

City of St. Catharines

Planning and Development Services
PO Box 3012, 50 Church Street
St. Catharines, ON L2R 7C2

Phone: 905-688-5600
Fax: 905-688-5873
TTY: 905-688-4TTY (4889)

March 4, 2013

Kathleen Hum
The Regional Municipality of Niagara
c/o Regional Clerk PO Box 1042 Stn Main
Thorold ON
L2V 4T7

Dear Madam:

Re: Project No: 13 101368 IL
To Construct a new Pump and Control Room Building
for "*Port Weller Wastewater Treatment Plant*"
79 Cumberland Street, St. Catharines

The plans for the above-referenced project have been reviewed and approval granted for the issuance of a building permit subject to complying with the following conditions. However, on-site inspections may reveal deficiencies not covered in this letter or the approved plans which must be brought into compliance with the requirements of the Ontario Building Code. Your certified drawings and building permit will be forwarded under separate cover unless we were initially instructed to hold the permit and drawings for pick up at our office.

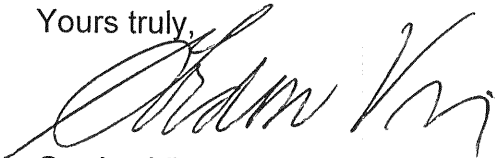
- 1) In accordance with the requirements of the Occupational Health and Safety Act, the Contractor must complete an approved notification form and file it with the Ministry of Labour offices located at 301 St. Paul Street, 8th Floor, St. Catharines, Ontario, L2R 7R4, telephone 905-704-3994, and must obtain any necessary approvals prior to commencing any work at the project.
- 2) **Shop drawings for the precast concrete structure, sealed by a registered Professional Engineer must be submitted to the Building Section for review and acceptance prior to construction / erection.**
- 3) **Provide a roof space access hatch with minimum dimensions of 35 inches by 22 inches.**
- 4) The building must not be occupied for its intended use until an approved final inspection has been made or until authorization has been obtained from the Building Inspector allowing occupancy of a building prior to being fully completed.
- 5) All exit doors must be fastened such that they are readily opened from the inside with not more than one releasing operation and without requiring keys, special devices or specialized knowledge of the door opening mechanism.

- 6) The flame spread rating of all interior materials used on the walls and ceilings must not exceed 150 in any part of the building.
- 7) Steps for stairs must have a run of not less than 230 mm (9 in.) and not more than 355 mm (14 in.). Risers between successive treads must be not less than 125 mm (4 7/8 in.) and not more than 200 mm (7 7/8 in.).
- 8) The leading edge of a stair tread must have either a radius or bevel between 8 mm (5/16 in.) and 13 mm (½ in.) in horizontal dimension.
- 9) Each of the stairs shown on the drawings is wider than 3'-7", and as a result, a handrail must be provided on each side of the stairs. At least one handrail at each stair must extend horizontally at the required height, not less than 300 mm (1 ft.) beyond the top riser ,and continue to slope for a depth of one tread beyond the bottom riser followed by a 300 mm (1 ft.) horizontal extension.
- 10) All sheet metal work must be performed by licensed, journeyman sheet metal workers possessing a valid Certificate of Qualification (308A) from the Ministry of Training, Colleges and Universities in the Province of Ontario.
- 11) Outdoor air must be provided by a ventilation system that meets the requirements of ANSI/ASHRAE 62, "Ventilation for Acceptable Indoor Air Quality" (O.Reg.350/06, Div.B, 6.2.2.1.(2)).
- 12) All plumbing must conform to O.Reg.350/06, Div. B Part 7 of the Building Code. *Please note that backflow protection is required for the service sink.*
- 13) All plumbing work must be performed by licensed journeyman plumbers working under the supervision of a Master Plumber licensed by the City of St. Catharines.
- 14) All installed plumbing drains, wastes and vents shall be tested, inspected and approved prior to covering.
- 15) The contractor shall be responsible for contacting the Fire Prevention Office at 905-688-5601 extension 4224 to arrange any and all inspections that fall under the responsibility of Fire Services PRIOR to closing and occupancy. Those being fire alarm, sprinkler system, exit signage, emergency lighting, portable fire extinguishers, firefighter elevators, emergency power for building services, and commercial cooking equipment.
- 16) An Electrical Permit and Inspection by the Electrical Safety Authority must be obtained for the fire alarm system, emergency lighting, and exit signage.
- 17) Portable fire extinguishers shall be installed in conformance with the provisions of Division B, Part 6 of the Ontario Fire Code and to the satisfaction of the Fire Prevention Office. Portable fire extinguishers shall be clearly visible and accessible. In areas where fire extinguisher visibility is obscured or obstructed, additional approved signage indicating the location of fire extinguishers shall be installed.

- 18) Emergency lighting providing an average illumination of not less than 10 lx at the floor or tread level for a minimum of two hours in a building within the scope of O.Reg.350/06, Div. B 3.2.6.; one hour for a building of a Group B major occupancy but not within the scope of O.Reg.350/06, Div. B 3.2.6. or thirty minutes for all others must be provided in conformance with O.Reg.350/06, Div. B 3.2.7.3. of the Ontario Building Code and to the satisfaction of the Fire Prevention Office. Emergency power for the emergency lighting shall be provided by self contained units conforming to CSA C22.2 No. 141, 'Unit Equipment for Emergency Lighting' or CSA C282, 'Emergency Electrical Supply for Buildings'.
- 19) Illuminated exit signs displaying the words EXIT or EXIT/SORTIE shall be installed throughout the building to the satisfaction of the Fire Prevention Office in accordance with the requirements of O.Reg.350/06, Div. B 3.4.5. of the Ontario Building Code. Exit signs shall be connected to a primary electrical supply with the circuit servicing only emergency equipment as well as an emergency power supply in conformance with O.Reg.350/06, Div. B 3.2.7.4. of the Ontario Building Code.

The foregoing requirements are in accordance with the present regulations of the City of St. Catharines and the Ontario Building Code. It is understood that if no reply is received in writing by the undersigned, except as specifically indicated herein, then you acknowledge and agree with the foregoing conditions. Should you wish any further information in this regard, please do not hesitate to contact the undersigned.

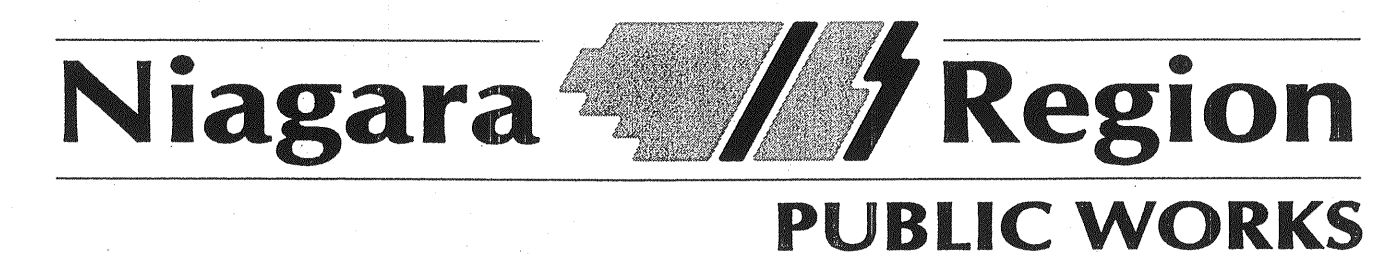
Yours truly,



Gordon Vis, C.E.T., M.A.A.T.O., C.B.C.O.
Building Plans Examiner

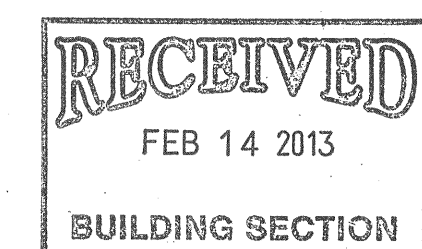
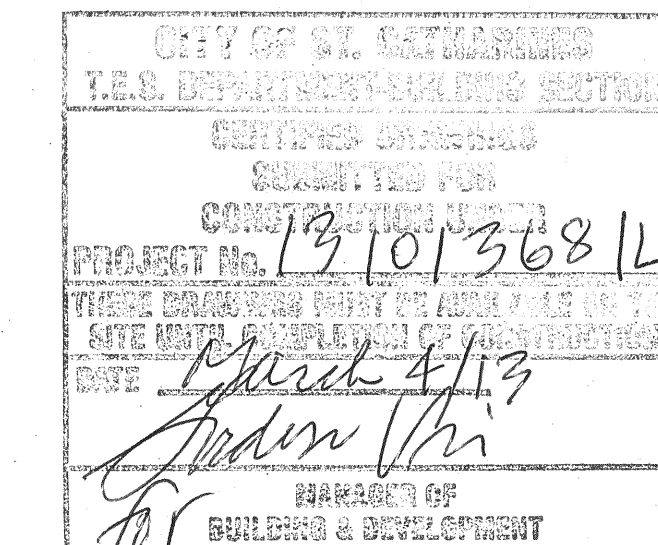
c.c. 13 101368 IL
Gordon Vis (2)
Cole Engineering Group Ltd.

THE REGIONAL MUNICIPALITY OF NIAGARA PUBLIC WORKS DEPARTMENT



BUILDING PERMIT IS ISSUED SUB-
JECT TO THE CONDITIONS OUTLINED
IN THE ATTACHED LETTER OF
APPROVAL DATED

March 4/13



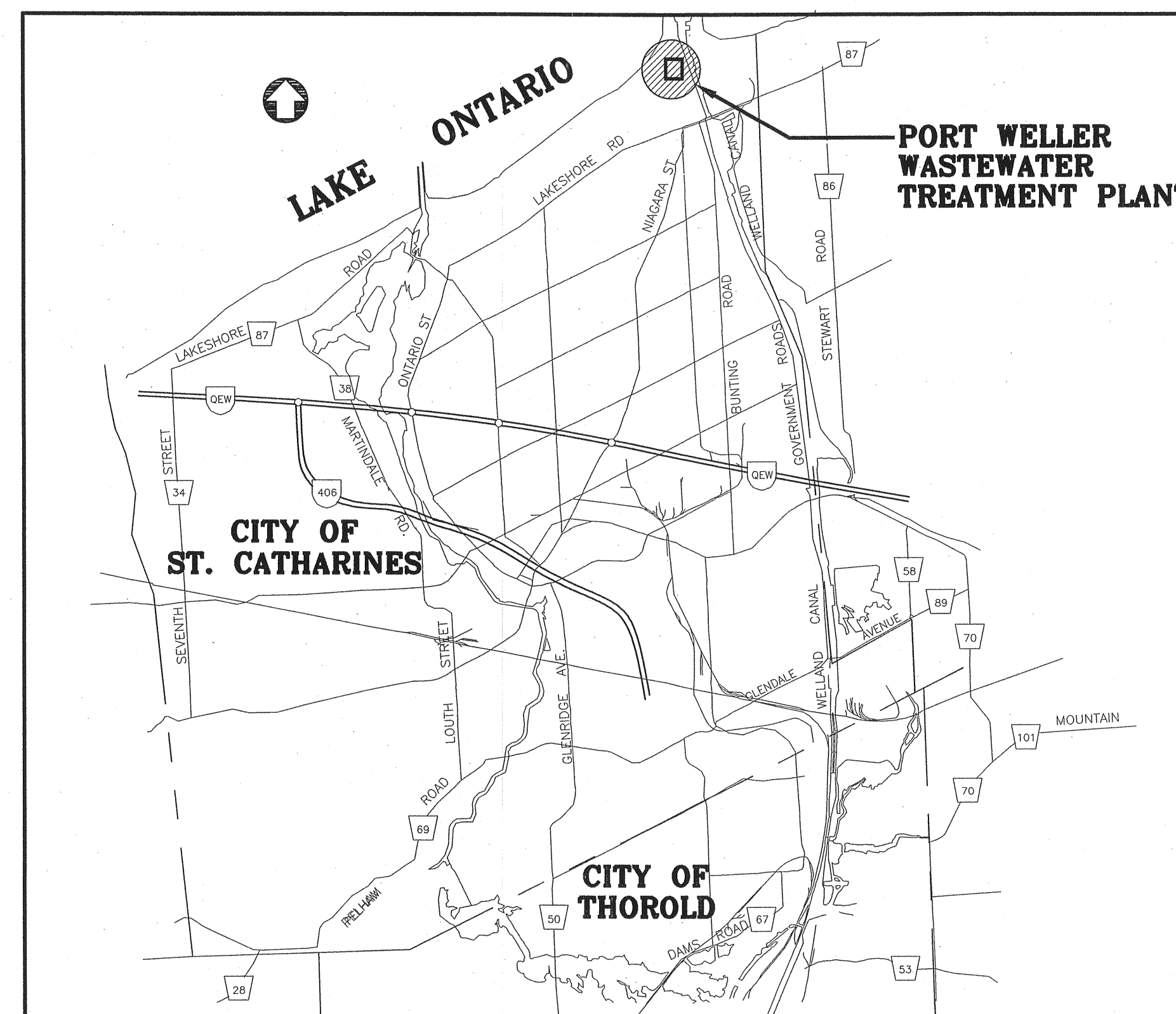
PROJECT NO: 13 101 368 12
(79 Cumberland)
LOCATION:
APPLICANT: COLE ENGINEERING GROUP LTD.

CONTRACT NO. 2013-T-103 (RN 13-03)

PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT IN THE CITY OF ST. CATHARINES

KENNETH J. BROTHERS, P.ENG.
COMMISSIONER OF PUBLIC WORKS

GARY BURROUGHS
REGIONAL CHAIR

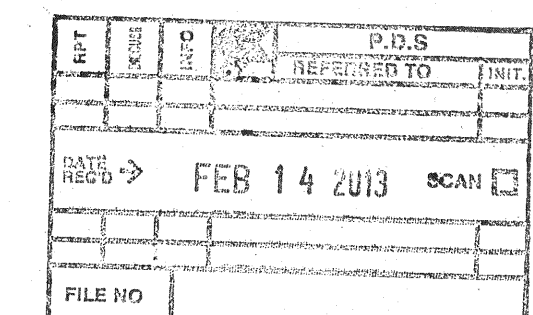


LOCATION PLAN - (NOT TO SCALE)

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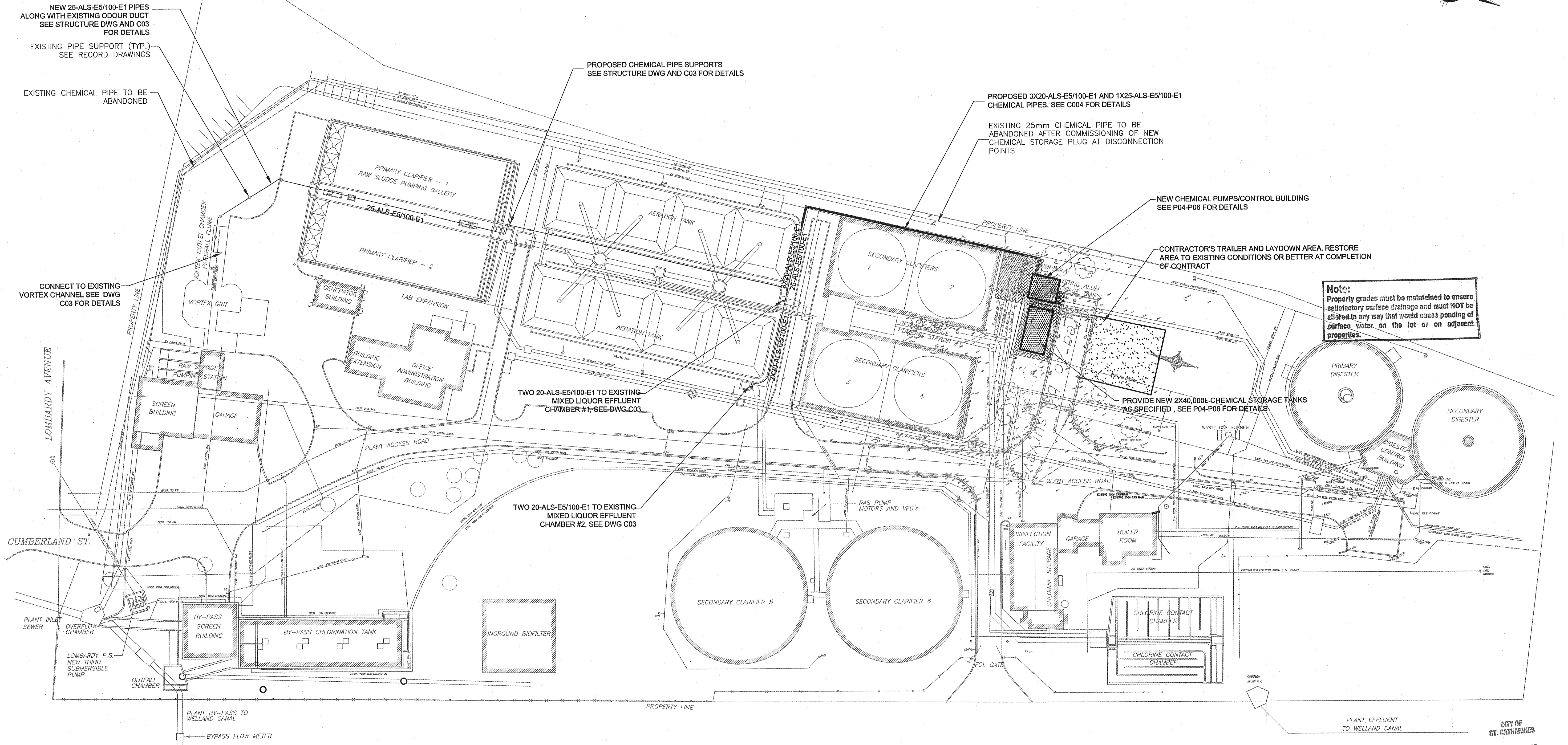
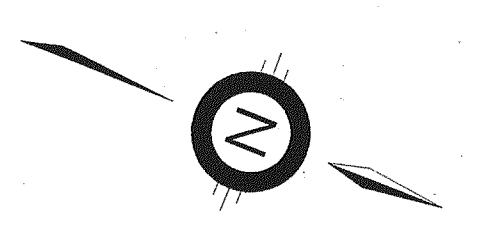
ISSUED FOR BUILDING PERMIT FEBRUARY 2013



RN 13-03
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PORT WELLER WASTEWATER TREATMENT PLANT
ALUM TANK & RAS REPLACEMENT

Office



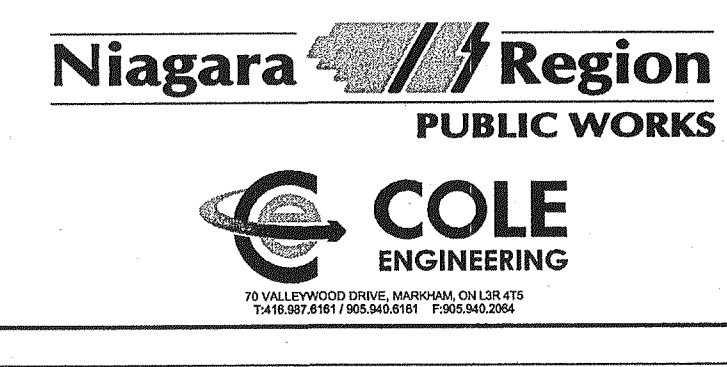
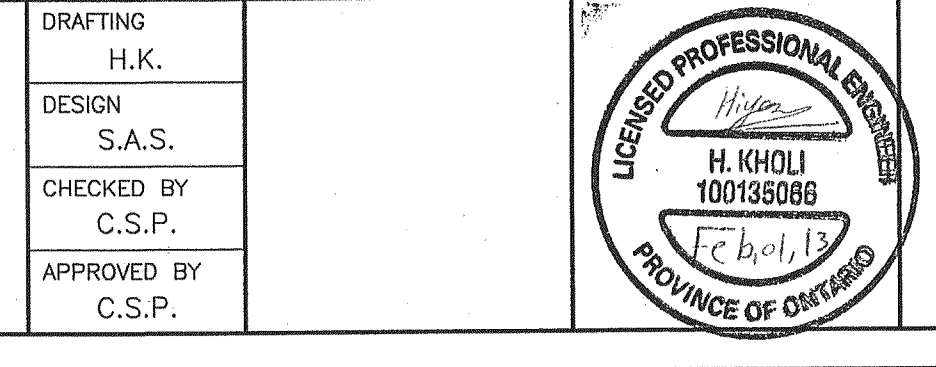
NOTE:
THESE RECORD DOCUMENTS (INCLUDING DIMENSION AND LOCATION OF EXISTING ABOVE GROUND AND UNDERGROUND INFRASTRUCTURE AND UTILITIES) HAVE BEEN PREPARED BASED IN PART UPON INFORMATION PROVIDED BY OTHERS. COLE ENGINEERING GROUP CAN NOT ASSUME THE ACCURACY OF OTHER'S INFORMATION AND THIS IS NOT RESPONSIBLE FOR THE ACCURACY OF THESE RECORD DOCUMENTS OR FOR ANY ERROR OR OMISSION THAT MAY HAVE BEEN INCORPORATED INTO THEM AS A RESULT. THOSE RELYING ON THESE RECORD DOCUMENTS ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF THEIR ACCURACY BEFORE APPLYING THEM FOR ANY PURPOSE

NOTES:
SEE GENERAL NOTES ON DWG C02

CITY OF
ST. CATHARINES
FEB 22 2013
DESIGNED BY
[Signature]

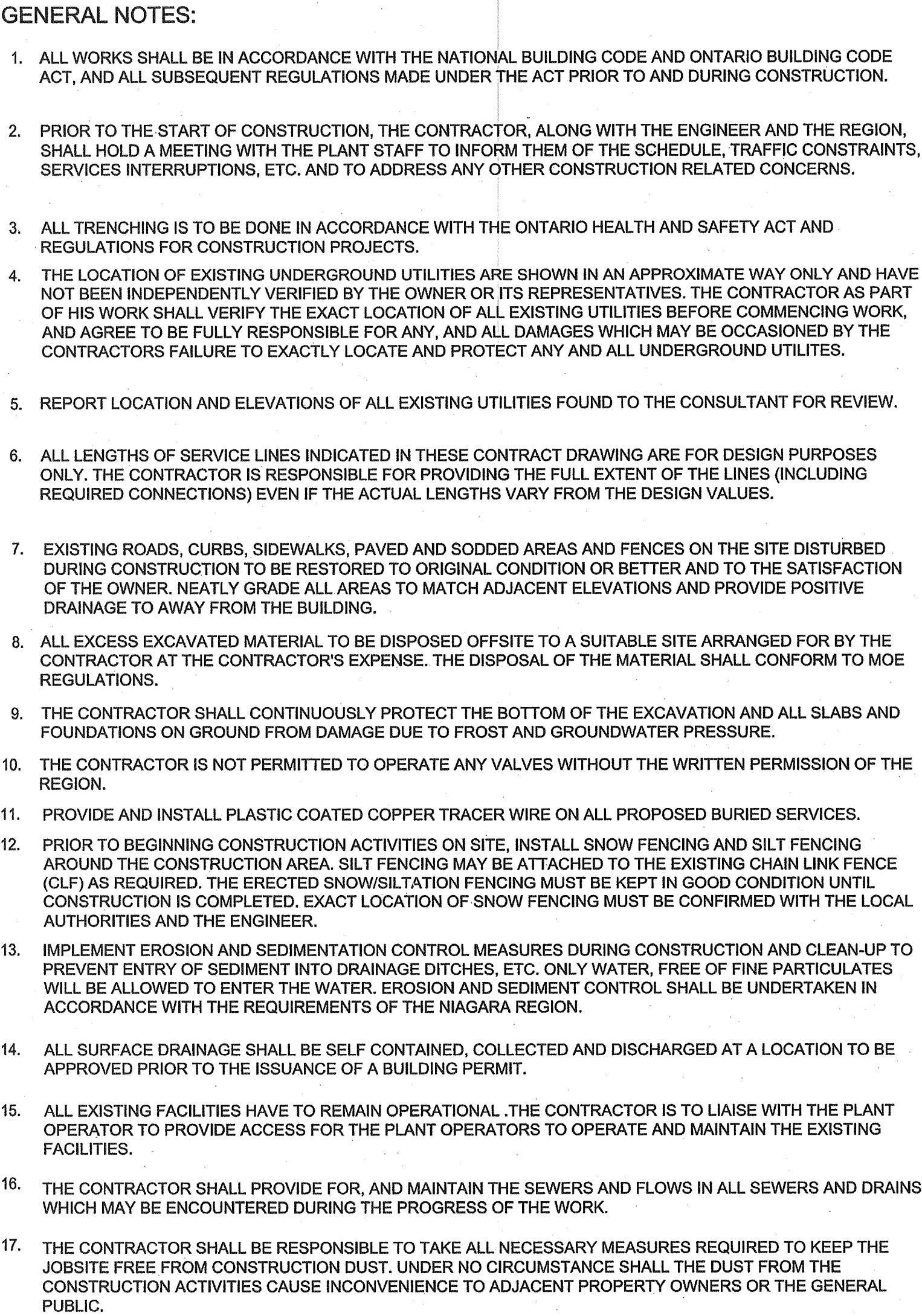
NOTES/LEGEND		
1 THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWER AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.		
2 PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD. TO VERIFY THE ACCURACY OF THESE PROPERTY LINES, A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.		
1	ISSUED FOR BUILDING PERMIT	2013-02-01 C.S.P.
NO.	REVISION	DATE INIT.

DRAFTING	H.K.
DESIGN	S.A.S.
CHECKED BY	C.S.P.
APPROVED BY	C.S.P.



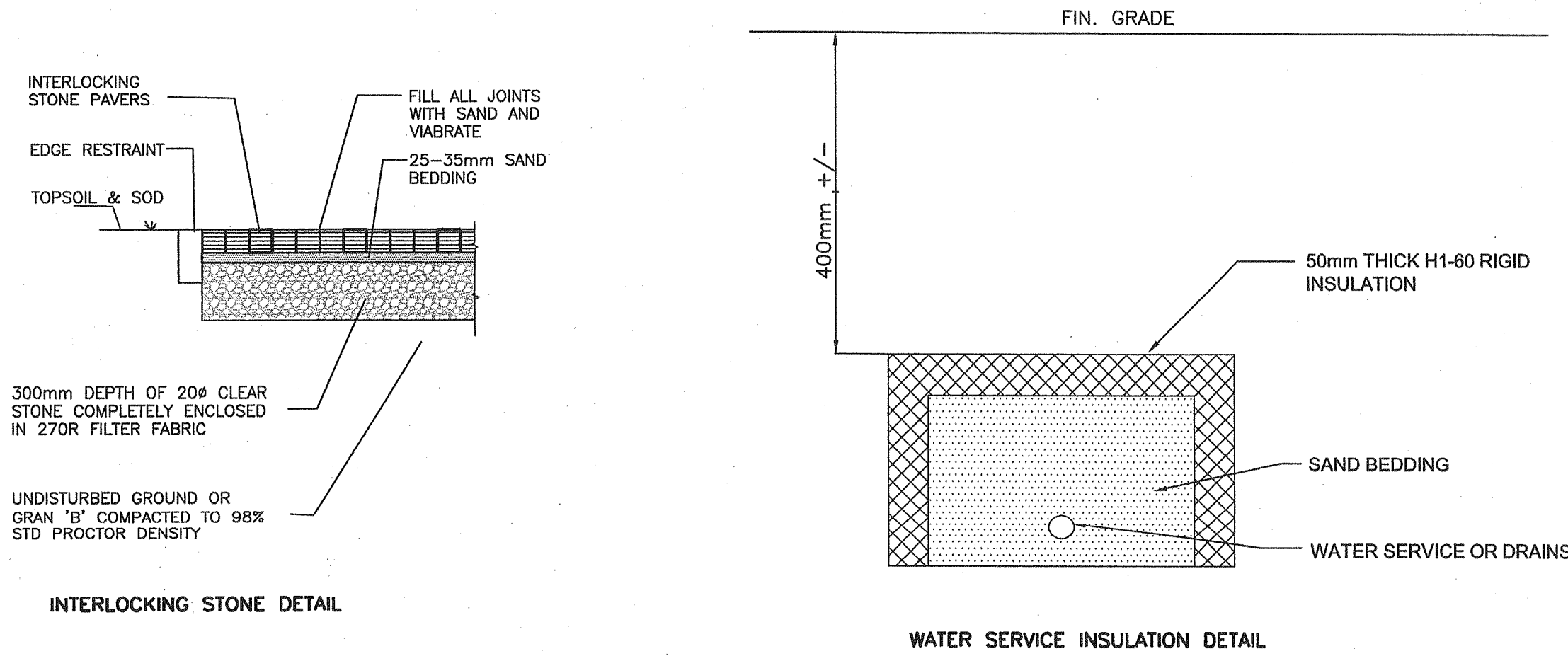
CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT IN THE CITY OF ST. CATHARINES
SITE PLAN
CIVIL



CONSULTANT FILE No. E11-434	
DATE	2012-05-09
SCALE	Hor : 1:500 Ver : 1:500
REF. No.	RN 13-03
DWG No.	C01
REV.	1

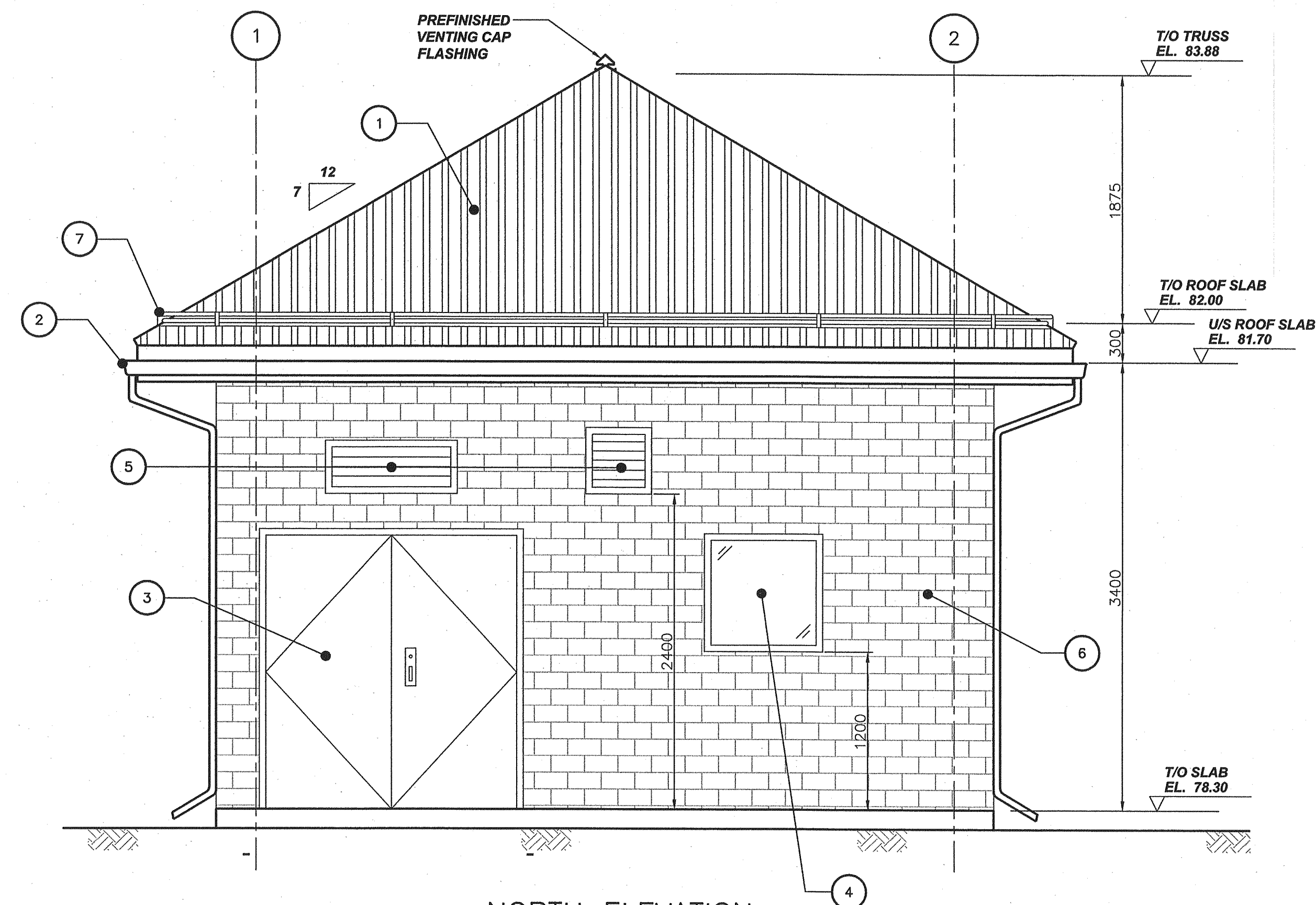


1. ALL INTERNAL COMBUSTION ENGINES ON CRANES, BACKHOES, LOADERS AND ANY OTHER EQUIPMENT EMPLOYED MUST HAVE MUFFLERS CAPABLE OF REDUCING NOISE GENERATED BY THEIR OPERATION TO A LEVEL ACCEPTABLE TO THE CONTRACT ADMINISTRATOR.
2. THE USE OF CHAIN AND OTHER TYPES OF SAWS SHALL BE LIMITED TO HOURS OF THE DAY WHEN NOISE FROM THIS SOURCE WILL PRODUCE NO COMPLAINTS FROM RESIDENTS LIVING IN THE VICINITY OF THE WORK SITE.
3. BLASTING IS NOT PERMITTED.

1. COMPLETELY DEMOLISH AND REMOVE THE EXISTING ALUM TANKS, ASSOCIATED PIPING AND REINFORCED CONC BASE FILL REMAINING VOID WITH GRANULAR "B" BACKFILL.
2. COMPLETELY DEMOLISH AND REMOVE THE EXISTING SLUDGE LOADING STRUCTURE CAP ALL REMAINING EXISTING PIPES. FILL REMAINING VOID WITH GRANULAR "B" BACKFILL.
3. CONTRACTOR TO PROVIDE TEMPORARY STORAGE AND SUPPLY FACILITY FOR ALUM REQUIREMENTS TO THE PLANT BEFORE PROCEEDING WITH ANY DEMOLITION OF THE EXISTING ALUM TANKS.

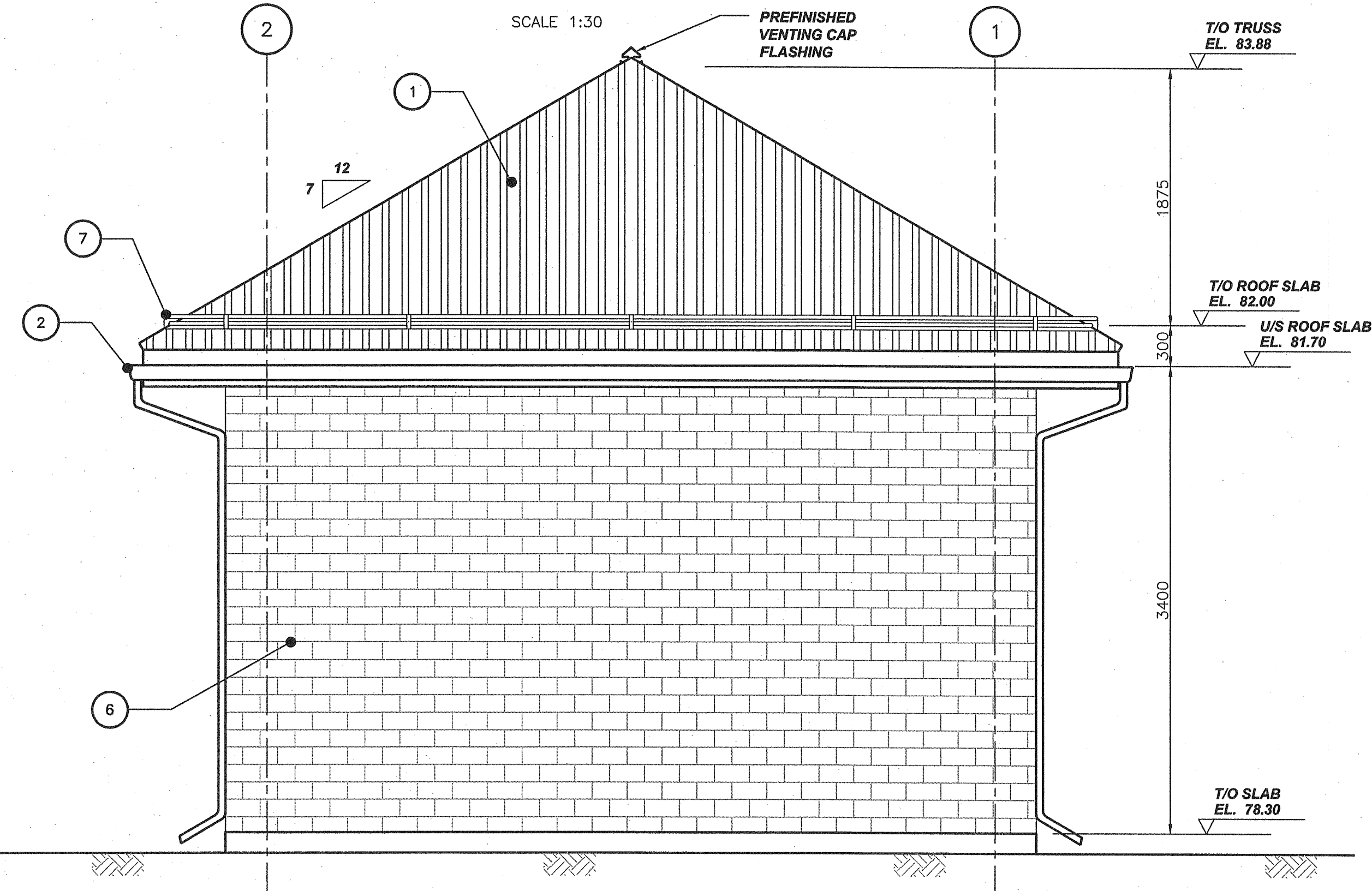


				<p>NOTES / LEGEND</p> <p>1 THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWER AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN THE ACCURACY OF THE POSITIONS OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.</p> <p>2 PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD. TO VERIFY THE ACCURACY OF THESE PROPERTY LINES, A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.</p>				<p>DRAFTING</p> <p>H.K.</p> <p>DESIGN</p> <p>S.A.S.</p> <p>CHECKED BY</p> <p>C.S.P.</p> <p>APPROVED BY</p> <p>C.S.P.</p>								<p>Niagara Region</p> <p>PUBLIC WORKS</p> <p> COLE ENGINEERING</p> <p>10 VALLEY ROAD, ORFORD, ONTARIO L6V 6K4 TEL: 519-897-1000 FAX: 519-897-1001 WWW.COLE-ENGINEERING.COM</p>				<p>CONTRACT NO. 2013-T-103 (RN 13-03)</p> <p>PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT IN THE CITY OF ST. CATHARINES</p> <p>GENERAL NOTES</p> <p>CIVIL</p>				<p>CONSULTANT FILE No. E11-434</p> <p>DATE 2012-05-09</p> <p>SCALE Hor : 1:200 m</p> <p>REF. No. RN 13-03</p> <p>DWG No. C02</p> <p>REV. 1</p>			
<p>1 ISSUED FOR BUILDING PERMIT 2013-02-01 C.S.P.</p> <p>NO. REVISION DATE INIT.</p>																											
DRAWING FILE: S:\2011 Projects\T-EE(E11)\Wastewater Treatment\E11-434 Niagara Port Weller WWTP\Task Region\DetailedDesign\ACAD-DWG\Submission\etE11-434--C02.dwg PLOTTED: Feb 05, 2013 - 10:07am PLOTTED BY: maraujo																											



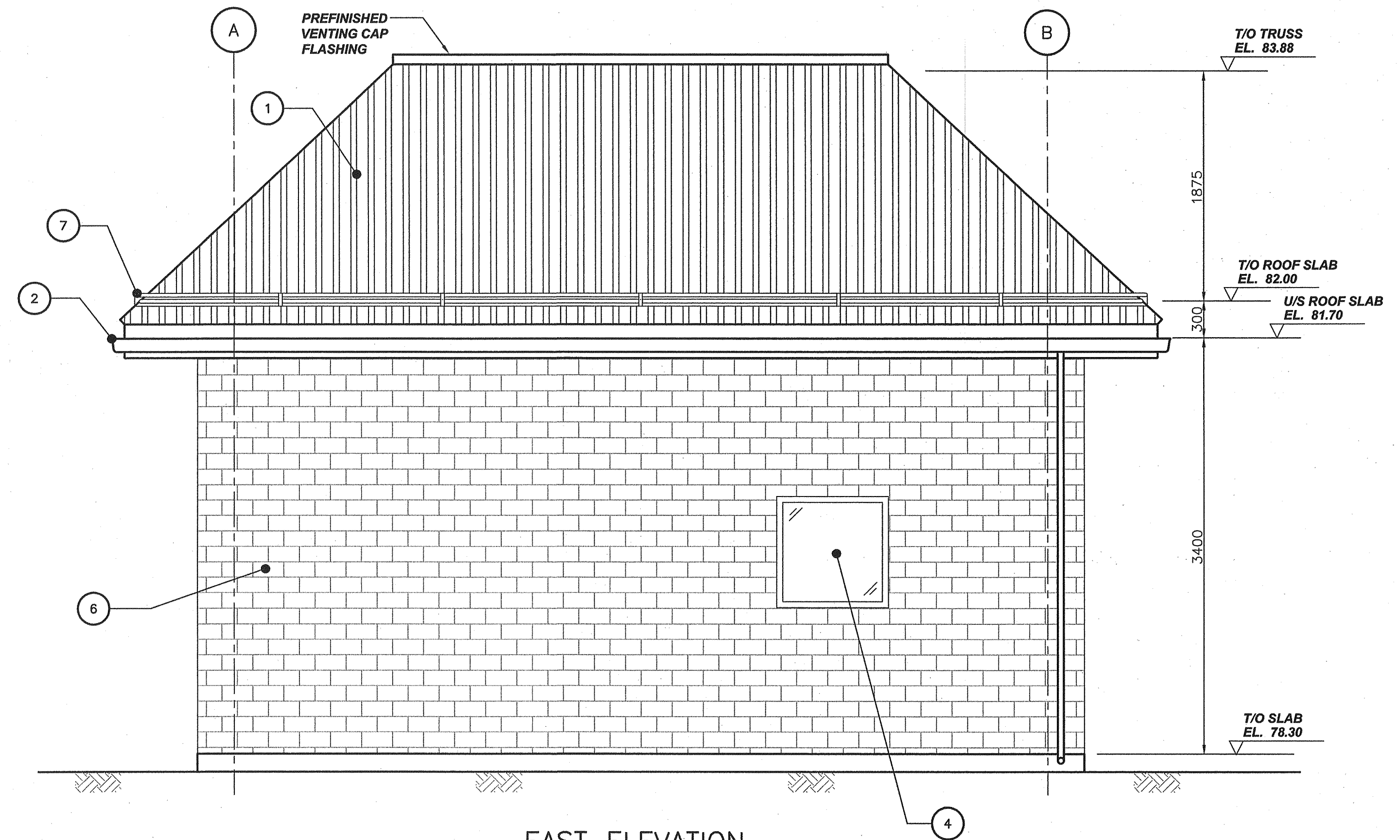
NORTH ELEVATION

SCALE 1:30



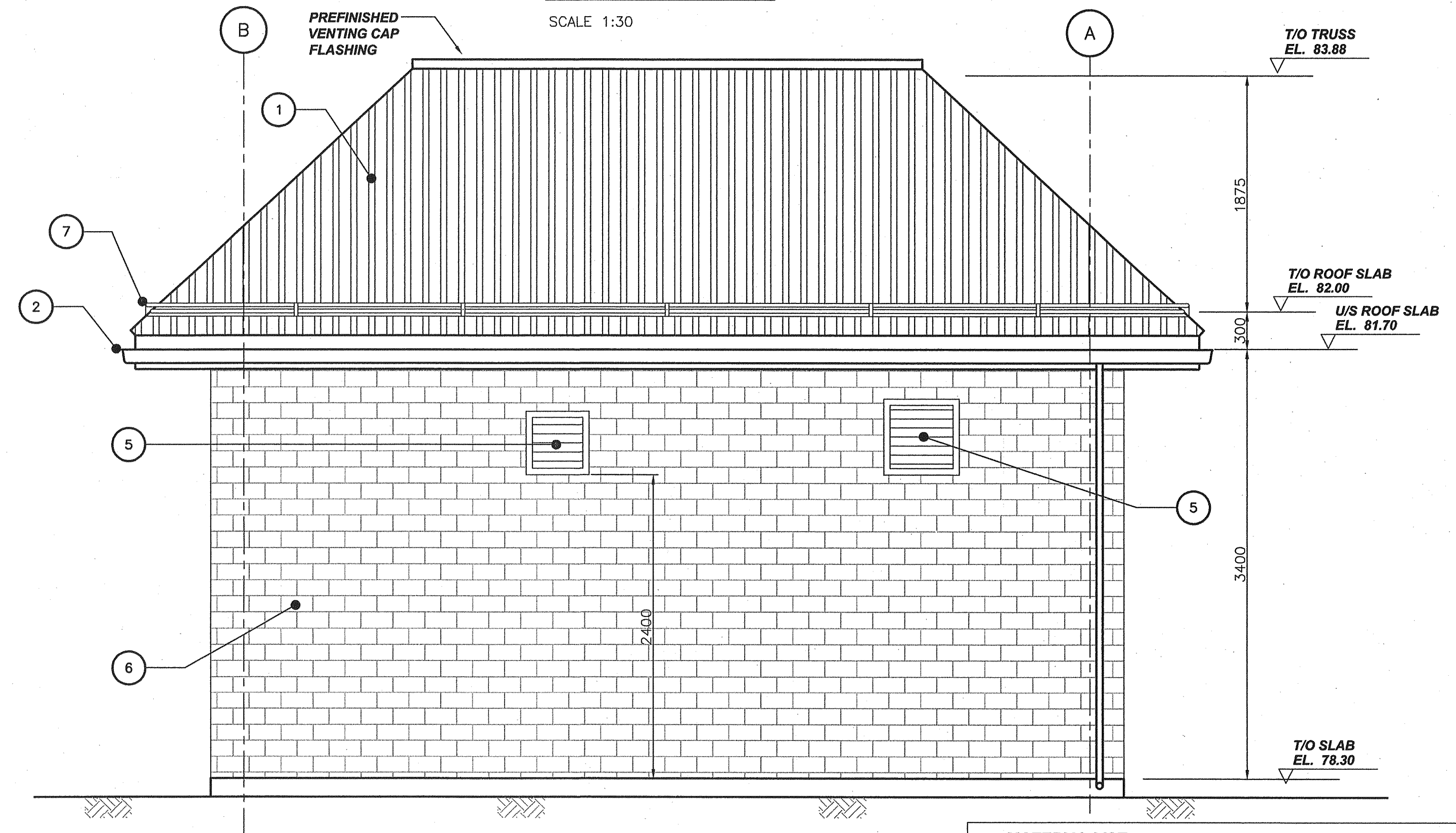
SOUTH ELEVATION

SCALE 1:30



EAST ELEVATION

SCALE 1:30



WEST ELEVATION

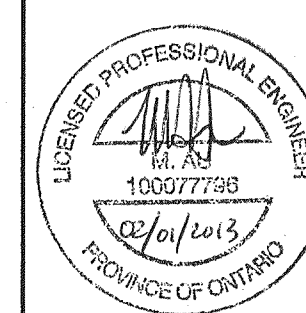
SCALE 1:30

MATERIAL LIST

- | | |
|--|--|
| 1 PRE-FINISHED METAL ROOFING
COLOR : ROYALE BLUE
STYLE : CL435
MANUFACTURER : VICWEST | 5 LOUVER
COLOR TO MATCH ROOFING |
| 2 PRE-FINISHED METAL GUTTER & DOWNSPOUTS
COLOR TO MATCH ROOFING | 6 PRECAST BUILDING
COLOR : SPECIAL GREY
FINISH : ASHLAR STONE
MANUFACTURER : HY-GRADE |
| 3 HOLLOW METAL DOOR & FRAME
COLOR TO MATCH ROOFING | 7 SNOW FENCE
COLOR : ROYALE BLUE |
| 4 WINDOW 900x900
COLOR TO MATCH ROOFING | |

NO.	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
1	REVISION	DATE	INIT.

