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REGIONAL DISTRICT OF NANAIMO

NANOOSE BAY PUMP STATION No. 6 UPGRADE AND SANITARY FORCEMAIN REPLACEMENT

ISSUE FOR TENDER
26JUL23

GENERAL NOTES:

1. ALL LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES ARE APPROXIMATE ONLY AND ARE NOT NECESSARILY SHOWN. ACTUAL LOCATIONS SHOULD BE CONFIRMED BY MANUAL EXCAVATION. EXISTING AND PROPOSED SERVICES MAY REQUIRE ADJUSTMENT WHERE A CONFLICT OCCURS. THE ENGINEER SHALL BE NOTIFIED OF ANY CONFLICTS.
2. ALL STRUCTURES ARE NOT NECESSARILY SHOWN.
3. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH MMCD ENGINEERING STANDARDS AND SPECIFICATIONS AND MoTI STANDARDS, UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING SURFACE AND UNDERGROUND UTILITIES THAT MAY AFFECT THE WORK.
5. CONTRACTOR SHALL REINSTATE DISTURBED OR DAMAGED LANDSCAPING TO ORIGINAL OR BETTER CONDITION.
6. CONTRACTOR SHALL REPAIR, AT HIS EXPENSE, ALL BROKEN OR DISTURBED PIPES, CONDUITS AND STRUCTURES THAT ARE DAMAGED DURING CONSTRUCTION.
7. CONTRACTOR SHALL RESTORE ALL DISTURBED PAVEMENT TO ORIGINAL OR BETTER CONDITION TO MOTI SPECIFICATIONS.
8. ALL OFFSETS SHOWN ARE TO PIPE CENTRELINE UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL SUBMIT A EROSION AND SEDIMENT CONTROL PLAN FOR THE WORK AREA TO THE ENGINEER FOR APPROVAL AT THE PRE-CONSTRUCTION MEETING.
10. CONTRACTOR SHALL SUBMIT A TRAFFIC MANAGEMENT PLAN TO THE ENGINEER FOR APPROVAL AT THE PRE-CONSTRUCTION MEETING.
11. CONTRACTOR SHALL HYDROSEED ALL DISTURBED AREAS OF THE SITE UPON COMPLETION OF THE PROJECT.
12. ALL DRAINAGE FEATURES SHALL BE REINSTATED TO PRE-CONSTRUCTION CONDITIONS OR BETTER.
13. ELEVATIONS ARE TO METRIC GEODETIC DATUM.
14. THE CONTRACTOR SHALL ARRANGE FOR ALL UTILITY COMPANIES TO LOCATE AND MARK UNDERGROUND UTILITIES PRIOR TO COMMENCING WITH ANY EXCAVATION WORK.
15. THE CONTRACTOR SHALL ENSURE EXISTING PIPING AND STRUCTURES ARE PROTECTED AT ALL TIMES.
16. DRAINAGE FROM THIS PROJECT FLOWS TO FISH BEARING WATERS. THE CONTRACTOR SHALL ENSURE SEDIMENT FROM THIS PROJECT DOES NOT ENTER FISH HABITAT. PRIOR TO COMMENCING WORK ON THIS PROJECT, THE CONTRACTOR SHALL ENSURE SEDIMENT CONTROL STRUCTURES ARE IN PLACE AS REQUIRED.
17. CONTRACTOR TO LOCATE AND EXPOSE ALL TIE-IN POINTS FOR VERIFICATION BY THE ENGINEER PRIOR TO COMMENCING WITH THE WORK. ALL TIE-INS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIRED TIE-IN SEQUENCE AND FINAL COMMISSIONING INSTRUCTIONS PROVIDED IN THE SPECIFICATIONS.
18. STATION WILL BE OPERATIONAL AND ACCESSIBLE TO RDN OPERATORS AT ALL TIMES.
19. PIPE CURVATURE SHALL NOT EXCEED MANUFACTURERS MINIMUM BENDING RADIUS.
20. THE CONTRACTOR SHALL FOLLOW WORKSAFEBC REGULATIONS FOR WORK IN CONFINED SPACES AND SANITARY SEWER WET WELLS.
21. TEMPORARY BYPASS MEASURES SHALL BE CONSTRUCTED AND MAINTAINED AS SPECIFIED IN THE CONTRACT DOCUMENTS.
22. ALL WORK INSIDE WET WELL TO BE COORDINATED WITH THE REGIONAL DISTRICT OF NANAIMO.
23. SUSPEND SAFETY TARPS UNDER WORK TO PREVENT DEBRIS FROM FALLING INTO WET WELL.
24. RESIDENCES DIRECTLY AFFECTED BY CONSTRUCTION, EMERGENCY SERVICES (E.G. FIRE, AMBULANCE), AND OTHER AFFECTED SERVICES (E.E. PUBLIC TRANSIT, POSTAL SERVICE, ETC.) SHALL BE GIVEN AT LEAST 2 DAYS NOTICE PRIOR TO THE START OF CONSTRUCTION.
25. ALL OPEN CUT EXCAVATION SHALL BE BACKFILLED BY THE END OF THE WORKING DAY UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.
26. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SIGNAGE, BARRIERS, FLASHING INDICATORS, ETC. AT ALL TIMES TO ENSURE THE SAFETY OF THE PUBLIC. TRAFFIC CONTROL WILL BE REQUIRED FOR ALL CONSTRUCTION WORKS WITHIN THE TRAVELED PORTION OF THE ROAD. NO ROAD OR DRIVEWAY SHALL BE CLOSED WITHOUT THE WRITTEN CONSENT OT THE REGIONAL DISTRICT OF NANAIMO.
27. ALL PUBLIC ROADWAYS AFFECTED BY THE WORKS SHALL BE KEPT IN A CLEAN STATE AT ALL TIMES. DUST CONTROL MEASURES SHALL ALSO BE EMPLOYED DURING THE COURSE OF THE WORK.
28. WORKING HOURS FOR CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE REGIONAL DISTRICT OF NANAIMO BYLAW No. 1054, UNLESS APPROVAL IS OBTAINED FROM THE DISTRICT, WITH NO WORK PERFORMED ON SUNDAY; NO WORK SHALL TAKE PLACE ON ANY STATUTORY HOLIDAY.
29. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR UTILITY POLES IN ACCORDANCE WITH CURRENT BC HYDRO REGULATIONS DURING CONSTRUCTION.
30. ALL WASTE MATERIAL TO BE REMOVED FROM THE PROJECT AREA AND DISPOSED AT A SITE SECURED BY THE CONTRACTOR. NO ONSITE DUMPING WILL BE PERMITTED.
31. CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE FLOWS DURING CONSTRUCTION. WATER WILL NOT BE PERMITTED TO BACK UP ONTO PRIVATE PROPERTY.
32. CONTRACTOR SHALL EXCERCISE CAUTION WHEN WORKING ADJACENT TO THE EXISTING WATERMAIN, GAS, AND HYDRO.
33. TRAVELLED SURFACE TO BE REINSTATED WITHIN THREE WEEKS OF THE COMPLETION OF TRENCH BACKFILL.

SANITARY SEWER NOTES

1. ALL SANITARY SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS AND CONTRACT DOCUMENTS.
2. ALL PIPE SHALL BE BEDDED AND BACKFILLED IN ACCORDANCE WITH THE DRAWINGS AND CONTRACT DOCUMENTS. ALL BACKFILL WILL BE IMPORTED GRANULAR MATERIAL. BEDDING AND BACKFILL MATERIALS SHALL BE COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR UNLESS OTHERWISE SPECIFIED ON THE APPROVED ENGINEERING DRAWINGS.
3. ALL BEDDING AND BACKFILL SHALL BE SPOT TESTED FOR COMPACTION WITH A NUCLEAR DENSOMETER. FREQUENCY OF TESTING SHALL BE AS DETERMINED BY THE ENGINEER.
4. ALL SANITARY SEWER SHALL BE PRESSURE TESTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE ENGINEER SHALL BE CONTACTED AT LEAST 48 HOURS IN ADVANCE TO WITNESS TESTING.

ROADWORKS NOTES

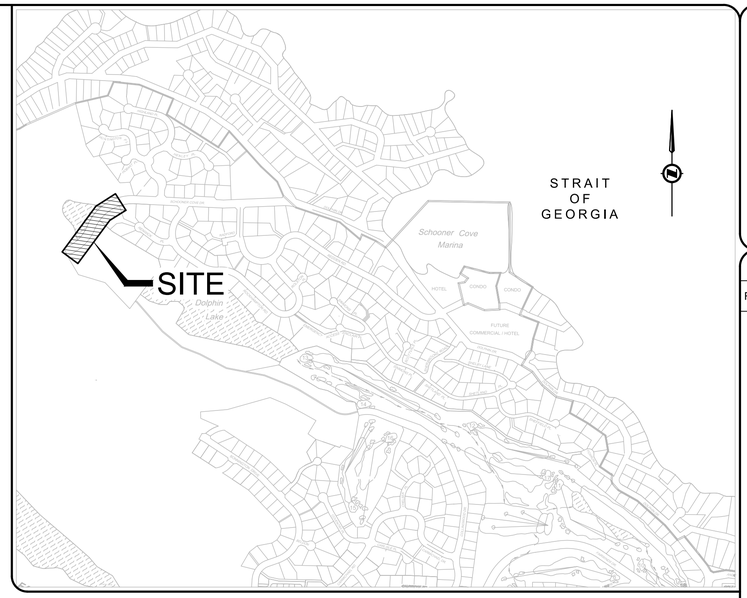
1. A GEOTECHNICAL ENGINEER RETAINED BY THE OWNER MAY CONDUCT INTERMITTENT TESTING AND QUALITY CONTROL DURING THE PREPARATION OF SUBGRADE AND CONSTRUCTION OF THE DESIGN ROAD STRUCTURE. FREQUENCY OF TESTING SHALL BE AS DETERMINED BY THE ENGINEER.
2. ALL ROAD SUBGRADE, SUBBASE, AND BASE STRUCTURES SHALL BE COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR DENSITY. COMPACTION FOR EACH LAYER OF SUBGRADE, SUBBASE AND BASE COURSE SHALL BE SPOT TESTED WITH A NUCLEAR DENSOMETER AND A FINAL PROOF ROLL SHALL BE PERFORMED WITH A CONTRACTORS SUPPLIED LOADED SINGLE AXLE TRUCK PRIOR TO THE PLACEMENT OF ASPHALT. THE ENGINEER SHALL BE GIVEN AT LEAST 24 HOURS NOTICE IN ADVANCE TO WITNESS A PROOF ROLL TEST.
3. ASPHALT PAVING OF THE ROAD BASE SHALL NOT BE COMPLETED UNTIL ALL UNDERGROUND WORKS HAVE BEEN COMPLETED AND ACCEPTED BY THE ENGINEER. FREQUENCY AND TESTING OF HOT MIX ASPHALT CORES SHALL BE AS DIRECTED BY THE ENGINEER.
4. ALL ROAD CUTS ON ASPHALT ROADWAYS SHALL BE TEMPORARILY PATCHED WITHIN 24 HOURS OF COMPLETION OF EXCAVATION, UNLESS OTHERWISE APPROVED BY THE ENGINEER. COLD-MIX TO BE USED FOR CUTS PERPENDICULAR TO THE ROAD.
5. CRACK SEALING OF ALL PAVEMENT JOINTS IS TO BE COMPLETED TO ALL CUT PAVEMENT EDGES, BEFORE THE FINAL ACCEPTANCE AND AGAIN PRIOR TO THE EXPIRY OF THE MAINTENANCE PERIOD.

EROSION AND SEDIMENT CONTROL NOTES

1. EROSION AND SEDIMENT CONTROL FOR THIS PROJECT WILL BE AS OUTLINED IN THE FISHERIES AND OCEANS CANADA AND MINISTRY OF ENVIRONMENT HANDBOOK ENTITLED "LAND DEVELOPMENT GUIDELINES FOR THE PROTECTION OF AQUATIC HABITAT, MAY 1992". IT IS INCUMBENT UPON THE CONTRACTOR TO ACQUIRE THESE GUIDELINES AND BECOME FAMILIAR WITH THE REQUIREMENTS THEREIN.
2. TO PROTECT THE SOIL, WATER, AND VEGETATIVE RESOURCES OF THE DEVELOPMENT, ONLY THOSE AREAS NECESSARY TO CONSTRUCT THE WORKS AND SERVICES CONTAINED IN THE ENGINEERING DRAWINGS ARE TO BE DISTURBED.
3. PRIOR TO AND DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR CONTROLLING EROSION AND SEDIMENT TRANSFER BY UTILIZING SUCH MEASURES AS CONSTRUCTION OF INTERCEPTOR DITCHES, SILT FENCES, HAY BALE STRUCTURES, SEDIMENT CONTROL PONDS, SEDIMENT TRAPS, STAGED GRAVEL FILTERS, OR OTHER METHODS HE MAY DEEM NECESSARY TO PREVENT DISCHARGE OF SEDIMENT INTO WATER COURSES.
4. THE CONSULTANT ASSUMES NO RESPONSIBILITY FOR DAMAGES RESULTING FROM IMPROPER EROSION AND SEDIMENT CONTROL MEASURES UNDERTAKEN BY THE CONTRACTOR.
5. CONTRACTOR TO COMPLY WITH ALL APPLICABLE MINISTRY OF ENVIRONMENT AND MINISTRY OF FISHERIES AND OCEANS CANADA REQUIREMENTS AT ALL TIMES DURING CONSTRUCTION.
6. THE CONTRACTOR SHALL EXERCISE CAUTION TO ENSURE THAT SILTY WATER FROM CONSTRUCTION DOES NOT ENTER THE DOWNSTREAM DRAINAGE CHANNEL.

LEGEND

	EXISTING	DESCRIPTION	PROPOSED
WATERMAIN	W 200Ø PVC	WATERMAIN (SIZE NOTED)	
		WATER SERVICE & METER	
		FLUSH OUT	
		AIR VALVE	
		FIRE HYDRANT	
SANITARY	S 200Ø PVC	SANITARY SEWER (SIZE NOTED)	S 200Ø PVC
		SANITARY INSPECTION CHAMBER	
		SANITARY CLEANOUT	
		SANITARY MANHOLE	
	SFM 200 PVC	SANITARY FORCEMAIN (SIZE NOTED)	SFM 200Ø HDPE
STORM	D 200Ø PVC	STORM DRAIN (SIZE NOTED)	
		STORM INSPECTION CHAMBER	
		STORM CLEANOUT	
		STORM DRAIN MANHOLE	
		CATCH BASIN	
		CATCH BASIN - TYPE 2	
		DITCH/SWALE	
3rd PARTY UTILITIES	GAS 60Ø PE	GAS	
	UG HYDRO	U/G HYDRO ELECTRIC CONDUIT	
	U/G TEL	U/G TELEPHONE CONDUIT	
		TRAFFIC LIGHT	
		ELECT. JUNCTION BOX	
		UTILITY POLE	
ROAD AND SIDEWALK		STREET LIGHT	
		SIGN	
		EDGE OF PAVEMENT	
	ECC	EXTRUDED CONCRETE CURB	
	NMC	NON-MOUNTABLE CURB	
	MC	MOUNTABLE CURB	
		CONCRETE SIDEWALK	
LANDSCAPING / SURFACE TREATMENT		TOP OF BERM	
		TOE OF BERM	
	X	FENCE	
		TREE/TREELINE	



LOCATION PLAN

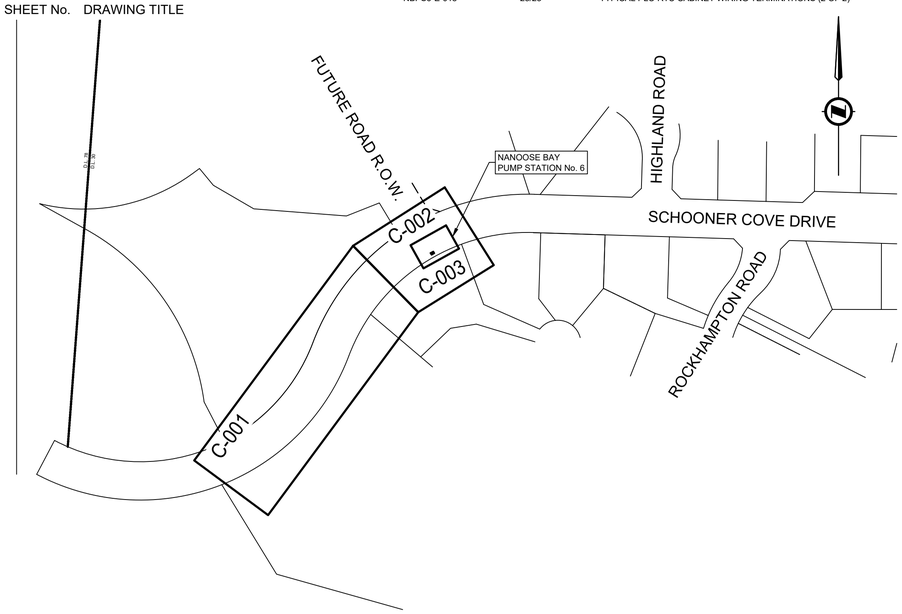
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DRAWING LIST

DWG. No.	SHEET No.	DRAWING TITLE
NBPS6-G-001	1/28	KEY PLAN LOCATION PLAN, DRAWING LIST, LEGEND, AND GENERAL NOTES
NBPS6-C-001	2/28	SANITARY FORCEMAIN - PLAN AND PROFILE STA. 1+000 TO 1+160
NBPS6-C-002	3/28	SANITARY SEWER AND FORCEMAIN - PLAN AND PROFILES STA. 1+160 TO 1+220 / STA. 1+300 TO 1+360
NBPS6-C-003	4/28	SANITARY PUMP STATION - SITE PLANS AND SECTIONS
NBPS6-C-004	5/28	MISCELLANEOUS DETAILS
NBPS6-M-001	6/28	MECHANICAL PLAN, COMPONENT LIST, SECTION AND DETAILS
NBPS6-M-002	7/28	MECHANICAL SECTIONS
NBPS6-S-001	8/28	STRUCTURAL GENERAL NOTES
NBPS6-S-002	9/28	STRUCTURAL GENERAL NOTES
NBPS6-S-003	10/28	STRUCTURAL PLAN AND SECTIONS

DWG. No.	SHEET No.	DRAWING TITLE
NBPS6-E-001	11/28	LEGEND AND GENERAL NOTES
NBPS6-E-002	12/28	SITE PLAN
NBPS6-E-003	13/28	DETAILS
NBPS6-E-004	14/28	KIOSK (1 OF 3)
NBPS6-E-005	15/28	KIOSK (2 OF 3)
NBPS6-E-006	16/28	KIOSK (3 OF 3)
NBPS6-E-007	17/28	POWER DISTRIBUTION - SINGLE LINE DIAGRAM
NBPS6-E-008	18/28	COMMUNICATION AND INSTRUMENTATION BLOCK DIAGRAM
NBPS6-E-009	19/28	CONTROLS (1 OF 7)
NBPS6-E-010	20/28	CONTROLS (2 OF 7)
NBPS6-E-011	21/28	CONTROLS (3 OF 7)
NBPS6-E-012	22/28	CONTROLS (4 OF 7)
NBPS6-E-013	23/28	CONTROLS (5 OF 7)
NBPS6-E-014	24/28	CONTROLS (6 OF 7)
NBPS6-E-015	25/28	CONTROLS (7 OF 7)
NBPS6-E-016	26/28	RTU IO
NBPS6-E-017	27/28	TYPICAL PLC-RTU CABINET WIRING TERMINATIONS (1 OF 2)
NBPS6-E-018	28/28	TYPICAL PLC-RTU CABINET WIRING TERMINATIONS (2 OF 2)

DWG. No.	SHEET No.	DRAWING TITLE



KEY PLAN

SCALE 1:2000

1:2,000 0 40 120m

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RECORD OF REVISIONS

REV	DATE	BY	ENG	DESCRIPTION

NOT FOR CONSTRUCTION

B	26JUL23	CACH	CJM	TENDER
A	27MAR23	CACH	CJM	75% DESIGN REVIEW

ISS	DATE	BY	ENG	DESCRIPTION

RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — C. J. MORRIS # 57052 — ENGINEERING

PERMIT TO PRACTICE No. 1001658

PROJECT NO.	2231
DRAWN	CACH
DESIGNED	CJM
CHECKED	CJM / MB
APPROVED	CD
DATE	DECEMBER 2022
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY PUMP STATION No. 6 UPGRADE AND SANITARY FORCEMAIN REPLACEMENT

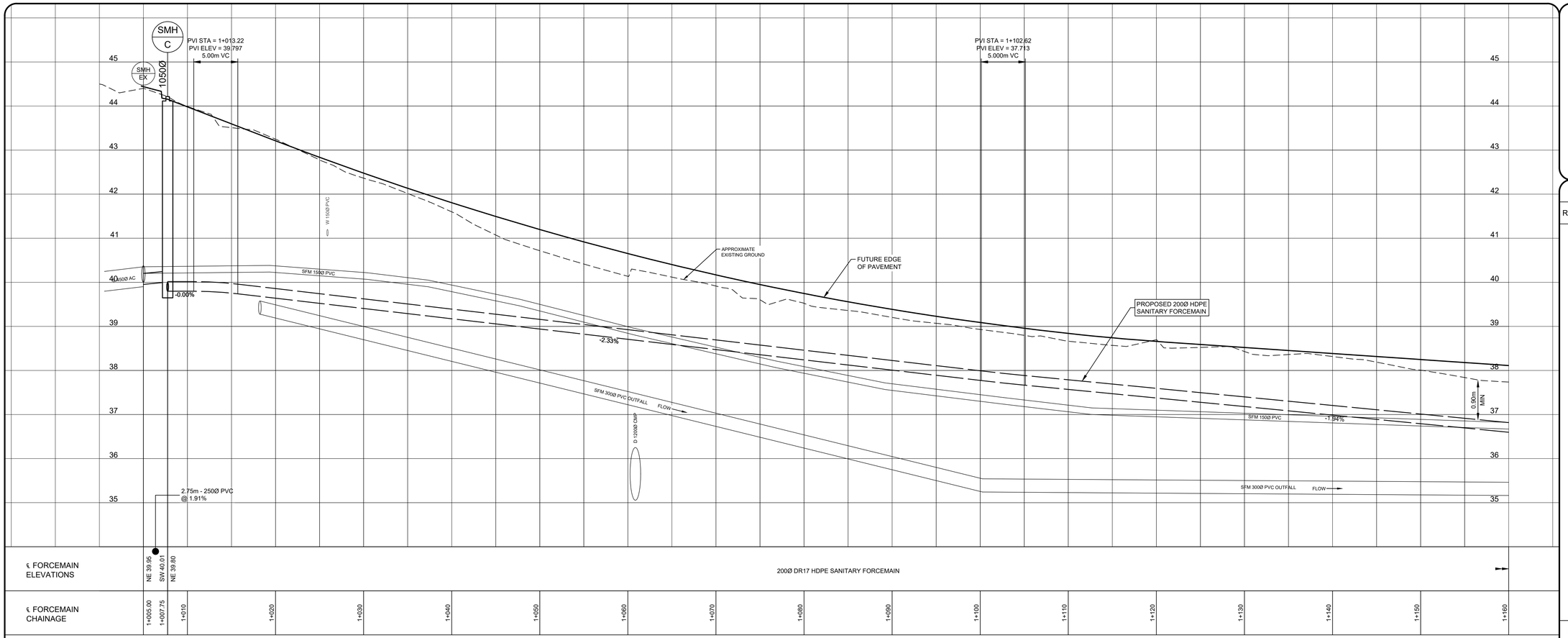
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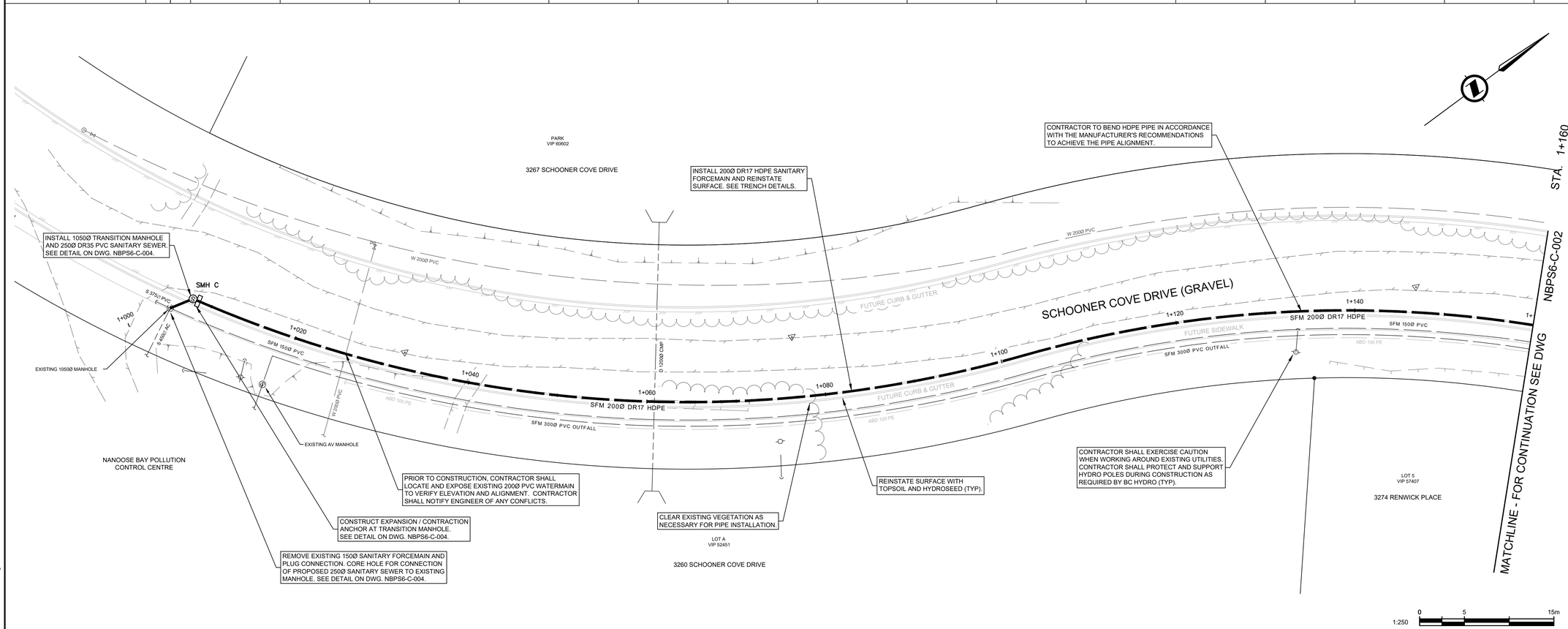
KEY PLAN, LOCATION PLAN, DRAWING LIST, LEGEND, AND GENERAL NOTES

KOERS DWG. No. 2231-01

DRAWING No.	REV.	SHEET
NBPS6-G-001	B	1 /28

File: 2231-01 to 05.dwg Plot Time: Jul 26, 2023 - 10:24am User: chearn





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RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA C. J. MORRIS # 57052 SURVEYOR OF LAND ENGINEER

PERMIT TO PRACTICE No. 1001658

PROJECT NO.	2231
DRAWN	CACH
DESIGNED	CJM
CHECKED	CJM / MB
APPROVED	CD
DATE	DECEMBER 2022
SCALE	1:250 H / 1:50 V

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY
PUMP STATION No. 6
UPGRADE AND
SANITARY FORCEMAIN
REPLACEMENT

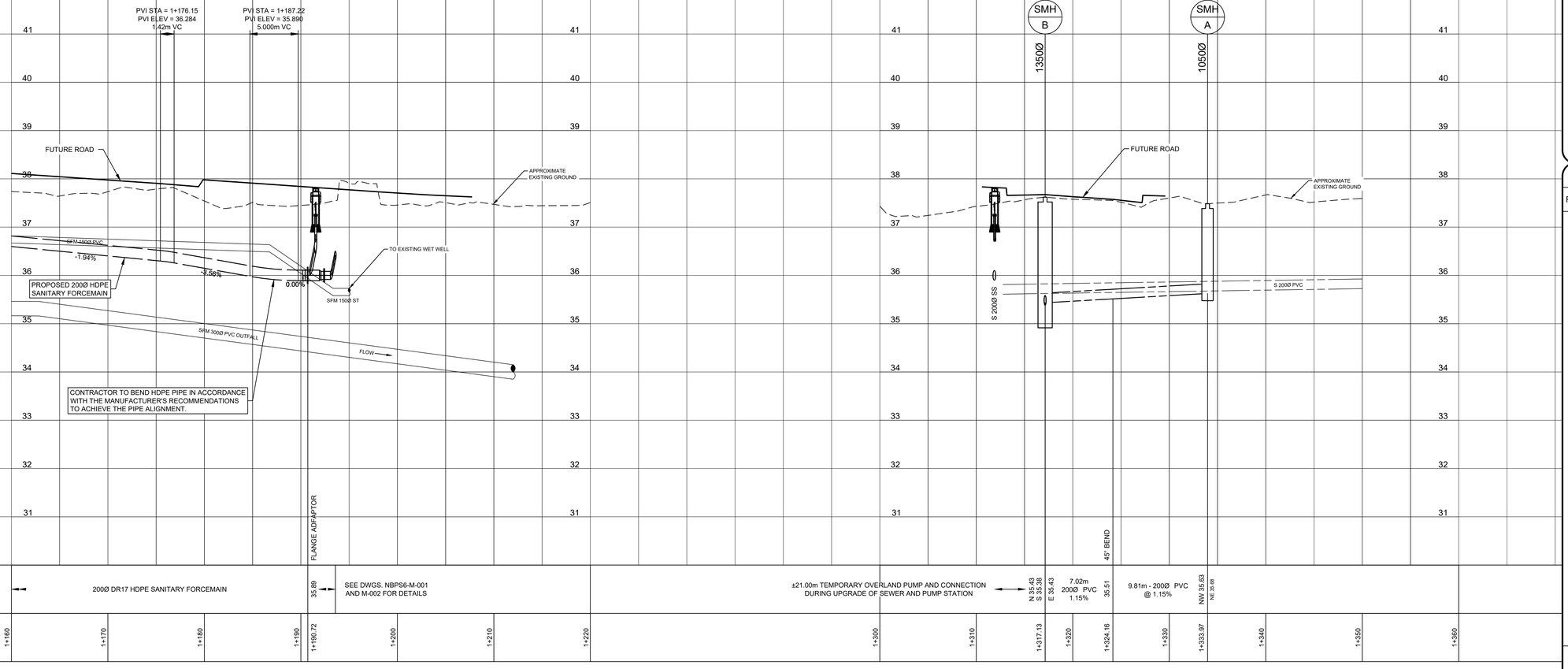
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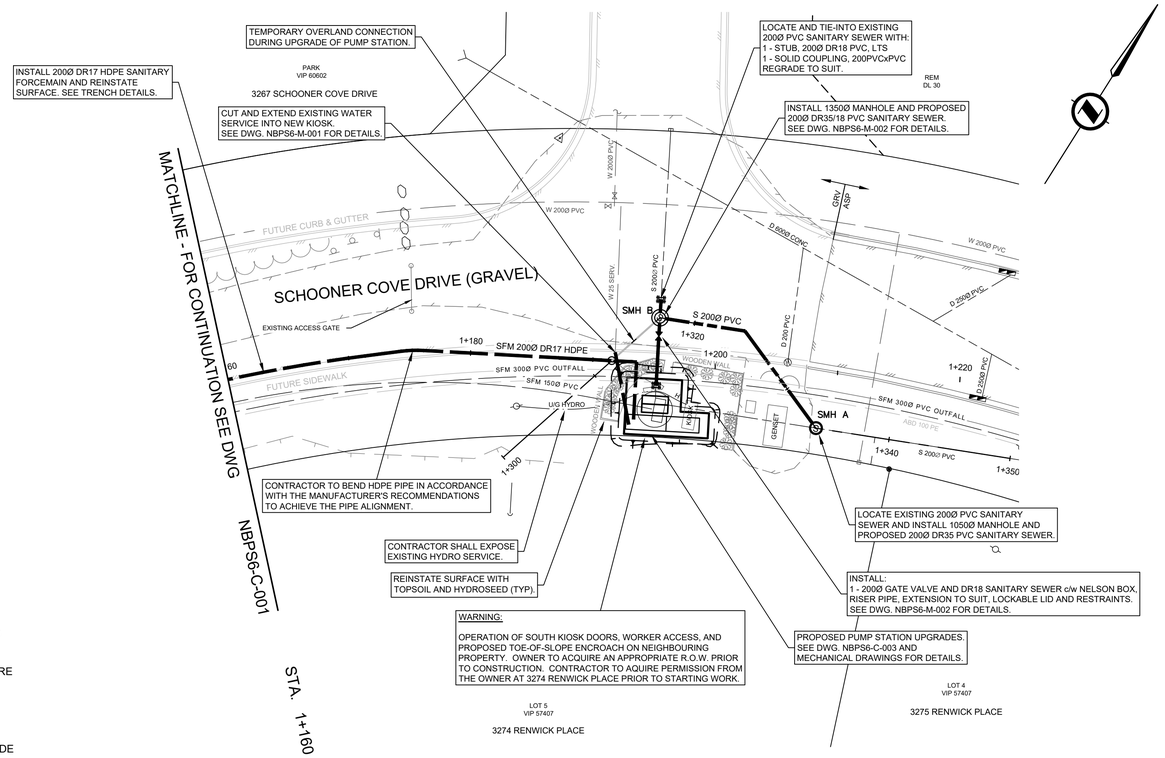
SANITARY FORCEMAIN
PLAN & PROFILE
STA. 1+000 TO 1+160

KOERS DWG. No. 2231-02

DRAWING No.	REV.	SHEET
NBPS6-C-001	B	2/28

File: 2231-01 to 05.dwg Plot Time: Jul 26, 2023 - 10:26am User: chearn





NOTES:

1. CONTRACTOR SHALL DEVELOP AND IMPLEMENT PROPER WORK SEQUENCING TO MINIMIZE THE TIME PUMP STATION No. 6 IS OPERATING UNDER THE BYPASS PUMPING AND SEQUENCING PLAN.
2. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL PUMP DOWN THE WET WELL, AND CO-ORDINATE WITH THE RDN TO VERIFY PUMP MOUNTING CONFIGURATIONS. THE CONTRACTOR SHALL WORK WITH THE PUMP SUPPLIER AND SUBMIT A PLAN SHOWING ANCHOR BOLTS. SEE SPECIFICATIONS FOR DETAILS.
3. ALL HDPE FITTINGS SHALL BE MANUFACTURED TO HAVE THE SAME MINIMUM PRESSURE RATING AS THE PIPE IT IS FUSED TO.
4. CONTRACTOR TO MAINTAIN ACCESS FOR RDN STAFF TO PUMP STATION FOR THE DURATION OF CONSTRUCTION.
5. ALL MANHOLES AND VALVE BOXES LOCATED OUTSIDE OF PAVED AREAS SHALL INCLUDE 1.5m WIDE ASPHALT SURROUND.

