WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL PARK SPS UPGRADES

Discover Life.
Pure & Simple.

SOUTHWEST MIDDLESEX

TENDER No. RFT-SM-008-26

ISSUED FOR TENDER

DRAWING NO.	DESCRIPTION
C-100	GENERAL NOTES
C-101	SITE PLAN
DI-001	PROCESS LEGEND SHEET 1
DI-002	PROCESS LEGEND SHEET 2
DI-003	PROCESS LEGEND SHEET 3
DI-101	P&ID - NEW PUMPS AND VALVE CHAM
DP-101	PLAN ABOVE 219.320
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DP-301	SECTION - EXISTING AND NEW VALVE CHAMBERS
DP-302	SECTIONS - WET WELL & PLAN VIEWS
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S-001	DESIGN AND GENERAL NOTES
S-002	STANDARD DETAILS
S-101	WET-WELL PLAN - NEW AND REMOVAL STRUCTURES PLAN
E-001	LEGEND & ABBREVIATIONS
ED-101	DEMOLITION PLAN

DRAWING NO.	DESCRIPTION
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E-210	WET WELL DETAILS
E-501	GENERAL ARRANGEMENT PP-1
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EI-623	CP-1 BACKUP LEVEL CONTROL
EI-630	TYPICAL LOOP DIAGRAM
EI-631	CONTROL PANEL CP-1 PLC I/O
EI-632	CP1 NETWORK AND AUTODIALER I/O

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Job No 1656-30252

GENERAL NOTES:

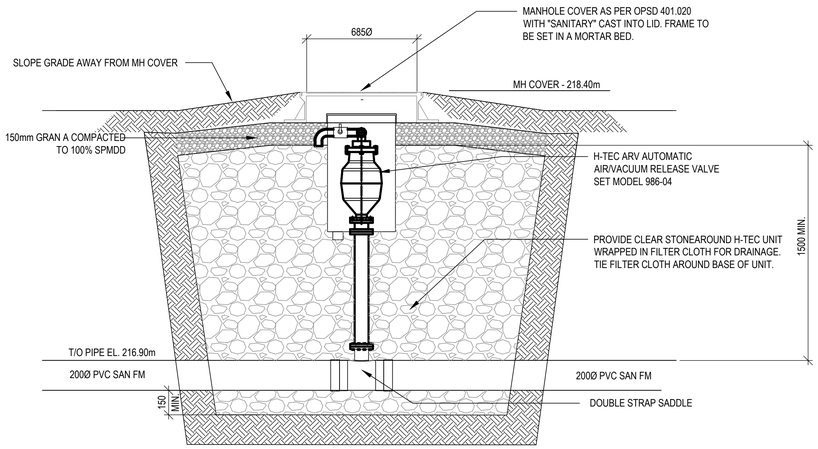
1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH AND MEET THE MINIMUM STANDARDS AND FULL SPECIFICATIONS OF THE MUNICIPALITY OF SOUTHWEST MIDDLESEX ENGINEERING SERVICES DEPARTMENT, THE ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS, OTM TRAFFIC MANUALS AND TECHNICAL SPECIFICATIONS. ALL PROPOSED WORKS INCLUDING EXTENTION OF THE SANITARY FORCEMAIN PIPE SHALL CONFORM WITH THE STANDARDS AND FULL SPECIFICATIONS OF THE OPS FOR PIPE MATERIAL CLASS AND BEDDING, AND THE MUNICIPALITY OF SOUTHWEST MIDDLESEX DESIGN AND CONSTRUCTION STANDARDS (2021).
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS, ELEVATIONS AND DIMENSIONS AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE CONTRACT ADMINISTRATOR.
3. THE POSITION OF ALL POLE LINES, CONDUIT, WATERMAIN, SEWERS AND OTHER UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND WHERE SHOWN THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL VERIFY AND LOCATE FOR THEIRSELF THE EXACT LOCATION OF ALL SUCH STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
4. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO FACILITATE UTILITY RELOCATIONS AND UTILITY SUPPORT MEASURES. UTILITIES DAMAGED OR DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
5. ALL SUBSTITUTIONS MUST BE APPROVED BY THE CONTRACT ADMINISTRATOR.
6. AREAS SHOWN FOR RESTORATION ARE APPROXIMATE ONLY AND WILL DEPEND ON THE EXISTING CONDITIONS AND ACTUAL LOCATION OF THE SERVICES. EXISTING SURFACES WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION.
7. SAFE PEDESTRIAN ACCESS MUST BE MAINTAINED AT ALL TIMES IN RESIDENTIAL AREAS.
8. THE CONTRACTOR SHALL COORDINATE ALL CHANGES IN TRAFFIC MOVEMENT WITH THE CONTRACT ADMINISTRATOR IN CONJUNCTION WITH TRANSPORTATION PLANNING AND DESIGN DIVISION AND SHALL FOLLOW OTM TRAFFIC CONTROL MANUAL (BOOK 7) AS A MINIMUM FOR ROADWAY WORK OPERATION.
9. SURFACE AND UNDERGROUND DRAINAGE TO BE MAINTAINED DURING CONSTRUCTION IN ACCORDANCE WITH MUNICIPALITY OF SOUTHWEST MIDDLESEX SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF SURFACE AND SUBSURFACE WATER.
10. CONTRACTOR TO PROVIDE TEMPORARY PUMPING AND BYPASS PIPING AS PART OF THE PROPOSED UPGRADES. SCHEDULING OF TEMPORARY PUMPING MUST BE COORDINATED WITH THE CONTRACT ADMINISTRATOR AT LEAST ONE (1) WEEK IN ADVANCE FOR APPROVAL. THE CONTRACTOR SHALL COORDINATE WORK TO MINIMIZE THE DURATION OF THE TEMPORARY PUMPING.
11. CONTRACTOR SHALL ENSURE THAT ACCESS TO THE SPS IS MAINTAINED AT ALL TIMES FOR OPERATIONS STAFF.