DRAFTING	M.L.
DESIGN	M.AU
CHECKED BY	B.Y.
APPROVED BY	B.Y.

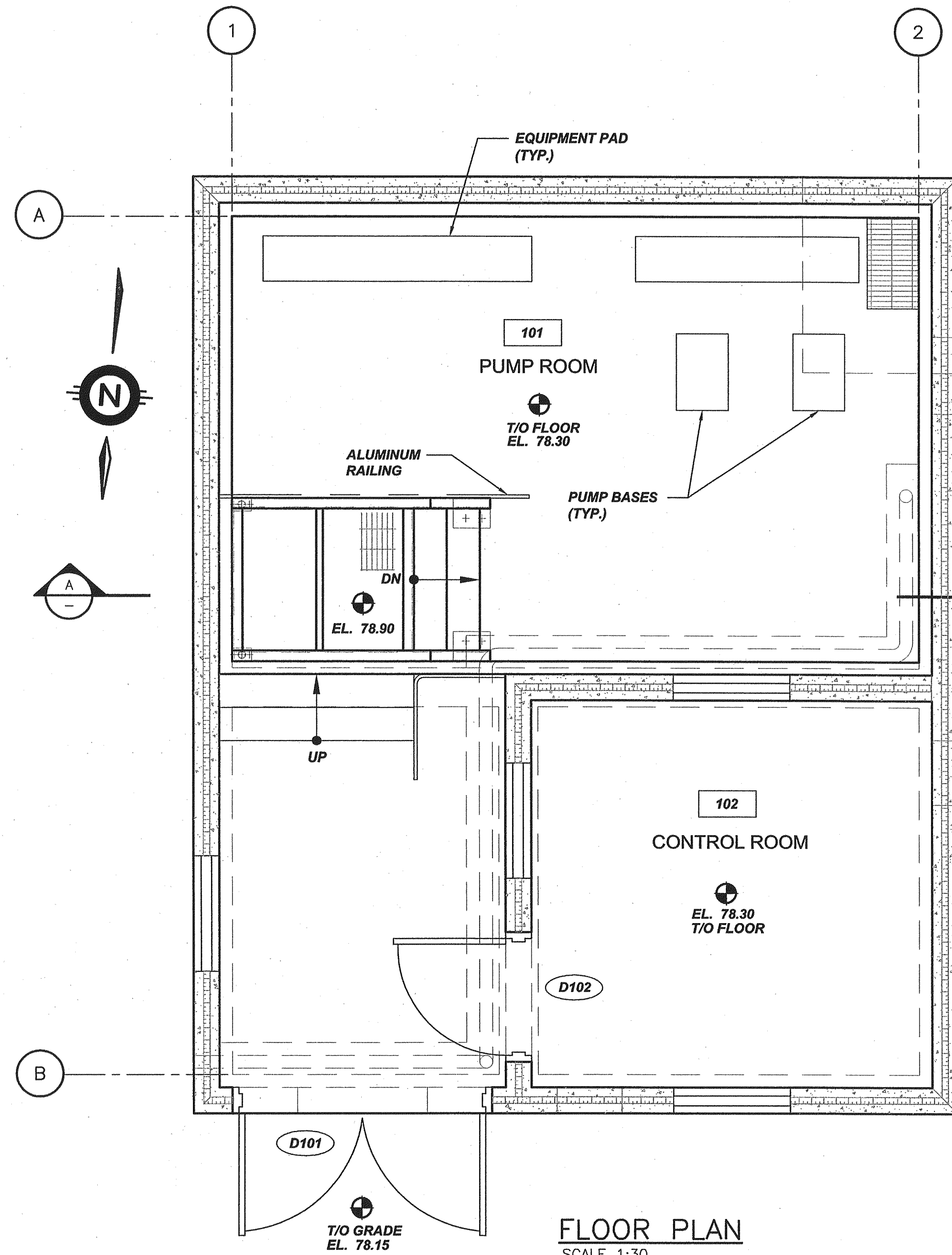


Niagara Region
PUBLIC WORKS



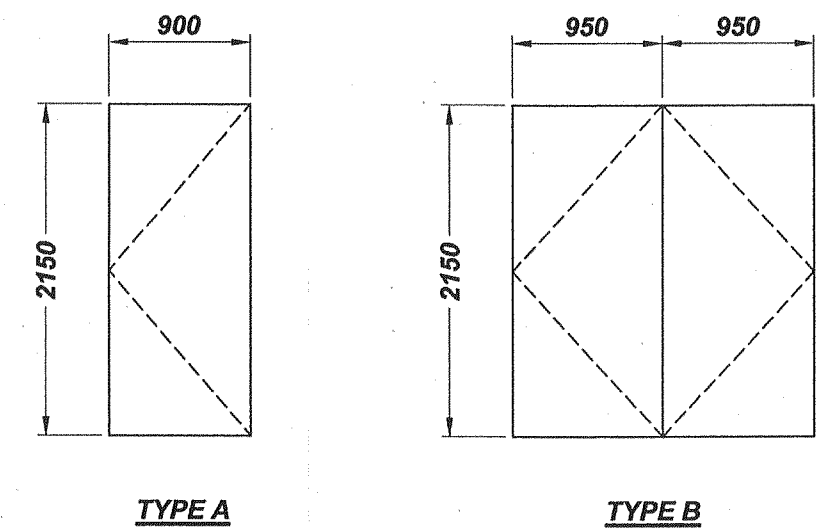
CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
PUMP AND CONTROL ROOM ELEVATIONS
ARCHITECTURAL

CONSULTANT FILE No. E11-434	REV.
DATE 2012-05-09	1
SCALE 1:30	
REF. No. RN 13-03	
DWG No. A01	

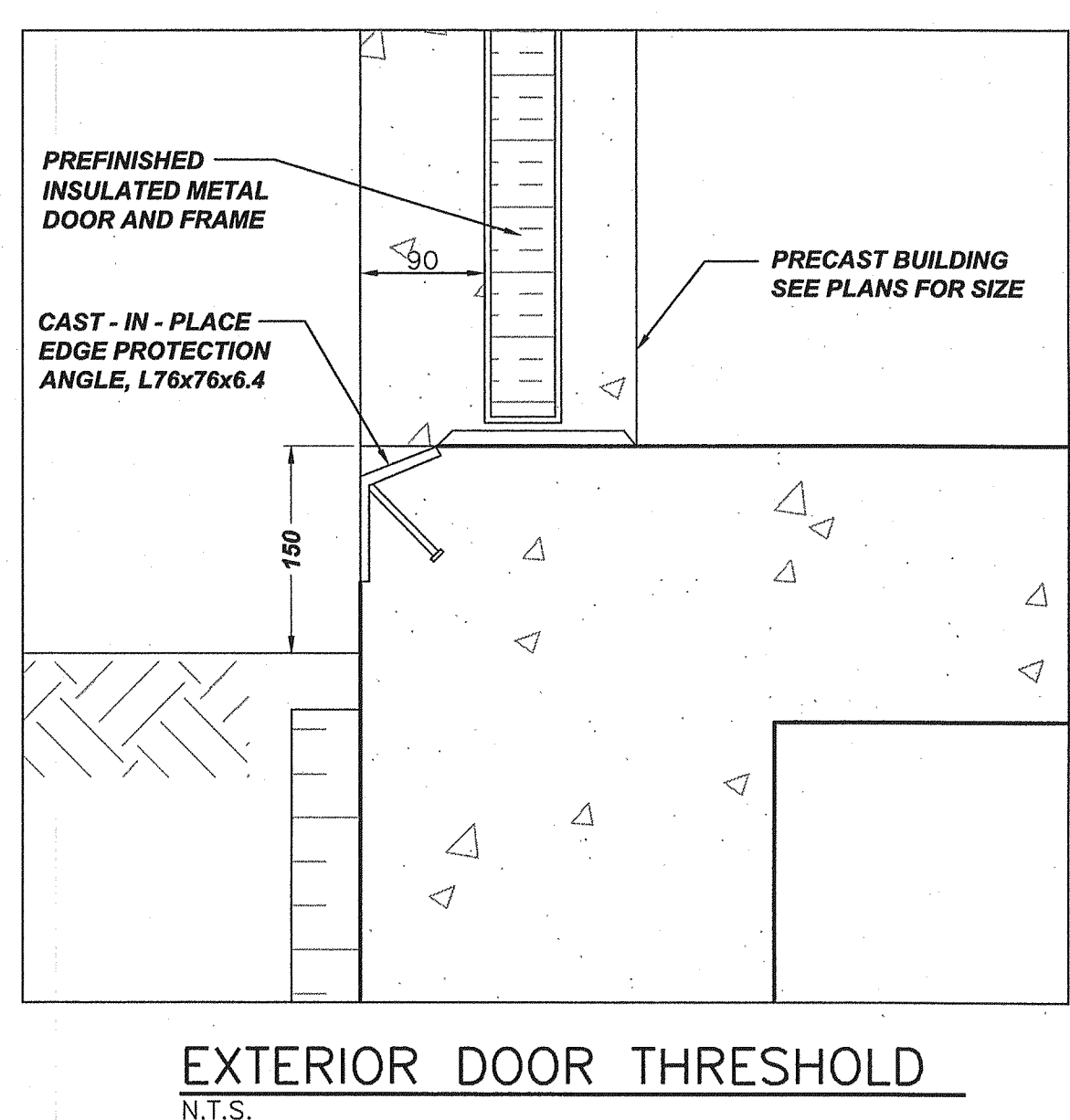
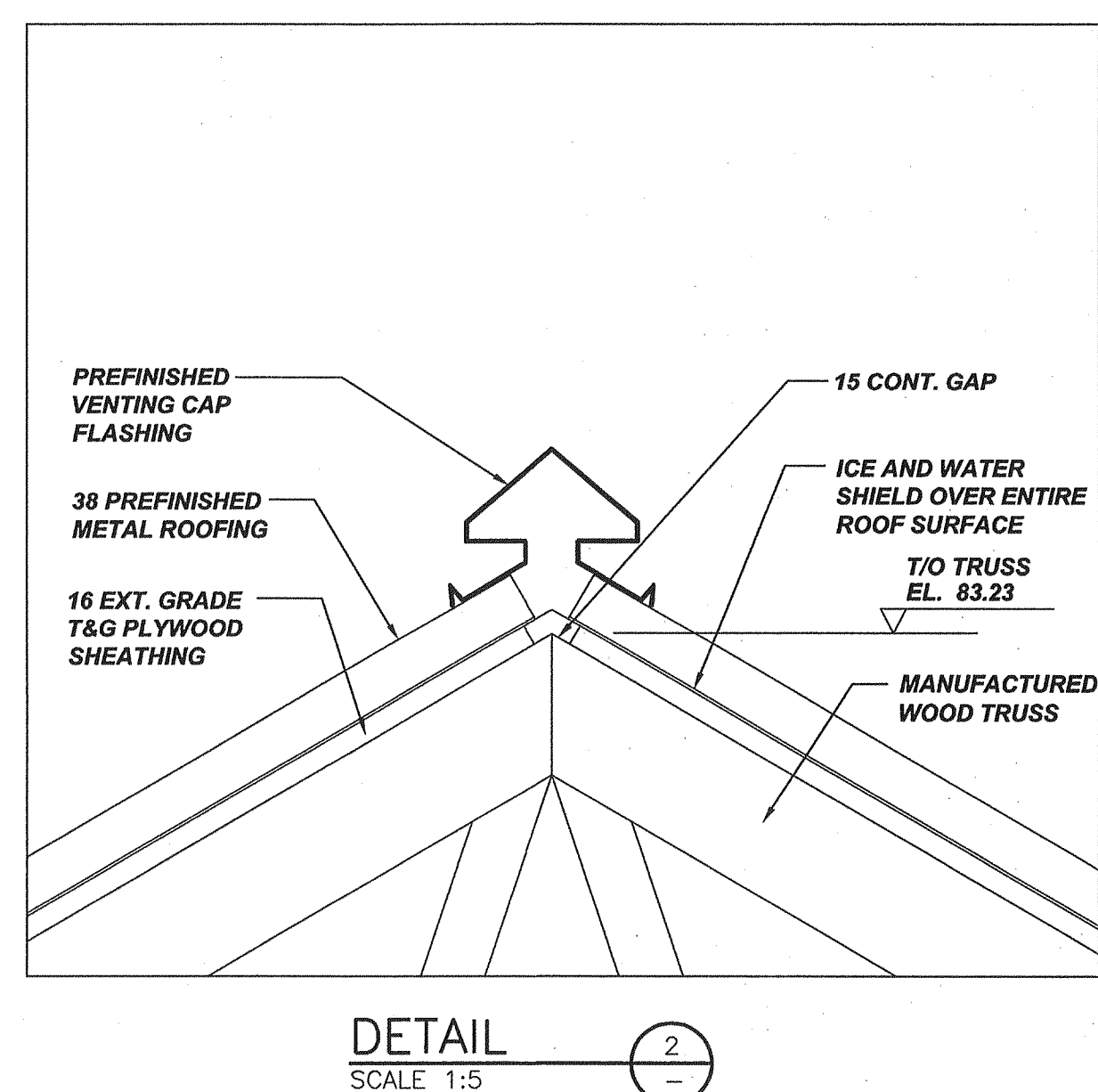
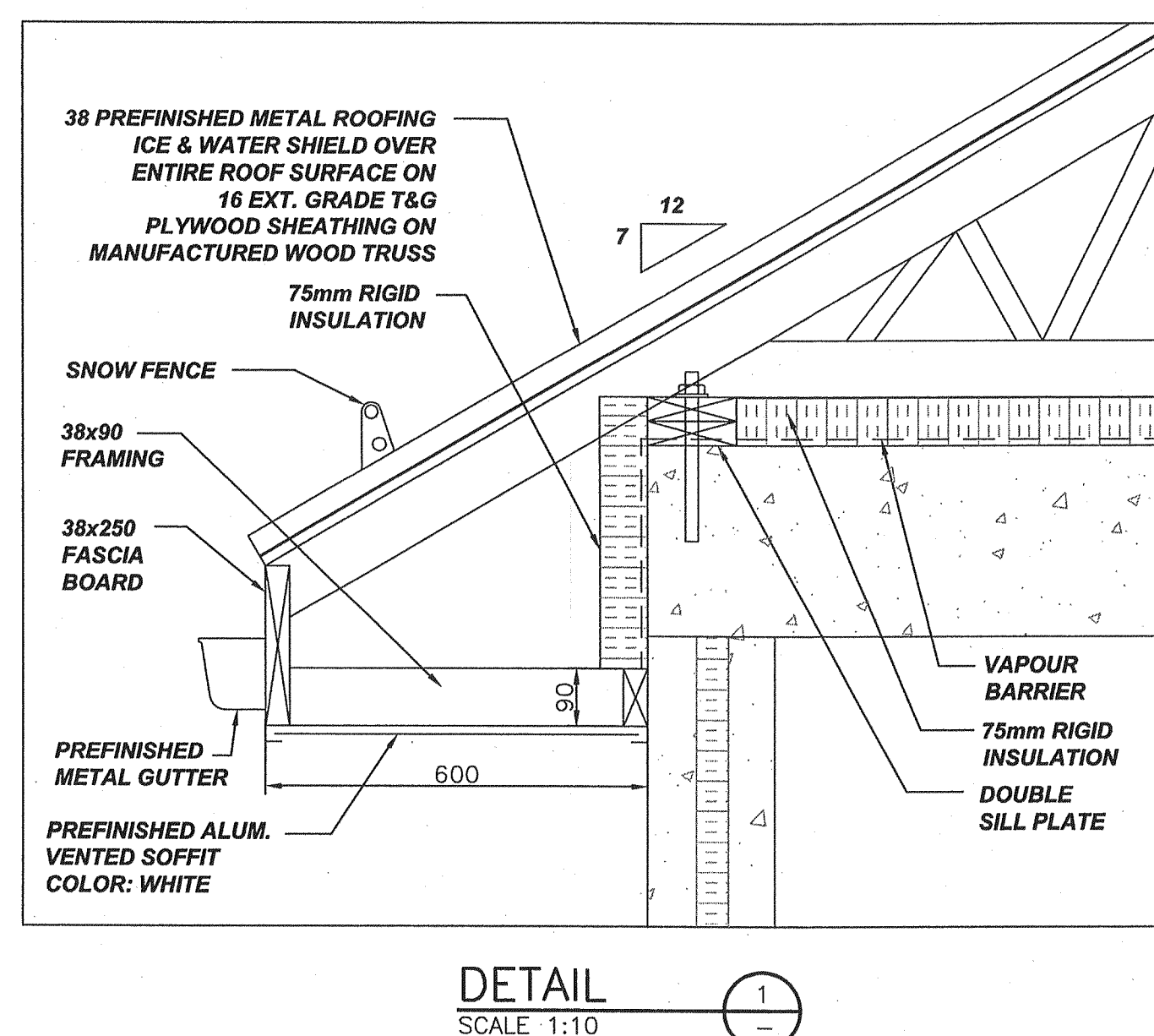
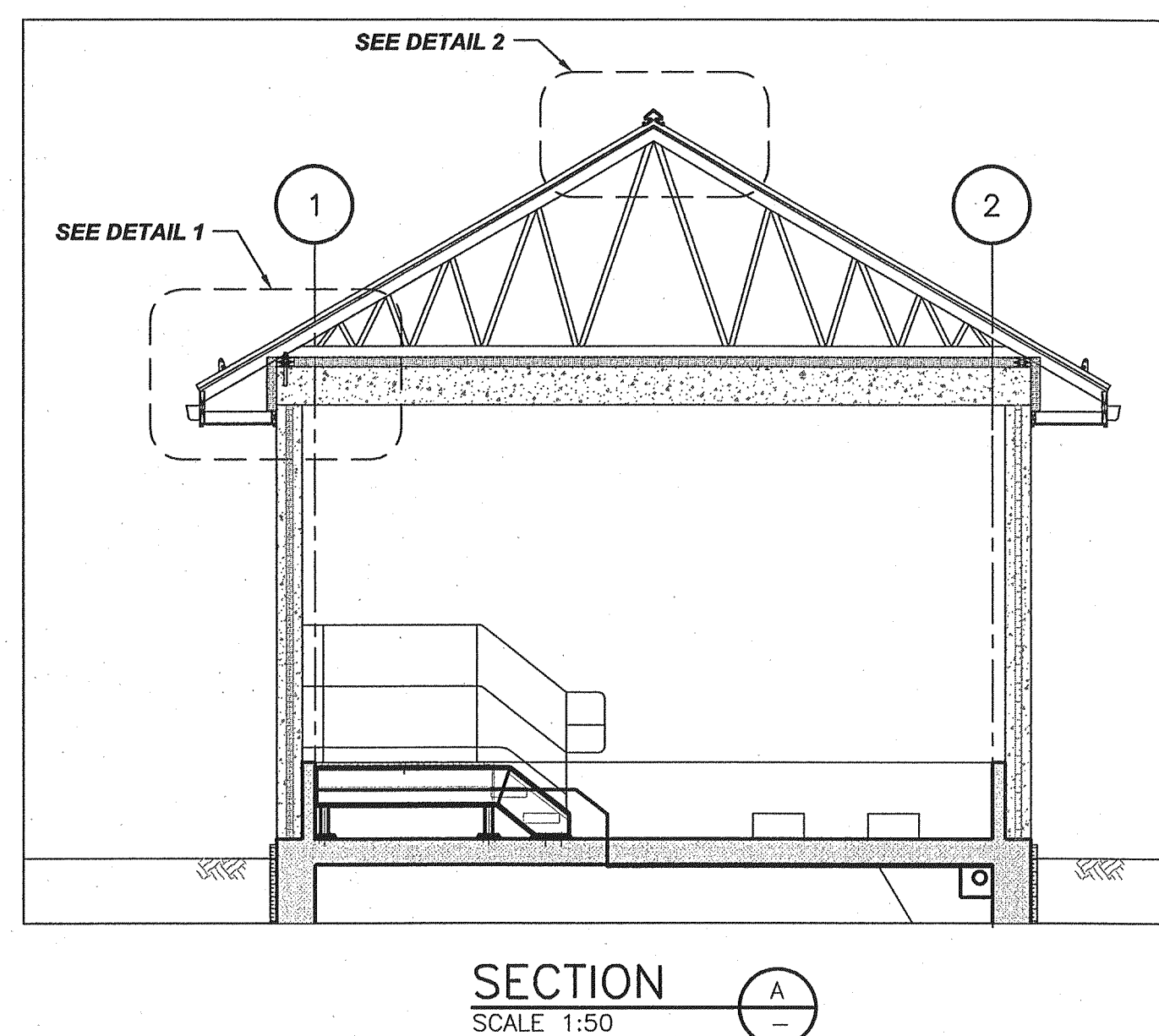


ROOM FINISH SCHEDULE																																
ROOM		FLOOR						BASE			WALLS				CEILINGS				REMARKS													
NUMBER	ROOM NAME	STRUCTURAL MATERIAL	CONCRETE FIN.			FINISH		MATERIAL	FINISH		MATERIAL	FINISH			MATERIAL	FINISH		HEIGHT		FIRE RATING												
		CONCRETE	METAL	WOOD	STEEL TROWEL	STEEL TROWEL NON-SLIP	HARDENED FLOOR	EPOXY FLOORING	SEALER	NON METALLIC HARDENER	CHEMICAL RESISTANT COATING	EPOXY FLOORING	CONCRETE	CONCRETE BLOCK	CONCRETE	CHEMICAL RESISTANT COATING	PAINT				CONCRETE	PRECAST BUILDING	GYPSUM BOARD	PAINT	PRECAST BUILDING	SANDBLAST	CHEMICAL RESISTANT PAINT	EXPOSED CONSTRUCTION	GYPSUM BOARD	ACOUSTIC TILE	PAINT	CHEMICAL RESISTANT PAINT
101	PUMP ROOM	●			●					●		●		●	●			●	●						●					3400		INTERIOR, SMOOTH CONCRETE FINISH FOR PRECAST BUILDING. CHEMICAL RESISTANCE COATING IN CONTAINMENT AREA ONLY.
102	CONTROL ROOM	●			●			●	●			●			●			●	●						●					3400		

DOOR SCHEDULE																	
NUMBER	OPENING		THICKNESS	TYPE	DOOR		FRAME		HARDWARE								REMARKS
	WIDTH	HEIGHT			MATERIAL	FINISH	MATERIAL	FINISH	SELF CLOSER	KICKPLATE	LOCKSET	DOOR STOP	PANIC HARDWARE	WEATHER STRIPPING	ASTRAGAL	FIRE RATING (HOUR)	
D101	2000	2200	45	B	•	•	•	•	•	•	•	•	•	•	•	N/A	INSULATED
D102	1000	2200	45	A	•	•	•	•	•	•	•	•	•	•	•	N/A	INSULATED

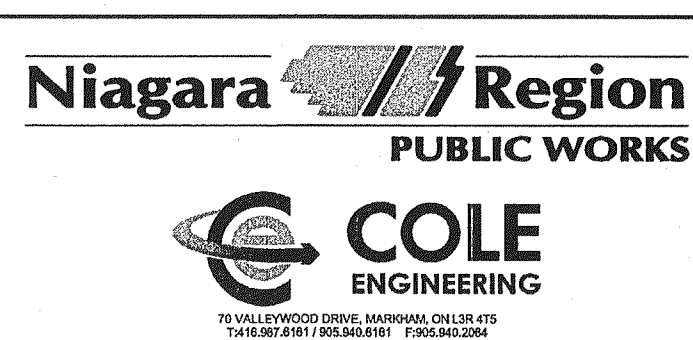
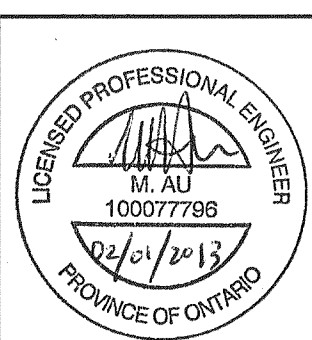


ONTARIO BUILDING CODE ANALYSIS			O.B.C REF
PORT WELLER SEWAGE PUMPING STATION			
1. MAJOR OCCUPANCY	GROUP 'F' DIVISION 3		3.1.2.1.(1)
2. BUILDING AREA	43m²		1.4.1.2
3. NUMBER OF STOREYS	ABOVE GRADE - 1 STOREY		1.4.1.2
4. NUMBER OF STREETS/ACCESS ROUTES	1		3.2.2.10 & 3.2.5.5
5. BUILDING CLASSIFICATION	GROUP F, DIVISION 3 - 1 STOREY		3.2.2.76
6. SPRINKLER SYSTEM	NOT REQUIRED		3.2.2.76
7. STANDPIPE SYSTEM	NOT REQUIRED		3.2.9.1
8. FIRE ALARM SYSTEM	NOT REQUIRED		3.2.4.1
9. PERMITTED CONSTRUCTION	COMBUSTIBLE/NON-COMBUSTIBLE		3.3.2.76
10. MEZZANINE AREA	N/A		3.2.1.1 (3)
11. OCCUPANT LOAD	TYPICALLY UNOCCUPIED. SERVICE PERSONNEL ONLY		3.1.17.1
12. BARRIER FREE DESIGN	NOT REQUIRED		3.8.1.1 (1) (C)
13. HAZARDOUS SUBSTANCES	N/A		3.3.1.2
14. REQUIRED FIRE RESISTANCE RATINGS			
FLOOR ASSEMBLIES	NON-COMBUSTIBLE NON-FIRE RATED SEPARATION		3.2.2.76
ROOF	3/4 HR FIRE RESISTANCE RATING SEPARATION		3.2.2.76
LOAD-BEARING WALLS AND COLUMNS	NON-COMBUSTIBLE NON-FIRE RATED SEPARATION		3.2.2.76
EXIST ENCLOSURE	3/4 HR FIRE RESISTANCE RATING SEPARATION		3.4.4.1 (1)
15. PLUMBING FIXTURE REQUIREMENTS	OCCUPANT LOAD	REQ'D FIX	PROVIDED
	N/A	N/A	N/A
16. TRAVEL DISTANCE	F3 UNSPRINKLERED - 30m		3.7.4.2



NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

DRAFTING	M.L.
DESIGN	M.A.U.
CHECKED BY	B.Y.
APPROVED BY	B.Y.



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
PUMP AND CONTROL ROOM PLAN AND DOOR SCHEDULE
ARCHITECTURAL

CONSULTANT FILE No.	E11-434
DATE	2012-05-09
SCALE	AS SHOWN
REF. No.	RN 13-03
DWG No.	A02
REV.	1

1. GENERAL NOTES

- 1.1. THE GENERAL NOTES AND STRUCTURAL STANDARD DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.
- 1.2. CONSTRUCTION TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE AT TIME OF TENDER. THE ABOVE TO GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR THE FOLLOWING NOTES ARE MORE RESTRICTIVE.
- 1.3. STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO PROCESS, MECHANICAL OR ELECTRICAL EQUIPMENT TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
- 1.4. PROCESS, MECHANICAL, HVAC AND ELECTRICAL EQUIPMENT SUPPORTS, PADS, CURBS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS REQUIRED BY OTHER CONTRACT DRAWINGS TO BE CO-ORDINATED AND VERIFIED FOR SIZE AND LOCATION PRIOR TO CASTING CONCRETE. REINFORCEMENT MAY ALSO BE SHOWN ON OTHER DISCIPLINE DRAWINGS AS WELL AS STRUCTURAL DRAWINGS.
- 1.5. PROVIDE ALL REQUIRED TEMPORARY BRACING AND SUPPORTS FOR ALL SLABS, BEAMS, WALLS AND FRAMES. TEMPORARY BRACING AND SUPPORTS MUST BE CAPABLE OF TRANSFERRING ALL IMPOSED CONSTRUCTION AND DEAD LOADS TO THE STRUCTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOADS.
- 1.6. BACKFILLING OF WALLS IS NOT PERMITTED UNTIL THE SUPPORTING SLABS ARE IN PLACE AND HAVE ATTAINED 28 DAY DESIGN STRENGTH.
- 1.7. OPENINGS LARGER THAN 300mm OR GROUPS OF OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS TO BE REVIEWED BY ENGINEER PRIOR TO CASTING CONCRETE.
- 1.8. REINFORCEMENT STEEL FABRICATING AND PLACING TOLERANCES SHALL NOT REDUCE THE CONCRETE COVER TO LESS THAN THE SPECIFIED MINIMUM CLEAR CONCRETE COVER NOTED IN THE GENERAL NOTES.
- 1.9. NO SLEEVES, DUCTS, PIPES OR OTHER OPENINGS SHALL PASS THROUGH JOISTS, BEAMS OR COLUMNS, EXCEPT WHERE DETAILED ON THE DRAWINGS.
- 1.10. SUBMIT PROPOSALS FOR CONSTRUCTION JOINT LOCATIONS OTHER THAN THOSE SHOWN ON DRAWINGS TO ENGINEER FOR REVIEW.
- 1.11. BEFORE CASTING CONCRETE, ENSURE THAT ALL EMBEDDED ITEMS, SUCH AS ANCHOR BOLTS, SLEEVES AND WATER STOPS ARE IN POSITION AND SECURELY FASTENED IN PLACE TO THE SATISFACTION OF THE ENGINEER.
- 1.12. ENSURE THAT THE SOIL BELOW A FOUNDATION IS NOT ALLOWED TO FREEZE, EITHER DURING OR AFTER CONSTRUCTION. UNDER NO CIRCUMSTANCES SHALL CONCRETE BE PLACED ON FROZEN SOIL.
- 1.13. ACCURACY OF THE SITE SURVEY AND LAYOUT IS THE RESPONSIBILITY OF THE CONTRACTOR. REMEDIAL ACTION RESULTING FROM INACCURACIES WILL BE AT THE CONTRACTOR'S OWN EXPENSE.
- 1.14. BUILDING CONTROL LINES, REFERENCE LINES, GRID LINES AND TEMPORARY BENCH MARKS TO BE CLEARLY IDENTIFIED AND MAINTAINED DURING THE ENTIRE CONSTRUCTION PERIOD.
- 1.15. INTERNAL WATERSTOPS ARE REQUIRED IN ALL JOINTS OF WATER RETAINING STRUCTURES AND IN ALL JOINTS OF ALL BASE SLABS AND EXTERIOR WALLS BELOW GRADE. TERMINATE INTERNAL WATERSTOPS AT GRADE IN NON-WATER RETAINING EXTERIOR WALLS.
- 1.16. REINFORCEMENT REQUIREMENTS ARE SHOWN ON DETAIL DRAWINGS. WHERE DETAILS OF BAR SIZINGS AND SPACING ARE NOT SHOWN, ALLOW FOR MINIMUM REINFORCEMENT IN ACCORDANCE WITH CAN/CSA A23.3 ALL REINFORCEMENT SHOWN SHALL BE CONTINUOUS UNLESS AS DETAILED OTHERWISE.
- 1.17. SEE ARCHITECTURAL DRAWINGS FOR DOOR DIMENSIONS, SLOPES, ROOFING DETAILS AND WALL ASSEMBLY DETAILS.
- 1.18. SEE PROCESS DRAWINGS FOR LOCATION AND SIZE OF ALL FLOOR DRAINS. SLOPE ALL FLOOR TO FLOOR DRAINS UNO MAINTAIN A MINIMUM SLOPE OF 0.5%.
- 1.19. ALL EXISTING ADJACENT STRUCTURES SHALL BE MONITORED VERY CLOSELY DURING CONSTRUCTION, INCLUDING TOTAL STATION SURVEY CHECKS AND VISUAL MONITORING.

- 1.20. ALL DIMENSIONS ON STRUCTURES ARE GIVEN AS AN AID TO ITS LOCATION TO THESE STRUCTURES. THEY ARE NOT GUARANTEED TO BE ACCURATE AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO PROCEEDING WITH CONSTRUCTION.
- 1.21. ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS ARE BASED ON RECORD DRAWINGS AND ARE APPROXIMATE. FIELD VERIFY DIMENSIONS, ELEVATIONS AND DETAILS BEFORE COMMENCING WORK. REPORT DISCREPANCIES TO THE ENGINEER.
- 1.22. ALL WORKS SHALL CONFORM TO THE ONTARIO BUILDING CODE AND THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT.
- 1.23. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DISTURBED AREAS BACK TO ORIGINAL CONDITIONS OR BETTER AFTER THE COMPLETION OF WORKS.
- 1.24. ALL EXISTING FACILITIES HAVE TO REMAIN OPERATIONAL UNLESS NOTED OTHERWISE. CONTRACTOR IS RESPONSIBLE TO COORDINATE AND LIAISE WITH THE PLANT OPERATOR DURING CONSTRUCTION PERIOD WITH RESPECT TO AVAILABLE WORKS AREA. ACCESS MUST BE PROVIDED TO THE PLANT OPERATOR TO OPERATE AND MAINTAIN THE EXISTING FACILITY.
- 1.25. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES. THE REGION AND THE ENGINEER ASSUME NO RESPONSIBILITY FOR THE ACCURACY OF UTILITIES INDICATED ON THE DRAWINGS.
- 1.26. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CLEANLINESS OF THE FACILITY ROADS FROM THE ENTRANCE TO THE WORK AREA.
- 1.27. THE CONTRACTOR IS RESPONSIBLE TO CARRY OUT ANY TEMPORARY SHORING WORK IN SUCH A MANNER THAT EXCESSIVE VIBRATION IS MINIMIZED. ALL COST OF DAMAGES IMPAIRED BY THE TEMPORARY SHORING WORK AS IDENTIFIED FROM THE POST CONSTRUCTION SURVEY OF NEIGHBORING PROPERTIES AND EXISTING ADJACENT STRUCTURES SHALL BE BORNE BY THE CONTRACTOR.

2. DESIGN LOADS:

FOR DESIGN LOADS SEE GENERAL ARRANGEMENT PLAN PERTAINING TO EACH STRUCTURE.

(NOTE: THIS INFORMATION IS FOR REFERENCE PURPOSES ONLY. CONTRACTOR TO REFER TO SPECIFICATIONS.)

2.1 FOUNDATIONS

GEOTECHNICAL INFORMATION BASED ON GEOTECHNICAL INVESTIGATION REPORT PREPARED BY INSPEC-SOL DATED: SEPTEMBER 25, 2012

ALLOWABLE BEARING CAPACITY100 kPa
ULTIMATE BEARING CAPACITY150 kPa

2.2 SNOW LOAD DATA:
GROUND SNOW LOADING..... S_g = 1.0kPa
ASSOCIATED RAIN LOADING..... S_r = 0.4kPa

2.3 WIND LOAD DATA:
1/50 YEAR PRESSURE (q).....0.46kPa

2.4 SEISMIC DATA:
 S_o (0.2) = 0.41
 S_o (0.5) = 0.20
 S_o (1.0) = 0.072
 S_o (2.0) = 0.021
PGA = 0.3 SITE CLASS D

2.5 IMPORTANCE FACTORS (ULS):

I_s = 1.25
 I_w = 1.25
 I_e = 1.5

SERVICE LOADS

LIVE LOADS:

- SURCHARGE AT GROUND SURFACE (AREA OUTSIDE OF BUILDING FOOTPRINT)..... 12.0 KPA
- GRATING, PLATFORMS AND STAIRS..... 5.0 KPA
- FOR ALL OTHER FLOOR LOADING SEE PLANS

DEAD LOADS:

- UNIT WEIGHT OF CONCRETE..... 24.0KN/M3
- ROOF - (SEE ROOF PLAN FOR LIVE LOADS)
+1.5KPA SDL
+ALL MECHANICAL AND ELECTRICAL EQUIPMENT WEIGHT

3. MATERIALS:

3.1 STRUCTURAL STEEL:

- 3.1.1 STANDARD STRUCTURAL SECTIONS: TO CSA G40.21M GRADE 350W TO HOLLOW STRUCTURAL SECTIONS: TO CSA G40.21M GRADE 350W
- 3.1.2 DESIGN AND CONSTRUCTION TO CONFORM TO THE FOLLOWING CODES/STANDARDS (LATEST EDITIONS/REVISIONS): CAN/CAS W59 WELDED STEEL CONSTRUCTION (METAL ARC WELDING), CISC HANDBOOK OF STEEL CONSTRUCTION, CISC FUNDAMENTALS OF SHOP DRAWING, CISC DESIGN GUIDE FOR HOLLOW STRUCTURAL SECTION CONNECTION.
- 3.1.3 ALL STRUCTURAL STEEL SECTIONS HSS WELDED PLATE MEMBERS TO BE DESIGNED ACCORDING TO CSA S16.1.
- 3.1.4 HOT ROLLED SECTIONS SHALL CONFORM TO CSA STANDARD G40.21 AND GR 350W (ASTM A992 OR A572 GR50)
- 3.1.5 HOT ROLLED STEEL SHEET, PLATE AND STRIP USED IN THE FABRICATION OF WELDED ASSEMBLIES TO CONFORM TO CSA STANDARD G40.21 GR 350W.
- 3.1.6 HOLLOW STRUCTURAL STEEL SECTIONS SHALL CONFORM TO CSA STANDARD G40.21 GR 350W CLASS C.
- 3.1.7 ALL MATERIAL USED FOR THIS PROJECT SHALL BE NEW, FREE FROM DEFECTS IMPAIRING STRENGTH, DURABILITY AND APPEARANCE.
- 3.1.8 SHOP CONNECTIONS (WHERE PRACTICAL AND POSSIBLE) TO BE WELDED.
- 3.1.9 FIELD CONNECTIONS (WHERE PRACTICAL AND POSSIBLE) TO BE BOLTED.
- 3.1.10 THE FABRICATOR SHALL BE FULLY APPROVED IN ACCORDANCE WITH CSA STANDARD W47.1.
- 3.1.11 ALL WELDS TO CONFORM TO CAN/CSA W59. USE STITCH WELDS FOR EMBEDDED PLATES AND ANGLES UNO. ALL BUTT WELDS AT JOINTS TO BE COMPLETE JOINT PENETRATION UNO. CONNECTIONS TO BE DETAILED SUCH THAT MINIMIZE WATER AND DIRT ACCUMULATION. ANGLE AND CHANNEL MEMBERS TO BE TOE DOWN WHERE PRACTICAL. WIDE FLANGE AND CHANNEL MEMBERS WITH HORIZONTAL WEBS TO HAVE ADEQUATE DRAINAGE HOLES. PROVIDE WASHER PLATES MIN. 6mm THICK WITH OVERSIZED HOLES OR SLOTTED HOLES.
- 3.1.12 BOLTED CONNECTIONS WITH MINIMUM OF 2 M20 BOLTS CONFORMING TO ASTM A325M UNO.
- 3.1.13 BOLTS TO BE SUPPLIED WITH HARDENED WASHERS TO ASTM F436 AND HEAVY HEX NUTS TO ASTM A563.
- 3.1.14 ALL FRAMING MEMBERS SHALL BE EASILY IDENTIFIABLE I.E. EITHER STAMPED, STENCILED OR PAINTED.
- 3.1.15 ANCHOR BOLTS AND DRILLED ANCHORS: GRADE 316L STAINLESS STEEL, UNO.

3.2 BACKFILL

UNIT WEIGHT OF NATIVE = 22kN/m3
COEFFICIENT OF LATERAL EARTH PRESSURE(AT REST).....0.5

3.3 CONCRETE:

CONCRETE 28-DAY COMPRESSIVE STRENGTH:
STRUCTURAL CONCRETE.....32MPa EXPOSURE CLASS S-2
MASS FILL CONCRETE.....20MPa EXPOSURE CLASS N

MINIMUM CONCRETE STRENGTH TO SPECIFICATIONS.

ALL EXPOSED EDGES TO HAVE 20mm CHAMFER UNO

3.4 REINFORCEMENT:

REINFORCEMENT TO CSA G30.18M GRADE 400 UNO

MINIMUM CLEAR COVER FOR CAST IN PLACE CONCRETE REINFORCEMENT TO BE 50mm UNLESS SPECIFICALLY NOTED OTHERWISE. THIS INCLUDES FORMED SURFACES AND CONCRETE BEARING ON A MUD SLAB. UNFORMED SURFACES AGAINST GRADE TO BE 75mm, FOR LOCATIONS WHERE 40mm AGGREGATE ARE USED, INCREASE CLEAR COVER FOR CAST IN PLACE CONCRETE TO 60mm.

ALL HOOKS SHOWN ON DRAWINGS TO BE STANDARD HOOKS CONFORMING TO CAN/CSA A23.3. (UNO)

UNLESS NOTED OTHERWISE, PROVIDE FOLLOWING MINIMUM LAP LENGTHS:

BAR SIZE	ONLY FOR: 30 MPa CONCRETE, NORMAL WEIGHT 400MPa REINFORCING BAR		ALL OTHER BARS (mm)		DOWELS	
	CLASS A	CLASS B	CLASS A	CLASS B	A	B
10M	390	500	300	390	300	390
15M	550	710	420	550	420	550
20M	670	870	520	670	520	670
25M	1080	1400	830	1080	830	1080
30M	1280	1660	990	1280	990	1280
35M	1530	1990	1180	1530	1180	1530

NOTES:

- TOP BARS ARE:
 - ALL BARS IN CONCRETE WITH MORE THAN 300mm CONCRETE BELOW.
 - ALL HORIZONTAL BARS IN WALLS.
- PROVIDE CLASS B LAP UNLESS NOTED OTHERWISE.
- LAP SPLICE LENGTHS SHOWN IN THE TABLE ARE BASED ON HEAVIER CONFINED BARS.
- TABLE APPLIES UNLESS SHOWN OTHERWISE.
- DEVELOPMENT LENGTHS ARE EQUAL TO CLASS A LAP SPLICES.

WHERE REINFORCEMENT IS SHOWN AS ALTERNATED, THE LAP LENGTH TO BE USED WILL BE GOVERNED BY DISTANCE TO ADJACENT BARS.

DETAIL ALL REINFORCEMENT IN ACCORDANCE WITH REINFORCEMENT STEEL MANUAL OF STANDARD PRACTICE BY RSIC.

3.5 MASONRY

CONSTRUCT MASONRY AS PER CSA CAN3-A371

3.6 STAINLESS STEEL

ALL STAINLESS STEEL SHALL BE GRADE 316L UNO.

3.7 ALUMINUM

ALL ALUMINUM SHALL BE ALLOY 6061-T6

3.8 FRP

ALL FRP ITEMS AND SUPPORTS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. ALL SHOP DRAWINGS SUBMITTED SHALL BE SIGNED AND SEALED BY THE PROFESSIONAL ENGINEER.

CROSSHATCH PATTERNS

- (1) NEW EARTH OR GRADE
- (2) ENGINEERING BACKFILL
- (3) GRANULAR FILL (CRUSHED ROCK OR GRAVEL)
- (4) CONCRETE, PRECAST OR PRESTRESSED CONCRETE
- (5) STEEL
- (6) BAR GRATING (LINES IN DIRECTION OF SPAN)
- (7) CUT STONE OR SAND FILL, GROUT, MORTAR, AND PILASTER
- (8) CHEMICAL RESISTANCE COATING

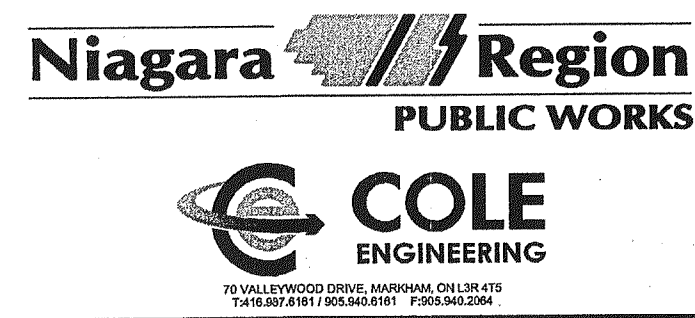
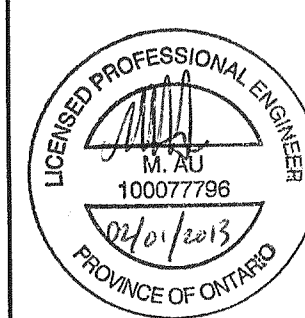
ABBREVIATIONS

ADDIT	ADDITIONAL
ADH	ADHESIVE
ALT	ALTERNATIVE
ALUM	ALUMINUM
APPROX	APPROXIMATE
B	BOTTOM
BH	MANHOLE
BLL	BOTTOM LOWER LAYER
BUL	BOTTOM UPPER LAYER
BM	BENCH MARK
CIP	CAST IN PLACE
CIRC	CIRCULAR
CTRL JT	CONTROL JOINT
COL	COLUMN
CONST JT	CONSTRUCTION JOINT
C/W	COMPLETE WITH
CL	CLEARANCE
DIA	DIAMETER
DL	DEAD LOAD
DN	DOWN
EF	EACH FACE
EL	ELEVATION
EQ	EQUAL
EW	EACH WAY
EX	EXISTING
EXP. JT.	EXPANSION JOINT
EXT	EXTERIOR
F.F.	FINISHED FLOOR
FD	FLOOR DRAIN
FIN GR	FINISH GRADE
GA	GAUGE
GALV	GALVANIZED
GRAN	GRANULAR
HP	HIGH POINT
HOF	HORIZONTAL OUTSIDE FACE
HIF	HORIZONTAL INSIDE FACE
LP	LOW POINT
PL	PLATE
REINF	REINFORCING
SEP JT	SEPARATION JOINT
SIM	SIMILAR
SOG	SLAB ON GRADE
S.S.	STAINLESS STEEL
STIR	STIRRUP
STD	STANDARD
SQ	SQUARE
T	TREAD
T&B	TOP AND BOTTOM
THK	THICK, THICKNESS
TLL	TOP LOWER LAYER
T/O	TOP OF
T/O CONC	TOP OF CONCRETE
TUL	TOP UPPER LAYER
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
U/S	UNDERSIDE
VERT	VERTICAL
VOF	VERTICAL OUTSIDE FACE
VIF	VERTICAL INSIDE FACE
W	WITH
W/O	WITHOUT
WS	WATERSTOP
WWF	WELDED WIRE FABRIC
&	AND
@	AT
#	CENTRELINE
%	NUMBER
Ø	PER CENT DIAMETER

1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.		
NO.	REVISION	DATE	INIT.		

