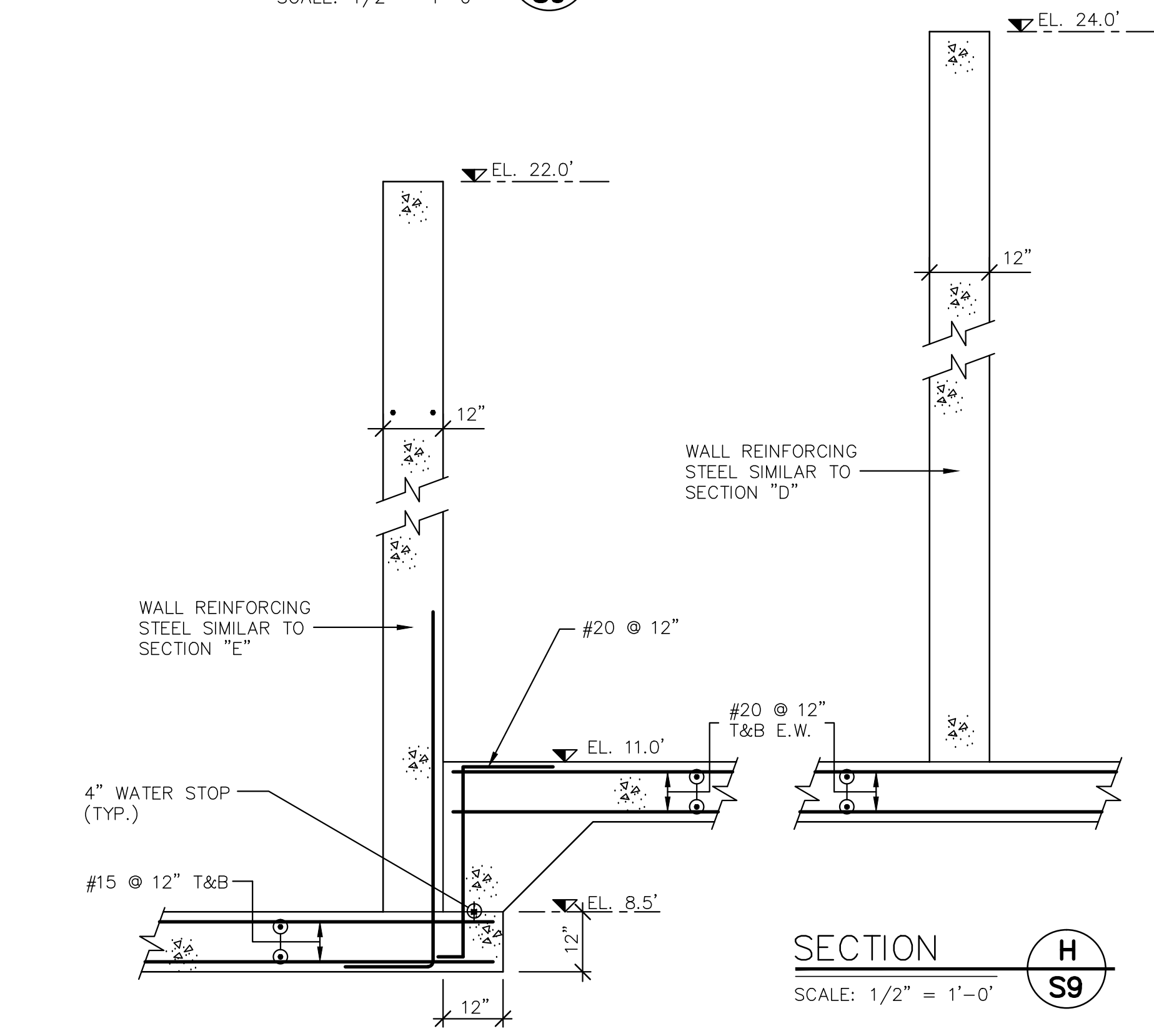
SECTION **F**
SCALE: 1/2" = 1'-0"



SECTION **L**
SCALE: 1/2" = 1'-0"

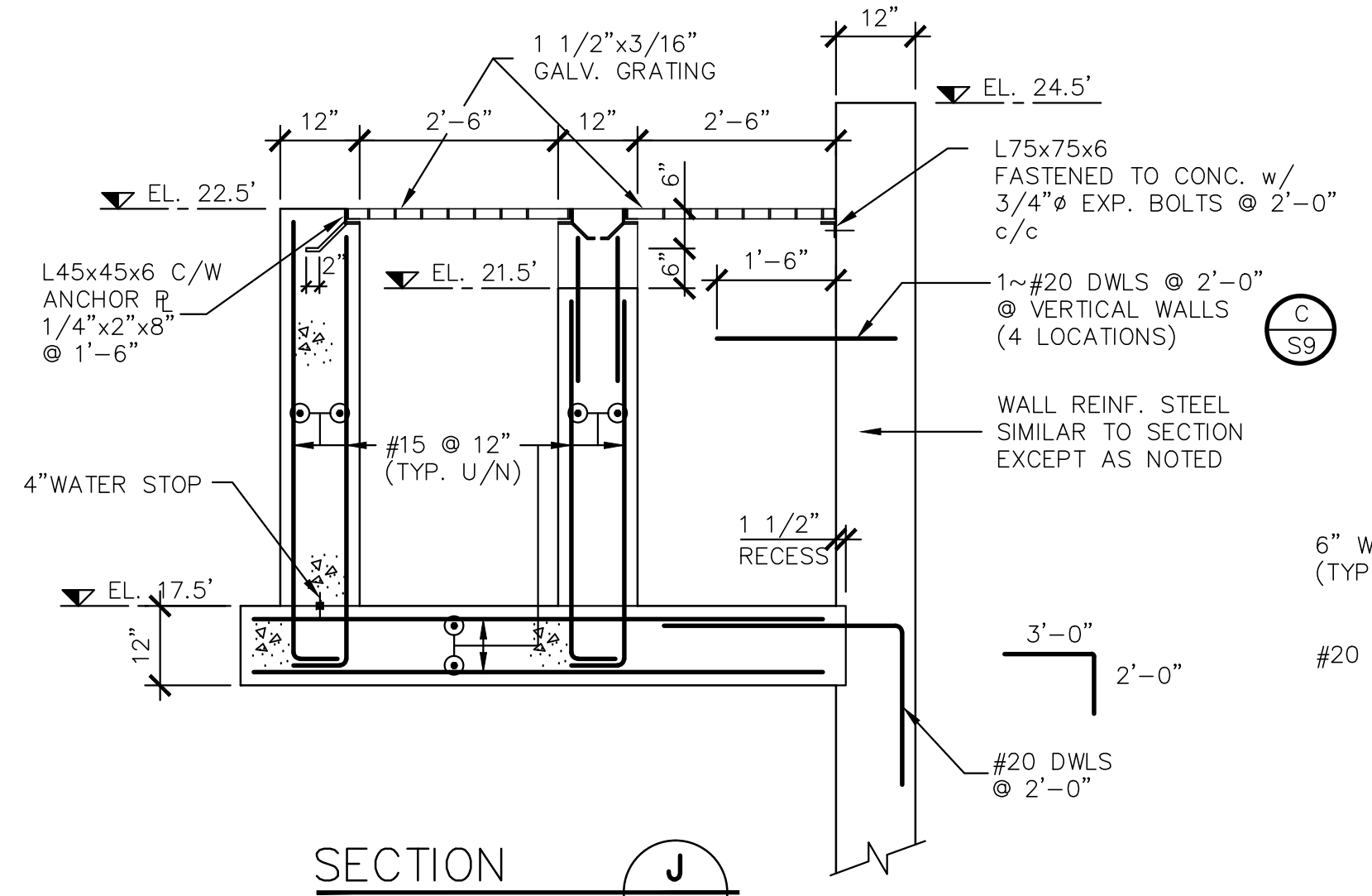


SECTION **A**
SCALE: 1/2" = 1'-0"

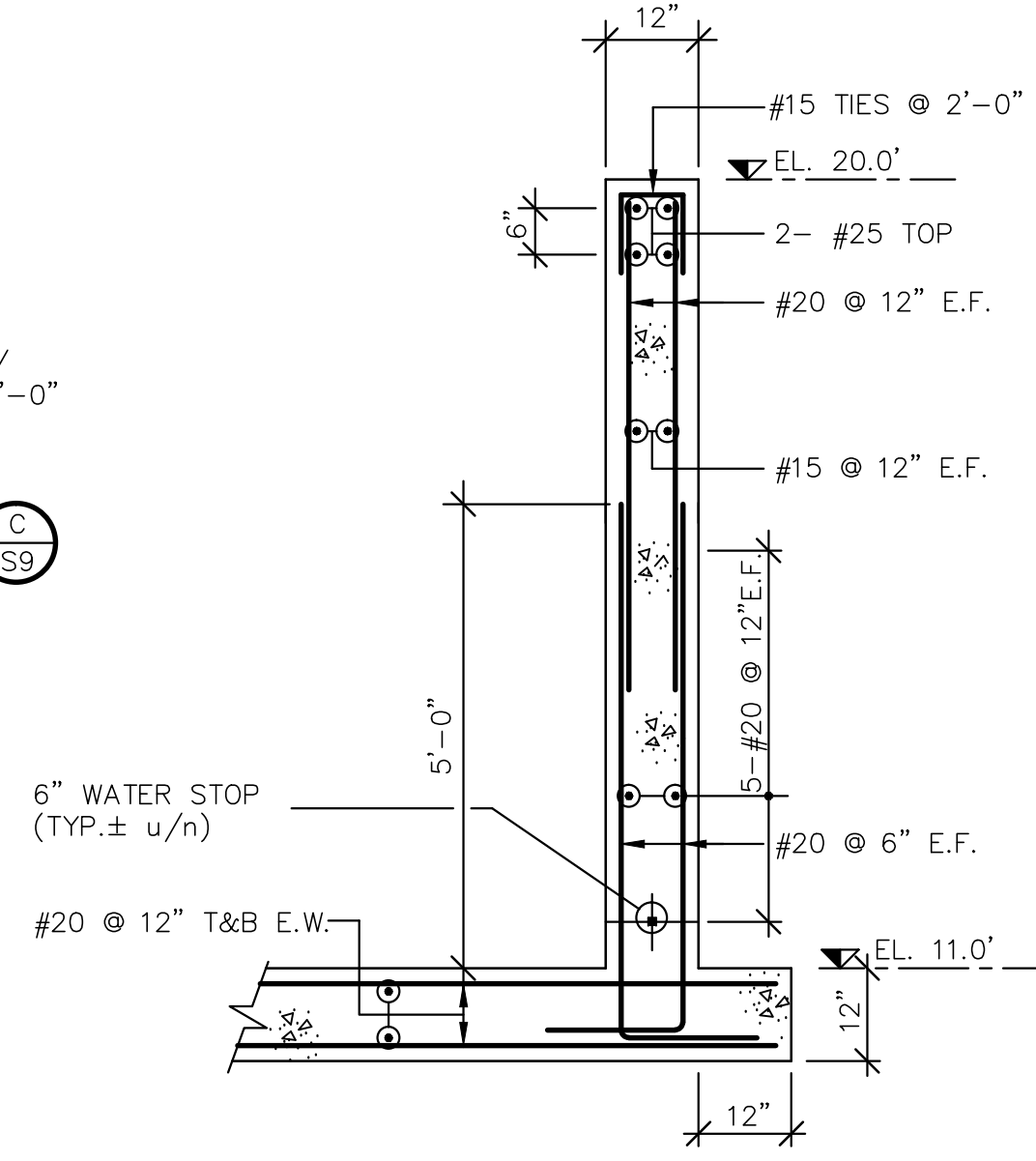


SECTION **G**
SCALE: 1/2" = 1'-0"

SECTION **H**
SCALE: 1/2" = 1'-0"



SECTION **J**
SCALE: 1/2" = 1'-0"



SECTION **K**
SCALE: 1/2" = 1'-0"

GENERAL NOTES:
1. FOR NOTES SEE DRAWING S7.

No.	Description	Date	By
02	ISSUED FOR TENDER	APR./02	SWP
01	ISSUED FOR REVIEW	AUG./98	C.T.

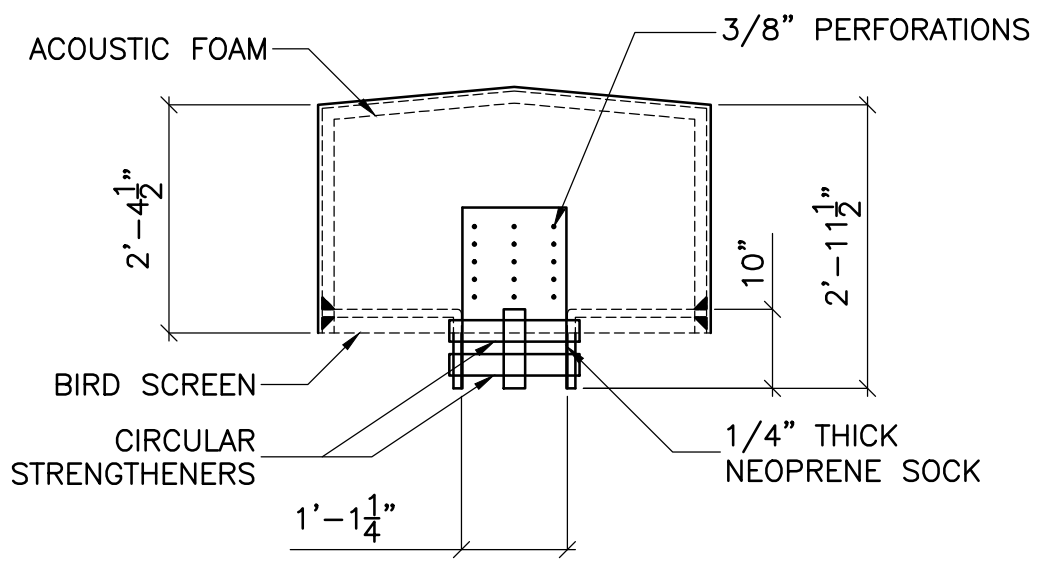
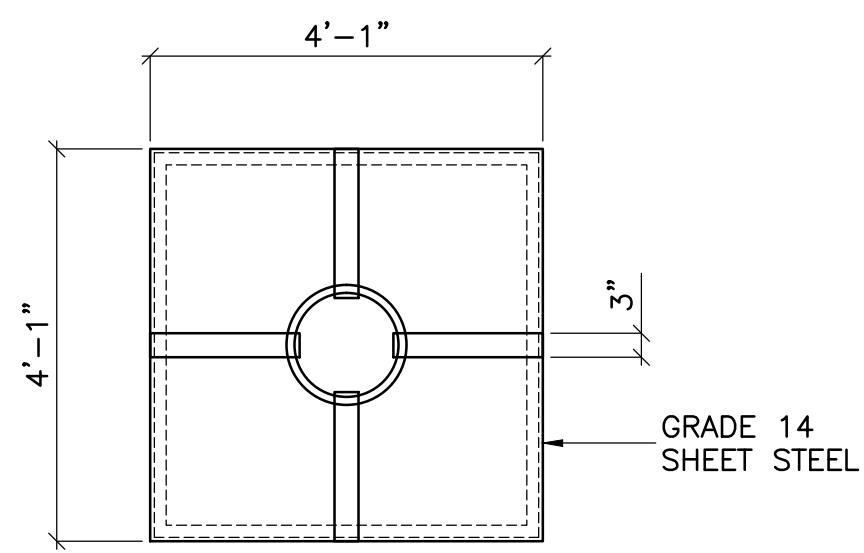
TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
AERATION BASIN
SECTIONS

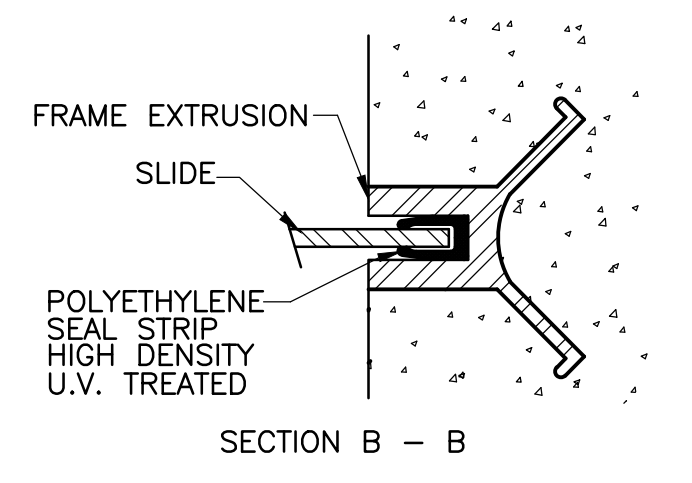
ABL Environmental
Consultants Ltd.

YMCL
Engineering Limited

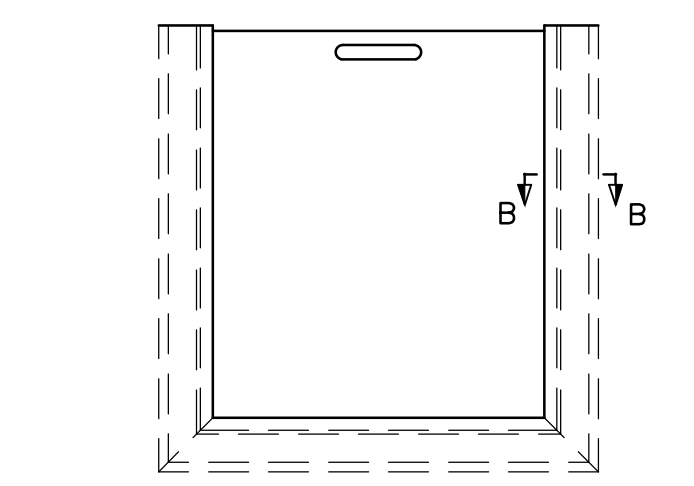
Scale AS SHOWN			
Date	AUG., 1998	Drawn	CT
Designed	CTC	Checked	CTC
Contract No		Sheet of	X OF X
Drawing No	S10	Revision	



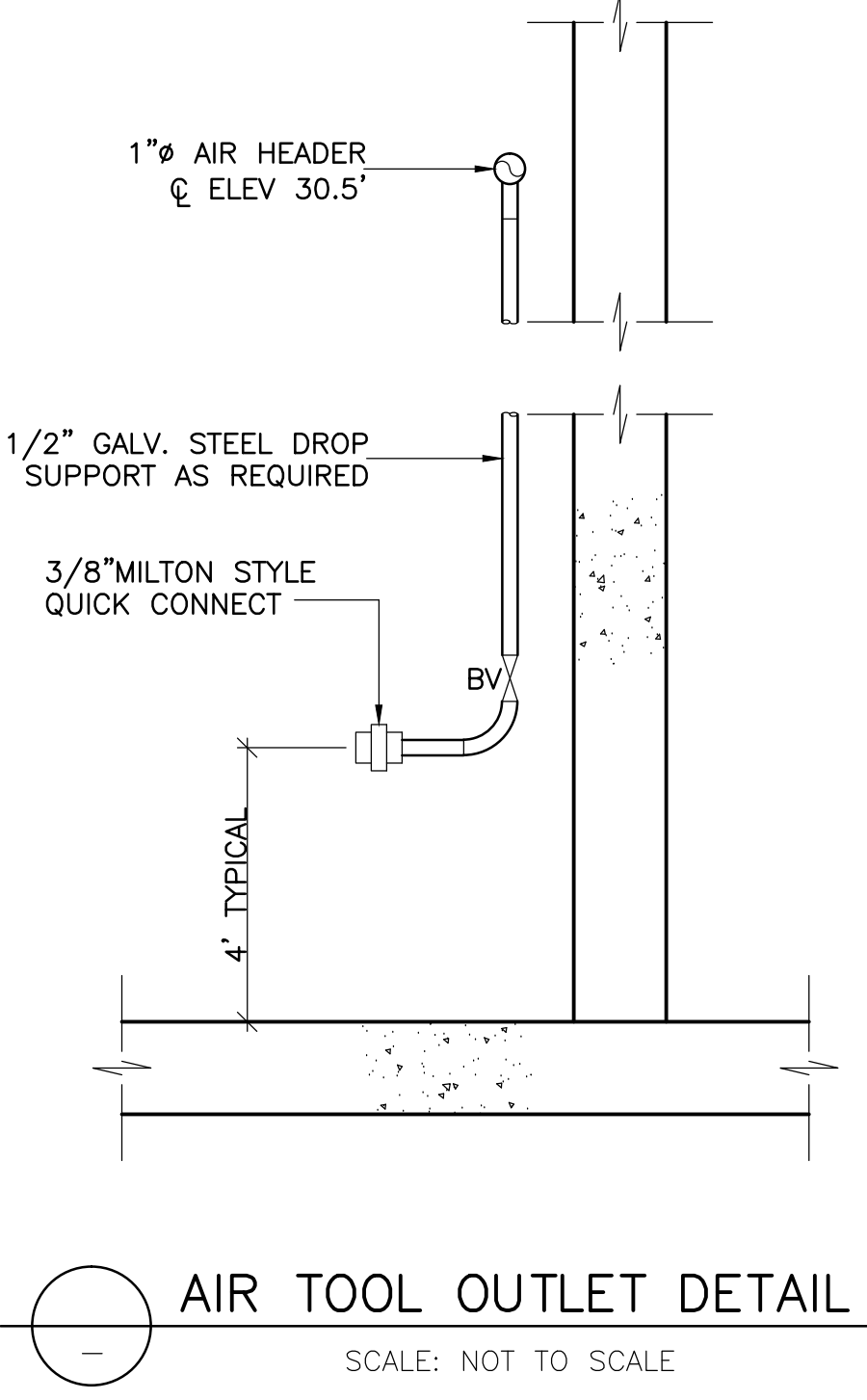
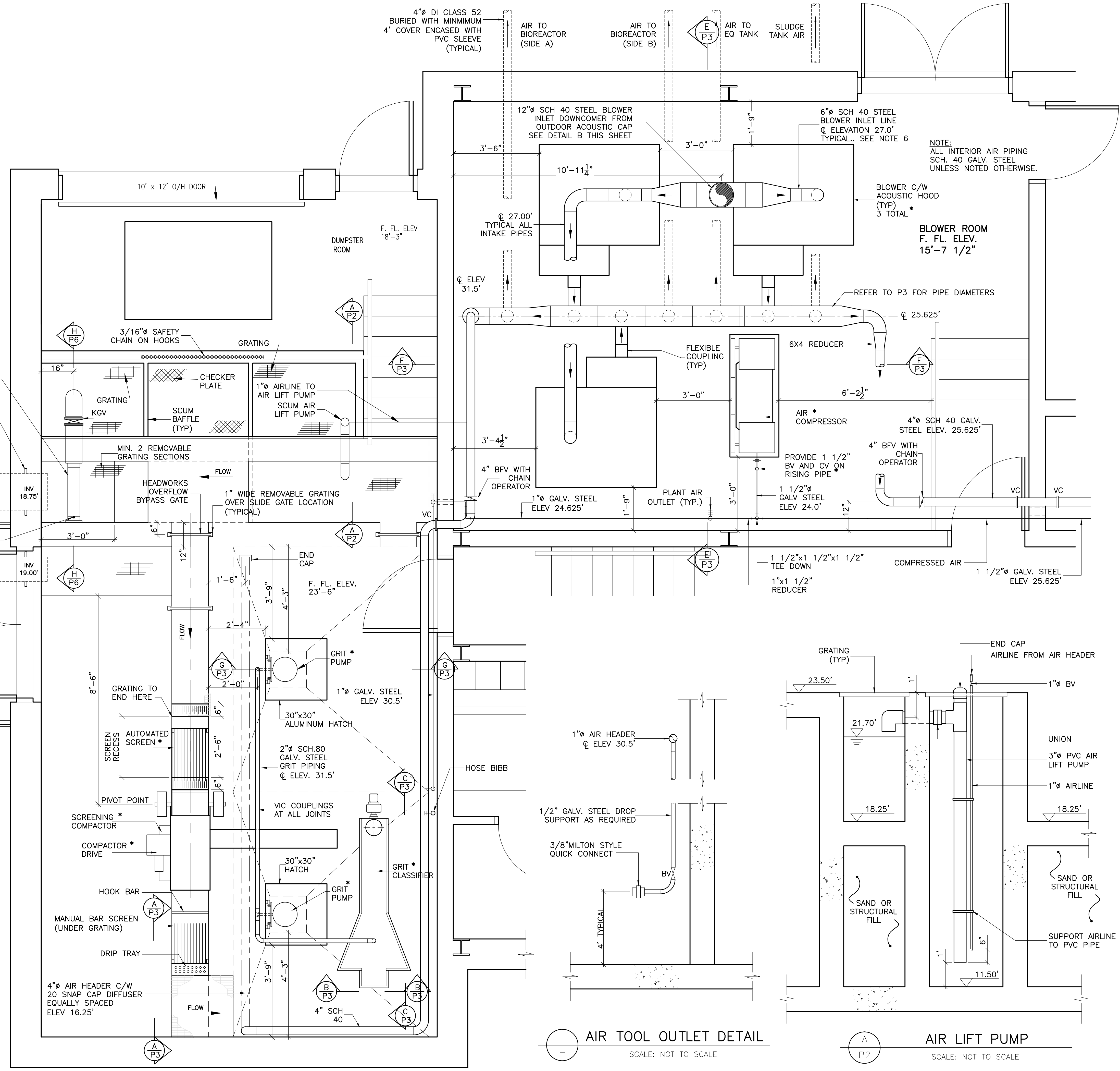
B **OUTDOOR ACOUSTIC CAP**
SCALE: NOT TO SCALE