THE FOLLOWING OPSS STANDARDS SHALL BE USED ON THIS CONTRACT:

OPSS 180	MANAGEMENT OF EXCESS MATERIAL
OPSS 206	GRADING
OPSS 314	GRANULAR
OPSS 401	TRENCH BACKFILLING & COMPACTION
OPSS 402	EXCAVATING, BACKFILLING, AND COMPACTING FOR MAINTENANCE HOLE, CATCH BASINS, DITCH INLETS, AND VALVE CHAMBERS
OPSS 802	TOPSOIL
OPSS 805	SEED AND COVER
OPSS 805	TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES
OPSS 902	EXCAVATING AND BACKFILLING – STRUCTURES
OPSS 1002	AGGREGATES, CONCRETE
OPSS 1010	AGGREGATES – BASE, SUB-BASE, SELECT SUB-GRADE, AND BACKFILL MATERIAL
OPSS 1860	GEOTEXTILES

SEDIMENT AND EROSION CONTROL NOTES:

1. MINIMIZE ALL AREA(S) TO BE DISTURBED DURING CONSTRUCTION.
2. PROTECT ALL EXPOSED SURFACES FROM EROSION.
3. CONTROL RUNOFF DURING CONSTRUCTION.
4. ALL EROSION CONTROL MEASURES ARE TO BE IN PLACE AND INSPECTED BY A QUALIFIED PERSON BEFORE STARTING CONSTRUCTION AND REMAIN IN PLACE UNTIL RESTORATION IS COMPLETE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES. ANY FAILURES OF THE IMPLEMENTED ESC PLAN WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NOT THE CONTRACT ADMINISTRATOR.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING BUT NOT LIMITED TO, MAINTAINING FENCING, DIVERSION SWALES, CATCHBASIN SILT SACKS, TEMPORARY SEDIMENTATION BASINS, AND REMOVING ALL ACCUMULATED SEDIMENT FROM THESE CONTROLS WHEN WARRANTED.
7. ALL DISTURBED AREAS WHERE WORK WILL NOT OCCUR FOR 30 DAYS OR MORE SHALL BE STABILIZED IN ACCORDANCE WITH OPSS MUNI 804. IF GRADING IS COMPLETED DURING OFF-SEASON CONSTRUCTION MONTHS, THE SLOPES WILL BE STABILIZED, AS PER OPSS MUNI 804, WHEN WEATHER PERMITS.
8. ANY SOIL STOCKPILES SHALL BE SURROUNDED WITH HEAVY DUTY SILT FENCE AND STABILIZED IN ACCORDANCE WITH OPSS MUNI 804.
9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL SITE RESTORATION IS COMPLETE.
10. UNLESS OTHERWISE SPECIFIED, GEOTEXTILE (TERRAFIX 270R OR APPROVED EQUIVALENT) SHALL BE INSTALLED IN ALL MAINTENANCE HOLES AND PIPE ENDS TO PROTECT THE STORM SEWER SYSTEM FROM SEDIMENT ACCUMULATION.
11. ALL ACCUMULATED SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED LOCATION, IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.
12. ALL DEWATERING MUST BE CONDUCTED USING AN APPROVED OUTLET CONTROL METHOD SUCH AS A SEDIMENTATION BASIN OR FILTER BAG. EFFLUENT MONITORING SHALL BE CONDUCTED IN ACCORDANCE WITH THE ACCEPTED E&SC MONITORING PROGRAM REQUIREMENTS AND TO ENSURE DISCHARGE IS CONSISTENT WITH THE RECEIVER'S BACKGROUND WATER QUALITY REQUIREMENTS.