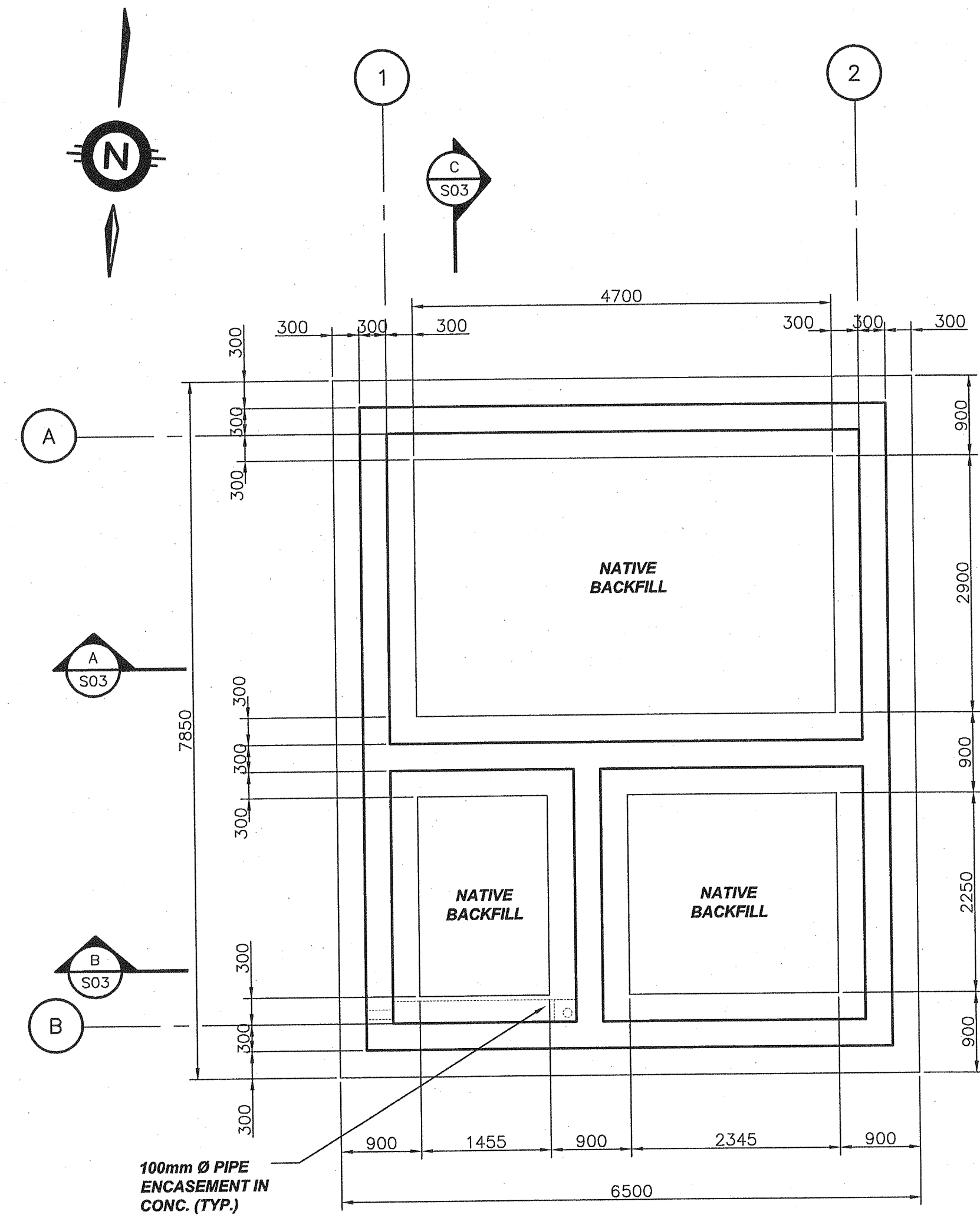
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DRAFTING	S.W.
DESIGN	M.A.U
CHECKED BY	B.Y.
APPROVED BY	B.Y.

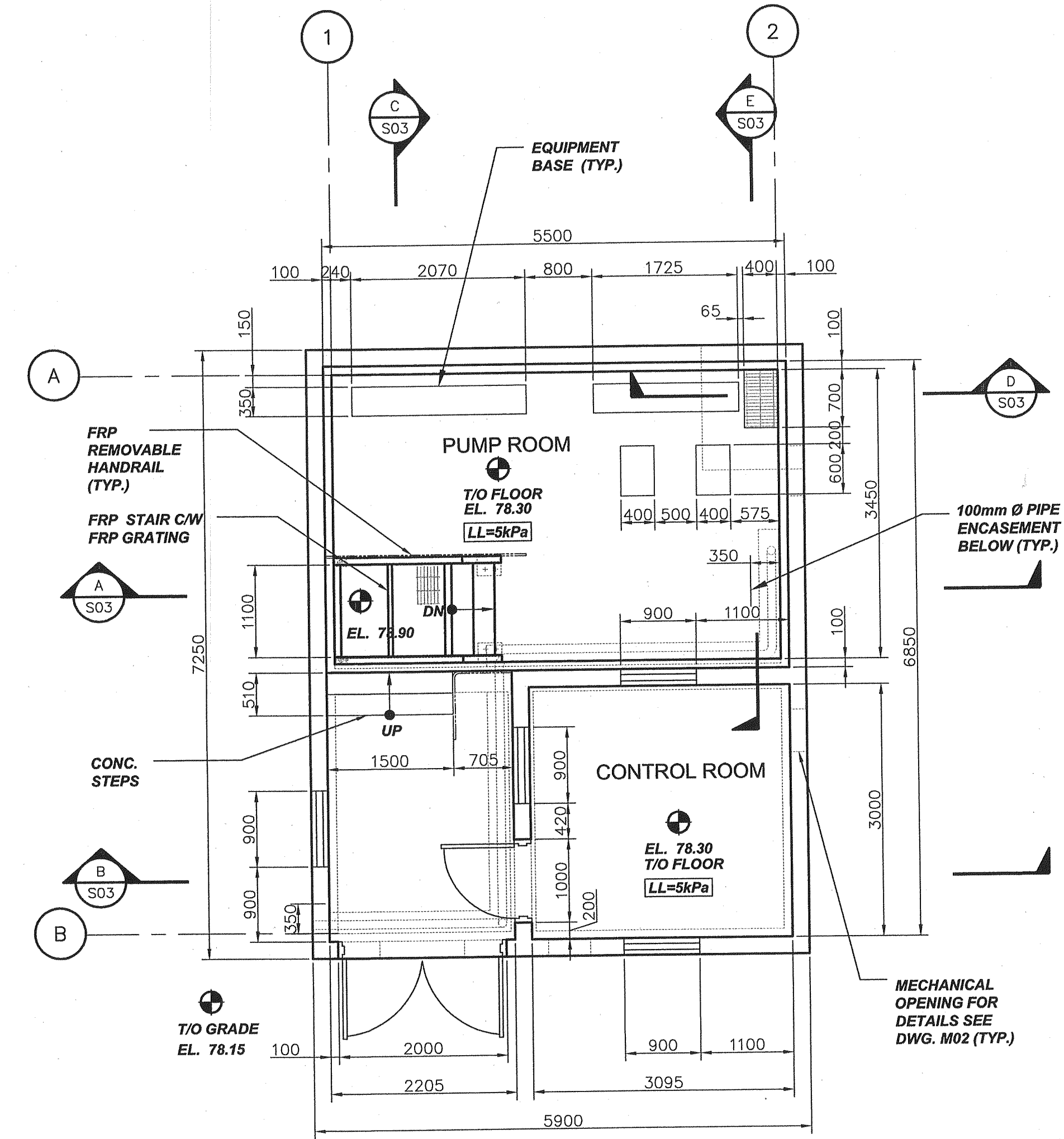


CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
GENERAL NOTES
STRUCTURAL

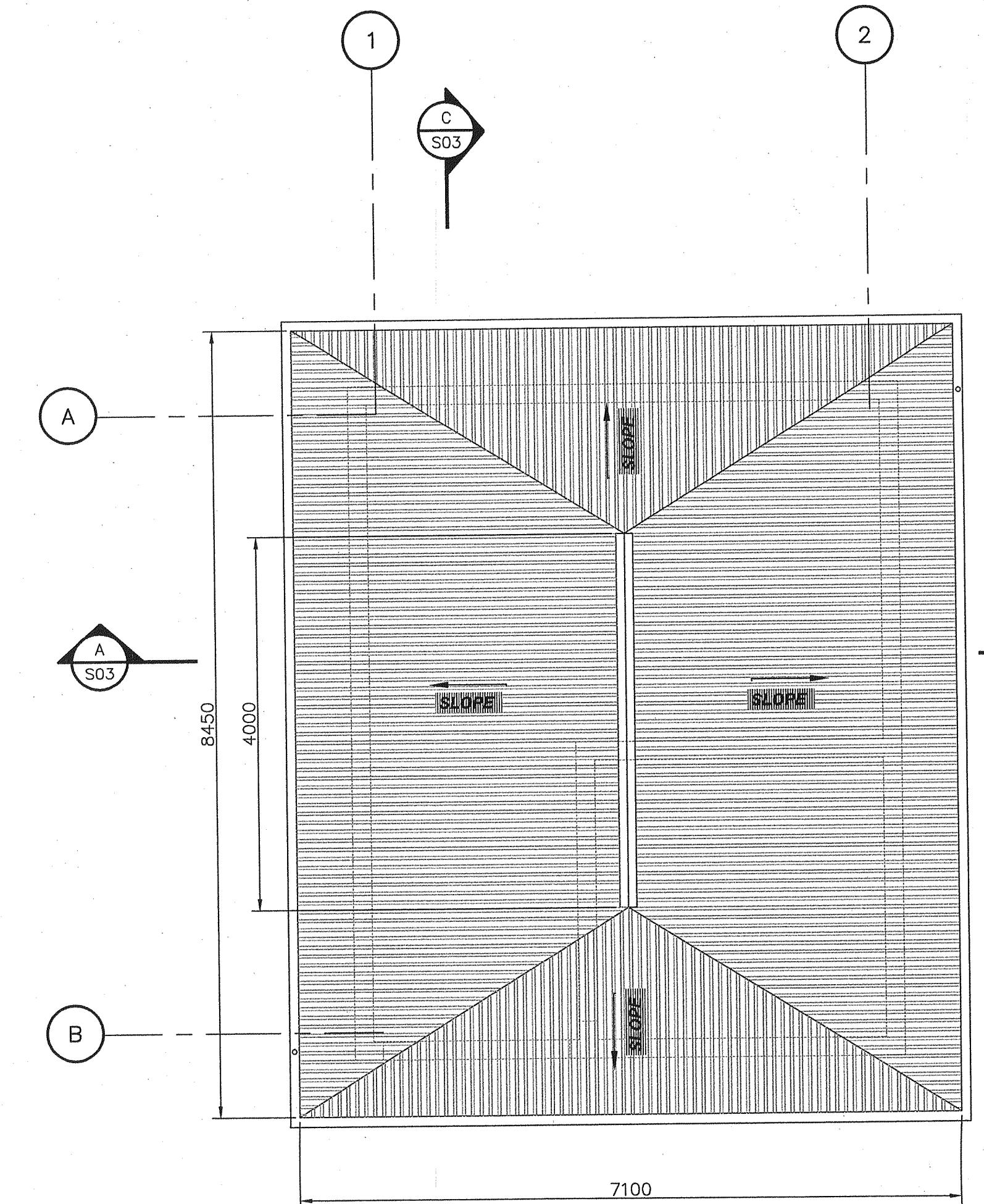
CONSULTANT FILE NO. E11-434	
DATE 2012-05-09	
SCALE N.T.S.	
REF. No. RN 13-03	
DWG No. S00	REV. 1



FOUNDATION PLAN
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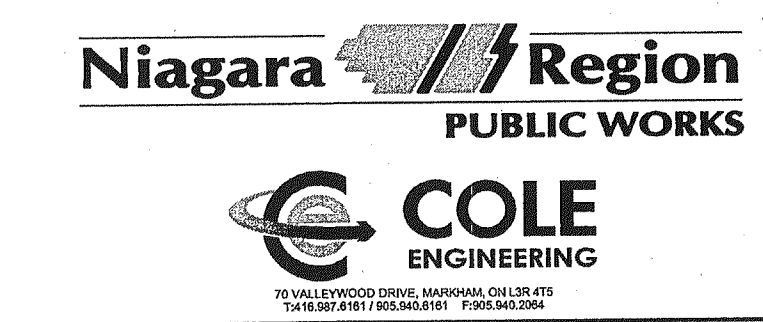
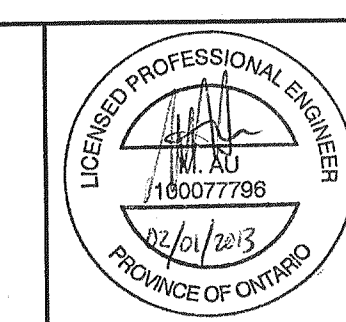
FLOOR PLAN
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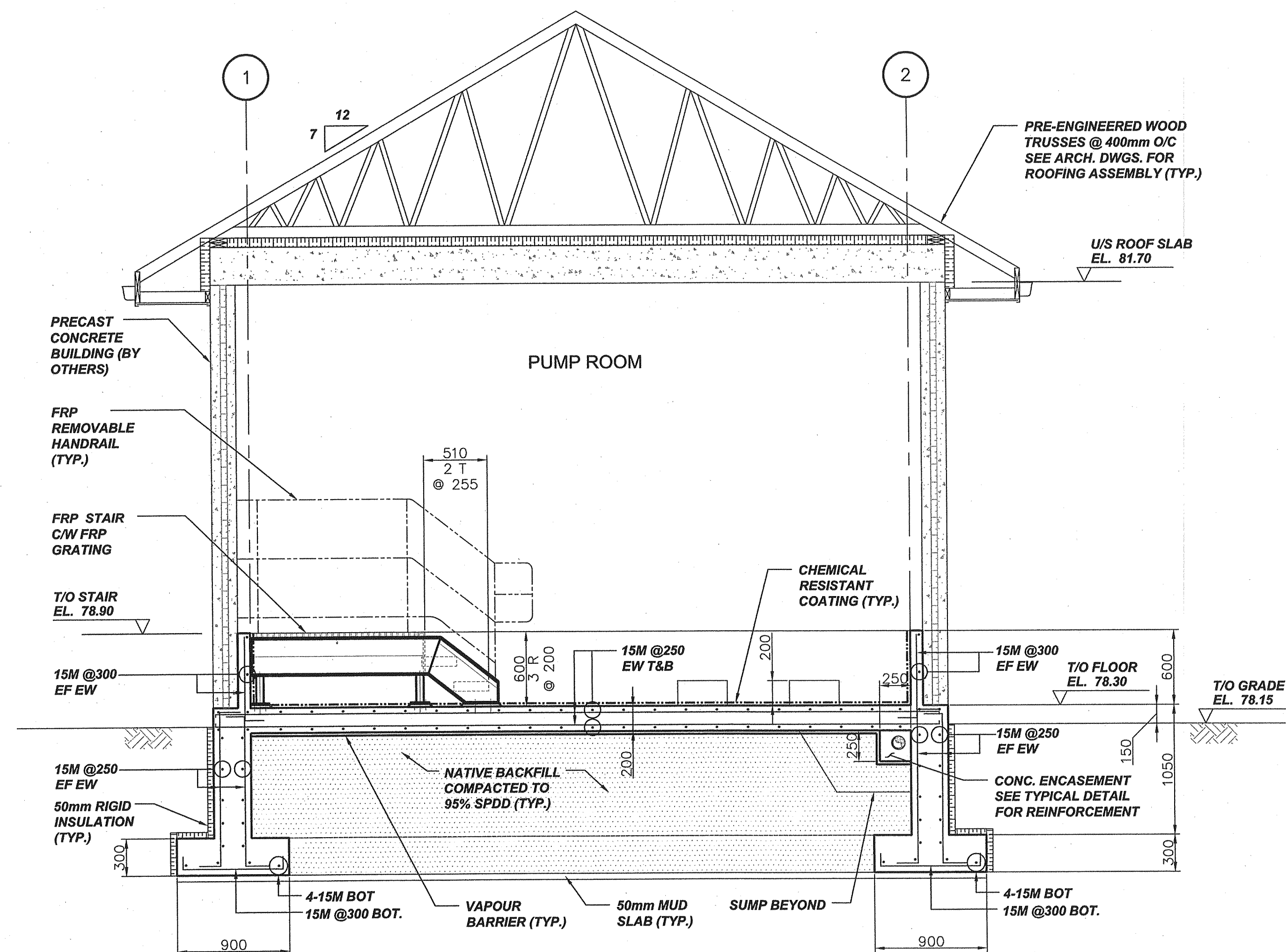
ROOF PLAN
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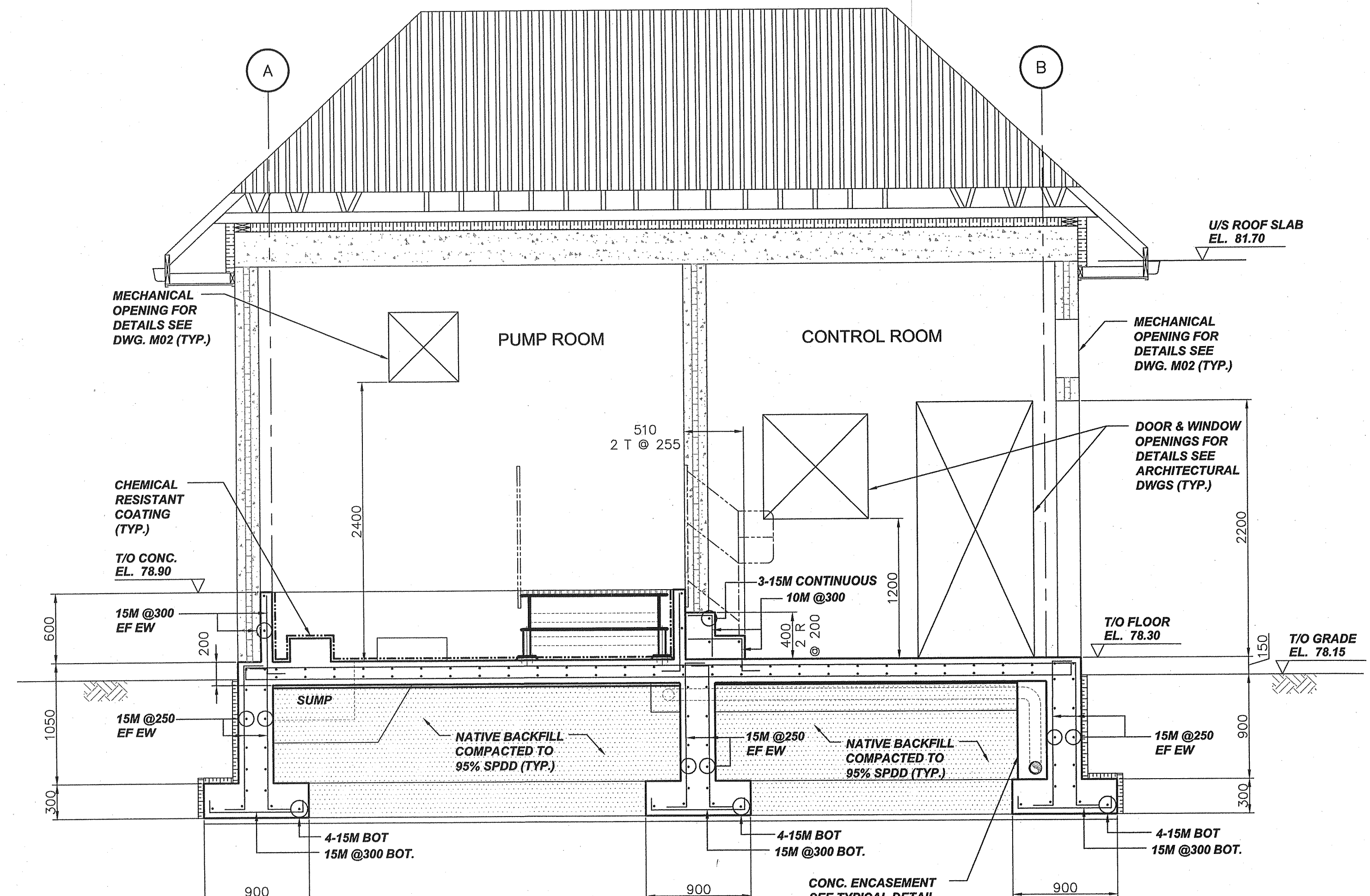
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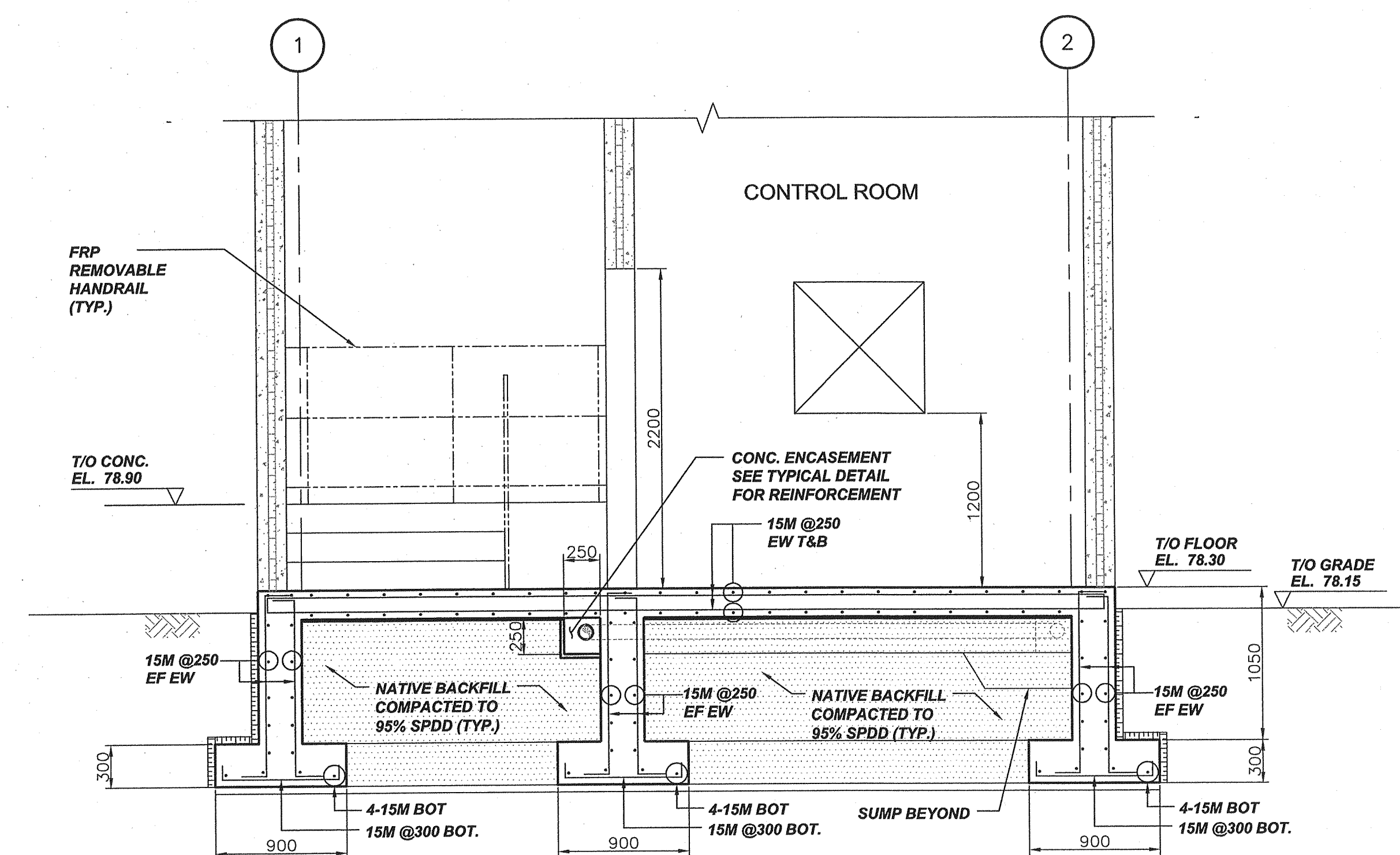
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PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT		DATE 2012-05-09
IN THE CITY OF ST. CATHARINES		SCALE 1:30
PUMP AND CONTROL ROOM PLANS		REF. No. RN 13-03
STRUCTURAL		DWG No. S02
		REV. 1



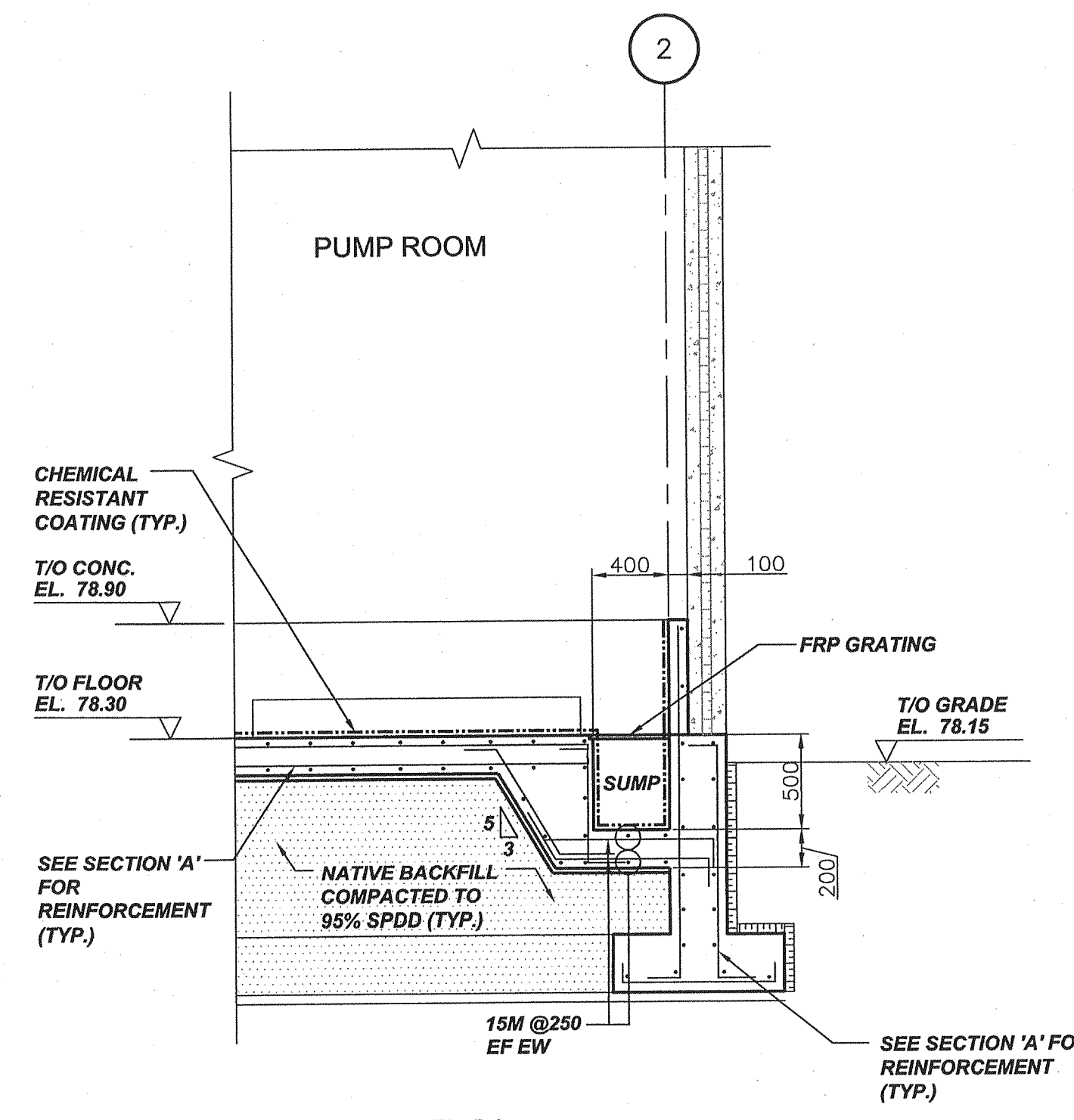
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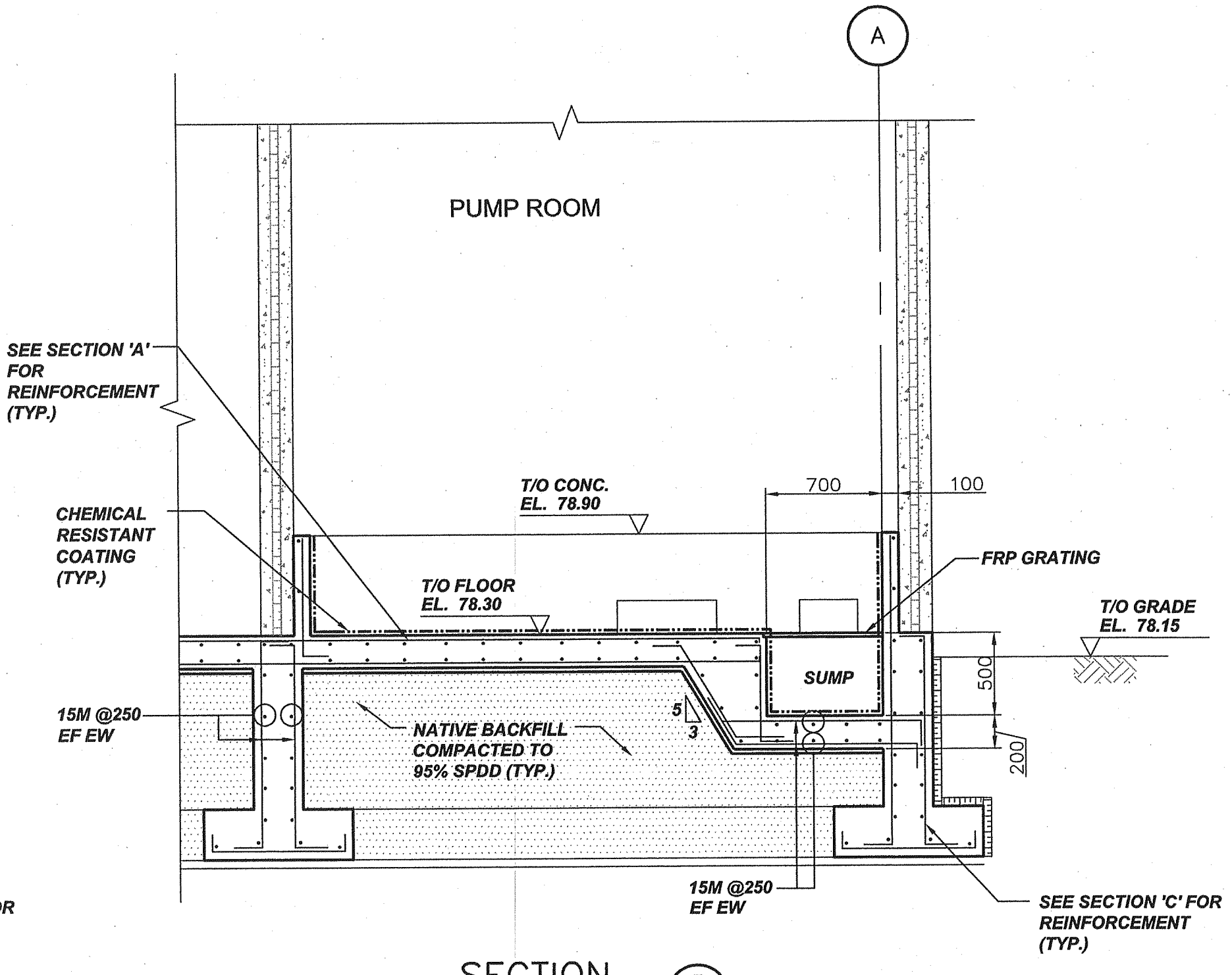
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SECTION B
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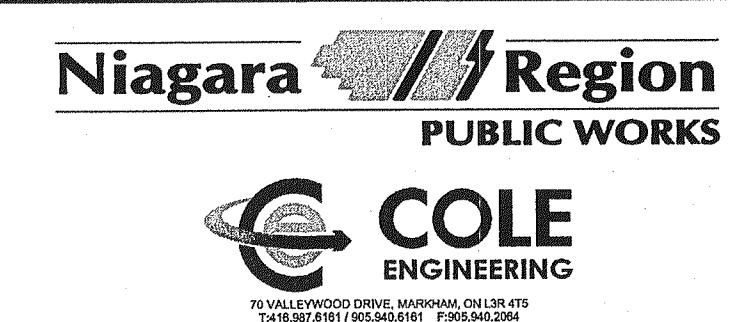
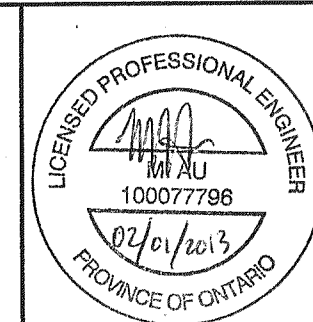
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SECTION E
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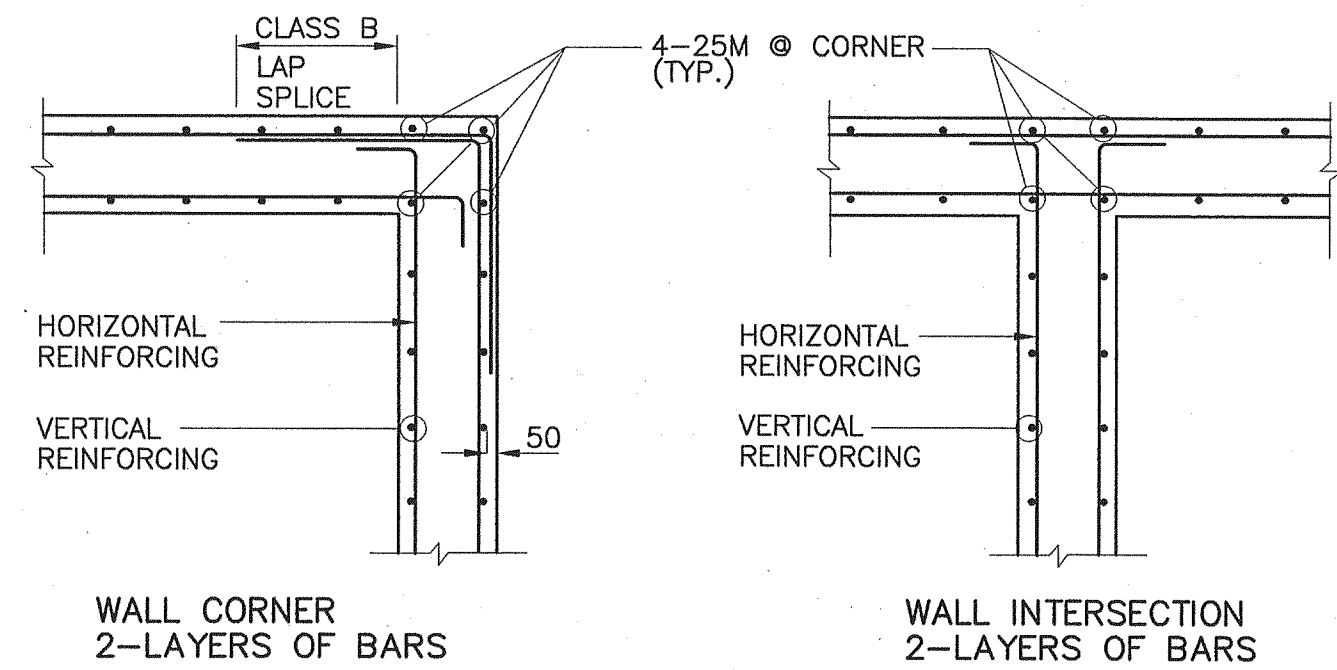
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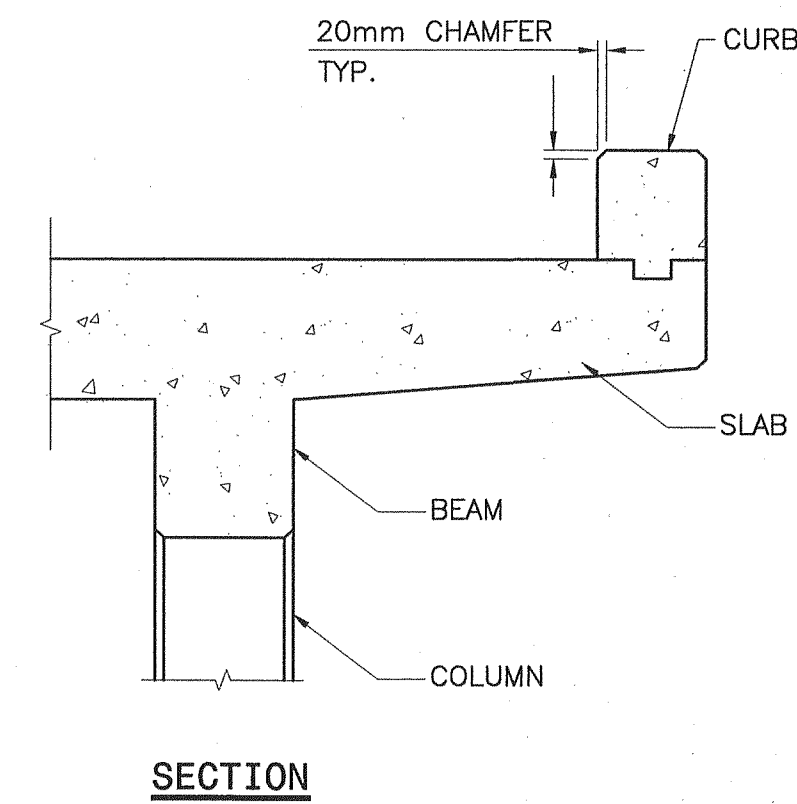
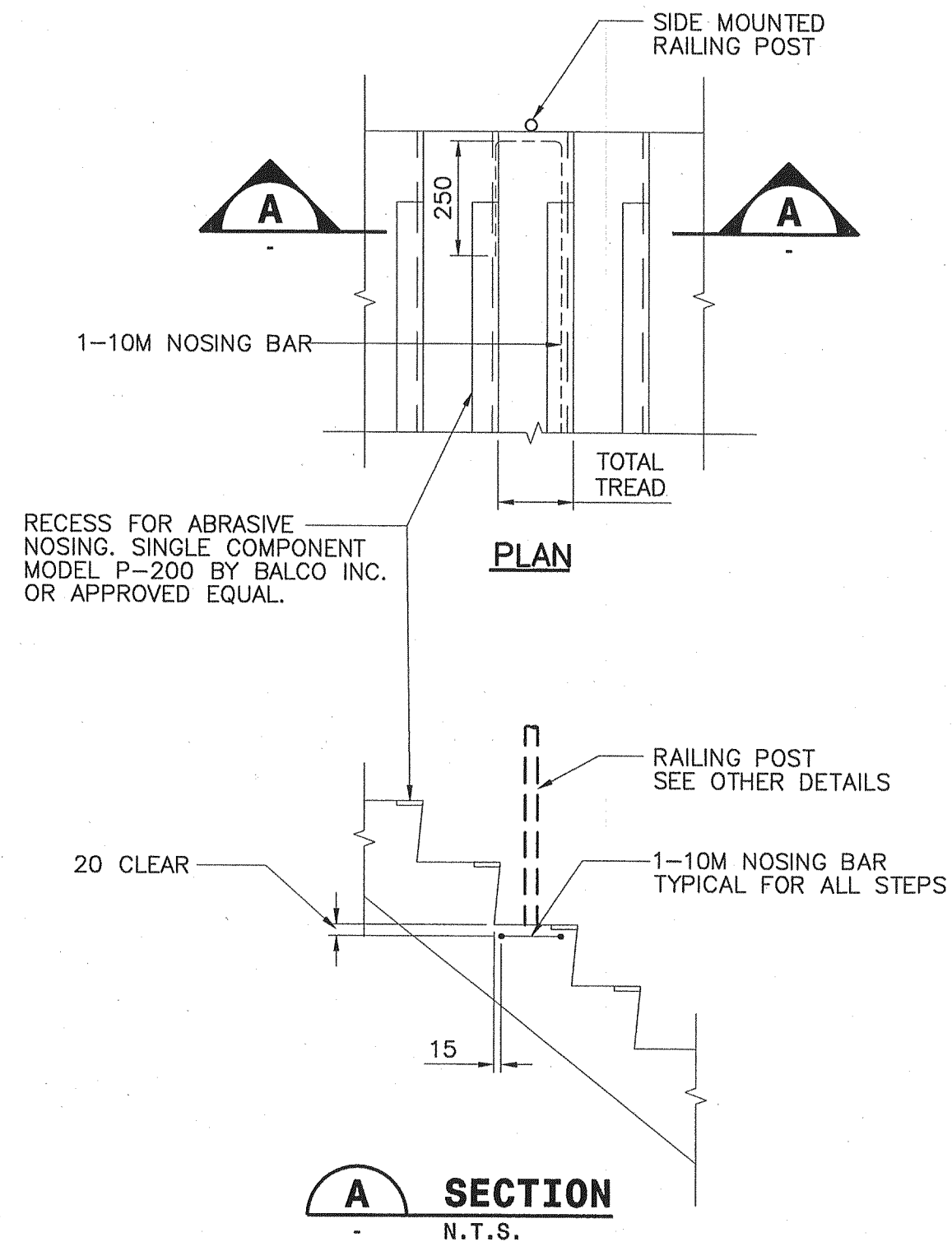


CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
PUMP AND CONTROL ROOM SECTIONS
STRUCTURAL

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE 1:30	REF. No. RN 13-03
DWG No. S03	REV. 1

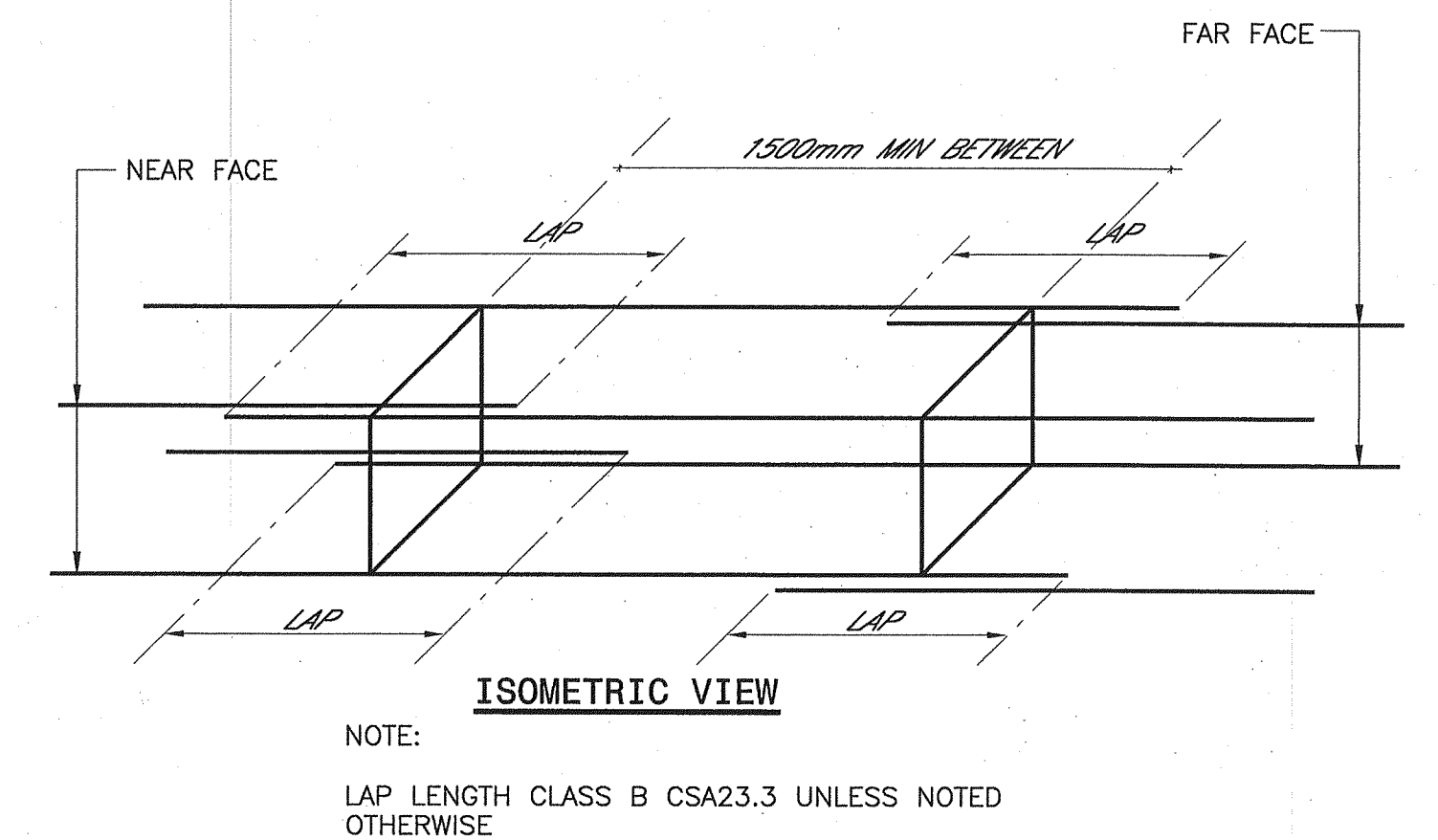


- NOTES:
1. EXCEPTIONS ARE DETAILED ELSEWHERE.
 2. REINFORCEMENT AT CIRCULAR WALL OPENING SHALL BE SIMILAR.
 3. WALL REINFORCEMENT SHALL BE DEFLECTED AROUND OPENING. WHERE POSSIBLE, CUT BARS SHALL BE REPLACED WITH EQUIVALENT STEEL BARS ON BOTH SIDES OF OPENING.



NOTE:

PROVIDE CHAMFER ALONG EXPOSED EDGES ON CONCRETE SLABS, BEAMS, CURBS, COLUMNS, WALL OPENINGS AND SIMILAR ITEMS UNLESS OTHERWISE NOTED OR DIRECTED.