1:250 0 5 15m

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B	26JUL23	CACH	CJM	TENDER
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RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER — C. J. MORRIS # 57052 — PROVINCE OF BRITISH COLUMBIA — ENGINEER

PERMIT TO PRACTICE No. 1001658

PROJECT NO.	2231
DRAWN	CACH
DESIGNED	CJM
CHECKED	CJM / MB
APPROVED	CD
DATE	DECEMBER 2022
SCALE	1:250 H / 1:50 V

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

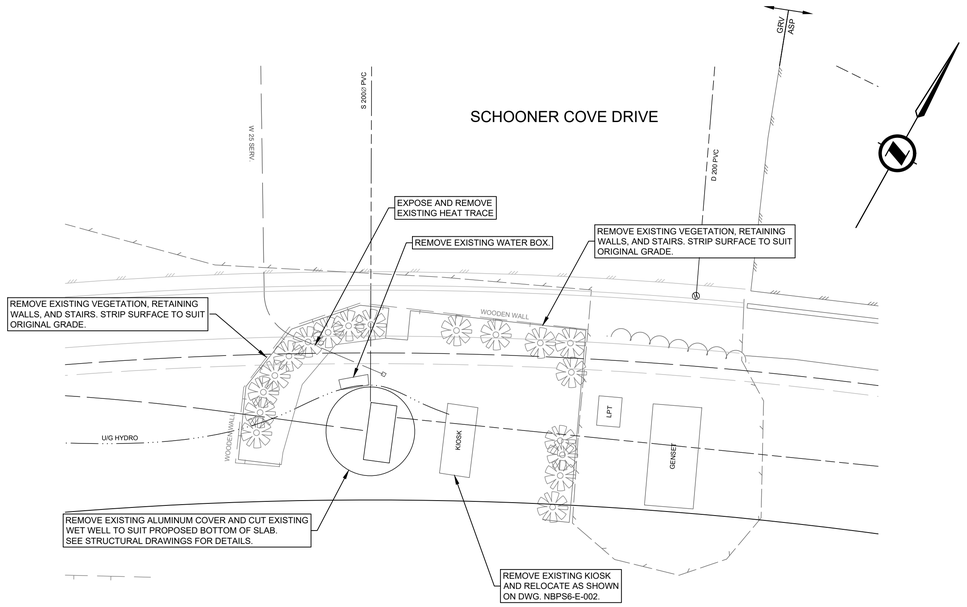
NANOOSE BAY
PUMP STATION No. 6
UPGRADE AND
SANITARY FORCEMAIN
REPLACEMENT

TITLE

SANITARY SEWER
AND FORCEMAIN
PLAN & PROFILES
STA. 1+160 TO 1+220
STA. 1+300 TO 1+360
KOERS DWG. No. 2231-03

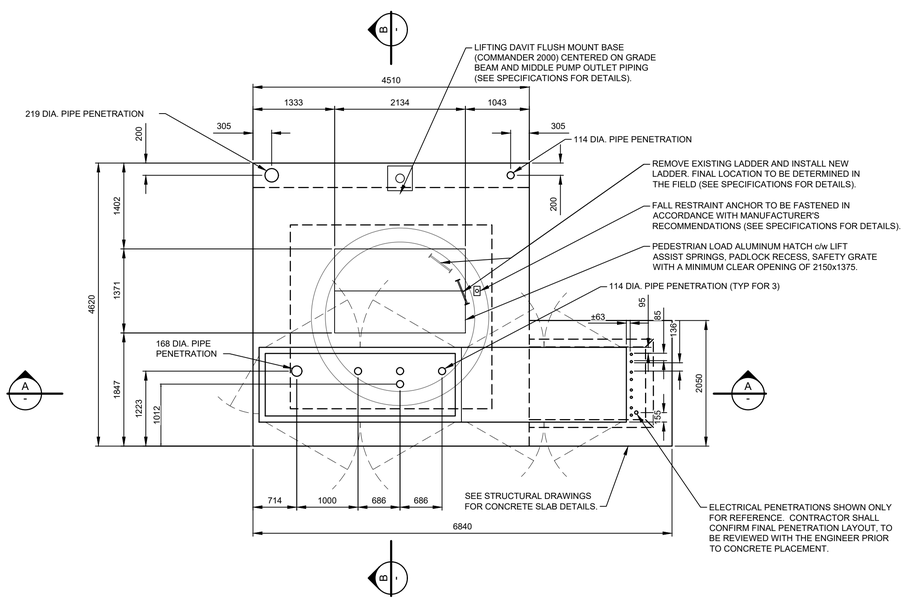
DRAWING No.	REV.	SHEET
NBPS6-C-002	B	3/28

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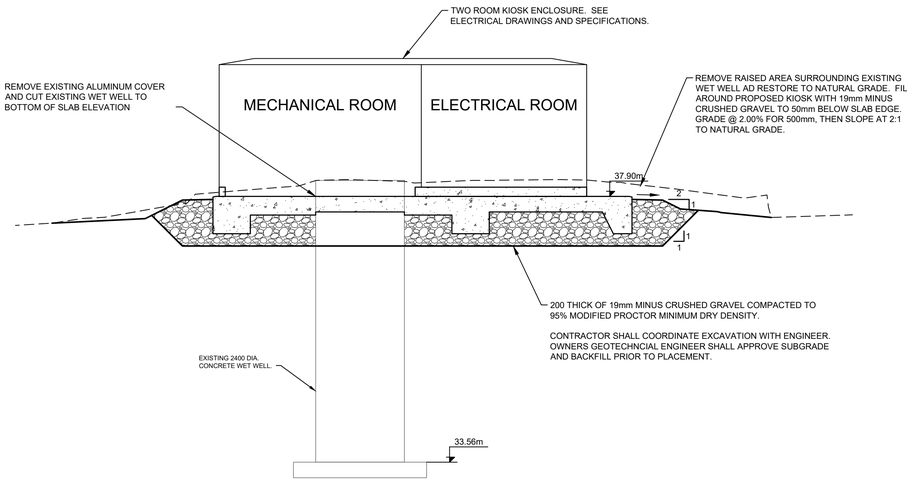
EXISTING REMOVALS PLAN

SCALE 1:100



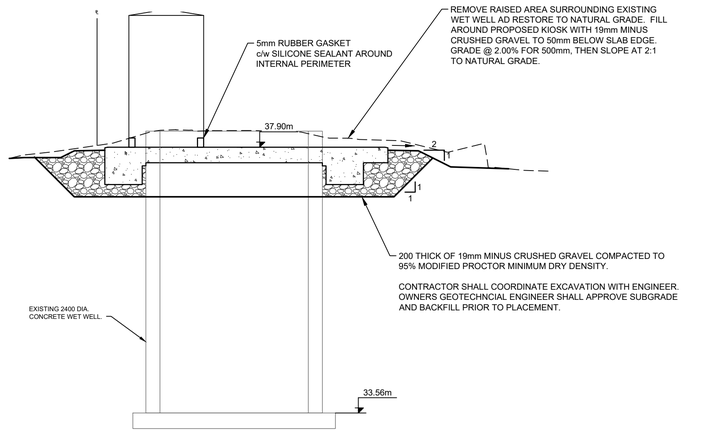
PROPOSED SLAB PLAN

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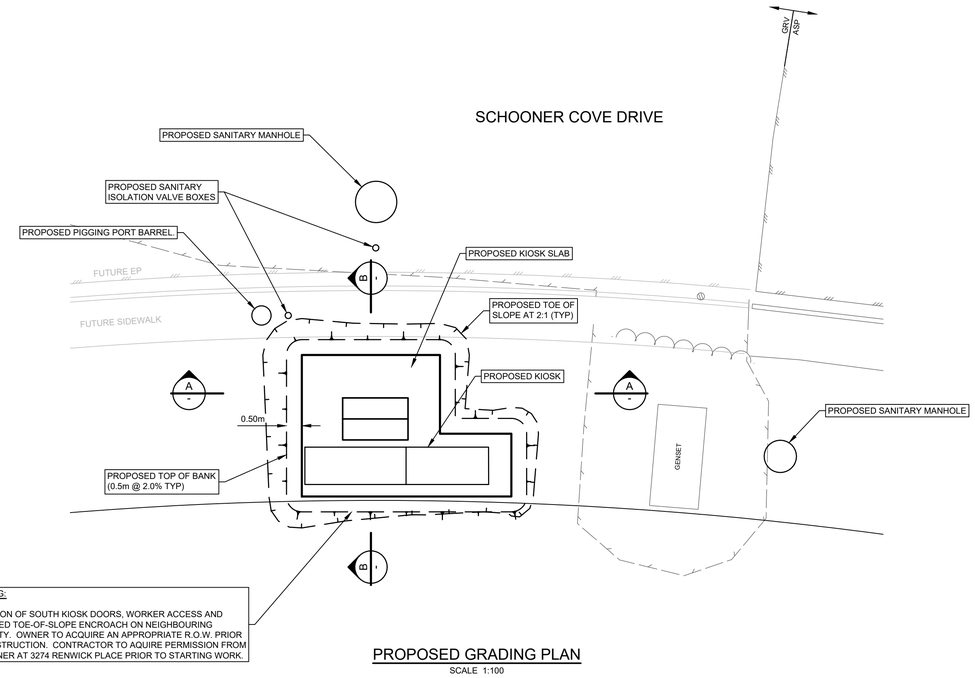
A SECTION

SCALE 1:50



B SECTION

SCALE 1:50



PROPOSED GRADING PLAN

SCALE 1:100

1:100 0 2 6m

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PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA C. J. MORRIS # 57052 ENGINEER

PERMIT TO PRACTICE No. 1001658

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DATE	DECEMBER 2022
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REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY
PUMP STATION No. 6
UPGRADE AND
SANITARY FORCEMAIN
REPLACEMENT

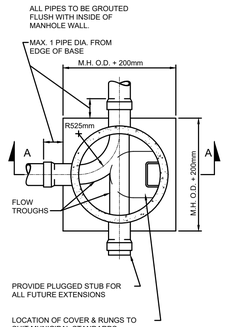
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SANITARY PUMP STATION
SITE PLANS
AND SECTIONS

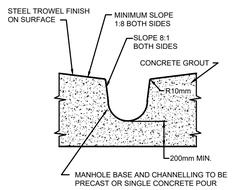
KOERS DWG. No. 2231-04

DRAWING No.	REV.	SHEET
NBPS6-C-003	B	4 /28

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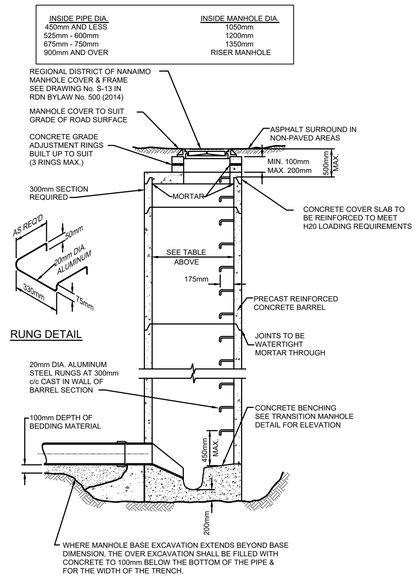


PLAN



INVERT CHANNELLING IN MANHOLE

INSIDE PIPE DIA.	INSIDE MANHOLE DIA.
450mm AND LESS	1050mm
525mm - 600mm	1200mm
675mm - 750mm	1350mm
900mm AND OVER	RISER MANHOLE



RUNG DETAIL

SECTION A-A
TYPICAL MANHOLE

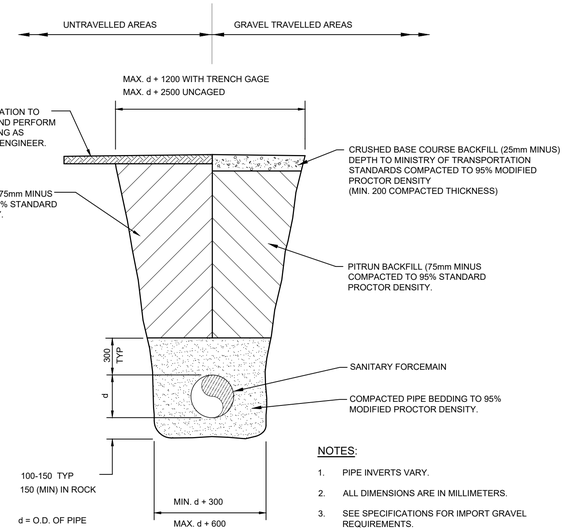
PRECAST REINFORCED CONCRETE BARREL TO ASTM C-478

NOTE:

WHERE EXISTING SANITARY SEWER MANHOLES ARE BEING REMOVED, REMOVE EXISTING BASE AND CONCRETE SURROUND AND PLACE CONTROL DENSITY FILL BELOW SPRING LINE 1.0m UPSTREAM AND DOWNSTREAM OF REMOVED STRUCTURE.

STANDARD PRECAST MANHOLE

N.T.S.

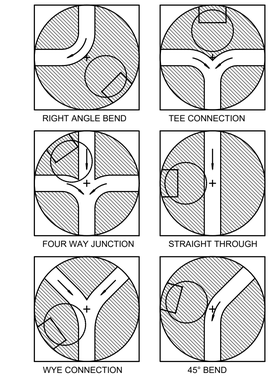


NOTES:

1. PIPE INVERTS VARY.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. SEE SPECIFICATIONS FOR IMPORT GRAVEL REQUIREMENTS.
4. ALL BACKFILL AND TRENCH RESTORATION SHALL BE IN ACCORDANCE WITH MoTI STANDARDS.

SANITARY SEWER TRENCH SECTION

N.T.S.

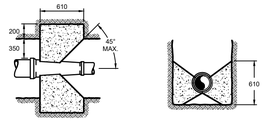


NOTES

1. ALL CHANNELS SHALL BE FINISHED WITH A STEEL TROWEL. BENCHING (SHADED AREAS) SHALL BE BROOM FINISHED.
2. MANHOLE RUNG LOCATIONS SHALL BE AS SHOWN UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS.

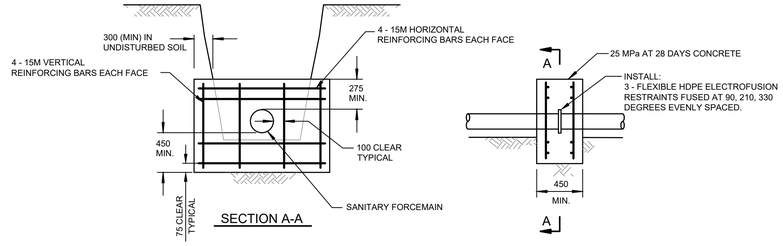
TYPICAL MANHOLE LAYOUT

N.T.S.



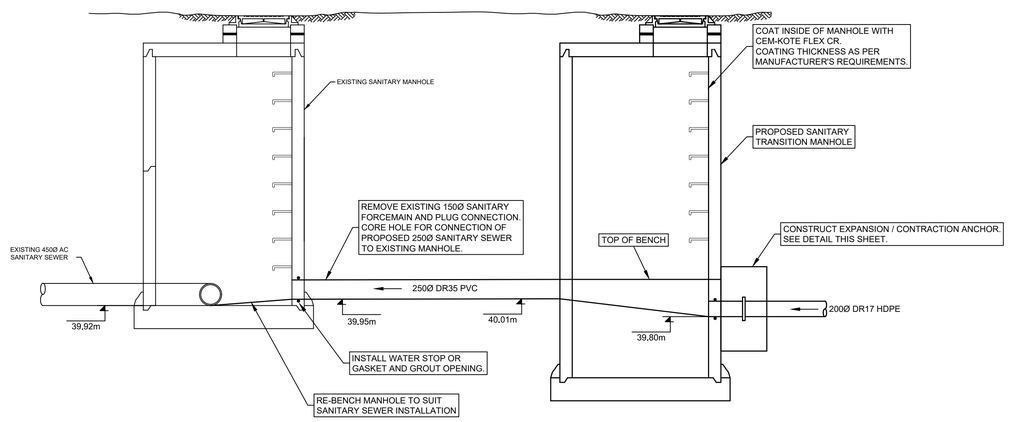
THRUST BLOCK DETAILS

MINIMUM THRUST AREAS FOR FITTINGS AT 1030kN/m² PRESSURE AND FOR SOILS WITH A MINIMUM BEARING OF 96kN/m²



EXPANSION / CONTRACTION ANCHOR DETAIL

N.T.S.



TRANSITION MANHOLE DETAIL

N.T.S.

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Consulting Engineers
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Parksville, BC V9P 2G8 www.koers-eng.com Fax: 250-248-5362

RECORD OF REVISIONS

REV	DATE	BY	ENG	DESCRIPTION

NOT FOR CONSTRUCTION

ISS	DATE	BY	ENG	DESCRIPTION
B	26JUL23	CACH	CJM	TENDER
A	27MAR23	CACH	CJM	75% DESIGN REVIEW

RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA C. J. MORRIS # 57052 ENGINEER

PERMIT TO PRACTICE No. 1001658

PROJECT NO.	2231
DRAWN	CACH
DESIGNED	CJM
CHECKED	CJM / MB
APPROVED	CD
DATE	DECEMBER 2022
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY PUMP STATION No. 6 UPGRADE AND SANITARY FORCEMAIN REPLACEMENT

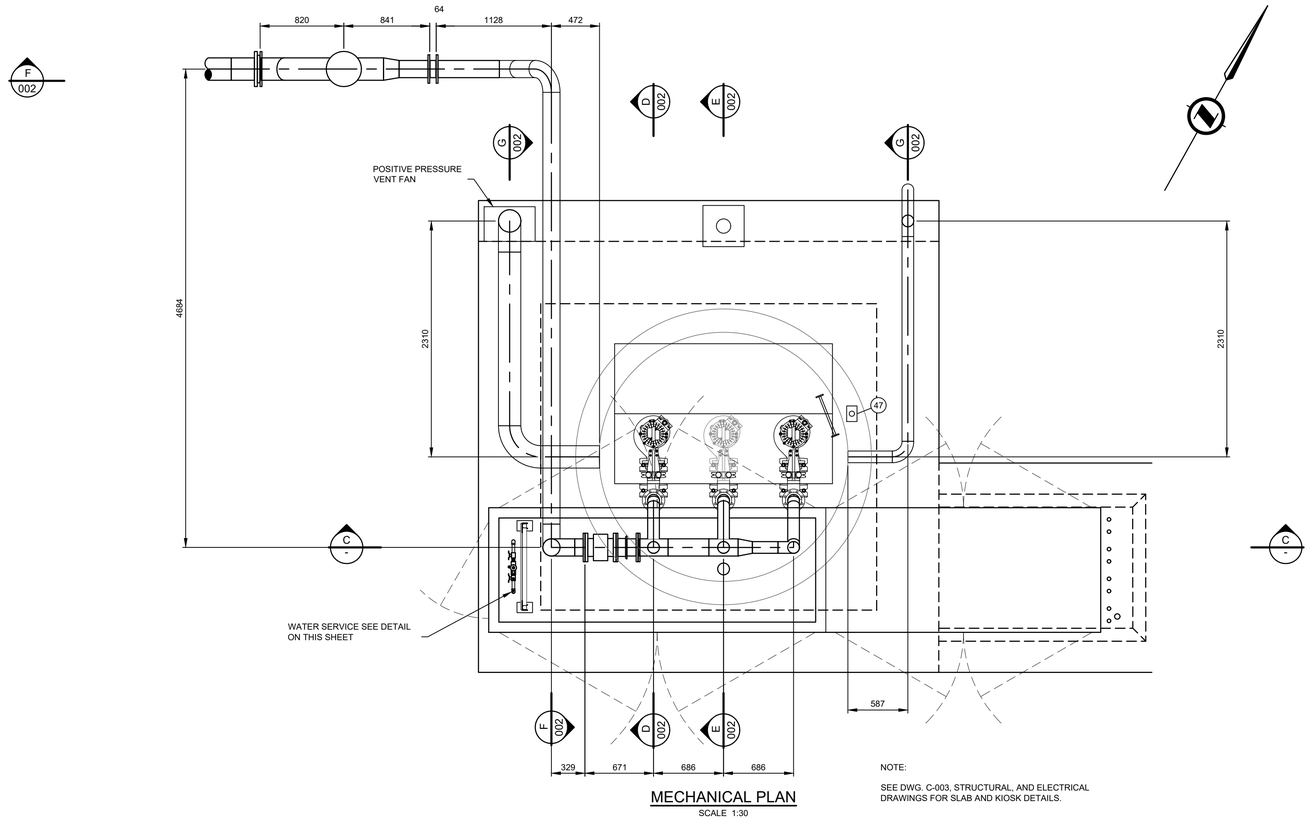
TITLE

MISCELLANEOUS DETAILS

KOERS DWG. No. 2231-05

DRAWING No.	REV.	SHEET
NBPS6-C-004	B	5 /28

File: 2231-01 to 05.dwg Plot Time: Jul 26, 2023 - 10:30am User: chearn



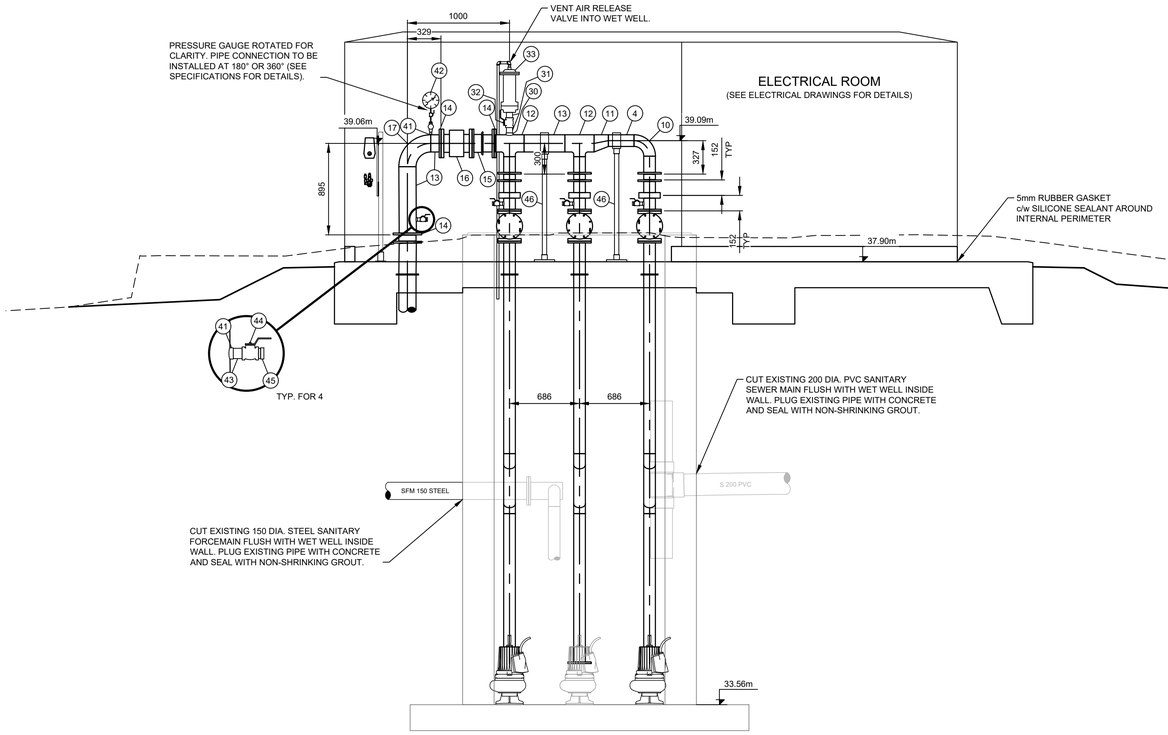
MECHANICAL PLAN
SCALE 1:30

NOTE:

SEE DWG. C-003, STRUCTURAL, AND ELECTRICAL DRAWINGS FOR SLAB AND KIOSK DETAILS.

COMPONENT LIST

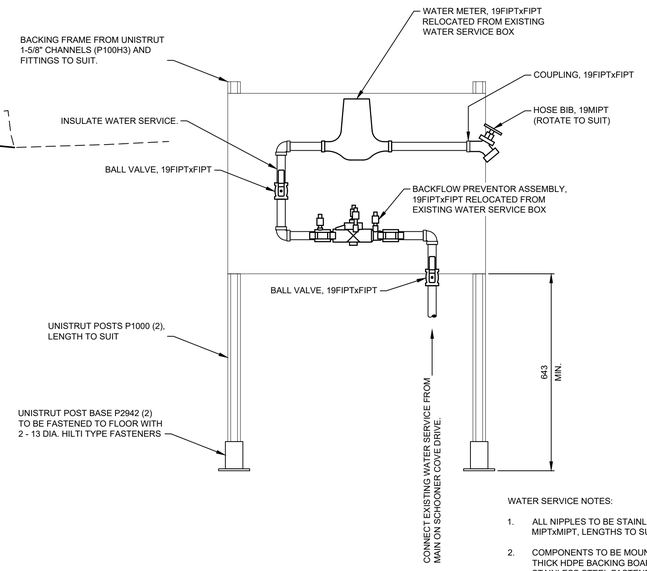
ITEM No.	DESCRIPTION	QUANTITY
1	SEWAGE LIFT PUMP (RE-USE EXISTING, SEE SPECIFICATIONS)	OWNER SUPPLIED
2	DISCHARGE CONNECTION, 100F c/w LIFTING CHAIN, CHAIN CONNECTOR, GUIDE BARS, AND UPPER GUIDE BAR HOLDER (SEE SPECIFICATIONS)	3
3	SLIP-ON RING FLANGE, 100 DIA. AWWA C228 CLASS SD STAINLESS STEEL	16
4	PIPE, 100 DIA. SCH 40 STAINLESS STEEL 316L	TO SUIT
5	LONG RADIUS 45° BEND, 100 DIA. SCH 40 STAINLESS STEEL 316L	6
6	THRUST RING, 25 WIDE x 10 THICK, STAINLESS STEEL	4
7	CHECK VALVE, 100FxF (APCO CVS SERIES 250, SEE SPECIFICATIONS)	3
8	COUPLING, 100GxG (VICTAULIC MODEL 489 SHOWN, SEE SPECIFICATIONS)	3
9	KNIFE GATE VALVE, 100 DIA. WAFER STYLE (PMP MONO, SEE SPECIFICATIONS)	3
10	LONG RADIUS 90° BEND, 100 DIA. SCH 40 STAINLESS STEEL 316L	1
11	ECCENTRIC REDUCER, 150x100 SCH 40 STAINLESS STEEL 316L (COMMON CROWN)	1
12	REDUCING TEE, 150x100 SCH 40 STAINLESS STEEL 316L	2
13	PIPE, 150 DIA. SCH 40 STAINLESS STEEL 316L	TO SUIT
14	SLIP-ON RING FLANGE, 150 DIA. AWWA C228 CLASS SD STAINLESS STEEL	6
15	DISMANTLING JOINT, 150FxF (ROMAC INDUSTRIES DJ400 SHOWN)	1
16	ELECTROMAGNETIC FLOWMETER, 150FxF (SEE SPECIFICATIONS)	1
17	LONG RADIUS 90° BEND, 150 DIA. SCH 40 STAINLESS STEEL 316L	3
18	KNIFE GATE VALVE, 150 DIA. WAFER (PMP MONO, SEE SPECIFICATIONS)	2
19	LONG RADIUS 45° BEND, 150 DIA. SCH 40 STAINLESS STEEL 316L	1
20	NELSON BOX c/w RISER PIPE, EXTENSION TO SUIT, AND LOCKABLE LID	1
21	CONCENTRIC REDUCER, 200x150 SCH 40 STAINLESS STEEL 316L	1
22	FABRICATED WYE, 200 DIA. SCH40 STAINLESS STEEL 316L	1
23	SLIP-ON RING FLANGE, 200 DIA. AWWA C228 CLASS SD STAINLESS STEEL	2
24	LONG RADIUS 45° BEND, 200 DIA. SCH 40 STAINLESS STEEL 316L	1
25	PIPE, 200 DIA SCH 40 STAINLESS STEEL 316L	TO SUIT
26	BLIND FLANGE, 200 DIA. AWWA C228 CLASS SD STAINLESS STEEL DRILLED AND TAPPED TO 50FIPT	1
27	NIPPLE, 50MIPTxMIPT STAINLESS STEEL	TO SUIT
28	LOCKABLE BALL VALVE, 50FIPTxFIPT STAINLESS STEEL	1
29	PLUG, 50MIPT STAINLESS STEEL	1
30	THREADOLET, 50FIPT STAINLESS STEEL	1
31	NIPPLE, 50MIPTxG STAINLESS STEEL	TO SUIT
32	LOCKABLE BALL VALVE, 50GxG STAINLESS STEEL	1
33	AIR VALVE ASSEMBLY, 50FIPT (APCO S-400) c/w STAINLESS STEEL DISCHARGE PIPING AND VALVES (SEE SPECIFICATIONS)	1
34	PIPE, 100 DIA. SCH 10 STAINLESS STEEL 316L	TO SUIT
35	LONG RADIUS 90° BEND, 100 DIA. SCH 10 STAINLESS STEEL 316L	2
36	LONG RADIUS 180° RETURN, 100 DIA. SCH 10 STAINLESS STEEL 316L	1
37	ODOR CONTROL VALVE, 100F CONTINENTAL CARBON GROUP (WAGER MODEL 4-1800 INVERTED VENT SHOWN, SEE SPECIFICATIONS)	1
38	PIPE, 200 DIA SCH 10 STAINLESS STEEL 316L	TO SUIT
39	LONG RADIUS 90° BEND, 200 DIA. SCH 10 STAINLESS STEEL 316L	2
40	POSITIVE PRESSURE VENT FAN (SEE SPECIFICATIONS)	1
41	THREADLOET, 25FIPT STAINLESS STEEL 316L	5
42	FLUID FILLED PRESSURE GAUGE, 25MIPT c/w 25MIPTxFIPT ROOT VALVE (SEE SPECIFICATIONS)	1
43	NIPPLE, 25MIPTxMIPT STAINLESS STEEL	TO SUIT
44	LOCKABLE BALL VALVE, 25FIPTxFIPT STAINLESS STEEL	4
45	PLUG, 25MIPT STAINLESS STEEL	4
46	ADJUSTABLE PIPE SUPPORT (STANDON MODEL C92 CLAMP STYLE)	2
47	FALL ARREST ANCHOR (DBI SALA FLOORMOUNT SLEEVE 8518347)	1
48	FLOOR DRAIN, 100 DIA. FIPT STAINLESS STEEL c/w PVC STUB AND MECHANICAL PLUG	1



NOTE:

ALL BURIED STAINLESS STEEL PIPE, FLANGES, AND FITTINGS TO BE WRAPPED IN DENSO TAPE.

C - SECTION
SCALE 1:30



WATER SERVICE NOTES:

1. ALL NIPPLES TO BE STAINLESS STEEL, MIPTxMIPT, LENGTHS TO SUIT.
2. COMPONENTS TO BE MOUNTED ON 10mm THICK HDPE BACKING BOARD USING STAINLESS STEEL FASTENERS AND SUPPORTS.