13. PROTECT ALL CATCHBASINS FROM SEDIMENT INTRUSION USING CATCHBASIN FILTER SACKS OR EQUIVALENT.
14. PROTECT ALL CURB INLET CATCHBASINS FROM SEDIMENT INTRUSION USING CATCHBASIN FILTER SACKS AND PROTECT THE CURB INLET PORTION WITH THE USE OF SECTIONS OF LINEAR FILTER SOCKS OR EQUIVALENT.
15. KEEP ALL SUMPS CLEAN DURING CONSTRUCTION AND IDENTIFY A REGULAR MAINTENANCE PROGRAM TO DO SO.
16. HAVE A PLAN TO MINIMIZE/PREVENT WIND-BLOWN DUST SUCH AS SPRAYING CALCIUM CHLORIDE, WATER AND APPLYING GROUND SOIL TACKIFIERS (PAM) VIA HYDROSEED OR STRAW AND REGULAR STREET SCRAPING/SWEEPING TO REMOVE DEBRIS.
17. STRAW BALES AND/OR WATTLES TO BE USED IN LOCALIZED OVERLAND FLOW AREAS AS SHOWN AND AS DIRECTED BY THE ENGINEER DURING CONSTRUCTION FOR WORKS.
18. STRAW BALES, WATTLES AND SILT FENCE ARE TO BE TERMINATED BY ROUNDING THE ENDS (J- HOOKING) TO CONTAIN AND FILTER RUNOFF.
19. ALL REFUELING AND MAINTENANCE OF EQUIPMENT SHOULD BE AT A MINIMUM OF 30 METERS AWAY FROM ANY SURFACE WATER FEATURE. WHERE SITE CONSTRAINTS CANNOT ACCOMMODATE THIS SEPARATION ALL FUEL AND EQUIPMENT SHALL BE PLACED WITHIN AN APPROVED SPILL CONTAINMENT KIT.



C 1 AIR/VACUUM RELEASE VALVE DETAIL
N.T.S.

LEGEND:

- EXISTING SANITARY SEWER AND MANHOLE
- PROPOSED SANITARY SEWER AND MANHOLE WITH LID LOCATION
- PROPOSED CAP
- EXISTING DITCH INLET CATCH BASIN
- EXISTING CATCH BASIN
- EXISTING STORM SEWER AND MANHOLE
- PROPOSED STORM SEWER AND MANHOLE WITH LID LOCATION
- EXISTING CATCH BASIN MANHOLE
- PROPOSED CATCH BASIN MANHOLE
- PROPOSED CURB INLET CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED STORM SEWER REDUCER
- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- PROPOSED WATERMAIN CAP
- EXISTING WATERMAIN REDUCER
- PROPOSED WATERMAIN REDUCER
- EXISTING FIRE HYDRANT AND VALVE
- PROPOSED FIRE HYDRANT AND VALVE (WITH STORZ CONNECTION)
- PROPOSED WATERMAIN BEND
- EXISTING TREE
- EXISTING BURIED GAS MAIN
- EXISTING UNDERGROUND TELEPHONE CABLE
- EXISTING HYDRO POLE/STREET LIGHT
- EXISTING BELL / TV PEDESTAL
- DIRECTION OF SURFACE DRAINAGE
- BORE HOLE
- PROPOSED ELEVATION
- SITE BENCHMARK

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No.	Revision	By	Appd	YYYY.MM.DD
-				

No.	Issued	By	Appd	YYYY.MM.DD
2	ISSUED FOR TENDER	A.J.	N.O.	2026.02.13
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Permit/Seal