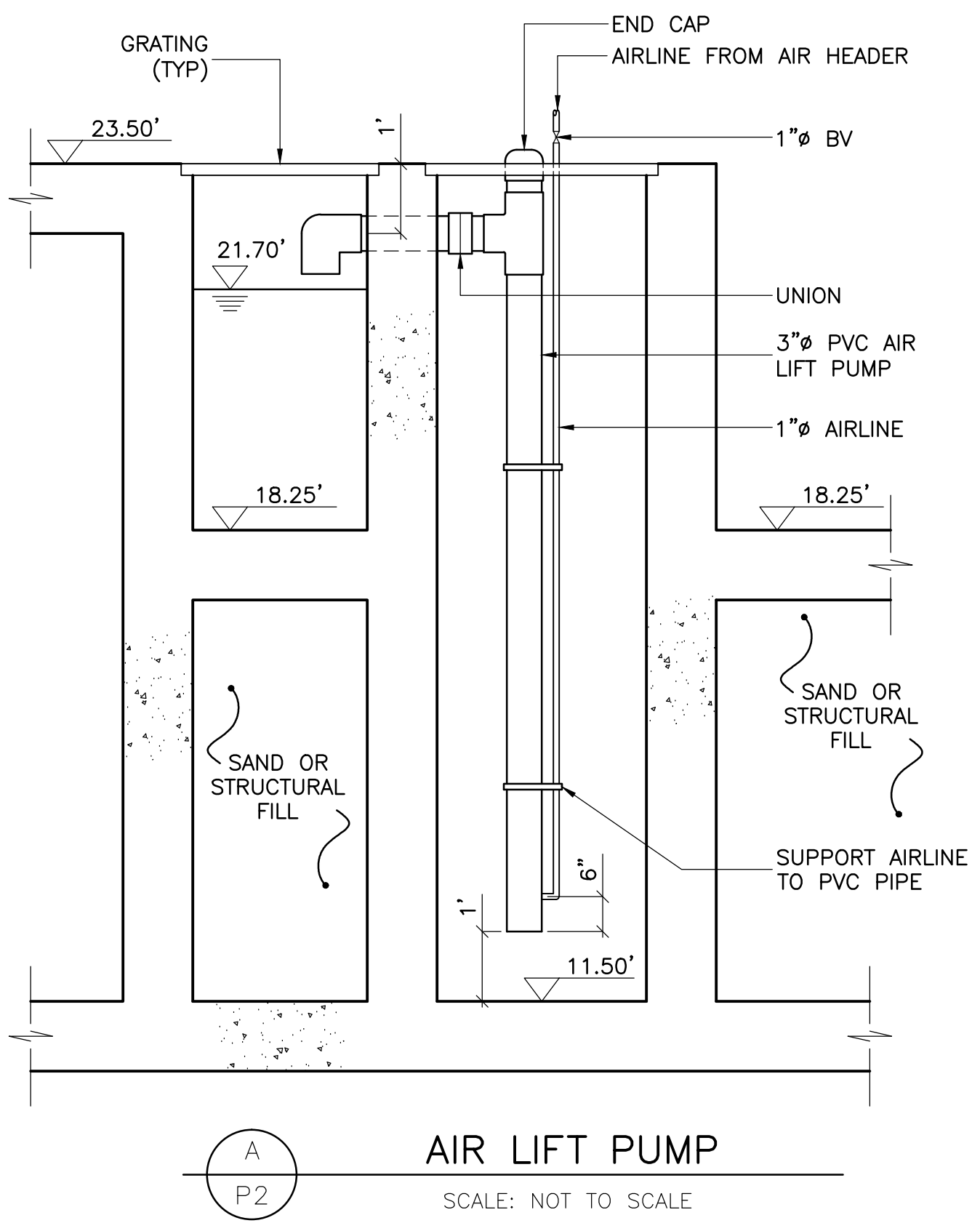
SECTION B - B



1 **SLIDE GATE**
SCALE: NOT TO SCALE



2 **AIR TOOL OUTLET DETAIL**
SCALE: NOT TO SCALE



A **AIR LIFT PUMP**
SCALE: NOT TO SCALE

- GENERAL NOTES:**
- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.
 - PIPE ELEVATION ARE TO CENTRELINE UNLESS OTHERWISE NOTED.
 - WHEN PIPE CONFLICTS OCCUR THE LARGER DIAMETER PIPE WILL HAVE ROUTING PRIORITY.
 - * - INDICATES PRE-PURCHASED EQUIPMENT.
 - INSULATE ALL INTAKE PIPE WITH MINIMUM 1" THICK INSULATED WRAP.

- LEGEND**
- WELD
 - VIC COUPLING
 - FLANGED
 - UNION
 - PLANT AIR OUTLET
- BV - BALL VALVE
 BFV - BUTTERFLY VALVE
 GV - GATE VALVE
 GLV - GLOBE VALVE
 PV - PLUG VALVE
 PNV - PINCH VALVE
 CV - CHECK VALVE
 BV - BALL VALVE
 KGV - KNIFE GATE VALVE
 VC - VICTAULIC COUPLING MAINTENANCE JOINT

No.	Description	Date	By
04	RE-ISSUED FOR TENDER	APR/02	JH
03	RE-ISSUED FOR DAF PRE-PURCHASE	JAN/02	JH
02	ISSUED FOR EQUIPMENT PRE-PURCHASE	OCT 3/01	JH
01	ISSUED FOR REVIEW	DEC./98	TA

Revision or Issue

TOWN OF LUNENBURG

MUNICIPAL WASTEWATER COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT HEADWORKS / BLOWER ROOM PLAN



Scale 1/2" = 1'-0"

Date	Drawn
OCT 2001	GP
Designed GFB	Checked TA
Contract No 98001	Approved JCL
Sheet No 22/43	Revision
Drawing No	

P2

98001.P2.dwg
 12/04/2002 9:59 PM
 ABL Environmental Consultants Ltd.

GENERAL NOTES:

- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.
- * - INDICATES PRE-PURCHASED EQUIPMENT.

LEGEND

- WELD
- VIC COUPLING
- FLANGED
- UNION
- PLANT AIR OUTLET
- LIMIT OF GENERAL CONTRACTOR.

- BV - BALL VALVE
- BFV - BUTTERFLY VALVE
- GV - GATE VALVE
- GLV - GLOBE VALVE
- PV - PLUG VALVE
- PNV - PINCH VALVE
- CV - CHECK VALVE
- BV - BALL VALVE
- KGV - KNIFE GATE VALVE
- VC - VICTAULIC COUPLING MAINTENANCE JOINT

No.	Description	Date	By
03	RE-ISSUED FOR TENDER	APR/02	JH
02	ISSUED FOR EQUIPMENT PRE-PURCHASE	OCT 3/01	TA
01	ISSUED FOR REVIEW	DEC./98	TA

Revision or Issue

TOWN OF LUNENBURG
MUNICIPAL WASTEWATER COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
HEADWORKS / BLOWER ROOM DETAILS

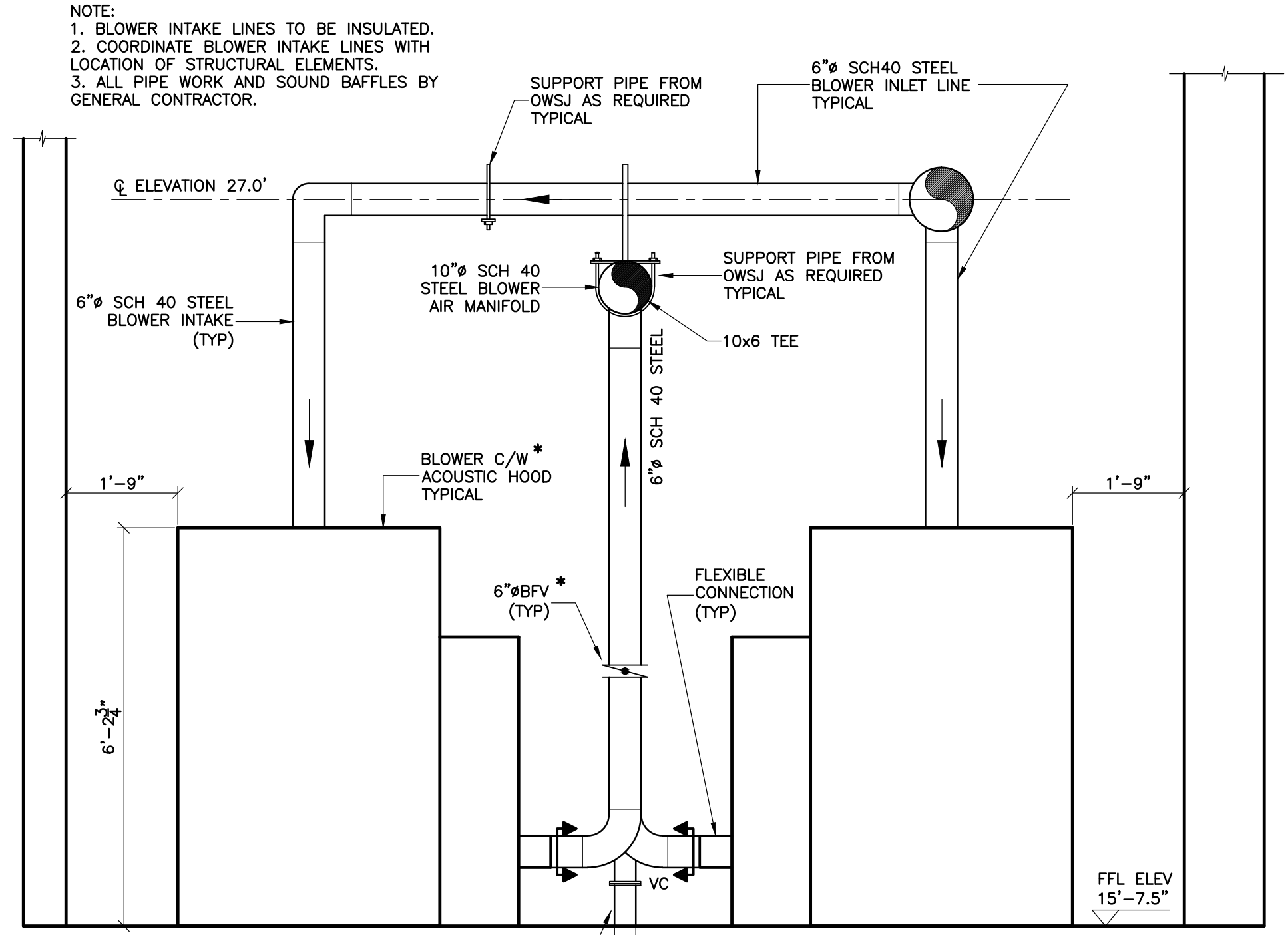
ABL Environmental Consultants Ltd.

102 PORTLAND STREET, P.O. BOX 501
DARTMOUTH, NS, B2Y 3Y8 TEL: (902)468-0050
FAX: (902)468-4399

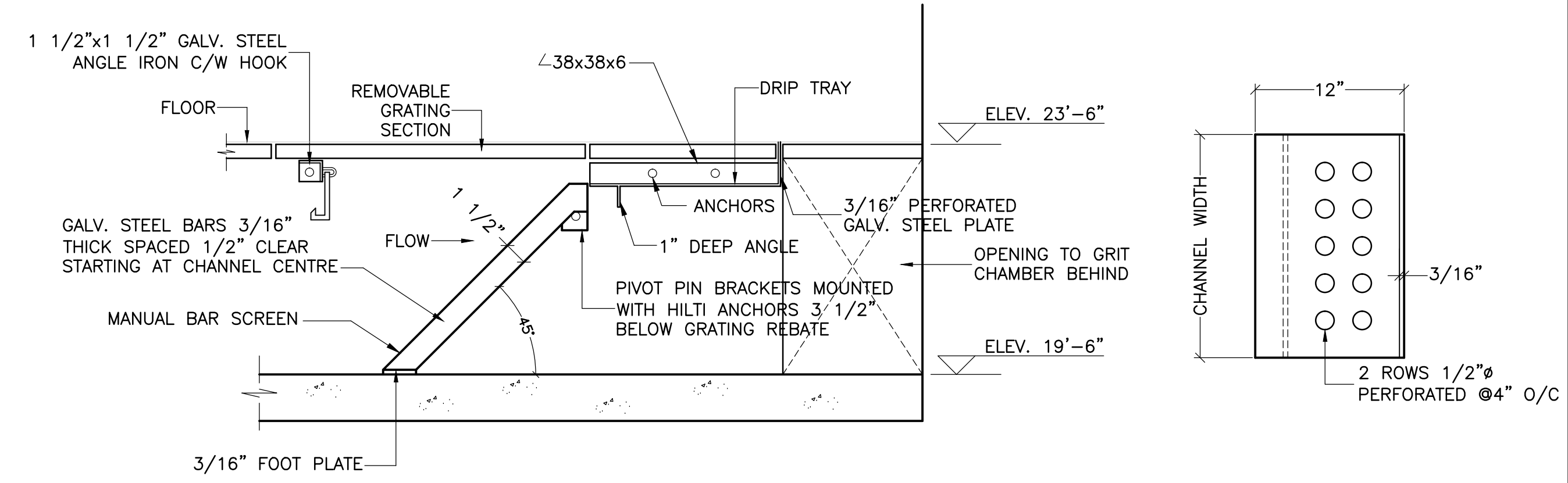
Scale 1/2" = 1'-0"

Date	Drawn
OCT 2001	GP
Designed	Checked
GFB	TA
Contract No	Approved
98001	JCL
Drawing No	Sheet of
	23/43
	Revision

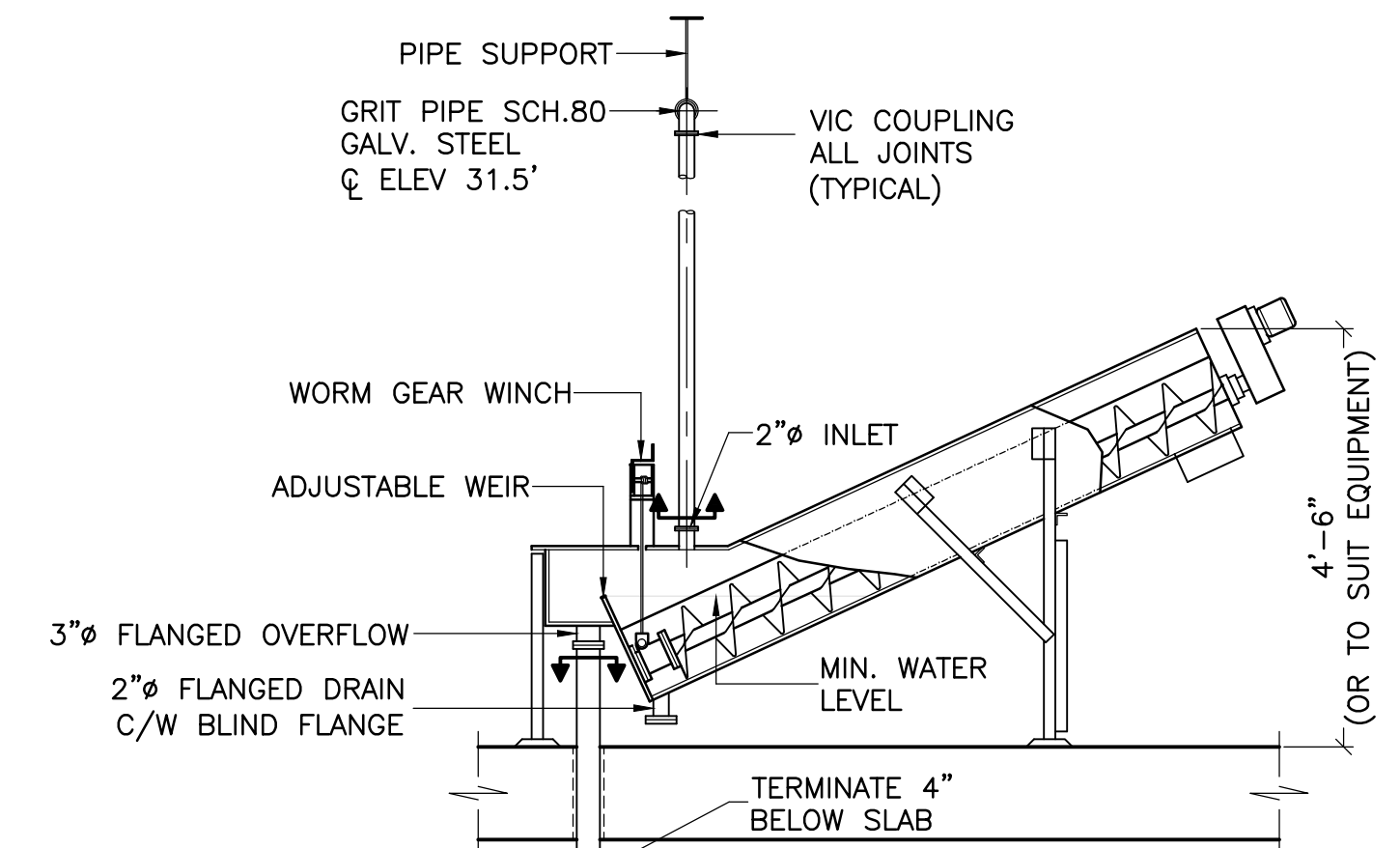
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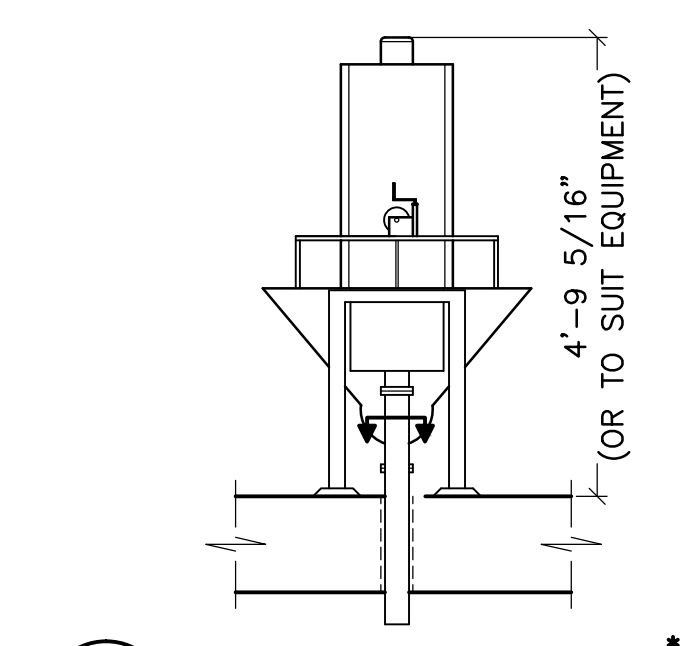
E BLOWER AIR MANIFOLD
N.T.S.