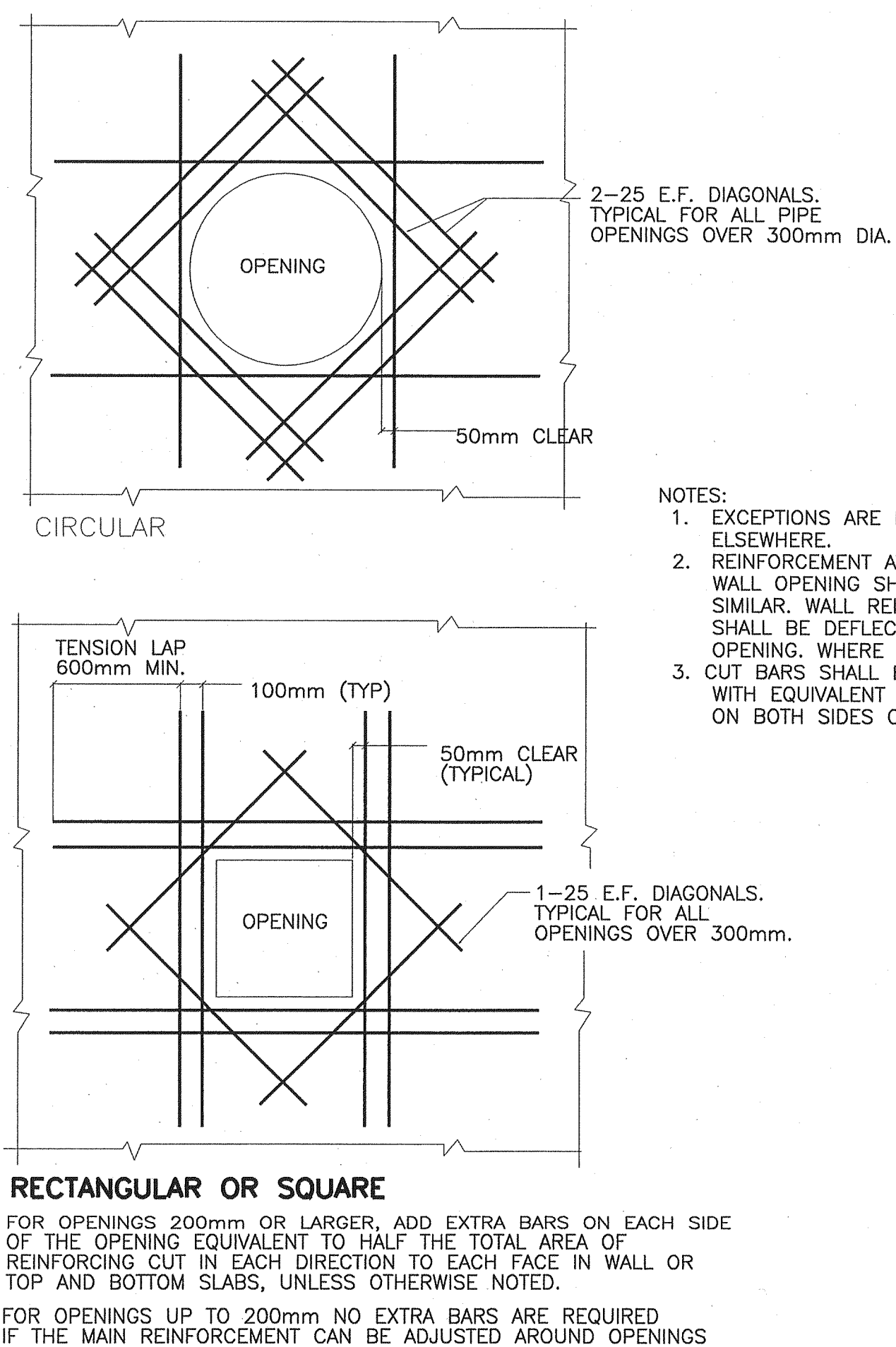


WALL AND CURB REINFORCEMENT DETAILS

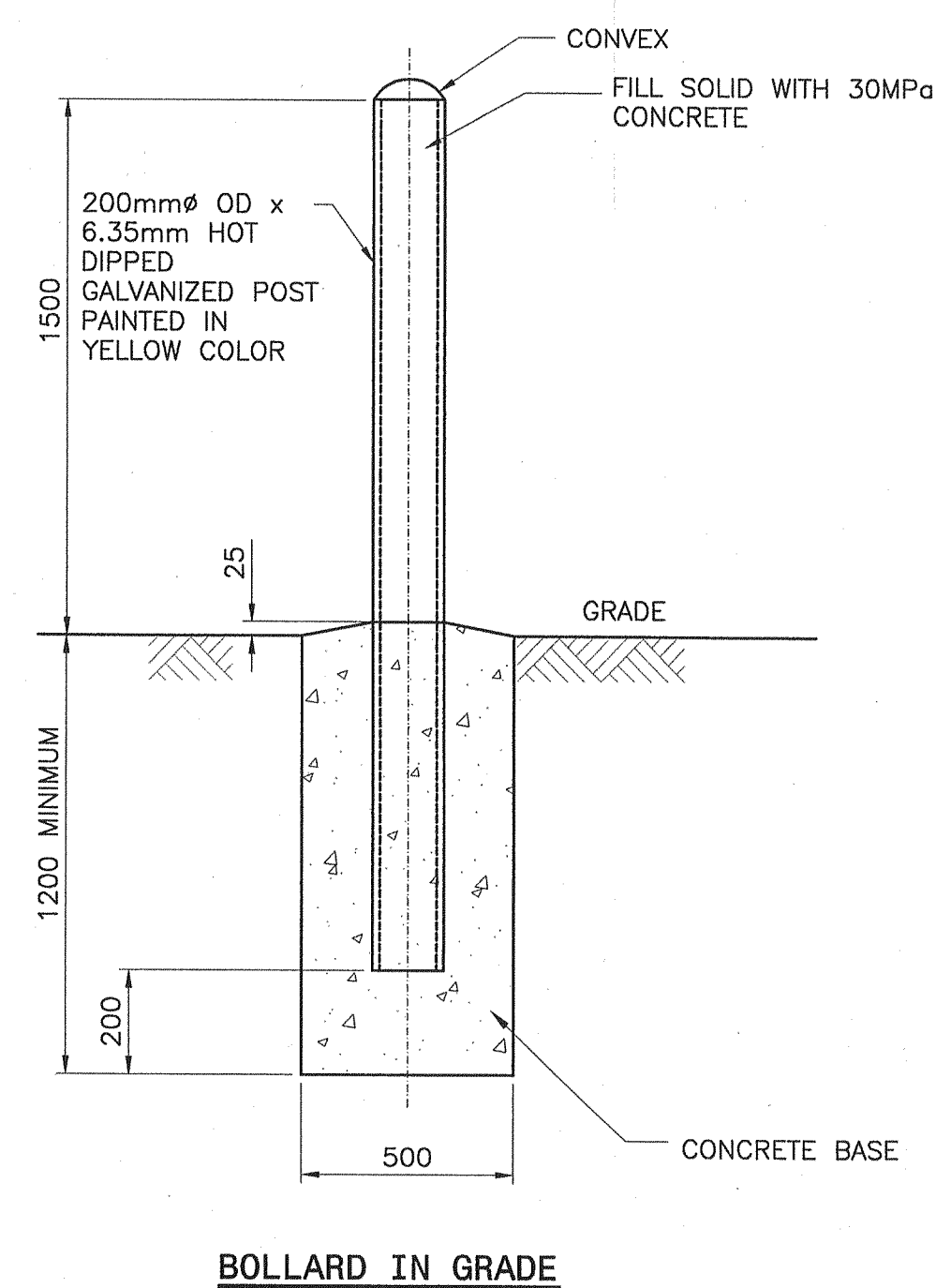
ADDITIONAL REINFORCING AT STAIR TREADS

CHAMFERS

TYPICAL ARRANGEMENT FOR HORIZONTAL REINFORCING BARS



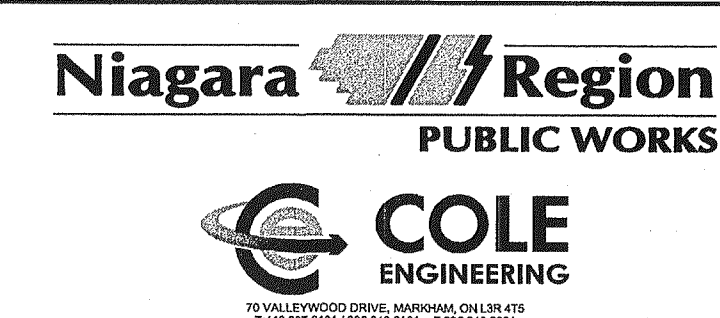
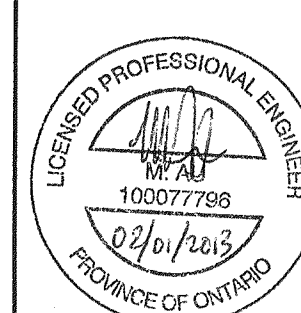
EXTRA REINFORCING BARS AT OPENINGS IN WALLS AND SLABS



BOLLARD DETAILS

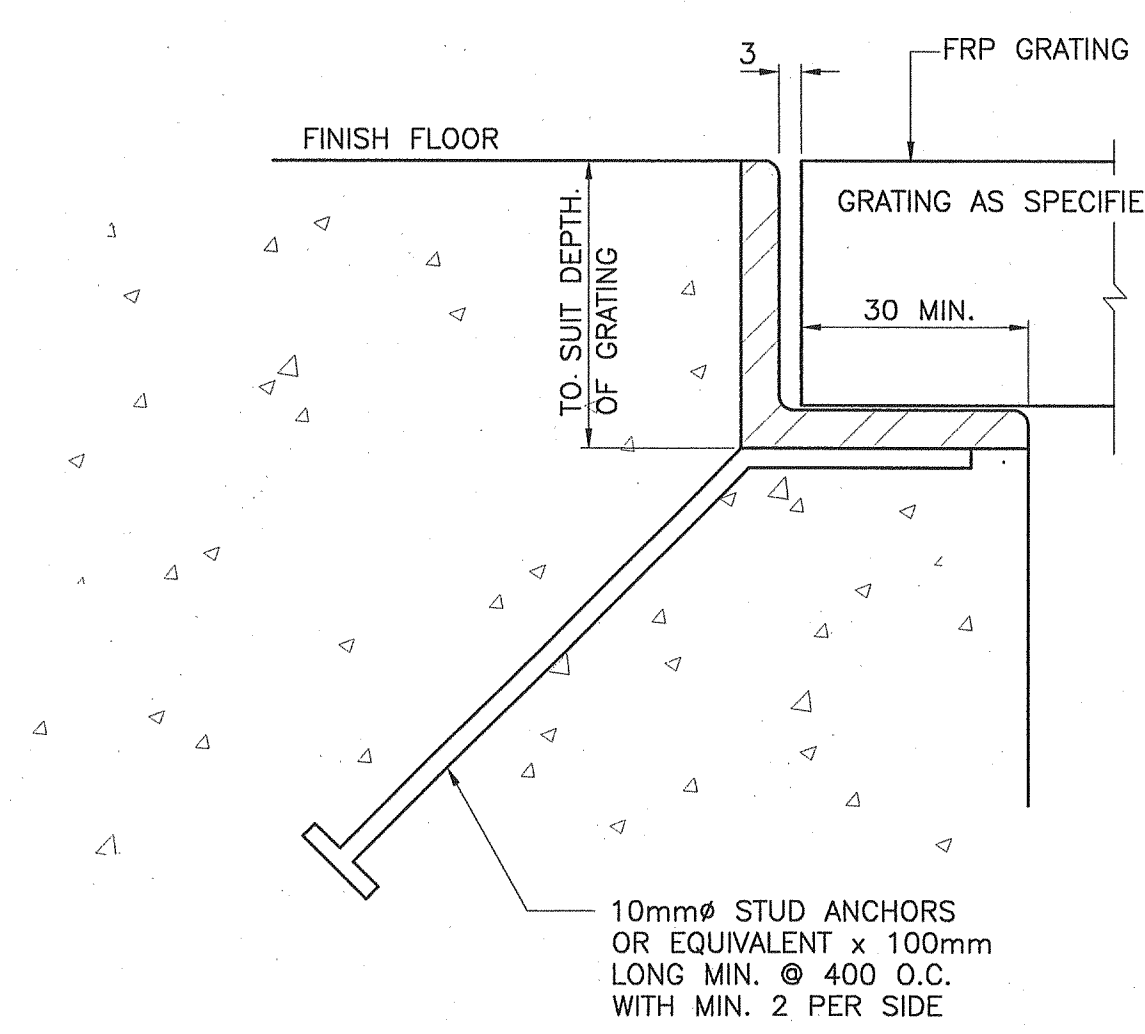
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

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DESIGN	M.AU
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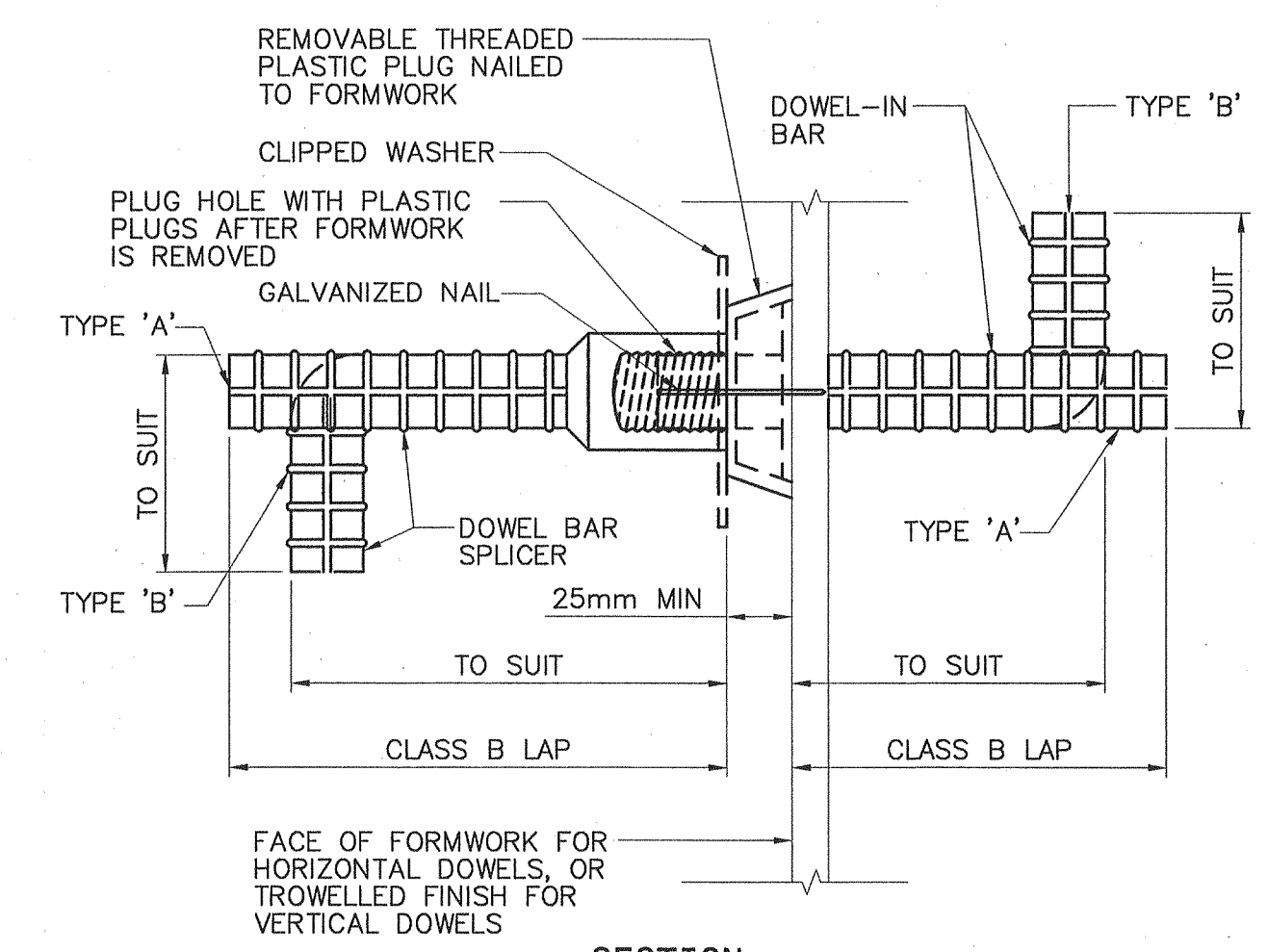
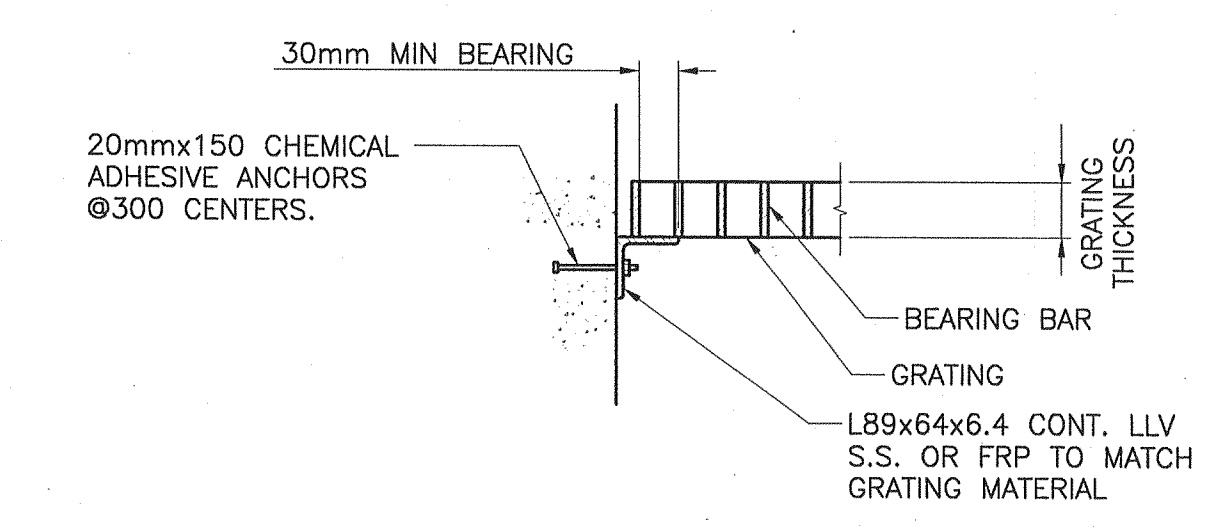
CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
TYPICAL DETAILS (1)
STRUCTURAL

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE N.T.S.	REF. No. RN 13-03
DWG No. S04	REV. 1

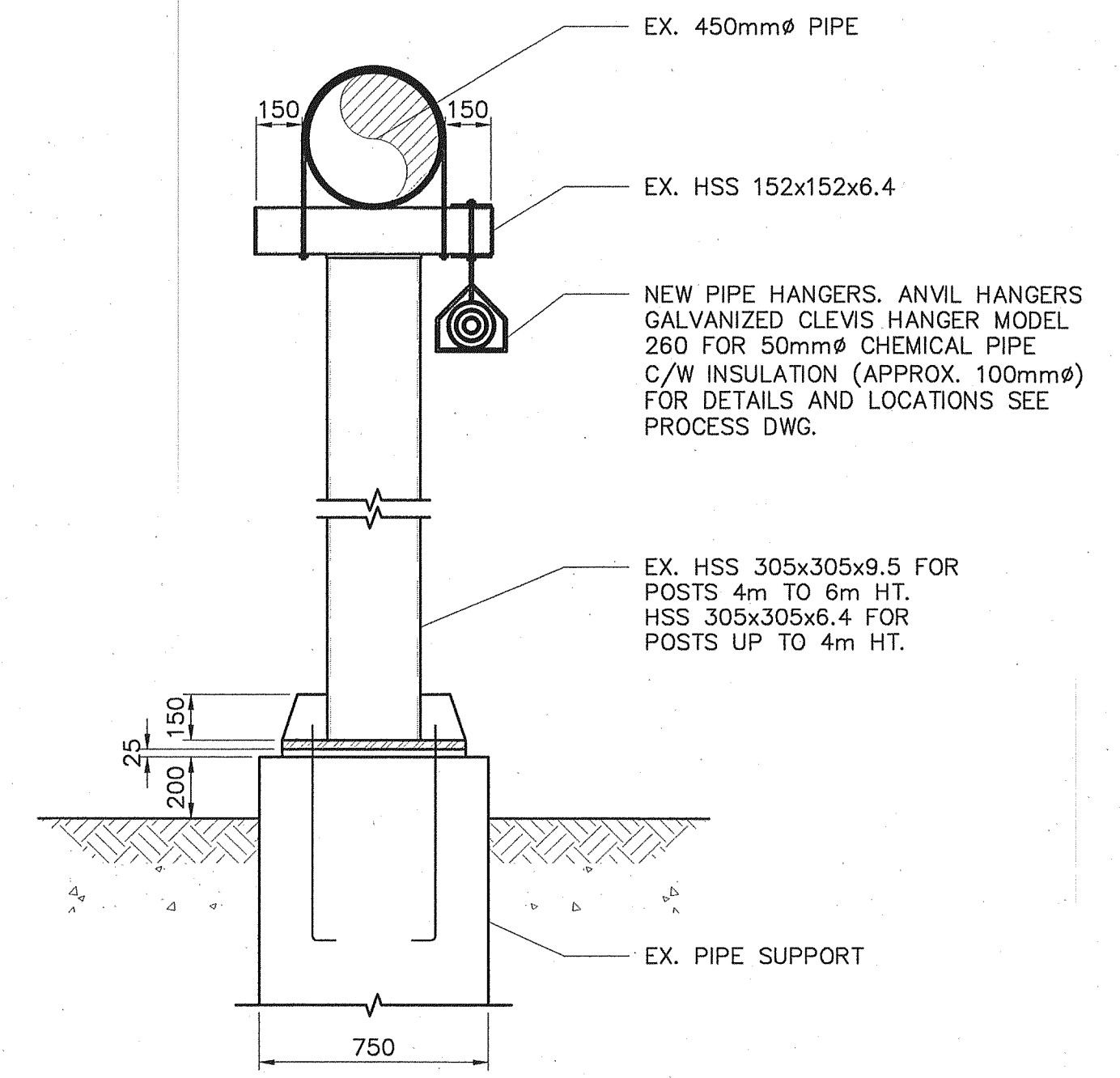


GENERAL NOTES:

1. GRATING SPAN SEE PLAN.
2. ALL GRATING SHALL BE FRP, AS NOTED ON DRAWINGS.
3. UNLESS NOTED OTHERWISE ON PLANS, GRATING THICKNESS SHALL BE DESIGNED FOR A SUPERIMPOSED LIVELOAD OF 5 KPa LOADING U/N AND POINT LOAD OF 4.5kN USING A L/480 DEFLECTION MAX. OR 6mm.
4. BEARING BAR THICKNESS FOR GRATING TO BE 5 MM MINIMUM.
5. BEND ALL EDGES WITH 5mm X DEPTH OF BEARING BAR.
6. PROVIDE GRATING FASTENERS TO FIRMLY ANCHORED GRATING TO THEIR SUPPORTS @ 600mm O/C.
7. THE HORIZONTAL CLEARANCE BETWEEN THE GRATING AND GRATING SUPPORTS SHALL NOT BE LESS THAN 6 MM NOR GREATER THAN 13mm U/N.
8. L FRAME CORNERS ARE TO BE MITRED WELDED & GROUND SMOOTH.
9. MIN. SEATING L THICKNESS TO BE 6mm.
10. L FRAME & GRATING TO BE OF SAME MATERIAL.



*- WHERE THREADS ARE CUT INTO REINFORCING BAR, USE LARGER BAR SIZE AS REQUIRED. PROVIDE THE FULL STRENGTH OF SPECIFIED BAR.
- DETAIL APPLIES TO SYSTEM AS SUPPLIED BY NCA/ACROW-RICHMOND
ALTERNATE SPLICING SYSTEM:
IF THREADED RODS AND COUPLINGS ARE USED, PROVIDE EQUIVALENT BAR DIAMETERS (THREADS EXCLUDED) TO REPLACE THE REINFORCING BARS.



NOTE: SEE CIVIL DRAWING C03 FOR LOCATION, TYPICAL 11 REQUIRED

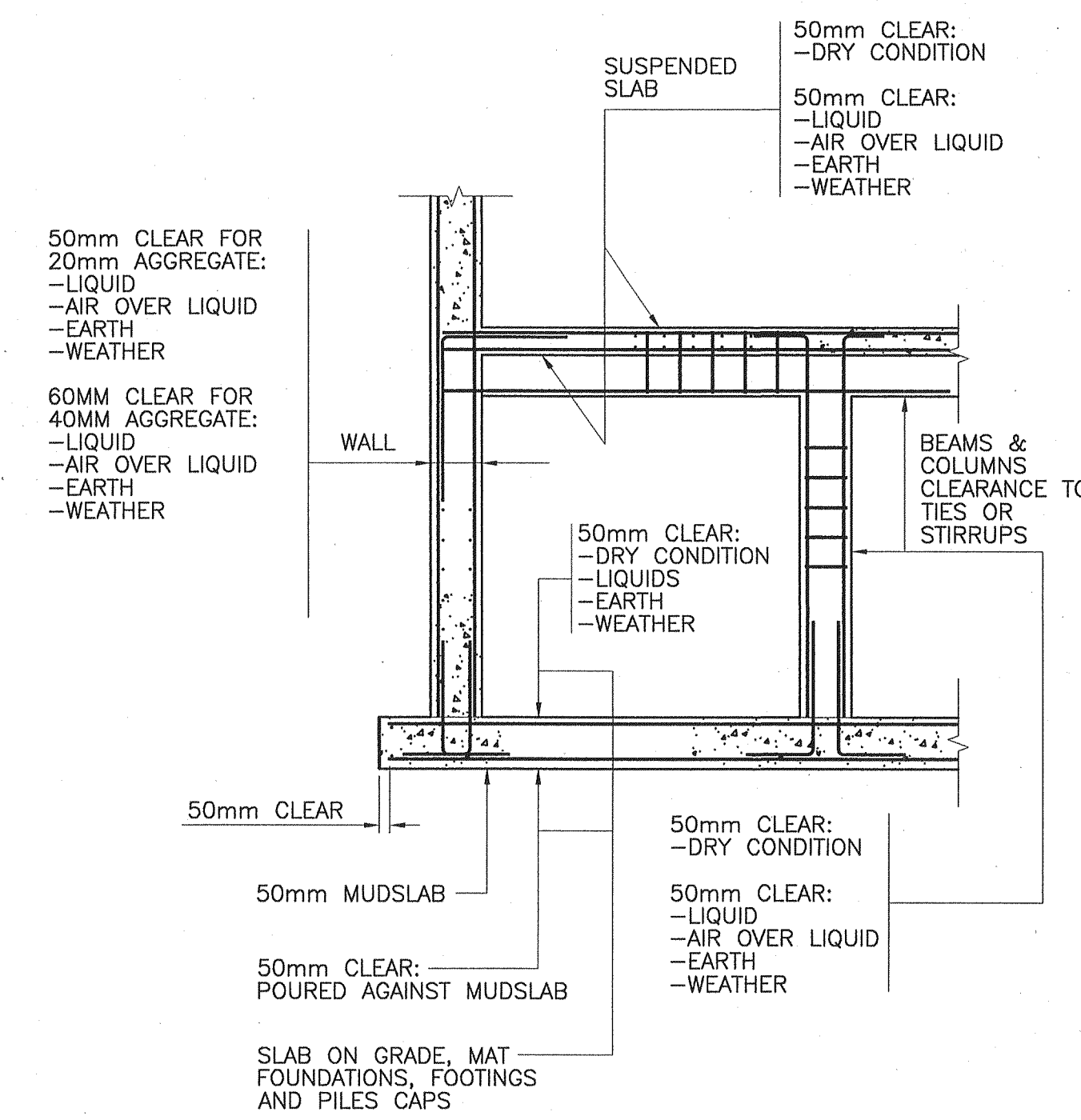
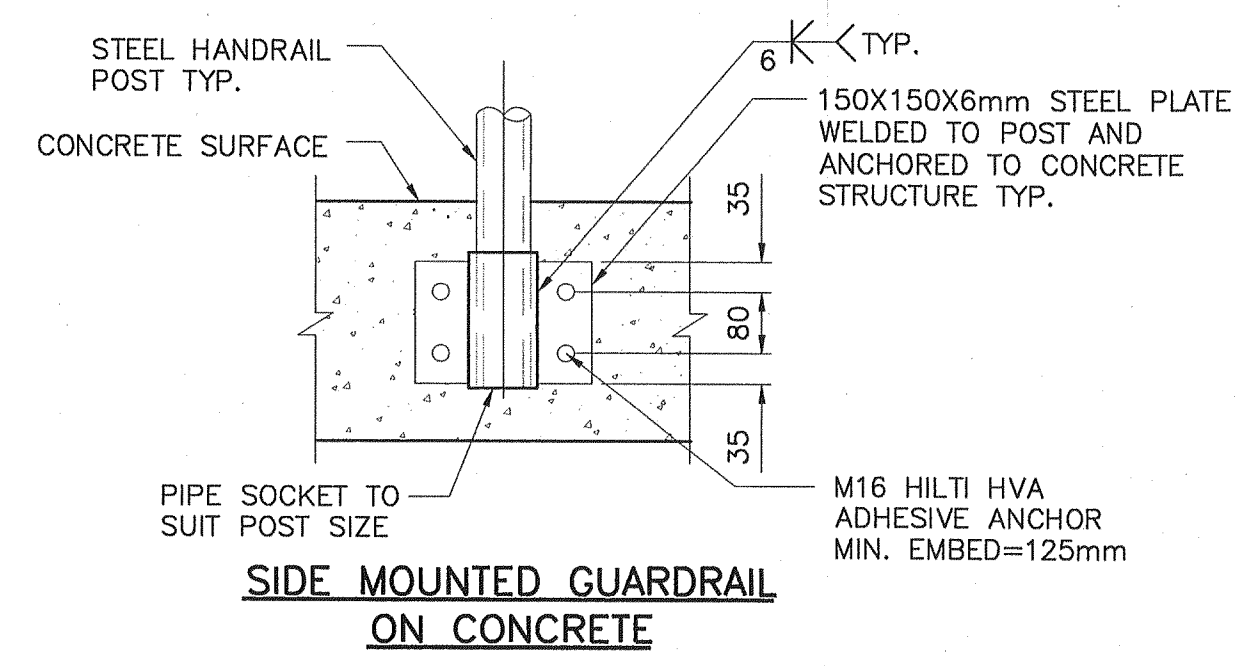
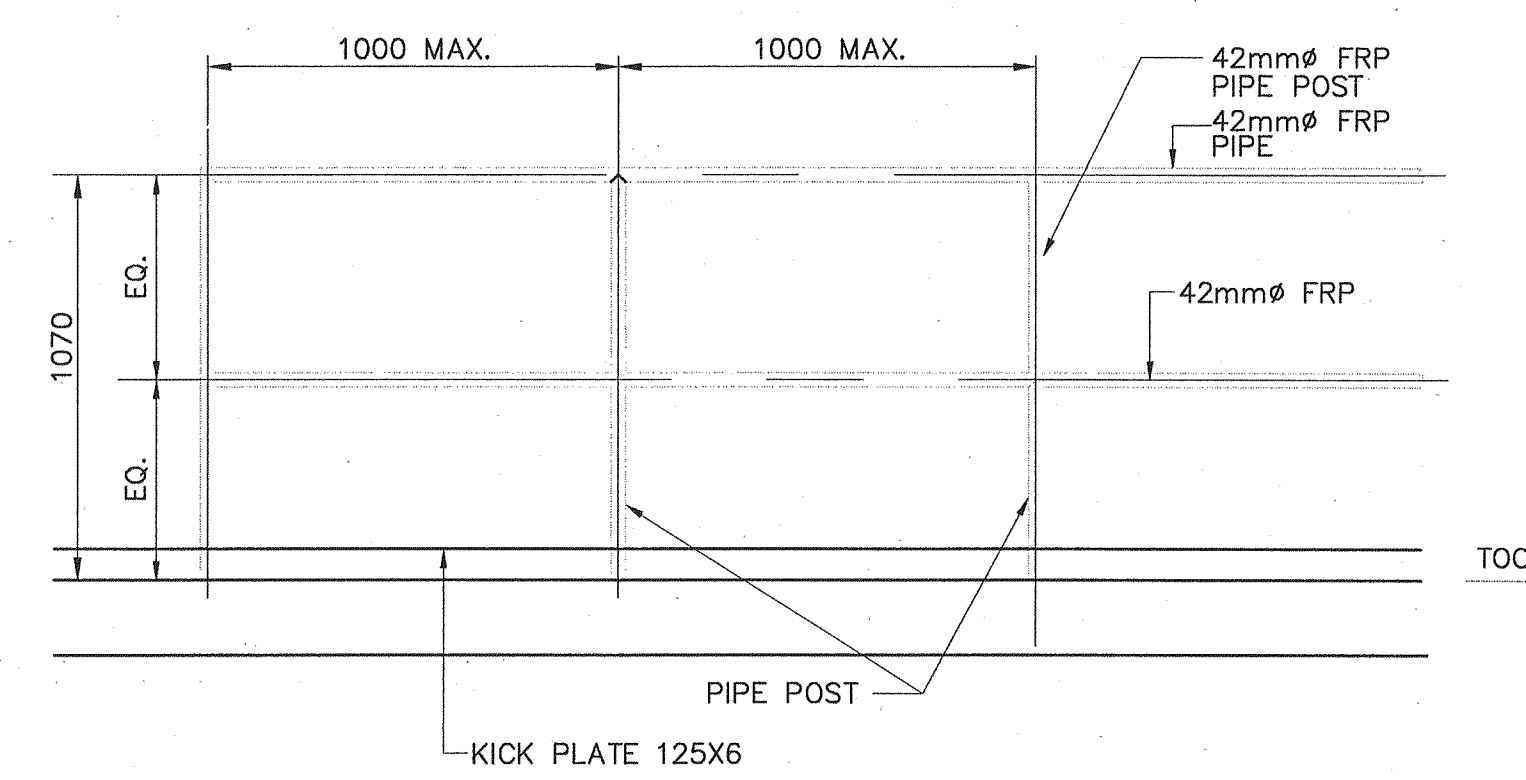
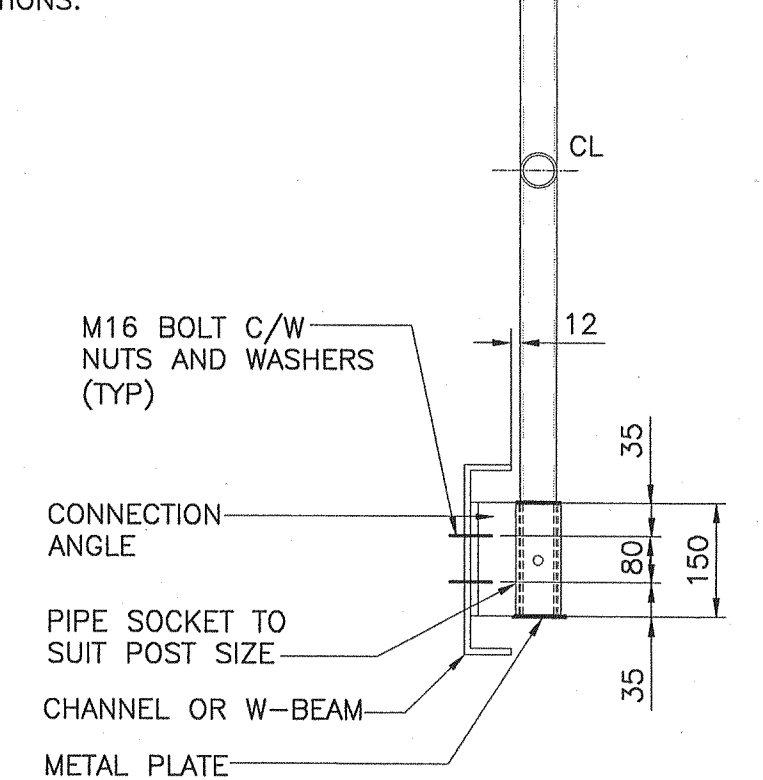
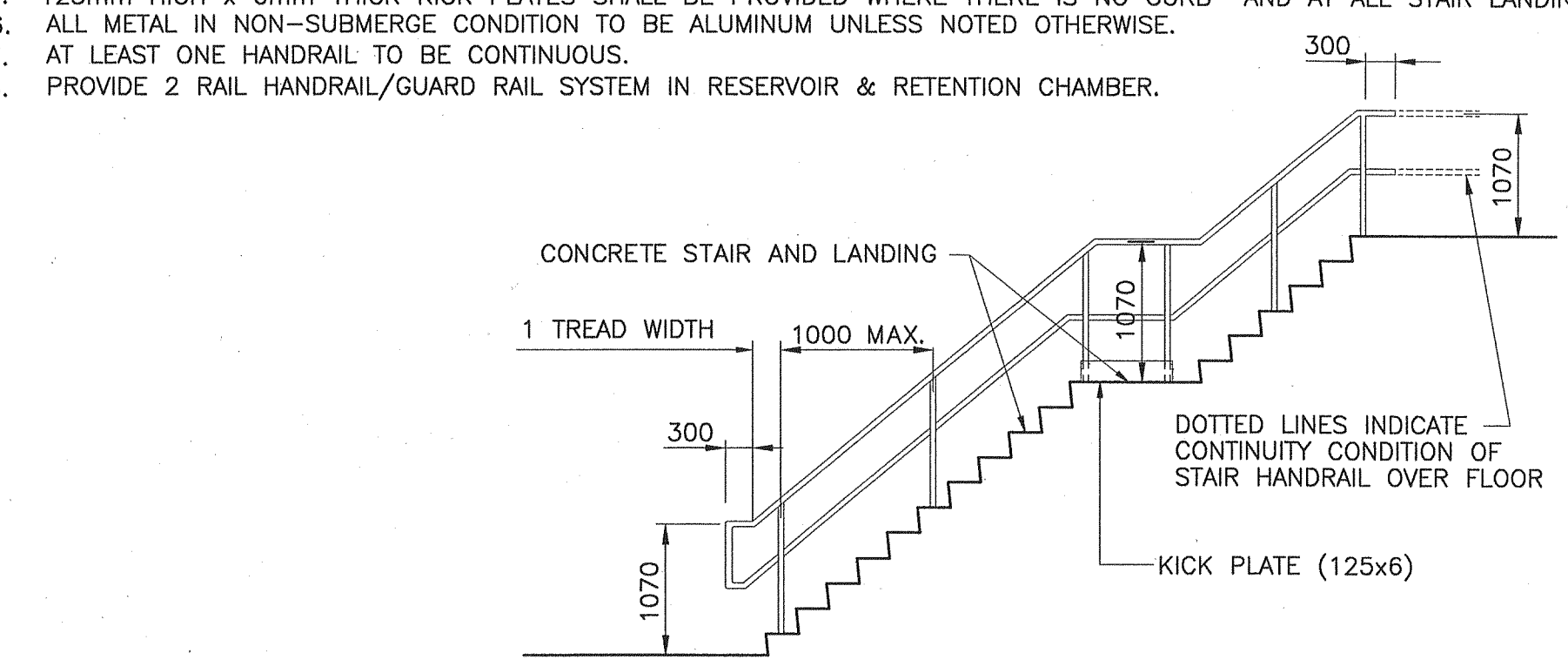
TYPICAL GRATING DETAIL

TYPICAL DOWEL BAR SPLICER

TYPICAL PIPE SUPPORT DETAIL

NOTES:

1. ALL ROUGH EDGES AND WELDS OF ASSEMBLIES SHALL BE GROUND SMOOTH.
2. ALL 90° CORNERS SHALL BE MITERED USE MIN. RADIUS BEND FOR ALL OTHER CORNERS AND CURVES.
3. ALL CONNECTIONS SHALL BE WELDED.
4. WHEN HANDRAIL POSTS ARE EMBEDDED IN SLEEVES OR CONNECTED TO BRACKETS BELOW FLOOR LEVEL, POSTS SHALL BE ADJUSTED IN LENGTH.
5. 125mm HIGH x 6mm THICK KICK PLATES SHALL BE PROVIDED WHERE THERE IS NO CURB AND AT ALL STAIR LANDINGS LOCATIONS.
6. ALL METAL IN NON-SUBMERGE CONDITION TO BE ALUMINUM UNLESS NOTED OTHERWISE.
7. AT LEAST ONE HANDRAIL TO BE CONTINUOUS.
8. PROVIDE 2 RAIL HANDRAIL/GUARD RAIL SYSTEM IN RESERVOIR & RETENTION CHAMBER.

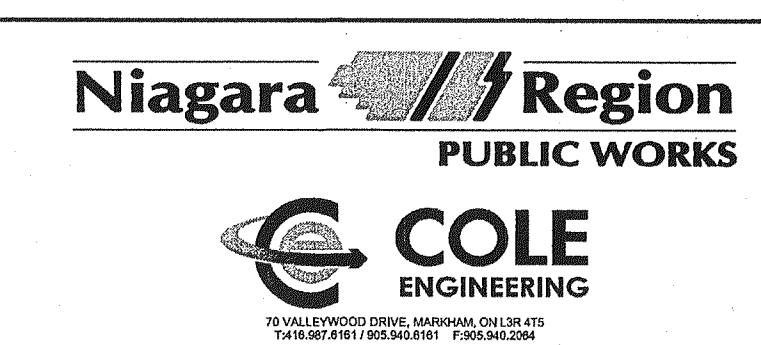
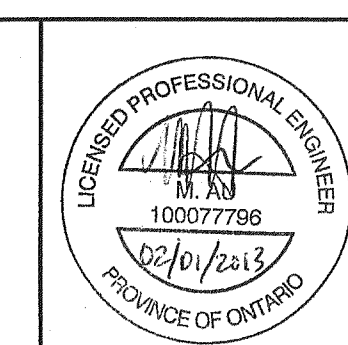


TYPICAL SIDEMOUNTED REMOVABLE HANDRAIL DETAILS

TYPICAL COVER CONCRETE

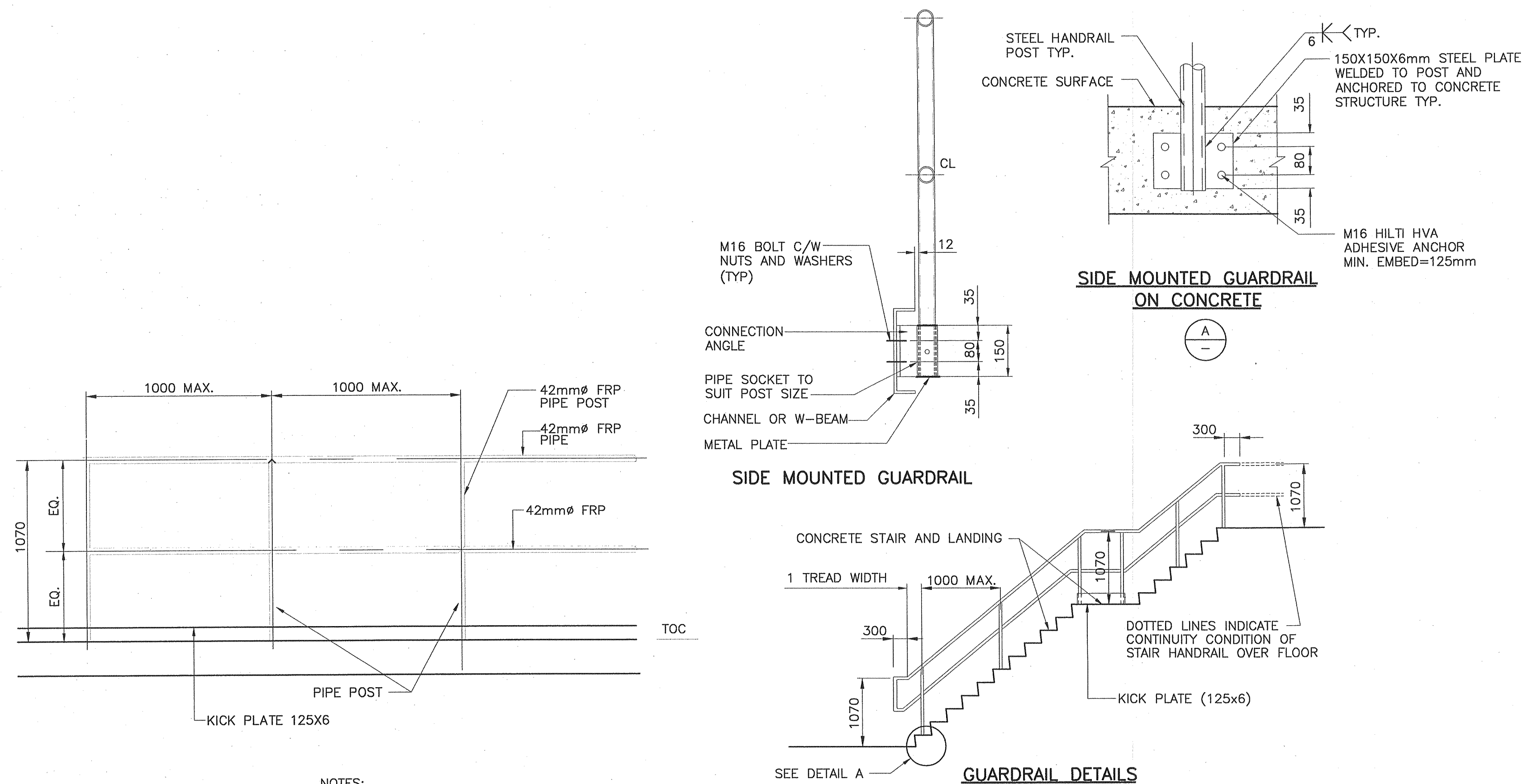
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1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

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DESIGN	M.AU
CHECKED BY	B.Y.
APPROVED BY	B.Y.