1 - WATER SERVICE DETAIL
SCALE 1:10

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RECORD OF REVISIONS

REV	DATE	BY	ENG	DESCRIPTION
B	26JUL23	CACH	CJM	TENDER
A	27MAR23	CACH	CJM	75% DESIGN REVIEW

NOT FOR CONSTRUCTION

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ISS	DATE	BY	ENG	DESCRIPTION

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA C. J. MORRIS # 57052 ENGINEERING

PERMIT TO PRACTICE No. 1001658

PROJECT NO.	2231
DRAWN	CACH
DESIGNED	CJM
CHECKED	CJM / MB
APPROVED	CD
DATE	DECEMBER 2022
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY PUMP STATION No. 6 UPGRADE AND SANITARY FORCEMAIN REPLACEMENT

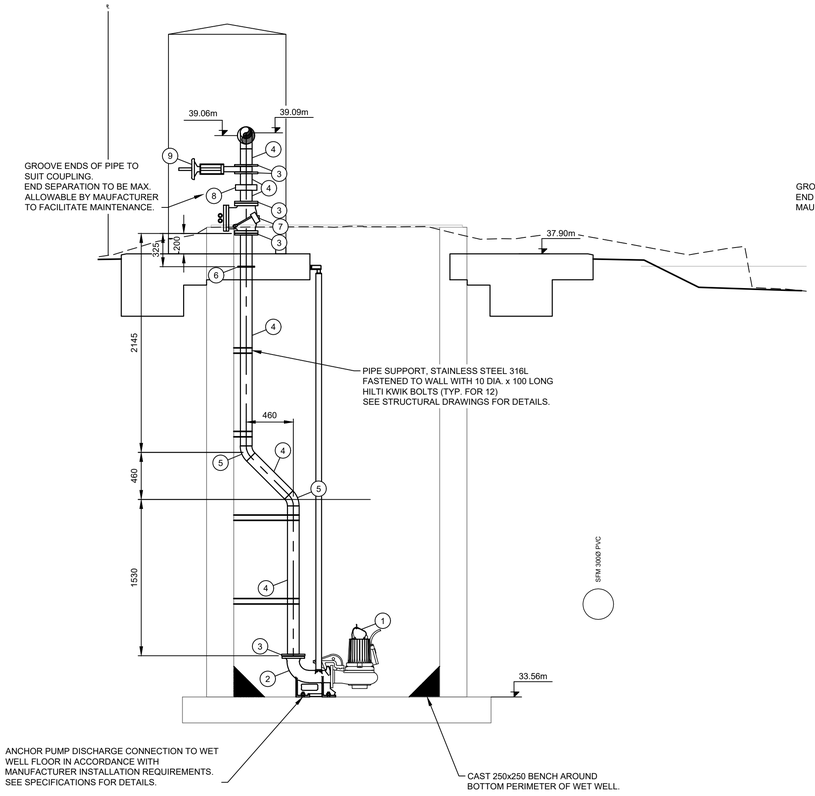
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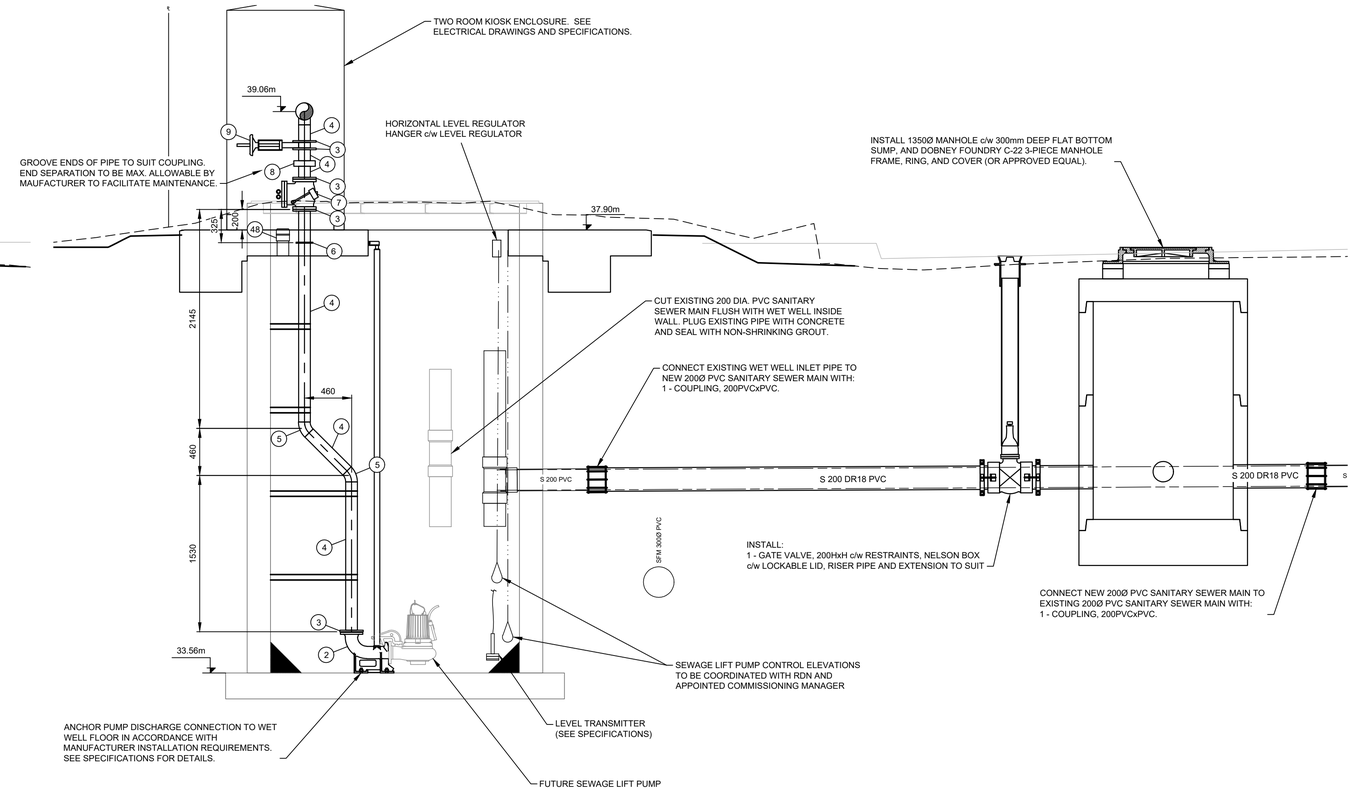
MECHANICAL PLAN, COMPONENT LIST, SECTION AND DETAILS

KOERS DWG. No. 2231-101

DRAWING No.	REV.	SHEET
NBPS6-M-001	B	6 /28

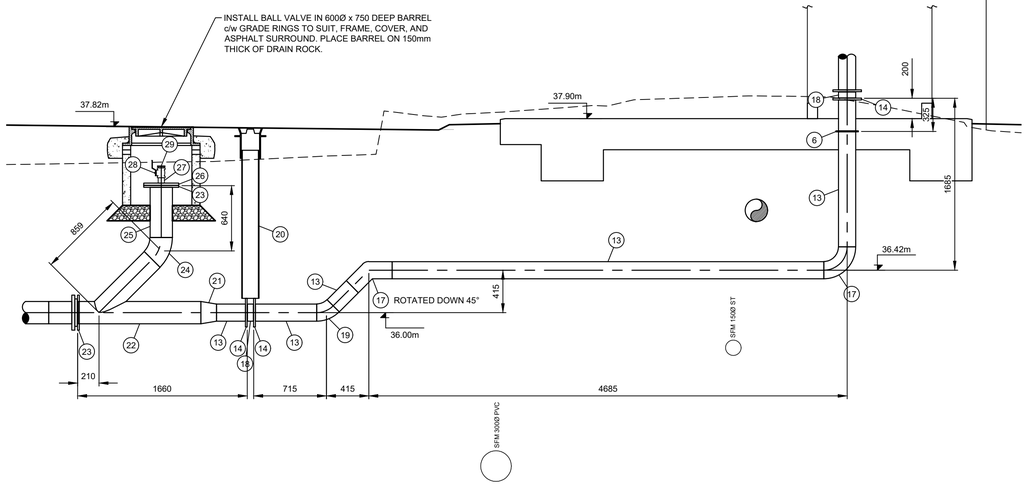
File: 2231-101 to 102.dwg Plot Time: Jul 26, 2023 - 10:33am User: chearn

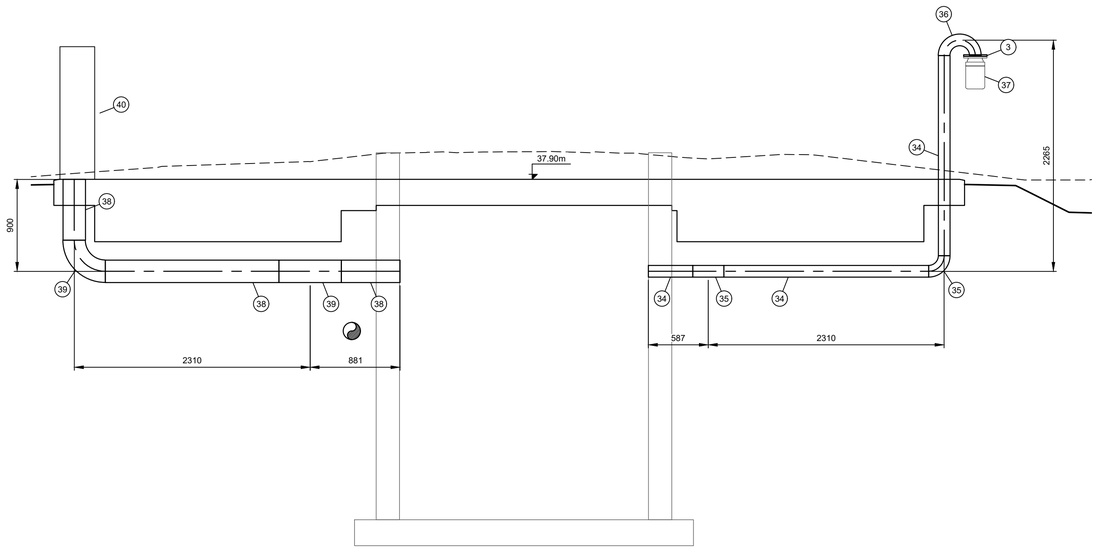




D 001 SECTION (TYP. FOR 2)
SCALE 1:30

E 001 SECTION
SCALE 1:30





F 001 SECTION
SCALE 1:30

G 001 SECTION
SCALE 1:30

NOTE:

ALL BURIED STAINLESS STEEL PIPE, FLANGES, AND FITTINGS TO BE WRAPPED IN DENSO TAPE.

File: 2231-101 to 102.dwg Plot Time: Jul 26, 2023 - 10:45am User: chearn

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RECORD OF REVISIONS

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A	27MAR23	CACH	CJM	75% DESIGN REVIEW

RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BC C. J. MORRIS # 57052 SPECIALIZED IN MECHANICAL ENGINEERING

PERMIT TO PRACTICE No. 1001658

PROJECT NO.	2231
DRAWN	CACH
DESIGNED	CJM
CHECKED	CJM / MB
APPROVED	CD
DATE	DECEMBER 2022
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY PUMP STATION No. 6 UPGRADE AND SANITARY FORCEMAIN REPLACEMENT

TITLE

MECHANICAL SECTIONS

KOERS DWG. No. 2231-102

DRAWING No.	REV.	SHEET
NBPS6-M-002	B	7 /28

GENERAL

1. THE STRUCTURAL DESIGN HAS BEEN COMPLETED IN ACCORDANCE WITH THE GOVERNING BUILDING CODE AND ADDENDA.

2. STRUCTURAL DESIGN CRITERIA:

NANOOSE BAY			2018 BRITISH COLUMBIA BUILDING CODE				
SNOW LOAD CRITERIA			SEISMIC DATA		SEISMIC LOAD CRITERIA		
Ss	2.10 kPa (43.86psf)		Sa(0.2)	1.02	CONCRETE SHEAR WALLS		
Sr	0.40 kPa (8.35 psf)		Sa(0.5)	0.942	Rd	Ro	Ie
Is	ULS	SLS	Sa(1.0)	0.542	-	-	1.5
	1.25	0.9	Sa(2.0)	0.328	WOOD BASED PANEL SHEAR WALLS		
WIND LOAD CRITERIA			Sa(5.0)	0.104	-	-	1.5
q10	0.39 kPa (8.13 psf)		Sa(10.0)	0.037	GEOTECHNICAL CRITERIA		
q50	0.50 kPa (10.41 psf)				SOIL CAPACITY		SITE CLASS
Iw	ULS	SLS	PGA	0.446g	ULS	SLS	
	1.25	0.75	PGV	0.684	100 kPa	75kPa	-

3. ALL CODES AND STANDARDS ARE TO BE AS REFERENCED IN THE THE BUILDING CODE. WHERE STANDARDS ARE NOT REFERENCED, THE LATEST EDITION OF THE BUILDING CODES AND STANDARDS ARE TO BE REFERRED TO.

4. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE INCLUDING ALL ADDENDA, REFERENCED CODES AND FEDERAL AND MUNICIPAL REGULATIONS AND BYLAWS.

5. THE STRUCTURAL DOCUMENTS INCLUDING DIMENSIONING SHALL BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE STRUCTURAL ENGINEER FOR CLARIFICATION PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR ITEMS REFERRED TO IN OTHER DOCUMENTS THAT ARE NOT INDICATED IN THE STRUCTURAL DOCUMENTS.

6. REFER TO THE ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE SEPARATIONS, FIRE RATINGS AND ASSEMBLIES AS WELL AS ROOF AND FLOOR ELEVATIONS, SLOPES AND DRAIN LOCATIONS.

7. THE STRUCTURAL DOCUMENTS SHOW THE COMPLETED STRUCTURE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR ANY TEMPORARY BRACING AND SHORING THAT MAY BE REQUIRED DURING CONSTRUCTION.

8. THE CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF APPLICABLE IN ACCORDANCE WITH WORK SAFE BC REGULATIONS FOR THE DESIGN AND FIELD REVIEW OF ANY TEMPORARY SHORING, BRACING, SCAFFOLDING OR OTHER TEMPORARY STRUCTURES THAT MAY BE REQUIRED TO COMPLETE CONSTRUCTION. UNDER NO CIRCUMSTANCES ARE THE CONSTRUCTION LOADS IMPOSED BY TEMPORARY STRUCTURES TO EXCEED THE DESIGN LOADING INDICATED IN THE STRUCTURAL DOCUMENTS.

9. THE CONTRACTOR IS RESPONSIBLE FOR THE LAYOUT OF THE STRUCTURE INCLUDING STRUCTURAL COMPONENTS AND ASSEMBLIES.

10. UNDER NO CIRCUMSTANCES ARE THE STRUCTURAL DRAWINGS TO BE SCALED.

FIELD REVIEW

1. THE CONTRACTOR SHALL PROVIDE SORENSEN TRILOGY ENGINEERING LTD WITH A MINIMUM OF 24 HOURS (1 WORKING DAY) NOTICE FOR FIELD REVIEW.

2. FIELD REVIEWS ARE CARRIED OUT IN ORDER TO CONFIRM GENERAL CONFORMANCE WITH THE STRUCTURAL DOCUMENTS. FIELD REVIEWS DO NOT RELIEVE THE CONTRACTOR OR SUB-TRADES OF THEIR RESPONSIBILITY TO COMPLY WITH THE CONTRACT DOCUMENTS.

3. WORK WHICH HAS BEEN REVIEWED AND COMMENTED ON IS NOT NECESSARILY CONSIDERED COMPLETE AND MAY RECEIVE FURTHER COMMENTARY DURING FUTURE REVIEWS.

4. ALL WORK WHICH HAS BEEN DEEMED UNSATISFACTORY BY THE STRUCTURAL ENGINEER DUE TO POOR WORKMANSHIP, FAULTY MATERIALS, ERRORS OR OMISSIONS, NONCOMPLIANCE WITH PROJECT DOCUMENTS, OR OTHER CAUSES SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE STRUCTURAL ENGINEER. COST OF REMEDIATION OF UNSATISFACTORY WORK SHALL BE BORNE BY THE CONTRACTOR.

5. ALL WORK TO BE REVIEWED SHALL BE SUBSTANTIALLY COMPLETE AT TIME OF REVIEW. THE FOLLOWING ITEMS ARE CONSIDERED TO BE THE MINIMUM STRUCTURAL FIELD REVIEWS REQUIRED FOR THE PROJECT:

CONCRETE:
1. REINFORCING STEEL SHALL BE REVIEWED PRIOR TO PLACING CONCRETE.
2. REINFORCING IN CONCRETE WALLS AND COLUMNS SHALL BE REVIEWED PRIOR TO "BUTTONING UP" FORMS.
3. ALL EMBEDS ARE TO BE TIED INTO FINAL POSITION PRIOR TO FIELD REVIEW.
4. A COPY OF THE FIELD REVIEWS PERFORMED BY THE GEOTECHNICAL ENGINEER SHALL BE AVAILABLE ON SITE PRIOR TO SORENSEN TRILOGY ENGINEERING LTD COMMENCING A FIELD REVIEW.

MASONRY:
1. REINFORCING STEEL SHALL BE REVIEWED PRIOR TO PLACING GROUT.
2. VERTICAL AND HORIZONTAL REINFORCING SHALL BE IN PLACE AT THE TIME OF THE REVIEW.
3. ALL EMBEDS ARE TO BE TIED INTO FINAL POSITION PRIOR TO FIELD REVIEW.

STRUCTURAL STEEL:
1. STEEL WORK SHALL BE REVIEWED AFTER ALL MEMBERS HAVE BEEN FABRICATED AND ARE IN THEIR FINAL POSITION WITH CONNECTIONS COMPLETE.
2. A COPY OF THE FIELD REVIEW PERFORMED BY THE SPECIALTY ENGINEER SHALL BE AVAILABLE ON SITE PRIOR TO SORENSEN TRILOGY ENGINEERING LTD COMMENCING A FIELD REVIEW.
4. STEEL DECKING SHALL BE REVIEWED PRIOR TO PLACING CONCRETE OR COVERING.
5. ALL GROUT UNDER BASE PLATES IS TO BE PLACED PRIOR TO FIELD REVIEW.

TIMBER FRAMING
1. FLOOR AND ROOF DIAPHRAGMS SHALL BE REVIEWED PRIOR TO COVERING.
2. A COPY OF THE FIELD REVIEWS PERFORMED BY THE SPECIALTY ENGINEER SHALL BE AVAILABLE ON SITE PRIOR TO SORENSEN TRILOGY ENGINEERING LTD COMMENCING A FIELD REVIEW.
3. TIMBER FRAMING SHALL BE REVIEWED AFTER MECHANICAL AND ELECTRICAL IS SUBSTANTIALLY COMPLETE.

6. FIELD REVIEWS REQUIRED BY SPECIALTY ENGINEERS SHALL BE PROVIDED TO SORENSEN TRILOGY ENGINEERING LTD WITH WRITTEN CONFIRMATION THAT THE WORK IS SUBSTANTIALLY COMPLETE AND IN GENERAL CONFORMANCE WITH THE REVIEWED SHOP DRAWINGS. CONFIRMATION SHALL BE PROVIDED PRIOR TO SORENSEN TRILOGY ENGINEERING LTD PERFORMING ANY FIELD REVIEWS OF THE ASSOCIATED WORK.

7. MATERIAL TESTING REPORTS SHALL BE FORWARDED TO SORENSEN TRILOGY ENGINEERING LTD.

8. IF THE ENGINEER IS NOT PROVIDED WITH THE OPPORTUNITY TO PERFORM THE REQUIRED FIELD REVIEWS AND DOES NOT RECEIVE WRITTEN CONFIRMATIONS FROM THE SPECIALTY ENGINEERS FINAL CERTIFICATION OF THE PROJECT WILL NOT BE ISSUED.

STRUCTURAL SHOP DRAWINGS

1. AS REQUESTED IN THE GENERAL NOTES. THE CONTRACTOR SHALL SUPPLY THE STRUCTURAL ENGINEER WITH PDF SETS OF SHOP DRAWINGS FOR THE ENGINEERS REVIEW PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL INDICATE DETAILS, MATERIALS AND DESIGN LOADS AND INCLUDE REFERENCE MATERIAL AS SPECIFIED IN SPECIFIC GENERAL NOTE SECTIONS.

2. SHOP DRAWINGS SHALL BE SEALED BY A SPECIALTY ENGINEER REGISTERED IN THE APPLICABLE PROVINCE WHERE SO NOTED IN THE GENERAL NOTES.

3. THE FOLLOWING SUBMISSIONS ARE REQUIRED FOR THIS PROJECT:

CONCRETE MIX DESIGNS *
REINFORCING SHOP DRAWINGS
PREFABRICATED METAL STRUCTURE*

* INDICATES THE REQUIREMENT THAT THE SUBMISSION BE SEALED BY A SPECIALTY ENGINEER.

4. SHOP DRAWINGS WILL BE REVIEWED BY SORENSEN TRILOGY ENGINEERING LTD FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMANCE WITH THE PROJECT STRUCTURAL DRAWINGS AND SPECIFICATIONS. THE SHOP DRAWING REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWINGS OR OF THE RESPONSIBILITY TO MEET ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL CONFIRM ALL QUANTITIES AND DIMENSIONS AND COORDINATE ALL CONSTRUCTION AND THE WORK OF ALL SUB-TRADES.

5. SHOP DRAWINGS WHICH DO NOT HAVE THE REQUIRED SPECIALTY ENGINEER'S SEAL AND SIGNATURE WILL NOT BE REVIEWED.

6. THE SPECIALTY ENGINEER OR HIS REPRESENTATIVE SHALL VISIT THE SITE AND REVIEW THE COMPLETED WORK DESIGNED AND DETAILED ON HIS SHOP DRAWINGS TO SATISFY HIMSELF THAT THE FINISHED COMPONENTS AND ASSEMBLIES ARE IN COMPLIANCE WITH HIS DESIGN AND THE REVIEWED SHOP DRAWINGS. THE SPECIALTY ENGINEER SHALL PROVIDE THE STRUCTURAL ENGINEER WITH A COMPLETED SCHEDULE 'S' FOR THIS WORK ALONG WITH ANY SKETCHES INDICATING FIELD MODIFICATIONS. THESE SKETCHES SHALL BEAR THE SEAL AND SIGNATURE OF THE SPECIALTY ENGINEER.

FOUNDATIONS

1. FOUNDATIONS HAVE BEEN DESIGNED FOR THE FOLLOWING ASSUMED BEARING CAPACITIES (TO BE CONFIRMED BY A GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.

DESCRIPTION	ULT LIMIT STATES	SPEC LIMIT STATES	SEISMIC LOADING
FOOTINGS	100 kPa (2000 psf)	75 kPa (1500 psf)	ULS UNO

2. ALL FOOTINGS TO BE CENTERED BELOW WALLS AND COLUMNS UNLESS NOTED OTHERWISE.

3. FOOTING ELEVATIONS INDICATED ON THE STRUCTURAL DRAWINGS ARE FOR INFORMATION PURPOSES ONLY AND REPRESENT A MINIMUM DEPTH OF COVER.

4. FOUNDATION BEARING MATERIAL SHALL BE PROTECTED BEFORE AND AFTER CONCRETE PLACEMENT FROM RAIN, FROST, SNOW AND WATER INFILTRATION.

5. CLEAN ALL DAMAGED AND LOOSE MATERIAL BELOW FOOTINGS PRIOR TO FORMING AND PLACING CONCRETE.

6. WHEN REQUIRED BY SITE CONDITIONS AND AS DIRECTED BY THE GEOTECHNICAL ENGINEER, PLACE A GROUND SEAL BELOW FOOTINGS. GROUND SEALS ARE TO BE A MINIMUM OF 50mm (2") OF 10 MPa (1500 psi) CONCRETE UNLESS NOTED OTHERWISE BY THE GEOTECHNICAL ENGINEER.

7. FIRM BEARING DEPTHS FOR FOOTINGS AND FILL WILL BE ESTABLISHED BY THE GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION. ANY QUERIES REGARDING THE ESTABLISHMENT OF THE DEPTHS SHALL BE DIRECTED TO THE GEOTECHNICAL ENGINEER.

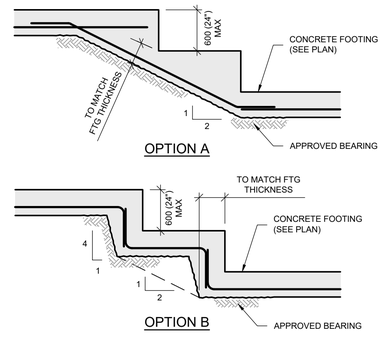
8. VARIABLE SITE CONDITIONS, UNDERGROUND SERVICES AND EXISTING STRUCTURES MAY REQUIRE ADJUSTMENT OF THE FOOTING ELEVATIONS AND/OR FOUNDATION DETAILS. THE CONTRACTOR SHALL MAKE ALLOWANCES FOR MINOR VARIANCES IN HIS BID ACCORDINGLY. THE CONTRACTOR SHALL CONTACT THE GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER WHEN SITE CONDITIONS SUBSTANTIALLY DIFFER FROM WHAT IS INDICATED ON THE STRUCTURAL DRAWINGS AND IN THE GEOTECHNICAL REPORT PRIOR TO COMMENCING FOUNDATION WORK.

9. THE CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF FOUNDATIONS WITH UNDERGROUND SERVICES AS INDICATED ON THE CIVIL, MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS. FOOTINGS SHALL NOT BE UNDERMINED BY SERVICE TRENCHES, PITS, ETC. CONFLICTS SHALL BE REPORTED TO THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO FORMING AND PLACING CONCRETE.

10. MINIMUM COMPACTION OF GRANULAR FILL MATERIAL BELOW ALL FOOTINGS AND SLABS SHALL BE IN ACCORDANCE WITH THE CIVIL DRAWINGS AND CONFIRMED BY THE GEOTECHNICAL ENGINEER. HOWEVER, UNDER NO CIRCUMSTANCES SHALL THE COMPACTION BELOW THE FOOTINGS AND SLABS BE LESS THEN 98% CORRECTED STANDARD PROCTOR DENSITY AND 95% CORRECTED STANDARD PROCTOR DENSITY RESPECTIVELY. MATERIAL TESTING REPORTS FOR BEARING MATERIAL SHALL BE FORWARDED TO SORENSEN TRILOGY ENGINEERING LTD PRIOR TO PLACING CONCRETE.

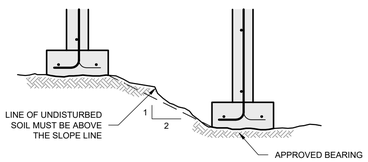
11. NO FOUNDATIONS SHALL BE POURED PRIOR TO THE REVIEW AND APPROVAL OF THE BEARING MATERIAL BY THE GEOTECHNICAL ENGINEER OF RECORD.

12. MAXIMUM SLOPE OF BEARING MATERIAL FOR STEPPED AND SLOPED FOOTINGS SHALL BE LIMITED TO 2:1 (HORIZONTAL:VERTICAL) UNLESS NOTED OTHERWISE IN WRITING BY THE GEOTECHNICAL ENGINEER. MAXIMUM VERTICAL SLOPE FOR STEPPED FOOTINGS SHALL BE LIMITED TO 1:4 (HORIZONTAL:VERTICAL) WITH STEPS SPACED IN ORDER TO MAINTAIN A 2:1 (HORIZONTAL:VERTICAL) BEARING SLOPE BETWEEN STEPS.

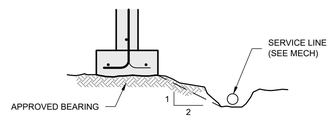


STEPPED FOOTING DETAIL
NTS

13. FOOTINGS AND SERVICES ADJACENT TO NEW OR EXISTING FOOTINGS SHALL BE POSITIONED SUCH THAT THE MAXIMUM SLOPE BETWEEN FOOTINGS AND SERVICES SHALL BE LIMITED TO 2:1 (HORIZONTAL:VERTICAL) UNLESS NOTED OTHERWISE IN WRITING BY THE GEOTECHNICAL ENGINEER.

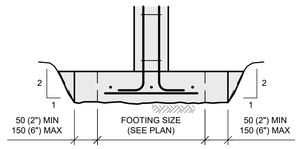


ADJACENT FOOTING DETAIL
NTS



ADJACENT SERVICE TRENCH DETAIL
NTS

14. FORMLESS FOOTINGS ARE ACCEPTABLE PROVIDED THE EXCAVATIONS ARE OVER EXCAVATED BY A MINIMUM OF 50mm (2") AND A MAXIMUM OF 150mm (6") ALONG ALL SIDES. SIDES OF EXCAVATIONS FOR FORMLESS FOOTINGS ARE TO BE SLOPED AT A MAXIMUM SLOPE OF 1:2 (HORIZONTAL:VERTICAL). ALL LOOSE MATERIAL TO BE REMOVED FROM FOOTINGS PRIOR TO POUR.



FORMLESS FOOTING DETAIL
NTS

15. FOUNDATION WALLS SHALL HAVE FLOOR SYSTEMS COMPLETED PRIOR TO BACKFILLING UNLESS NOTED OTHERWISE IN WRITING BY THE STRUCTURAL ENGINEERING.

16. BACKFILL MATERIAL SHALL BE CLEAN, FREE DRAINING GRANULAR MATERIAL. COMPACTION SHALL BE LIMITED TO HAND OPERATED COMPACTION EQUIPMENT WITHIN 1200mm (4'-0") OF THE BACKFILLED WALL UNLESS DIRECTED OTHERWISE BY THE GEOTECHNICAL ENGINEER AND APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.

CAST-IN-PLACE CONCRETE

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CSA A23.1 AND A23.2.

2. CONCRETE MIXES SHALL CONFORM TO CSA A23.1 AND A23.2 AND SHALL HAVE THE FOLLOWING PROPERTIES UNLESS NOTED OTHERWISE. CEMENT SHALL BE GU - GENERAL USE UNLESS SPECIFIED OTHERWISE.

DESCRIPTION	28 DAY STR	MAX AGG	MAX SLUMP	AIR	EXPOSURE
INTERIOR					
FOOTINGS - TYPICAL	25 MPa (3750 psi)	19mm (3/4")	75mm (3")	-	N
FOOTINGS - CONCRETE SHEAR WALL	30 MPa (4500 psi)	19mm (3/4")	75mm (3")	-	N
WALLS - TYPICAL	25 MPa (3750 psi)	19mm (3/4")	75mm (3")	4-7%	F-2
WALLS - CONCRETE SHEAR WALL	30 MPa (4500 psi)	19mm (3/4")	75mm (3")	4-7%	F-2
COLUMNS - INTERIOR	30 MPa (4500 psi)	19mm (3/4")	75mm (3")	-	N
SUSPENDED SLABS & BEAMS - INT	35 MPa (5250 psi)	19mm (3/4")	75mm (3")	-	N
SUSP. SLABS SUPPORTING VEHICLES	35 MPa (5250 psi)	19mm (3/4")	75mm (3")	5-8%	C1
SLAB ON GRADE - INTERIOR	30 MPa (4500 psi)	19mm (3/4")	75mm (3")	-	N
TOPPING	32 MPa (4800 psi)	10mm (3/8")	75mm (3")	-	N
HOUSEKEEPING PADS	30 MPa (4500 psi)	19mm (3/4")	75mm (3")	4-7%	F-2
ICF WALLS	25 MPa (3750 psi)	10mm (3/8")	150mm (6")	-	-
EXTERIOR					
RETAINING WALLS	25 MPa (3750 psi)	19mm (3/4")	75mm (3")	4-7%	F-2
COLUMNS - EXTERIOR	35 MPa (5250 psi)	19mm (3/4")	75mm (3")	4-7%	F-2
SUSPENDED SLABS & BEAMS - EXT	30 MPa (4500 psi)	19mm (3/4")	75mm (3")	4-7%	F-2
SLAB ON GRADE - EXTERIOR	32 MPa (4800 psi)	19mm (3/4")	75mm (3")	5-8%	C-2

3. CONCRETE TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH CSA A23.1, A23.2 AND A23.3. THE MINIMUM NUMBER OF TESTS PERFORMED SHALL BE AS PER CSA A23.2. ADDITIONAL TESTING SHALL BE PERFORMED AT THE DISCRETION OF THE STRUCTURAL ENGINEER. THE CONTRACTOR SHALL COORDINATE THE TESTING AND PROVIDE THE TESTING AGENCY WITH ADEQUATE NOTICE OF THE REQUIRED TESTS. THE OWNER SHALL EITHER PAY FOR OR PROVIDE AN ALLOWANCE WITHIN THE CONTRACT FOR THE COSTS OF MATERIAL TESTING.

4. THE CONTRACTOR SHALL PROVIDE SUITABLE ON-SITE FACILITIES FOR CURING OF TEST CYLINDERS.

5. ALL CONCRETE CURING SHALL BE IN ACCORDANCE WITH CSA A23.1. SPECIAL PRECAUTIONS SHALL BE TAKEN FOR PLACING AND CURING CONCRETE ABOVE 30°C (85°F) AND BELOW 5°C (40°F).

6. CHAMFER ALL EXPOSED EDGES OF CONCRETE WITH A 19mm (¾") CHAMFER UNLESS NOTED OTHERWISE IN THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

7. CONCRETE FINISHES SHALL BE IN ACCORDANCE WITH CSA A23.1 AND AS FOLLOWS UNLESS NOTED OTHERWISE IN THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

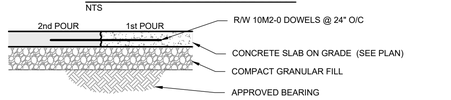
INTERIOR SLABS	TROWEL FINISH
EXTERIOR SLABS	BROOM FINISH
SLABS TO RECEIVE CONCRETE TOPPING	ROUGH BROOM FINISH
WALLS	FILL ALL DEFECTS LARGER THAN 25mm (1") DIAMETER AND GRIND RIDGES FLUSH WITH SURROUNDING SURFACES
SUSPENDED SLABS AND BEAMS	FILL ALL DEFECTS LARGER THAN 19mm (¾") DIAMETER AND GRIND RIDGES FLUSH WITH SURROUNDING SURFACES
CONSTRUCTION JOINTS	ROUGH WITH 6mm (¼") AMPLITUDE

8. ALL REINFORCING STEEL SHALL HAVE THE FOLLOWING CLEAR COVER DISTANCES UNLESS NOTED OTHERWISE. REFER TO THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR LOCATIONS OF FIRE SEPARATIONS AND FIRE RESISTANCE RATINGS (FRR).