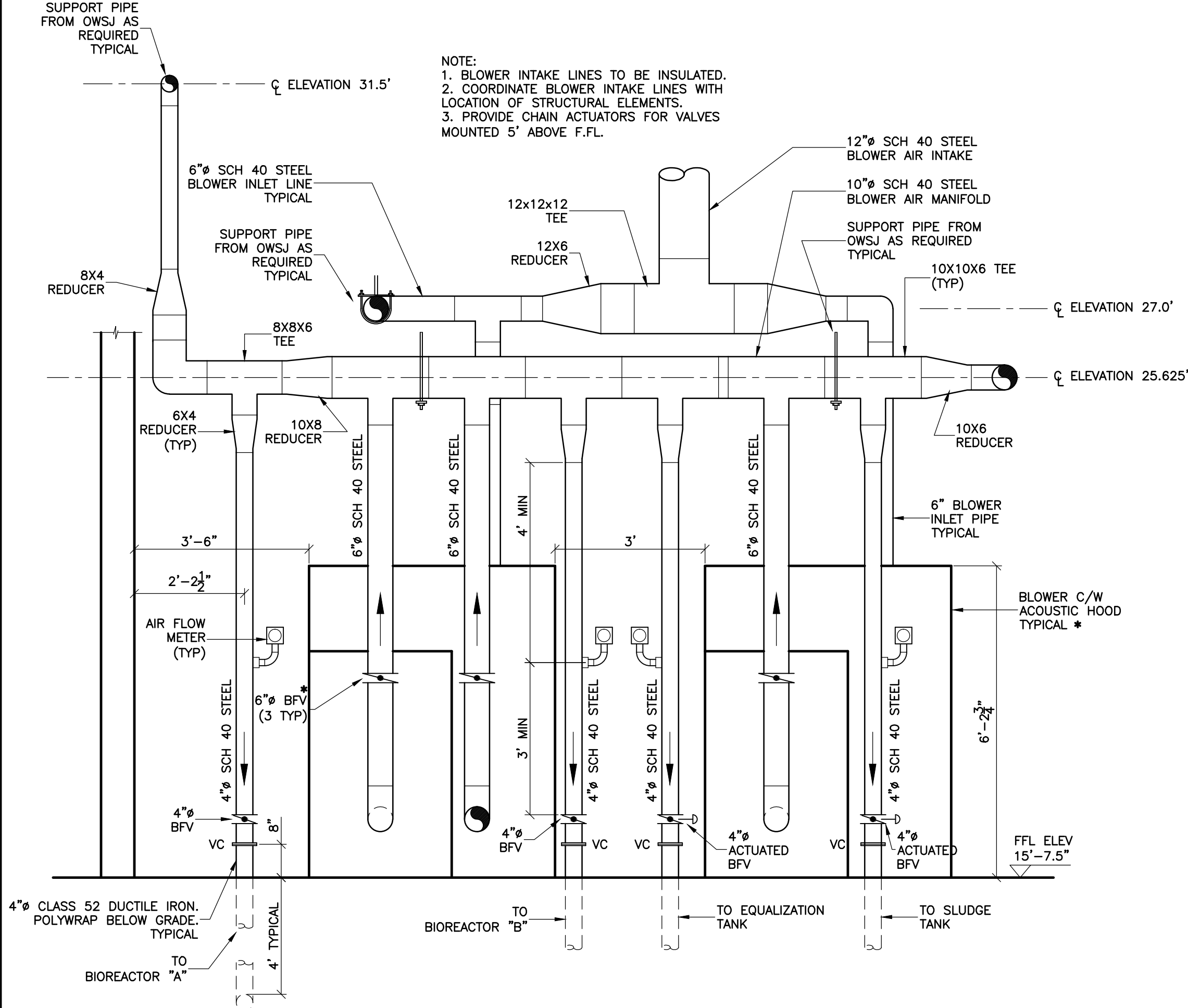
A BAR SCREEN - SECTION SCALE: NOT TO SCALE
B DRIP TRAY - PLAN SCALE: NOT TO SCALE



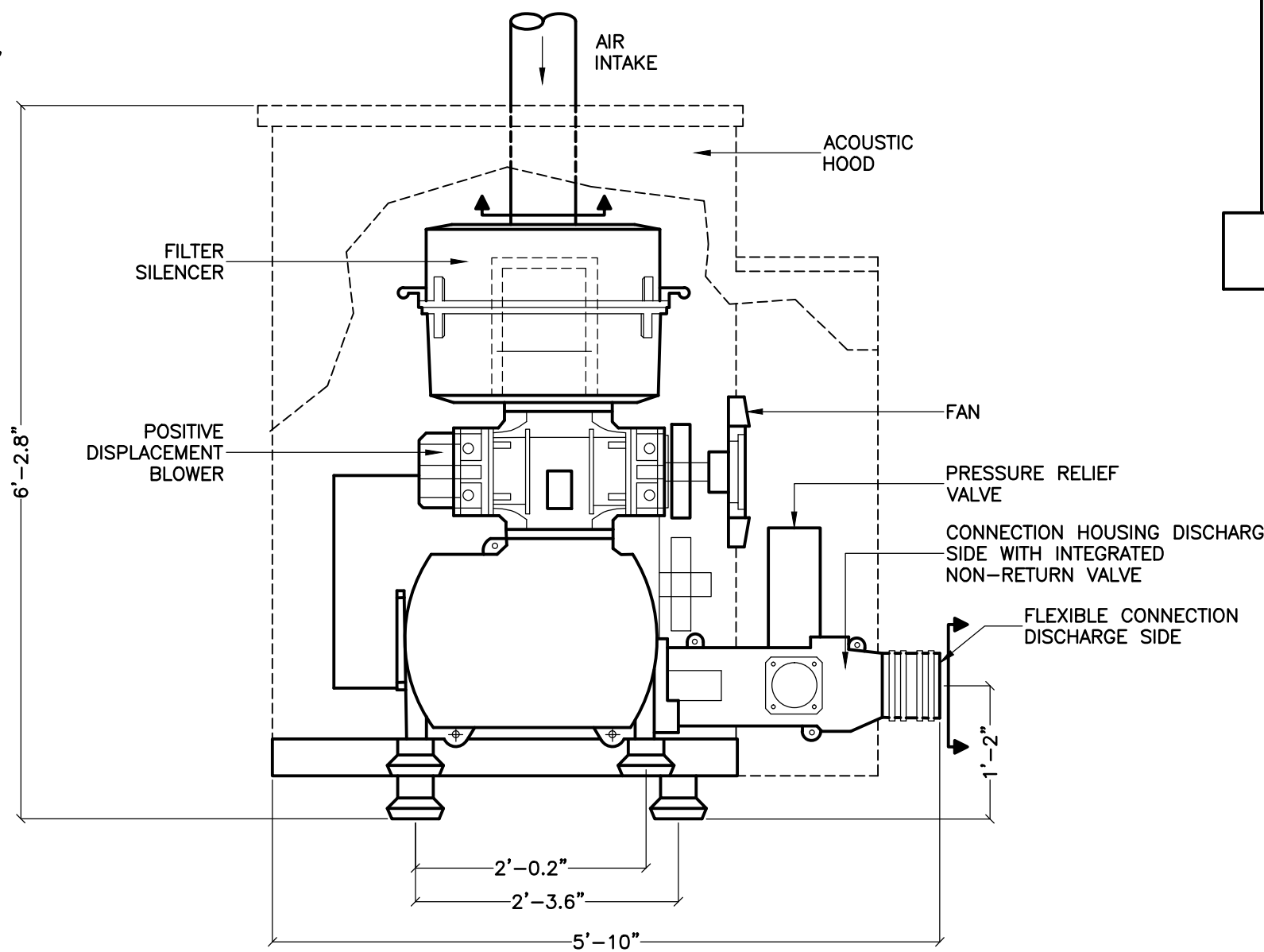
C GRIT CLASSIFIER - SECTION*
N.T.S.



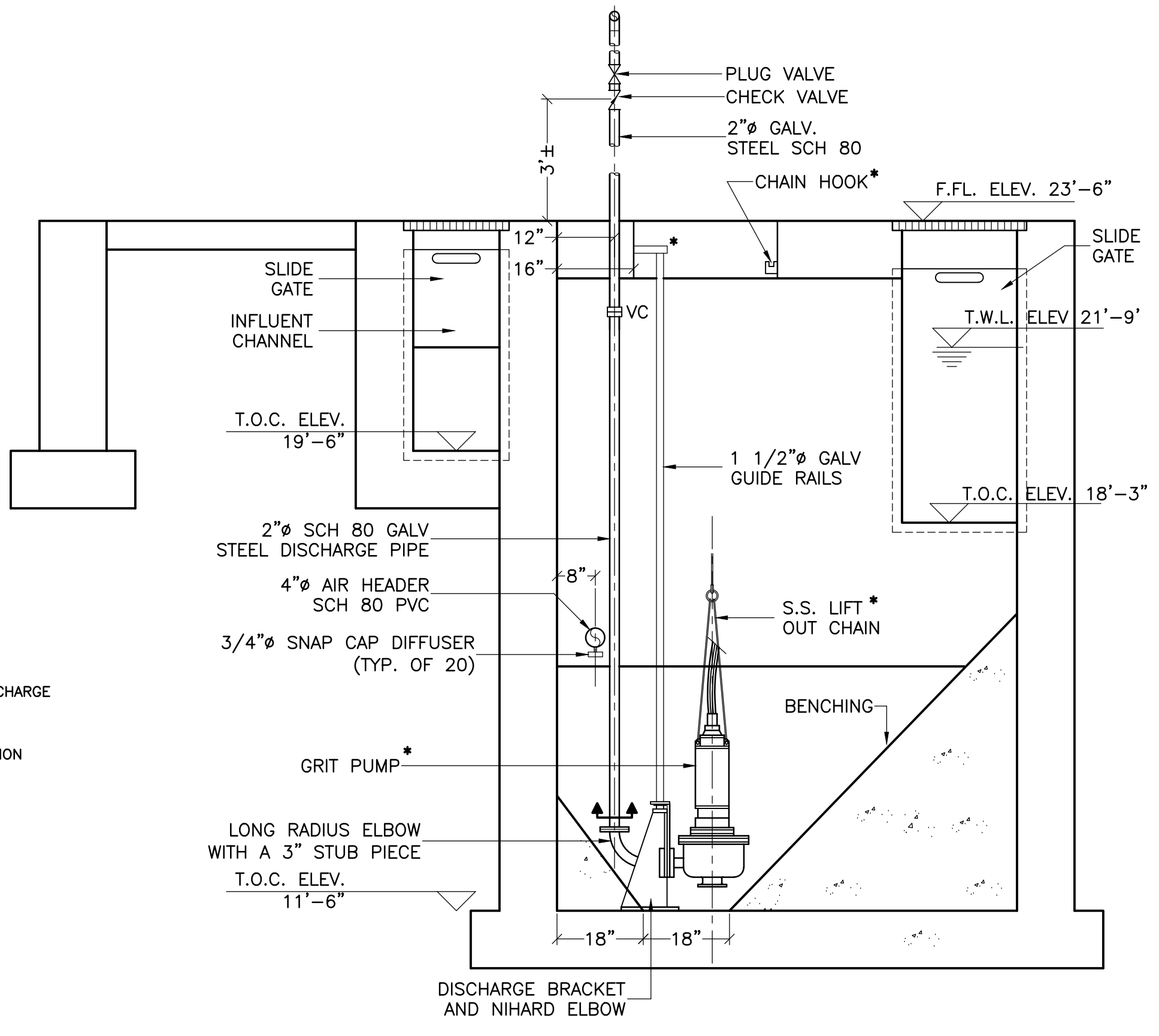
B GRIT CLASSIFIER*
N.T.S.



F BLOWER AIR MANIFOLD
N.T.S.

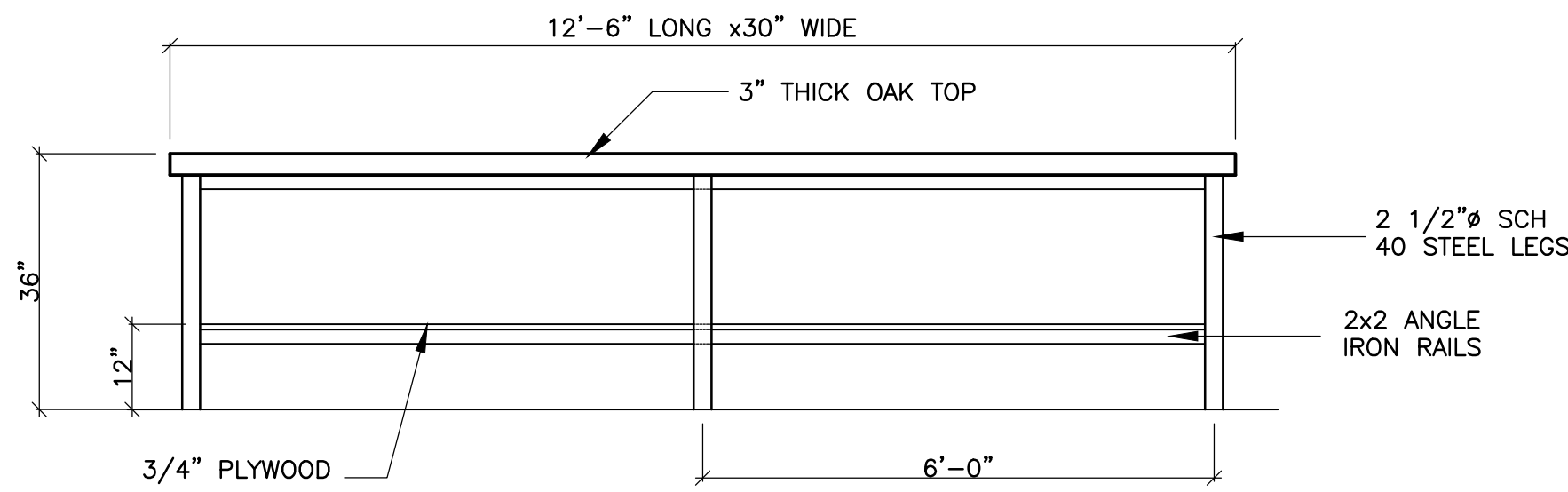


D BLOWER ARRANGEMENT*
N.T.S.

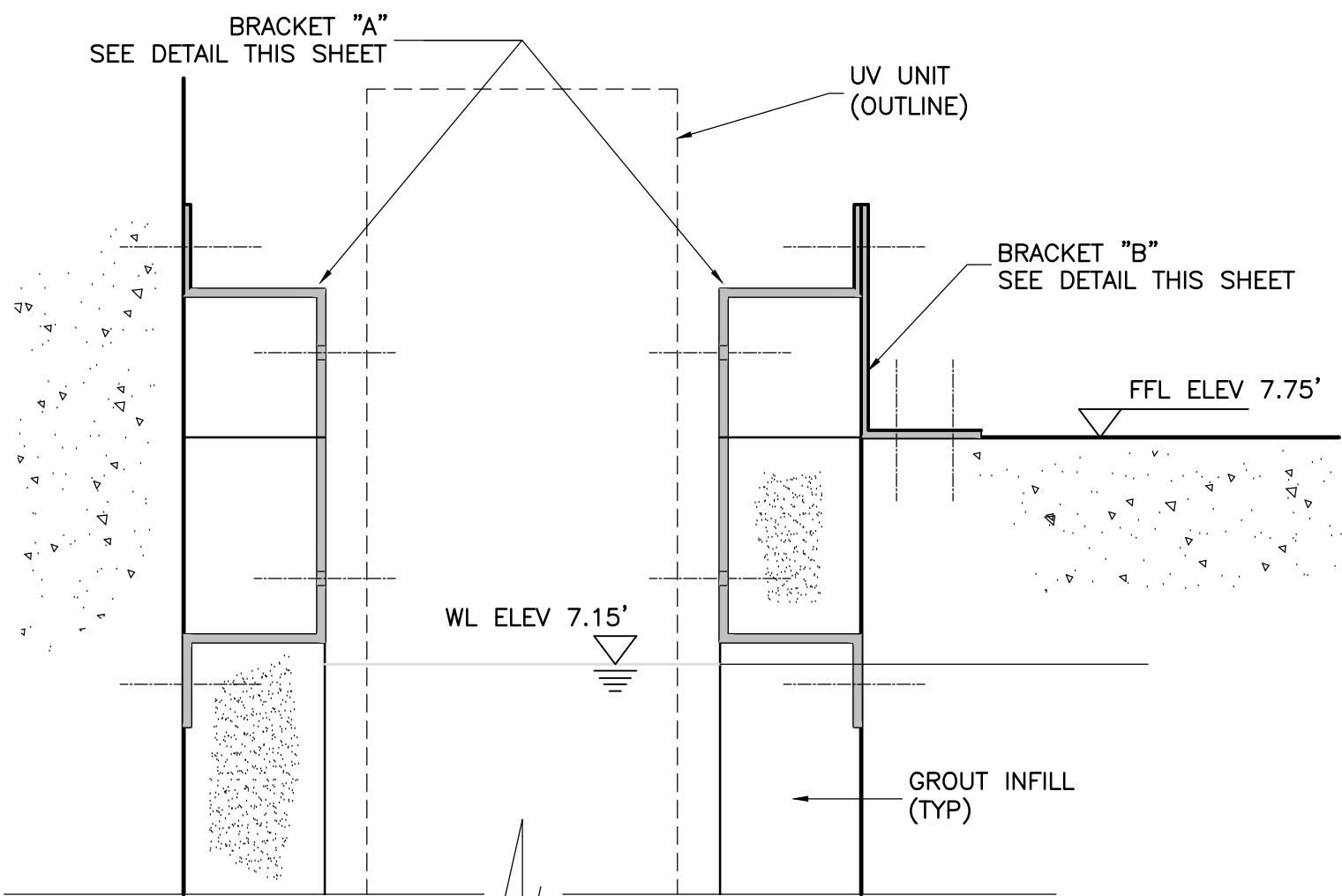


G GRIT PUMP*
1/2" = 1'-0"

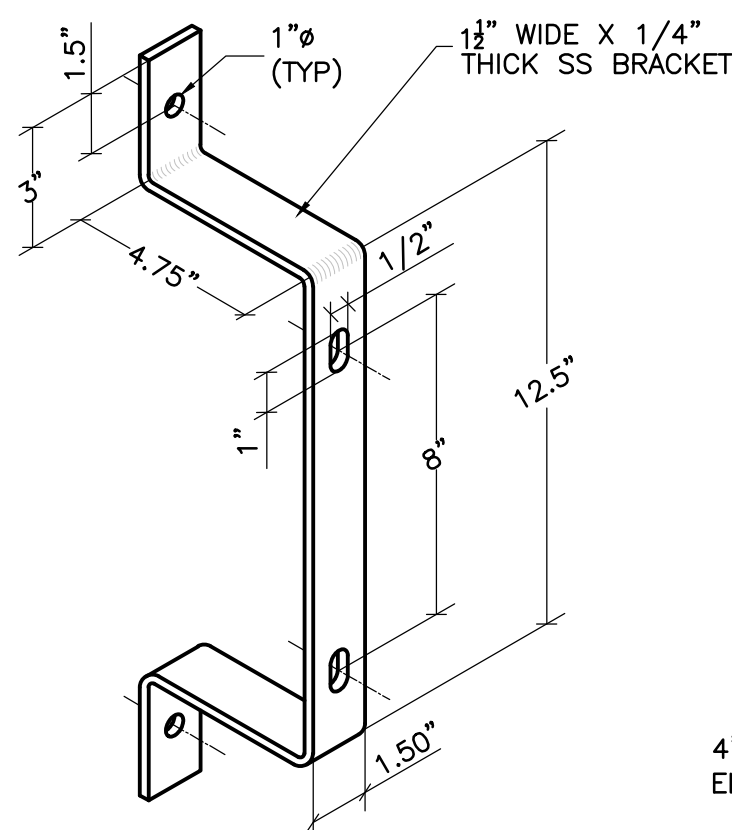
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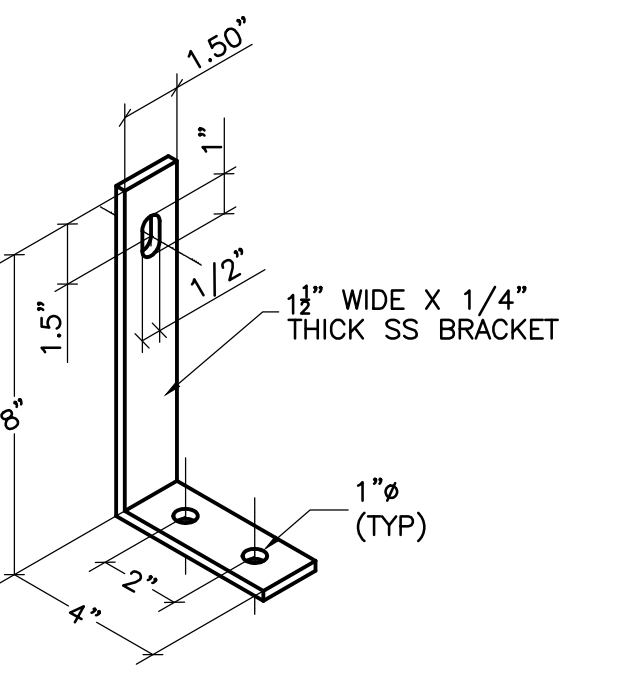
WORKSHOP BENCH
SCALE: 1/2" = 1'-0"