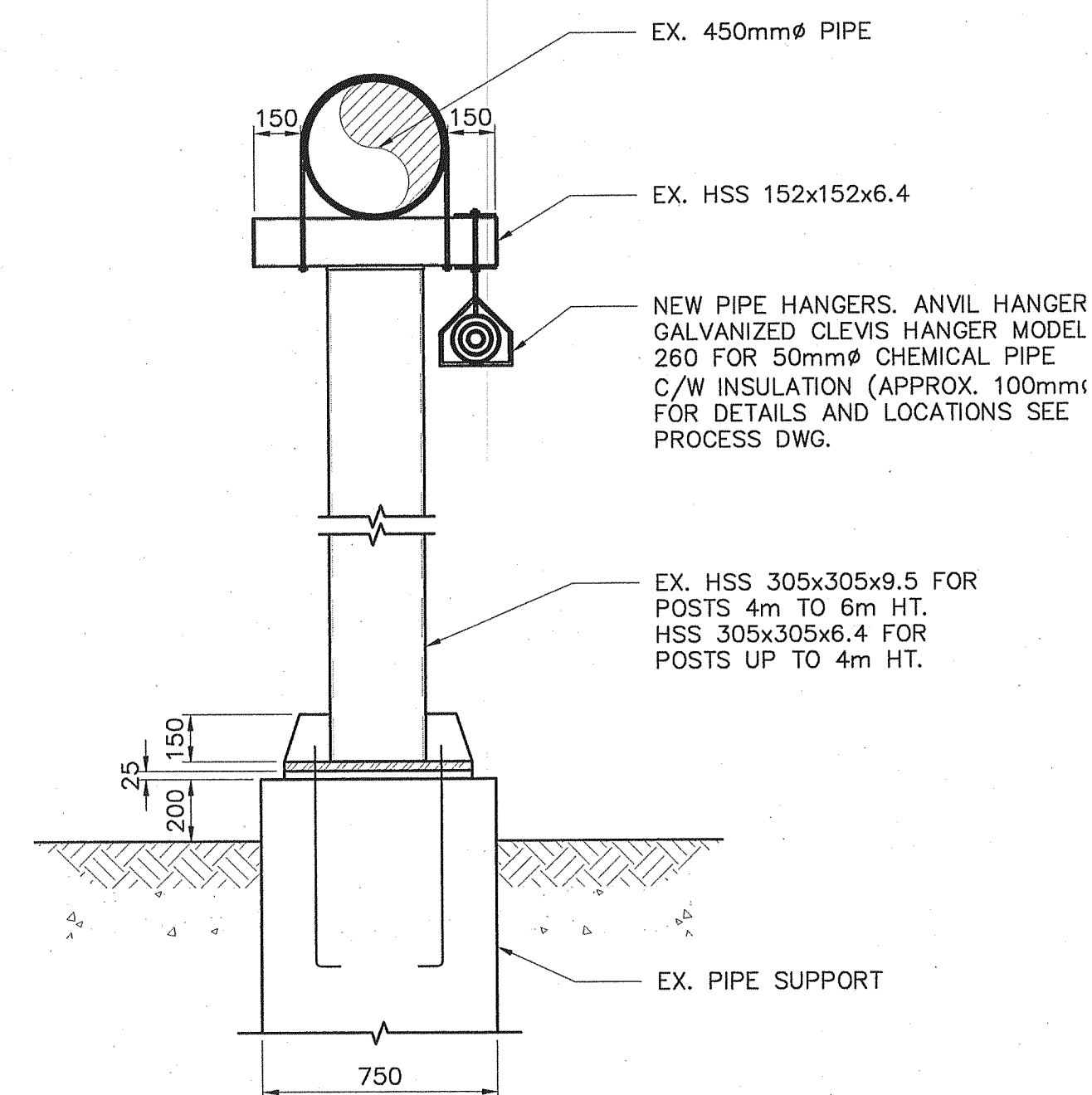


CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT IN THE CITY OF ST. CATHARINES
TYPICAL DETAILS (2)
STRUCTURAL

CONSULTANT FILE No. E11-434	DATE	2012-05-09
SCALE	N.T.S.	
REF. No.	RN 13-03	
DWG No.	S05	REV. 1



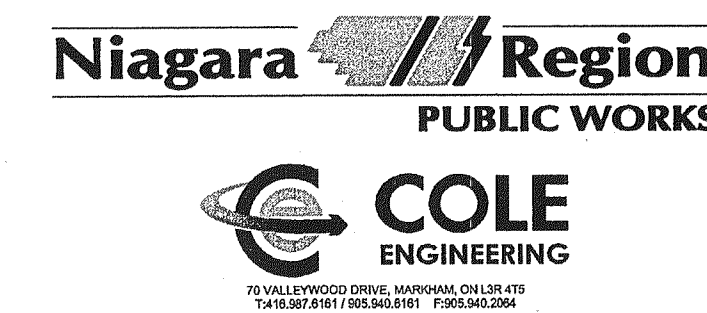
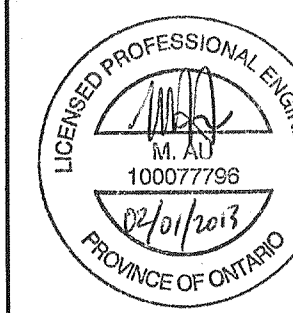
TYPICAL GUARD DETAILS



TYPICAL PIPE SUPPORT DETAILS

1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

DRAFTING
M.L.
DESIGN
M.A.U.
CHECKED BY
B.Y.
APPROVED BY
B.Y.



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
TYPICAL DETAILS (3)
STRUCTURAL

CONSULTANT FILE No. E11-434
DATE 2012-05-09
SCALE N.T.S.
REF. No. RN 13-03
DWG No. S06
REV. 1

PROCESS MECHANICAL - COMMODITY SYMBOLS

SYMBOL	COMMODITY
AA	AQUEOUS AMMONIA
AAS	AERATION AIR SUPPLY
ACS	ACTIVATED CARBON SOLUTION (SLURRY)
AIR	AIR
AL	ALUM LIQUID
ALS	ALUM SOLUTION
AMG	AMMONIA GAS (ANHYDROUS)
AML	AMMONIA LIQUID (ANHYDROUS)
AMS	AMMONIA SOLUTION
AP	ALUM POWDER (DRY)
ARL	AIR RELIEF LINE
AS	ALUM SOLUTION
ASS	ACTIVATED SLUDGE (SEWAGE)
ASW	ALUM SOLUTION WASTE
AWS	AIR WASH SUPPLY
BL	BY-PASS LINE
BPE	BACKWASH PLANT EFFLUENT
BWR	BACKWASH RECIRCULATION WATER
BWS	BACKWASH SUPPLY WATER
BWW	BACKWASH WASTE WATER
CAS	CAUSTIC SODA
CD	CENTRIFUGE DECONTANT
CDG	CHLORINE DIOXIDE GAS
CDS	CHLORINE DIOXIDE SOLUTION
CG	CARBON DIOXIDE GAS
CHW	CHEMICAL WASTE (LAB WASTE)
CLG	CHLORINE GAS
CLL	CHLORINE LIQUID
CLS	CHLORINE SOLUTION
CLV	CHLORINE VACUUM
CTS	CALCIUS TRIOSULPHATE SOLUTION
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
CWW	COOLING WATER WASTE
DCW	DOMESTIC COLD WATER
DE	DECANTER EFFLUENT
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRCULATION
DIS	DIGESTED SLUDGE
DR	DRAIN
DS	DESILTING LINE
EAS	EXCESS ACTIVATED SLUDGE
EE	ENGINE EXHAUST
F	FLUORIDE (FLUORINE)
FA	FLUOSILICIC ACID
FAS	FILTER AID SOLUTION
FC	FERRIC CHLORINE
FEF	FILTER EFFLUENT
FIL	FILTERED WATER
FIN	FILTER INFLUENT
FL	HYDROFLUORISILICIC ACID (FLUORIDE)
FLO	FLUSHING OIL
FLS	FLUORIDE SOLUTION
FLT	FILTRATE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FTW	FILTER TO WASTE
FW	FIRE WATER
G	SLUDGE GAS
GR	GLYCOL RETURN
GRE	GREASE
GS	GLYCOL SUPPLY
GT	GRIT LINE
HL	HYDRATED LIME (DRY)
HPS	HYDROGEN PEROXIDE
HPW	HEATED POTABLE WATER
HRWR	HEATED RAW WATER RETURN
HRWS	HEATED RAW WATER SUPPLY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IA	INSTRUMENT AIR (FILTERED & DRIED)
LO	LUBRICATING OIL
LOX	LIQUID OXYGEN
LPG	LIQUID PROPANE GAS
LS	LIME SOLUTION (LIME SLURRY)
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
MS	MICROSAND
MSD	MICROSAND DRAIN (HYDROCYCLONE)

SYMBOL	COMMODITY
NGH	NATURAL GAS HIGH PRESSURE
NGL	NATURAL GAS LOW PRESSURE
NGM	NATURAL GAS MEDIUM PRESSURE
NI	NITROGEN GAS
OF	PLANT OUTFALL
OV	PLANT OVERFLOW
OZ	OZONE
OZS	OZONE SOLUTION
PE	PLANT EFFLUENT (DRAIN) MAY DUMP TO RECREATIONAL WATER SOURCE
PET	GASOLINE (PETROLEUM)
PFW	FLUSHING LINE (USUALLY PW)
PHWR	POTABLE HOT WATER RECIRCULATION
PHWS	POTABLE HOT WATER SUPPLY
PLS	PRIMARY LIME SLUDGE
PLY	POLYELECTROLYTE
PLYS	POLYELECTROLYTE SOLUTION
PLY1	POLYELECTROLYTE SOLUTION (TYPE 1)
PLY2	POLYELECTROLYTE SOLUTION (TYPE 2)
PPE	PRIMARY PLANT EFFLUENT
PPS	POTASSIUM PERMANGANATE SOLUTION
PRL	PRESSURE RELIEF LINE
PS	PRIMARY SLUDGE
PSW	PLANT SERVICE WATER (USUALLY PW)
PW	POTABLE WATER (SAFE FOR HUMAN CONSUMPTION)
QL	QUICK LIME (DRY)
RAG	RECARBONATION AIR GAS SUPPLY
RAS	RETURN ACTIVATED SLUDGE
RCD	RECARBONATOR DECONTANT
RCS	RECIRCULATED SLUDGE
RS	RETURN SLUDGE
RSW	RAW SANITARY WASTE
RW	RAW WATER (NOT SAFE FOR HUMAN CONSUMPTION)
RWCR	RAW WATER COOLING RETURN
RWCS	RAW WATER COOLING SUPPLY
RWD	REWASH DRAIN
RWL	RAIN WATER LEADER
RWW	RAW WASTE WATER
SA	SERVICE AIR
SAM	SAMPLE LINE
SAS	SODA ASH SOLUTION
SBF	SODIUM BISULFITE
SC	SCUM LINE
SD	STORM DRAIN
SDG	SULFUR DIOXIDE GAS
SDS	SULFUR DIOXIDE SOLUTION
SE	SECONDARY EFFLUENT
SEL	SENSING LINE
SET	SETTLED WATER
SGC	SLUDGE GAS RECIRCULATED (DIGESTER)
SOD	SLUDGE GAS DIGESTER
SLD	SUPERNATANT LIQUOR DRAFFOFF
SLR	SURGE RELIEF LINE
SLS	SECONDARY LIME SLUDGE
SO	SUPERNATANT OVERFLOW
SPE	SURFACE WASH - PLANT EFFLUENT (SEWAGE)
SSS	SODIUM SILICATE SOLUTION
ST	SLUDGE TRANSFER
SUL	SULPHURIC ACID SOLUTION
SUP	LAGOON SUPERNATANT
SW	SANITARY WASTE
SWS	SURFACE WASH SUPPLY
TD	THICKENER DECONTANT
TO	THICKENER OVERFLOW
TS	THICKENER SLUDGE
TU	THICKENER UNDERFLOW
TW	TREATED WATER (PRIMARY TREATMENT, NOT YET SAFE FOR HUMAN CONSUMPTION)
UD	UNDER DRAIN (WEEPING TILE)
VA	VACUUM LINE
VE	VENT
VSS	VOLATILE SUSPENDED SOLIDS
WAS	WASTE ACTIVATED SLUDGE
WLS	WASTE LIME SLUDGE
ZW	ZEOLITE SOFTENED WATER

PIPE MATERIAL CODE

CODE	MATERIAL AND FLANGE RATING
A1	STEEL PIPE 900mmØ & SMALLER - 40°C 150 POUND FLANGE RATING
A2	STEEL PIPE 900mmØ & SMALLER - 40°C 300 POUND FLANGE RATING
A3	STEEL PIPE 1050mmØ & LARGER - 40°C 150 POUND FLANGE RATING PIPE & FLANGE SPEC TO AWWA STANDARDS
A4	STEEL PIPE 1050mmØ & LARGER - 40°C 300 POUND FLANGE RATING PIPE & FLANGE SPEC TO AWWA STANDARDS
A5	STEEL PIPE 600mmØ & SMALLER - 130°C 150 POUND FLANGE RATING
A6	STEEL PIPE 600mmØ & SMALLER - 130°C 300 POUND FLANGE RATING
A7	STEEL PIPE 600Ø & SMALLER - 40°C 150 POUND FLANGE RATING GAS SERVICE ONLY
A8	GALVANIZED STEEL PIPE 200Ø & SMALLER - 40°C 150 POUND FLANGE RATING
A9	STEEL PIPE 200Ø & SMALLER - 40°C AI PIPE CODE VICTAULIC COUPLED
A10	STEEL PIPE 100Ø & SMALLER - 40°C A2 PIPE CODE CHLORINE GAS, CARBON DIOXIDE GAS
AE	PLASTIC LINED CARBON STEEL
B1	CONCRETE PIPE STEEL REINFORCED (HYPPRESSON TYPE)
C1	CONCRETE PIPE - GRAVITY SERVICE
D1	ASBESTOS CEMENT PIPE
E1	PVC PIPE (PRESSURE PIPE)
E2	PVC PIPE - GRAVITY SERVICE
E3	POLYETHYLENE PIPE (PE)
E4	PIGMENTED POLYPROPYLENE PIPE (PP)
E5	PLASTIC FLEXIBLE TUBING
E6	RUBBER HOSE
E7	PLASTIC WEEPING TILE PIPE
F1	CAST IRON PRESSURE PIPE
F2	CAST IRON DRAINAGE PIPE
F3	DUCTILE IRON PIPE - PRESSURE SERVICE
G1	COPPER PIPE - TYPE K
G2	COPPER PIPE - TYPE L
H1	STAINLESS STEEL PIPE
H2	STAINLESS STEEL TUBING
H3	STEEL TUBING
J1	CORRUGATED METAL PIPE - GALVANIZED
J2	CORRUGATED METAL PIPE (WEEPING TILE)
P1	PLASTIC DWV, COPPER DWV, CAST IRON DWV PLUMBING SERVICE

PROCESS EQUIPMENT SYMBOLS

SYMBOL	EQUIPMENT
AA	AMMONIA ANALYZER
AAP	AQUEOUS AMMONIA PUMP
AASP	AQUEOUS AMMONIA SOLUTION PUMP
AAST	AQUEOUS AMMONIA SOLUTION TANK
AAT	AQUEOUS AMMONIA TANK
AC	AIR COMPRESSOR
ACF	ACTIVATED CARBON FEEDER
ACSP	ACTIVATED CARBON SOLUTION (SLURRY) PUMP
ACST	ACTIVATED CARBON SOLUTION (SLURRY) TANK
AD	AREA DRAIN
AF	AIR FILTER
AGC	AIR GAS COMPRESSOR (RECARBONATION UNIT)
AGD	AMMONIA GAS DETECTOR
AH	ALUM HOPPER
AID	AIR DIFFUSER
ALF	ALUM FEEDER
AMF	AMMONIATOR (FEEDER)
ART	AIR RECEIVER TANK
ASP	ALUM SOLUTION PUMP
AT	ALUM TANK
BC	BELT CONVEYOR
BF	BAG FILTER
BFP	BACK FLOW PREVENTOR
BLO	BLOWER
BRP	BACKWASH WATER RECYCLE PUMP
BRT	BRINE TANK
BSP	BACKWASH SUPPLY PUMP
BWP	BACKWASH WASTE PUMP
C	CLARIFIER
CB	CATCH BASIN (STORM DRAIN)
CC	CALIBRATION CHAMBER
CDG	CHLORINE DIOXIDE GENERATOR
CEC	CHLORINE EXPANSION CHAMBER
CEF	CENTRIFUGE
CGA	CHLORINE GAS ANALYZER
CGC	CHLORINE GAS CYLINDER
CGD	CHLORINE GAS DETECTOR
CGF	CHLORINATOR (FEEDER)
COF	CARBON DIOXIDE FEEDER (CO2)
COMP	COMPRESSOR (GAS PUMPING STATION)
CR	CRANE (BRIDGE, JIB OR MONORAIL)
CO	CLEAN OUT
DCL	DUST COLLECTOR
DEC	DECHLORINATOR
DL	DOCK LEVELLER
DLT	DILUTION TANK (UNSPECIFIED SERVICE)
DWH	DOMESTIC WATER HEATER
E	ELEVATOR
ED	EDUCTOR OR EJECTOR
ENG	ENGINE
ES	EXHAUST SILENCER (MUFFLER)
ESH	EMERGENCY SHOWER UNIT
EV	EVAPORATOR
FAP	FLUOSILICIC ACID PUMP
FASP	FLUOSILICIC ACID SOLUTION PUMP
FAT	FLUOSILICIC ACID TANK
FAST	FLUOSILICIC ACID SOLUTION TANK
FB	FLOOR BOX (VALVE)
FD	FLOOR DRAIN
FEX	FIRE EXTINGUISHER
FF	FLUORIDE FEEDER
FH	FIRE HYDRANT
FHC	FIRE HOSE CONNECTION
FIL	FILTER (PROCESS WATER)
FOF	FUEL OIL FILTER
FS	FIXED SCREEN (BAR OR MESH)
FSP	FUEL SUPPLY PUMP
FT	FUEL TANK
FUD	FUNNEL DRAIN
FWP	FIRE PUMP
GD	GEAR DRIVE
GEN	GENERATOR (GEN SET C/W ENGINE)
GM	GAS METER
H	HOIST (ELECTRIC OR MANUAL)
HB	HOSE BIBB
HC	HOSE CONNECTION
HD	HUB DRAIN
HEX	HEAT EXCHANGER
HPC	HYPOCHLORINATOR
HR	HOSE REEL
IMP	IMPACTOR

VALVE SYMBOLS

SYMBOL	VALVE
AR	AIR RELEASE VALVE
ARV	AIR RELEASE / VACUUM VALVE
AV	AIR VACUUM VALVE (ANTI-SYPHON)
BAV	BALL VALVE
BBV	BLOCK & BLEED VALVE
BUV	BUTTERFLY VALVE
BV	BLOCK VALVE
BWV	BACK WATER VALVE
CHV	CHECK VALVE
DIV	DIAPHRAGM VALVE
FGV	FLAP GATE VALVE
FOT	FOOT VALVE
GAV	GATE VALVE
GLV	GLOBE VALVE
KBV	KNIFE GATE VALVE
MUV	MUD VALVE
NEV	NEEDLE VALVE
PLV	PLUG VALVE
PV	PINCH VALVE
ROV	ROTARY VALVE (OUTLET OF SILO)
SG	SLUICE GATE VALVE
SGV	SLIDE GATE VALVE

COMPONENT NUMBERS

COMPONENT NUMBER	DESCRIPTION
DESIGNATED NUMBER ASSIGNED TO PROJECT	
CODE NUMBER	DESCRIPTION
4	PROCESS MECHANICAL
5	BUILDING MECHANICAL
6	ELECTRICAL
7	INSTRUMENTATION

PIPE TREATMENT CODE

CODE	DESCRIPTION
A	CEMENT MORTAR LINED (40 TO 900mmØ PIPE)
B	INTERNAL HOT COAL TAR ENAMEL
C	INTERNAL EPOXY LINED
D	YELLOW JACKET (20 TO 600mmØ PIPE)
E	DOPED AND KRAFT PAPER WRAPPED TO AWWA SPEC
F	EXTERNAL COAL TAR ENAMEL
G	EXTERNAL EPOXY
H	INSULATION
J	INSULATION C/W JACKET (HIGH TEMP)
K	POLYETHYLENE ENCASEMENT (BURIED SERVICE)
M	PLASTIC LINED FOR ACID SERVICE

NOTE:
1. FOR FRAGMENT 1 TO 3 OF EQUIPMENT TAG REFER TO REGION'S STANDARDS.
2. REFER TO P&IDs FOR ADDITIONAL PROCESS COMPONENT INFORMATION.

1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

DRAWING FILE: S:\2011 Projects\0-EE(E11)\Wastewater Treatment\E11-434 Niagara Port Weller WWT\Task Region\DetailedDesign\ACAD-DWG\Submission\E11-434-P01.dwg PLOTTED: Jan 30, 2013 - 4:18pm PLOTTED BY: maraupa

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C.S.P.



Niagara Region
PUBLIC WORKS

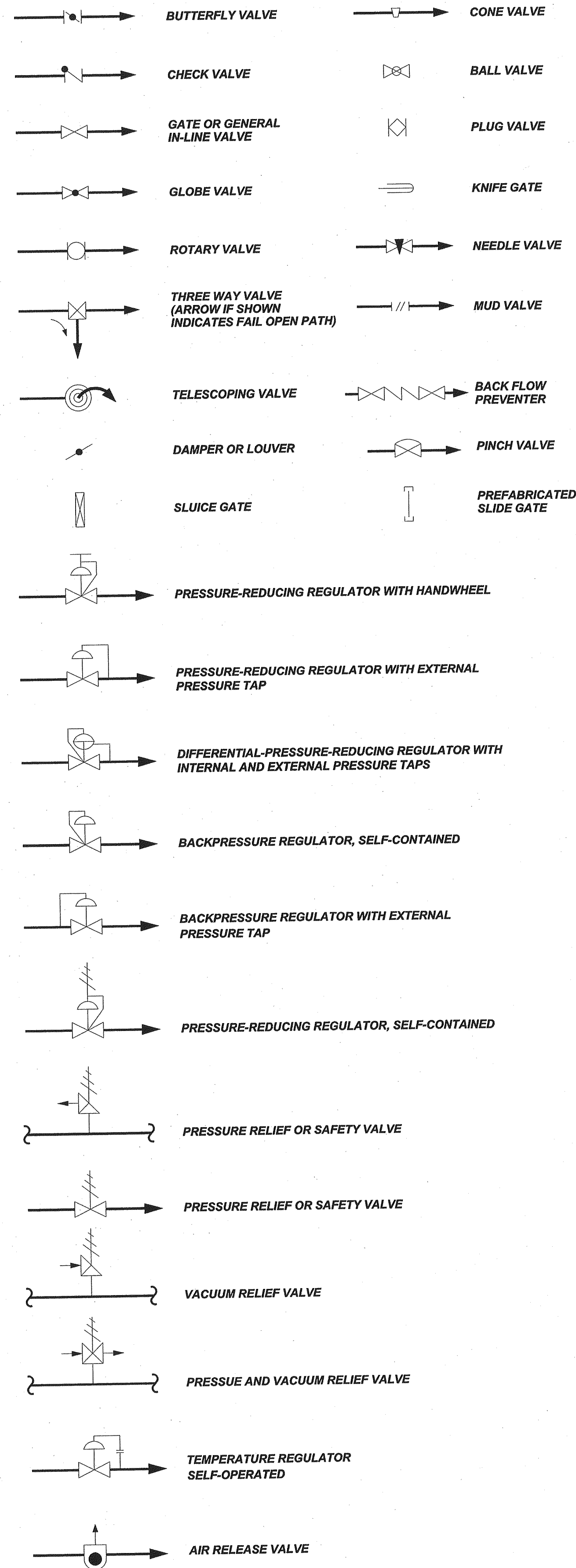


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PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
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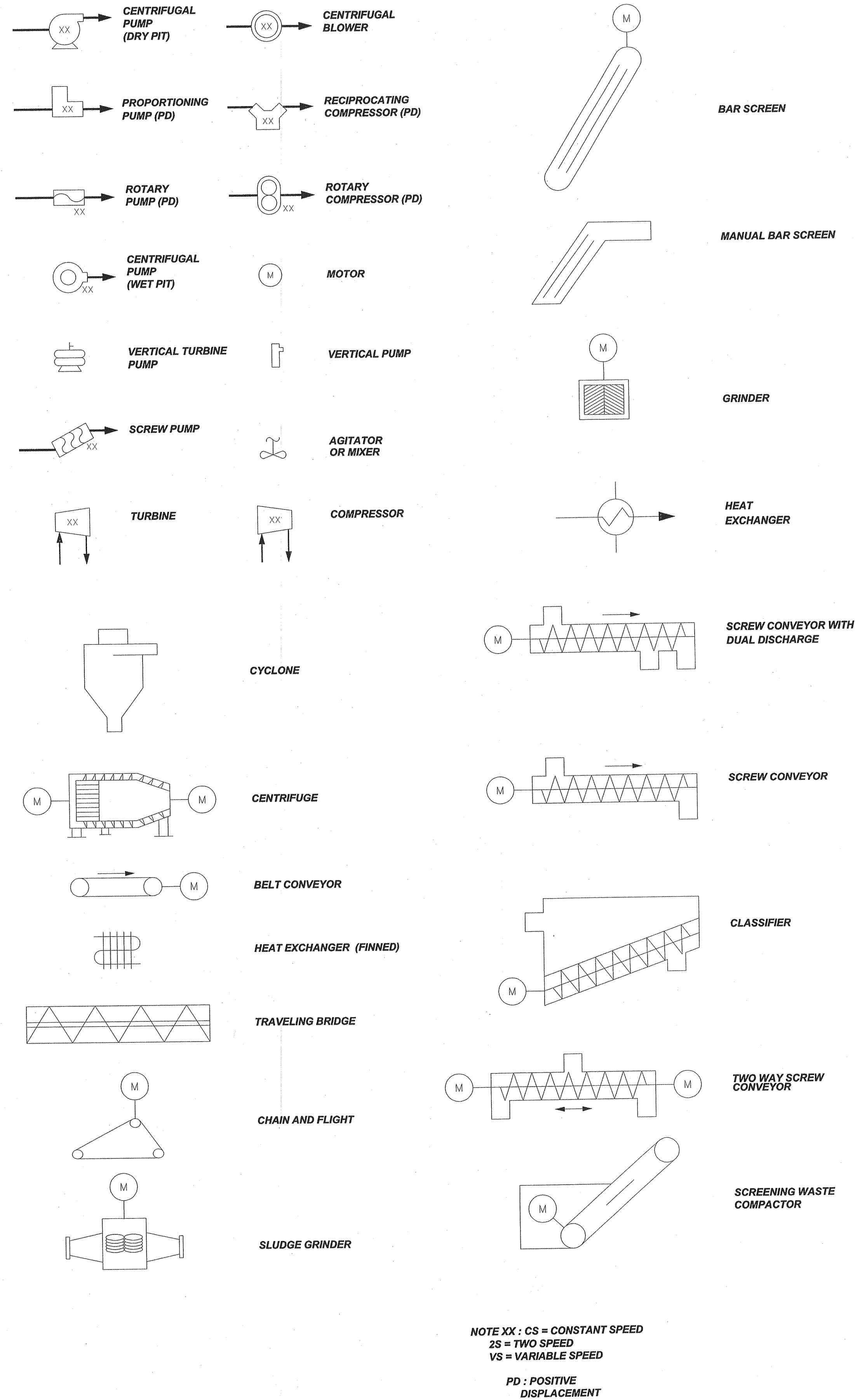
LEGEND (1)
PROCESS

CONSULTANT FILE No. E11-434
DATE 2012-05-09
SCALE Hor : N.T.S. Ver : N.T.S.
REF. No. RN 13-03
DWG No. P01
REV. 1

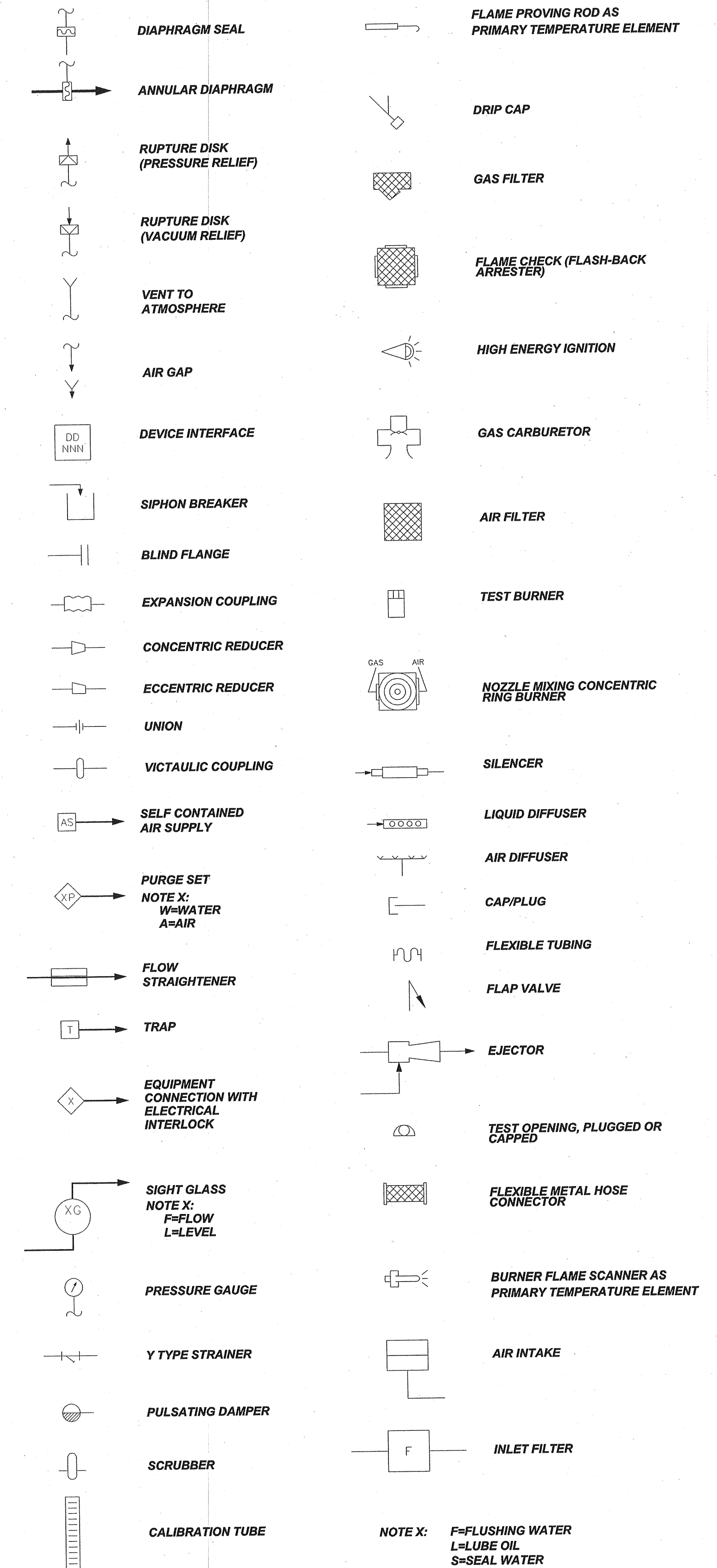
VALVE, REGULAOR & GATE SYMBOLS



EQUIPMENT SYMBOLS

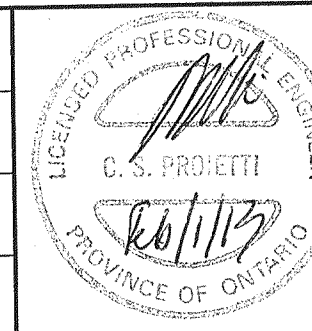


MISCELLANEOUS SYMBOLS



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NO.	REVISION	DATE	INIT.

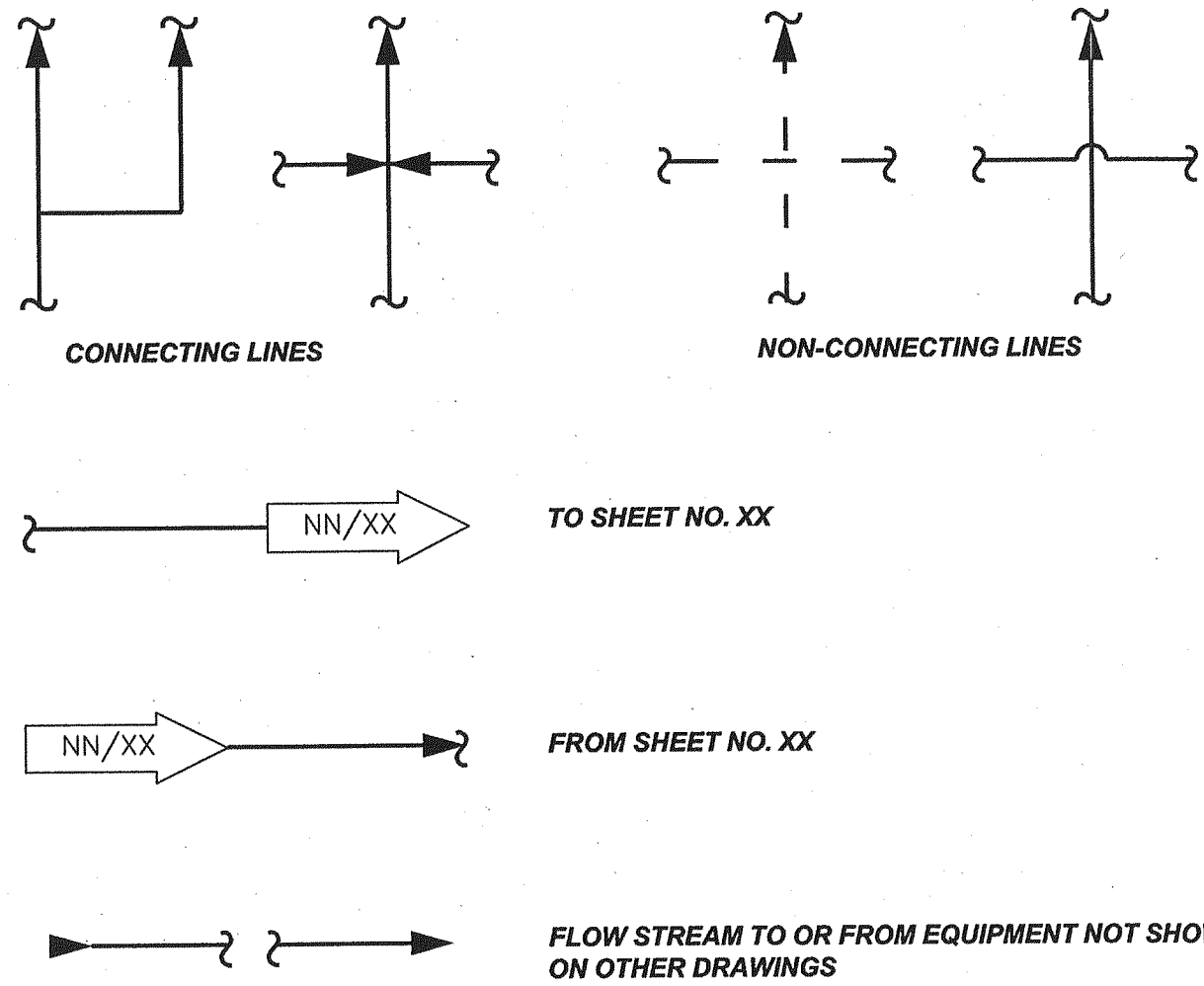
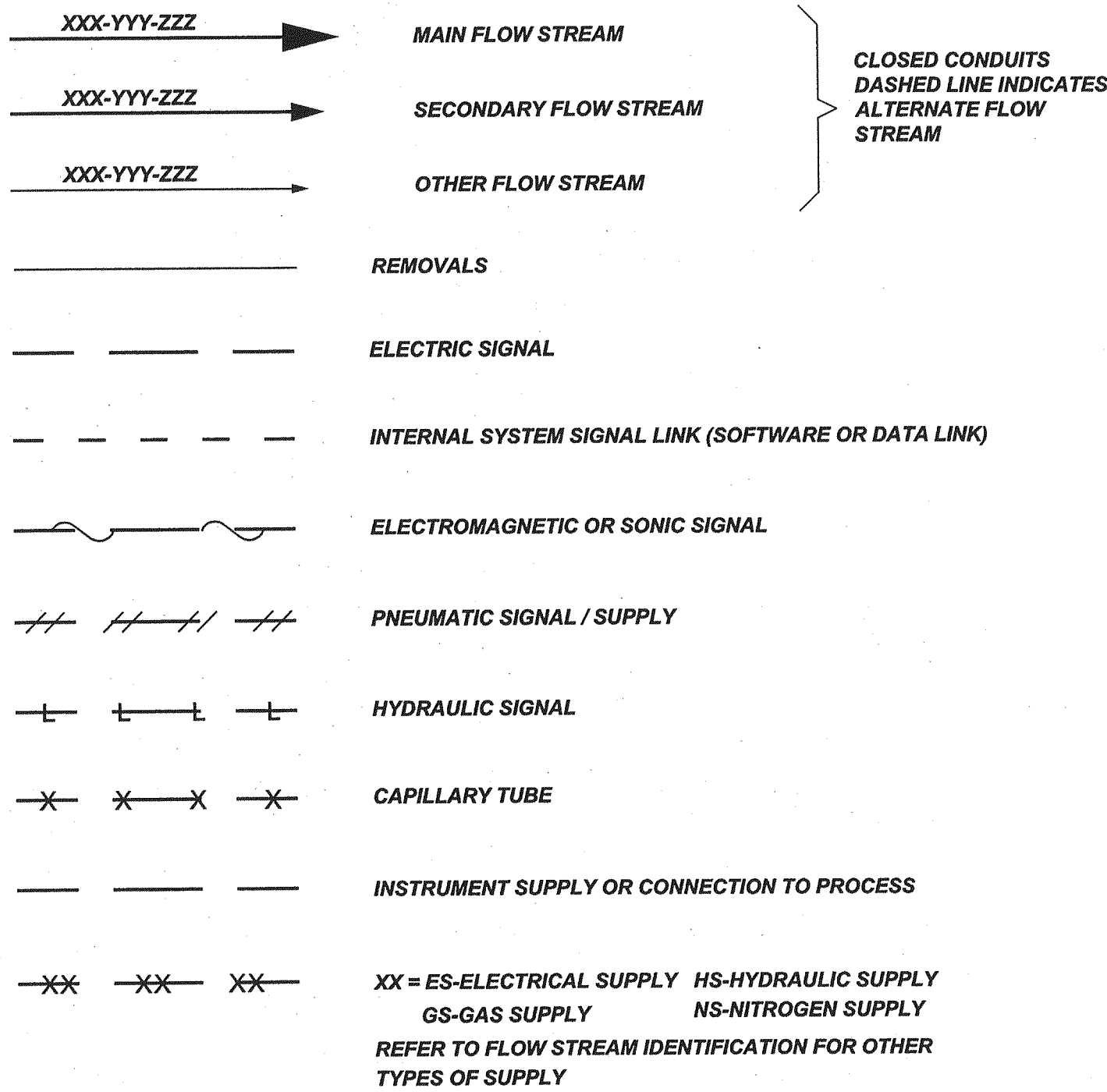
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C.S.P.



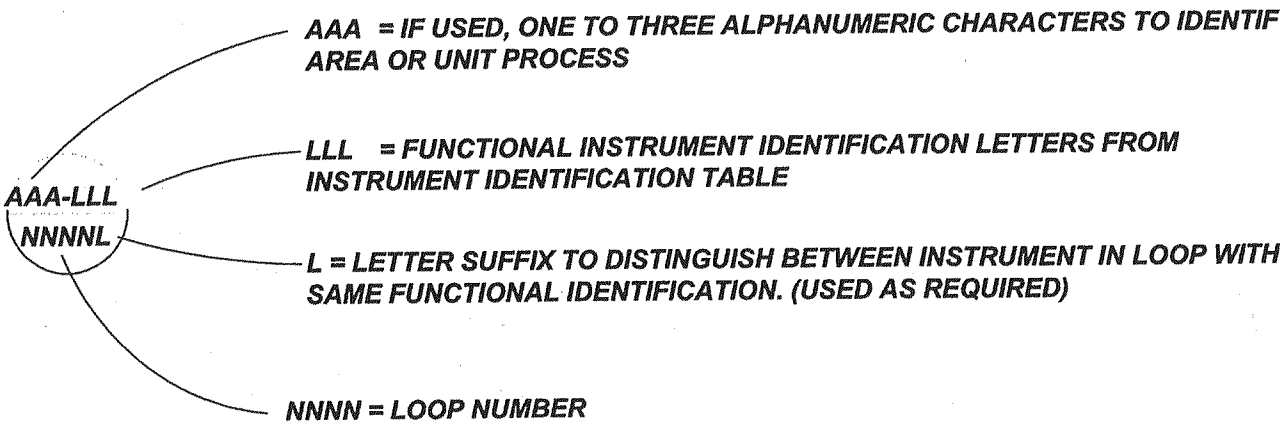
CONTRACT NO. 2013-T-103 (RN 13-03)
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PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
LEGEND (2)
PROCESS

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE Hor : N.T.S. Ver : N.T.S.	REF. No. RN 13-03
DWG No. P02	REV. 1

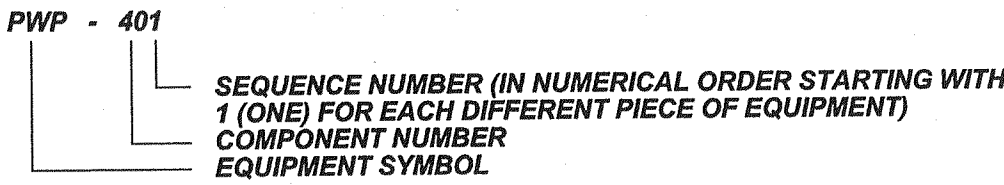
FLOW STREAM & INSTRUMENT LINE SYMBOLS



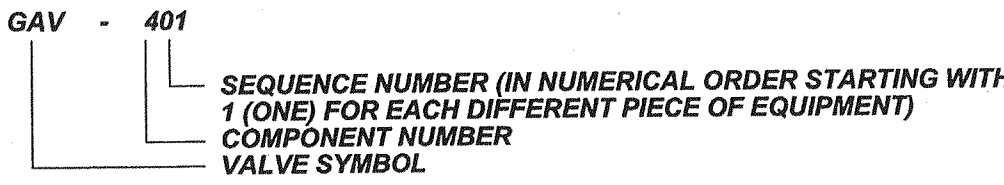
INSTRUMENT & FUNCTION TAGGING



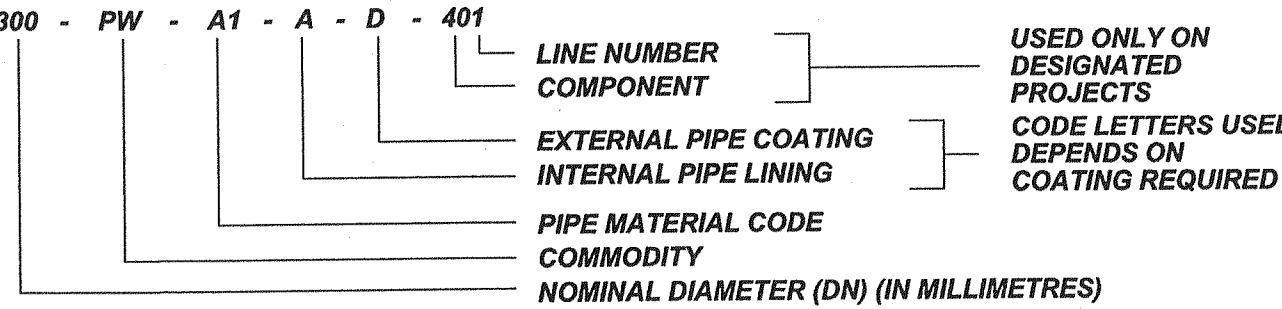
EQUIPMENT IDENTIFICATION



VALVE IDENTIFICATION



LINE IDENTIFICATION



GENERAL NOTES

- THIS IS A GENERAL P & ID SYMBOL SHEET. SOME SYMBOLS OR NOTATIONS MAY NOT BE USED ON THIS PROJECT.
- MOTOR CONTROL (MC) & VARIABLE SPEED DRIVE (VSD) PANELS ARE SHOWN WITH FACE OF PANEL MOUNTED INSTRUMENTS & EXTERNAL INTERFACE SIGNALS ONLY.
- A CONTROL PANEL (CP) PACKAGED WITH MECHANICAL EQUIPMENT OR A SYSTEM IS SHOWN WITH FACE OF PANEL MOUNTED INSTRUMENTS & EXTERNAL INTERFACE SIGNALS SIMILAR TO MC & VSD PANELS.
- CONTROL PANELS (CP) OTHER THAN THOSE PREVIOUSLY DESCRIBED ARE SHOWN WITH FACE & INTERIOR OF PANEL MOUNTED INSTRUMENTS.
- SEE ELECTRICAL DRAWINGS FOR MC & VSD LOCATIONS WITHIN THE MCC.
- EXISTING PIPING, EQUIPMENT & INSTRUMENTS ARE SHOWN LIGHT-LINED, SCREENED OR DOTTED.