DESCRIPTION	0-1 HR FRR	2 HR FRR	3 HR FRR
SURFACES PLACED IN CONTACT WITH SOIL OR FILL	75mm (3")	75mm (3")	75mm (3")
FORMED SURFACES EXPOSED TO GROUND OR WEATHER	50mm (2")	50mm (2")	50mm (2")
WALLS	40mm (1 1/2")	40mm (1 1/2")	40mm (1 1/2")
COLUMNS	40mm (1 1/2")	50mm (2")	50mm (2")
BEAMS	20mm (3/4")	25mm (1")	40mm (1 1/2")
SUSPENDED SLABS	20mm (3/4")	25mm (1")	35mm (1 3/8")

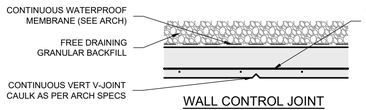
9. CONTROL JOINTS SHALL BE PROVIDED IN BOTH DIRECTIONS IN ALL SLAB-ON-GRADE LOCATIONS AT A MAXIMUM SPACING OF 4500mm (15'-0") FOR UNREINFORCED SLABS AND 6000mm (20'-0") FOR REINFORCED SLABS UNLESS NOTED OTHERWISE ON THE STRUCTURAL AND/OR ARCHITECTURAL DRAWINGS.

SLAB ON GRADE CONTROL JOINT
NTS

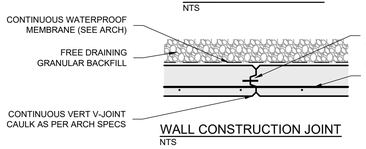


SLAB ON GRADE CONSTRUCTION JOINT
NTS

10. CONTROL JOINTS IN WALLS SHALL BE PROVIDED AT A MAXIMUM SPACING OF 9000mm (30'-0") UNLESS INDICATED OTHERWISE IN THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.



WALL CONTROL JOINT
NTS



WALL CONSTRUCTION JOINT
NTS

11. JOINT FILLER SHALL BE INSTALLED IN EXPANSION JOINTS AND CONSTRUCTION JOINTS UNLESS INDICATED OTHERWISE IN THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

12. WATERSTOPS SHALL BE INSTALLED WHERE INDICATED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. WATERSTOPS SHALL BE RIGIDLY TIED IN PLACE WITHOUT DISTORTION OR PUNCTURE. REINFORCING IS NOT TO BE DISPLACED DURING WATERSTOP PLACEMENT.

13. EMBEDDED PLATES AND ANCHOR BOLTS FOR STRUCTURAL STEEL SHALL BE SECURELY TIED OR FASTENED INTO PLACE PRIOR TO POURING CONCRETE. ALL ANCHOR BOLTS FOR MEMBERS OTHER THAN STANDARD TIMBER WALL FRAMING SHALL BE INSTALLED USING A TEMPLATE. "WET DOWELING" OF ANCHOR BOLTS AND EMBEDDED PLATES IS NOT PERMITTED.

14. INSTALL EMBEDDED DOVETAIL ANCHOR SLOTS IN CAST-IN-PLACE CONCRETE FOR DOVETAIL MASONRY ANCHORS @ 400mm (16") WHERE CONCRETE BLOCK WALLS MEET CONCRETE WALLS OR COLUMNS UNLESS NOTED OTHERWISE.

15. FORMWORK SHALL REMAIN IN PLACE UNTIL THE FOLLOWING CRITERIA HAS BEEN MET:

DESCRIPTION	COMP STR	MIN TIME
STRUCTURAL CONCRETE WALLS AND COLUMNS	8 MPa (1200 psi)	3 DAYS
ARCHITECTURAL CONCRETE WALLS AND COLUMNS	10 MPa (1500 psi)	3 DAYS

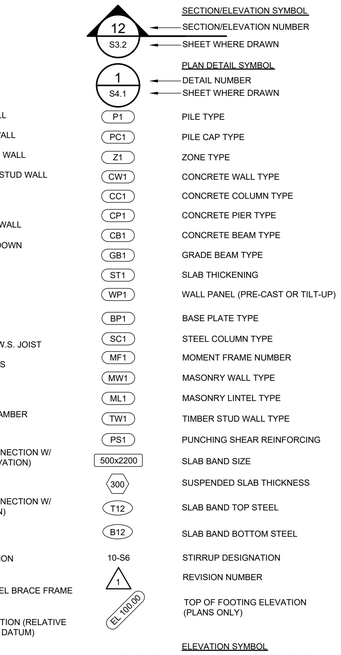
16. CONCRETE STRENGTHS SHALL BE CONFIRMED BY TEST CYLINDERS PRIOR TO STRIPPING FORMWORK UNLESS ALTERNATE MEANS HAVE BEEN APPROVED BY THE STRUCTURAL ENGINEER.

17. SHORING FOR SLABS AND BEAMS SHALL REMAIN IN PLACE FOR A MINIMUM OF 21 DAYS AND CONCRETE HAS ACHEIVED THE DESIGN STRENGTH.

18. SHORING AND RE-SHORING SHALL BE DESIGNED BY A SPECIALTY ENGINEER REGISTERED IN THE PROVINCE OF APPLICABLE. FOR MULTI-STOREY SLAB CONSTRUCTION, SHORING SHALL BE PROVIDED FOR A MINIMUM OF THREE LEVELS BELOW THE SLAB BEING CONSTRUCTED. SHORING DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW OF THE EFFECT SHORING MAY HAVE ON THE BUILDING STRUCTURE ONLY.

LEGEND





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RECORD OF REVISIONS

REV	DATE	BY	ENG	DESCRIPTION

NOT FOR CONSTRUCTION

2023-06-23

ISS	DATE	BY	ENG	DESCRIPTION
D	23JUN23	KMF	KT	TENDER
C	03MAY23	KMF	KT	95% COORDINATION
B	28MAR23	KMF	KT	75% COORDINATION
A	02MAR23	KMF	KT	COORDINATION

RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A.K. TRAN
EGBC Permit # 1001245
2023-06-23

PROJECT NO.	
DRAWN	KMF
DESIGNED	DH
CHECKED	KT
APPROVED	–
DATE	MARCH 01, 2023
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY
PUMP STATION No. 6
UPGRADE
AND SANITARY FORCEMAIN
REPLACEMENT

TITLE

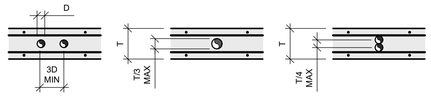
STRUCTURAL
GENERAL NOTES

DRAWING No.	REV.	SHEET
NBPS6–S–001	D	8/28

SUSPENDED CONCRETE SLABS

1. SUSPENDED SLABS SHALL COMPLY TO THE REQUIREMENTS OF CSA-S413.

2. CONDUIT PLACEMENT SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS.
3. CENTER TO CENTER SPACING OF CONDUIT AND PIPING IN SUSPENDED SLABS SHALL BE NO LESS THEN THREE DIAMETERS.
4. LOCATE CONDUIT AND PIPING BETWEEN TOP AND BOTTOM REINFORCING LAYERS
5. MAXIMUM ALLOWABLE OUTSIDE DIAMETER OF CONDUIT OR PIPE FOR A SINGLE LAYER SHALL BE LESS THEN ⅓ CONCRETE THICKNESS
6. MAXIMUM ALLOWABLE OUTSIDE DIAMETER OF CONDUIT OR PIPE FOR A DOUBLE LAYER SHALL BE LESS THEN ¼ CONCRETE THICKNESS
7. TRIPLE LAYERS OF CONDUIT OR PIPE SHALL NOT BE PERMITTED



8. FOR OPENINGS 300mm (12") OR LESS THE REINFORCING SHALL BE SPREAD TO EACH SIDE OF THE OPENING. REINFORCING SHALL NOT BE CUT.

9. SUSPENDED SLABS SHALL BE CAMBERED 3mm (⅛") FOR EACH 2400mm (8'-0") OF THE SPAN UNLESS INDICATED OTHERWISE ON THE STRUCTURAL DRAWINGS.

10. MINIMUM BOTTOM REINFORCING IN EACH DIRECTION SHALL IN ACCORDANCE WITH THE FOLLOWING UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS:

SLAB THICKNESS	REINFORCING
125mm (5")	10M @ 400 (16")
150mm (6")	10M @ 325 (13")
175mm (7")	10M @ 275 (9")
200mm (8")	15M @ 450 (18")
225mm (9")	15M @ 425 (17")
250mm (10")	15M @ 400 (16")
275mm (11")	15M @ 350 (14")
300mm (12")	15M @ 325 (13")

11. THE CONTRACTOR SHALL FABRICATE AND ERECT FORMWORK AND FALSEWORK IN ACCORDANCE WITH CSA S269.1. WHERE REQUIRED BY WCB REGULATIONS THE CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF APPLICABLE TO DESIGN AND SEAL THE FORMWORK AND/OR FALSEWORK DRAWINGS. THE ENGINEER SHALL VISIT THE SITE AND REVIEW THE COMPLETED WORK DESIGNED AND DETAILED ON HIS SHOP DRAWINGS TO SATISFY HIMSELF THAT THE FINISHED COMPONENTS AND ASSEMBLIES ARE IN COMPLIANCE WITH HIS/ HER DESIGN PRIOR TO PLACING CONCRETE.

12. FALSEWORK SHALL REMAIN IN PLACE UNTIL THE FOLLOWING CRITERIA HAS BEEN MET:

DESCRIPTION	COMP STR	MIN TIME
BUILDING SUSPENDED SLAB AND BEAMS	GREATER OF 18MPa or 75% OF 28 DAYS	7 DAYS
PARKING SUSPENDED SLAB AND BEAMS	75% OF 28 DAYS	21 DAYS

13. CONCRETE STRENGTHS SHALL BE CONFIRMED BY TEST CYLINDERS PRIOR TO STRIPPING FORMWORK UNLESS ALTERNATE MEANS HAVE BEEN APPROVED BY THE STRUCTURAL ENGINEER.

14. SHORING AND RE-SHORING SHALL BE DESIGNED BY A SPECIALTY ENGINEER REGISTERED IN THE APPLICABLE PROVINCE. FOR MULTI-STOREY SLAB CONSTRUCTION SHORING SHALL BE PROVIDED FOR A MINIMUM OF THREE LEVELS BELOW THE SLAB BEING CONSTRUCTED. SHORING DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW OF THE EFFECT SHORING MAY HAVE ON THE BUILDING STRUCTURE ONLY

CONCRETE COLD WEATHER REQUIREMENTS

1. THE REQUIREMENTS OF CSA A23.1 AND THE FOLLOWING SHALL BE MET WHEN PLACING CONCRETE DURING COLD WEATHER BELOW 5°C (40°F):

A. FORCASTED TEMPERATURE NOT BELOW 2°C (35°F).
   1. MIXING WATER SHALL BE HEATED TO MAINTAIN CONCRETE TEMPERATURE OF 10°C (50°F) AT POINT OF POUR.
   2. CONCRETE SHALL NOT BE PLACED ON OR AGAINST ANY SURFACE THAT IS BELOW 5°C (40°F).
   3. THE CONTRACTOR SHALL BE PREPARED TO COVER SLABS IN THE EVENT OF AN UNEXPECTED DROP IN AIR TEMPERATURE.
   4. THE CONCRETE TEMPERATURE SHALL BE MAINTAINED ABOVE 10°C (50°F) FOR AT LEAST 7 DAYS OR UNTIL THE CONCRETE REACHES 70% OF DESIGN STRENGTH.

B. FORCASTED AIR TEMPERATURE BETWEEN 2°C (35°F) AND MINUS 4°C (25°F)
   1. FORMS AND REINFORCING STEEL SHALL BE FREE FROM ICE AND SNOW.
   2. MIXING WATER SHALL BE HEATED TO MAINTAIN CONCRETE TEMPERATURE OF 10°C (50°F) AT POINT OF POUR.
   3. CONCRETE SHALL NOT BE PLACED ON OR AGAINST ANY SURFACE THAT IS BELOW 5°C (40°F).
   4. SLABS SHALL BE COVERED IN CANVAS OR SIMILAR MATERIAL PLACED A FEW INCHES OFF THE CONCRETE SURFACE.
   5. DURING WINDY WEATHER THE STOREY BELOW THE POUR LOCATIONS SHALL BE ENCLOSED.
   6. PROTECTION SHALL BE MAINTAINED FOR A MINIMUM OF 3 DAYS.
   7. THE CONCRETE TEMPERATURE SHALL BE MAINTAINED ABOVE 10°C (50°F) FOR AT LEAST 7 DAYS. IN ADDITION, THE CONCRETE SHALL BE KEPT ABOVE FREEZING UNTIL THE CONCRETE REACHES 70% OF DESIGN STRENGTH.

C. FORCASTED AIR TEMPERATURE BELOW MINUS 5°C (23°F)
   1. FORMS AND REINFORCING STEEL SHALL BE FREE FROM ICE AND SNOW.
   2. MIXING WATER SHALL BE HEATED TO MAINTAIN CONCRETE TEMPERATURE OF 10°C (50°F) AT POINT OF POUR.
   3. CONCRETE SHALL NOT BE PLACED ON OR AGAINST ANY SURFACE THAT IS BELOW 5°C (40°F).
   4. SLABS SHALL BE COVERED IN CANVAS OR SIMILAR MATERIAL PLACED A FEW INCHES OFF THE CONCRETE SURFACE.
   5. DURING WINDY WEATHER THE STOREY BELOW THE POUR LOCATIONS SHALL BE ENCLOSED AND MAINTAINED FOR A MINIMUM OF 3 DAYS AFTER THE POUR.
   6. PROTECTION SHALL BE MAINTAINED FOR A MINIMUM OF 3 DAYS.
   7. THE CONCRETE TEMPERATURE AT ALL SURFACES SHALL BE MAINTAINED ABOVE 20°C (68°F) FOR AT LEAST 3 DAYS OR ABOVE 10°C (50°F) FOR AT LEAST 7 DAYS. IN ADDITION, THE CONCRETE SHALL BE KEPT ABOVE FREEZING UNTIL THE CONCRETE REACHES 70% OF DESIGN STRENGTH.
   8. ENCLOSURES MUST BE CONSTRUCTED SO THAT THE AIR CAN CIRCULATE OUTSIDE THE OUTER EDGES OF MEMBERS.
   9. STOREY BELOW SHALL BE ENCLOSED AND ARTIFICIAL HEAT PROVIDED. HEATING TO BE STARTED AT LEAST THREE HOURS PRIOR TO POURING AND MAINTAINED FOR MINIMUM OF THREE DAYS THEREAFTER.

2. WHEN POURING CONCRETE TOPPING ON METAL DECK USE THE PRECAUTIONS SPECIFIED IN ITEM C ABOVE.

CONCRETE HOT WEATHER REQUIREMENTS

1. THE REQUIREMENTS OF CSA A23.1 SHALL BE MET WHEN PLACING CONCRETE DURING HOT WEATHER ABOVE 30°C (°F)

MECHANICAL & ADHESIVE ANCHORS

1. ALL ANCHORS ARE TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

2. ALL ANCHORS ARE TO BE THE ADHESIVE TYPE. MECHANICAL ANCHORS ARE ONLY TO BE USED WHEN SPECIFICALLY CALLED UP ON THE DRAWINGS. SUBSTITUTIONS MUST BE APPROVED BY THE PROJECT ENGINEER PRIOR TO USE.

3. UNLESS NOTED OTHERWISE, ADHESIVE ANCHORS SHALL BE HILTI 'HAS' ROD. REFER TO DRAWINGS FOR ANCHOR LOCATIONS, SIZES, CENTRES AND EMBEDMENT LENGTH. USE HILTI HIT-HY200 OR HILTI HIT ICE ADHESIVE AS NOTED BELOW.
   A. USE HILTI HIT-HY200 MAX WHEN:
      1. A QUICK CURE IS REQUIRED
      2. CONDITIONS ARE DRY
      3. HOLES ARE HAMMER DRILLED
      4. HOLES ARE NOT OVER-SIZED
      5. BASE MATERIAL TEMPERATURE IS ABOVE -10° CELSIUS AND BELOW 40° CELSIUS.
   B. WHEN THE BASE MATERIAL TEMPERATURE IS ABOVE -23° CELSIUS AND BELOW 30° CELSIUS, HILTI HIT-ICE MAY BE USED IN NON-SEISMIC APPLICATIONS W/ THE APPROVAL OF THE ENGINEER.

4. HOLES FOR ADHESIVE ANCHORS SHALL BE CLEANED OUT WITH HIGH PRESSURE AIR AND IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

5. REFER TO DRAWINGS FOR MECHANICAL ANCHOR LOCATIONS, SIZES, CENTRES AND EMBEDMENT LENGTH.

6. INSTALLERS OF HILTI PRODUCTS SHALL HAVE RECEIVED TRAINING BY HILTI (CANADA) CORP. IN THE USE OF THE SPECIFIED PRODUCTS. THE GENERAL CONTRACTOR SHALL PROVIDE THE DESIGN ENGINEER WITH A LETTER STATING THAT THIS TRAINING HAS BEEN COMPLETED.

7. 10% OF ALL ADHESIVE ANCHORS ARE TO BE LOAD TESTED. IF ANY TESTS FAIL THEN ALL ADHESIVE ANCHORS ARE TO BE TESTED. ANY FAILING CONNECTIONS ARE TO BE RE-INSTALLED.

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE TO THE FOLLOWING STANDARDS UNLESS NOTED OTHERWISE:

DESCRIPTION	STANDARD	GRADE
WELDED WIRE MESH	CSA G30.5	400
10M REINFORCING BAR AND LARGER	CSA G30.18R	400R
REINFORCING TO BE WELDED	CSA G30.18W	400W
PRE-STRESSING STRANDS	CSA G279	1870

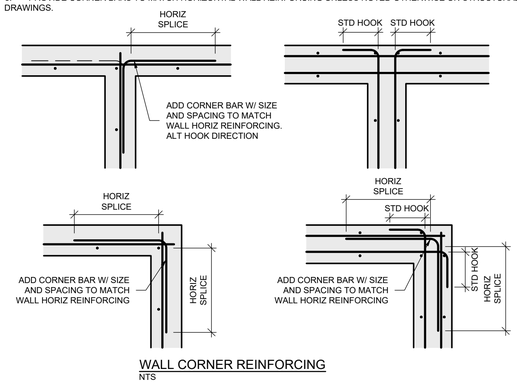
2. WHEN REQUESTED BY THE STRUCTURAL ENGINEER MILL CERTIFICATES SHALL BE SUPPLIED FOR ALL WELDABLE REINFORCING STEEL USED IN CONCRETE SHEAR WALLS AND CONCRETE FRAMES.

3. WELDING OF REINFORCING STEEL SHALL CONFORM TO CSA W186 "WELDING OF REINFORCING BARS IN REINFORCED CONCRETE CONSTRUCTION". WELDING OF REINFORCING SHALL BE ALLOWED ONLY AS NOTED ON THE PLANS. WHERE WELDING OF REINFORCING IS REQUIRED MILL CERTIFICATES FOR WELDABLE REINFORCING SHALL BE PROVIDED PRIOR TO WELDING. WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER IS REQUIRED FOR ANY WELDING NOT SPECIFIED FOR IN THE STRUCTURAL DRAWINGS.

4. ALL REINFORCING BARS SHALL BE TIED SECURELY IN PLACE TO PREVENT DISPLACEMENT.

5. DOWELS ARE TO BE TIED IN PLACE PRIOR TO PLACING CONCRETE. "WET DOWELING" OF ANY REINFORCING STEEL IS NOT PERMITTED WITHOUT THE WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.

6. PROVIDE CORNER BARS TO MATCH HORIZONTAL WALL REINFORCING UNLESS NOTED OTHERWISE ON STRUCTURAL DRAWINGS.



WALL CORNER REINFORCING
NTS

7. WHERE CONCRETE SURFACES ARE TO BE EXPOSED, ONLY NON-CORROSIVE TYPE REINFORCING CHAIRS SHALL BE USED TO SUPPORT REINFORCING STEEL.

8. LAP LENGTHS AND EMBEDMENTS FOR REINFORCING STEEL SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS:

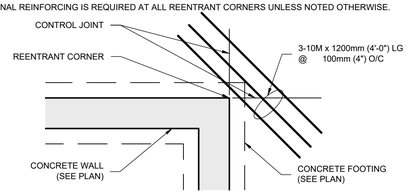
CONCRETE STRENGTH	BAR SIZE					
	10M	15M	20M	25M	30M	35M
	TENSION	TENSION	TENSION	TENSION	TENSION	TENSION
20 MPa	420 (16.5")	630 (24.8")	840 (33.0")	1310 (51.6")	1570 (61.8")	1835 (72.2")
25 MPa	375 (14.8")	565 (22.2")	750 (29.5")	1170 (46.1")	1405 (55.3")	1640 (64.6")
30 MPa	345 (13.6")	515 (20.3")	690 (27.2")	1070 (42.1")	1285 (50.6")	1500 (59.0")
35 MPa	320 (12.6")	475 (18.7")	635 (25.0")	990 (39.0")	1190 (46.9")	1385 (54.5")

9. FOR HORIZONTAL BARS WITH MORE THAN 12" (300) CONCRETE COVER BELOW THE BAR, MULTIPLY LENGTHS NOTED ABOVE BY (1.3) (DOES NOT INCLUDE HORIZONTAL BARS IN WALLS).

10. THE SPLICE TYPE FOR COLUMNS SHALL BE A COMPRESSION SPLICE UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS. ALL OTHER MEMBERS SHALL USE TENSION SPLICES.

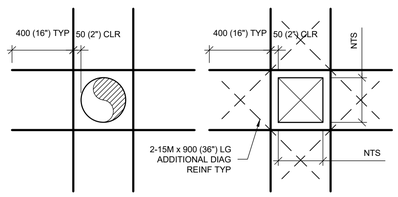
11. HOOKS ON ALL TIES SHALL BE BENT AT LEAST 135° AND HAVE A MINIMUM LEG OF 12 TIMES THE BAR DIAMETER UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS.

12. DIAGONAL REINFORCING IS REQUIRED AT ALL REENTRANT CORNERS UNLESS NOTED OTHERWISE.



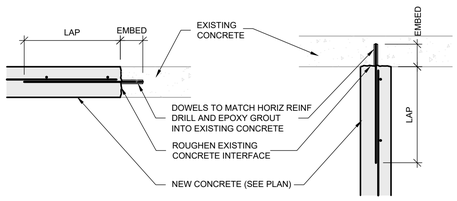
REENTRANT CORNER REINFORCING
NTS

13. PROVIDE 2-15M EACH SIDE OF OPENINGS EXTENDED 450mm (18") BEYOND EDGE OF OPENING UNLESS NOTED OTHERWISE. RECTANGULAR OPENINGS TO HAVE ADDITIONAL 2-15M x 900mm (3'-0") LG DIAGONALS AT ALL CORNERS UNLESS NOTED OTHERWISE.



REINFORCING AROUND OPENINGS IN SLABS AND WALLS
NTS

14. DOWELS TO MATCH REINFORCING FOR NEW CONSTRUCTION SHALL BE EPOXY GROUTED INTO EXISTING CONCRETE, MINIMUM EMBED 150mm (6") UNLESS NOTED OTHERWISE.



NEW TO EXISTING CONCRETE CONNECTIONS
NTS

MISCELLANEOUS METAL FABRICATIONS

1. MISCELLANEOUS METAL FABRICATIONS INCLUDE SUCH ITEMS AS METAL STAIRS AND LADDERS, ANGLE LINTELS, PIPE RAILINGS, CORNER GUARDS, BOLLARDS, TRENCH COVERS AND FRAMES, CONNECTORS FOR CONNECTIONS OF OTHER MATERIALS, ETC.

2. DESIGN OF MISCELLANEOUS METAL FABRICATIONS IS TO BE IN ACCORDANCE WITH CSA-S16.1.

3. DESIGN AND FABRICATE METAL STAIRS TO THE LATEST EDITION OF THE APPLICABLE BUILDING CODE AND THE ARCHITECTURAL AND STRUCTURAL DRAWINGS. FABRICATION AND INSTALLATION TO BE IN ACCORDANCE WITH THE METAL STAIR MANUAL AMP-510 BY THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS.

4. ALL WELDING SHALL BE IN ACCORDANCE WITH CSA W59-03 AND SHALL BE PERFORMED BY FABRICATORS "FULLY APPROVED" BY THE CANADIAN WELDING BUREAU UNDER CSA W55-3. FABRICATING SHOPS TO HAVE A MINIMUM DIVISION 2.1 CERTIFICATION BY THE CANADIAN WELDING BUREAU TO THE REQUIREMENTS OF CSA W47.1 AND CSA 255.3 FOR RESISTANCE WELDING OF STRUCTURAL COMPONENTS. THE FABRICATOR SHALL SUBMIT PROOF OF CERTIFICATION TO THE STRUCTURAL ENGINEER PRIOR TO COMMENCING FABRICATION.

5. MATERIALS SUPPLIED IN MISCELLANEOUS METAL FABRICATIONS ARE TO BE IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

DESCRIPTION	STANDARD	GRADE
STEEL SECTIONS	CSA G40.21	350W
STEEL PLATE	CSA G40.21	260W
STEEL PIPE	ASTM A53/A53M	300W
METAL BAR GRATING	ANSI/NAAMM MBG 531	-
WELDING MATERIAL	CSA W59	-
FILLER METALS AND ALLIED MATERIALS FOR METAL ARC WELDING	CSA W48	-
ANCHOR BOLTS	ASTM A307	F1554-GR-36
ERECTION BOLTS	ASTM A325	A325
GROUT	-	15 MPa @ 24 HRS

6. THE CONTRACTOR AND SUB-TRADES SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS ON SITE PRIOR TO COMMENCING FABRICATION.

7. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING DURING CONSTRUCTION. THE BRACING SHALL BE DESIGNED, INSTALLED AND MAINTAINED BY THE CONTRACTOR. THE BRACING SHALL BE REMOVED ONLY AFTER THE INSTALLATION IN COMPLETE.

8. FABRICATE WORK SQUARE, PLUMB, STRAIGHT AND ACCURATE TO THE REQUIRED SIZES WITH JOINTS CLOSELY FITTED AND PROPERLY SECURED. WHERE POSSIBLE, SHOP FIT AND ASSEMBLE READY FOR ERECTION. EXPOSED WELDS ARE TO BE CONTINUOUS FOR THE FULL LENGTH OF THE JOINT AND GROUND SMOOTH AND FLUSH UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS. USE SELF-TAPPING, SHAKE-PROOF, FLAT HEADED SCREWS ON ITEMS REQUIRING ASSEMBLY WITH SCREWS UNLESS NOTED OTHERWISE.

9. ALL STEEL WORK SHALL BE SHOP PRIMED EXCEPT PARTS TO BE EMBEDDED INTO CONCRETE OR GALVANIZED UNLESS NOTED OTHERWISE. PRIMING SHALL BE IN ACCORDANCE WITH CISC/CPMA-1-73a "QUICK DRYING PRIMER" WHEN NO TOP COAT IS REQUIRED AND IN ACCORDANCE WITH CISC/CPMA-2-75 WHEN TOP COAT IS SPECIFIED. WHEN A TOP COAT IS SPECIFIED THE PRIMER SHALL BE SELECTED TO ENSURE COMPATIBILITY WITH THE SPECIFIED SYSTEM.

10. HOT DIP GALVANIZE ALL EXTERIOR STEEL WORK AND STEEL WHICH PROTRUDES THROUGH THE BUILDING ENVELOPE UNLESS NOTED OTHERWISE. ITEMS SPECIFIED TO BE GALVANIZED SHALL BE HOT DIP GALVANIZED TO ASTM A-123-08 WITH A MINIMUM ZINC COATING OF 600g/sqm. FIELD TOUCHUP ALL ABRASIONS, SCRATCHES, WELDS AND BOLTS.

11. ISOLATE ALUMINUM SECTIONS FROM DISSIMILAR METALS EXCEPT STAINLESS STEEL, ZINC OR WHITE BRONZE WITH BITUMINOUS PAINT. ALL FASTENERS TO BE COMPATIBLE WITH MATERIALS THROUGH WHICH THEY PASS.

12. DELIVER, STORE, HANDLE AND PROTECT MATERIALS FROM DAMAGE. INSTALL PLUMB AND TRUE IN LOCATIONS SPECIFIED ON THE DRAWINGS. SECURELY FASTEN TO BUILDING STRUCTURE AS DETAILED.

13. THE STEEL FABRICATOR SHALL SUPPLY THE STRUCTURAL ENGINEER WITH PDF SETS OF SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION UNLESS NOTED OTHERWISE BY THE STRUCTURAL ENGINEER IN WRITING. SHOP DRAWINGS SHALL INDICATE ALL DETAILS, MATERIALS, SPECIFICATIONS AND DESIGN LOADS AND BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF APPLICABLE. SHOP DRAWINGS SHALL BE COORDINATED WITH THE WORK OF OTHER DISCIPLINES SUCH AS BUT NOT LIMITED TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL. THE SPECIALITY ENGINEER OR HIS REPRESENTATIVE SHALL INSPECT THE ERECTED STEEL WORK TO VERIFY CORRECT INSTALLATION AND PROVIDE WRITTEN CONFIRMATION OF SUCH TO THE STRUCTURAL ENGINEER PRIOR TO THE STRUCTURAL ENGINEER CERTIFYING THE PROJECT AS SUBSTANTIALLY COMPLETE.