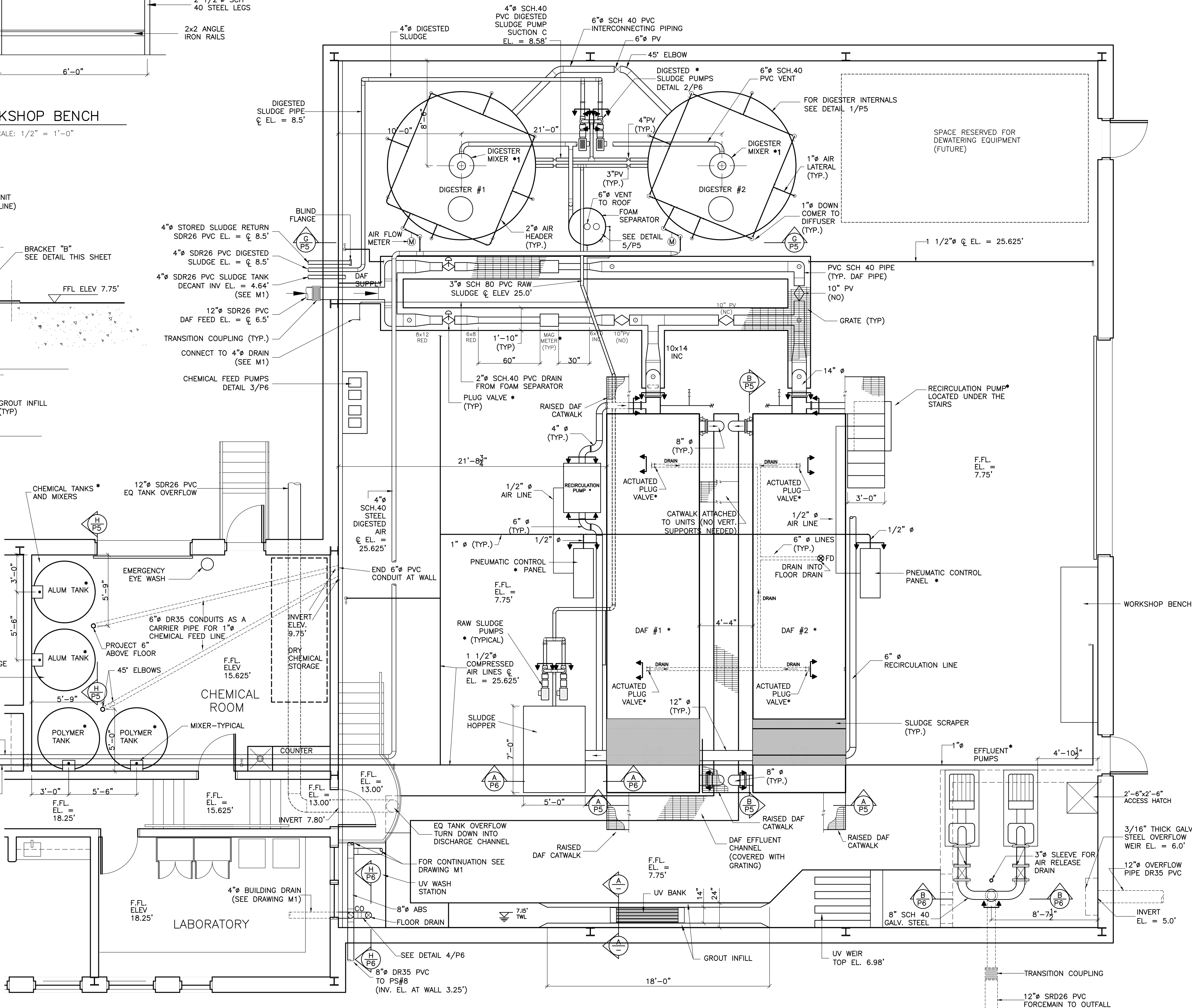
UV SUPPORT BRACKETS
SCALE: NTS



BRACKET "A"



BRACKET "B"



- GENERAL NOTES:**
- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.
 - CHANNELS AND PIPE TRENCHES TO BE PROVIDED WITH GRATING (BY OTHERS).
 - PRE-PURCHASED EQUIPMENT DENOTED WITH SYMBOL.
 - FOR SPECIFIC PRE-PURCHASE REQUIREMENTS, REFER TO THE SPECIFICATIONS.

- LEGEND**
- WELD
 - VIC COUPLING
 - FLANGED
 - UNION
 - PLANT AIR OUTLET
 - LIMIT OF PRE-PURCHASE SUPPLY
 - 1/2" TAP & NIPPLE, PLUGGED
- BV - BALL VALVE
 BFV - BUTTERFLY VALVE
 GV - GATE VALVE
 GLV - GLOBE VALVE
 PV - PLUG VALVE
 PNV - PINCH VALVE
 CV - CHECK VALVE
 BV - BALL VALVE
 KGV - KNIFE GATE VALVE
 VC - VICTAULIC COUPLING MAINTENANCE JOINT

No.	Description	Date	By
04	RE-ISSUED FOR TENDER	APR/02	JH
03	RE-ISSUED FOR DAF PRE-PURCHASE	JAN/02	JH
02	ISSUED FOR EQUIPMENT PRE-PURCHASE	OCT/01	JH
01	ISSUED FOR REVIEW	DEC./98	TA

Revision or Issue

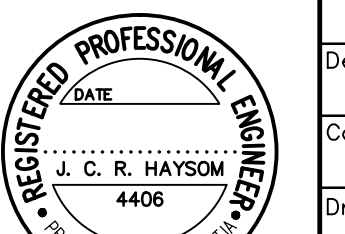
TOWN OF LUNENBURG
MUNICIPAL WASTEWATER COLLECTION AND TREATMENT

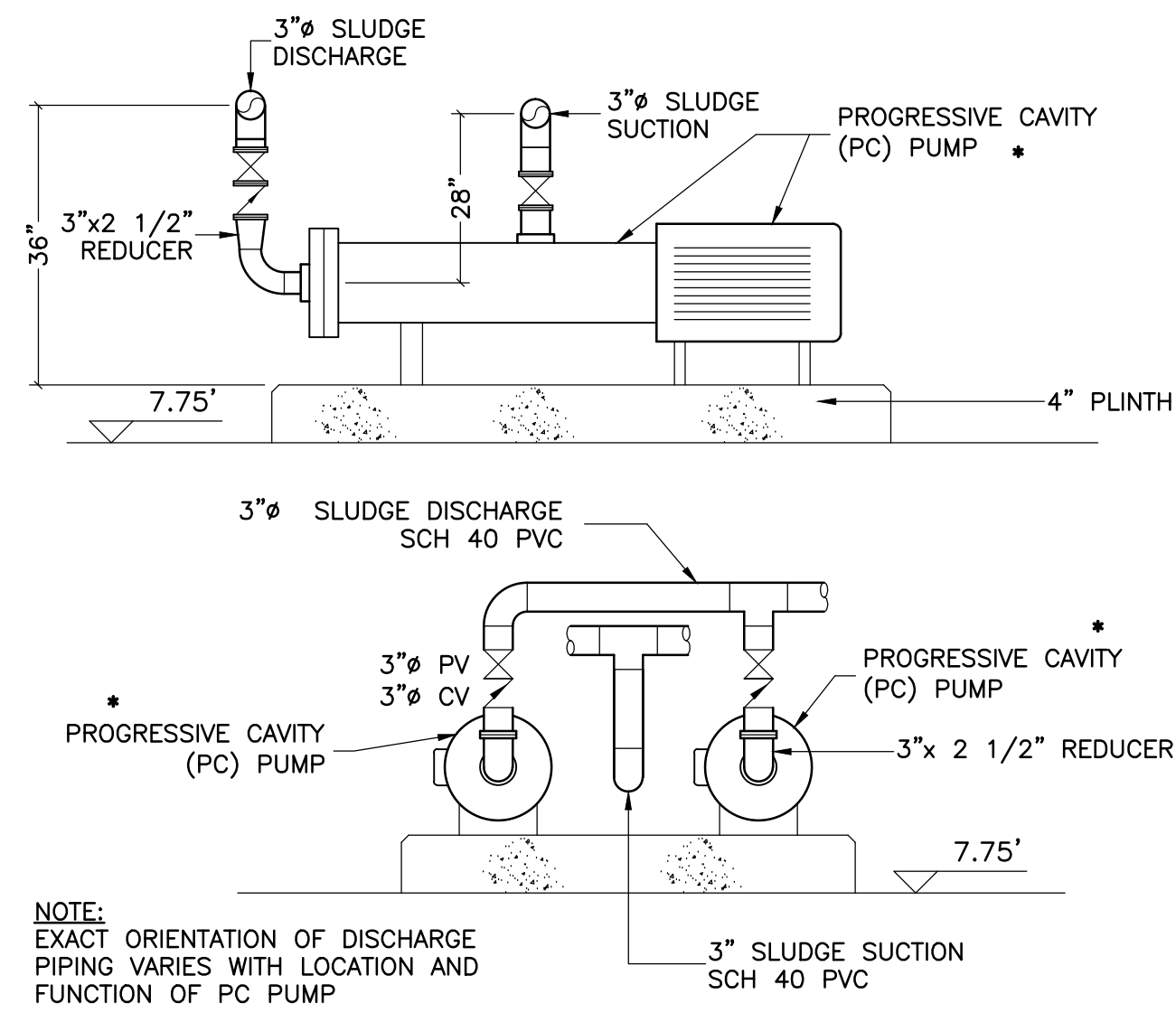
SEWAGE TREATMENT PLANT
PROCESS ROOM PLAN



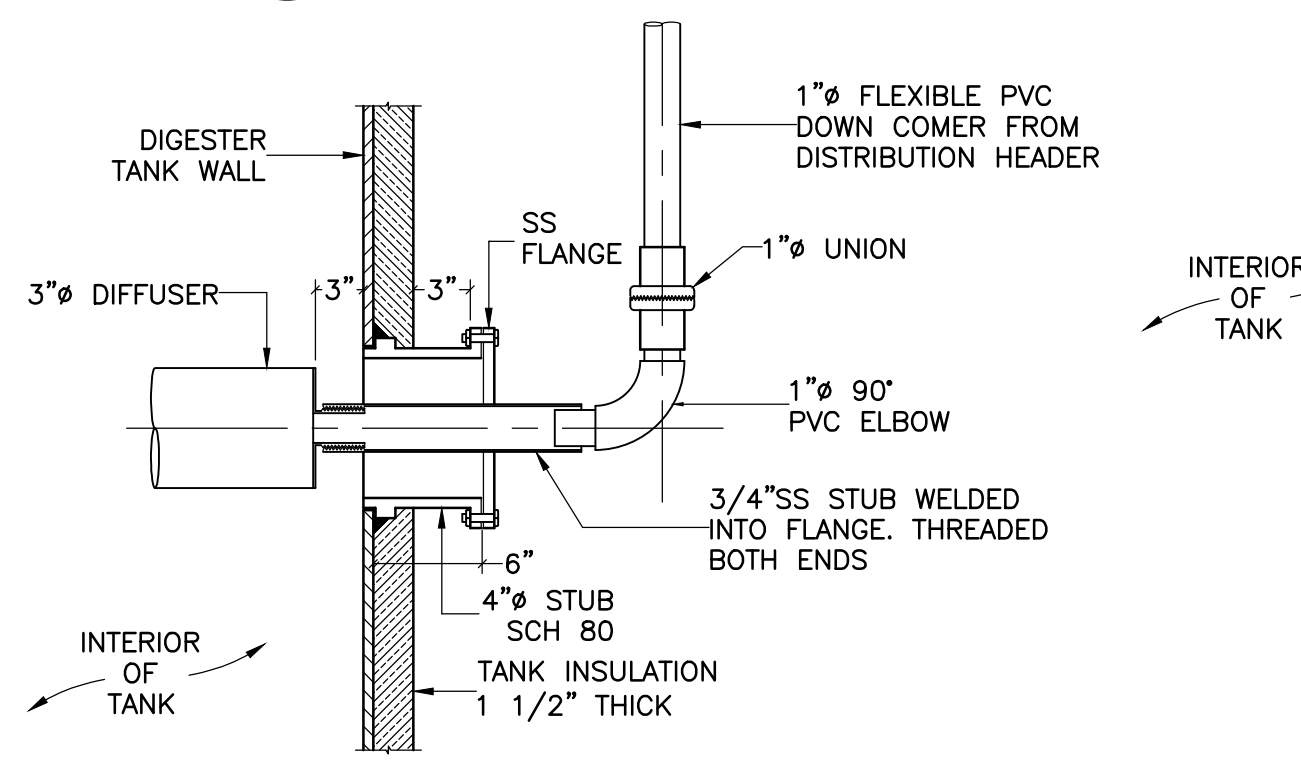
Scale 1/4"=1'-0"

Date	Drawn
OCT 2001	GP
Designed	Checked
GFB	TA
Contract No	Sheet of
98001	24/43
Drawing No	Revision
	P4

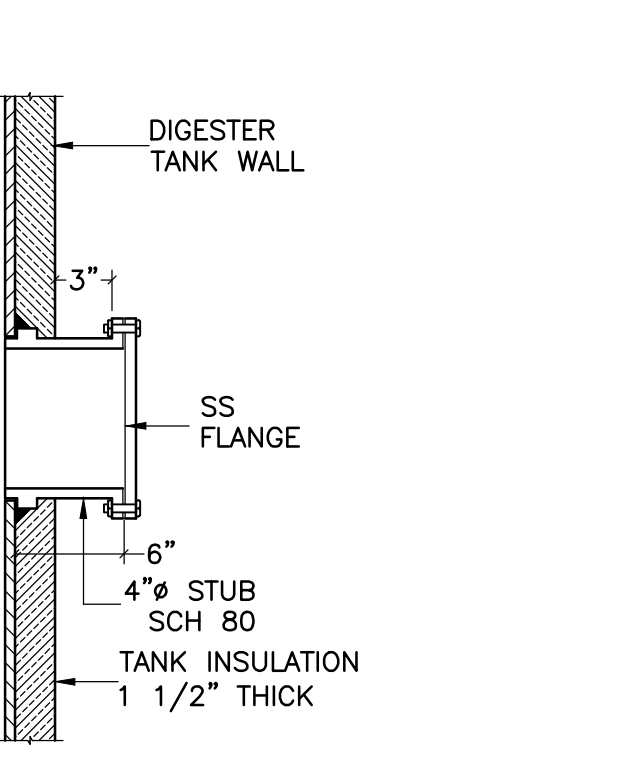




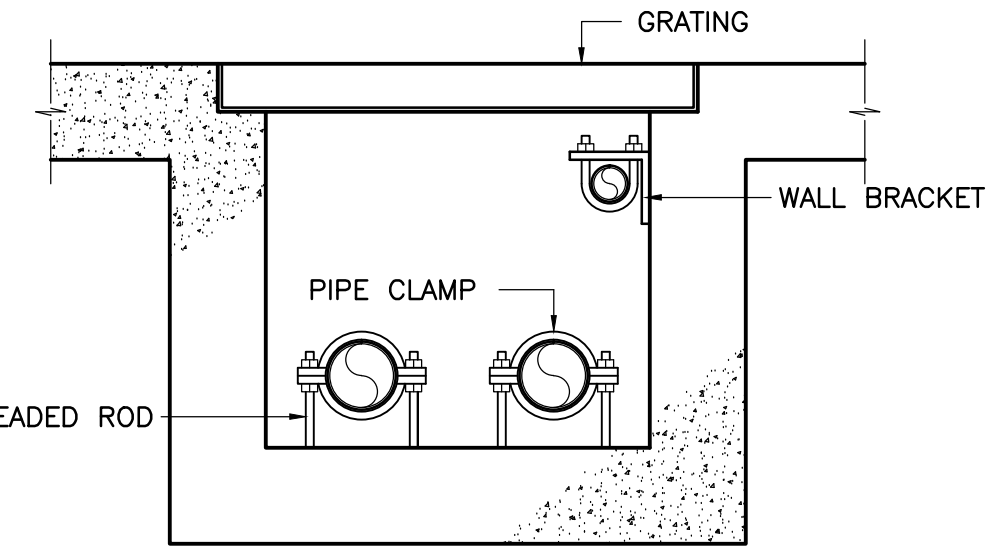
2 TYPICAL PC PUMP INSTALLATION
P4 N.T.S.



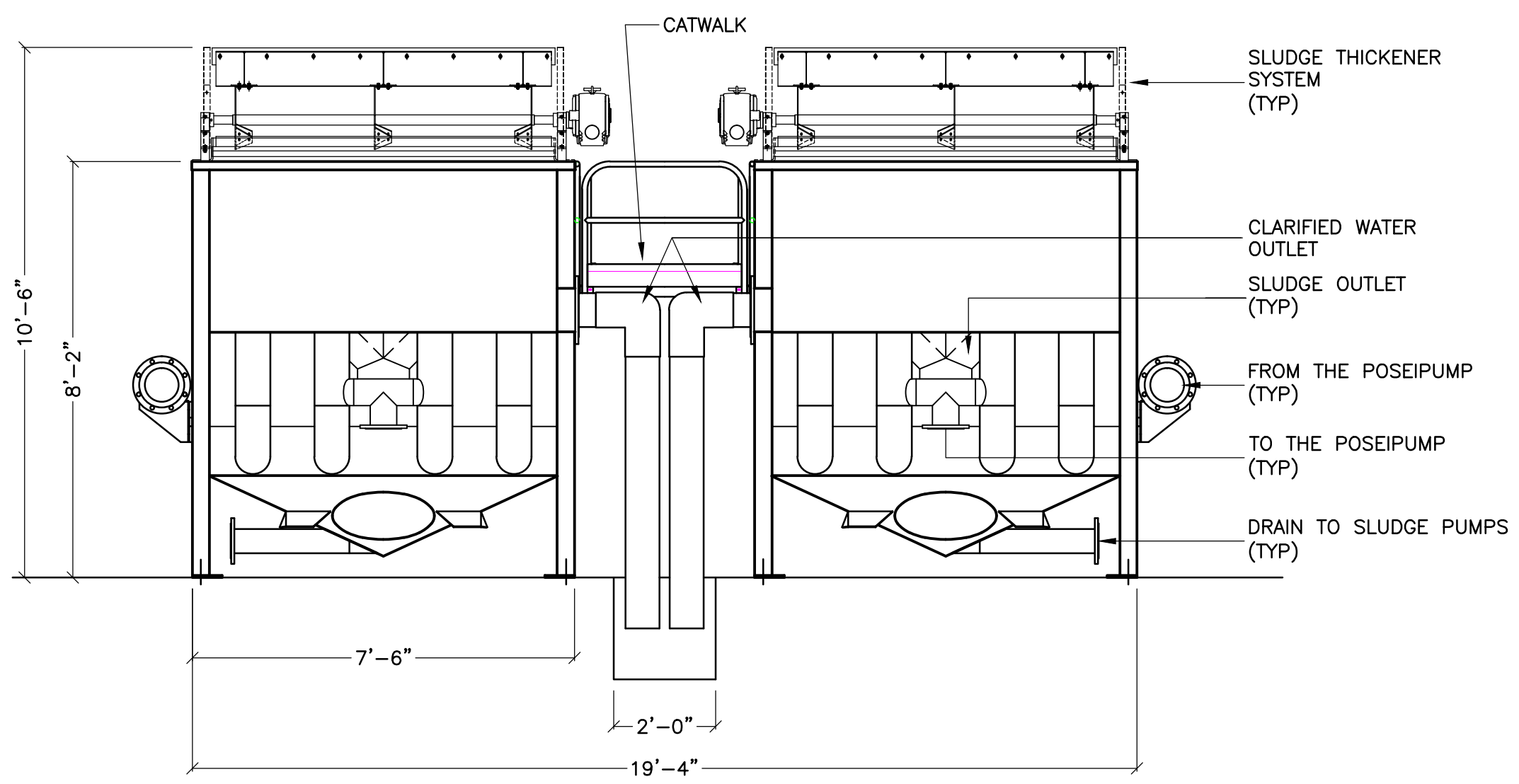
4 DIFFUSER MOUNTING DETAIL
N.T.S.



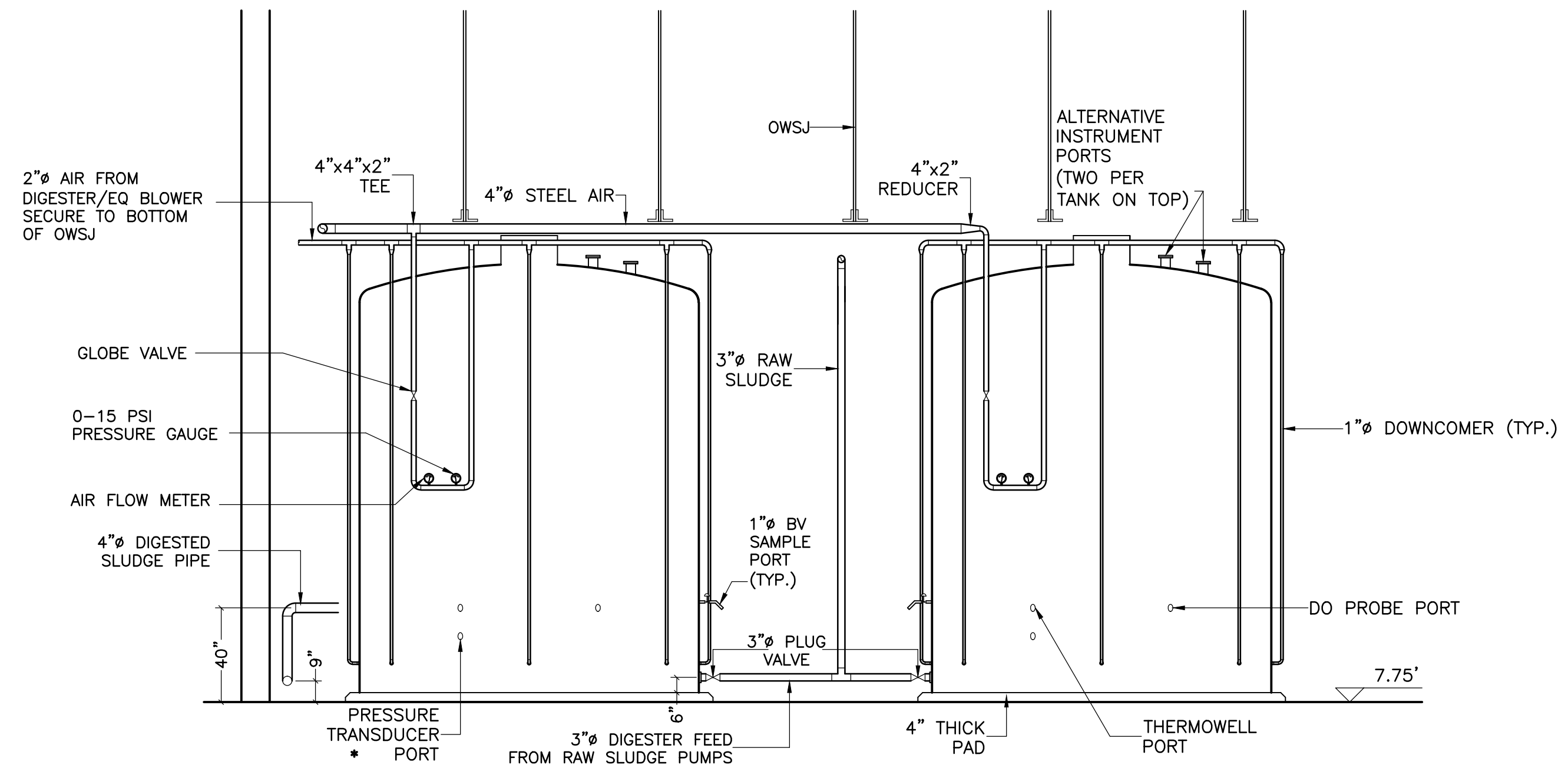
6 TYPICAL INSTRUMENT PORT
N.T.S.