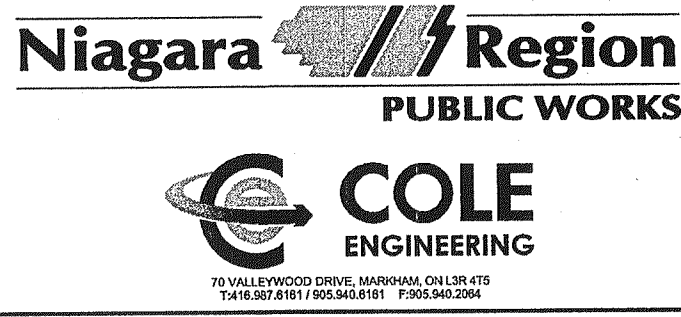
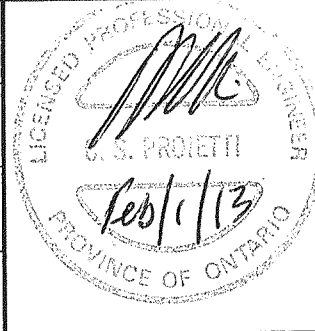
(AB-1C) EXISTING TAG NUMBERS

ABC-1234 NEW TAG NUMBERS

XXXXXX ITEMS TO BE REMOVED AND DISCONNECTED

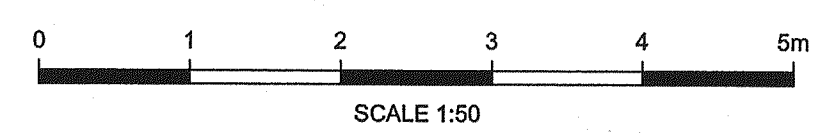
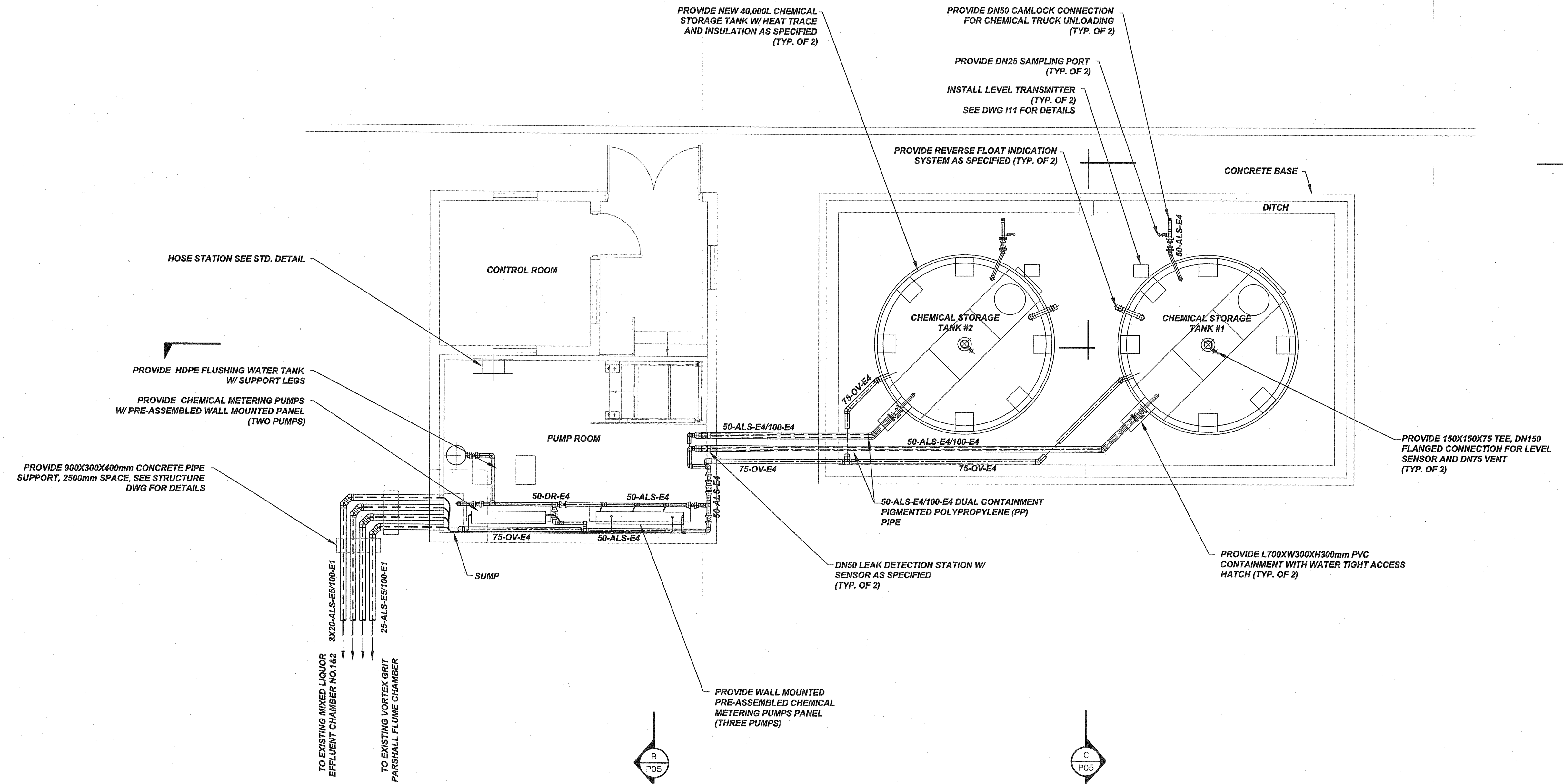
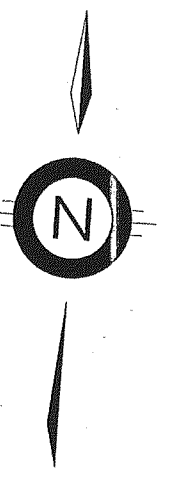
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

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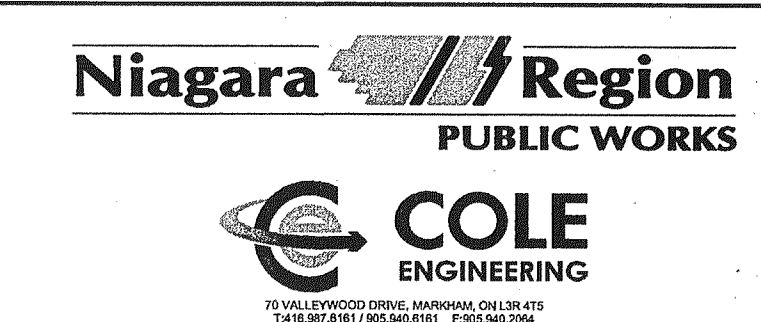
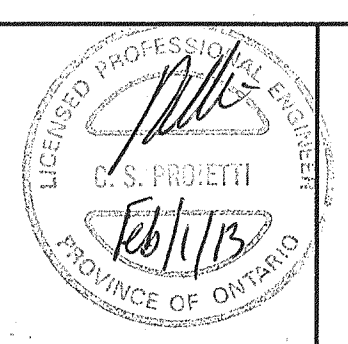
CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
LEGEND (3)
PROCESS

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE Hor : N.T.S. Ver : N.T.S.	REF. No. RN 13-03
DWG No. P03	REV. 1



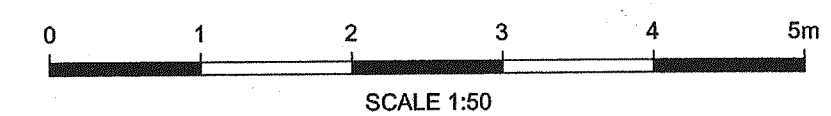
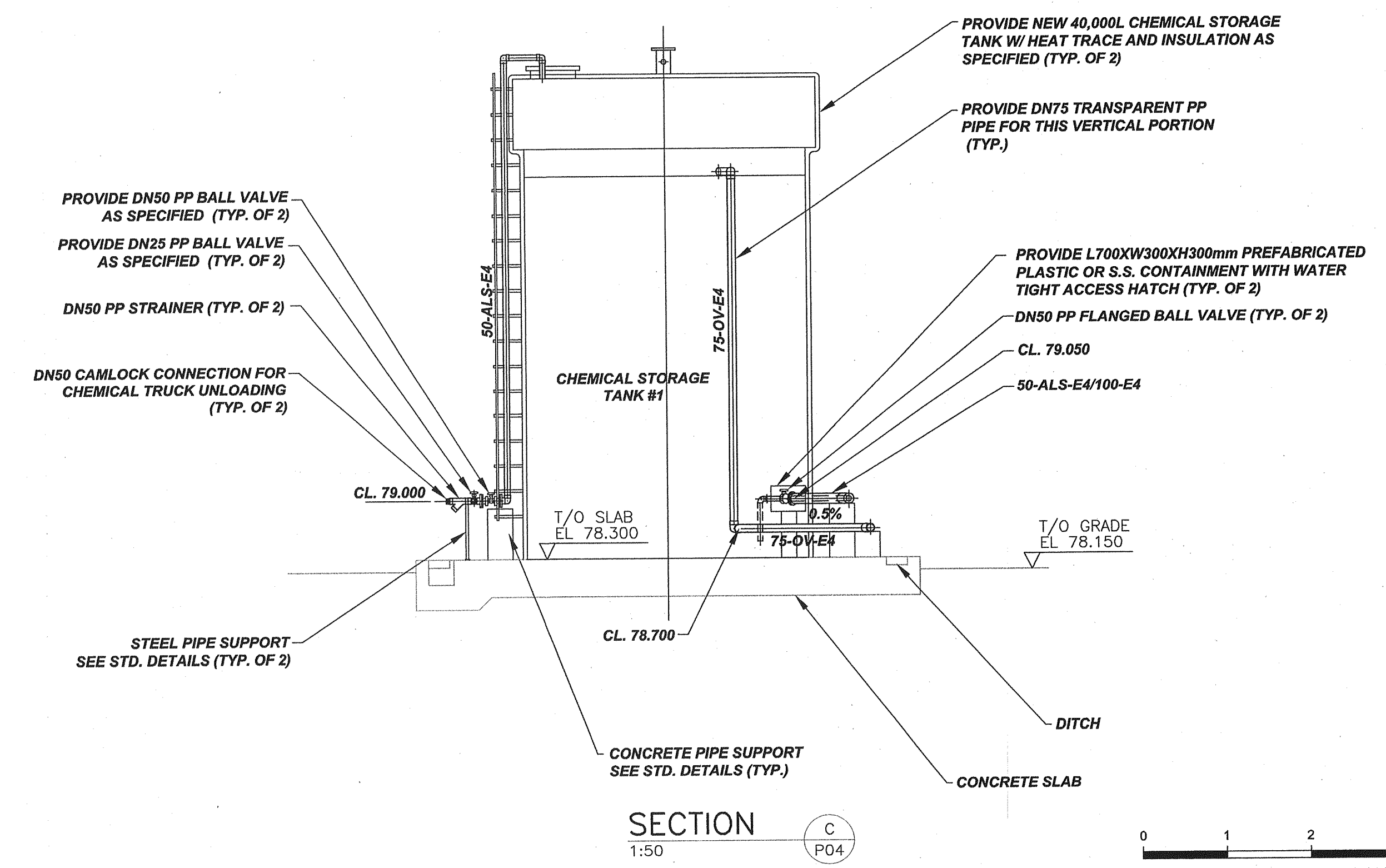
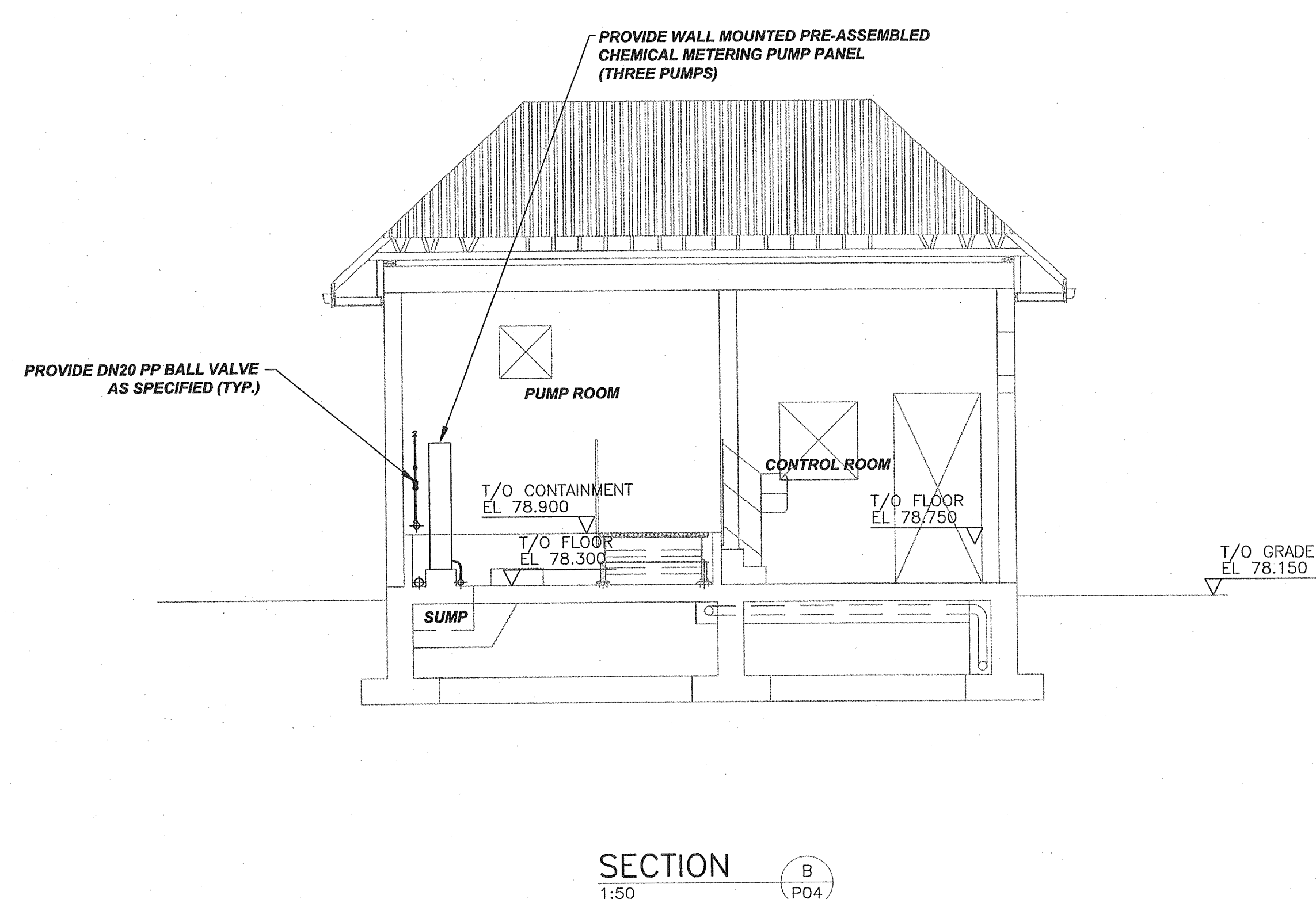
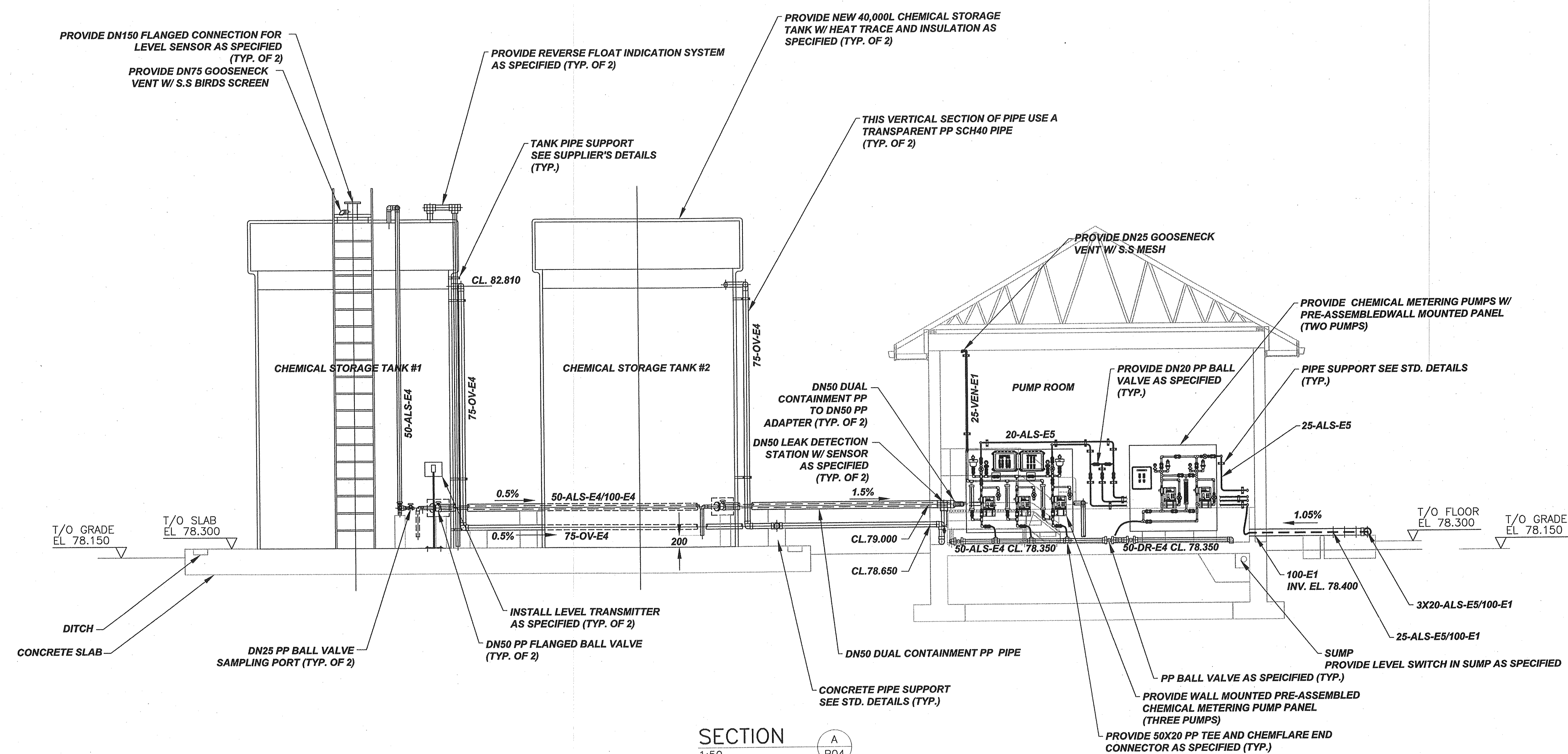
NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

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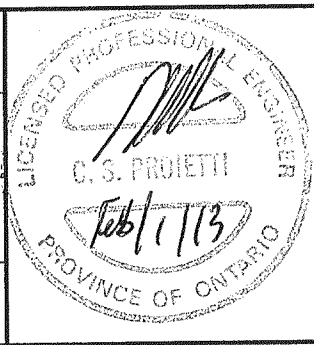
CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
PLAN
PROCESS

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE Hor : 1:50 Ver : 1:50	REF. No. RN 13-03
DWG. No. P04	REV. 1



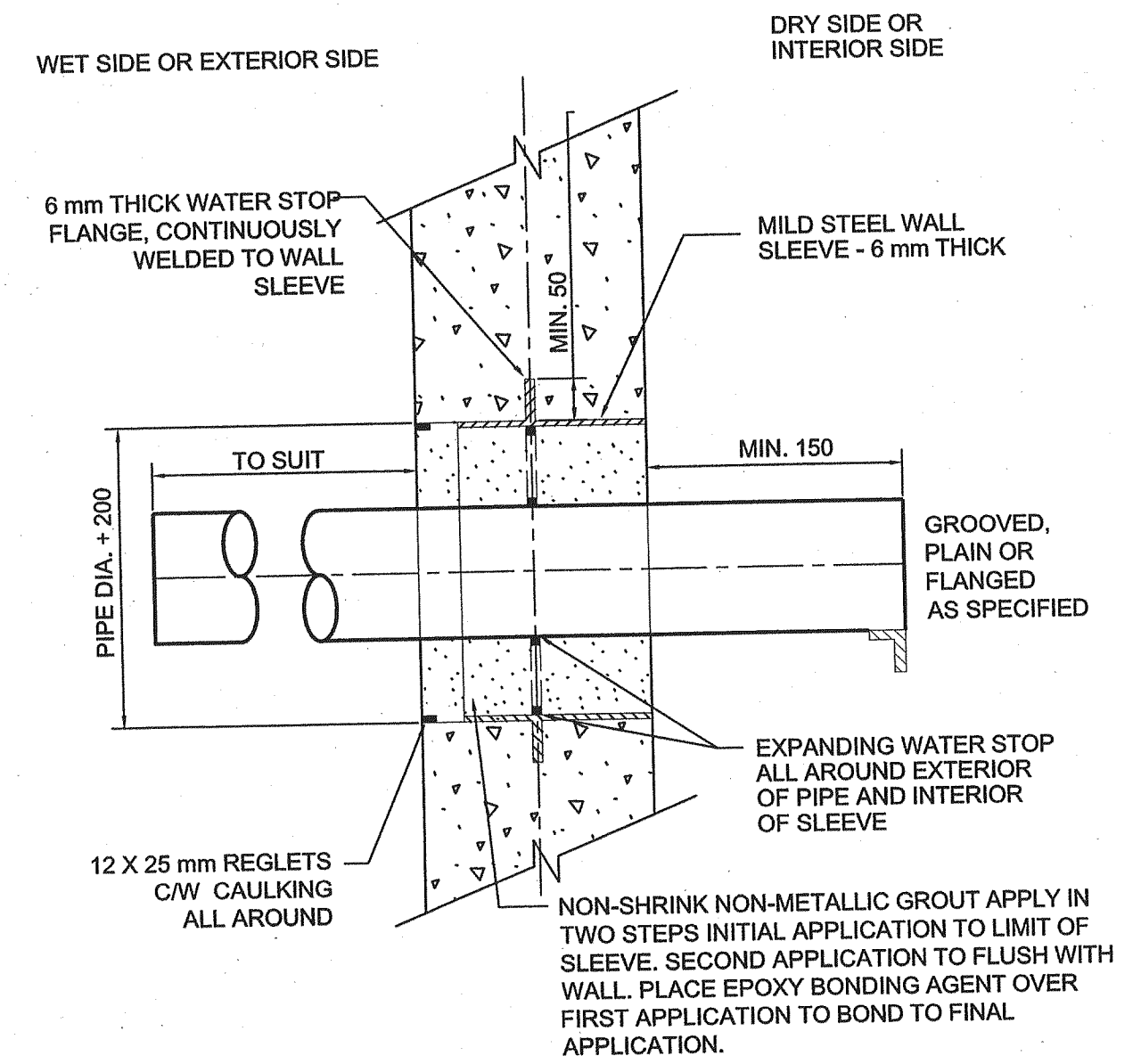
NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

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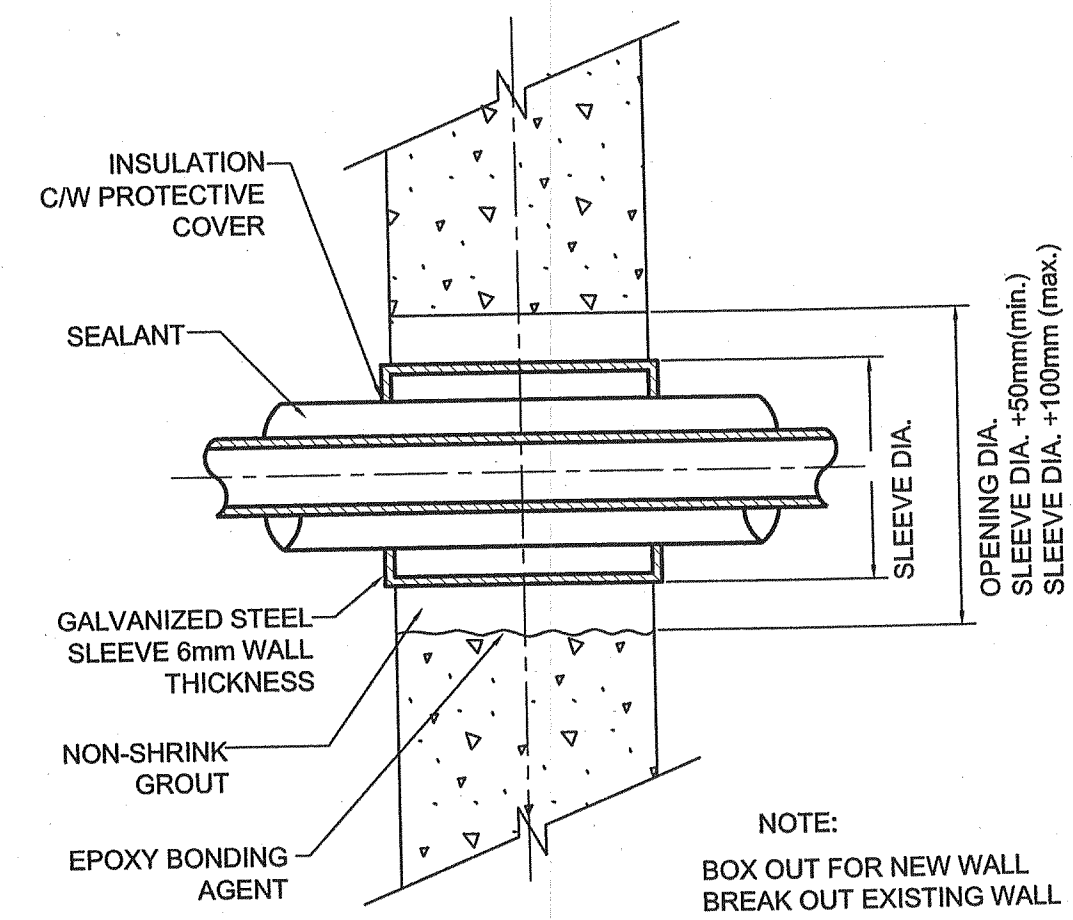
CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
SECTIONS
PROCESS

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE Hor : 1:50 Ver : 1:50	REF. No. RN 13-03
DWG No. P05	REV. 1



- APPLICATION NOTES**
1. CONCRETE WALL
 2. DUCTILE IRON, PVC PIPE.
 3. CONDITION
 - a) WET TO DRY
 - b) WET TO WET
 - c) INTERIOR TO EXTERIOR
 4. NO TRANSVERSE MOVEMENT ALLOWED
 5. LIQUID SIDE MUST PASS LEAKAGE TEST TO WHICH STRUCTURE IS SUBJECTED.
 6. SAME DETAIL FOR VERTICAL OR HORIZONTAL WALL.

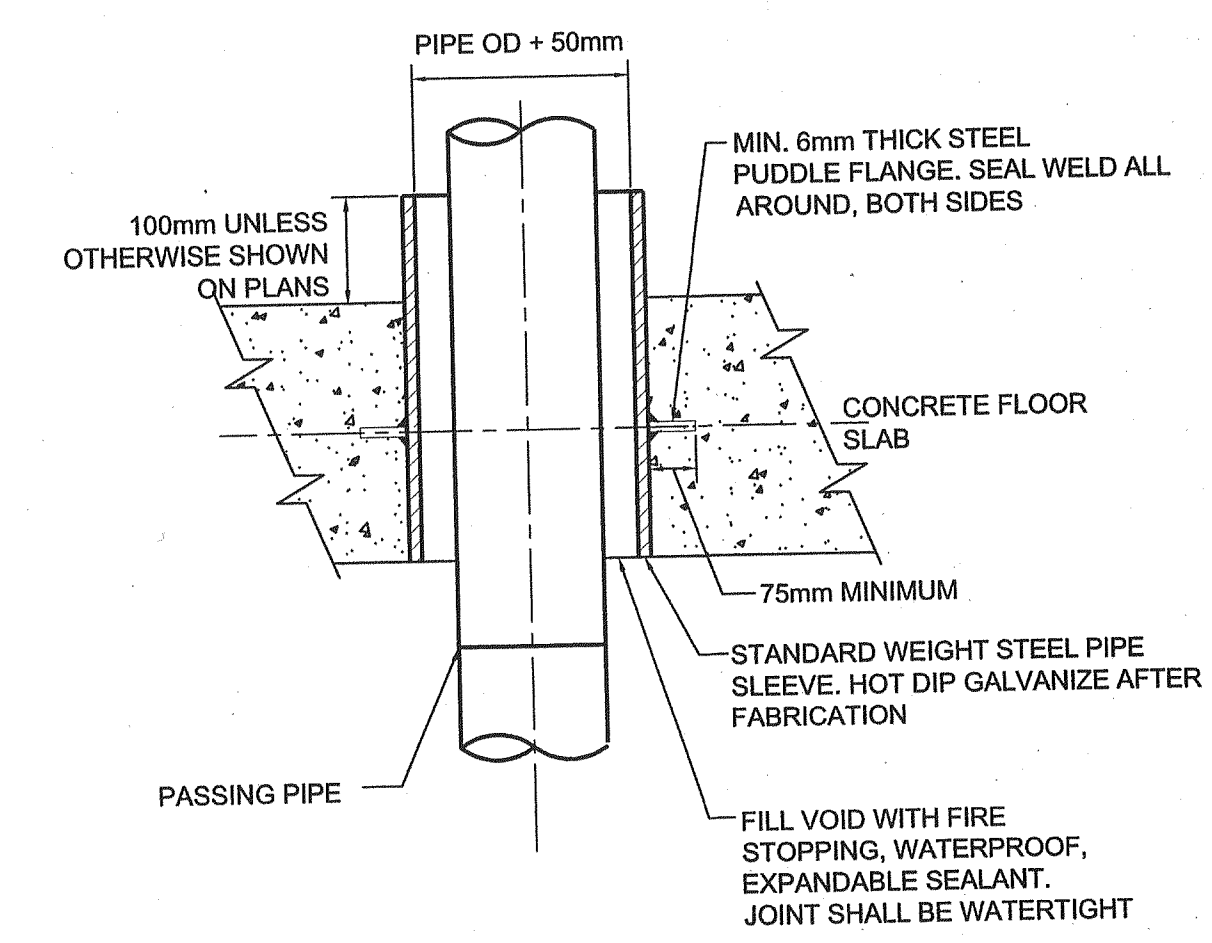
STD 1 WALL PENETRATION TYPE 2



NOMINAL PIPE I.D.	INSULATION THICKNESS	DIA. WALL SLEEVE
32	25	100
38	25	125
50	25	125
65	25	150
75	25	150
100	25	200
150	25	250
200	25	300

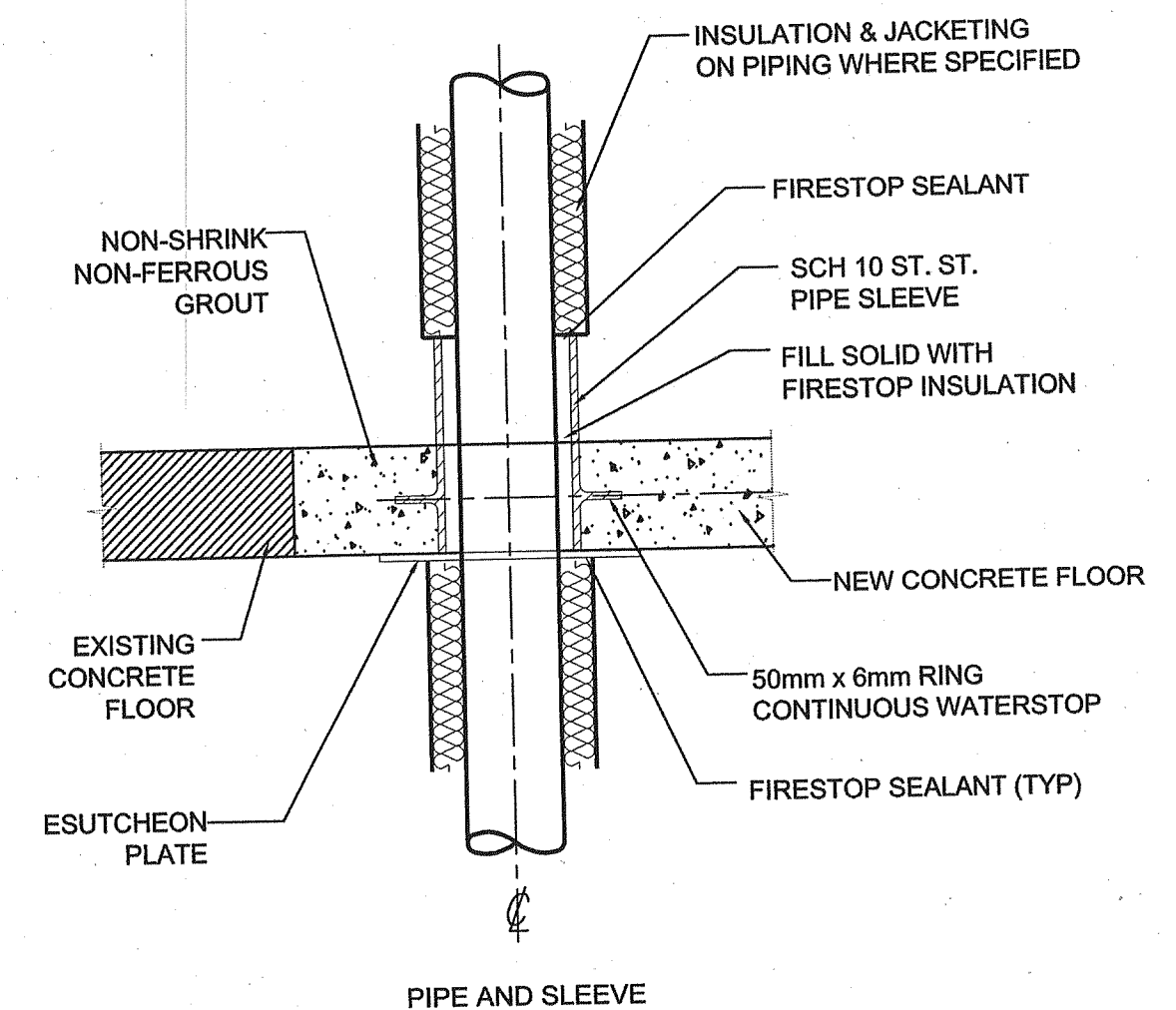
- APPLICATION NOTES**
1. CONCRETE OR MASONRY WALL (NEW OR EXISTING)
 2. INSULATED PIPE
 3. CONDITION
 - a) DRY TO DRY

STD 2 WALL PENETRATION TYPE 5

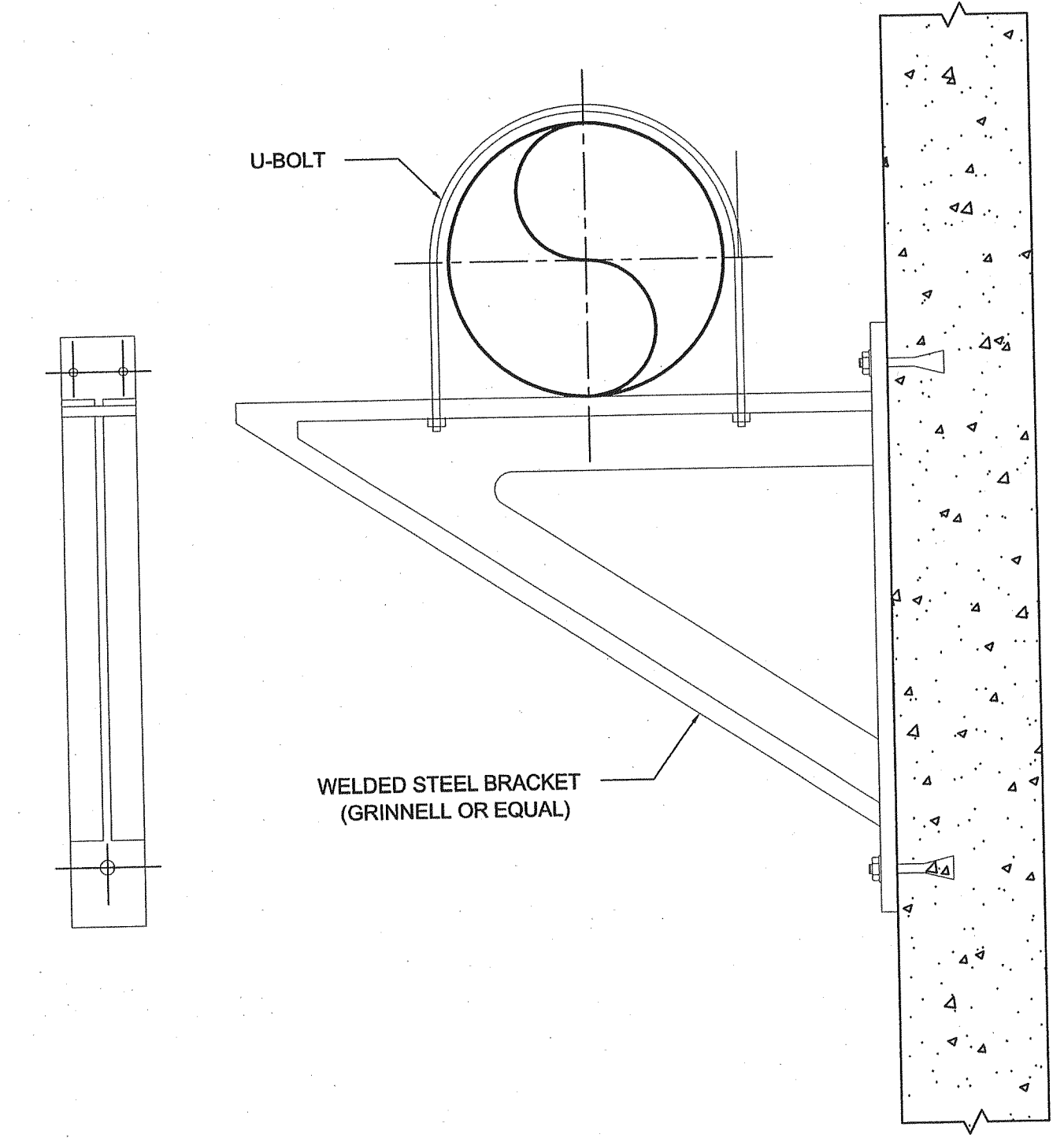


- NOTE:**
- COAT FLOOR SLEEVE WITH SPECIFIED PAINT SYSTEM BEFORE CONCRETE PLACEMENT

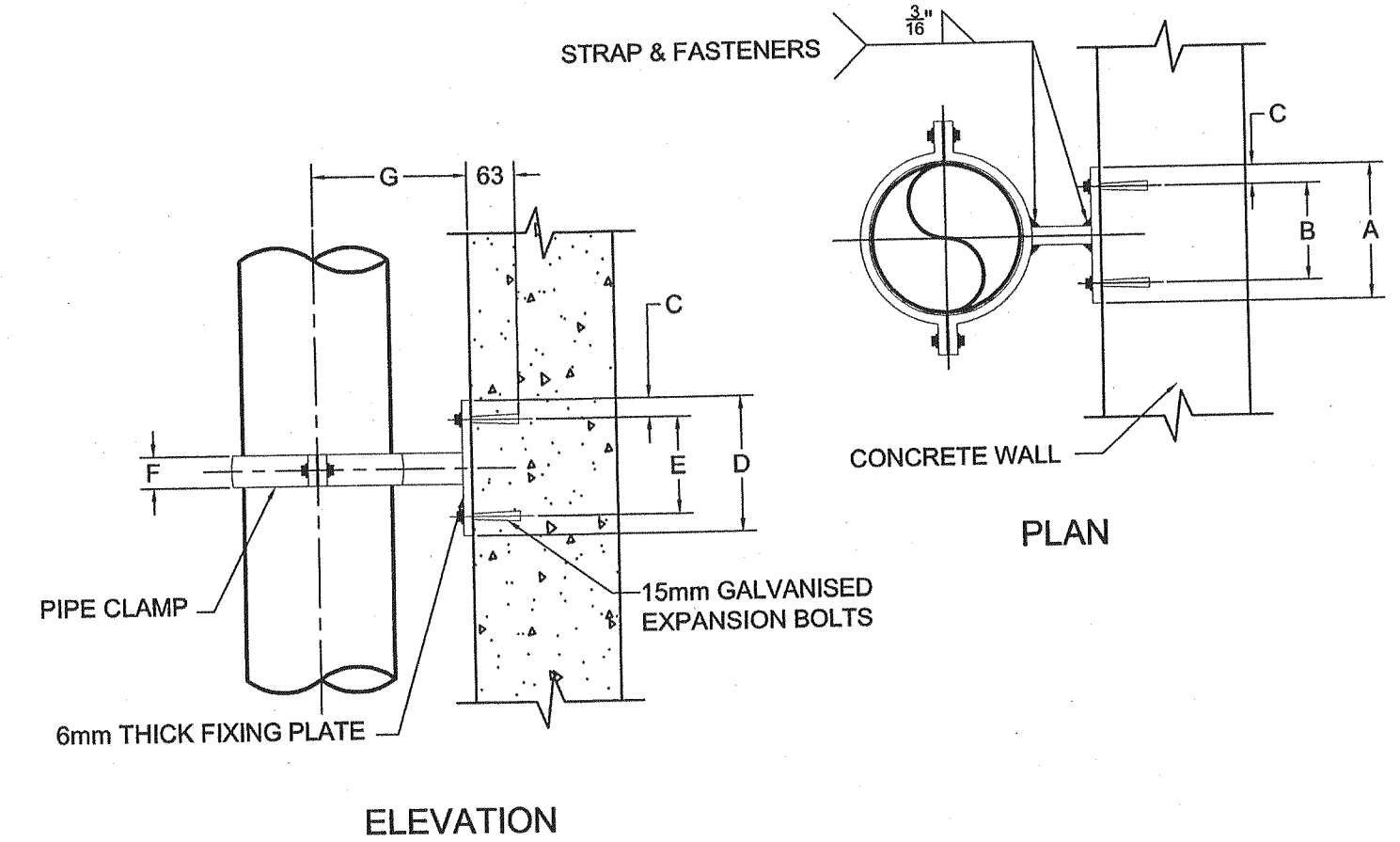
STD 3 PIPE SLEEVE THROUGH CONCRETE FLOOR



STD 4 PIPE SLEEVE THROUGH CONCRETE FLOOR



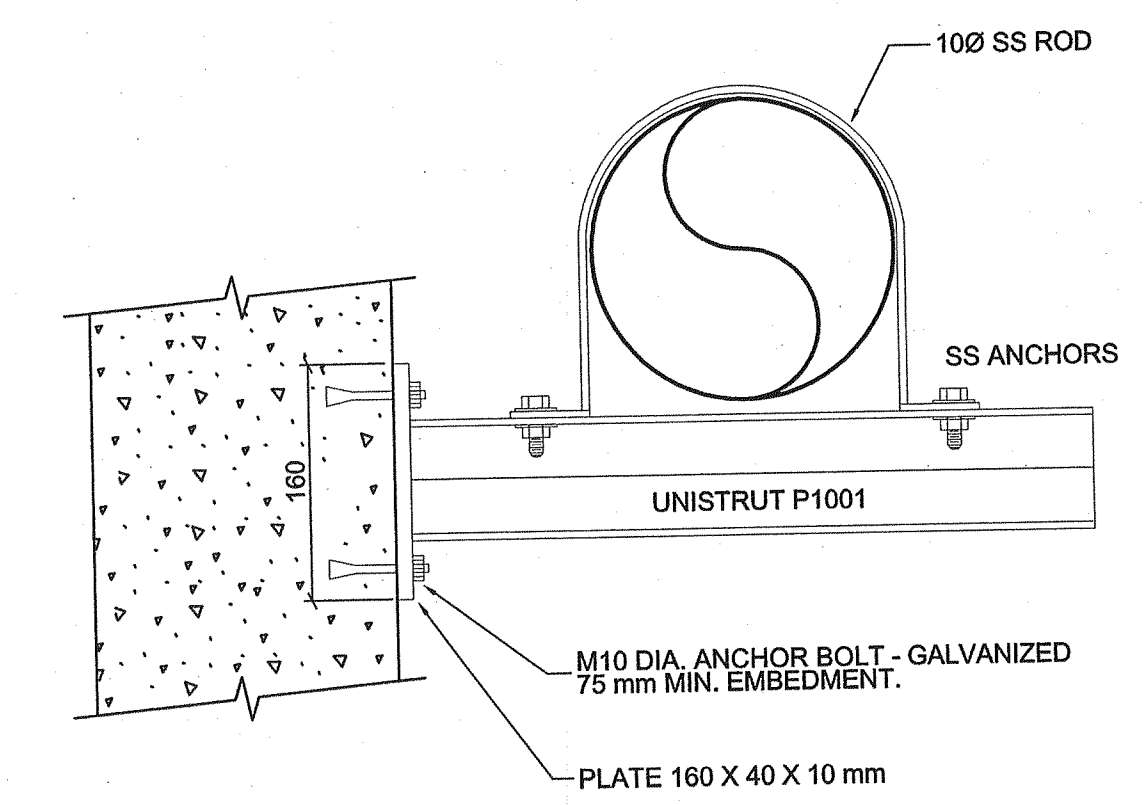
STD 5 WALL MOUNTED PIPE SUPPORT



- NOTES**
1. PIPES SUBJECT TO THERMAL EXPANSION OR SHOCK LOADING WILL OT UTILIZE THIS SUPPORT
 2. FOR LOCATION & SPACING OF SUPPORTS SEE DRAWINGS
 3. FABRICATION AND PAINTING OR GALVANISING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS

PIPE DIAMETER (mm)	A	B	C	D	E	F	G
50	50	XX	25	125	75	25	90
100	125	75	25	125	75	30	115
150	175	125	25	175	125	35	140

STD 6 VERTICAL PIPE SUPPORT WALL MOUNTED

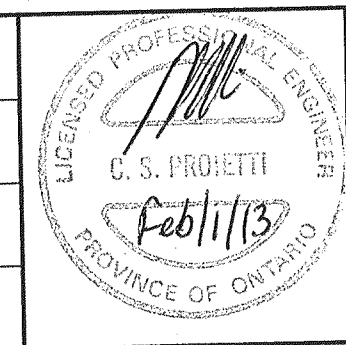


MAXIMUM LOAD OF BEAM LOADED @ CENTER (kg)	LENGTH OF SUPPORT L (mm)
440	760
740	450
1120	300

STD 7 TYPE 1 WALL MOUNTED PIPE SUPPORT

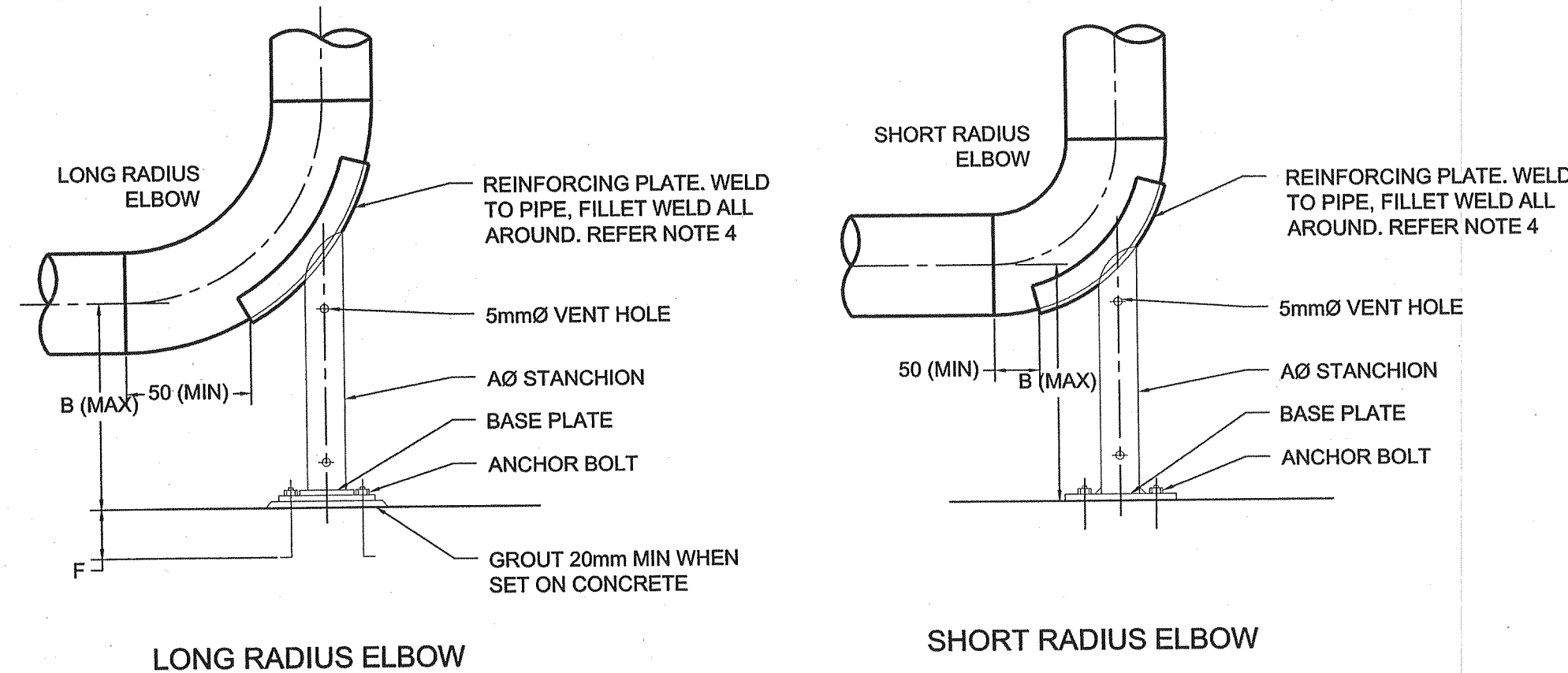
NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