14. A COPY OF THE FABRICATOR'S CANADIAN WELDING BUREAU CERTIFICATES SHALL BE INCLUDED WITH THE SHOP DRAWING SUBMISSION.

KOERS & ASSOCIATES ENGINEERING LTD.
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RECORD OF REVISIONS

REV	DATE	BY	ENG	DESCRIPTION

NOT FOR CONSTRUCTION

2023-06-23

ISS	DATE	BY	ENG	DESCRIPTION
D	23JUN23	KMF	KT	TENDER
C	03MAY23	KMF	KT	95% COORDINATION
B	28MAR23	KMF	KT	75% COORDINATION
A	02MAR23	KMF	KT	COORDINATION

RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. TRAN
EGBC Permit # 1001245
2023-06-23

PROJECT NO.	
DRAWN	KMF
DESIGNED	DH
CHECKED	KT
APPROVED	–
DATE	MARCH 01, 2023
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

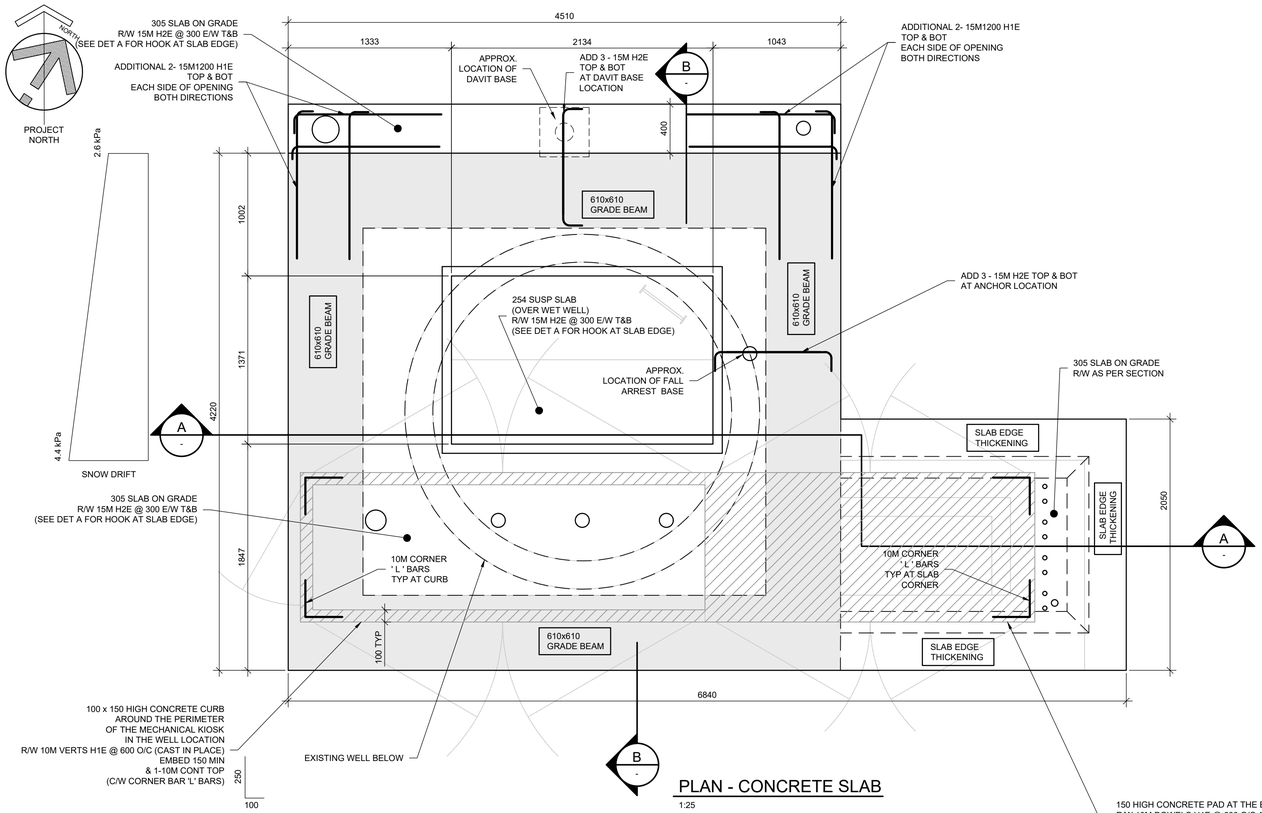
PROJECT

NANOOSE BAY
PUMP STATION No. 6
UPGRADE
AND SANITARY FORCEMAIN
REPLACEMENT

TITLE

STRUCTURAL
GENERAL NOTES

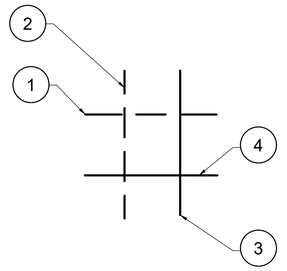
DRAWING No.	REV.	SHEET
NBPS6–S–002	D	9/28



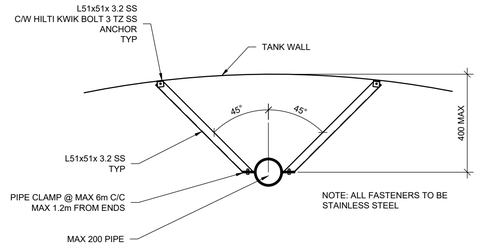
PLAN - CONCRETE SLAB

1:25

SPECIFIED SLAB LOADING	
LOADING CONDITION	LOADING
DEAD LOAD = CONC SELF WEIGHT + 1 kPa	1.65 kPa (35 psf)
LIVE LOAD	4.8 kPa
SNOW LOAD	2.6 kPa + DRIFT

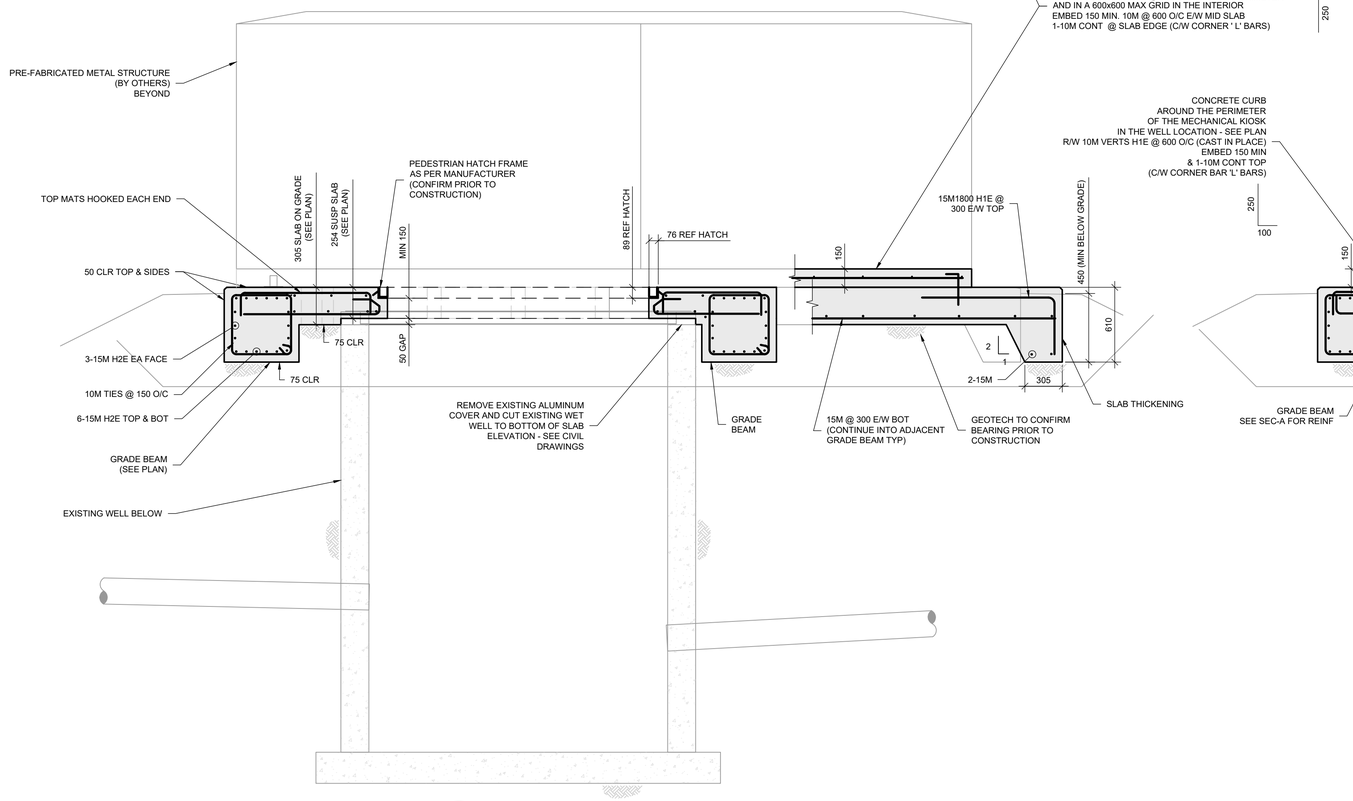


REINF PLACEMENT ORDER



PLAN - PIPE LATERAL RESTRAINT DETAIL

N.T.S.



A SECTION

1:25

B SECTION

1:25

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D	23JUN23	KMF	KT	TENDER
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RECORD OF ISSUE

SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A.K. TRAN
EGBC Permit # 1001245
2023-06-23

PROJECT NO.	
DRAWN	KMF
DESIGNED	DH
CHECKED	KT
APPROVED	–
DATE	MARCH 01, 2023
SCALE	AS NOTED

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY
PUMP STATION No. 6
UPGRADE
AND SANITARY FORCEMAIN
REPLACEMENT

TITLE

STRUCTURAL
PLAN & SECTIONS

DRAWING No.	REV.	SHEET
NBPS6–S–003	D	10/28

PBX ENGINEERING LTD.
PERMIT TO PRACTICE NUMBER:
1000208

GENERAL NOTES:

1. RESTORE ALL SURFACES TO MATCH EXISTING.
2. MMCD STANDARDS APPLY TO ALL ASPECTS OF THE WORK.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL CONCRETE BASES AND JB SYMBOLS ARE NOT TO SCALE.
4. ALL WORK SHALL COMPLY WITH THE CANADIAN ELECTRICAL CODE, PROJECT SPECIFICATIONS, LOCAL BY-LAWS AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
5. LOCATE EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATING.
6. ALL INSTALLATIONS SHALL CONFORM TO CSA C22.1-15 (CURRENT EDITION) INCLUDING BC ELECTRICAL SAFETY BRANCH AMENDMENTS. ALL UNDERGROUND CONDUITS SHALL BE RIGID PVC CONDUIT: COMPLYING CSA C22.2 No. 211.2-06 (NOTED AS "RPVC") ON THE DRAWINGS OR OTHERWISE NOTED. ALL OUTDOOR MOUNTED CONDUIT SHALL BE RGS OR OTHERWISE NOTED.
7. ALL MANUFACTURER AND CSA LABELS SHALL BE VISIBLE AND LEGIBLE AFTER THE EQUIPMENT IS INSTALLED.
8. ALL EQUIPMENT AND MATERIAL SHALL BE CSA CERTIFIED FOR INSTALLATION IN BC.
9. NO WORK SHALL INTERFERE WITH CURRENT CONSTRUCTION ACTIVITIES IN THE AREA BY OTHERS.
10. ALL WORK INCLUDING SHUTDOWNS AND POWER OUTAGES SHALL BE COORDINATED AND SCHEDULED WITH THE CONSTRUCTION MANAGER.
11. LOCK-OUT PROCEDURES SHALL APPLY FOR ALL HOT EQUIPMENT/WIRING THAT REQUIRES DISCONNECTION. CONTRACTOR TO COORDINATE ALL LOCK-OUTS WITH THE CONSTRUCTION MANAGER.
12. TRAFFIC CONTROL ON PORTION OF ROADS AFFECTED BY WORK SHALL BE COORDINATED WITH THE CONSTRUCTION MANAGER.
13. NOTIFY CONSULTANT OF CHANGES REQUIRED BY ELECTRICAL INSPECTION DEPARTMENT PRIOR TO MAKING CHANGES.
14. SUPPLY COPIES OF ALL INSPECTION REPORTS TO ENGINEER WITHIN 24 HOURS OF INSPECTION.
15. FURNISH CERTIFICATES OF ACCEPTANCE FROM ELECTRICAL INSPECTION DEPARTMENT ON COMPLETION OF WORK TO ENGINEER.
16. UNUSED MATERIAL AND ABANDONED EQUIPMENT SHALL BE DISPOSED OF AT THE CONTRACTORS EXPENSE.
17. INSTALLATION FOR ALL EQUIPMENT SHALL INCLUDE ALL NECESSARY CONNECTORS, TERMINATIONS, FASTENERS AND BONDING REQUIRED TO CREATE A FULLY FUNCTIONAL SYSTEM.
18. ALL CONDUCTORS SHALL BE STRANDED COPPER, RW90 XLPE INSULATED OR AS OTHERWISE NOTED.
19. ALL GROUNDING AND BONDING SHALL COMPLY WITH THE CANADIAN ELECTRICAL CODE.
20. MAINTAIN PHASE SEQUENCE AND COLOUR CODING THROUGHOUT. USE COLOUR CODED WIRES IN COMMUNICATION CABLES, MATCHED THROUGHOUT SYSTEM.
21. ALL EMPTY CONDUITS SHALL BE CAPPED.
22. ALL CONDUITS SHALL DRAIN TO JUNCTION BOXES. SPACING BETWEEN POWER AND COMMUNICATIONS CONDUITS FOR LONGITUDINAL RUNS SHALL BE 300mm (UNLESS CONCRETE ENCASED). THE SPACING MAY BE REDUCED TO 50mm AT CROSSOVER POINTS WHERE THE CONDUITS ENTER AND EXIT JUNCTION BOXES AND PULL PITS.
23. THE CONTRACTOR SHALL NOT USE ANY FACTORY BENDS IN THE CONDUIT RUNS EXCEPT WHERE SHOWN ON THE DRAWINGS OR APPROVED BY THE PROJECT ENGINEER IN THE FIELD. WHERE FACTORY 90 DEGREE BENDS ARE APPROVED, THE RADIUS SHALL BE GREATER THAN 900mm.
24. ALL CONDUITS SHALL BE VERIFIED AND CLEANED USING THE FOLLOWING PROCEDURE:
    - TO VERIFY INTEGRITY OF CONDUIT, PULL THROUGH EACH CONDUIT DUCT A HARD RUBBER MANDREL, NOT LESS THAN 300mm LONG AND OF A DIAMETER 6mm LESS THAN THE INTERNAL DIAMETER OF THE DUCT, PRECEDED BY A SWAB OF SUITABLE DIAMETER TO REMOVE SAND, EARTH AND OTHER FOREIGN MATERIALS.
    - NOTIFY PROJECT ENGINEER IN THE EVENT OF CONDUIT FAILURE.
    - CLEAN DUCTS BEFORE LAYING. CAP BOTH ENDS DURING CONSTRUCTION AND AFTER INSTALLATION TO PREVENT ENTRY OF ANY FOREIGN MATERIALS.
    - INSTALL PULL LINE.
    - TERMINATE CONDUIT ENDS IN THE JUNCTION BOX.
    - CLEAN AND VACUUM JUNCTION BOXES. LOCATIONS SHALL BE LAID OUT BY THE CONTRACTOR AND FIELD REVIEWED BY THE ENGINEER PRIOR TO INSTALLATION.
25. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY BENDS, COUPLINGS, REDUCERS, BELL END FITTINGS, PLUGS, CAPS AND ADAPTORS OF THE SAME PRODUCT MATERIAL AS THE CONDUIT TO ENSURE A COMPLETE INSTALLATION.
26. FOR CABLE INSTALLATION IN DUCTS, CONTRACTOR SHALL USE THE FOLLOWING PROCEDURE:
    - INSTALL CABLES AS INDICATED IN DUCTS.
    - DO NOT PULL SPLICED CABLES INSIDE DUCTS.
    - INSTALL MULTIPLE CABLES IN DUCT SIMULTANEOUSLY.
    - USE CSA APPROVED LUBRICANTS OF TYPE COMPATIBLE WITH CABLE JACKET TO REDUCE PULLING TENSION.
    - AFTER INSTALLATION OF CABLES, SEAL DUCT ENDS WITH DUCT SEALING COMPOUND.
27. FOR CABLE SPLICING:
    - REMOVE INSULATION CAREFULLY FROM ENDS OF CONDUCTORS.
    - CONNECTOR SPLICES SHALL BE SECURED WITH SOLDERLESS TWIST-ON (MARRETTE) TYPE CONNECTORS.
    - WHERE THE NUMBER AND/OR SIZE OF CONDUCTORS EXCEEDS THE CAPACITY OF THE TWIST-ON CONNECTOR, BURNDY BIT MULTI TAP CONNECTIONS SHALL BE USED.
    - ALL WIRING SHALL BE NEATLY BUNDLED AND LABELLED IN ALL JUNCTION BOXES, VAULTS, CHAMBERS, HAND HOLES, CONTROL BOXES, DEVICE BOXES AND PANELS.
28. SEALING OF OUTDOOR TWIST-ON CONNECTIONS SHALL BE PERFORMED USING DOUBLE DIPPING METHOD SUCH AS 3M "SCOTCHKOTE" OR APPROVED ALTERNATIVE.
29. TESTING:
    - PERFORM TESTS USING QUALIFIED PERSONNEL. PROVIDE NECESSARY INSTRUMENTS AND EQUIPMENT.
    - FOR FEEDERS SUPPLYING MOTORS, CHECK PHASE ROTATION AND IDENTIFY EACH PHASE CONDUCTOR OF EACH FEEDER.
    - AFTER INSTALLING CABLE BUT BEFORE SPLICING AND TERMINATING, PERFORM INSULATION RESISTANCE TEST WITH 1000V MEGGER ON EACH PHASE CONDUCTOR.
30. TOP OF VAULT/JB COVERS TO BE FLUSH WITH THE FINAL GRADE OR CONCRETE PAD, UNLESS NOTED OTHERWISE.
31. HARD WIRED COMMUNICATIONS AND CONTROL EQUIPMENT SHALL BE CONNECTED TO POWER THROUGH DIN RAIL MOUNTED TERMINAL BLOCKS. CIRCUIT PROTECTION FUSED BLOCKS AND APPROPRIATE FUSES SHALL BE USED TO POWER TRANSFORMERS 1500VA OR SMALLER.
32. ALL THE UNDERGROUND BOXES SHALL BE EQUIPPED WITH GALVANIZED STEEL COVERS. THE COVERS SHALL BE BONDED TO GROUND, AND SHALL BE LABELLED "ELEC" OR "COMM" AS SHOWN IN THE DRAWINGS.

NOMENCLATURE:

A	- AMBER	MSM	- MULTISMART
AS	- AUTOSTART	MM	- MILLIMETER
BCH	- BC HYDRO	N	- NEUTRAL
C	- COIL	NC	- NORMALLY CLOSED
C/W	- COMPLETE WITH	NO	- NORMALLY OPEN
CBX	- CIRCUIT BREAKER ("X" DENOTES NUMBER)	OL	- OVERLOAD
CCT	- CIRCUIT	OT	- OVERTEMPERATURE
CEC	- CANADIAN ELECTRICAL CODE, PART 1, LATEST EDITION	PEC	- PHOTOELECTRIC CELL
CMD	- COMMAND	PFC	- POWER FACTOR CORRECTION
COMM	- COMMUNICATION	PLC	- PROGRAMMABLE LOGIC CONTROLLER
CT	- CURRENT TRANSFORMER	PMR	- PHASE LOSS MONITOR RELAY
CTRL	- CONTROL	POTS	- PLAIN OLD TELEPHONE SERVICE
DDC	- DIRECT DIGITAL CONTROL	PWR	- POWER
DPDT	- DOUBLE POLE DOUBLE THROW	Px	- PUMP ("x" DENOTES NUMBER)
DS	- KIOSK DOOR SWITCH	R	- RED
EMR	- EMERGENCY RUN	RLY	- RELAY
ERR	- EMERGENCY RUN RELAY	RPVC	- RIGID POLYVINYL CHLORIDE
ETM	- ELAPSED TIME METER	RR	- REMOTE RUN
F	- FUSE	RS	- REMOTE START
FLS	- FLYGT LEAKAGE SENSOR	RTU	- REMOTE TELEMETRY UNIT
FRUN	- FAN RUN	SLF	- SECONDARY LOW FLOAT
FS	- FLOAT SWITCH	SPD	- SURGE PROTECTION DEVICE
G	- GREEN	SPDT	- SINGLE POLE DOUBLE THROW
GEN	- GENERATOR	SS	- SOFT STARTER
GFCI	- GROUND FAULT CIRCUIT INTERRUPTER	SST	- ELECTRONIC SOLID STATE TRIP DEVICE
GFLT	- GROUND FAULT RELAY	TD	- TIME DELAY
GND	- GROUND	TEMP	- TEMPERATURE
HLOA	- HIGH-LOW-OFF-AUTO	TRSW	- TRANSFER SWITCH
HMI	- HUMAN MACHINE INTERFACE	UPS	- UNINTERRUPTIBLE POWER SUPPLY
HOA	- HAND-OFF-AUTO CONTROL	US	- ULTRASONIC SENSOR
HP	- HORSE POWER	UTS	- UP TO SPEED
HSW	- HATCH SWITCH	UV	- ULTRAVIOLET
HTR	- HEATER	VFD	- VARIABLE FREQUENCY DRIVE
IS	- IN SERVICE	VFR	- VENTILATION FAN RELAY
LTG	- LIGHTING	XFMR	- TRANSFORMER
LVL	- LEVEL	W	- WHITE
MGB	- MASTER GROUND BUS	ZS	- POSITION SWITCH

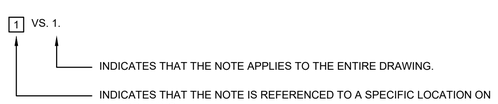
GENERAL NOTES:

32. THE CONTRACTOR SHALL NOT DISTURB OR DESTROY EXISTING PLANTS, BUSHES, TREES, OR ROOTS WHILE INSTALLING THE EQUIPMENT. MANUALLY DIG THROUGH HEDGES.
33. THE CONTRACTOR SHALL DISPOSE OF ALL THE REMOVED CONCRETE AND EXCESS NATIVE FILL.
34. ON-SITE DOCUMENTS SHALL BE STORED IN A SECURE LOCATION AND SHALL NOT BE LEFT IN VEHICLES OVERNIGHT.
35. THERE SHALL BE NO ENERGIZED EXPOSED PARTS INSIDE KIOSKS, CABINETS, CHAMBERS OR EQUIPMENT BOXES.
36. CABLE INSTALLATION INCLUDES CABLE TERMINATION, LABELLING, TESTING AND COMMISSIONING. ALL TESTING REPORTS SHALL BE SENT TO THE ENGINEER FOR REVIEW AND APPROVAL.
37. ALL THE POWER CABLES INSIDE OF CHAMBERS SHALL BE WITHIN RPVC CONDUIT AND ALL THE CONNECTORS SHALL BE WATER TIGHT.
38. WORK SHALL CONFORM TO ALL APPLICABLE REGULATIONS OF WORKSAFE BC.
39. IDENTIFY ELECTRICAL EQUIPMENT WITH LABELS. FOR EACH DEVICE, INSTALL LABEL ON EQUIPMENT, PANEL, AND BACKSIDE OF PANEL, WHERE APPLICABLE.

LABELLING CONVENTION NOTES:

1. ALL CABLES AND CONDUCTORS SHALL BE LABELLED AS SHOWN ON THESE DRAWINGS. CONDUCTORS SHALL BE LABELLED IN ALL JUNCTION BOXES, HANDHOLES, VAULTS, CONTROL CABINETS AND ALL OTHER ACCESSIBLE POINTS.
2. "LOCAL" SPECIFIES THE TERMINATION INSIDE THE CONTROL CABINET AND "REMOTE" INDICATES TERMINATION OUTSIDE.
3. IF THERE IS MORE THAN ONE CONDUCTOR OF THE SAME TYPE WITHIN A BUNDLE OR CABLE, THE CONDUCTORS SHALL BE LABELLED SEQUENTIALLY STARTING FROM ONE.
4. HOT AND NEUTRAL CIRCUITS ARE LABELLED HX OR NX, WHERE X IS THE CIRCUIT NUMBER IN THE PANEL.
5. ALL CONDUCTORS SHALL BE IDENTIFIED IN ALL JUNCTION BOXES, CABINETS OR OTHER ACCESS POINTS. IDENTIFY WIRING WITH PERMANENT INDELIBLE IDENTIFYING MARKINGS, EITHER NUMBERED AND/OR COLOUR CODED PLASTIC TAPE ON BOTH ENDS OF PHASE CONDUCTORS OF FEEDERS AND BRANCH CIRCUIT WIRING, PRINTED USING A THERMAL HEAT TRANSFER SYSTEM.
6. IDENTIFY GROUPS OF CONDUCTORS OR CABLES IN ENCLOSURES AND PANELS USING BRADY #B-342 (HEAT SHRINK SLEEVES) OR APPROVED ALTERNATE. IDENTIFY CABLES OR GROUPS OF CONDUCTORS IN JUNCTION BOXES USING BRADY #B-109 (TY-WRAP STYLE MULTIPURPOSE IDENTIFICATION TAG) OR APPROVED ALTERNATE.

NOTES LEGEND:



LEGEND

	LUMINAIRE (REFER TO SITE PLAN FOR TYPE AND WATTAGE)		ANTENNA
	POWER/COMMUNICATIONS UTILITY POLE		VENTILATION FAN
	CIRCUIT BREAKER	FS	FLOAT SWITCH
	FUSE		HYDROSTATIC LEVEL TRANSDUCER
	OVERLOAD PROTECTION	M	MAGNETIC FLOW METER SENSOR
	TRANSFORMER	HS	HATCH SWITCH
	LINE REACTOR		DISCONNECT
X.X kVAR	POWER FACTOR CORRECTION CIRCUIT	G	ILLUMINATED PUSH BUTTON (INDICATOR LIGHT)
M	BC HYDRO METER AND METER BASE	PMR	PHASE LOSS MONITOR RELAY
	CURRENT TRANSFORMER	SPD	SURGE PROTECTION DEVICE
M Px	PUMP MOTOR	ETM	ELAPSED TIME METER
	GENERATOR	X	CONTACTOR/RELAY COIL
	HEATING/COOLING THERMOSTAT		NORMALLY OPEN CONTACT
	DUAL RECEPTACLE 120V (GFCI)		NORMALLY CLOSED CONTACT
T	WALL MOUNTED THERMOSTAT (DUAL STAGE HEATING AND COOLING)		FLOAT SWITCH
$	SINGLE POLE LIGHT SWITCH		
	EXPLOSION PROOF EYS FITTING		PUSH BUTTON (NORMALLY OPEN)
	GROUND ELECTRODE/ROD		PUSH BUTTON (NORMALLY CLOSED)
	TERMINAL BLOCK LOCATED IN PUMP CONTROL PANEL		GROUND
	TERMINAL BLOCK LOCATED IN MOTOR CONTROL ENCLOSURE	EXP	EXPLOSION PROOF LIGHT FIXTURE
ISR	INTRINSICALLY SAFE RELAY	ISB	INTRINSICALLY SAFE BARRIER
	TERMINAL BLOCK LOCATED IN KIOSK VENTILATED COMPARTMENT		QUADRUPLE RECEPTACLE 120V (GFCI)

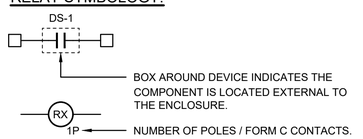
CABLE LABELLING NOMENCLATURE:

POWER

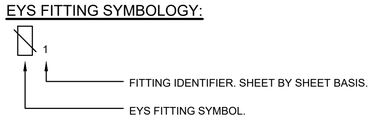
EXAMPLE: P1-CCT10/12/14-600V

- P1 — PANEL
- CCT10/12/14 — CIRCUIT
- 600V — VOLTAGE

RELAY SYMBOLOGY:



EYS FITTING SYMBOLOGY:



LINE TYPE LEGEND

LINE	DESCRIPTION
———	120/240V CONDUIT/CABLE
— — —	COMMUNICATIONS OR LOW VOLTAGE CONDUIT/CABLE
——·——	347/600V CONDUIT/CABLE
----------	GROUNDING
———⌐	CAPPED CONDUIT

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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — 2023-07-26

PROJECT NO.	220363
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CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

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REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE

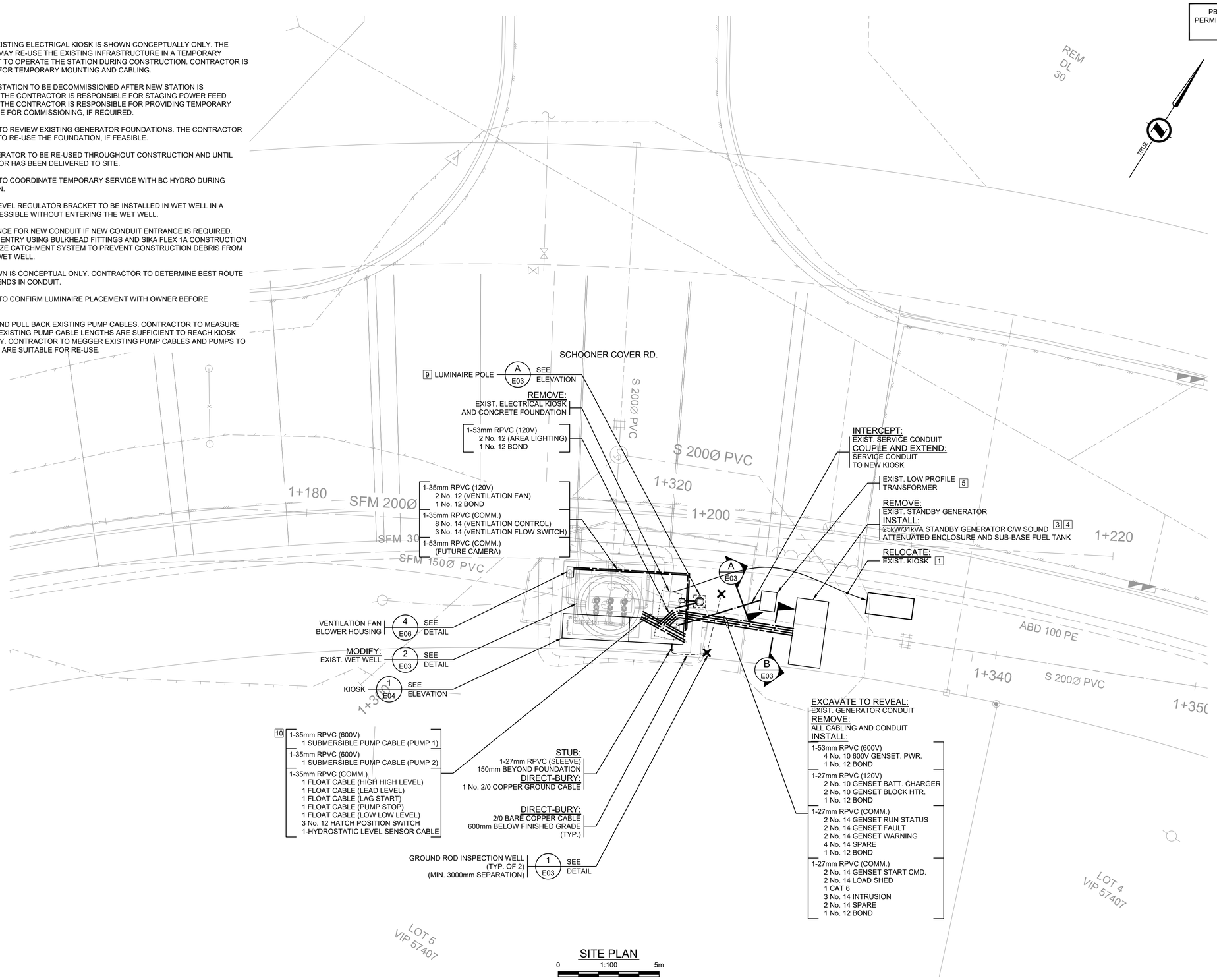
LEGEND AND GENERAL NOTES

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–001	–	11/28

NOTES:

1. RELOCATED EXISTING ELECTRICAL KIOSK IS SHOWN CONCEPTUALLY ONLY. THE CONTRACTOR MAY RE-USE THE EXISTING INFRASTRUCTURE IN A TEMPORARY ARRANGEMENT TO OPERATE THE STATION DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY MOUNTING AND CABLING.
2. EXISTING LIFT STATION TO BE DECOMMISSIONED AFTER NEW STATION IS OPERATIONAL. THE CONTRACTOR IS RESPONSIBLE FOR STAGING POWER FEED INSTALLATION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY POWER SOURCE FOR COMMISSIONING, IF REQUIRED.
3. CONTRACTOR TO REVIEW EXISTING GENERATOR FOUNDATIONS. THE CONTRACTOR IS PERMITTED TO RE-USE THE FOUNDATION, IF FEASIBLE.
4. EXISTING GENERATOR TO BE RE-USED THROUGHOUT CONSTRUCTION AND UNTIL NEW GENERATOR HAS BEEN DELIVERED TO SITE.
5. CONTRACTOR TO COORDINATE TEMPORARY SERVICE WITH BC HYDRO DURING CONSTRUCTION.
6. HORIZONTAL LEVEL REGULATOR BRACKET TO BE INSTALLED IN WET WELL IN A LOCATION ACCESSIBLE WITHOUT ENTERING THE WET WELL.
7. CORE CLEARANCE FOR NEW CONDUIT IF NEW CONDUIT ENTRANCE IS REQUIRED. SEAL CONDUIT ENTRY USING BULKHEAD FITTINGS AND SIKA FLEX 1A CONSTRUCTION SEALANT. UTILIZE CATCHMENT SYSTEM TO PREVENT CONSTRUCTION DEBRIS FROM FALLING INTO WET WELL.
8. CONDUIT SHOWN IS CONCEPTUAL ONLY. CONTRACTOR TO DETERMINE BEST ROUTE TO MINIMIZE BENDS IN CONDUIT.
9. CONTRACTOR TO CONFIRM LUMINAIRE PLACEMENT WITH OWNER BEFORE INSTALLATION.
10. DISCONNECT AND PULL BACK EXISTING PUMP CABLES. CONTRACTOR TO MEASURE AND CONFIRM EXISTING PUMP CABLE LENGTHS ARE SUFFICIENT TO REACH KIOSK CONDUIT ENTRY. CONTRACTOR TO MEGGER EXISTING PUMP CABLES AND PUMPS TO CONFIRM THEY ARE SUITABLE FOR RE-USE.



SITE PLAN
0 1:100 5m

ALL EQUIPMENT IS PROPOSED UNLESS NOTED OTHERWISE

BC 1C

CHECK BEFORE YOU DIG
CONTRACTOR SHALL CONFIRM THE LOCATIONS OF ALL UNDERGROUND UTILITIES.

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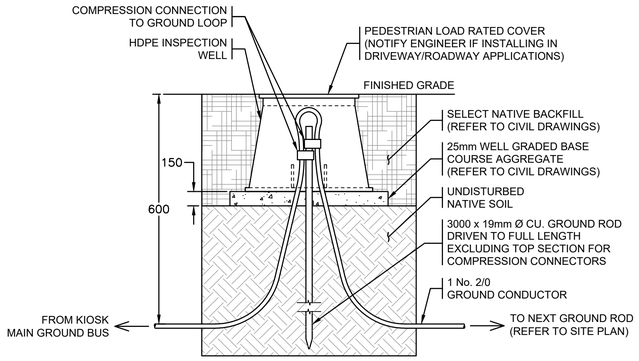
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PROJECT
NANOOSE BAY SANITARY PUMPSTATION NO. 6

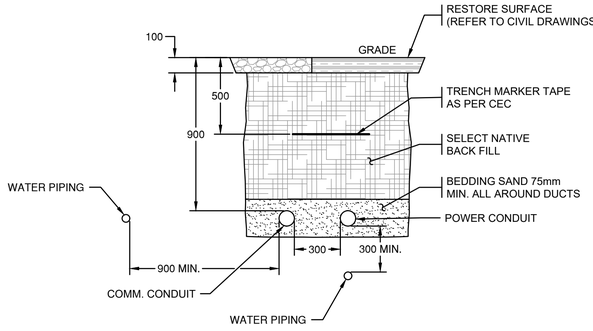
TITLE
SITE PLAN
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–002	–	12/28

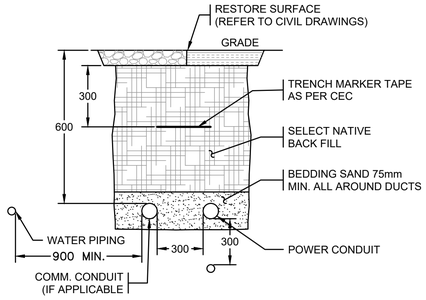
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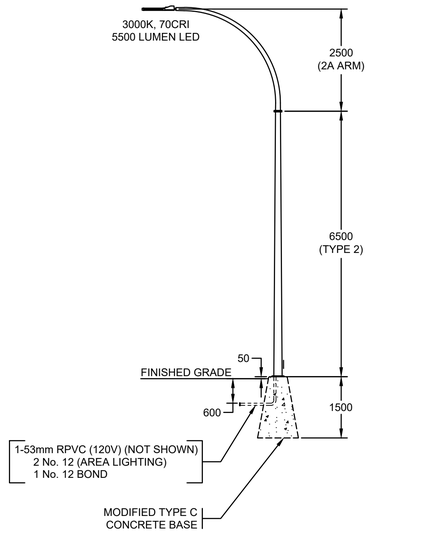
DETAIL 1 / E02
N.T.S.