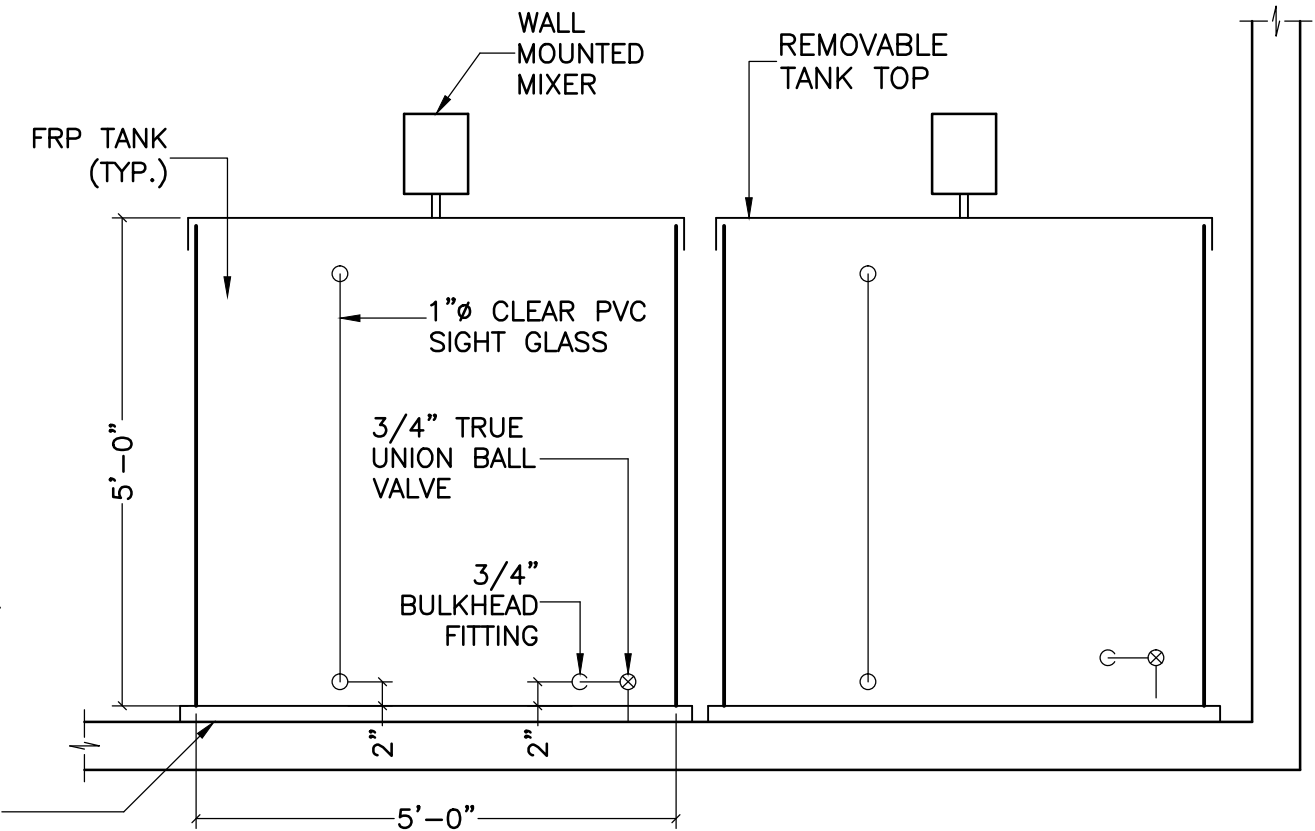
4 PIPE SUPPORT IN TRENCH
N.T.S.



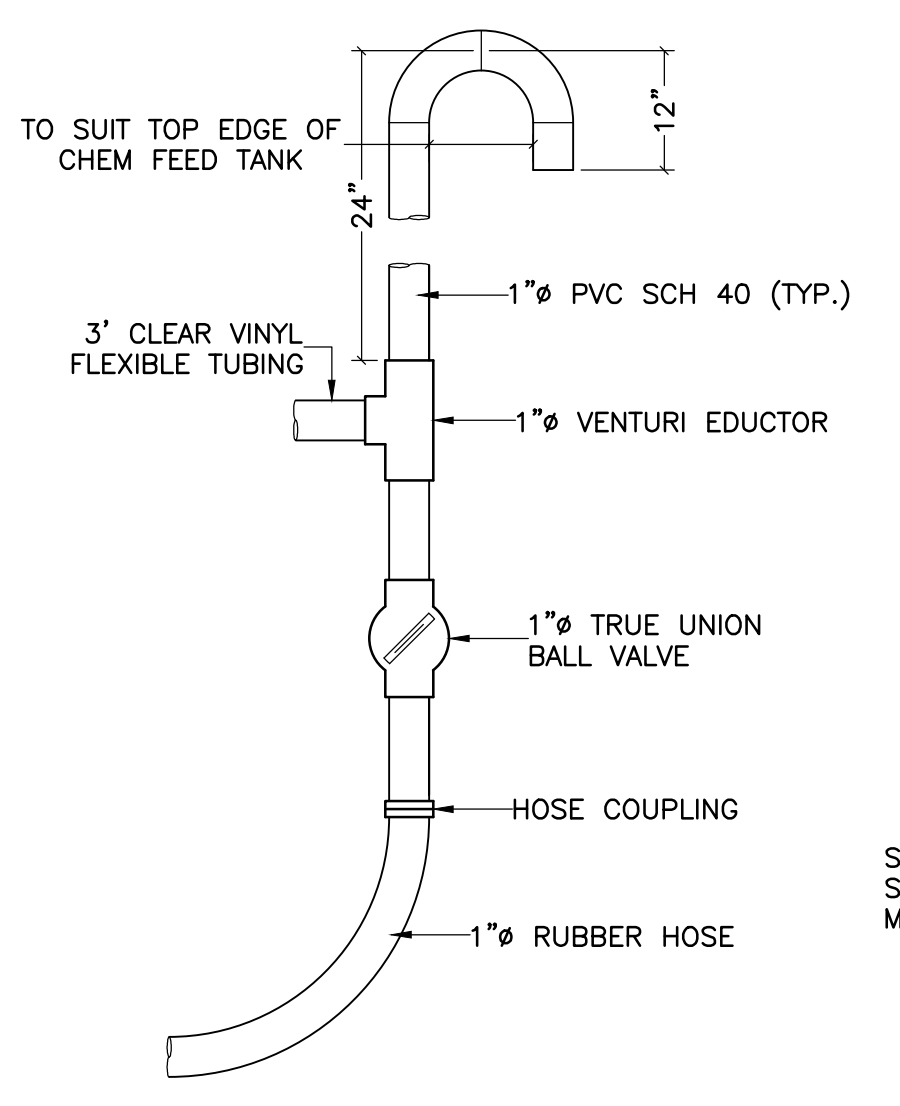
A DAF ASSEMBLY SECTION *
P4 N.T.S.



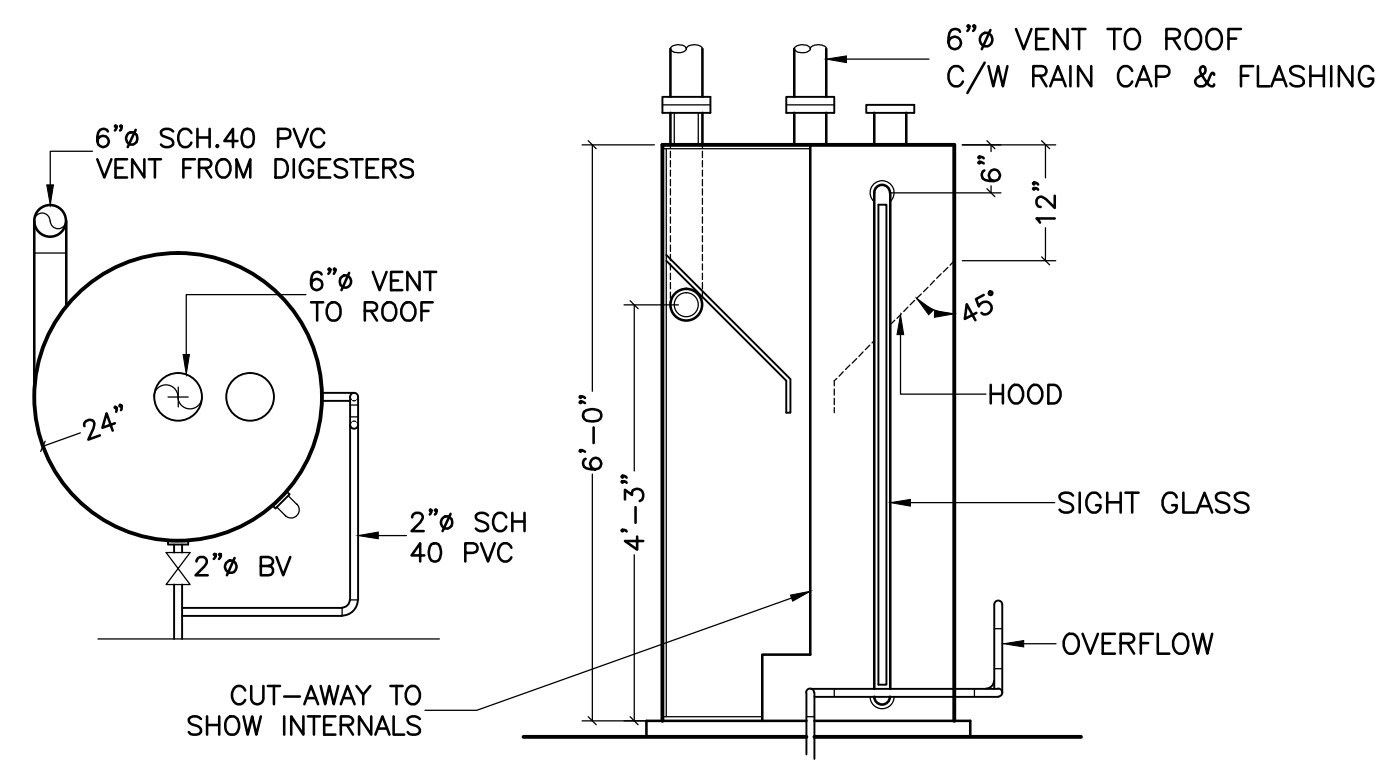
G DIGESTERS
P4 SCALE: 1/4"=1'-0"



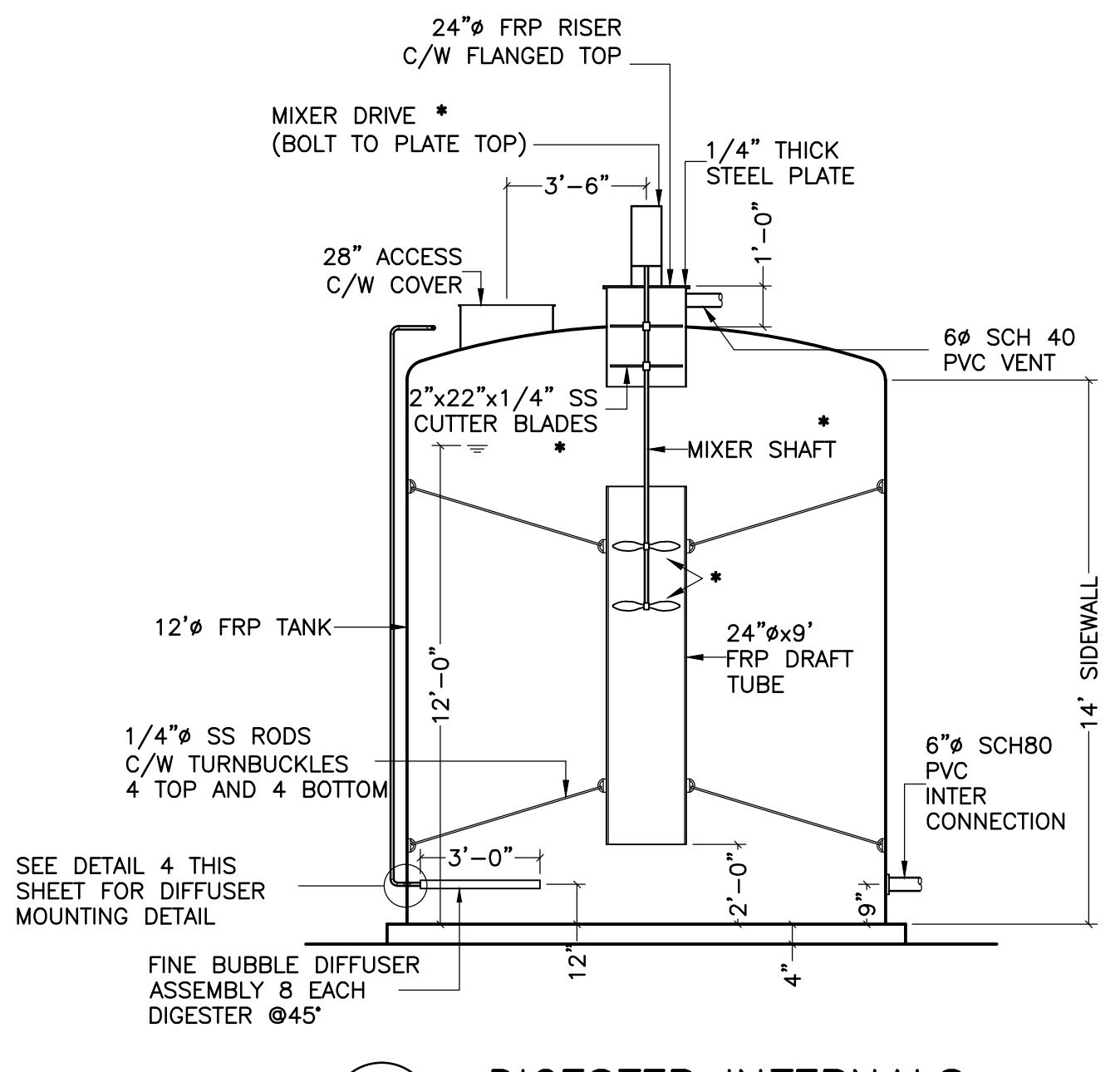
H CHEMICAL STORAGE TANKS *
P4 N.T.S.



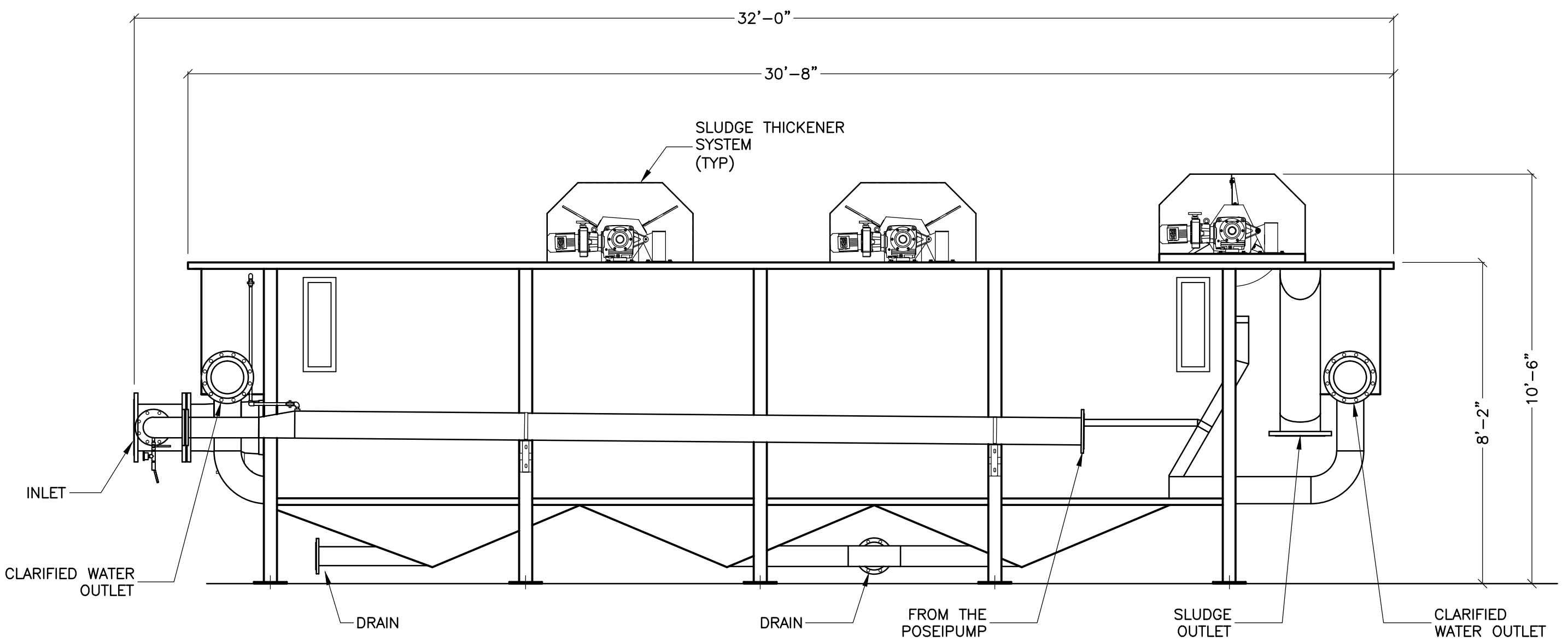
5 CHEMICAL MAKE-UP SYSTEM
N.T.S.



5 FOAM SEPARATOR
P4 SCALE: 1/2"=1'-0"



1 DIGESTER INTERNALS
P4 SCALE: 1/4"=1'-0"



B DAF ASSEMBLY SECTION *
P4 N.T.S.

- GENERAL NOTES:**
- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.
 - PREPURCHASED EQUIPMENT DEMOTED WITH "X" SYMBOL.
 - THIS DRAWING IS FOR INDICATION AND INFORMATION ONLY. FOR SPECIFIC PRE-PURCHASE REQUIREMENTS, REFER TO THE SPECIFICATIONS.