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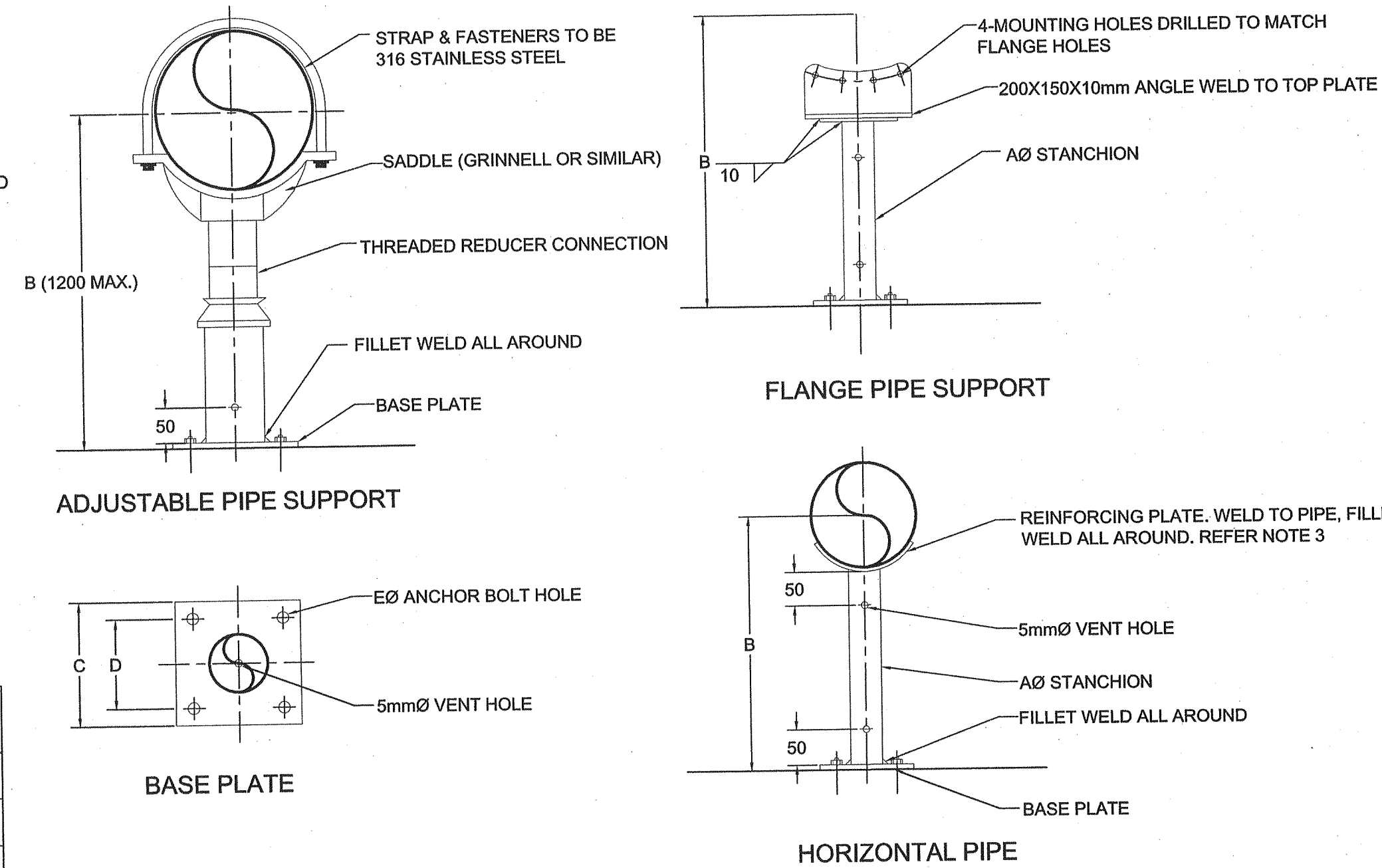


CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT IN THE CITY OF ST. CATHARINES
MISCELLANEOUS DETAILS (1)
PROCESS

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE Hor : N.T.S. Ver : N.T.S.	REF. No. RN 13-03
DWG No. P07	REV. 1



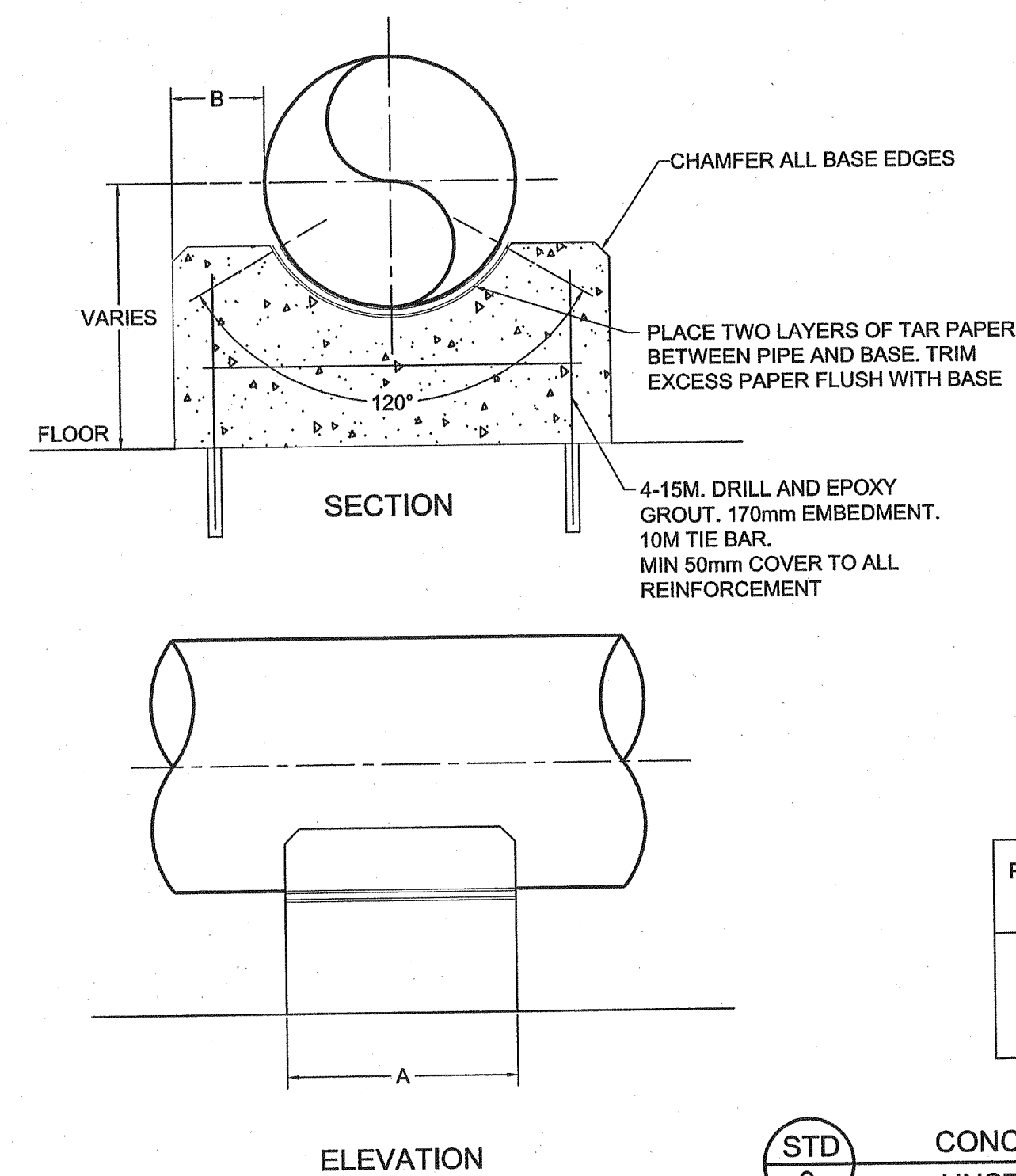
PIPE DIAMETER (mm)	50	65	75	100	125	150	200	250	300	350	400	450	500	600	750	900	1050	1200
A	40	50	65	75	100	100	150	150	200	200	200	250	250	300	300	400	400	400
B	1200	1200	1200	1500	2000	2000	2500	2500	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
C	150	150	150	200	200	200	250	250	300	300	300	400	400	500	500	600	600	600
D	115	115	115	150	150	150	200	200	240	240	240	300	300	380	380	480	480	480
PLATE THICKNESS	6	6	6	6	10	10	10	10	13	13	13	19	19	19	25	25	25	25
E DIA/NO. HOLES	15/2	15/2	15/2	15/4	15/4	15/4	20/4	20/4	20/4	20/4	20/4	25/4	25/4	25/4	25/4	25/4	25/4	25/4
F/BOLT DIA	100/M12 GALVANISED			100/M16 GALVANISED			150/M20 GALVANISED											



NOTES

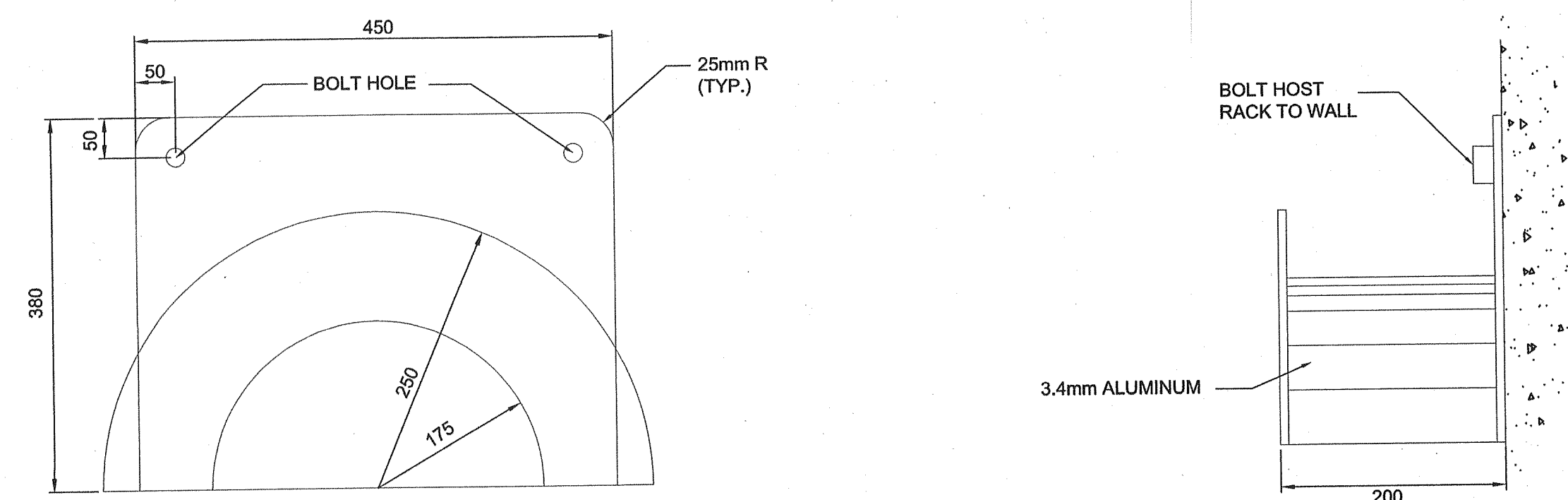
1. STANCHION MATERIAL SCH 80 PIPE FOR 50 TO 100 DIA, ALL LARGER PIPE DIA'S USE SCH 40 OR AS PER SPECIFICATIONS
2. BASE PLATE TO BE CARBON STEEL
3. REINFORCING PLATE TO BE CUT FROM A SECTION OF PIPE, LENGTH EQUAL TO WIDTH (WIDTH DETERMINED BY 120° ANGLE). REQUIRED ON ALL PIPES 500 DIA OR LARGER.
4. REINFORCING PLATE TO BE SAME THICKNESS AS PIPE MATERIAL. WIDTH DETERMINED BY 120° ANGLE.
5. TOP VENT HOLE REQUIRED ONLY IF STANCHION IS 1500mm OR LONGER. PLUG WELD VENT HOLES AFTER INSTALLATION OF STANCHION IS TO BE SUBMERGED IN WATER.
6. SHOP PRIME WITH 2 COATS OF RED OXIDE OR GALVANISE AS PER SPECIFICATION. TOUCH UP FIELD WELDS WITH RED OXIDE OR GALVICON.

STD 8 PIPE SUPPORTS



PIPE DIAMETER (mm)	100 to 150	200 to 250	300 to 400	450 to 600	750 & larger
A	150	200	250	300	400
B	75	100	125	150	150

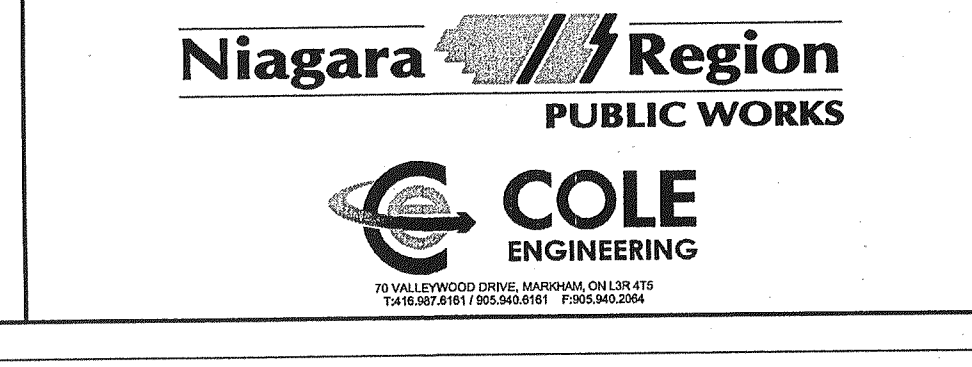
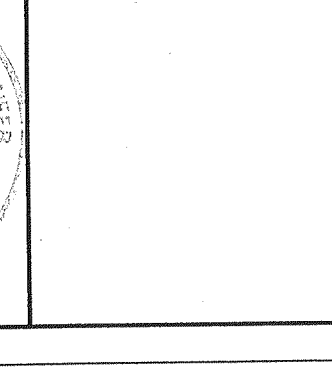
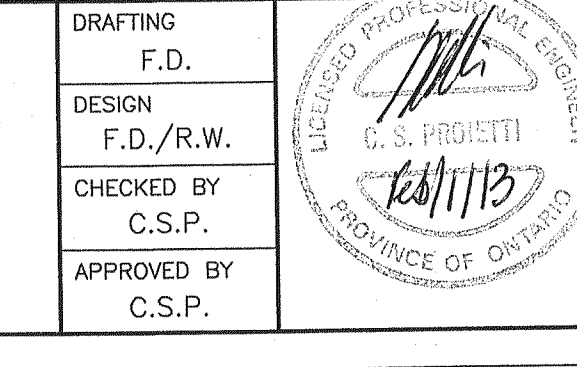
STD 9 CONCRETE PIPE SUPPORT UNSTRAPPED (UP TO 500Ø)



STD 10

NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

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CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
MISCELLANEOUS DETAILS (2)
PROCESS

CONSULTANT FILE No. E11-434	DATE	2012-05-09
SCALE	Hor : N.T.S.	Ver : N.T.S.
REF. No.	RN 13-03	
DWG No.	P08	REV.
		1

DAMPER AND LOUVER SCHEDULE											
DAMPER TAG	LOCATION	CAPACITY (m³/h)	SERVICE	SIZE (WxH)	DAMPER TYPE	LOUVER TAG	LOUVER MANUF.	TYPE	DEPTH (mm)	MODEL	REMARKS
DMP-01	PUMP ROOM	510	EXHAUST	600x600	MD	LVR-01	VENTEX	DRAINABLE	150	2635	-LOUVER SHALL COME WITH BIRD SCREEN -PROVIDE ACTUATOR IN 120 V -DAMPER SHALL HAVE INSULATED BLADES
DMP-02	PUMP ROOM	510	INTAKE	1000X400	MD	LVR-02	VENTEX	DRAINABLE	150	2635	-LOUVER SHALL COME WITH BIRD SCREEN -PROVIDE ACTUATOR IN 120 V -DAMPER SHALL HAVE INSULATED BLADES
DMP-03	CONTROL ROOM	510	EXHAUST	500X500	MD	LVR-03	VENTEX	DRAINABLE	150	2635	-LOUVER SHALL COME WITH BIRD SCREEN -PROVIDE ACTUATOR IN 120 V -DAMPER SHALL HAVE INSULATED BLADES
DMP-04	CONTROL ROOM	510	INTAKE	500X500	MD	LVR-04	VENTEX	DRAINABLE	150	2635	-LOUVER SHALL COME WITH BIRD SCREEN -PROVIDE ACTUATOR IN 120 V -DAMPER SHALL HAVE INSULATED BLADES

NOTES:
1. LOUVERS ASSOCIATED WITH PUMP ROOM SHALL BE STAINLESS STEEL. DAMPERS SHALL BE FRP CONSTRUCTION.

FAN SCHEDULE										
TAG	MANUFACTURER	MODEL	LOCATION	FLOW RATE (M³/H)	STATIC PRESSURE (Pa)	MOTOR (KW)	MOTOR RPM	VOLTAGE	PHASE	REMARKS
EXF-01	MK. PLASTICS	AXPR-12	PUMP ROOM	510/170	62	0.372	1140	208	3	FAN TO COME COMPLETE WITH VFD AND TEMPERATURE SENSOR FOR VARIABLE SPEED OPERATION
EXF-02	TWIN CITY	TCPE-102A	CONTROL ROOM	680	100	0.372	1604	208	3	FAN TO COME COMPLETE WITH VFD AND DISCONNECT SWITCH

NOTE: ALL FANS SHALL COME COMPLETE WITH VFD'S.

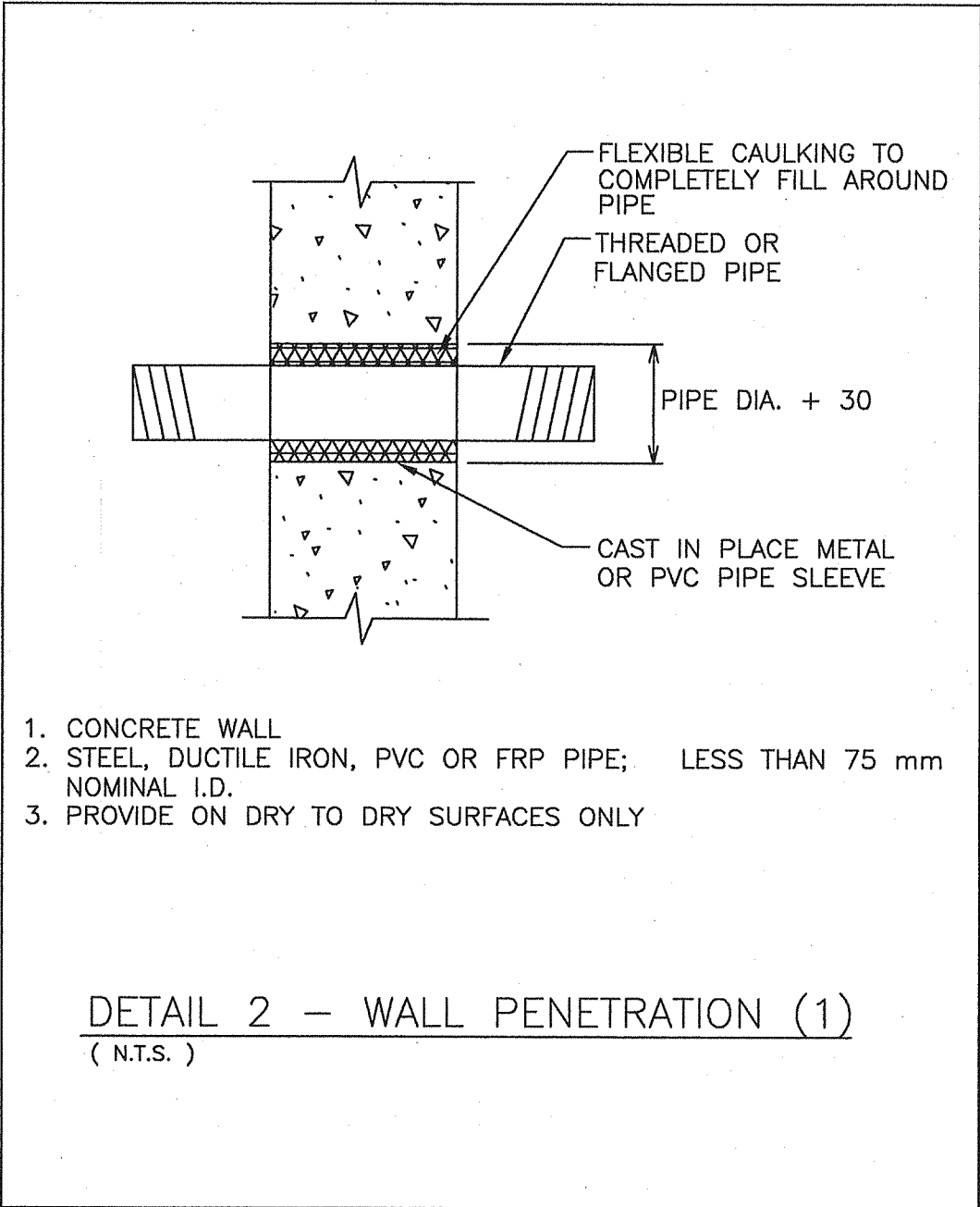
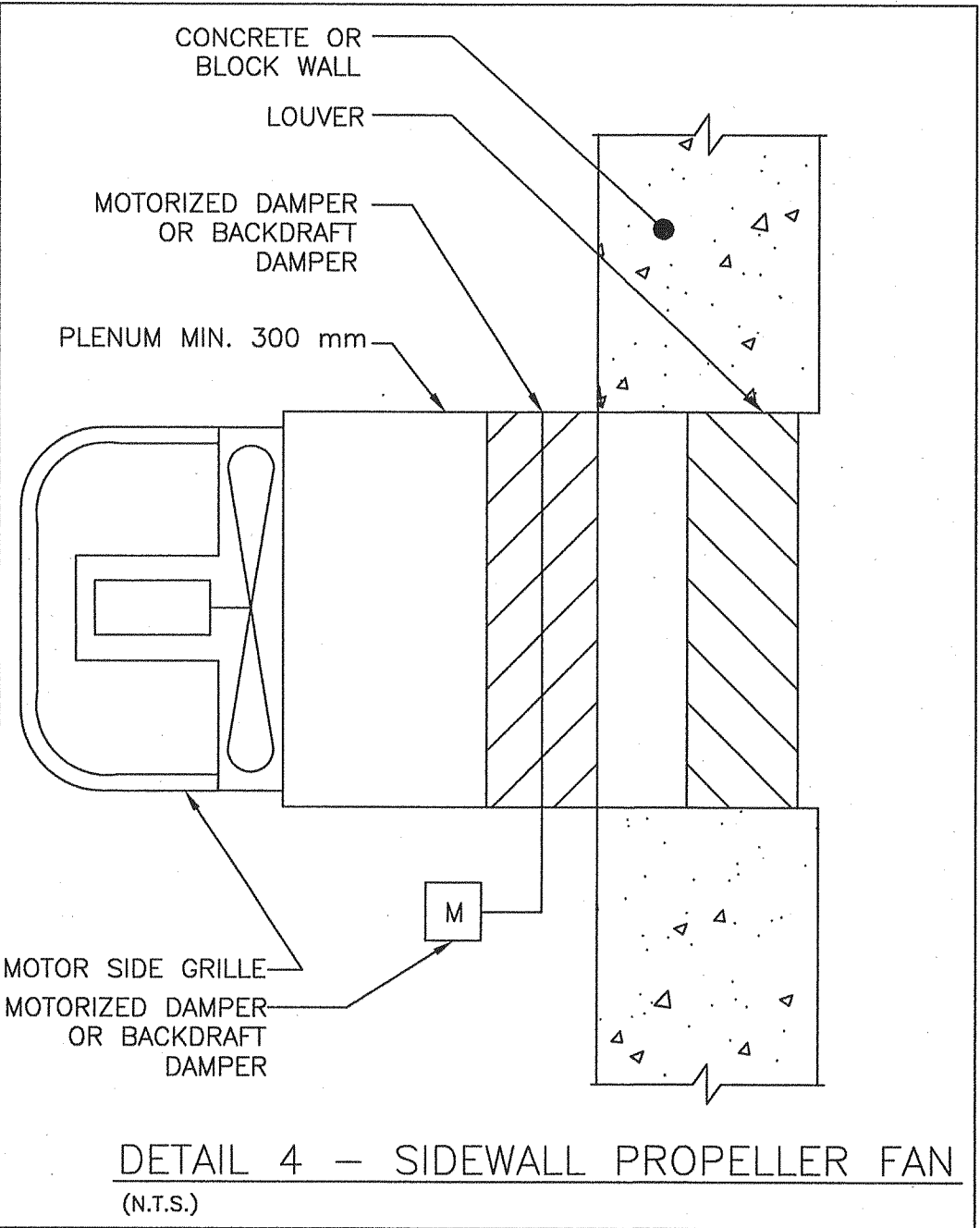
THERMOSTAT SCHEDULE						
SYMBOL	MANUFACTURER	MODEL	LOCATION	VOLTAGE	PHASE	REMARKS
①	JOHNSON CONTROLS	T26-LINE VOLTAGE	VARIOUS	120	1	THERMOSTAT SHALL BE PROVIDED WITH WALL BOX

UNIT HEATER SCHEDULE									
TAG	MANUFACTURER	MODEL	LOCATION	FLOW RATE (M³/H)	CAPACITY (W)	WEIGHT (KG)	VOLTAGE	PHASE	REMARKS
UHT-01	OUELLET	OWD05008	PUMP ROOM	1190	5,000	32	208	3	-C/W BUILT IN THERMOSTAT -C/W SWIVEL BRACKET FOR WALL MOUNTING
UHT-02	OUELLET	OWD05008	PUMP ROOM	1190	5,000	32	208	3	-C/W BUILT IN THERMOSTAT -C/W SWIVEL BRACKET FOR WALL MOUNTING
UHT-03	OUELLET	OAC02008	CONTROL ROOM	272	2,000	10.9	208	1	-C/W BUILT IN THERMOSTAT -UNIT TO BE RECESSED IN WALL
UHT-04	OUELLET	OAC04008	CONTROL ROOM	272	4,000	10.9	208	1	-C/W BUILT IN THERMOSTAT -UNIT TO BE RECESSED IN WALL

WATER HEATER SCHEDULE										
TAG	MANUFACTURER	MODEL	LOCATION	TANK CAPACITY	VOLTAGE	INPUT CAPACITY	FLA	PHASE	WEIGHT (KG)	REMARKS
HWT-01	RHEEM/RUUD	EG50-C-6	PUMP ROOM	190	208	6KW	17	3	122	-PROVIDE PIPING REDUCERS/INCREASERS AS REQUIRED

ABBREVIATIONS	
AHU	AIR HANDLING UNIT
UHT	UNIT HEATER
FRP	FIBER REINFORCED PLASTIC
GA	GALVANIZED STEEL
LVR	LOUVER
DMP	DAMPER
CW	COLD WATER
HW	HOT WATER
SAN	SANITARY
SS	SERVICE SINK
EWS	EMERGENCY EYEWASH/SHOWER
FD	FLOOR DRAIN
CO	CLEAN OUT
TSP	TRAP SEAL PRIMER

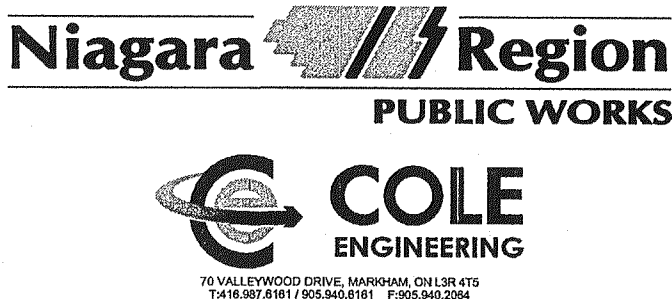
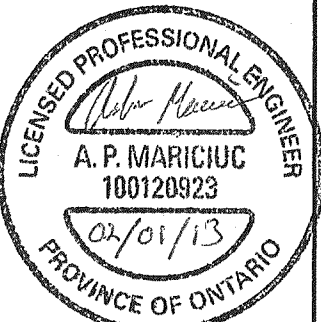
LEGENDS AND SYMBOLS	
	MOTORIZED DAMPER
	INSULATED DUCT
	DOMESTIC CW PIPE
	DOMESTIC HW PIPE
	SAN PIPE
	CLEAN OUT
	MANUAL VALVE
	CHECK VALVE
	UNION
	SPACE THERMOSTAT
	FIRE EXTINGUISHER
	TEMPERATURE SENSOR



1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
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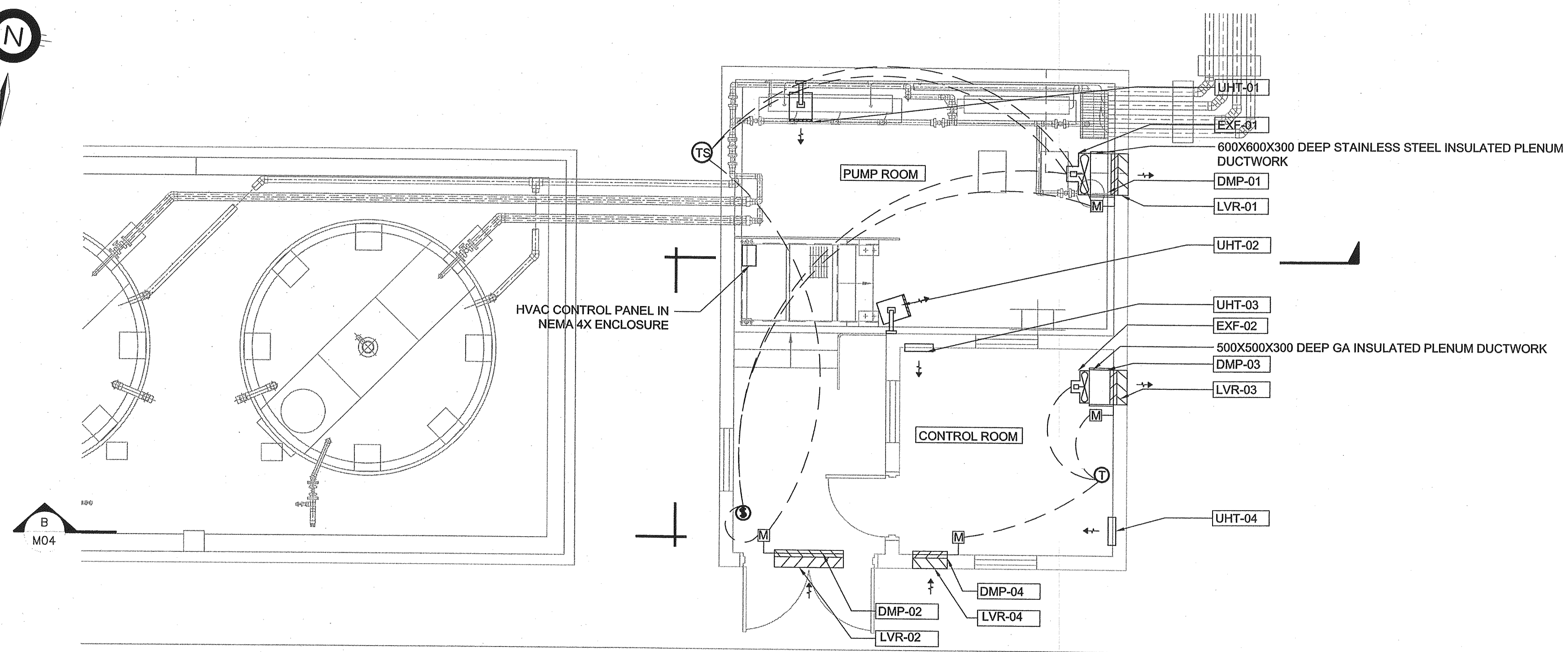
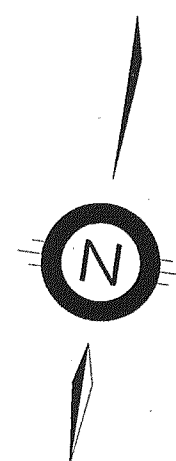
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C.S.P.
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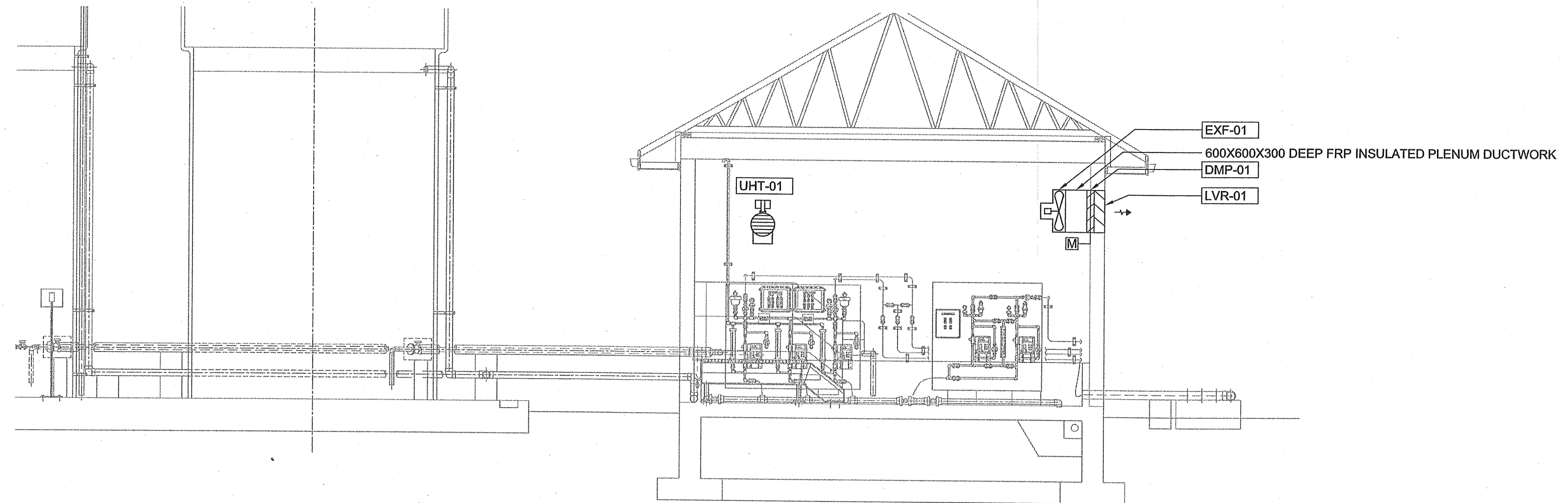


CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
LEGENDS & SCHEDULES
MECHANICAL

CONSULTANT FILE No. E11-434	REV.
DATE 2012-05-09	1
SCALE N.T.S.	
REF. No. RN 13-03	
DWG No. M01	



HVAC PLAN
1:50



SECTION
1:50

SEQUENCE OF OPERATION

PUMP ROOM

EXHAUST FAN (EXF-01), TEMPERATURE SENSOR (TS), ROOM THERMOSTAT (T) AND MOTORIZED DAMPERS (DMP-01 AND DMP-02)

1. EXF-01 SHALL BE INTERLOCKED WITH OUTSIDE TS, T, DMP-01 AND DMP-02 AND DESIGNED FOR CONTINUOUS OPERATION.
2. DURING SUMMER CONDITIONS, OUTSIDE TEMPERATURE GREATER THEN 13°C (ADJUSTABLE), EXF-01 SHALL EXHAUST 510 M³/H OF AIR FROM THE ROOM.
3. DURING WINTER CONDITIONS, OUTSIDE AIR TEMPERATURE LESS THEN 13°C (ADJUSTABLE), EXF-01 SHALL EXHAUST 170 M³/H OF AIR FROM THE ROOM.
5. CHANGEOVER FROM SUMMER TO WINTER CONDITIONS SHALL BE BY AUTOMATIC SWITCH OVER FROM THE HVAC CONTROL PANEL. A COMBINATION OF TIMING AND OUTSIDE TEMPERATURE SENSOR SHALL DETERMINE SWITCHOVER CONDITION.
6. ONCE EXF-01 IS TURNED OFF, BY MEANS OF A SWITCH (S), DMP-01 AND DMP-02 SHALL CLOSE.
7. ONCE EXF-01 IS TURNED ON, DMP-01 AND DMP-02 SHALL COMMENCE TO OPEN. ONCE DAMPERS ARE FULLY OPEN AS SENSED BY THEIR END SWITCH EXF-01 SHALL ENERGIZE AND CONTINUE ITS PREVIOUS OPERATION.

UNIT HEATERS (UHT-01, UHT-02)

1. UHT-01 AND UHT-02 SHALL COME COMPLETE WITH BUILT IN THERMOSTAT.
2. UPON A CALL FOR HEATING, SPACE TEMPERATURE LESS THEN 16°C (ADJUSTABLE) UHT-01 SHALL ENERGIZE RE-CIRCULATING HEATED AIR IN THE SPACE.

CONTROL ROOM

EXHAUST FAN (EXF-02), MOTORIZED DAMPERS (DMP-03, DMP-04) AND SPACE THERMOSTAT (T)

1. EXF-02 SHALL BE INTERLOCKED WITH DMP-03, DMP-04 AND (T).
2. UPON A CALL FOR HEATING, SPACE TEMPERATURE GREATER THEN 28°C (ADJUSTABLE), DMP-01 AND DMP-02 SHALL COMMENCE TO OPEN.
3. ONCE DAMPERS ARE FULLY OPEN AS SENSED BY THEIR END SWITCH, EXF-02 SHALL ENERGIZE EXHAUSTING AIR FROM THE SPACE.

UNIT HEATERS (UHT-03, UHT-04)

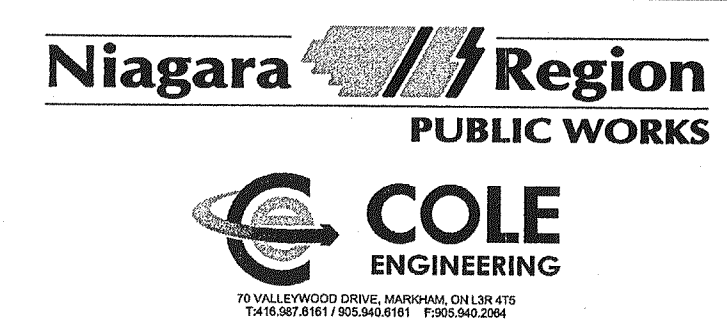
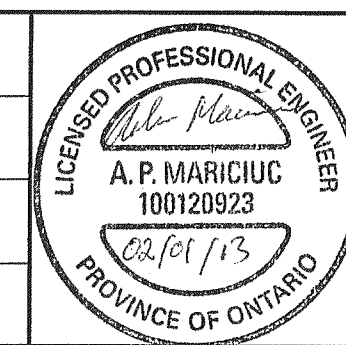
1. UHT-03 AND UHT-04 SHALL COME COMPLETE WITH BUILT IN THERMOSTAT.
2. UPON A CALL FOR HEATING, SPACE TEMPERATURE LESS THEN 16°C (ADJUSTABLE) UHT-01 SHALL ENERGIZE RE-CIRCULATING HEATED AIR IN THE SPACE.

NOTES:

1. ALL DUCTWORK SHALL BE CONSTRUCTED AND SUPPORTED IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS.
2. ALL UNIT HEATERS SHALL BE MOUNTED 2200 A.F.F. WITH LOUVER BLADES BLOWING AIR AT A 45° FROM THE HORIZONTAL.
3. UNIT HEATERS IN CONTROL ROOM SHALL BE RECESSED IN WALL.
4. BOTTOM OF LOUVERS LVR-01, LVR-02, LVR-03 AND LVR-04 SHALL BE AT 2400 A.F.F.
5. PROVIDE 300X300 HINGED AND LOCKABLE ACCESS DOORS IN PLENUMS. ENSURE ACCESS DOORS ARE AIR TIGHT.
6. CO-ORDINATE INSTALLATION OF UNIT HEATER WITH INDOOR EMERGENCY EYEWASH/SHOWER UNIT.

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CHECKED BY
C.S.P.
APPROVED BY
C.S.P.



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
HVAC PLAN AND SECTION
MECHANICAL

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE AS SHOWN	
REF. No. RN 13-03	
DWG No. M02	REV. 1



HW PIPE TO RUN DOWN TO DRENCH SHOWER AND EYEWASH UNITS. PROVIDE HEAT TRACING AND INSULATION FOR ALL EXTERIOR LINES

THERMOSTATIC MIXING VALVE TO BE INSIDE A NEMA 4X ENCLOSURE. PROVIDE ACCESS TO MIXING VALVE BY MEANS OF A HINGED AND LOCKABLE ACCESS DOOR

TEMPERED WATER CONNECTION TO EMERGENCY EYEWASH AND SHOWER UNITS

1000 DRAIN PIPE FROM STORM WATER COLLECTION TO COME WITH TRAP. SEE CIVIL DRAWINGS FOR CONTINUATION

320 CW LINE. SEE CIVIL DRAWINGS FOR CONTINUATION
CW LINE TO PENETRATE FLOOR SLAB INTO BUILDING AND RUN ALONG WALL

HOT AND COLD WATER BRANCH PIPE TO RUN DOWN FROM MAIN AND ATTACHED TO WALL MOUNTED FIXTURE. REFER TO SCHEMATIC FOR MORE DETAIL

SS

HOT AND COLD WATER CONNECTION FOR SERVICE SINK (SS)

CW LINE TO DROP DOWN AND CONNECT TO HWT-01

HWT-01

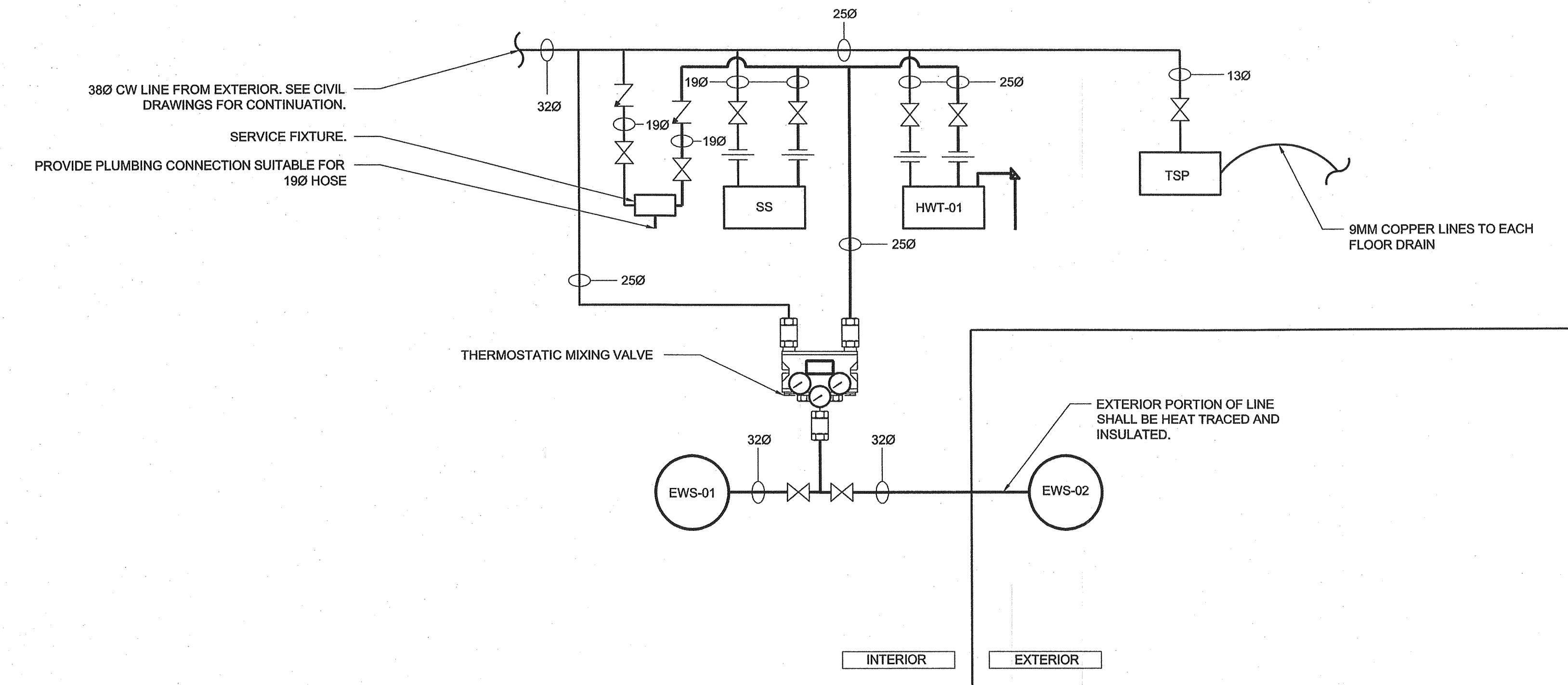
CW LINE TO DROP DOWN AND CONNECT TO TRAP SEAL PRIMING UNIT
TSP

1000 SAN PIPE TO RUN DOWN BELOW FROST LEVEL PRIOR TO LEAVING THE BUILDING

1000 SAN PIPING. SEE CIVIL DRAWING FOR CONTINUATION

PLUMBING PLAN

1:50



HOT AND COLD WATER SCHEMATIC

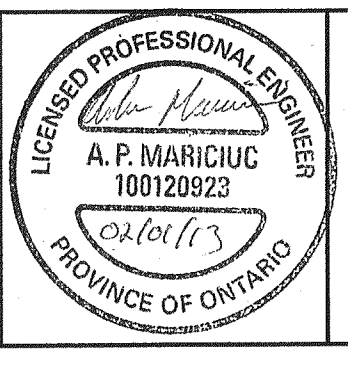
N.T.S.

NOTES:

1. ALL PLUMBING SHALL BE INSTALLED IN ACCORDANCE WITH THE ONTARIO BUILDING CODE, PLUMBING CODES AND BEST INDUSTRY PRACTICES.
2. ALL SANITARY PIPING SHALL BE 1000 WITH A 1% SLOPE UNLESS OTHERWISE SPECIFIED. ALL PIPING SHALL RUN UNDER FLOOR SLAB WITH A MINIMUM OF 150 MM COVER ABOVE THE TOP OF THE PIPE.
3. PROVIDE VENTS FOR NEW SANITARY PIPING AS REQUIRED BY CODE.
4. PROVIDE TRAP EQUIPPED WITH CLEANOUTS FOR SERVICE SINK.
5. CONTRACTOR TO COORDINATE EXACT LOCATION OF SERVICE SINK ON SITE. PROVIDE ADEQUATE CLEARANCE FROM WALL FOR HOT AND COLD WATER PIPING INSTALLATION TO FIXTURE.
6. ALL HOT AND COLD WATER PIPING SHALL BE INSULATED.
7. HOT WATER TANK SHALL BE MOUNTED AT HIGH LEVEL. CONTRACTOR TO PROVIDE NECESSARY SUPPORTS SUITABLE FOR THE TANK.

NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

DRAFTING	A.P.M.
DESIGN	A.P.M.
CHECKED BY	C.S.P.
APPROVED BY	C.S.P.