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100087337
2/13/2026
PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX

GLENCOE WW SYSTEM - INDUSTRIAL PARK SPS UPGRADE
Glencoe ON Canada

Project No.: 165630252

Scale: NTS

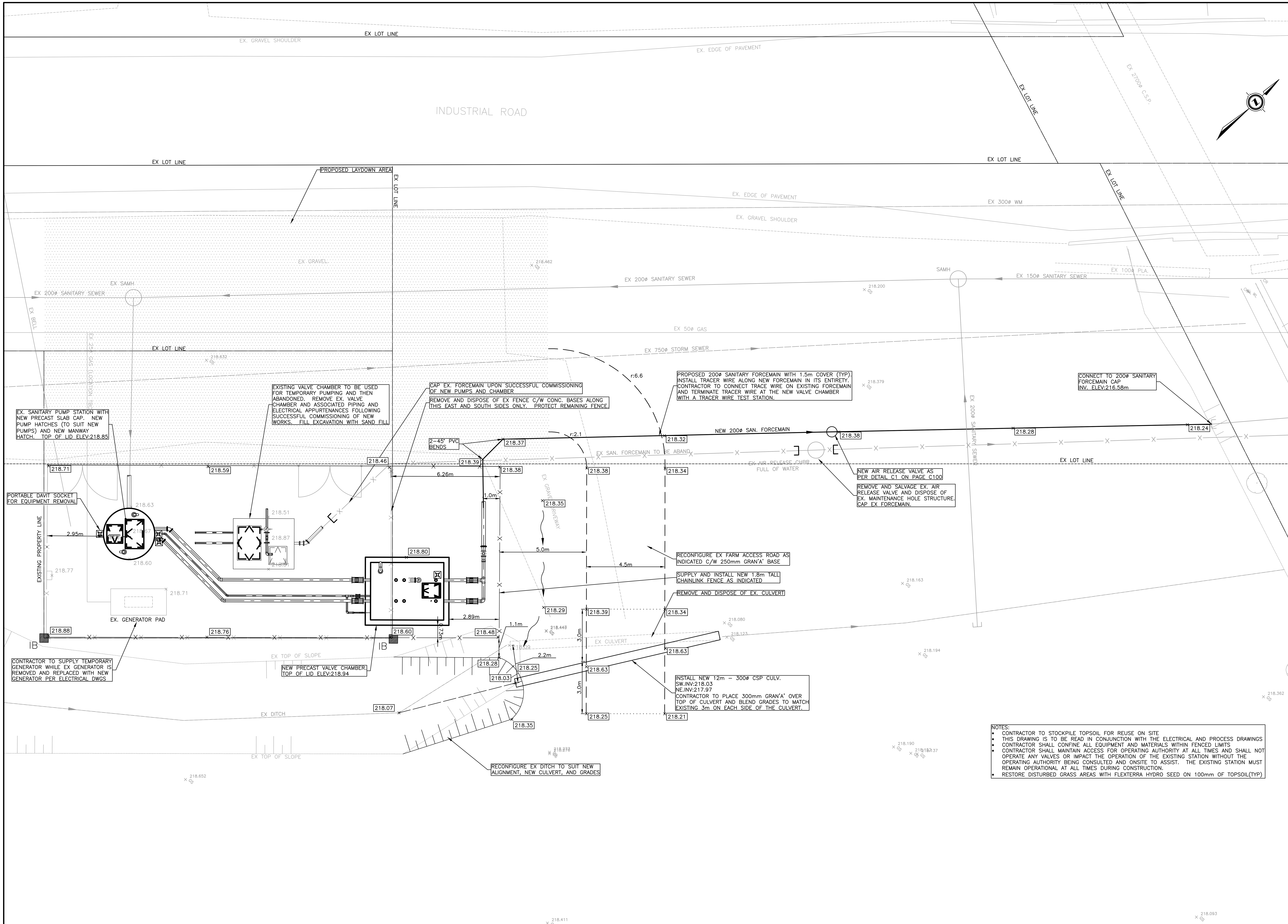
A.J.	A.J.	N.O.	2025/10/24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
GENERAL NOTES