- LEGEND**
- WELD
 - VIC COUPLING
 - FLANGED
 - UNION
 - PLANT AIR OUTLET

- BV - BALL VALVE
- BFV - BUTTERFLY VALVE
- GV - GATE VALVE
- GLV - GLOBE VALVE
- PV - PLUG VALVE
- PNV - PINCH VALVE
- CV - CHECK VALVE
- BV - BALL VALVE
- KGV - KNIFE GATE VALVE
- VC - VICTAULIC COUPLING MAINTENANCE JOINT

No.	Description	Date	By
04	RE-ISSUED FOR TENDER	APR/02	JH
03	RE-ISSUED FOR DAF PRE-PURCHASE	JAN/02	JH
02	ISSUED FOR EQUIPMENT PRE-PURCHASE	OCT 3/01	JH
01	ISSUED FOR REVIEW	DEC./98	TA

Revision or Issue

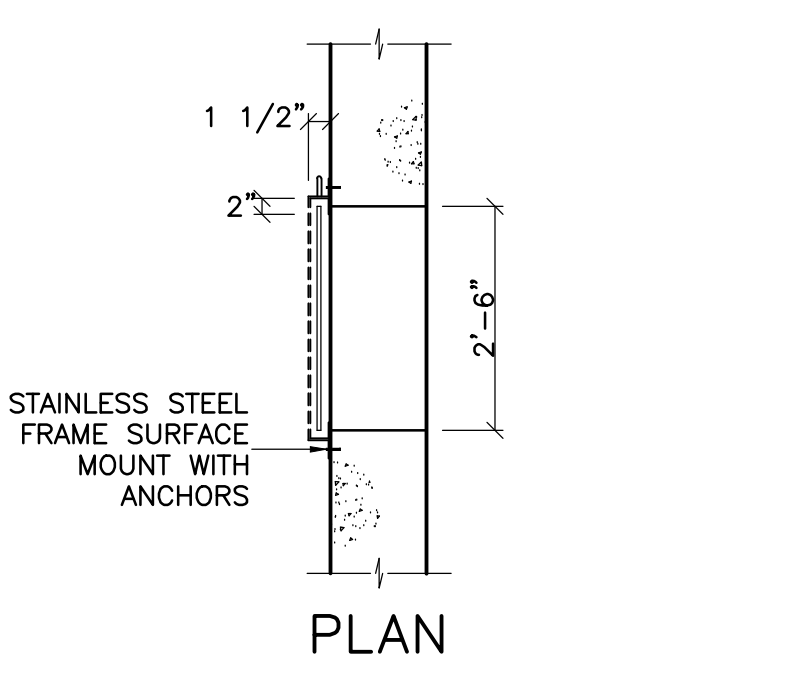
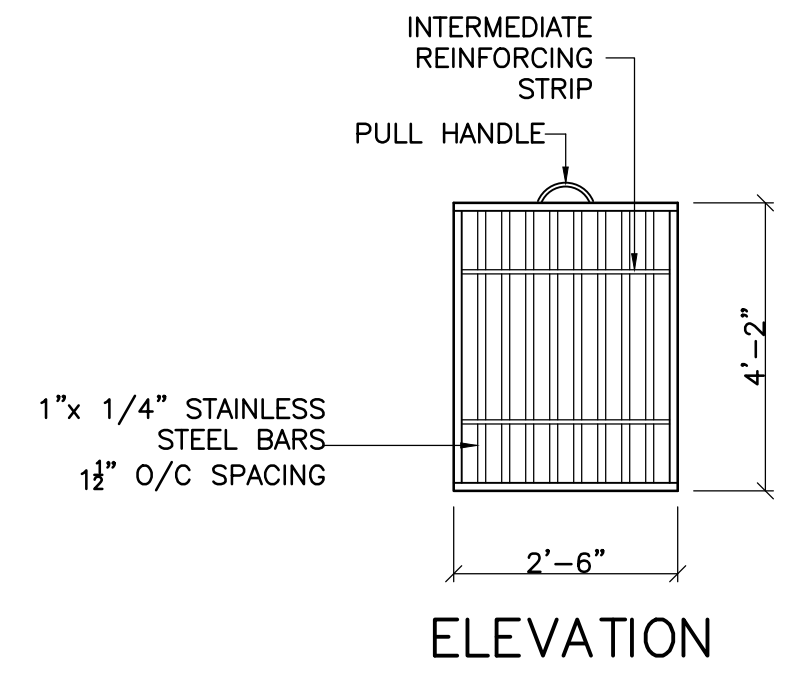
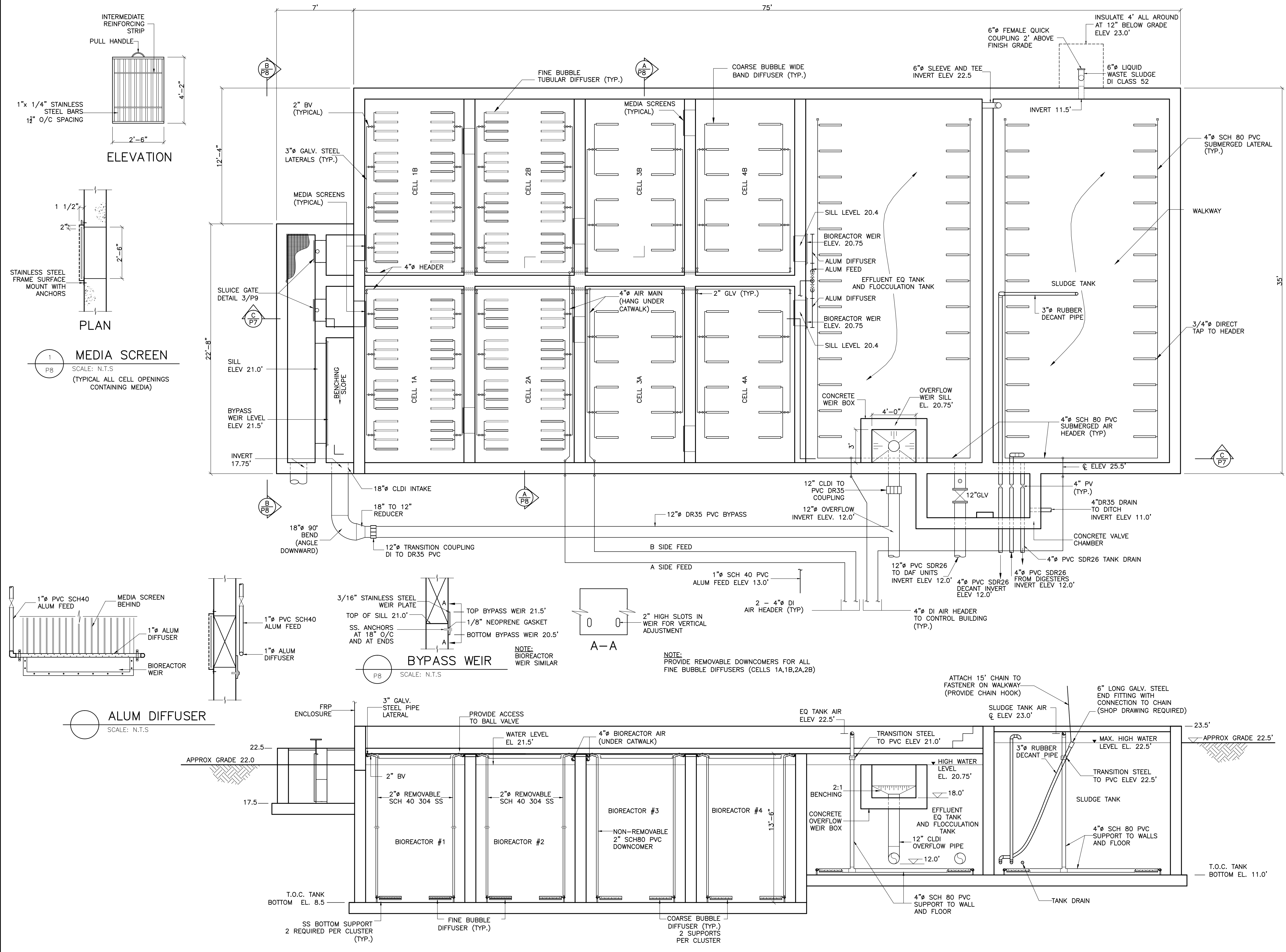
TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
PROCESS ROOM DETAILS

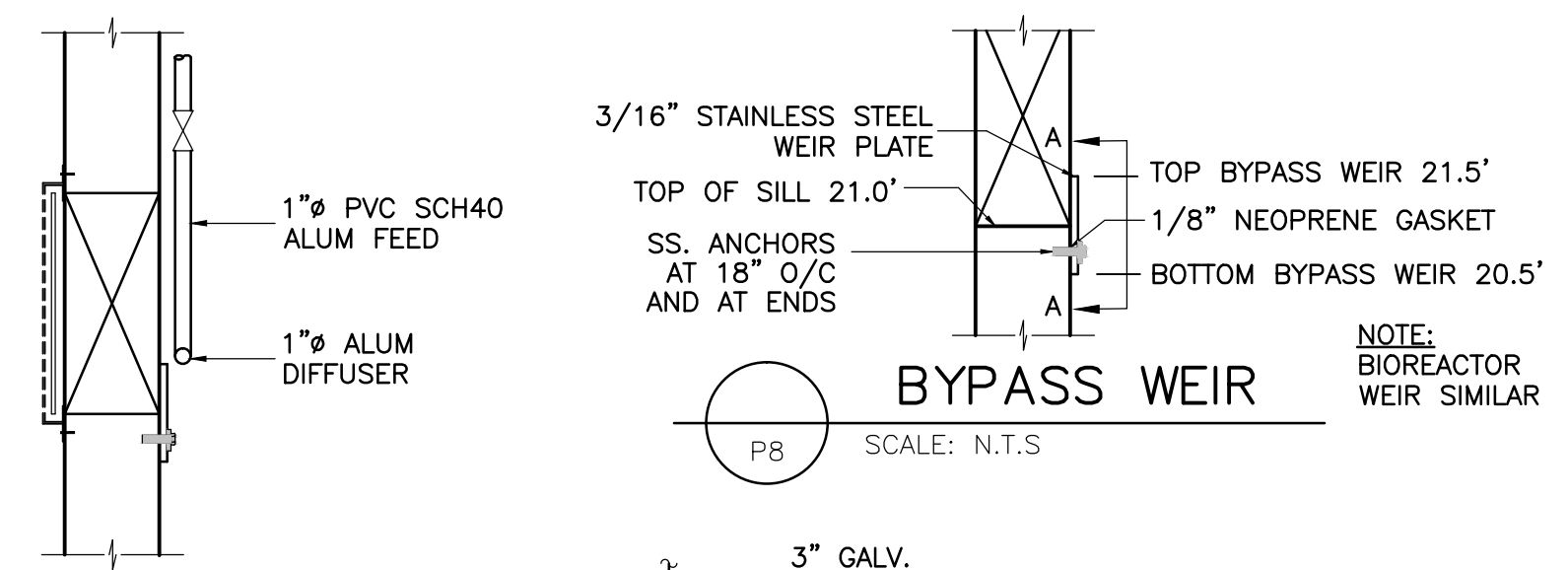


Scale AS SHOWN

Date	Drawn
OCT 2001	GP
Designed GFB	Checked TA
Contract No. 98001	Sheet of 25/43
Drawing No. P5	Revision 4



1 MEDIA SCREEN
 SCALE: N.T.S.
 (TYPICAL ALL CELL OPENINGS CONTAINING MEDIA)



ALUM DIFFUSER
 SCALE: N.T.S.

GENERAL NOTES:

- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.

- LEGEND**
- WELD
 - VIC COUPLING
 - FLANGED
 - UNION
 - PLANT AIR OUTLET
 - 1/2" TAP & NIPPLE, PLUGGED
- BV - BALL VALVE
 BFV - BUTTERFLY VALVE
 GV - GATE VALVE
 GLV - GLOBE VALVE
 PV - PLUG VALVE
 PNV - PINCH VALVE
 CV - CHECK VALVE
 BV - BALL VALVE
 KGV - KNIFE GATE VALVE
 VC - VICTAULIC COUPLING MAINTENANCE JOINT

No.	Description	Date	By
04	REVISED FOR TENDER	APR/02	JH
03	REVISED FOR DAF PRE-PURCHASE	JAN/02	JH
02	ISSUED FOR MEDIA PREPURCHASE	OCT./01	JH
01	ISSUED FOR REVIEW	DEC./98	JCL

Revision or Issue

TOWN OF LUNENBURG
MUNICIPAL WASTEWATER
COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
AERATION BASIN
PLAN

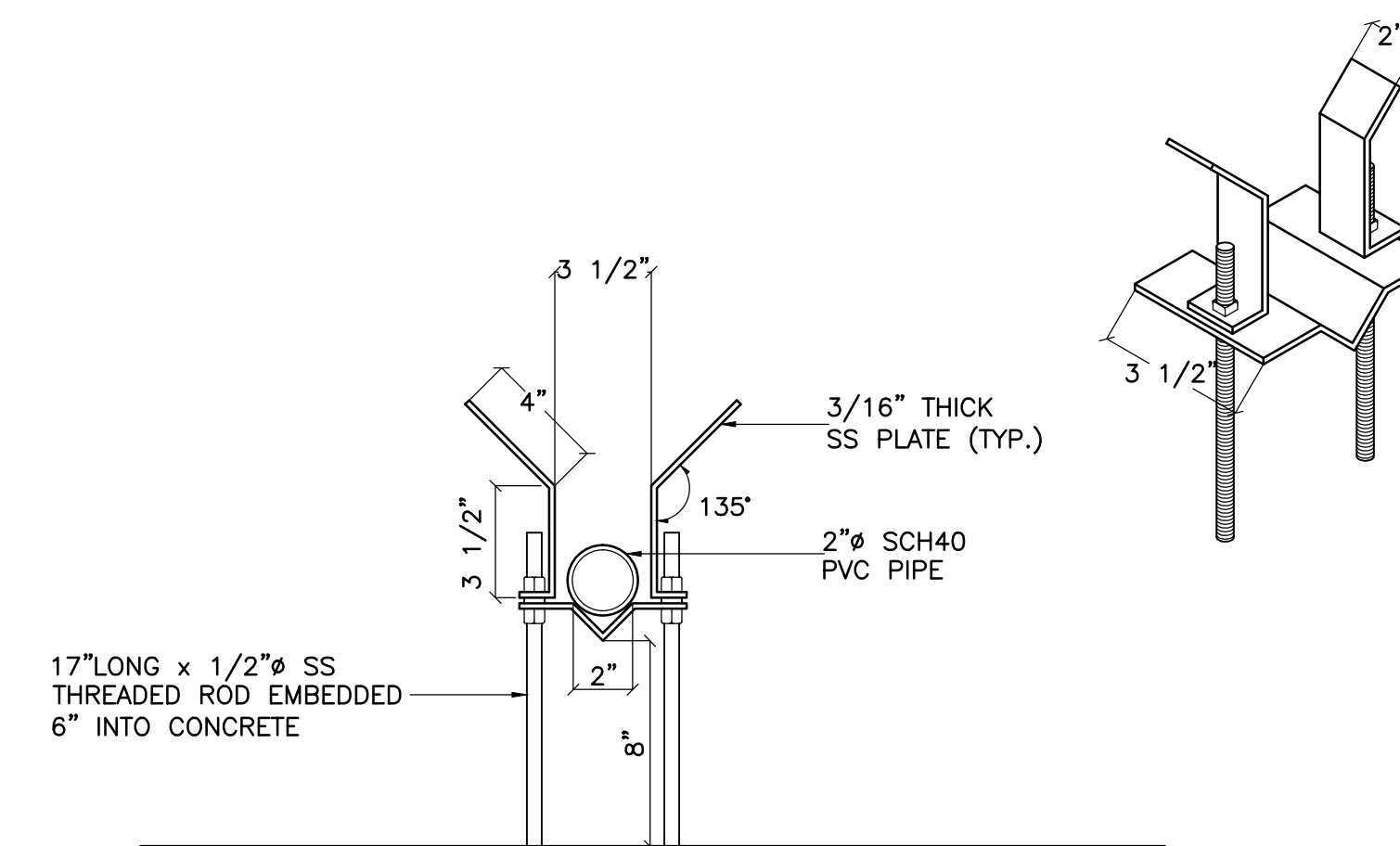
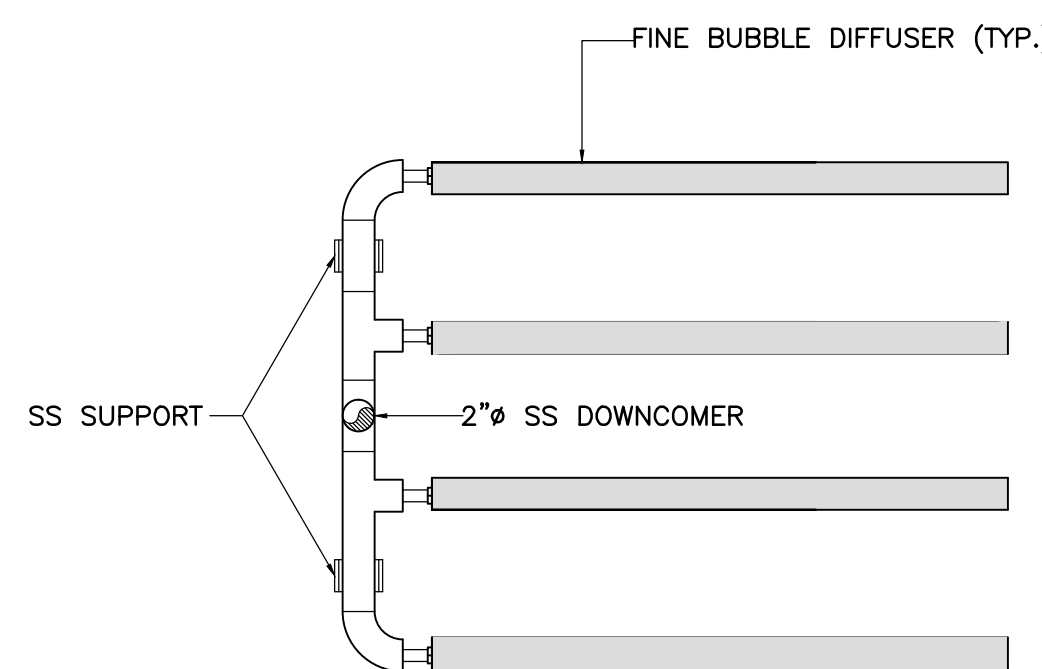
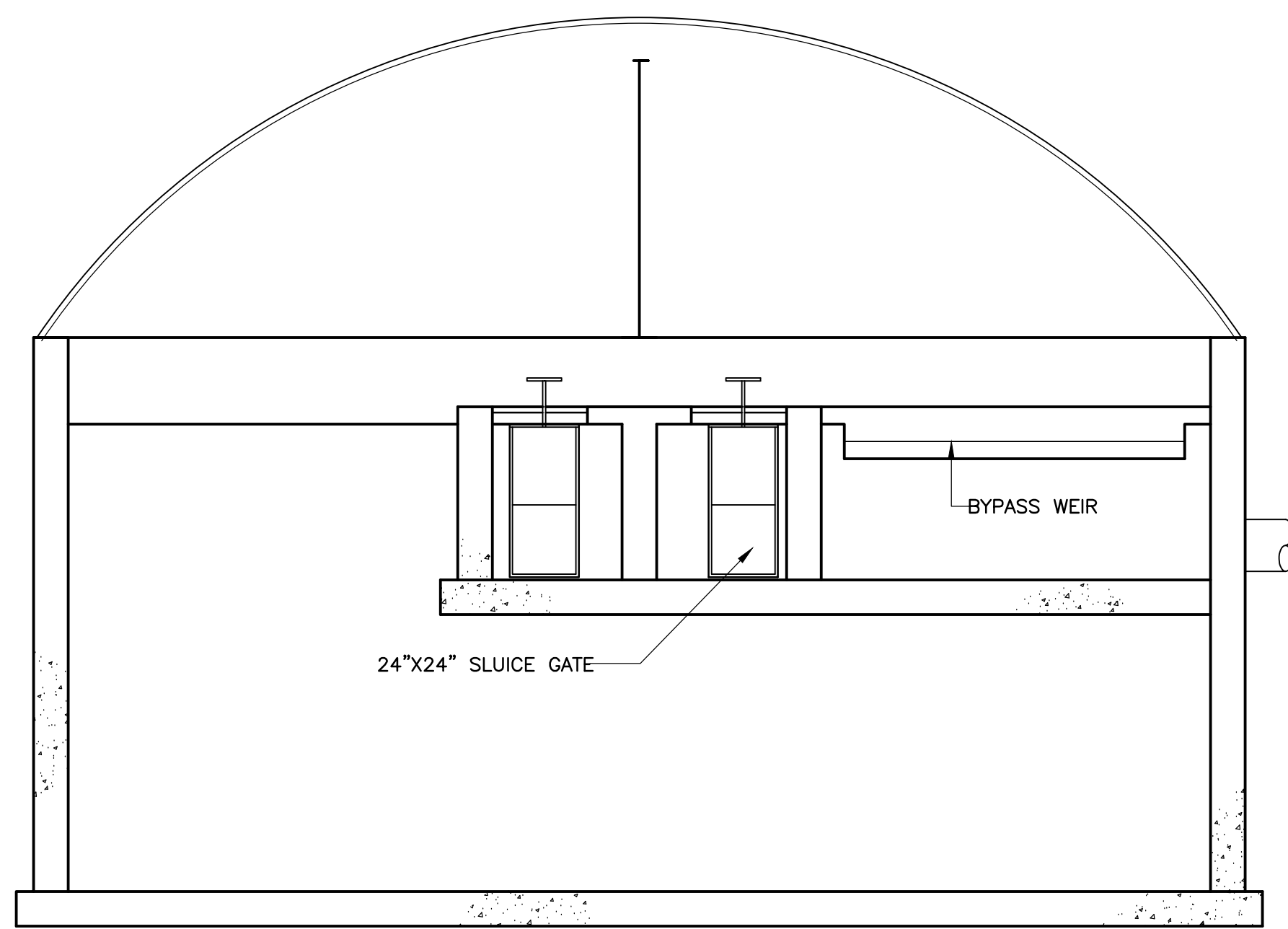
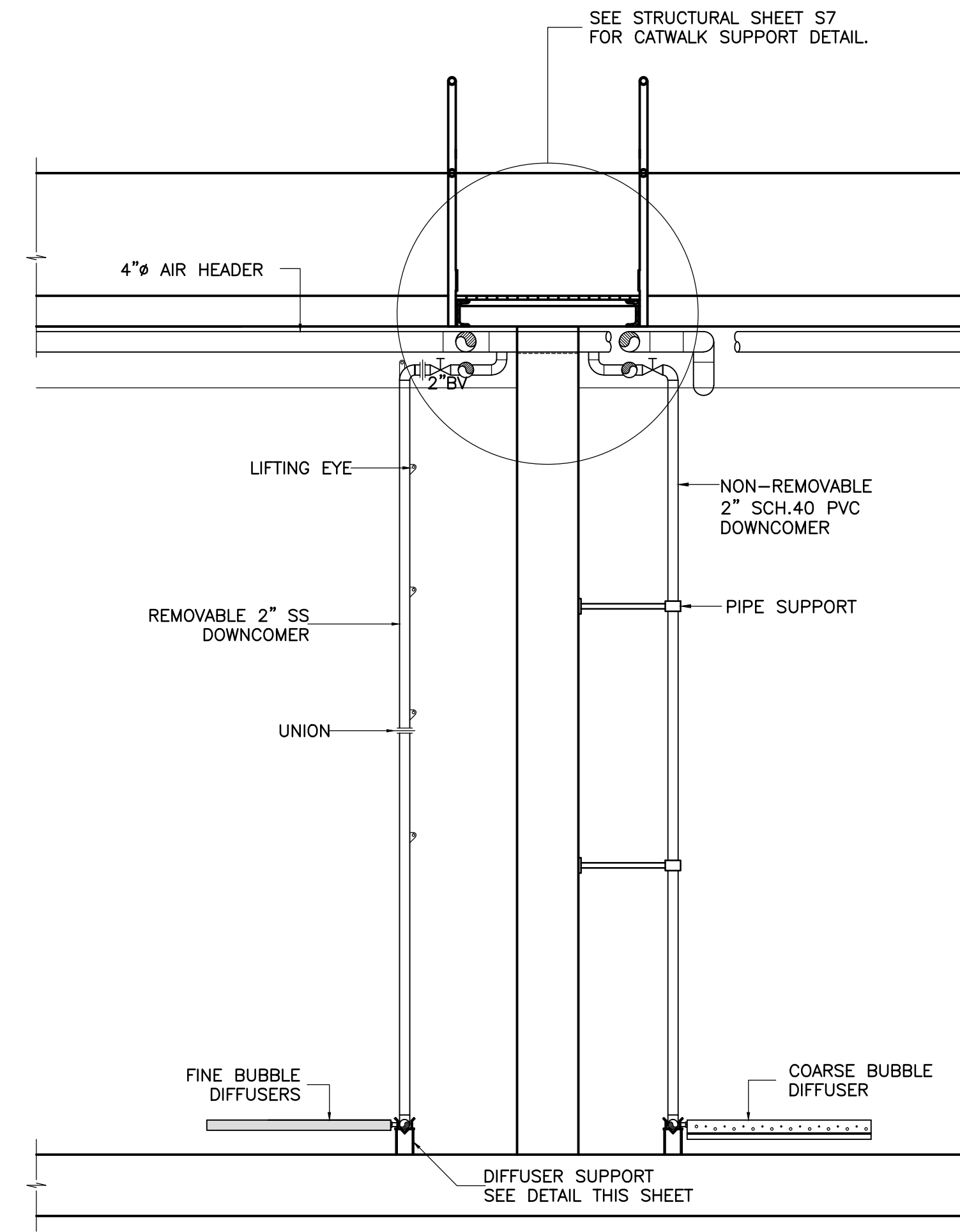
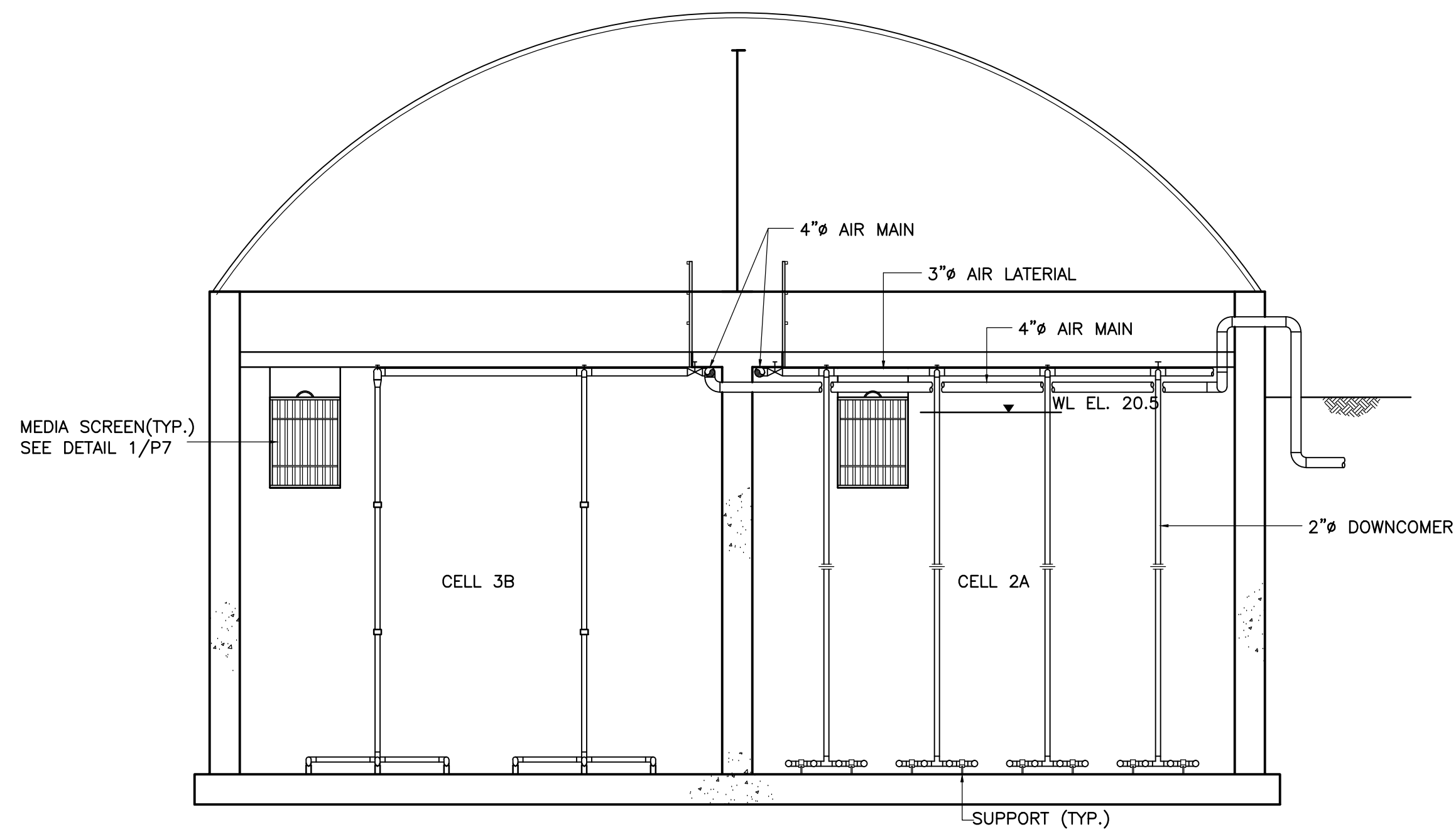