SECTION A / E02 TYPICAL TRENCH SECTION
N.T.S.

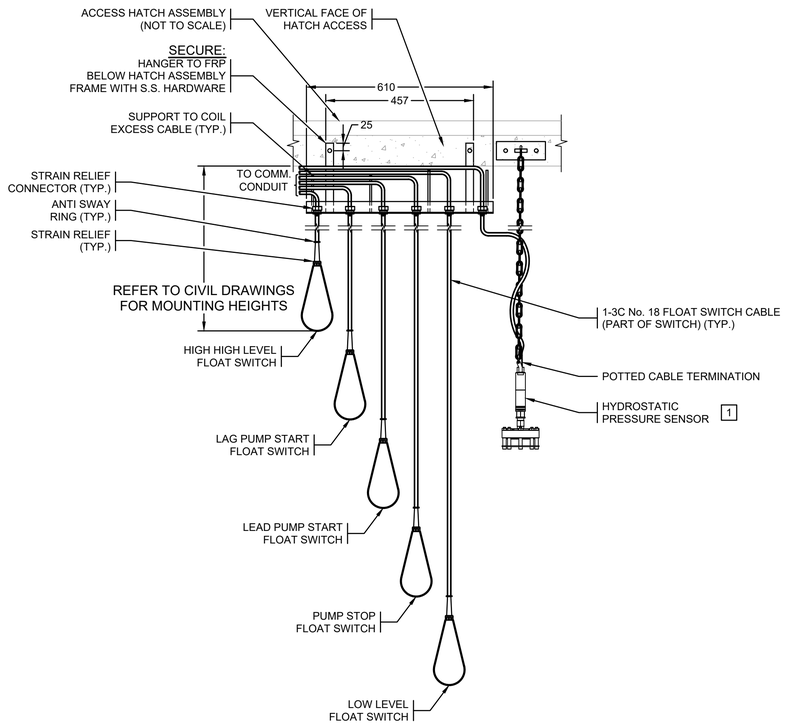


SECTION B / E02 TYPICAL TRENCH SECTION
N.T.S.



ELEVATION A / E02 LUMINAIRE POLE
1:75

0 1:75 5m



DETAIL 2 / E02 HORIZONTAL LEVEL REGULATOR HANGER
1:10

0 1:10 500mm

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NOTES:

1 INSTALL INSTRUMENTS/SENSORS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

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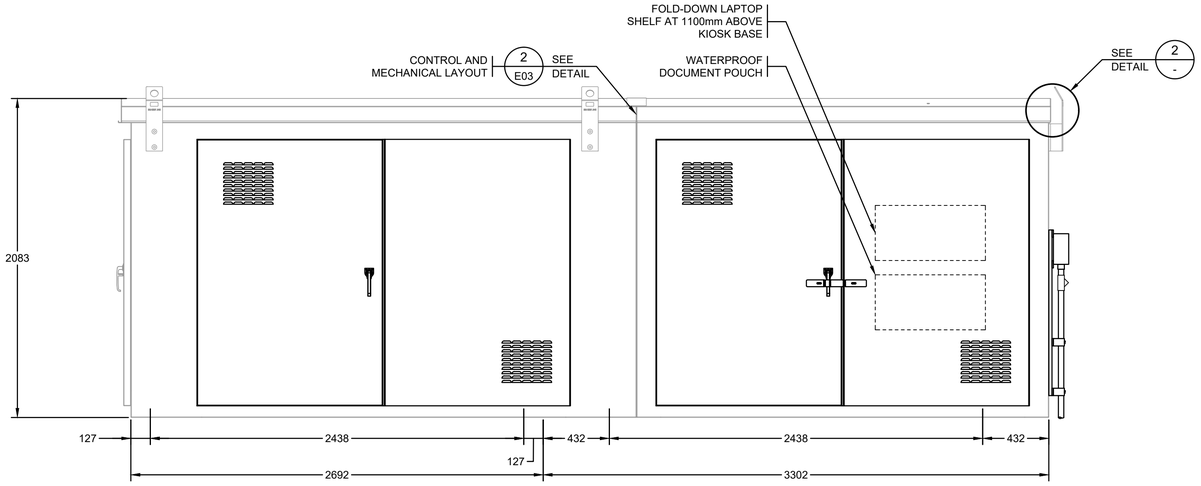
NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE

DETAILS

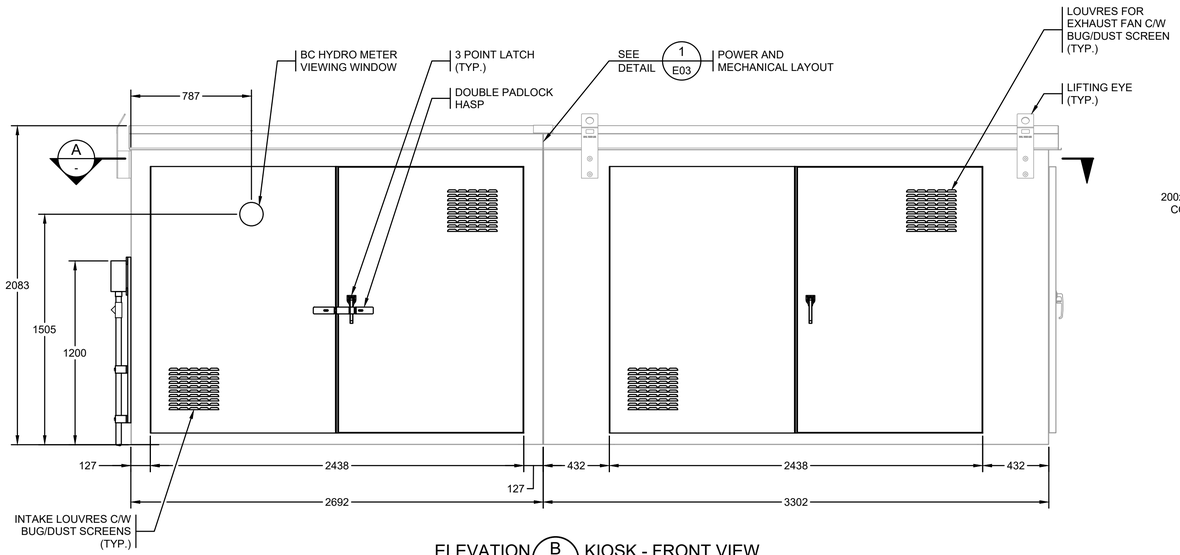
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–003	—	13/28



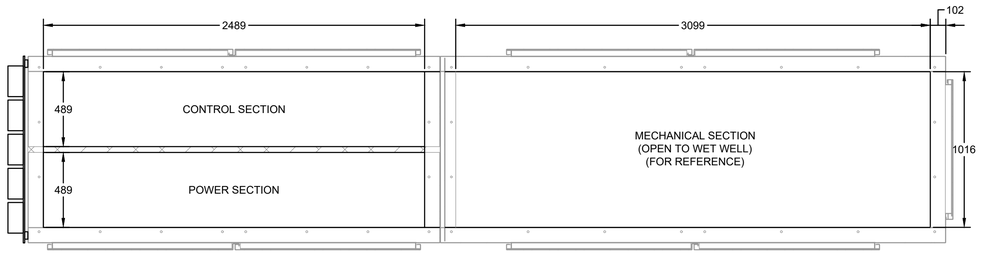
ELEVATION A KIOSK - REAR VIEW
1:20 (A, E02)

0 1:20 1



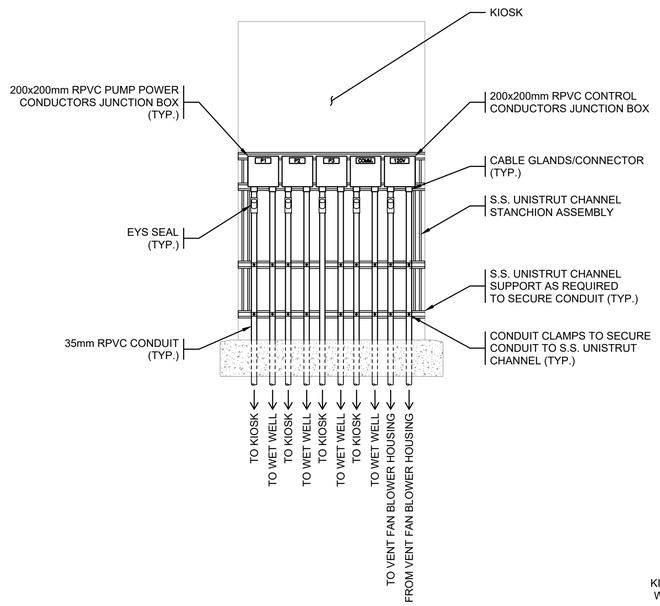
ELEVATION B KIOSK - FRONT VIEW
1:20 (B, -)

0 1:20 1



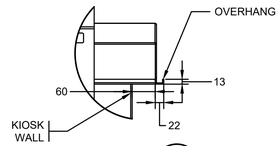
SECTION A KIOSK - TOP VIEW
1:20 (A, -)

0 1:20 1



ELEVATION C KIOSK EXTERIOR CONDUIT ENTRY
1:20 (C, E02)

0 1:20 1



DETAIL 2
N.T.S

NOTES:

1. KIOSK SHALL BE CSA TYPE 3R RATED. OUTER SHELL SHALL BE MARINE GRADE ALUMINIUM AND SHALL BE WELDED TO ROOF ASSEMBLY, EQUIPMENT MOUNTING PANEL MOUNTS AND BASE PLATES. KIOSK SHALL INCLUDE STRUCTURAL BRACING TO ACCOMMODATE TRANSPORTATION, WIND, SNOW AND ICE LOADING. KIOSK MANUFACTURER SHALL BE RESPONSIBLE FOR OBTAINING CERTIFICATION FROM APEGBC REGISTERED PROFESSIONAL ENGINEER. KIOSK MANUFACTURER SHALL INCLUDE ANCHOR REQUIREMENTS CONSIDERING WIND LOADING, SEISMIC LOADING, DEAD LOADS, AND SNOW LOADING.
2. KIOSK DIMENSIONS ARE APPROXIMATE ONLY. KIOSK MANUFACTURER SHALL PRODUCE DETAILED SHOP DRAWINGS WHICH SHALL INCLUDE INTERNAL EQUIPMENT LAYOUTS FOR REVIEW BY ENGINEER PRIOR TO PRODUCTION. THE MANUFACTURER SHALL ENSURE THE KIOSK IS SIZED APPROPRIATELY TO HOUSE THE INTENDED EQUIPMENT.
3. ALL LOUVERS SHALL HAVE BUG SCREENS. UPPER LOUVERS WITH FILTER AND 6" FAN MOUNTS. LOWER LOUVERS WITH FILTER AND VENT PLATE.
4. KIOSK DOORS SHALL INCLUDE A GAS SPRING. ALL LATCHES SHALL BE 3-POINT LATCHING SYSTEM WITH PAD LOCKABLE HANDLES. DOOR HANDLES ARE STAINLESS STEEL AND PADLOCK-ABLE. DOUBLE PADLOCK HASP ON ELECTRICAL SIDE ONLY.
5. KIOSK TO BE POWDER COATED. COLOUR CODE: MOSS GREEN PC114.
6. ALL COMPARTMENTS SHALL HAVE REMOVABLE MOUNTING PANELS. ALL INTERIOR PANELS SHALL BE 10 GA. GALVANIZED POWDER COATED WHITE.
7. ALL COUPLINGS BETWEEN THE COMPARTMENTS SHALL BE PLACED AND WELDED AT THE ENCLOSURE FABRICATION SHOP.
8. KIOSK SUPPLIER TO PROVIDE CONDUIT STUB-UP TEMPLATE FOR USE BY INSTALLATION CONTRACTOR.
9. PROVIDE 12mm THICK NEOPRENE CLOSED CELL GASKET BETWEEN KIOSK BASE AND CONCRETE PAD.
10. WET WELL CONFIGURATION TO BE CONFIRMED. CONDUIT MAY PASS DIRECTLY THROUGH WALL OF KIOSK TO ELECTRICAL SIDE WITHOUT GOING IN GROUND IF POSSIBLE.

FUNCTIONAL DESIGN ONLY
CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ENGINEER'S APPROVAL PRIOR TO FABRICATION

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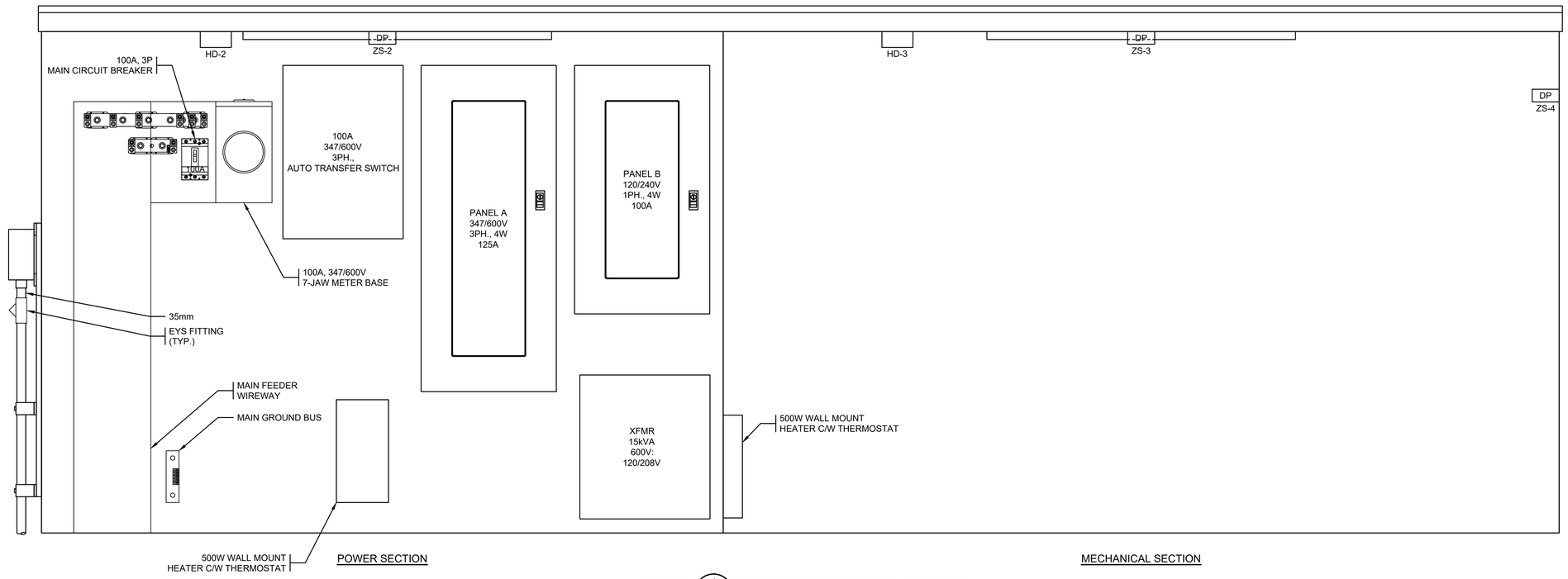
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CLIENT
REGIONAL DISTRICT OF NANAIMO

PROJECT
NANOOSE BAY SANITARY PUMPSTATION NO. 6

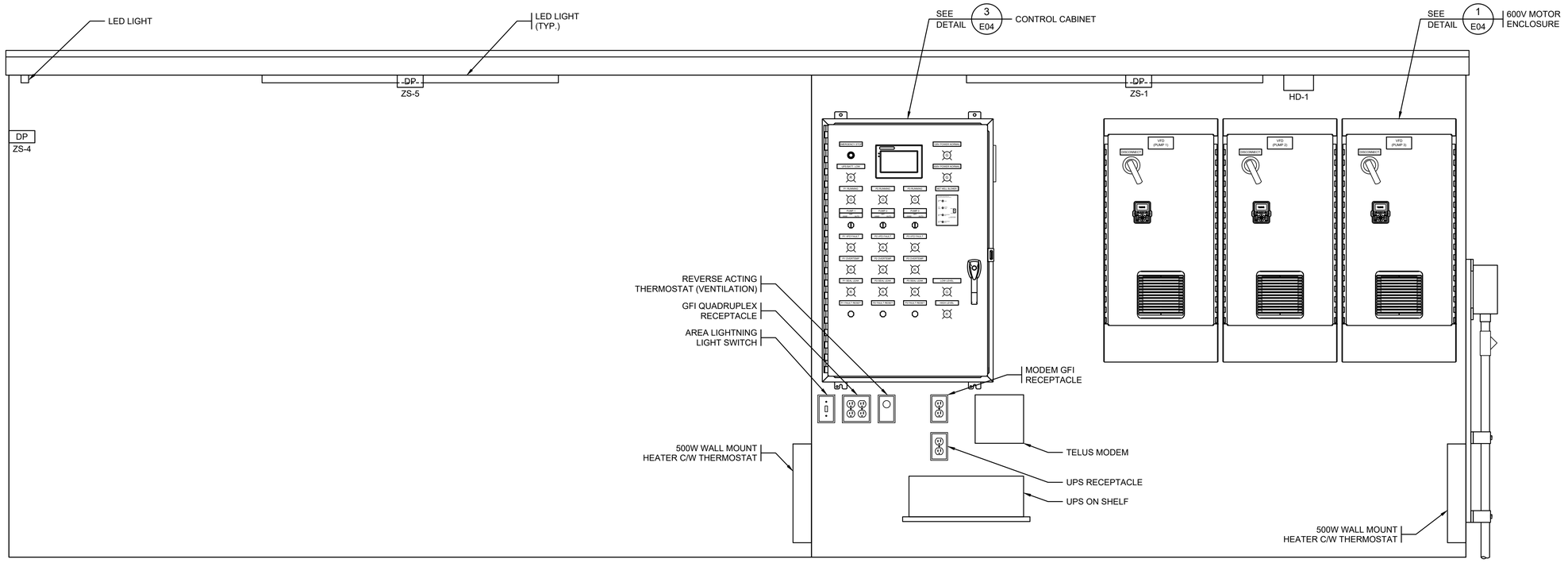
TITLE
KIOSK (1 OF 3)
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–004	—	14/28



DETAIL 1 POWER & MECHANICAL LAYOUT
1:10 (E02)

0 1:10 500mm



DETAIL 2 CONTROL & MECHANICAL LAYOUT
1:10 (E02)

0 1:10 500mm

NOTES:

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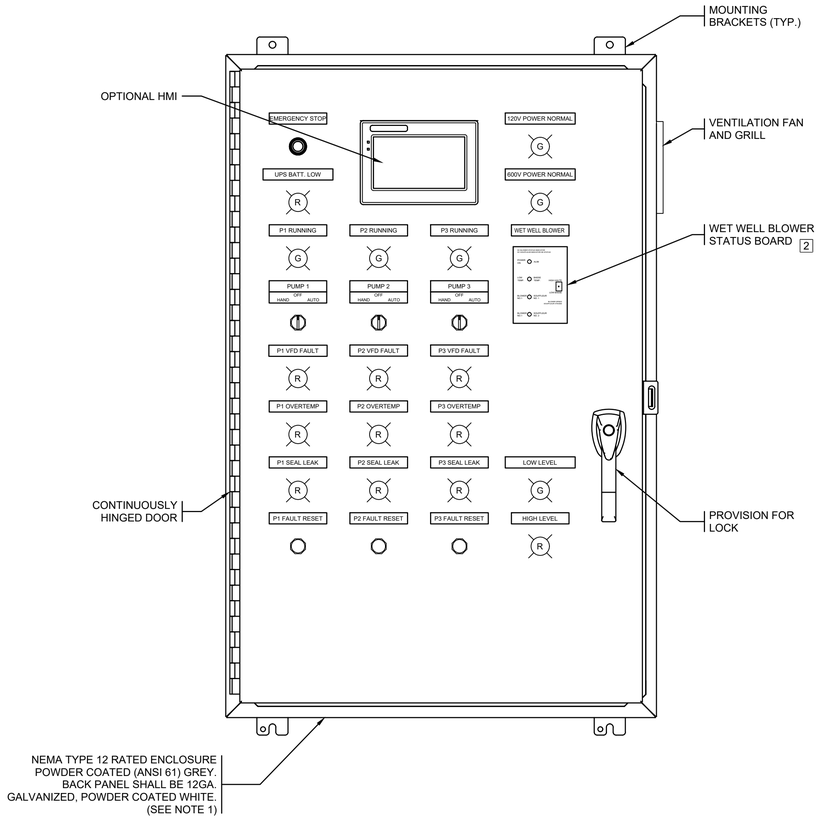
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NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE
KIOSK (2 OF 3)

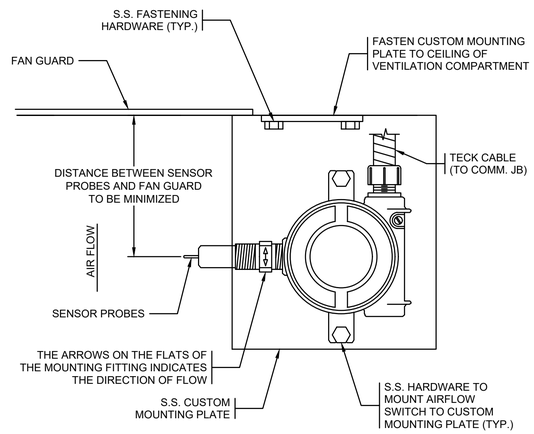
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DRAWING No.	REV.	SHEET
NBPS6–E–005	–	15/28

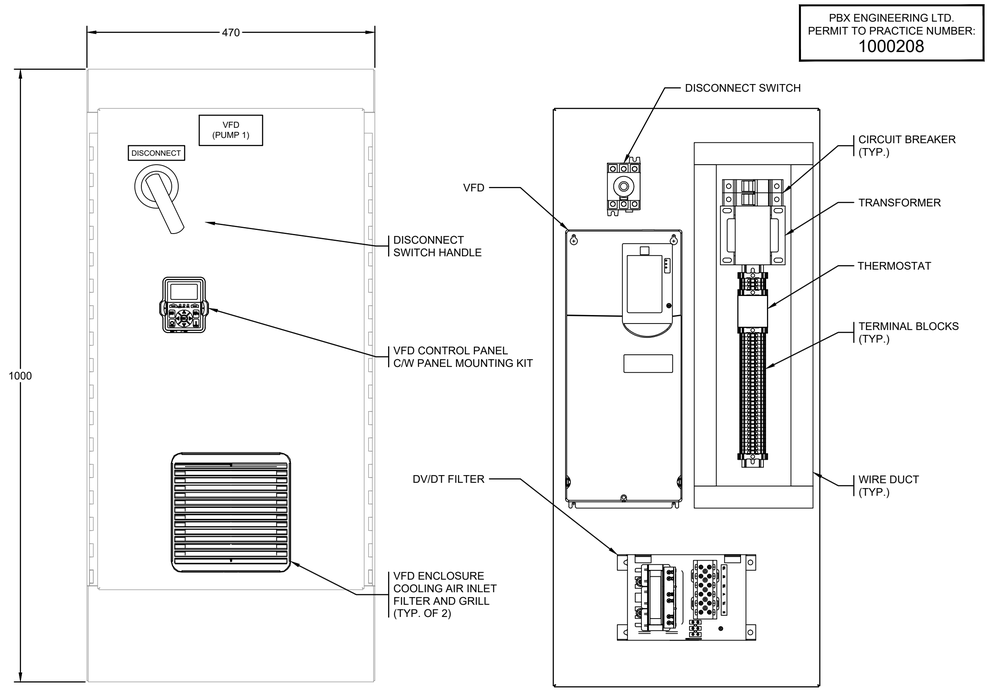


DETAIL 3 CONTROLS CABINET - FRONT PANEL
1:5 E03

0 1:5 250mm



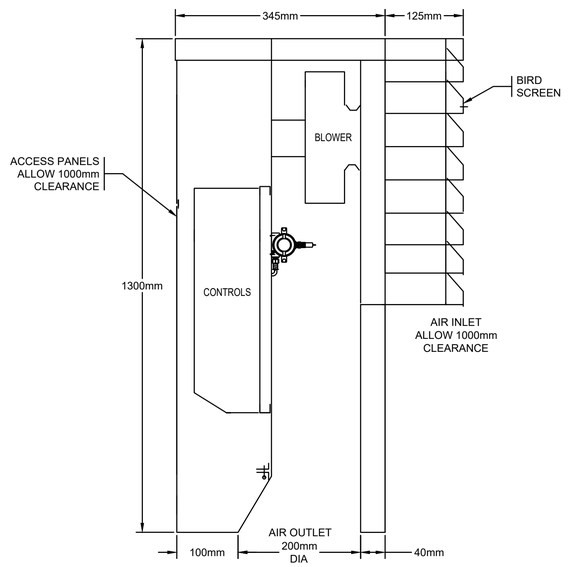
DETAIL 2 AIRFLOW SWITCH
N.T.S. -



FRONT LAYOUT INSIDE LAYOUT

DETAIL 1 600V MOTOR CONTROL ENCLOSURE
1:5 E03

0 1:5 250mm



DETAIL 4 VENT FAN BLOWER HOUSING
1:5 E02

0 1:5 250mm

NOTES:

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2. VENDOR PACKAGE BLOWER. SEE SHOP DRAWINGS FOR ADDITIONAL DETAILS. BASIS OF DESIGN IS DEXON CANADA VENT FAN SMVOD SERIES. VENT FAN AIR FLOW SWITCH TO BE ADDED TO BLOWER PACKAGE, BASIS OF DESIGN INNOVASWITCH 615 GAS AND LIQUID FLOW SWITCH.

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CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

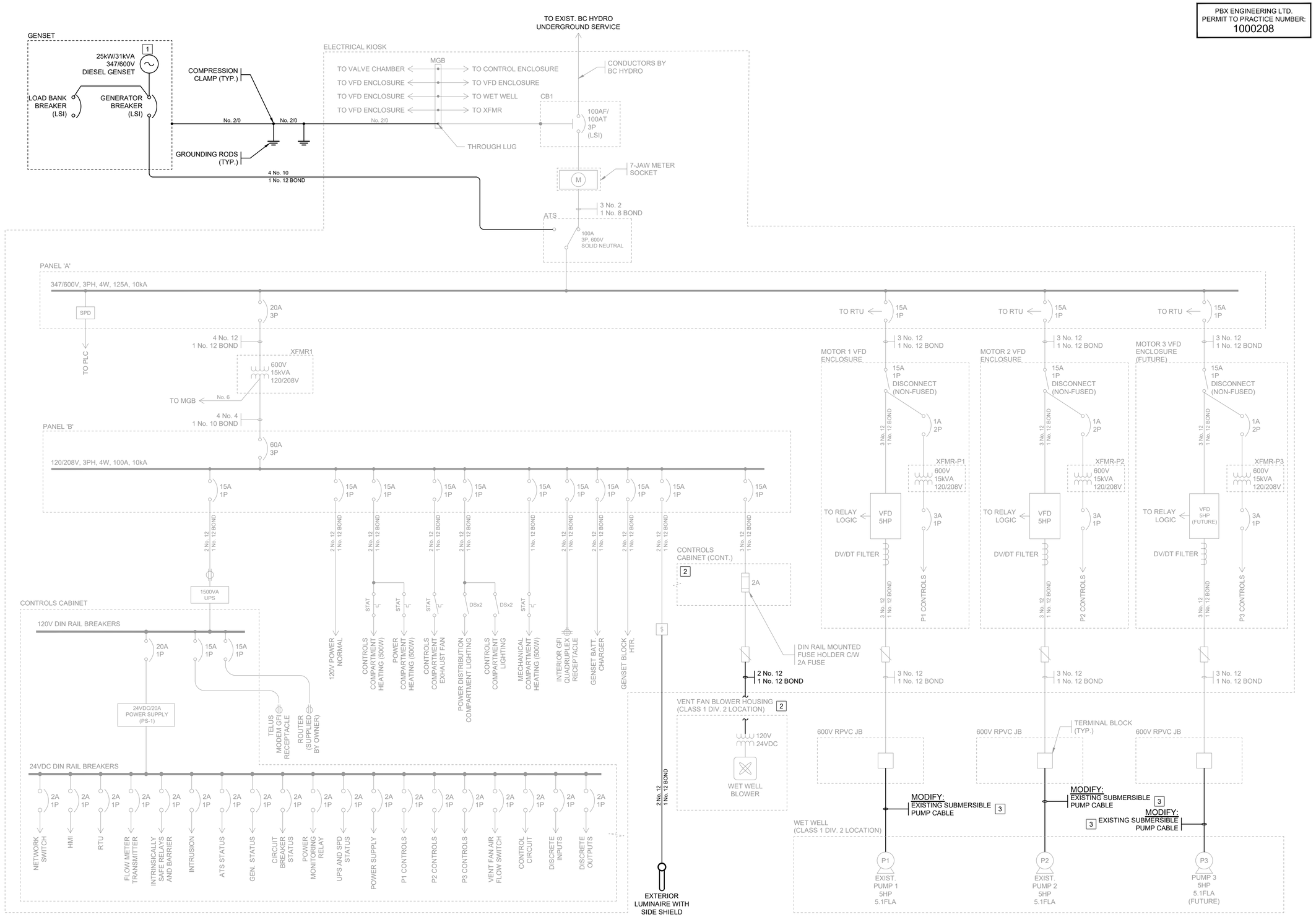
NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE

KIOSK (3 OF 3)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–006	–	16/28



NOTES:

1. EXISTING GENERATOR TO BE RE-USED THROUGHOUT CONSTRUCTION AND UNTIL NEW GENERATOR HAS BEEN DELIVERED TO SITE.
2. VENDOR PACKAGE BLOWER. SEE SHOP DRAWINGS FOR ADDITIONAL DETAILS. BASIS OF DESIGN IS DEXON CANADA VENT FAN SMVOD SERIES.
3. DISCONNECT AND PULL BACK EXISTING PUMP CABLES. CONTRACTOR TO MEASURE AND CONFIRM EXISTING PUMP CABLE LENGTHS ARE SUFFICIENT TO REACH KIOSK CONDUIT ENTRY. CONTRACTOR TO MEGGER EXISTING PUMP CABLES AND PUMPS TO CONFIRM THEY ARE SUITABLE FOR RE-USE.