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
PLUMBING PLAN AND SCHEMATIC
MECHANICAL

CONSULTANT FILE No. E11-434	DATE 2012-05-09
SCALE AS SHOWN	REF. No. RN 13-03
DWG No. M03	REV. 1

LAYOUT SYMBOLS

	FLUORESCENT LIGHTING FIXTURE - TYPE A
	FLUORESCENT LIGHTING FIXTURE - TYPE A WALL MOUNTED
	LIGHTING FIXTURE - TYPE A
	LIGHTING FIXTURE WALL MOUNTED TYPE A
	POLE MOUNTED FIXTURE, TYPE A
	STROBE LIGHT - TYPE S
	EMERGENCY LIGHTING UNIT C/W BATTERY AND 2 HEADS
	EMERGENCY LIGHTING COMBO UNIT (BATTERY, 2 HEADS, AND EXIT SIGN)
	REMOTE EMERGENCY LIGHTING DUAL HEAD
	REMOTE EMERGENCY LIGHTING SINGLE HEAD
	EXIT SIGN, SINGLE FACE, CEILING OR WALL MOUNTED, C/W DIRECTIONAL ARROWS
	EXIT SIGN, DUAL FACE, CEILING OR WALL MOUNTED, C/W DIRECTIONAL ARROWS
	PHOTOCELL, WALL MOUNTED
	SINGLE POLE SWITCH
	DOUBLE POLE (THREE WAY) SWITCH
	ELECTRONIC TIMER / LIGHT SWITCH
	TYPE 1, OCCUPANCY SENSOR/LIGHT SWITCH
	TYPE 2, OCCUPANCY SENSOR AND POWER PACK
	T - THERMOSTAT
	H - HUMIDISTAT
	SINGLE OUTLET RECEPTACLE
	120V DUPLEX RECEPTACLE GF - GROUND FAULT PROTECTION WP - WEATHERPROOF EXP - EXPLOSIONPROOF
	120V DUPLEX RECEPTACLE TW - TWIST LOCK
	LIGHTING PANEL
	LIGHTING PANEL AND TRANSFORMER
	WALL MOUNTED DISTRIBUTION TRANSFORMER
	POWER CONNECTION
	LOCKABLE DISCONNECT SWITCH
	MANUAL STARTER W/ DISCONNECT SWITCH
	LOCAL CONTROL STATION
	MOTOR SINGLE PHASE
	MOTOR THREE PHASE
	ELECTRIC UNIT HEATER
	JUNCTION BOX
	HYDRO POLE
	HYDRO UTILITY METER
	TELEPHONE OUTLET
	DATA OUTLET
	CCTV CAMERA

LAYOUT SYMBOLS

	PHOTOCELL EMITTER
	PHOTOCELL RECEIVER
	HORN
	BUZZER
	BELL
	STROBE/HORN FIRE ALARM
	FIRE ALARM PULL STATION
	SMOKE DETECTOR
	DUCT TYPE SMOKE DETECTOR
	HEAT DETECTOR
	SPRINKLER SYSTEM SUPERVISED VALVE
	SPRINKLER SYSTEM FLOW OR PRESSURE SWITCH AS NOTED
	GROUND ROD
	ROD ELECTRODE AND GROUND INSPECTION WELL
	GROUND CABLE CONNECTION AND GROUND STUB
	GROUND CABLE CONNECTION TO EQUIPMENT

STANDARD FUNCTION NUMBERS

25	SYNCHROCHECK
27	UNDERVOLTAGE RELAY
37	UNDERCURRENT RELAY
38	BEARING RTD RELAY
46	CURRENT UNBALANCE RELAY
47	PHASE REVERSAL RELAY
49	OIL TEMPERATURE ALARM
50	INSTANEOUS OVERCURRENT
51	AC TIME OVERCURRENT
51G	AC TIME GROUND FAULT
52	AC CIRCUIT BREAKER
59	OVERVOLTAGE RELAY
60	FUSE FAILURE
63	GAS PRESSURE RELAY
63Q	SUDDEN GAS PRESSURE RELAY
71	OIL LEVEL ALARM
81	FREQUENCY RELAY
86	LOCKOUT RELAY - MANUAL RESET
VR	VALVE CLOSING RELAY
95	DISOLVED GAS HIGH
96	DISOLVED GAS HIGH HIGH

CIRCUIT SYMBOLS

	POWER TRANSFORMER
	CONTROL TRANSFORMER
	DELTA-WYE (FOR TRANSFORMER)
	SOLIDLY GROUNDED NEUTRAL
	RESISTANCE GROUNDED NEUTRAL
	LIGHTNING ARRESTER
	HIGH VOLTAGE SWITCH
	HIGH VOLTAGE LOAD BREAK SWITCH
	HIGH VOLTAGE FUSED INTERRUPTER SWITCH
	HIGH AND MEDIUM VOLTAGE CIRCUIT BREAKER
	DRAW-OUT TYPE TRANSFER SWITCH
	RECTIFIER BRIDGE
	RESISTOR
	CAPACITOR
	REACTOR
	LIGHT EMITTING DIODE
	ZENER DIODE
	DIODE
	ARC SUPPRESSOR
	SOLENOID
	BATTERY
	FUSE
	FUSED DISCONNECT TERMINAL BLOCK
	DISCONNECT SWITCH
	CIRCUIT BREAKER
	BREAKER STABS
	MOTOR OVERLOAD
	MOTOR
	MOTORIZED VALVE
	MOTORIZED DAMPER
	GENERATOR
	INTERLOCK
	NORMALLY OPEN RELAY CONTACT
	NORMALLY CLOSED RELAY CONTACT
	METER: CTR-COUNTER AM - AMMETER VM - VOLTMETER WM - WAT (HOURMETER)
	RELAY COIL: CR - CONTROL RELAY C - CONTACTOR M - MOTOR STARTER CTR - COUNTER TR - TRAINING RELAY
	PILOT LIGHT: A - AMBER R - RED G - GREEN W - WHITE

CIRCUIT SYMBOLS

	FOOT OPERATED LIMIT SWITCH-PUSH TO CLOSE
	FOOT OPERATED LIMIT SWITCH-PUSH TO OPEN
	N/C TDD SWITCH INSTANT OPEN ON ENERGIZING DELAY CLOSE ON DE-ENERGIZING
	N/O TDD SWITCH INSTANT CLOSE ON ENERGIZING DELAY OPEN ON DE-ENERGIZING
	N/O TDE SWITCH DELAY OPEN ON ENERGIZING
	N/O TDE SWITCH DELAY CLOSE ON DE-ENERGIZING
	N/C LIMIT SWITCH
	N/O LIMIT SWITCH
	N/C PROXIMITY LIMIT SWITCH
	N/O PROXIMITY LIMIT SWITCH
	N/O FLOAT LEVEL SWITCH CLOSE ON HIGH LEVEL OPEN ON LOW LEVEL
	N/C FLOAT LEVEL SWITCH CLOSE ON LOW LEVEL OPEN ON HIGH LEVEL
	N/O FLOW SWITCH CLOSE ON HIGH FLOW OPEN ON LOW FLOW
	N/C FLOW SWITCH CLOSE ON LOW FLOW OPEN ON HIGH FLOW
	N/O PRESSURE SWITCH CLOSE ON HIGH PRESSURE OPEN ON LOW PRESSURE
	N/C PRESSURE SWITCH CLOSE ON LOW PRESSURE OPEN ON HIGH PRESSURE
	N/O TEMPERATURE SWITCH CLOSE ON HIGH TEMPERATURE OPEN ON LOW TEMPERATURE
	N/C TEMPERATURE SWITCH CLOSE ON LOW TEMPERATURE OPEN ON HIGH TEMPERATURE
	N/O VIBRATION SWITCH CLOSE ON HIGH VIBRATION OPEN ON LOW VIBRATION
	N/C VIBRATION SWITCH CLOSE ON LOW VIBRATION OPEN ON HIGH VIBRATION
	2 POSITION SELECTOR SWITCH
	4 POSITION SELECTOR SWITCH
	MOMENTARY START PUSHBUTTON
	MOMENTARY STOP PUSHBUTTON
	MAINTAINED EMERGENCY STOP PUSHBUTTON
	DISCONNECT SWITCH
	TWO POSITION SELECTOR SWITCH OPENED
	SPRING RETURN SELECTOR SWITCH N/O
	SPRING RETURN SELECTOR SWITCH N/C
	THREE POSITION SELECTOR SWITCH
	MCC TERMINAL
	LOCAL CONTROL PANEL / DEVICE TERMINAL
	PLC / RPU (PANEL) TERMINAL

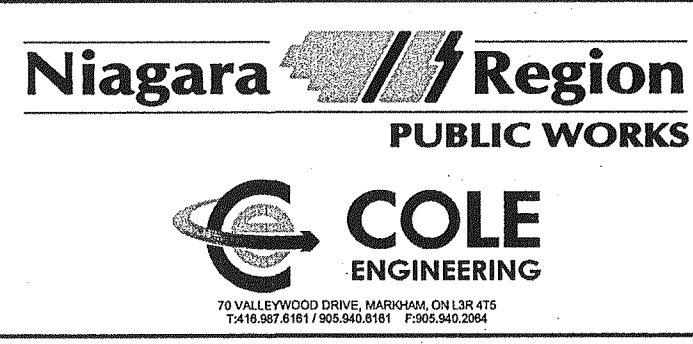
AF	AMPERE FRAME
ANF	DRY TYPE TRANSFORMER FAN COOLED
ANN	ANNUNCIATOR OR DRY TYPE TRANSFORMER - NATURALLY COOLED
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
BKR	BREAKER
CCT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
DG	DIESEL GENERATOR
DM	DIGITAL METERING
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
ELU	EMERGENCY LIGHTING UNIT
EM	EARLY MAKE (CONTACT)
EP	EXPLOSION PROOF
ESTOP	EMERGENCY STOP
ETM	ELAPSED TIME METER
FA	FIRE ALARM
FPR	FEEDER PROTECTION RELAY
FTB	FLEXITEST FIELD TERMINAL BLOCK
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
GFI	GROUND FAULT INTERRUPTER
GND	GROUNDING
HMI	HUMAN MACHINE INTERFACE
HDA	HAND-OFF-AUTOMATIC
HS	HAND SWITCH (STATION)
HTR	HEATER
ICP	INSTRUMENT CONTROL PANEL
JB	JUNCTION BOX
KAIC	KILO AMPERE INTERRUPTING CAPACITY
LA	LIGHTNING ARRESTOR
LB	LOAD BREAKER
LDR	LOCAL-OFF-REMOTE
LDS	LOCKOUT STOP
LP	LIGHTING PANEL
LR	LINE / LOAD REACTOR

ELECTRICAL ABBREVIATIONS

MCC	MOTOR CONTROL CENTER
MFR	MULTI FUNCTION RELAY
MCA	MANUAL-OFF-AUTOMATIC
MTS	MANUAL TRANSFER SWITCH
N	NUTRAL
NC	NORMALLY CLOSED
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
ONAN	OIL TYPE TRANSFORMER - NATURAL COOLED
ONAF	OIL TYPE TRANSFORMER - FORCED AIR COOLED
PB	PUSHBUTTON (STATION)
PDP	POWER DISTRIBUTION PANEL
PID	PROPORTIONAL INTEGRAL DERIVATIVE
P&ID	PROCESS AND INSTRUMENTATION DIAGRAM
PLC	PROGRAMMABLE LOGIC CONTROLLER
PM	POWER METERING
PNL	PANEL OR PANELBOARD
PT	POTENTIAL TRANSFORMER
RPU	REMOTE PROCESSING UNIT
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TERMINAL UNIT
SCR	SYNCHRONISM CHECK RELAY OR SOLID STATE CONTROL RELAY
SHLD	SHIELDED
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SS	SELECTOR SWITCH
STU	SOLID STATE TRIP UNIT
SWG	SWITCHGEAR
2S1W	TWO SPEED ONE WINDING
2S2W	TWO SPEED TWO WINDING
T	TRANSFORMER
TDOE	TIME DELAY ON ENERGIZATION
TDEE	TIME DELAY ON DE-ENERGIZATION
TDDO	TIME DELAY ON DROP-OUT
TDFU	TIME DELAY ON PICK-UP
TR	TIME RELAY
VFD	VARIABLE FREQUENCY DRIVE
VT	VOLTAGE TRANSFORMER
WP	WEATHER PROOF


1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

DRAFTING	M.L.
DESIGN	M.L.
CHECKED BY	J.L.
APPROVED BY	J.L.



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
LEGEND
ELECTRICAL

CONSULTANT FILE No. E11-434
DATE 2012-05-09
SCALE Hor : N.T.S. Ver : N.T.S.
REF. No. RN 13-03
DWG No. E01
REV. 1

MAINS: 225A VOLTAGE:120/208V, 3P, 4W NEW ALUM PUMPS/CONTROL BUILDING				PANEL 'PP-TA' SCHEDULE				CONNECTED LOAD: 35kW				
SERVICE DESCRIPTION	WATTS	WIRE	CKT. NO.	BRANCH CB	A ○	B ○	C ○	BRANCH CB	CKT. NO.	WIRE	WATTS	SERVICE DESCRIPTION
INDOOR LIGHTING	500	#12	1	15A	●	●	●	125A	2	#12	-	ALUM METERING PUMP
EXTERIOR LIGHTING	280	#12	3	15A	●	●	●		4	#12		
RECEPTACLES	600	#12	5	15A	●	●	●	15A	6	#12	150	MOTORIZED DAMPER DMP-01
UNIT HEATER UHT-01	5000	#10	7	30A	●	●	●	15A	8	#12	150	MOTORIZED DAMPER DMP-02
		#10	9		●	●	●	15A	10	#12	150	MOTORIZED DAMPER DMP-03
		#10	11		●	●	●	15A	12	#12	150	MOTORIZED DAMPER DMP-04
UNIT HEATER UHT-02	5000	#10	13	30A	●	●	●	15A	14	#12	372	EXHAUST FAN EXF-01
		#10	15		●	●	●		16	#12		
		#10	17		●	●	●		18	#12		
HEAT TRACING FOR ALUM TANK #1	2000	#10	19	25A GFI	●	●	●	15A	20	#12	372	EXHAUST FAN EXF-02
HEAT TRACING FOR ALUM TANK #1	2000	#10	21	25A GFI	●	●	●		22	#12		
HEAT TRACING FOR ALUM TANK #2	2000	#10	23	25A GFI	●	●	●		24	#12		
HEAT TRACING FOR ALUM TANK #2	2000	#10	25	25A GFI	●	●	●	15A	26	#12	2000	UNIT HEATER UHT-03
PROCESS PIPE HEAT TRACING HTC-1	-	#12	27	15A	●	●	●		28	#12		
PROCESS PIPE HEAT TRACING HTC-2	-	#12	29	15A	●	●	●	30A	30	#12	4000	UNIT HEATER UHT-04
HWT-01	6000	#10	31	30A	●	●	●		32	#12		
		#10	33		●	●	●	15A GFI	34	#12		NEMA 4X ENCLOSURE OF THERMOSTATIC MIXING VALVE
		#10	35		●	●	●	15A	36	#12		SPARE
SPARE			37	25A GFI	●	●	●	20A	38	#12	1500	PLC CONTROL PANEL
SPARE			39	25A GFI	●	●	●	15A	40	#12		CHEMICAL METERING PUMPS PANEL (3 PUMPS)
SPARE			41	15A	●	●	●	15A	42	#12		CHEMICAL METERING PUMPS PANEL (2 PUMPS)
SPARE			43	15A	●	●	●	20A	44	#12		CHEMICAL SYSTEM LOCAL CONTROL PANEL
SPARE			45	15A	●	●	●	15A	46	#12	300	CHEMICAL SUMP PUMP
SPARE			47	15A	●	●	●	15A	48			SPARE
SPACE			49		●	●	●		50			SPACE
SPACE			51		●	●	●		52			SPACE
SPACE			53		●	●	●		54			SPACE
SPACE			55		●	●	●		56			SPACE
SPACE			57		●	●	●		58			SPACE
SPACE			59		●	●	●		60			SPACE
SPACE			61		●	●	●		62			SPACE
SPACE			63		●	●	●		64			SPACE
SPACE			65		●	●	●		66			SPACE
								GND				

MAINS: 225A VOLTAGE: 120/208V, 3P, 4W RAS PUMP STATION MCC ROOM				PANEL 'PP-TB' SCHEDULE				CONNECTED LOAD: 15kW					
SERVICE DESCRIPTION	WATTS	WIRE	CKT. NO.	BRANCH CB	A	B	C	BRANCH CB	CKT. NO.	WIRE	WATTS	SERVICE DESCRIPTION	
PROCESS PIPE HEAT TRACING HTC-3	-	#8	1	20A GFI		20A GFI	2	#8	-	PROCESS PIPE HEAT TRACING HTC-6			
	-	#8	3				4	#8	-				
PROCESS PIPE HEAT TRACING HTC-4	-	#8	5	20A GFI					20A GFI	6	#8	-	PROCESS PIPE HEAT TRACING HTC-7
	-	#8	7							8	#8	-	
PROCESS PIPE HEAT TRACING HTC-5	-	#4	9	20A GFI					20A GFI	10	#8	-	PROCESS PIPE HEAT TRACING HTC-8
	-	#4	11							12	#8	-	
SPARE	-	-	13	20A GFI					20A GFI	14	#8	-	PROCESS PIPE HEAT TRACING HTC-9
	-	-	15							16	#8	-	
SPARE	-	-	17	15A					20A GFI	18	#8	-	PROCESS PIPE HEAT TRACING HTC-10
SPARE	-	-	19	15A						20	#8	-	
SPARE	-	-	21	15A					20A GFI	22	#8	-	PROCESS PIPE HEAT TRACING HTC-11
SPARE	-	-	23	15A						24	#8	-	
SPARE	-	-	25	15A					20A GFI	26	-	-	SPARE
SPARE	-	-	27	15A						28	-	-	
SPARE	-	-	29	15A					20A GFI	30	-	-	SPARE
SPARE	-	-	31	15A						32	-	-	
SPACE	-	-	33							34	-	-	SPACE
SPACE	-	-	35							36	-	-	SPACE
SPACE	-	-	37							38	-	-	SPACE
SPACE	-	-	39							40	-	-	SPACE
SPACE	-	-	41							42	-	-	SPACE
									GND				

LUMINARIES SCHEDULE					
SYMBOL	DESCRIPTION	MANUFACTURER	CAT NO.	MOUNTING	REMARKS
Ⓐ	120V, 2x32W T8 LAMP, 1'x4', C/W ASSOCIATED PARTS FOR PENDANT MOUNTING ON CEILING. CONSTRUCTION NOMINAL CHANNEL IS CODE GAUGE PRIME COLD ROLLED STEEL. END PLATE QUICKLY CONNECTS TO CHANNEL CONNECTOR. GROOVE FOR TONG HANGER LAMP HOLDER BRACKET FLIPS IN PLACE. ELECTRICAL BALLAST ARE CBM/ETL CLASS "P" AND POSITIVELY SECURED BY MOUNTING BOLTS. UL/CUL LISTED. SUITABLE FOR DAMP LOCATIONS. FINISH MULTISTAGE IRON PHOSPHATE PRETREATMENT ENSURES MAXIMUM BONDING AND RUST INHIBITOR. LIGHTING GRADE, BAKED WHITE ENAMEL FINISH. REFLECTORS DIE FORMED PRIME STEEL, CODE GAUGE, FORMED EDGES FOR ADDED STRENGTH. 12" WIDTH. REFLECTORS SECURED WITH QUARTER TURN FASTENERS. BAKED WHITE ENAMEL. 8% UPLIGHT (IAP).	COOPER LIGHTING - METALUX OR APPROVED EQUAL	IAF-232-UNV-EB82-U	PENDENT CEILING MOUNTED 3.2m A.F.F.	C/W 2x32W T8 LAMPS. MAIN ELECTRICAL ROOM. CSA APPROVED
Ⓑ	120V, 51W, 21 LED LIGHTING BARS. WALL MOUNTED CUTOFF LUMINAIRES. CONSTRUCTION HEAVY-WALL, DIE-CAST ALUMINUM HOUSING AND REMOVABLE HINGED DOOR FRAME. ELECTRICAL LED DRIVERS MOUNT TO DIE-CAST ALUMINUM BACK CASTING. CIRCUIT MODULE DESIGNED TO WITHSTAND 10KV OF TRANSIENT LINE SURGE. 50,000+ HOUR LIFE WITH NOMINAL 70% LUMEN MAINTENANCE. LED LUMINAIRES IS SUITABLE FOR OPERATION IN -30°C TO 40°C AMBIENT ENVIRONMENTS AND FEATURES AN IP66 ENCLOSURE RATING. MOUNTING GASKETED AND ZINC PLATED RIGID STEEL MOUNTING ATTACHMENT FITS DIRECTLY TO 4" J-BOX. SECURED WITH TWO(2) OPTIVE CORROSION RESISTANT BLACK OXIDE COATED ALLEN HEAD SET SCREWS. FINISH POLYESTER POWDER COAT PAINT, 2.5 MIL NOMINAL THICKNESS. BRONZE COLOR.	COOPER LIGHTING McGRAW-EDISON OR APPROVED EQUAL	ISW-B02-LED-EL-BL3 -BZ-P	EXTERIOR WALL SURFACE	C/W 120V PHOTOCONTROL, UL/CUL LISTED FOR WET LOCATION. CSA APPROVED
Ⓒ	BATTERY UNIT EMERGENCY LIGHT WITH SINGLE SIDED EXIT SIGN. LIGHT SOURCE • HIGH-EFFICIENCY LED, ILLUMINATE THE EXIT SIGNAGE • FULLY FIELD ADJUSTABLE EMERGENCY LIGHTING HEADS ARE MR16 WHITE 12V 4W LED LAMPS CHARGER FULLY AUTOMATIC ADVANCED DIAGNOSTIC MICRO-CONTROLLER. TESTS, DETECTS AND INDICATES BATTERY, CHARGER CIRCUITRY, LAMPS OR LED STRIP FAILURES. DUAL VOLTAGE INPUT OF 120/277VAC ELECTRICAL SEALED, MAINTENANCE-FREE NICKEL-CADMIUM BATTERY, 12V 24W FOR 90 MINUTES OF EMERGENCY OPERATION. SUITABLE FOR WET AND DAMP LOCATION (10°C TO 40°C) HOUSING NEMA-4X RATED HOUSING. FACEPLATES ARE MOLDED OF HEAVY-DUTY VANDAL-RESISTANT POLYCARBONATE, RUGGED UV-STABILIZED THERMOPLASTIC BODY, STAINLESS STEEL TAMPER-PROOF SCREWS. WHITE COLOR MOUNTING ALLOWING END, CEILING OR WALL-MOUNT INSTALLATION WARRANTY CARRIES A 5-YEAR FULL WARRANTY AND A 5-YEAR PRO-RATA WARRANTY	EMERGI-LITE OR APPROVED EQUAL	WW-SVX24N-1-R-D-4X-2-LG-FL	WALL MOUNTED 2.5m A.F.F. OR ABOVE DOOR	NON-CLASSIFICATION: ELECTRICAL ROOM, SOUTH STAIR SHAFT. CSA APPROVED

DESIGN INFORMATION OF CHEMICAL PIPES & HEAT TRACING

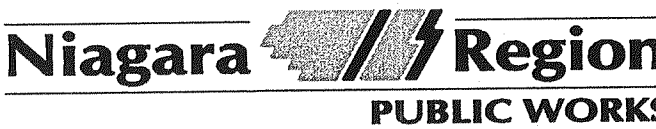

LOWEST AMBIENT TEMPERATURE		-20°C									
LOWEST AMBIENT TEMPERATURE		10°C									
CHEMICAL PIPES						HEAT TRACING CABLES					
PIPE LINE	QUANTITY OF RUN	APPROX. LENGTH OF EACH RUN (m)	SIZE (mm) CARRIER/CONTAINMENT	TYPE OF CONTAINMENT	PIPE INSULATION TYPE/THICKNESS	CABLE TAG	QUANTITY OF CABLE RUN	APPROX. CABLE LENGTH OF EACH RUN (m)	VOLTAGE/ PHASE	AMPERE OF EACH CIRCUIT BREAKER (A)	QUANTITY OF POWER CIRCUIT
TANK FEED LINE 1	1	10	50/100	SCH80PVC	FIBERGLASS/50	HTC-1	1	10	120/1	15	1
TANK FEED LINE 2	1	5	50/100	SCH80PVC	FIBERGLASS/50	HTC-2	1	5	120/1	15	1
PRIMARY TREATMENT	1	320	25/75	SCH80PVC	FIBERGLASS/50	HTC-3-5	3	110	208/1	20	3
SECONDARY TREATMENT	3	150	25/75	SCH80PVC	FIBERGLASS/50	HTC-6-11	6	80	208/1	20	6
NOTES:											
1. EACH CABLE RUN SHALL BE CONTROLLED BY ONE SINGLE POINT/DUAL RTD CONTROLLER. ONE RTD WILL MONITOR THE PVC PIPE TEMPERATURE WHILE THE SECOND RTD WILL MONITOR THE CABLE TEMPERATURE.											
2. ALUMINUM TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF EACH CABLE RUN TO AID IN HEAT TRANSFER.											
3. PROVIDE HEAT TRACING SYSTEM INCLUDING CONTROL BOXES, HEAT TRACING CABLE, THERMOSTAT/CONTROLLER, COLD TERMINATIONS AND NECESSARY INSTALLATION ACCESSORIES FOR A COMPLETE SAFE OPERATIONAL SYSTEM.											
ALL MATERIALS AND EQUIPMENT TO BE SUPPLIED FROM A SINGLE SOURCE(MANUFACTURE).											
4. COORDINATE WITH PROCESS DIVISION CONTRACTOR FOR EXACT PIPING INFORMATION AND SYSTEM INSTALLATION.											
5. ALL HEAT TRACING CABLE SHALL BE SELF REGULATIONS TYPE. REFER ELECTRICAL SPECIFICATIONS.											
6. DIV. 16 CONTRACTOR TO COORDINATE WITH PROCESS TRADE FOR EXACT HEAT TRACING CABLE LENGTHS & SIZE OF EACH CIRCUIT BREAKER BASED ON ACTUAL PIPE INSTALLATION.											

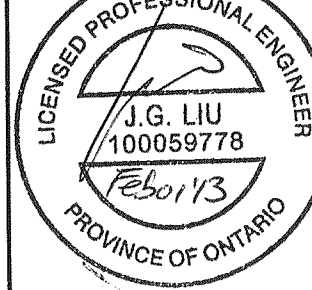
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

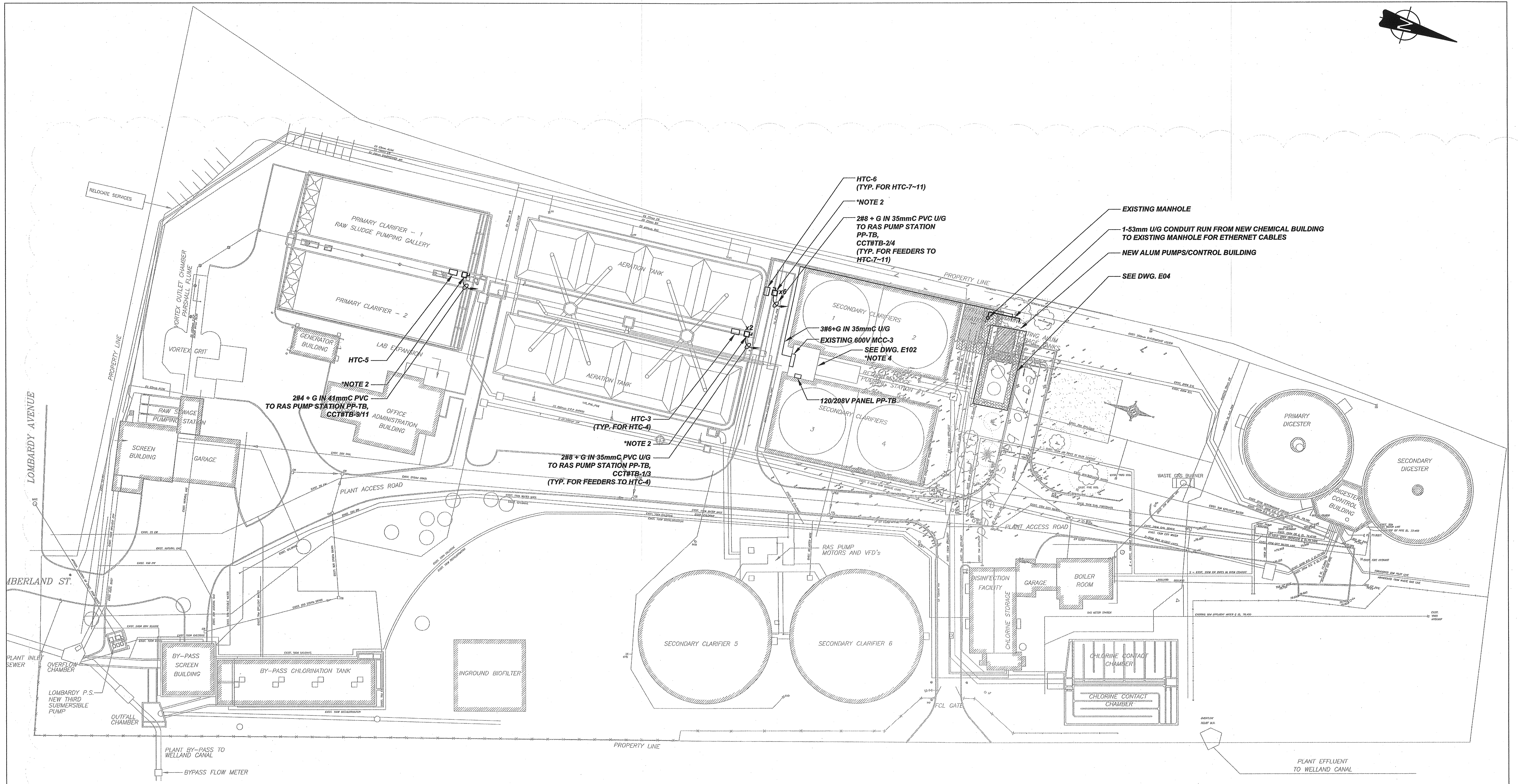
DRAFTING	M.L.
DESIGN	M.L.
CHECKED BY	J.L.
APPROVED BY	J.L.

CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT IN THE CITY OF ST. CATHARINES
LIGHTING PANEL & LUMINAIRES SCHEDULE ELECTRICAL

CONSULTANT FILE No. E11-434
DATE 2012-05-09
SCALE Hor : N.T.S.
REF. No. RN 13-03
DWG No. E02
REV. 1

 
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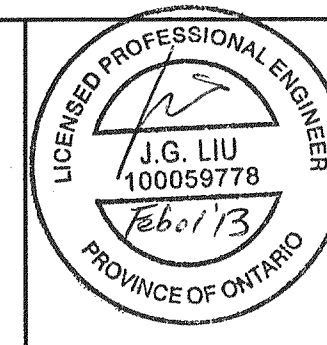


NOTES:

- CONTRACTOR TO SUPPLY AND INSTALL HEAT TRACING SYSTEM FOR FOUR PROCESS PIPES AS SHOWN. INSTALL HEAT TRACING CABLE AS PER MANUFACTURE'S INSTALLATION REQUIREMENTS.
- 240V, 30A-3P DISCONNECT SWITCH, NEMA 4X ENCLOSURE. PROVIDE GALVANIZED UNISTRUCT SUPPORTS TO PERMIT INSTALLATION OF DISCONNECT SWITCH(ES) AND HEAT TRACING CABLE CONTROLLER(S).
- REUSE EXISTING PANEL BREAKERS WHERE AVAILABLE OR INSTALL NEW BREAKER AT SPACE SECTION AND SIZE TO SUIT APPLICATION. ALL PANEL BRANCH BREAKERS FOR PROTECTING HEAT TRACING CIRCUITS SHALL BE GROUND FAULT INTERRUPTING TYPE, MINIMUM 30mA.
- SEAL ALL OF CONDUIT PENETRATIONS ON WALLS OR FLOOR SLAB BY USE OF 3M WATER RESISTANCE MATERIALS.

1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.
NO.	REVISION	DATE	INIT.

DRAFTING	M.L.
DESIGN	M.L.
CHECKED BY	J.L.
APPROVED BY	J.L.

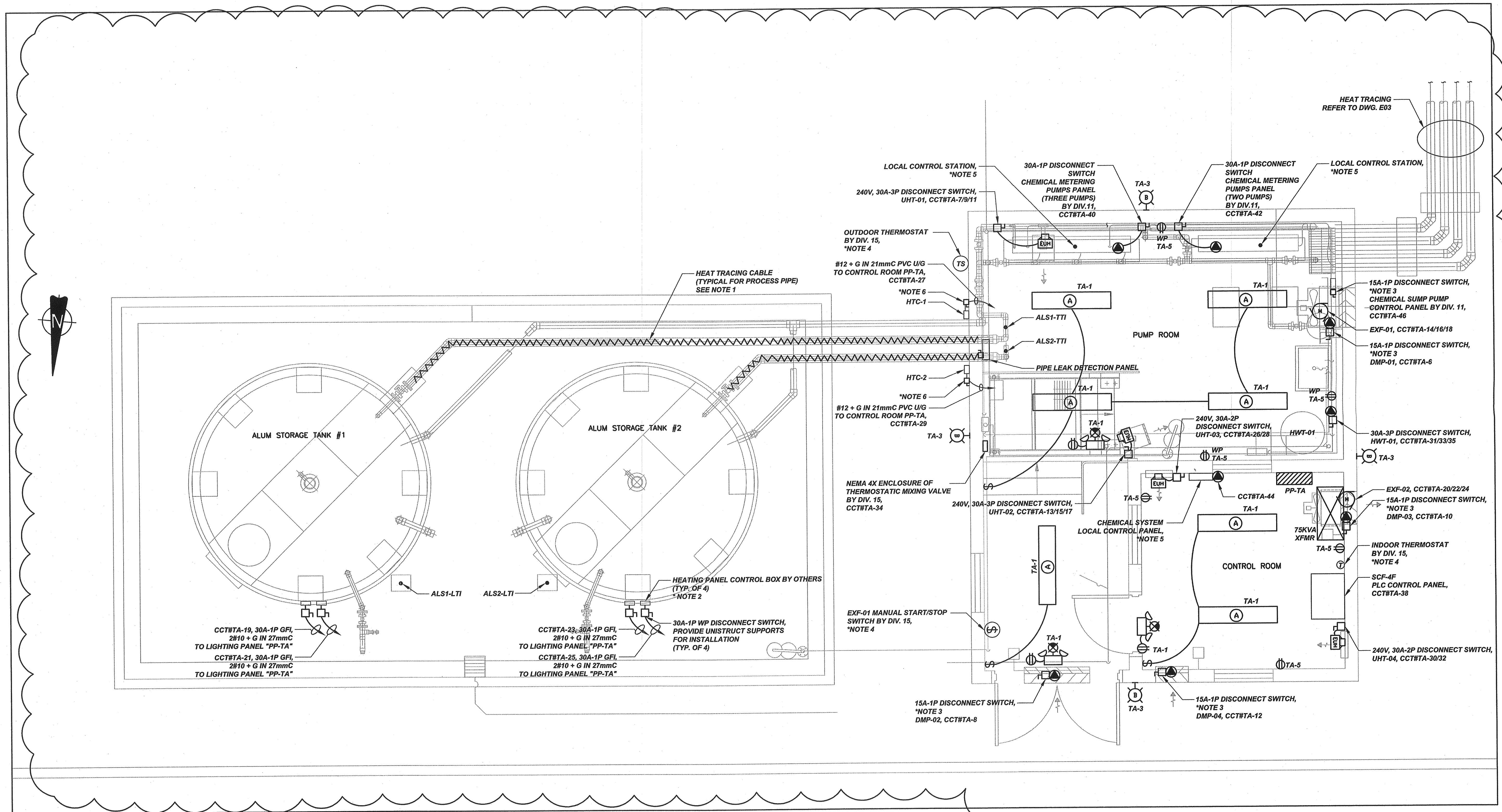


Niagara Region
PUBLIC WORKS



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
SITE PLAN
ELECTRICAL

CONSULTANT FILE No. E11-434
DATE 2012-05-09
SCALE 1:500
REF. No. RN 13-03
DWG No. E03
REV. 1

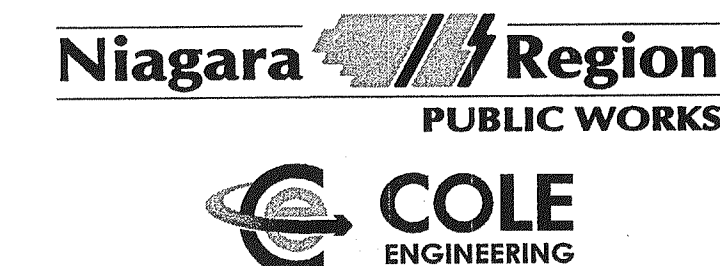
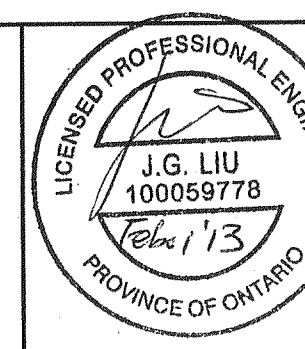


NOTES:

- SUPPLY AND INSTALL HEAT TRACING SYSTEM FOR PROCESS PIPES AS SHOWN. INSTALL HEAT TRACING CABLE AS PER MANUFACTURE'S INSTALLATION REQUIREMENTS.
- THE ALUM STORAGE TANKS HEAT TRACING SYSTEM WILL BE SUPPLIED WITH TANK AS PACKAGE BY TANK SUPPLIER, INCLUDING CONTROL BOXES, HEAT TRACING CABLE, THERMOSTAT/CONTROLLER, COLD TERMINATIONS AND NECESSARY INSTALLATION ACCESSORIES. ELECTRICAL CONTRACTOR TO PROVIDE POWER CONNECTIONS TO THE SYSTEM ACCORDINGLY. COORDINATE WITH PROCESS TRADE AND FOLLOW MANUFACTURE'S RECOMMENDATION FOR EXACT LOAD AND POWER CONNECTION REQUIRED.
- PROVIDE 15A, 1P HORSE POWER (HP) RATED TOGGLE SWITCH.
- COORDINATE WITH DIV.15 CONTRACTOR AND INSTALL CONTROL WIRING/CONDUIT AS REQUIRED.
- COORDINATE WITH DIV.13 CONTRACTOR AND INSTALL I&C WIRING/CONDUIT AS REQUIRED.
- 240V, 30A-3P DISCONNECT SWITCH, NEMA 4X ENCLOSURE. PROVIDE GALVANIZED UNISTRUCT SUPPORTS TO PERMIT INSTALLATION OF DISCONNECT SWITCH(ES) AND HEAT TRACING CABLE CONTROLLER(S).

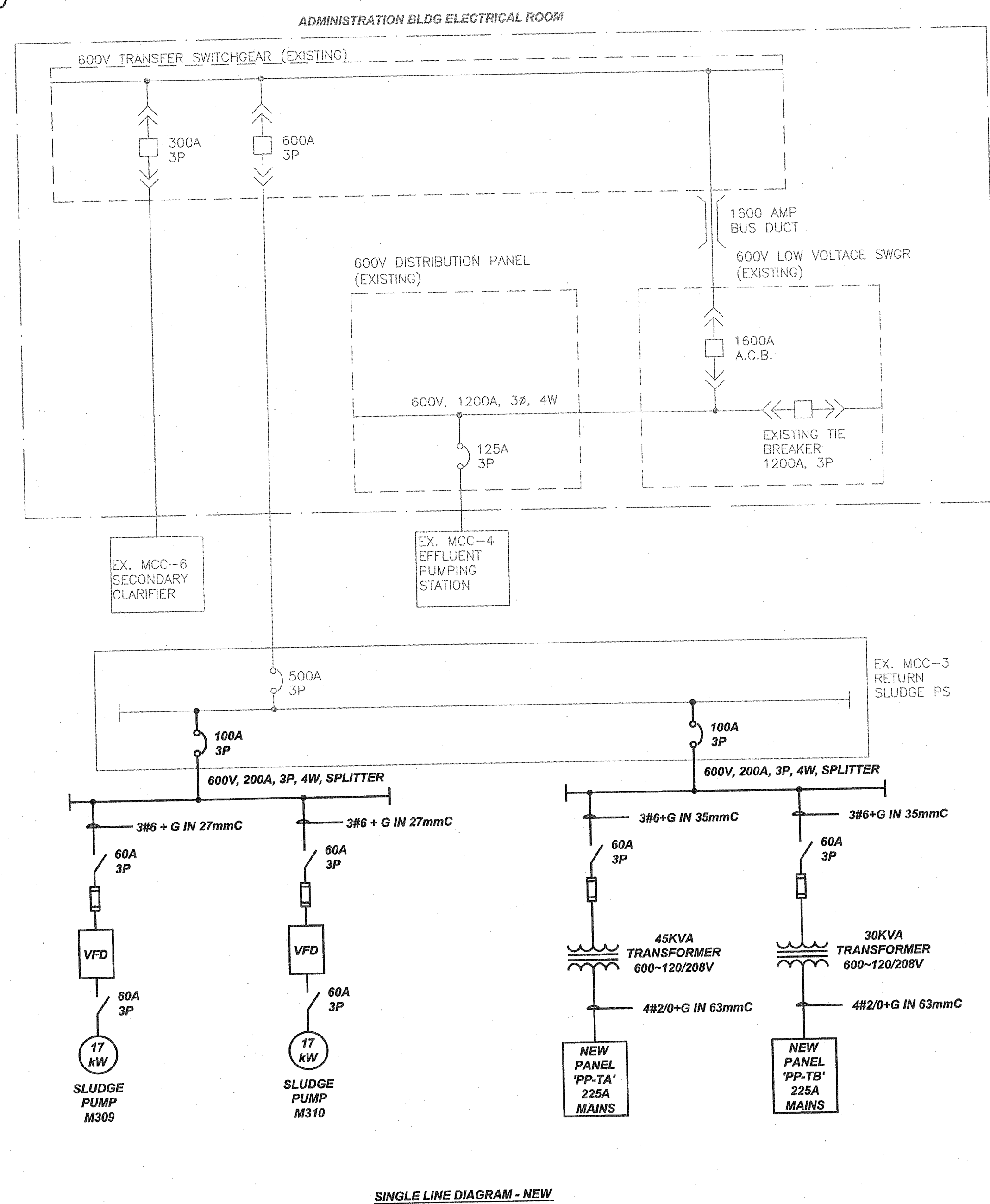
NO.	REVISION	DATE	INIT.
1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.P.

DRAFTING	M.L.
DESIGN	M.L.
CHECKED BY	J.L.
APPROVED BY	J.L.



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
LIGHTING AND POWER LAYOUT
ELECTRICAL

CONSULTANT FILE No.	E11-434
DATE	2012-05-09
SCALE	Hor : 1:30 Ver : N.T.S.
REF. No.	RN 13-03
DWG No.	E04
REV.	1



1		2		3		4		5		6	
500A MAIN BREAKER		SLUDGE PUMP NO.1 (M309)		SLUDGE PUMP NO.1 (M310)		EXISTING		EXISTING		EXISTING	SARE
						SPACE				LIGHTING PANEL D	
AERATOR NO.1A		AERATOR NO.2A		AERATOR NO.3A		AERATOR NO.4A		EXISTING			
AERATOR NO.1B		AERATOR NO.2B		AERATOR NO.3B		AERATOR NO.4B					
SPLITTER NO.1	UNIT HEATER NO.16	EXISTING	EXISTING	SPACE		EXISTING	EXISTING	EXISTING			
SPACE		SPACE		SPACE		SPACE				SPACE	

1		2		3		4		5		6	
500A MAIN BREAKER		NEW SLUDGE PUMP M309 & M310		NEW LIGHTING PANEL "PP-1A" & "PP-TB"		EXISTING		EXISTING		EXISTING SPARE	
						SPACE				LIGHTING PANEL D	
AERATOR NO.1A		AERATOR NO.2A		AERATOR NO.3A		AERATOR NO.4A		EXISTING			
AERATOR NO.1B		AERATOR NO.2B		AERATOR NO.3B		AERATOR NO.4B		EXISTING		LIGHTING PANEL D 15KVA TRANSFORMER	
SPLITTER NO.1	UNIT HEATER NO.16	EXISTING	EXISTING	SPACE		EXISTING	EXISTING	EXISTING			
SPACE		SPACE		SPACE		SPACE		SPACE		SPACE	

LEGEND:

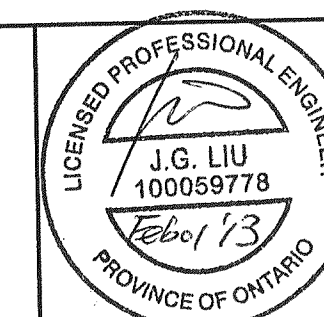
_____ **NEW**
_____ **EXISTING**

NOTES:

1. CONTRACTOR TO REMOVE EXISTING CONTROL PANEL CP-4, ALL EXISTING ELECTRICAL WIRING AND CONDUITS ASSOCIATED WITH THE REMOVAL OF EXISTING EFFLUENT PUMPING STATION EQUIPMENT.
2. PROVIDE NEW POWER FEED FROM EXISTING 600V MCC-3 LOCATED AT RETURN SLUDGE PUMPING STATION TO NEW PUMPING STATION. INSTALL A NEW BREAKER AT MCC-3 SPACE SECTION TO FEED NEW TRANSFORMER AS SHOWN.
3. INSTALL HEAT TRACING SYSTEM FOR TWO NEW ALUM STORAGE TANKS. HOT WATER PIPES AS SHOWN. COORDINATE WITH PROCESS TRADE FOR EXACT TANK DIMENSION AND LENGTH OF PIPE TO BE HEAT TRACED. PROVIDE ENOUGH QUANTITIES OF HEATING CABLE AS REQUIRED.
4. PANEL BRANCH BREAKERS FOR PROTECTING HEAT TRACING CIRCUITS SHALL BE GROUND FAULT INTERRUPTING TYPE, MINIMUM 30mA. PROVIDE EXTRA BREAKERS AS REQUIRED.

1	ISSUED FOR BUILDING PERMIT	2013-02-01	C.S.	
NO.	REVISION	DATE	INITIALS	

DRAFTING	M.L.
DESIGN	M.L.
CHECKED BY	J.L.
APPROVED BY	J.L.



Niagara Region
PUBLIC WORKS



CONTRACT NO. 2013-T-103 (RN 13-03)
PORT WELLER WASTEWATER TREATMENT
PLANT ALUM SYSTEM & RAS PUMPS REPLACEMENT
IN THE CITY OF ST. CATHARINES
PART SINGLE LINE DIAGRAM AND ELEVATION
ELECTRICAL

CONSULTANT FILE No. E11-434	
DATE	2012-05-09
SCALE	Hor : N.T.S. Ver : N.T.S.
REF. No.	RN 13-03
DWG No.	REV.
E05	1