Revision: Sheet: 1 of 2

Drawing No.
C-100

ORIGINAL SHEET - ANSI D


EX LOT LINE
EX. GRAVEL SHOULDER
EX. EDGE OF PAVEMENT
INDUSTRIAL ROAD
PROPOSED LAYDOWN AREA
EX. 300ø WM
EX. GRAVEL
EX. SAMH
EX. 200ø SANITARY SEWER
SAMH
EX. 150ø SANITARY SEWER
EX. 100ø PLA.
EX. 50ø GAS
EX. 750ø STORM SEWER
EX. 2700ø C.S.P.
EXISTING VALVE CHAMBER TO BE USED FOR TEMPORARY PUMPING AND THEN ABANDONED. REMOVE EX. VALVE CHAMBER AND ASSOCIATED PIPING AND ELECTRICAL APPURTENANCES FOLLOWING SUCCESSFUL COMMISSIONING OF NEW WORKS. FILL EXCAVATION WITH SAND FILL
CAP EX. FORCEMAIN UPON SUCCESSFUL COMMISSIONING OF NEW PUMPS AND CHAMBER
REMOVE AND DISPOSE OF EX FENCE C/W CONC. BASES ALONG THIS EAST AND SOUTH SIDES ONLY. PROTECT REMAINING FENCE
PROPOSED 200ø SANITARY FORCEMAIN WITH 1.5m COVER (TYP). INSTALL TRACER WIRE ALONG NEW FORCEMAIN IN ITS ENTIRETY. CONTRACTOR TO CONNECT TRACE WIRE ON EXISTING FORCEMAIN AND TERMINATE TRACER WIRE AT THE NEW VALVE CHAMBER WITH A TRACER WIRE TEST STATION.
CONNECT TO 200ø SANITARY FORCEMAIN CAP INV. ELEV:216.58m
EX. SANITARY PUMP STATION WITH NEW PRECAST SLAB CAP. NEW PUMP HATCHES (TO SUIT NEW PUMPS) AND NEW MANWAY HATCH. TOP OF LID ELEV:218.85
2-45° PVC BENDS
NEW 200ø SAN. FORCEMAIN
EX SAN. FORCEMAIN TO BE ABAND.
EX AIR RELEASE CHBR FULL OF WATER
NEW AIR RELEASE VALVE AS PER DETAIL C1 ON PAGE C100
REMOVE AND SALVAGE EX. AIR RELEASE VALVE AND DISPOSE OF EX. MAINTENANCE HOLE STRUCTURE. CAP EX FORCEMAIN.
PORTABLE DAVIT SOCKET FOR EQUIPMENT REMOVAL
EXISTING PROPERTY LINE
EX. GENERATOR PAD
RECONFIGURE EX FARM ACCESS ROAD AS INDICATED C/W 250mm GRAN'A' BASE
SUPPLY AND INSTALL NEW 1.8m TALL CHAINLINK FENCE AS INDICATED
REMOVE AND DISPOSE OF EX. CULVERT
EX CULVERT
CONTRACTOR TO SUPPLY TEMPORARY GENERATOR WHILE EX GENERATOR IS REMOVED AND REPLACED WITH NEW GENERATOR PER ELECTRICAL DWGS
NEW PRECAST VALVE CHAMBER. TOP OF LID ELEV:218.94
EX TOP OF SLOPE
INSTALL NEW 12m – 300ø CSP CULV. SW.INV:218.03 NE.INV:217.97 CONTRACTOR TO PLACE 300mm GRAN'A' OVER TOP OF CULVERT AND BLEND GRADES TO MATCH EXISTING 3m ON EACH SIDE OF THE CULVERT.
EX DITCH
RECONFIGURE EX DITCH TO SUIT NEW ALIGNMENT, NEW CULVERT, AND GRADES
IB
r:6.6
r:2.1
6.26m
1.0m
5.0m
4.5m
2.95m
2.89m
1.1m
2.2m
3.0m
218.71
218.59
218.46
218.39
218.37
218.38
218.32
218.34
218.28
218.24
218.35
218.80
218.29
218.88
218.76
218.60
218.48
218.63
218.25
218.03
218.07
218.21

NOTES:

- CONTRACTOR TO STOCKPILE TOPSOIL FOR REUSE ON SITE
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE ELECTRICAL AND PROCESS DRAWINGS
- CONTRACTOR SHALL CONFINE ALL EQUIPMENT AND MATERIALS WITHIN FENCED LIMITS
- CONTRACTOR SHALL MAINTAIN ACCESS FOR OPERATING AUTHORITY AT ALL TIMES AND SHALL NOT OPERATE ANY VALVES OR IMPACT THE OPERATION OF THE EXISTING STATION WITHOUT THE OPERATING AUTHORITY BEING CONSULTED AND ONSITE TO ASSIST. THE EXISTING STATION MUST REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION.
- RESTORE DISTURBED GRASS AREAS WITH FLEXTERRA HYDRO SEED ON 100mm OF TOPSOIL(TYP)