LEGEND	
	LIGHT GREY DENOTES EQUIPMENT SUPPLIED BY OWNER
	BOLD DENOTES EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR

ALL EQUIPMENT IS PROPOSED UNLESS NOTED OTHERWISE

ISSUED FOR TENDER NOT FOR CONSTRUCTION

PBX ENGINEERING LTD.
PERMIT TO PRACTICE NUMBER:
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SEAL

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — 34602 — 2023-07-26

PROJECT NO.	220363
DRAWN	PBX
DESIGNED	MS
CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

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REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE

POWER DISTRIBUTION SINGLE LINE DIAGRAM

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–007	—	17/28

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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — 31402 — MICHAEL SCOPATZ
2023-07-26

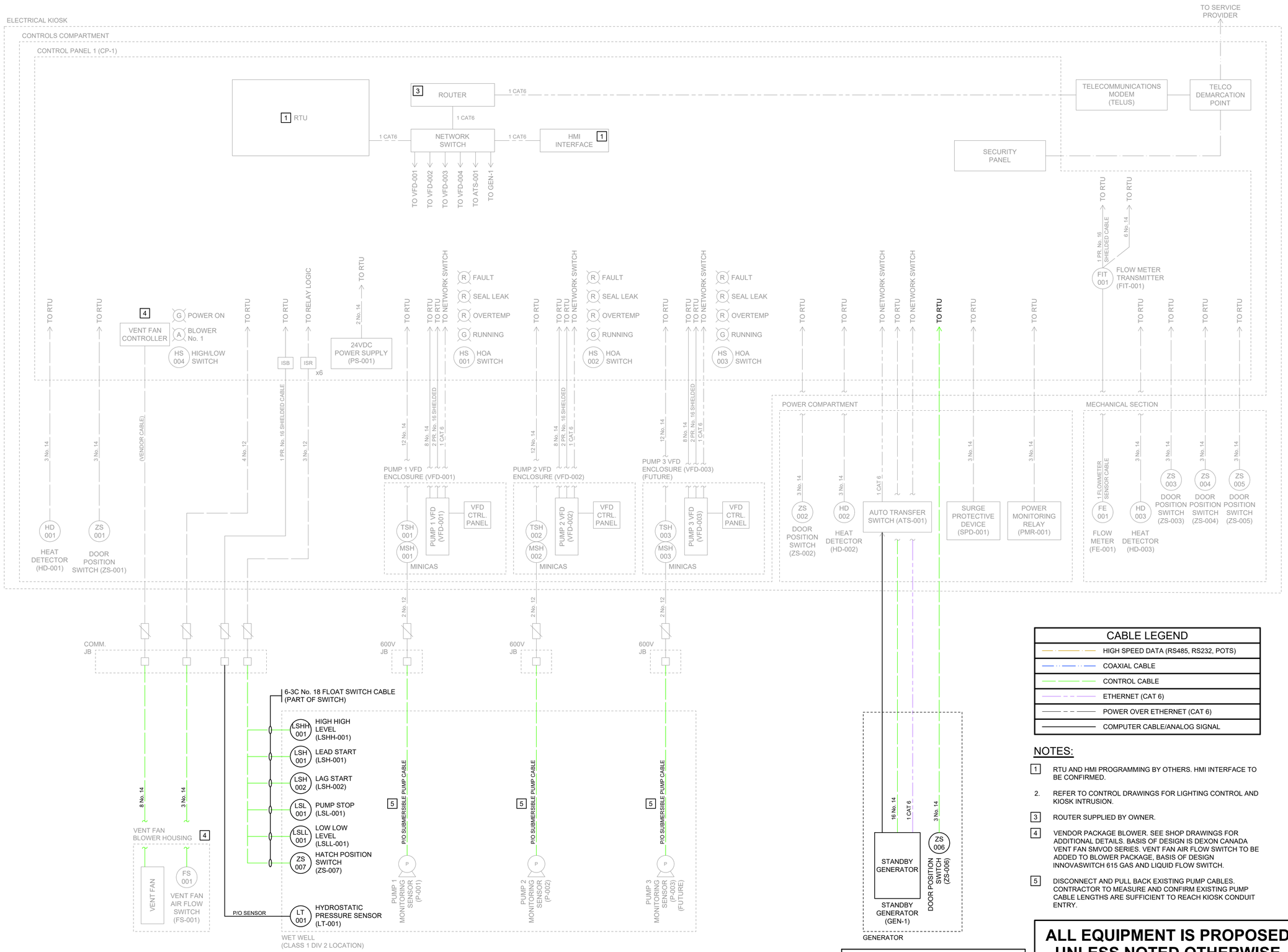
PROJECT NO.	220363
DRAWN	PBX
DESIGNED	MS
CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

CLIENT
REGIONAL DISTRICT OF NANAIMO

PROJECT
NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE
COMMUNICATION AND INSTRUMENTATION BLOCK DIAGRAM
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–008	—	18/28



CABLE LEGEND
HIGH SPEED DATA (RS485, RS232, POTS)
COAXIAL CABLE
CONTROL CABLE
ETHERNET (CAT 6)
POWER OVER ETHERNET (CAT 6)
COMPUTER CABLE/ANALOG SIGNAL

NOTES:

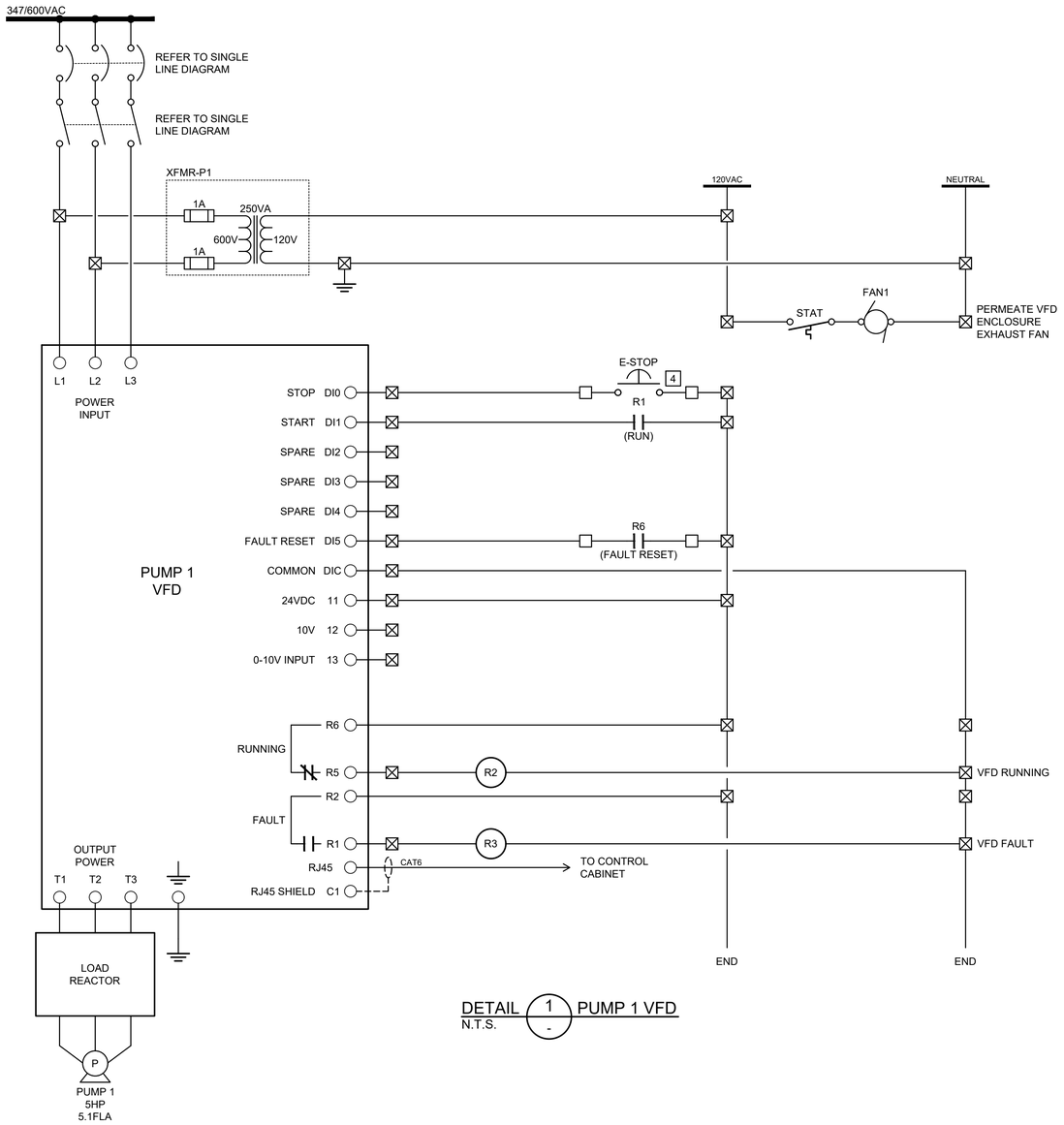
1. RTU AND HMI PROGRAMMING BY OTHERS. HMI INTERFACE TO BE CONFIRMED.
2. REFER TO CONTROL DRAWINGS FOR LIGHTING CONTROL AND KIOSK INTRUSION.
3. ROUTER SUPPLIED BY OWNER.
4. VENDOR PACKAGE BLOWER. SEE SHOP DRAWINGS FOR ADDITIONAL DETAILS. BASIS OF DESIGN IS DEXON CANADA VENT FAN SMVOD SERIES. VENT FAN AIR FLOW SWITCH TO BE ADDED TO BLOWER PACKAGE, BASIS OF DESIGN INNOVASWITCH 615 GAS AND LIQUID FLOW SWITCH.
5. DISCONNECT AND PULL BACK EXISTING PUMP CABLES. CONTRACTOR TO MEASURE AND CONFIRM EXISTING PUMP CABLE LENGTHS ARE SUFFICIENT TO REACH KIOSK CONDUIT ENTRY.

LEGEND	
	LIGHT GREY DENOTES EQUIPMENT SUPPLIED BY OWNER
	BOLD DENOTES EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR

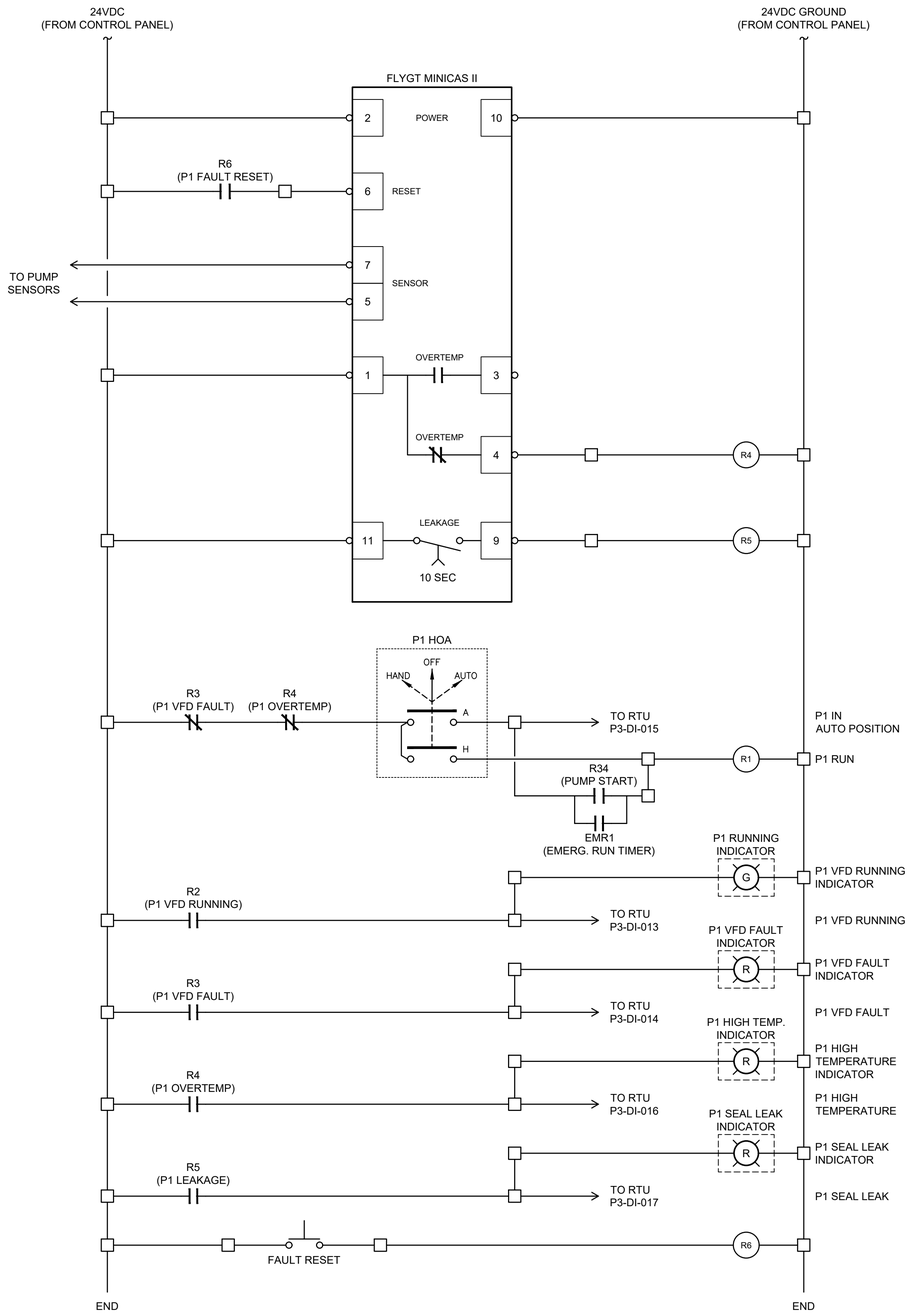
ALL EQUIPMENT IS PROPOSED UNLESS NOTED OTHERWISE

**ISSUED FOR TENDER
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DETAIL 1 PUMP 1 VFD
N.T.S.



NOTES:

1. INTERNAL CABINET WIRING SHALL BE TEW (TINNED), No. 14 FOR 120VAC CIRCUITS, AND No. 18 FOR 24VDC CIRCUITS. UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO PROVIDE DETAILED SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION. INTERIOR AND EXTERIOR PANEL LAYOUTS AND WIRING DIAGRAMS TO BE PROVIDED AS PART OF THE SUBMISSION. REFER TO SPECIFICATIONS FOR SPECIFIC LAYOUT DETAILS AND EQUIPMENT REQUIREMENTS.
3. FERRULES SHALL BE USED ON CONTROL CABLING TERMINATIONS.

[4] E-STOP IS PART OF 3-POLE SWITCH LOCATED ON CONTROL PANEL.

5. INCLUDE ALLEN BRADLEY POWERFLEX MODEL 20-750-2262C-2R (24 VOLT DC) I/O MODULE.

TERMINAL BLOCK LEGEND

- INTRINSICALLY SAFE BARRIER ENCLOSURE
- CONTROL CABINET
- JUNCTION BOX
- VFD ENCLOSURE

FUNCTIONAL DESIGN ONLY
CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ENGINEER'S APPROVAL PRIOR TO FABRICATION

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SEAL
2023-07-26

PROJECT NO.	220363
DRAWN	PBX
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CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

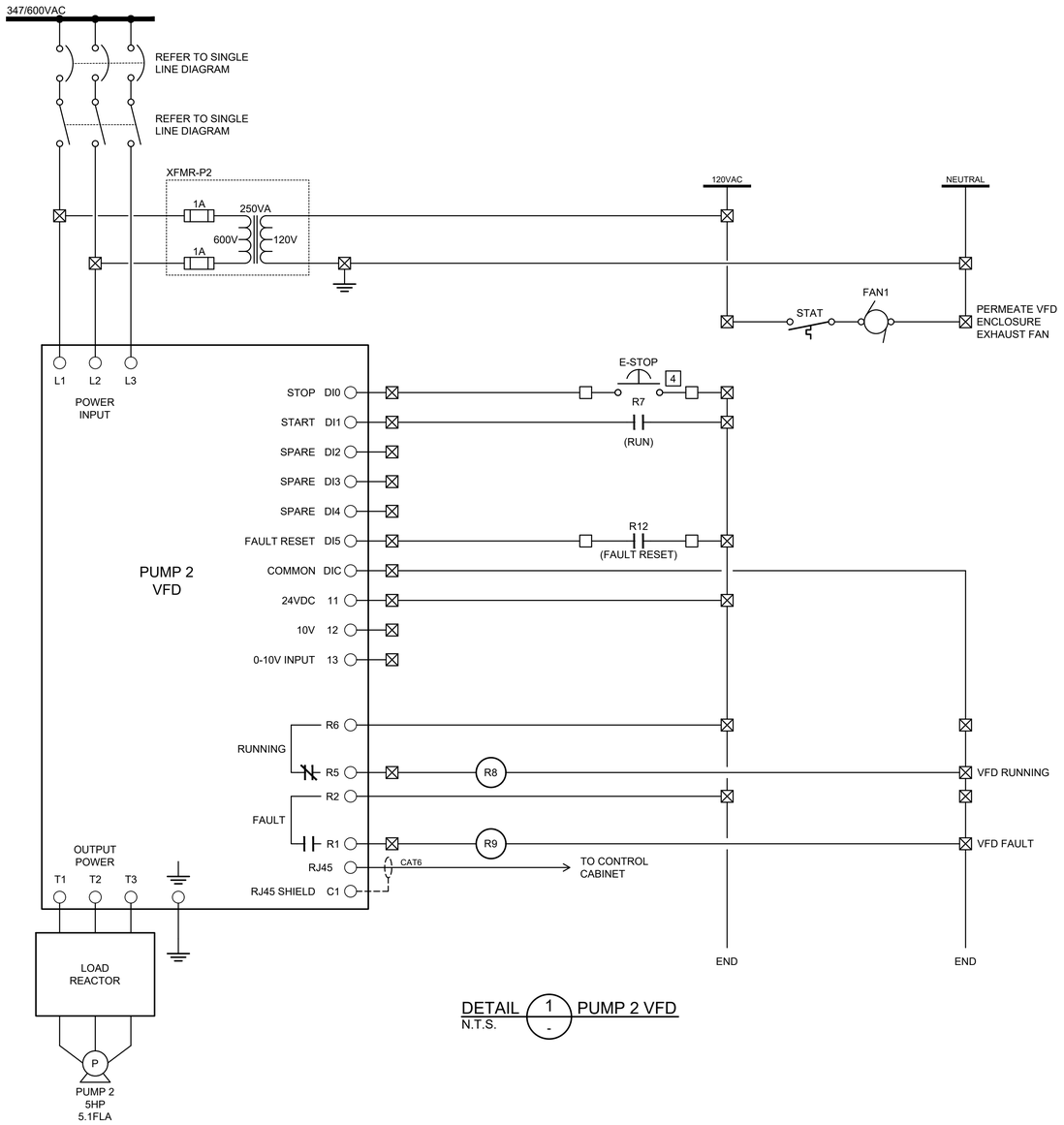
CLIENT
REGIONAL DISTRICT OF NANAIMO

PROJECT
NANOOSE BAY SANITARY PUMPSTATION NO. 6

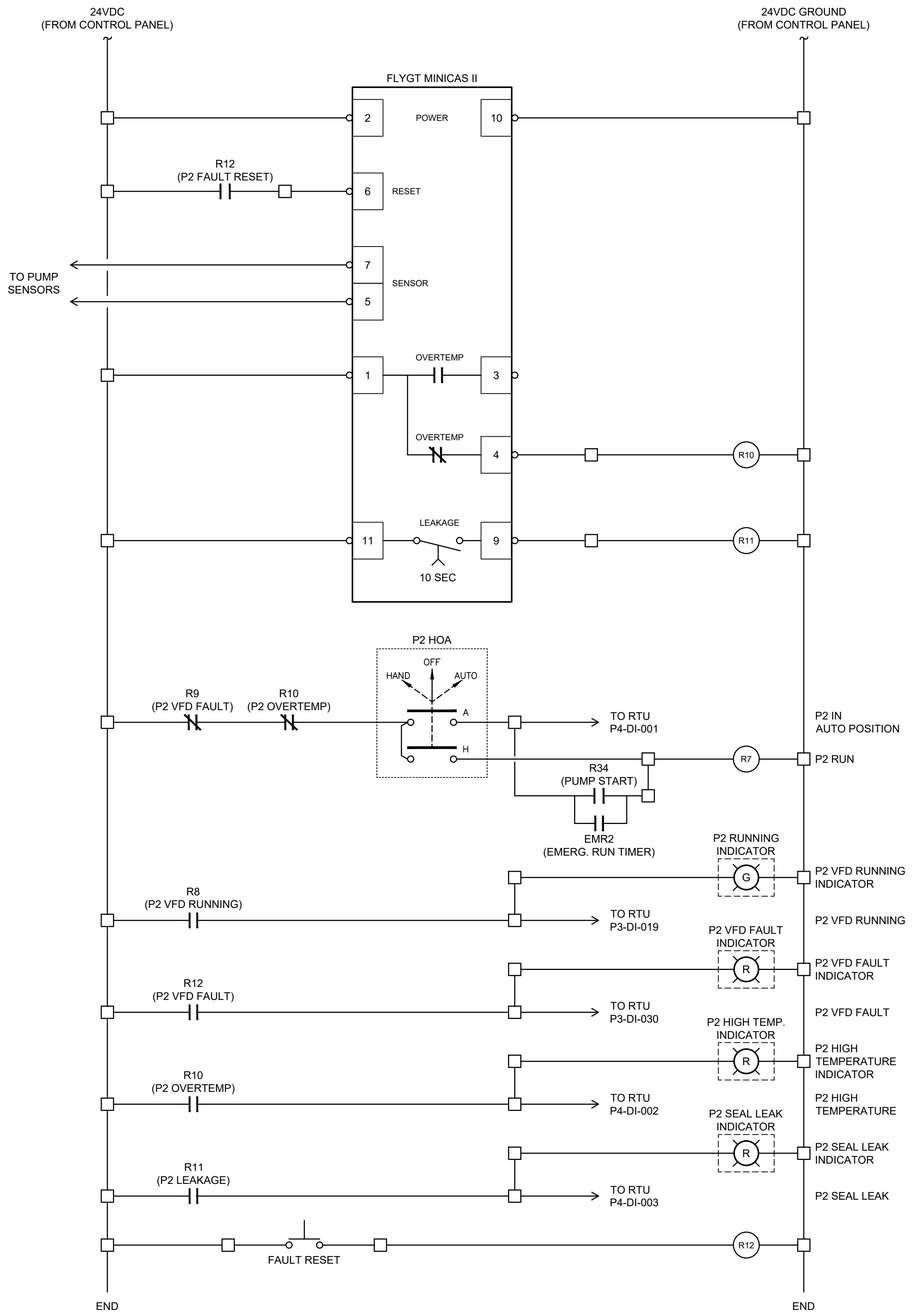
TITLE
CONTROLS (1 OF 7)
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–009	—	19/28

PBX ENGINEERING LTD.
PERMIT TO PRACTICE NUMBER:
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DETAIL 1 PUMP 2 VFD
N.T.S.



NOTES:

1. INTERNAL CABINET WIRING SHALL BE TEW (TINNED), No. 14 FOR 120VAC CIRCUITS, AND No. 18 FOR 24VDC CIRCUITS. UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO PROVIDE DETAILED SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION. INTERIOR AND EXTERIOR PANEL LAYOUTS AND WIRING DIAGRAMS TO BE PROVIDED AS PART OF THE SUBMISSION. REFER TO SPECIFICATIONS FOR SPECIFIC LAYOUT DETAILS AND EQUIPMENT REQUIREMENTS.
3. FERRULES SHALL BE USED ON CONTROL CABLING TERMINATIONS.

[4] E-STOP IS PART OF 3-POLE SWITCH LOCATED ON CONTROL PANEL.

5. INCLUDE ALLEN BRADLEY POWERFLEX MODEL 20-750-2262C-2R (24 VOLT DC) I/O MODULE.

TERMINAL BLOCK LEGEND

- INTRINSICALLY SAFE BARRIER ENCLOSURE
- CONTROL CABINET
- JUNCTION BOX
- VFD ENCLOSURE

FUNCTIONAL DESIGN ONLY
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PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. SHOCK
2023-07-26

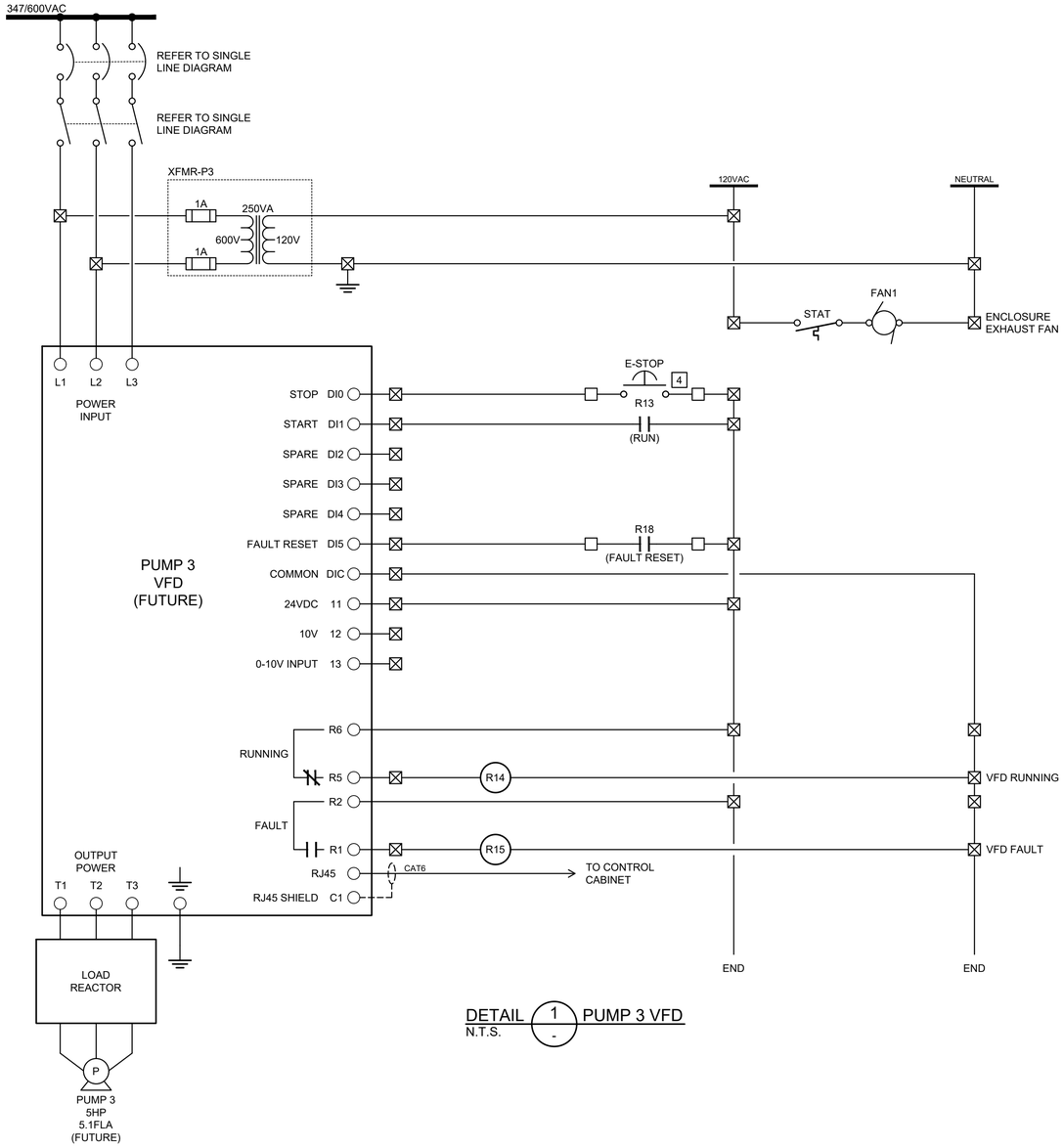
PROJECT NO.	220363
DRAWN	PBX
DESIGNED	MS
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APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

CLIENT
REGIONAL DISTRICT OF NANAIMO

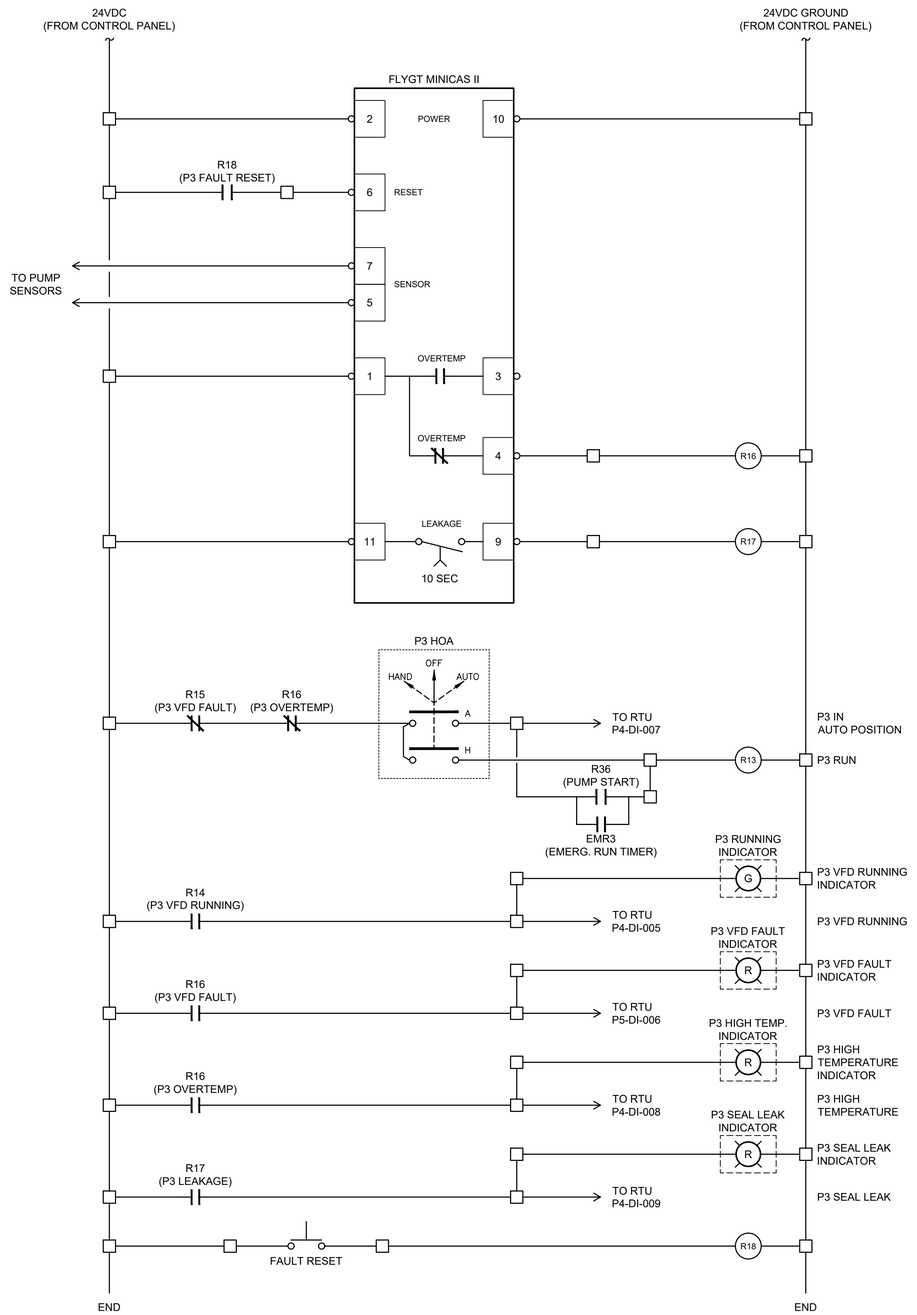
PROJECT
NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE
CONTROLS (2 OF 7)
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–010	—	20/28



DETAIL 1 PUMP 3 VFD
N.T.S.



NOTES:

1. INTERNAL CABINET WIRING SHALL BE TEW (TINNED), No. 14 FOR 120VAC CIRCUITS, AND No. 18 FOR 24VDC CIRCUITS. UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO PROVIDE DETAILED SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION. INTERIOR AND EXTERIOR PANEL LAYOUTS AND WIRING DIAGRAMS TO BE PROVIDED AS PART OF THE SUBMISSION. REFER TO SPECIFICATIONS FOR SPECIFIC LAYOUT DETAILS AND EQUIPMENT REQUIREMENTS.
3. FERRULES SHALL BE USED ON CONTROL CABLING TERMINATIONS.

[4] E-STOP IS PART OF 3-POLE SWITCH LOCATED ON CONTROL PANEL.

5. INCLUDE ALLEN BRADLEY POWERFLEX MODEL 20-750-2262C-2R (24 VOLT DC) I/O MODULE.

TERMINAL BLOCK LEGEND

- INTRINSICALLY SAFE BARRIER ENCLOSURE
- CONTROL CABINET
- JUNCTION BOX
- VFD ENCLOSURE

FUNCTIONAL DESIGN ONLY
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SEAL
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. J. THOMPSON
2023-07-26

PROJECT NO.	220363
DRAWN	PBX
DESIGNED	MS
CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

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REGIONAL DISTRICT OF NANAIMO

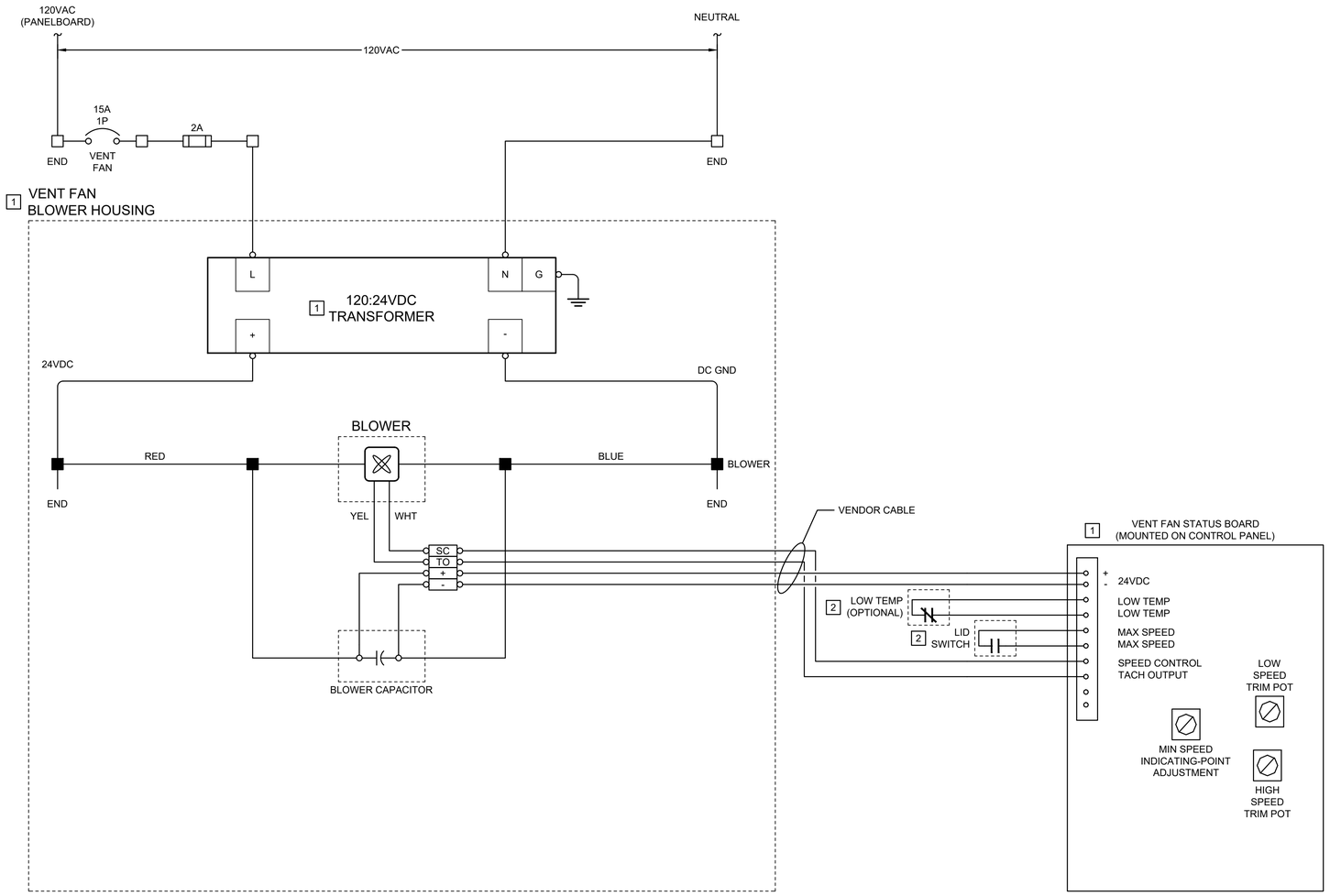
PROJECT
NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE
CONTROLS (3 OF 7)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–011	—	21/28

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NOTES:

1. VENDOR PACKAGE BLOWER. SEE SHOP DRAWINGS FOR ADDITIONAL DETAILS. BASIS OF DESIGN IS DEXON CANADA VENT FAN SMVOD SERIES. VENT FAN AIR FLOW SWITCH TO BE ADDED TO BLOWER PACKAGE.
2. LOW TEMPERATURE SWITCH AND LIT SWITCH MUST BE DRY CONTACT.