Scale 1/4" = 1'-0"

Date	DEC.1998	Drawn	GP
Designed	GFB	Checked	TA
Contract No	98001	Sheet No	27 / 43
Drawing No		Revision	

P7

12/04/2002 9:41 AM
 98001-PT.dwg
 ABL Environmental Consultants Ltd.



- GENERAL NOTES:**
- DRAWINGS IN GENERAL ARE TO SCALE BUT THE FIGURED DIMENSIONS SHALL ALWAYS BE FOLLOWED AND THE DRAWINGS SHALL NOT BE SCALED.
 - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO PROCEEDING WITH ANY WORK.

LEGEND

- WELD
- VIC COUPLING
- FLANGED
- UNION
- PLANT AIR OUTLET
- BV - BALL VALVE
- BFV - BUTTERFLY VALVE
- GV - GATE VALVE
- GLV - GLOBE VALVE
- PV - PLUG VALVE
- PNV - PINCH VALVE
- CV - CHECK VALVE
- BV - BALL VALVE
- KGV - KNIFE GATE VALVE
- VC - VICTAULIC COUPLING MAINTENANCE JOINT

No.	Description	Date	By
02	ISSUED FOR TENDER	APR/02	JH
01	ISSUED FOR REVIEW	DEC./98	TA

Revision or Issue

TOWN OF LUNENBURG
 MUNICIPAL WASTEWATER
 COLLECTION AND TREATMENT

SEWAGE TREATMENT PLANT
 AERATION BASIN
 DETAILS

ABL ENVIRONMENTAL
 consultants limited

102 PORTLAND STREET
 DANFORTH, NOVA SCOTIA
 B2V 1Y6

Tel: (902)466-0050
 Fax: (902)466-4399
 Email: abl@ablenvironmental.com

Scale 1/2" = 1'-0"

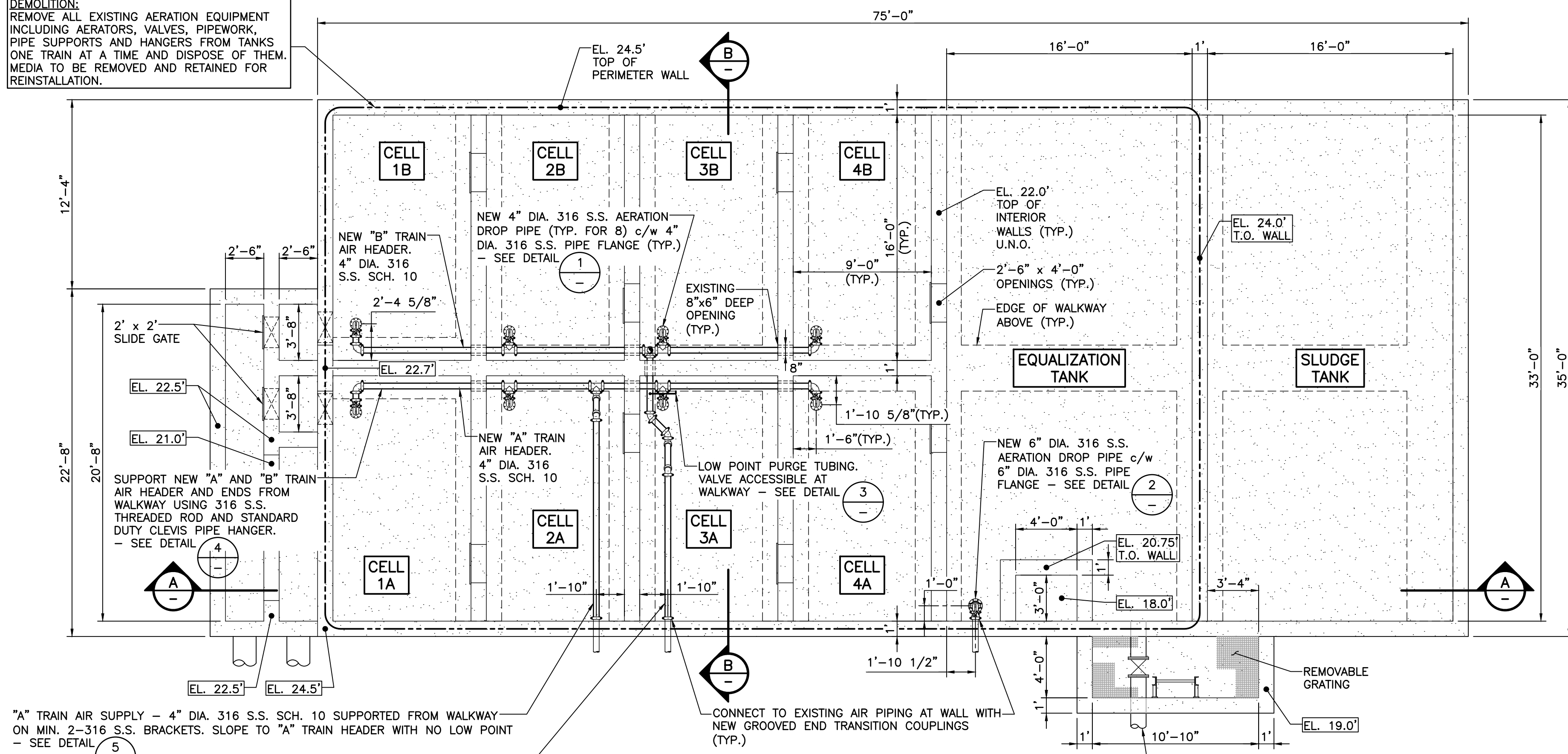
Date	DEC.1998	Drawn	GP
Designed	GFB	Checked	TA
Approved	JCL	Contract No.	98001
Sheet of	28	Revision	43
		P8	

98001.P8.dwg

15/04/2002 9:42 AM

ABL Environmental Consultants Ltd.

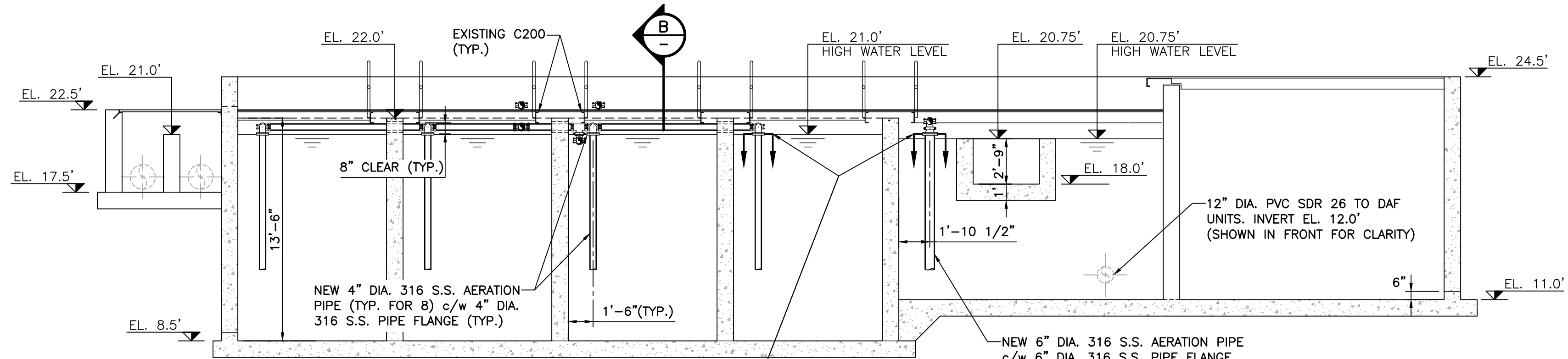
DEMOLITION:
REMOVE ALL EXISTING AERATION EQUIPMENT INCLUDING AERATORS, VALVES, PIPEWORK, PIPE SUPPORTS AND HANGERS FROM TANKS ONE TRAIN AT A TIME AND DISPOSE OF THEM. MEDIA TO BE REMOVED AND RETAINED FOR REINSTALLATION.



"A" TRAIN AIR SUPPLY - 4" DIA. 316 S.S. SCH. 10 SUPPORTED FROM WALKWAY ON MIN. 2-316 S.S. BRACKETS. SLOPE TO "A" TRAIN HEADER WITH NO LOW POINT - SEE DETAIL 5

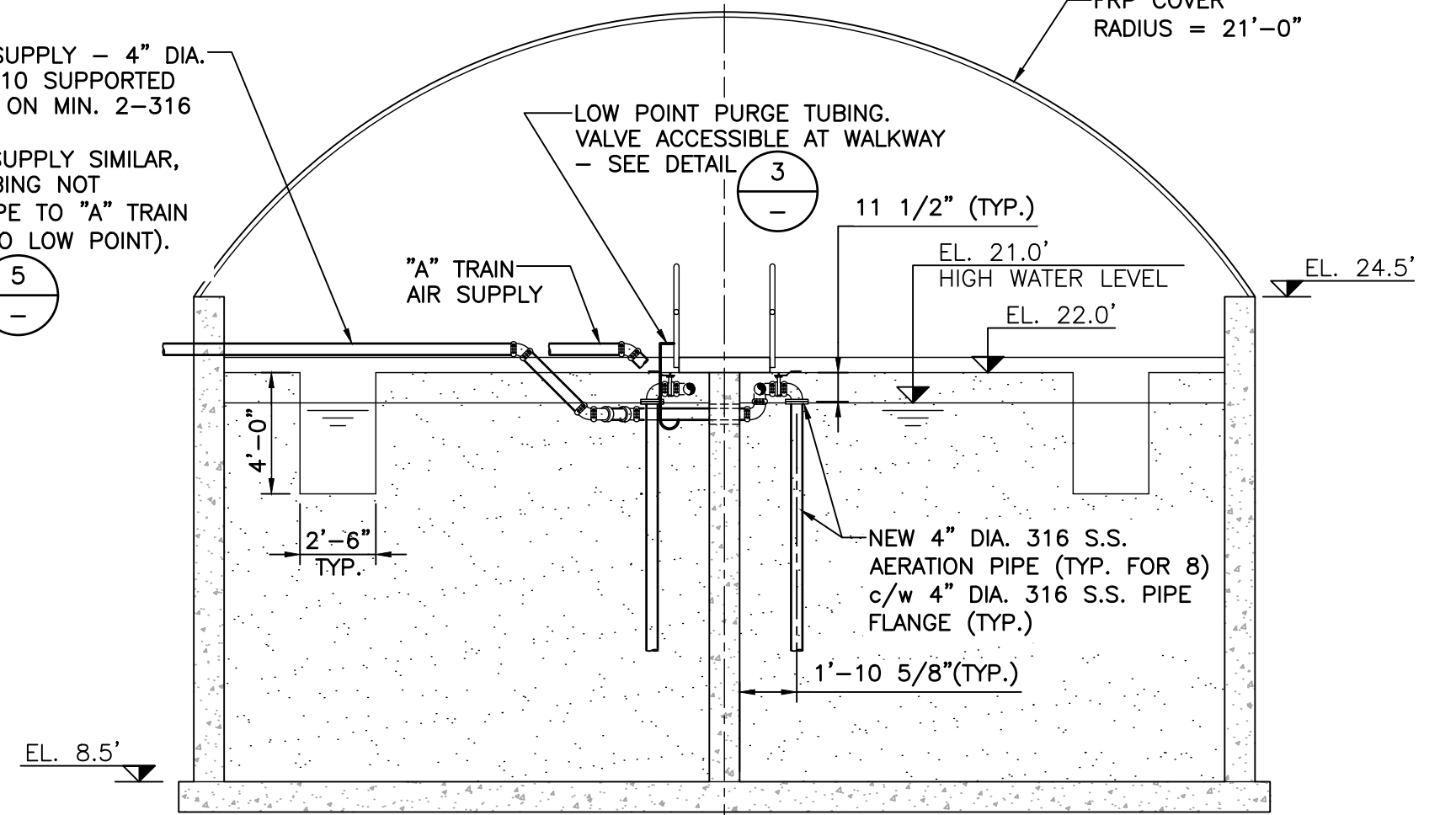
"B" TRAIN AIR SUPPLY - 4" DIA. 316 S.S. SCH. 10 SUPPORTED FROM WALKWAY ON MIN. 2-316 S.S. BRACKETS - SEE DETAIL 5

PLAN
3/16"=1'-0"

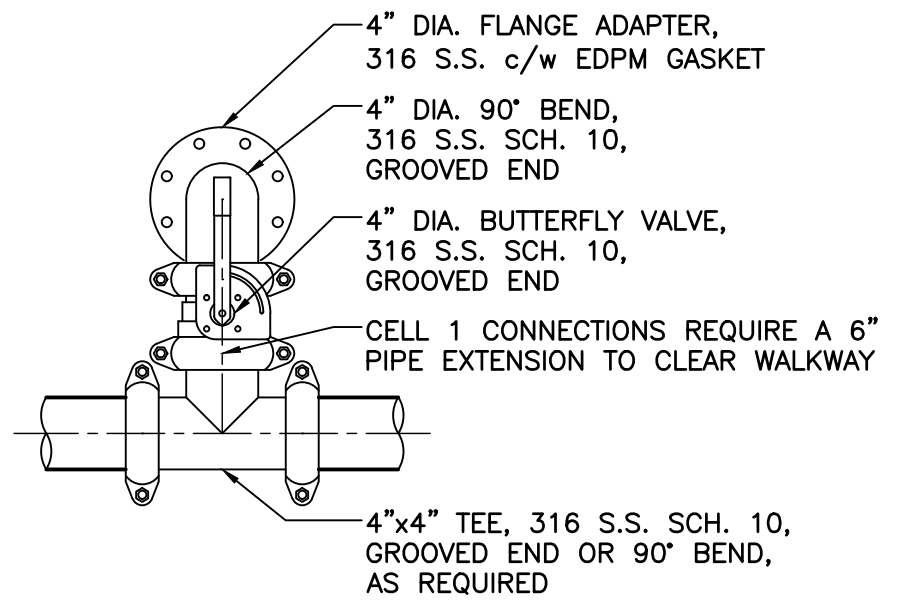


A SECTION
3/16"=1'-0"

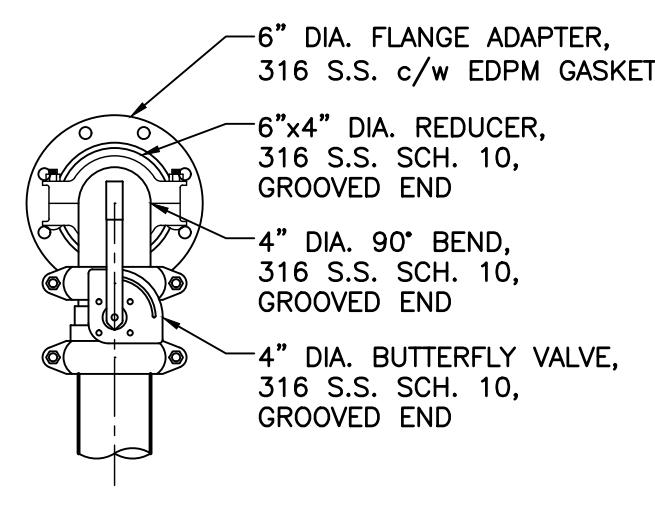
"B" TRAIN AIR SUPPLY - 4" DIA. 316 S.S. SCH. 10 SUPPORTED FROM WALKWAY ON MIN. 2-316 S.S. BRACKETS. "A" TRAIN AIR SUPPLY SIMILAR, BUT PURGE TUBING NOT REQUIRED (SLOPE TO "A" TRAIN HEADER WITH NO LOW POINT). - SEE DETAIL 5



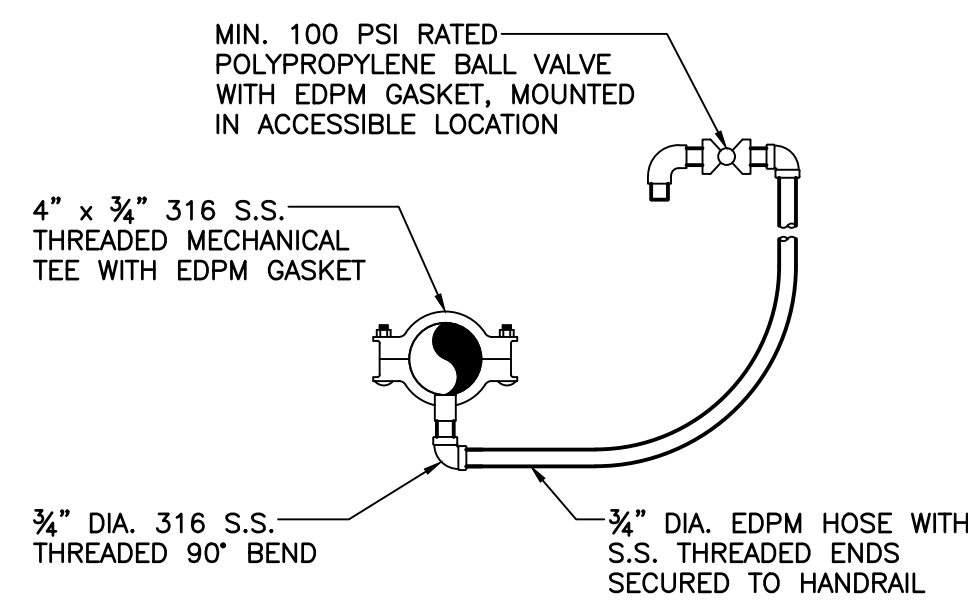
B SECTION
3/16"=1'-0"