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Revision	By	Appd	YYYY.MM.DD
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Issued	By	Appd	YYYY.MM.DD
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Permit/Seal

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Project No.: 165630252

Scale: 1:100

A.J.	S.J.	N.O.	2025/10/24
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
SITE PLAN

Revision: Sheet: 2 of 2

Drawing No.
C-101

ORIGINAL SHEET - ANSI D

PROCESS DRAWINGS PIPING

- EXIST. PIPING,> 75 mm DIA.
- EXIST. PIPING,< 75 mm DIA
- NEW PIPING, > 75 mm DIA.
- NEW PIPING, < 75 mm DIA
- EXISTING PIPING TO BE REMOVED
- EXISTING EQUIPMENT TO BE REMOVED

LEGEND FOR PROCESS FLOW AND INSTRUMENTATION DIAGRAMS

- INSTRUMENT SIGNAL
- PRIMARY PIPING LINES
- PRIMARY PIPING LINES EXISTING
- PRIMARY PIPING LINES FUTURE
- SECONDARY PIPING LINES
- SECONDARY PIPING LINES EXISTING
- SECONDARY PIPING LINES FUTURE
- UTILITY PIPING LINES
- UTILITY PIPING LINES EXISTING
- UTILITY PIPING LINES FUTURE
- (E) EXISTING
- (F) FUTURE
- (S) PRE SELECTED EQUIPMENT
- YH YARD HYDRANT
- REMOVAL
- VENDOR PACKAGE BOUNDARY

MATCH LINE No. 2 DI102 — MATCH SHEET No. IDENTIFIER

DI102 5 — PROCESS LINE GOING TO OR FROM ANOTHER SHEET

T — TIE IN POINT

IDENTIFICATION SYSTEM

EQUIPMENT IDENTIFICATION

RSP-211 or RSP211
- EQUIPMENT IDENTIFIER
- SEQUENTIAL NUMBER

VALVE IDENTIFICATION

BFV-101 or BFV101
- VALVE TYPE
- SEQUENTIAL NUMBER
- REDUCER SIZE 350x100

PIPE IDENTIFICATION

250-DRN-822-SS-ET+I
- INSULATED
- ELECTRIC TRACED
- PIPE MATERIAL
- LINE NUMBER
- SERVICE
- PIPE SIZE (DIAMETER mm)

PIPE SPECIFICATION DATA SHEET

ABS/DWV	ABS
CAST IRON	CI
CONCRETE PRESSURE PIPE	CCP1
CHLORINATED POLYVINYL CHLORIDE	CPVC
CARBON STEEL	CS1.1/CS1.2/CS1.3/SC2
CARBON STEEL - POLYPROPYLENE LINED	CS/PP
CARBON STEEL - POLYVINYLIDENE FLUORIDE LINED	CS/PVDF
COPPER	CU1/CU2/CU3
DUCTILE IRON	DI1/DI2/DI3
FIBER REINFORCED PLASTICE	FRP
GALVANIZED CARBON STEEL	GCS1/GCS2
HASTELLOY	HT
HIGH DENSITY POLYETHYLENE	HDP1/HDP2/HDP3
POLYETHYLENE	PE
POLYVINYL CHLORIDE	PVC1/PVC2/PVC3.1 PVC3.2/PVC3.3/PVC4
RUBBER	RUB
STAINLESS STEEL TYPE 304L	SS1.1/SS1.2/SS2/SS3
STAINLESS STEEL TYPE 316L	SS4.1/SS4.2/SS5/SS6
TEFLON TUBING (TC)	TU1
POLYETHYLENE TUBING (TVP)	TU2
TEFLON TUBING (PFA)	TU3