TERMINAL BLOCK LEGEND

- INTRINSICALLY SAFE BARRIER ENCLOSURE
- CONTROL CABINET
- JUNCTION BOX
- VFD ENCLOSURE

FUNCTIONAL DESIGN ONLY
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SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA 34602 — 2023-07-26

PROJECT NO.	220363
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CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

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REGIONAL DISTRICT OF NANAIMO

PROJECT

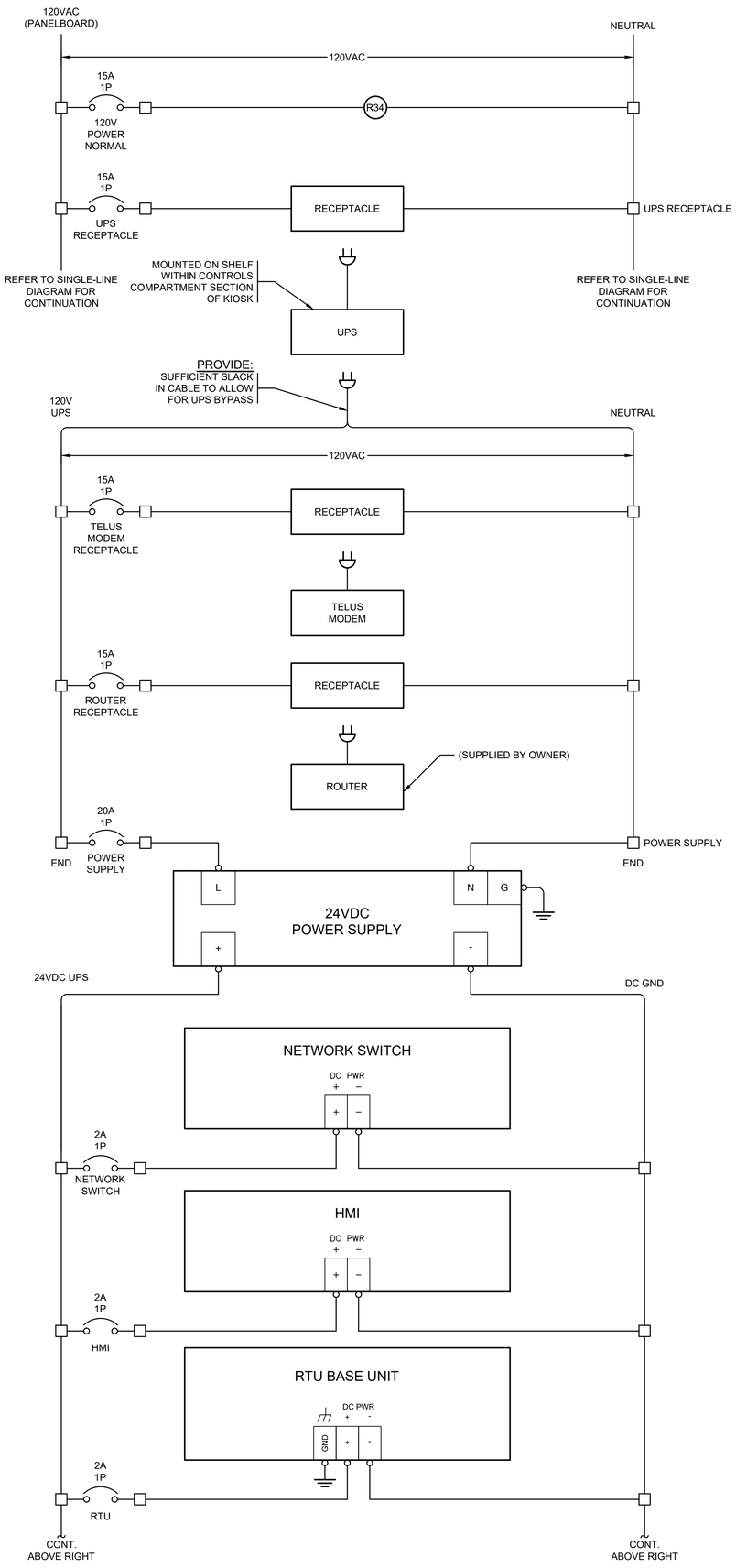
NANOOSE BAY
SANITARY
PUMPSTATION
NO. 6

TITLE

CONTROLS (4 OF 7)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–012	—	22/28



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2023-07-26

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REGIONAL DISTRICT OF NANAIMO

PROJECT

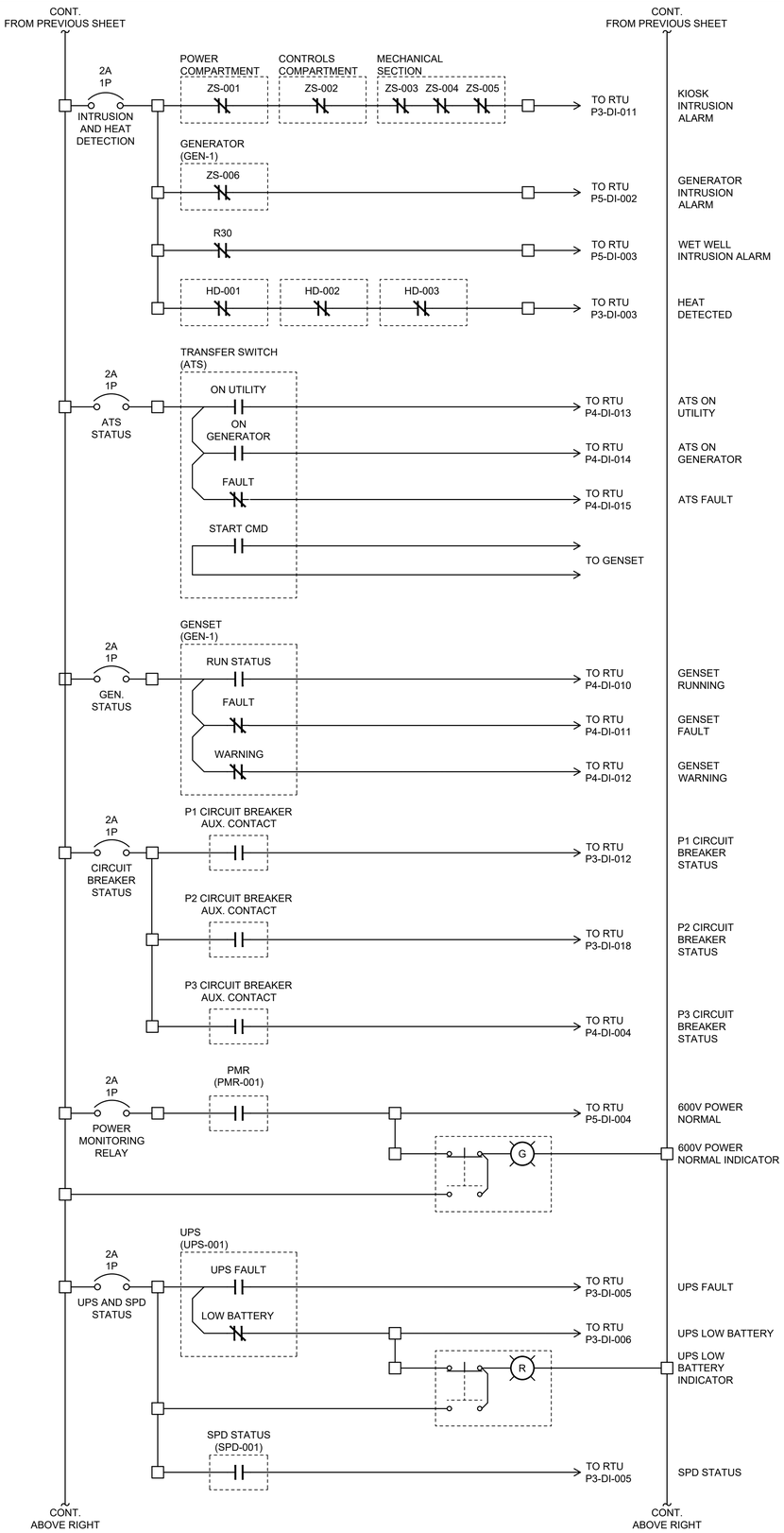
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SANITARY
PUMPSTATION
NO. 6

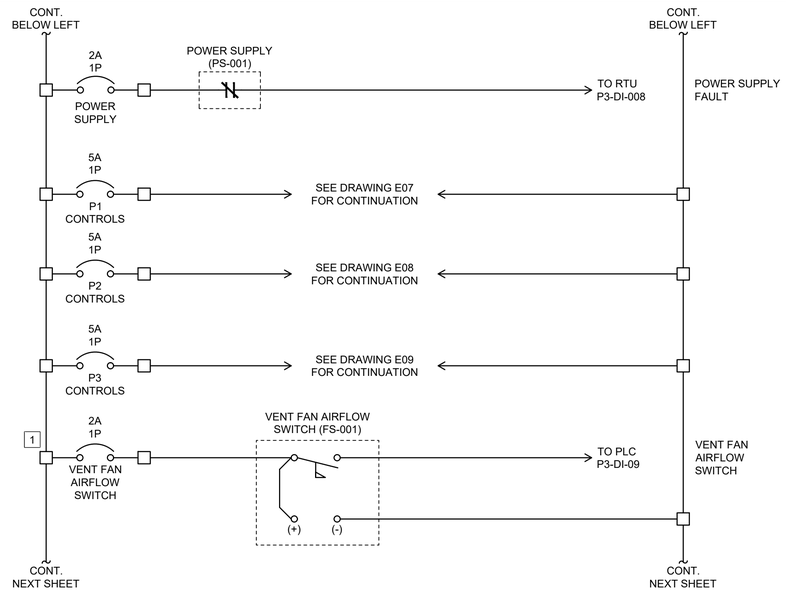
TITLE

CONTROLS (5 OF 7)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–013	—	23/28





NOTES:

1. VENT FAN AIR FLOW SWITCH TO BE INSTALLED IN WET WELL BLOWER ENCLOSURE, BASIS OF DESIGN INNOVASWITCH 615 GAS AND LIQUID FLOW SWITCH.

FUNCTIONAL DESIGN ONLY
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PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — 34602 — MICHAEL SCHMIDT
2023-07-26

PROJECT NO.	220363
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APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

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REGIONAL DISTRICT OF NANAIMO

PROJECT

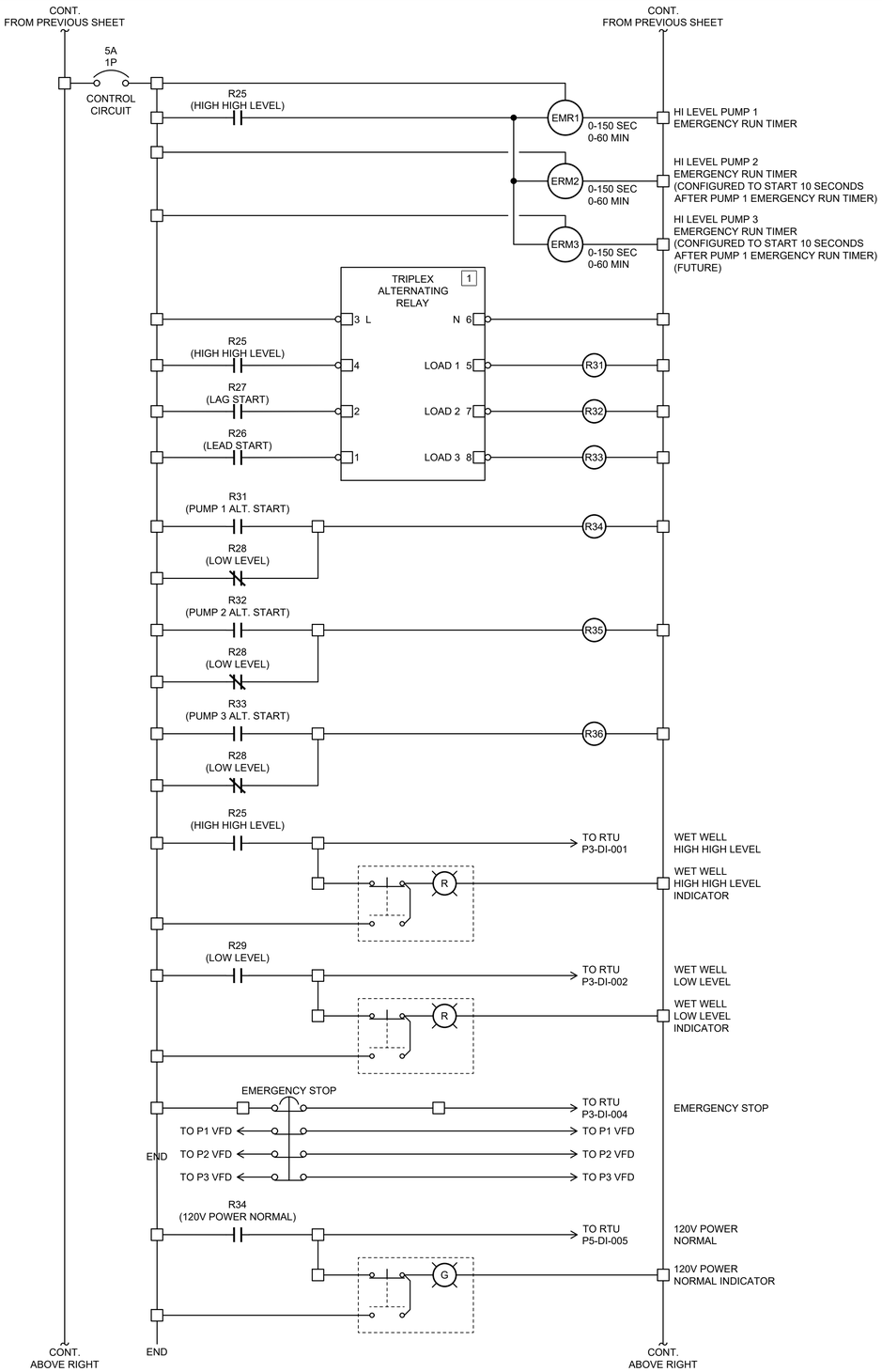
NANOOSE BAY SANITARY PUMPSTATION NO. 6

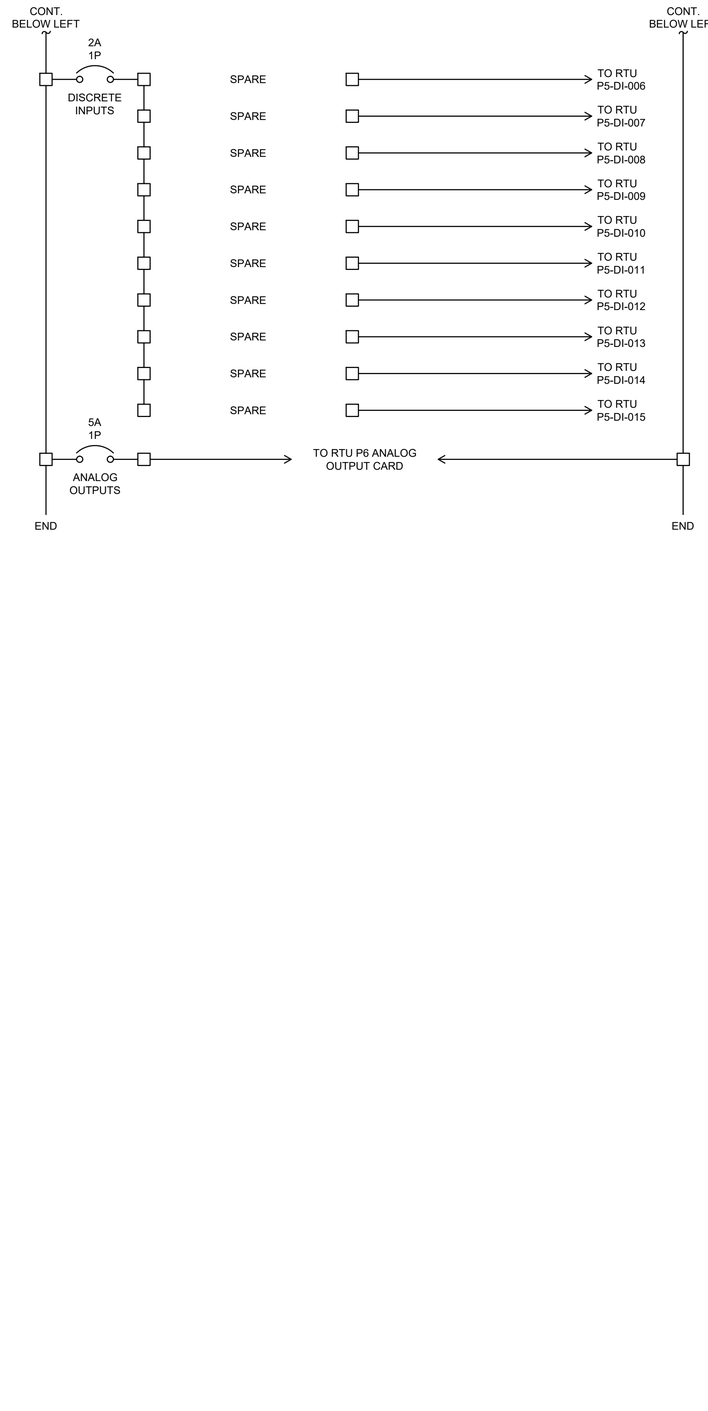
TITLE

CONTROLS (6 OF 7)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6-E-014	—	24/28





NOTES:

1 TRIPLE ALTERNATING RELAY BASIS OF DESIGN: MACROMATIC ATP SERIES TRIPLEX (ATP024A1R) WITH OPTIONAL SWITCH TO OPERATE AS DUPLEXOR.

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PROVINCE OF BRITISH COLUMBIA
2023-07-26

PROJECT NO.	220363
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CLIENT

REGIONAL DISTRICT OF NANAIMO

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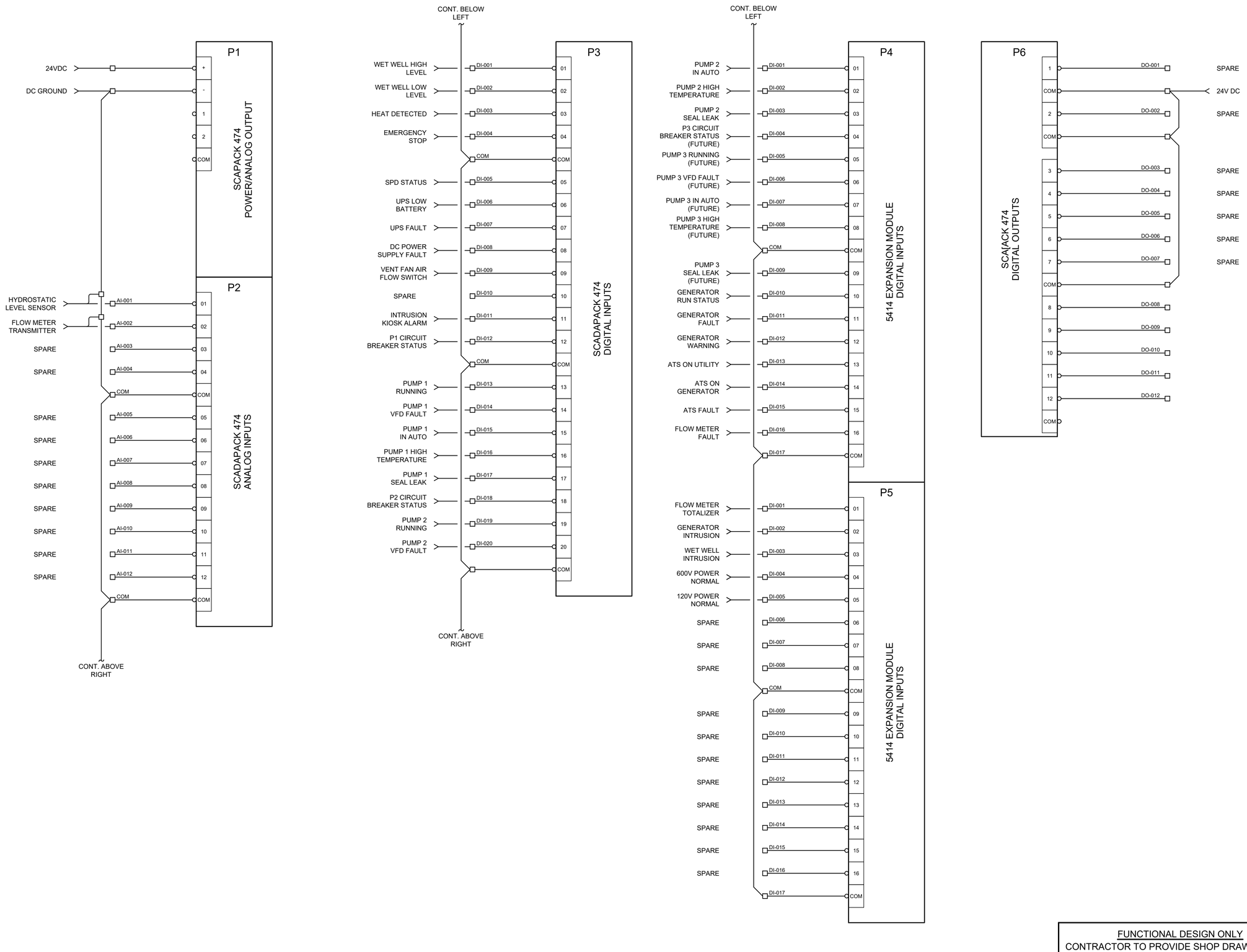
NANOOSE BAY
SANITARY
PUMPSTATION
NO. 6

TITLE

CONTROLS (7 OF 7)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–015	–	25/28



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SEAL

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. J. SCOPICK 31402
2023-07-26

PROJECT NO.	220363
DRAWN	PBX
DESIGNED	MS
CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY SANITARY PUMPSTATION NO. 6

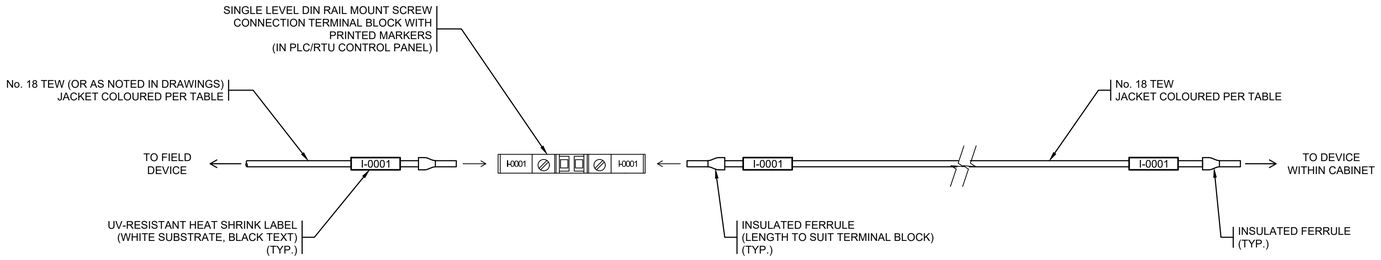
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RTU IO

Pump Station No. 6

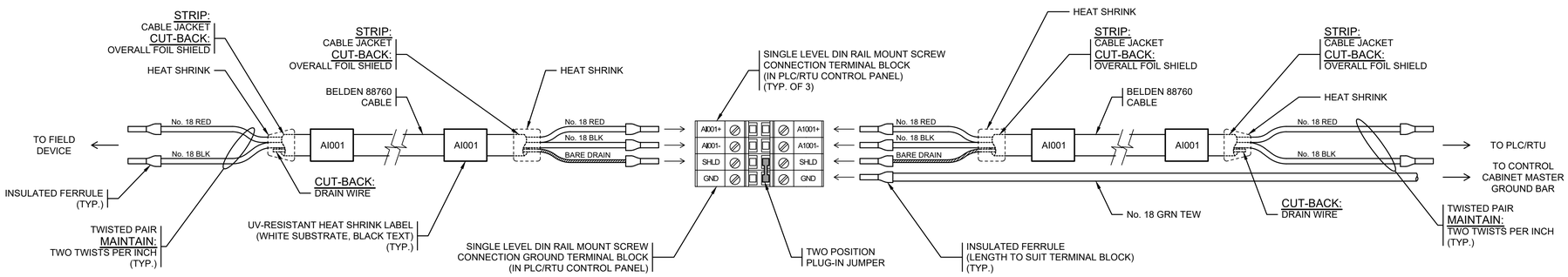
DRAWING No.	REV.	SHEET
NBPS6-E-016	—	26/28

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PERMIT TO PRACTICE NUMBER:
1000208

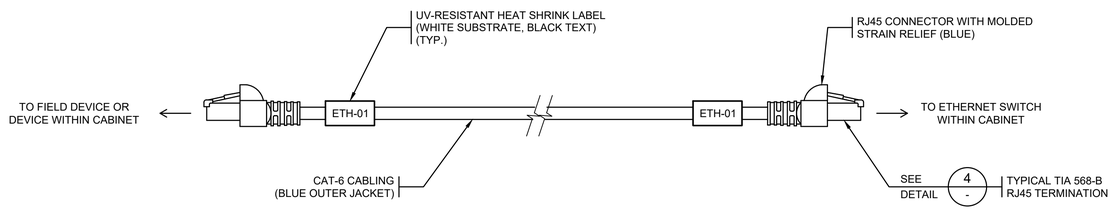


DETAIL 1 N.T.S. — TYPICAL DISCRETE CONTROL FIELD WIRING TERMINATION METHOD

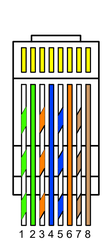
INSTRUMENTATION FIELD WIRING COLOUR CODE	
FUNCTION	COLOUR
AC HOT	BLACK
AC NEUTRAL	WHITE
DC POSITIVE	RED
DC NEGATIVE	BROWN
GROUND	GREEN



DETAIL 2 N.T.S. — TYPICAL ANALOG CONTROL FIELD WIRING TERMINATION METHOD

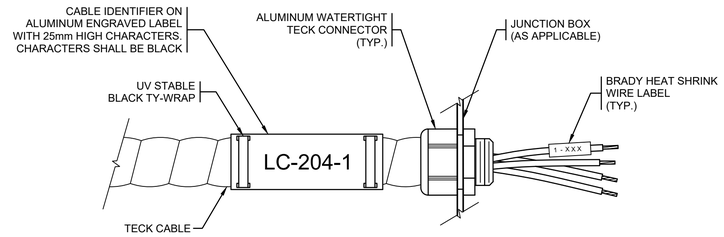


DETAIL 3 N.T.S. — TYPICAL ETHERNET CABLING TERMINATION METHOD



PIN	COLOUR
1	WHT/ORG
2	GRN
3	WHT/GRN
4	BLU
5	WHT/BLU
6	ORG
7	WHT/BRN
8	BRN

DETAIL 4 N.T.S. — TYPICAL TIA 568-A RJ45 TERMINATION (CLIP FACING AWAY)



DETAIL 5 N.T.S. — TECK CABLE TERMINATION

FOR INFORMATION ONLY

KOERS & ASSOCIATES ENGINEERING LTD.
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Victoria BC, V8T 4S9
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www.pbxeng.com

RECORD OF REVISIONS

REV	DATE	BY	ENG	DESCRIPTION

ISS	DATE	BY	ENG	DESCRIPTION
–	23JUN23	PBX	MS	ISSUED FOR INFORMATION

RECORD OF ISSUE

SEAL

2023-07-26

PROJECT NO.	220363
DRAWN	PBX
DESIGNED	MS
CHECKED	AT
APPROVED	AT
DATE	JUNE 2023
SCALE	AS SHOWN

CLIENT

REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY SANITARY PUMPSTATION NO. 6

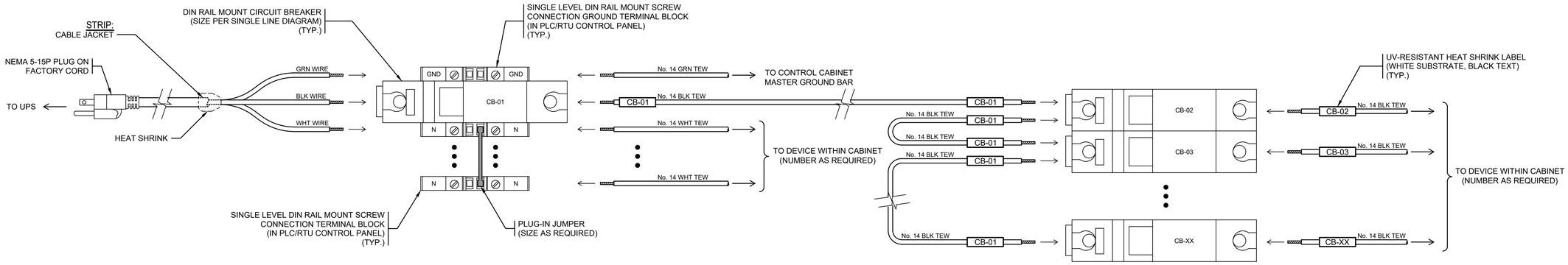
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TYPICAL PLC–RTU CABINET WIRING TERMINATIONS (1 OF 2)

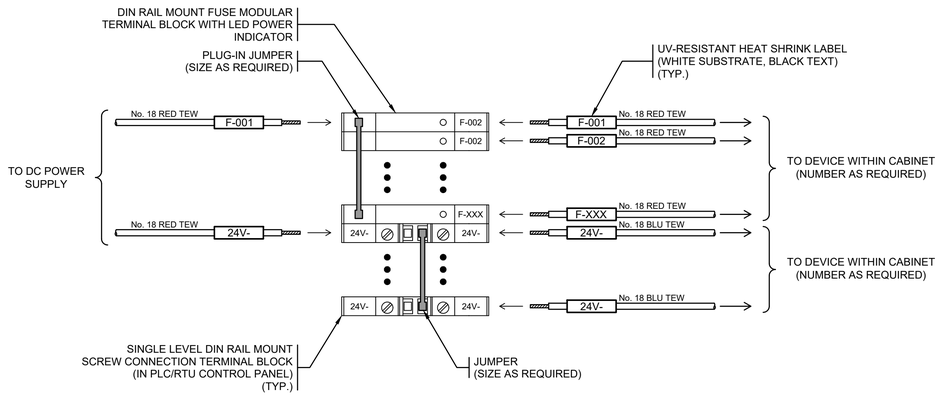
Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–017	–	27/28

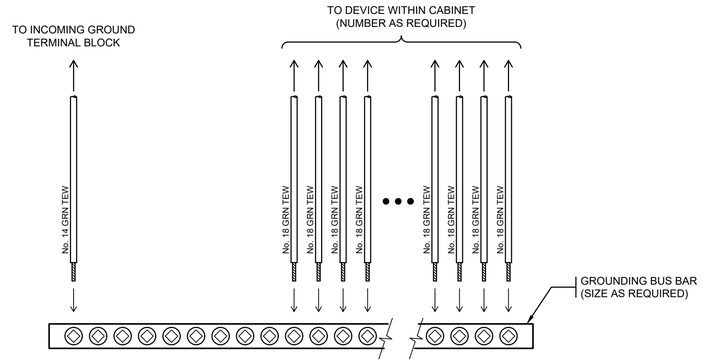
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DETAIL 1 - N.T.S. TYPICAL 120V AC DISTRIBUTION WIRING TERMINATION METHOD



DETAIL 2 - N.T.S. TYPICAL DC DISTRIBUTION WIRING TERMINATION METHOD



DETAIL 3 - N.T.S. TYPICAL MASTER GROUND BUS TERMINATION METHOD

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REGIONAL DISTRICT OF NANAIMO

PROJECT

NANOOSE BAY SANITARY PUMPSTATION NO. 6

TITLE

TYPICAL PLC–RTU CABINET WIRING TERMINATIONS (2 OF 2)

Pump Station No. 6

DRAWING No.	REV.	SHEET
NBPS6–E–018	—	28/28