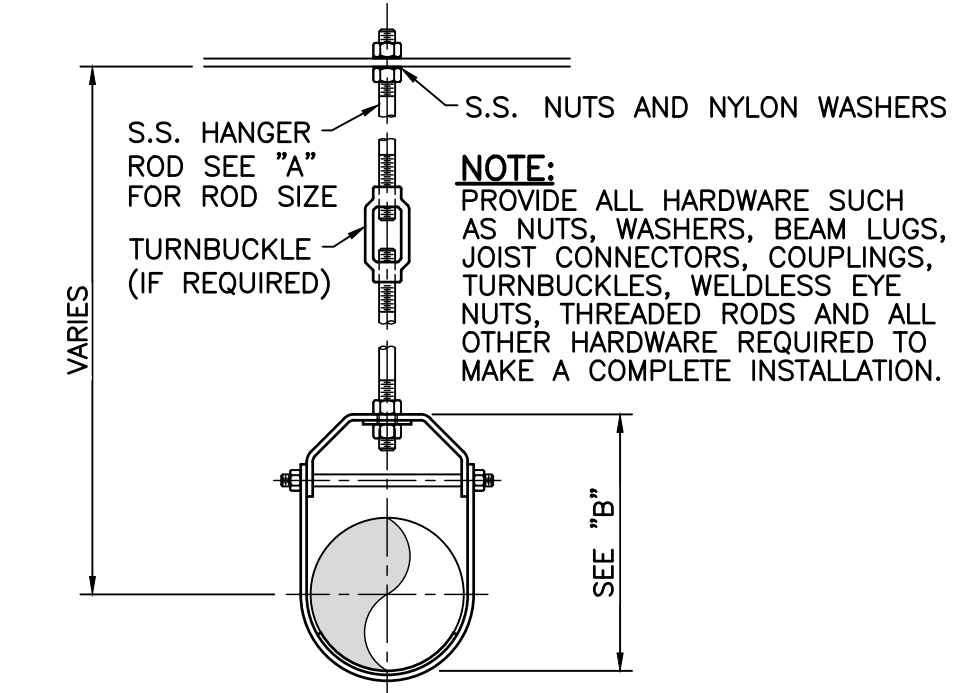
1 DETAIL - CONNECTION TO DROP PIPE
1"=1'-0" (IN CELLS 1-4, TRAINS "A" AND "B")



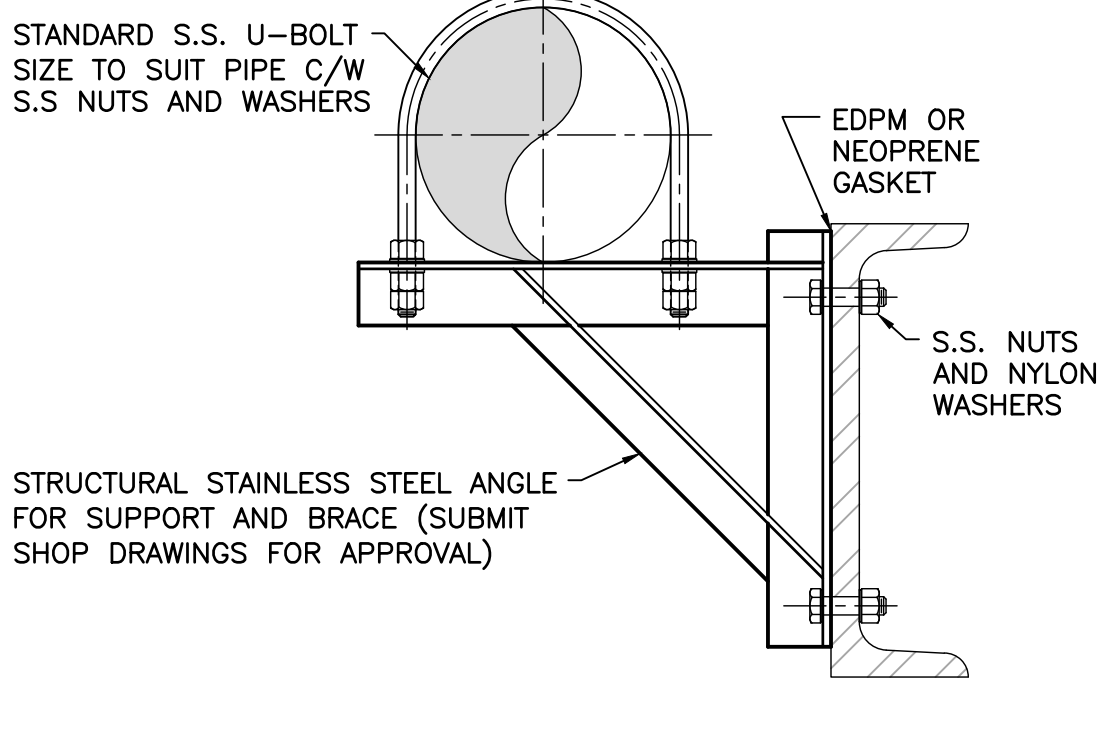
2 DETAIL - CONNECTION TO DROP PIPE
1"=1'-0" (EQUALIZATION TANK)



3 DETAIL - LOW POINT PURGE TUBING
1"=1'-0" (CELL 3A ONLY, ALL OTHER PURGE POINTS TO BE SUPPLIED IN THE AERATION EQUIPMENT PACKAGE AND INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS)



4 DETAIL - TYPICAL CLEVIS HANGER
N.T.S. STANDARD DUTY PIPE HANGER



5 DETAIL - WALKWAY MOUNTED PIPE SUPPORT
N.T.S. STAINLESS STEEL ANGLE BRACKET

- PROCESS NOTES:**
- THIS IS AN OPERATIONAL PLANT AND MUST REMAIN OPERATIONAL TO THE MAXIMUM EXTENT POSSIBLE THROUGHOUT CONSTRUCTION. THE WORK WILL TAKE PLACE IN TRAIN "A", TRAIN "B", AND THE EQUALIZATION TANK. THE WORK MUST BE PHASED: ONE TRAIN ONLY MAY BE TAKEN OUT OF SERVICE AT A TIME, AND MUST BE PUT FULLY BACK INTO SERVICE BEFORE THE OTHER TRAIN, OR THE EQUALIZATION TANK, MAY BE TAKEN OUT OF SERVICE. WORK MUST BE SCHEDULED SO THAT TIMES WHEN ANY AERATION EQUIPMENT IS OUT OF SERVICE ARE MINIMIZED, AND AT TIMES OF LOW FLOW AND LOW RAINFALL AS FAR AS POSSIBLE. INSTALLATION OF EQUIPMENT IN EQUALIZATION TANK SHALL BE DONE FIRST IF POSSIBLE. TRAIN "A" AND TRAIN "B" MAY BE TAKEN OUT OF SERVICE FOR NO LONGER THAN 240 HOURS EACH. THE EQUALIZATION TANK MAY BE TAKEN OUT OF SERVICE FOR NO LONGER THAN 120 HOURS. THE PLANT WILL BE IN PARTIAL BYPASS DURING THESE TIMES AND IS REGULATED BY FISHERIES AND OCEANS CANADA AND ENVIRONMENT CANADA; INSTALLATION TIME IS CRITICAL TO MINIMIZE PARTIALLY TREATED DISCHARGES.
 - EACH TANK MUST BE FULLY DRAINED AND CLEANED OF ALL SLUDGE, DEBRIS, GRAVEL, GRIT AND AERATION EQUIPMENT BEFORE INSTALLATION WORK MAY START IN THAT AREA. TRAIN "A" AND TRAIN "B" CONTAIN APPROXIMATELY 2000 cu.ft. PER TRAIN OF FLOATING PLASTIC MEDIA WHICH MUST BE CAREFULLY REMOVED FROM THE TANK AND RETAINED FOR REINSTALLATION. THE MEDIA MUST NOT BE ALLOWED TO DRY OUT. NO MEDIA SHALL BE PUT INTO EQUALIZATION TANK UNDER ANY CIRCUMSTANCES.
 - CONTRACTOR SHALL COORDINATE WITH THE SUPPLIERS OF THE PRE-PURCHASED EQUIPMENT TO ENSURE THE SCOPE OF SUPPLY IS COMPLETE IN EVERY ASPECT FOR THE EQUIPMENTS INTENDED USE AND OPERATION ON THE WHOLE.
 - CONTRACTOR SHALL REFER TO APPROVED VENDOR SHOP DRAWINGS TO CONFIRM SCOPE OF WORK.
 - CONTRACTOR SHALL MAKE HIMSELF THOROUGHLY FAMILIAR WITH ALL REQUIREMENTS OF THE PRE-PURCHASED EQUIPMENT BY DISCUSSION WITH AND REVIEW OF INFORMATION PROVIDED BY SUPPLIERS.

- GENERAL NOTES:**
- DRAWINGS IN GENERAL ARE TO SCALE BUT FIGURED DIMENSIONS TAKE PRECEDENCE. THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR THE ACCURACY OF INFORMATION SCALED FROM THE DRAWINGS.
 - ALL DIMENSIONS USE IMPERIAL UNITS. DIMENSIONS SHOWN IN FEET AND INCHES AND POINT ELEVATIONS AS DECIMAL FEET (UNLESS NOTED OTHERWISE).
 - THE CONTRACTOR IS TO VISIT THE SITE AND REVIEW ALL SITE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO CHECK AND VERIFY THAT ALL DIMENSIONS, ELEVATIONS, PIPE SIZES AND EQUIPMENT LOCATIONS ARE CORRECT, AND TO REPORT, IN WRITING, ANY DISCREPANCIES OR OMISSIONS TO THE OWNER'S ENGINEER PRIOR TO PROCEEDING WITH ANY WORK.
 - ALL WORK IS TO BE EXECUTED IN A SAFE AND ORDERLY MANNER. CONTRACTOR IS TO MAINTAIN A CLEAN JOBSITE AND REMOVE DEBRIS AND WASTE FROM THE SITE ON A DAILY BASIS. WASTE DISPOSAL TO BE IN ACCORDANCE WITH ENVIRONMENTAL REGULATIONS, AND IS THE RESPONSIBILITY OF THE CONTRACTOR.
 - NO CHANGES OR REVISIONS TO THE WORK SHALL BE EXECUTED WITHOUT THE APPROVAL OF THE ENGINEER.
 - SHOP DRAWINGS FOR ALL COMPONENTS SHALL BE SUBMITTED TO THE OWNER'S ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE PURCHASE OR USE.
 - ALL DISTURBED AREAS SHALL BE REINSTATED TO ORIGINAL CONDITION TO THE APPROVAL OF THE ENGINEER. ANY REPAIR TO EXISTING INFRASTRUCTURE DAMAGED DURING CONSTRUCTION SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
 - ALL SUPPORTS, HANGERS, BRACKETS AND ASSOCIATED HARDWARE WITHIN TANKS SHALL BE 316 STAINLESS STEEL UNLESS NOTED OTHERWISE.
 - ABSOLUTELY NO JUNCTION BOXES WITHIN TANKS.
 - DRAWINGS DO NOT INDICATE ALL EXISTING SITE SERVICES, PIPING, VALVES, CONDUIT, FITTINGS, ETC. AND LOCATION AS INDICATED ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY AS REQUIRED. TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGING OR DISTURBING EXISTING SYSTEM AND SERVICES.

No.	Description	Date	By
1	ISSUED FOR CONSTRUCTION	APR 17/20	JH
0	ISSUED FOR TENDER	MAR 03/20	SE
B	ISSUED FOR APPROVAL	JAN 31/20	SE
A	ISSUED TO SUPPLIER	DEC 11/19	SE

Revision or Issue
TOWN OF LUNenburg
LUNenburg WWTP
AERATION SYSTEM UPGRADE

PROCESS
AERATION BASIN
PLAN, SECTIONS
AND DETAILS



CBCL No	Contract No	Date	Scale
190805.03	190805	DEC 2019	AS NOTED

Checked	Drawn
SE	NHM
NM	MC

Sheet No
1 of 1
P01

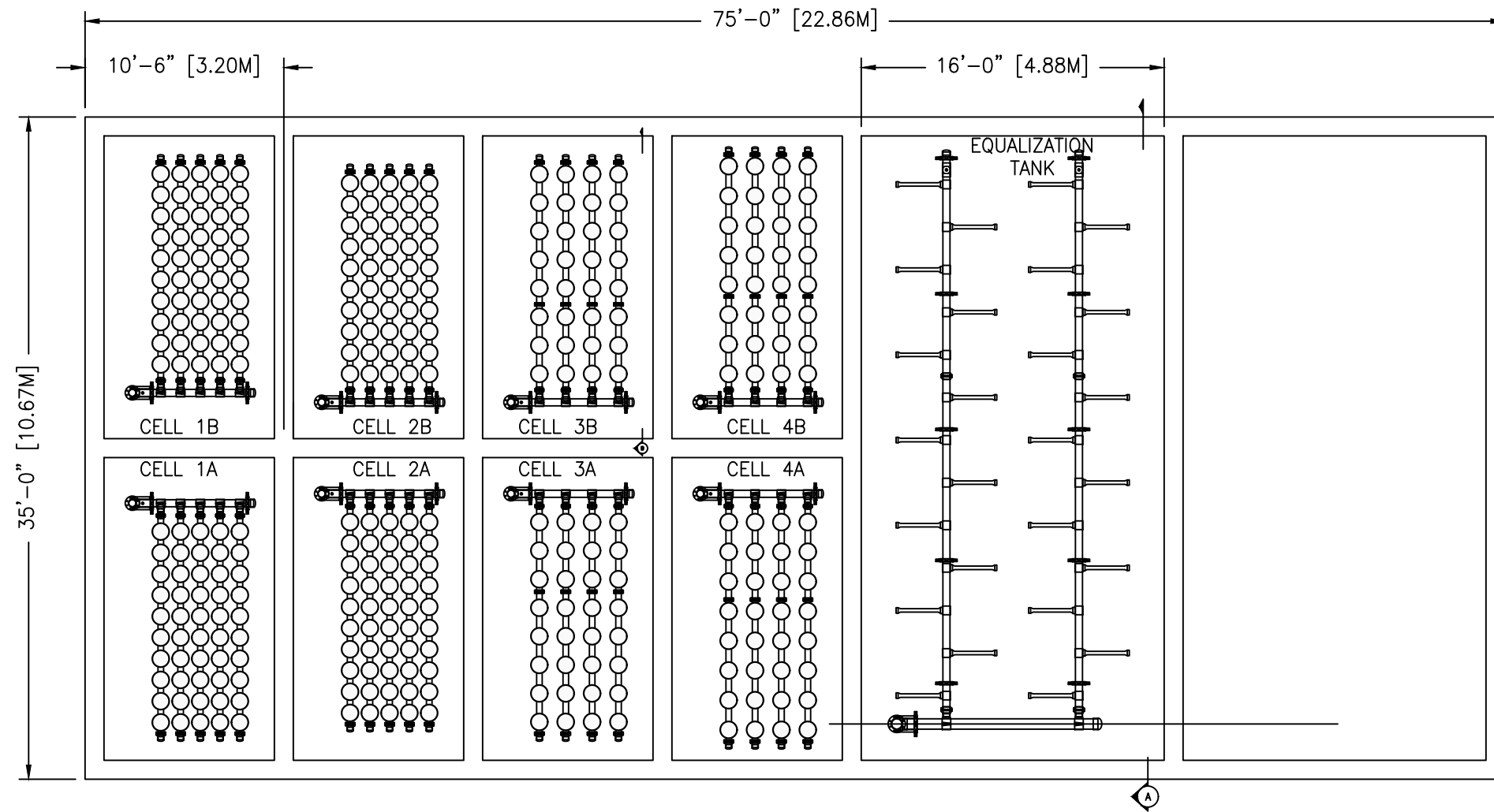
DRAWING NAME: P:\PROJECTS\190805.03 TOWN OF LUNenburg WWTP AERATION SYSTEM UPGRADE\PROCESS\190805.03 P01.DWG CAD USER: NADIA NOELIA LAYOUT NAME: P01_PLOT_DATE: 18-20 4:13:22 PM CAD GENERATED: NOELIA

REVISION HISTORY

REV	DESCRIPTION	DATE	APPROVED
B	CUSTOMER REMARKS	2/4/20	JPD

	# OF DISC DIFFUSERS
TOTAL	328

	# OF MAXAIR DIFFUSERS
TOTAL	26



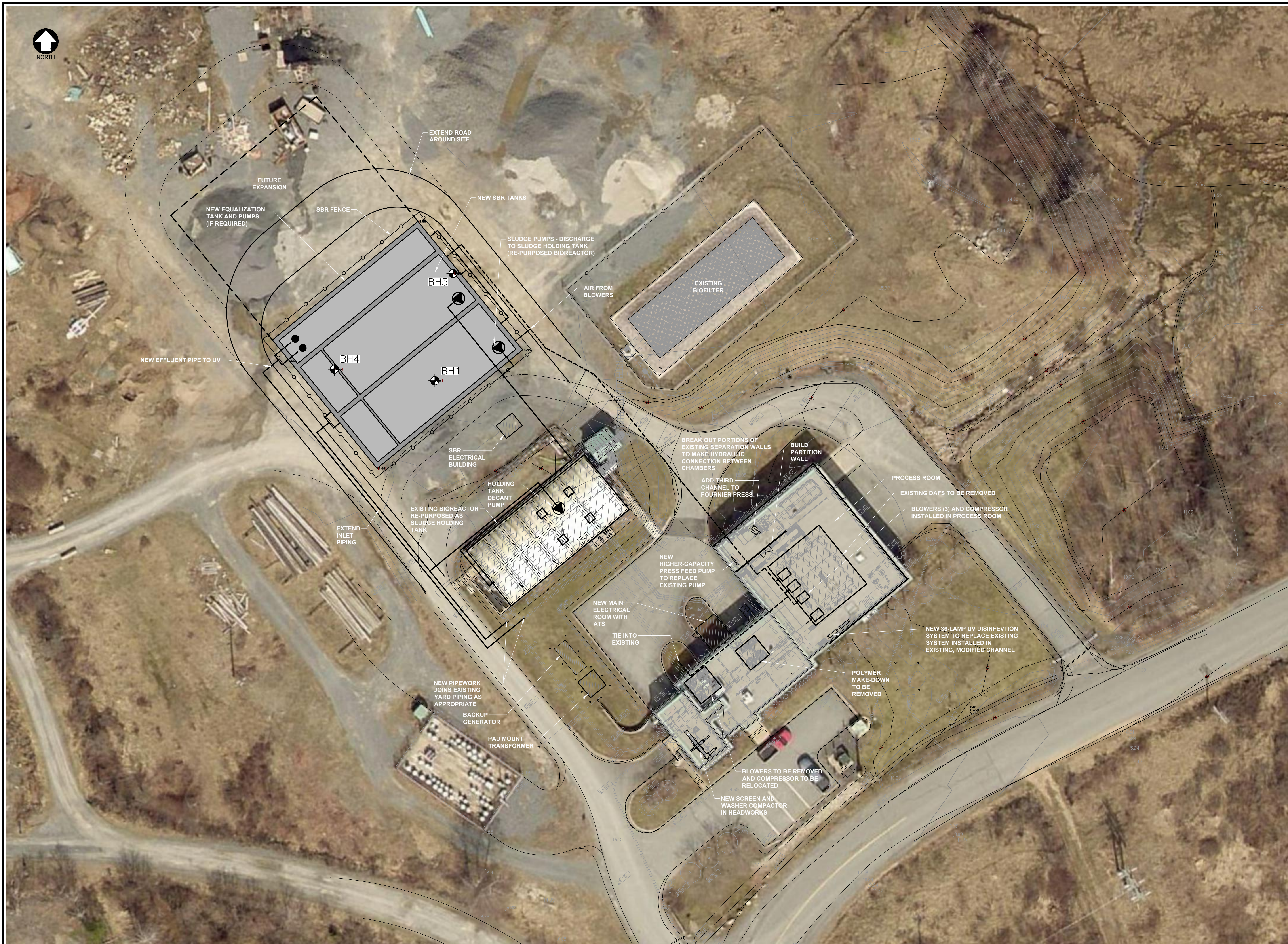
READ INSTALLATION INSTRUCTIONS PRIOR TO INSTALLING SYSTEM

NOTE: CONTRACTOR TO CONFIRM EDI LAYOUT IS SUITABLE FOR INSTALLATION AND WILL NOT CONFLICT WITH OTHER PROCESS PIPING AND/OR STRUCTURAL COMPONENTS.

PROJECT NAME				NS, LUNENBERG			
PROJECT DESCRIPTION				OVERALL LAYOUT			
				EDI FLEXAIR® AERATION-MIXING SYSTEM			
FOR:	BY:	DATE:	SCALE:				
JPD	JMA	1/10/20	1/8" = 1'-0"				
Environmental Dynamics International							
		P: +1 573.474.9456		Worldwide Headquarters:			
		F: +1 573.474.6988		5601 Paris Road			
		wastewater.com		Columbia, MO USA 65202			
PROJECT NUMBER		SHEET NUMBER		DWG NUMBER			
33998		1 OF 6		156080			

APPENDIX C

Proposed Work Drawings



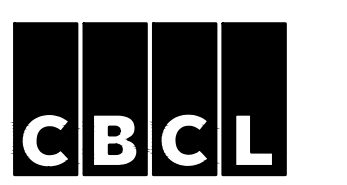
NOTES:
 1. SCOPE OF WORK ALSO INCLUDES ROOFING REPLACEMENT ON EXISTING PROCESS BUILDING AND OTHER 0-10 ITEMS RECOMMENDED IN BUILDING CONDITION ASSESSMENT.

A ISSUED FOR REPORT			
No.	Description	Date	By

Revision or Issue

TOWN OF LUNENBURG
 LUNENBURG WASTEWATER TREATMENT PLANT
 SBR EXPANSION

PROCESS
 SITE LAYOUT



CBCL No. 210803.02	Contract No.
Date MAR 2022	Scale AS NOTED
Designed SHE	Drawn NHM
Checked DAT	Approved
Sheet No.	Drawing No.

P02

PLAN - SITE LAYOUT
 1:250