ACETIC ACID	ACET	NITROGEN	N
ACETYLENE	C2H2	NITROUS OXIDE	N2O
ACTIVATED CARBON - GRANULAR	CA	ODOR CONTROL	ODC
AERATION	AER	OFF GAS	OGAS
AERATION AIR/PROCESS AIR	AA	OIL - FUEL	FO
AIR WASH	AW	OIL - LUBRICATING	LO
ALUMINUM SULFATE	Al2	OIL - WASTE	WO
ALUM	ALUM	OVERFLOW	OFL
ANHYDROUS AMMONIA	NH3	OZONE	OZ
AQUA AMMONIA	NHOH	OZONE DESTRUCT	OZD
ARGON	Ar	PHOSPHORIC ACID	H3PO
ASH	ASH	PHOSPHATE	PO4
BACKWASH SUPPLY	BWS	POLYALUMINUM CHLORIDE	PACL
BACKWASH RETURN	BWR	POLYMER	POLY
BACKWASH WASTE	BWW	POTASSIUM PERMANGANATE	KMnO
BIOSOLIDS	BIOS	POWDERED ACTIVATE CARBON	PAC
BLENDED SLUDGE	BLS	PRE-AERATION	PAER
CARBON DIOXIDE	CO2	PRESEDIMENTATION	PSED
CARBON SLURRY	CASR	PRIMARY CLARIFICATION	PCLR
CAUSTIC SODA	NA0H	PRIMARY EFFLUENT	PEFF
CENTRATE	CEN	PRIMARY INFLUENT	PIFF
CHEMICAL	PCHM	PRIMARY SCUM	PSCM
CHLORINE LIQUID	CI	PRIMARY SLUDGE	PSLG
CHLORINE DIOXIDE	ClO2	PRIMARY TREATED EFFLUENT	PTEF
CHLORINE GAS	CLG	PROCESS AIR	PAIR
C02 DOSING	C02	RAW SEWAGE	RS
COAGULANT	COAG	RAW SLUDGE	RSLG
COLD WATER POTABLE	CPW	RAW WATER	RW
COLD WATER RETURN	CPWR	RAW WASTEWATER	RWW
COLD WATER SUPPLY	CPWS	RECIRCULATED SLUDGE	RCS
COLD WATER CIRCULATION	CPWC	RECLAIMED WATER	RCW
COLD WATER NON-POTABLE	CNW	REFRIGERANT	R
COLD WATER NON-POTABLE RETURN	CNWR	RESIDUALS	WRES
COLD WATER NON-POTABLE SUPPLY	CNWS	RETURN ACTIVATED SLUDGE	RAS
COLD WATER NON-POTABLE CIRCULATION	CNWC	RETURN AIR	RTN
COMPRESSED AIR - INSTRUMENT	IA	SANITARY DRAIN	SANR
COMPRESSED AIR - SERVICE	SA	SANITARY SEWER	SSWR
COPPER SULFATE	CuSO4	SCREENINGS	SCRN
CORROSION INHIBITOR	CINH	SECONDARY CLARIFICATION	SCLR
DEWATERING	DWTR	SECONDARY EFFLUENT	SEFF
DEWATERED SLUDGE	DWSL	SECONDARY INFLUENT	SCIN
DIESEL FUEL	DF	SECONDARY SCUM	SSCM
DIGESTED SLUDGE	DIG	SECONDARY SLUDGE	SSLG
DIGESTED SLUDGE	DSL	SEPTAGE	SEPT
DIGESTER GAS	DG	SETTLED WATER	SET
DIGESTER GAS MIXING	DGM	SEWAGE	SEW
DISINFECTION CONTACT BASIN	DCB	SLUDGE - DIGESTER	DS
DISSOLVED AIR FLOTATION	DAF	SODA ASH	Na2CO
DRAIN/DRAINAGE	DRN	SODIUM ALUMINATE	NaIO
ENGINE EXHAUST	EXH	SODIUM BICARBONATE	NaHCO
EQUALIZATION BASIN	EQB	SODIUM BISULFITE	NaHSO
EXHAUST AIR	AIR	SODIUM CHLORIDE	NaCl
FERRIC CHLORIDE	FeCl3	SODIUM HEXAMETAPHOSPHATE	NaPO
FERRIC SULFATE	FeSF	SODIUM HYDROXIDE	NaOH
FERROUS CHLORIDE	FeCl2	SODIUM HYPOCHLORIDE	NaOCl
FERROUS SULFATE	FeSO	SODIUM HYPOCHLORITE	NaClO
FILTRATION	FLTR	SODIUM SILICOFLUORIDE	Na2
FILTER EFFLUENT	FTEF	STEAM	STM
FILTER TO WASTE	FTW	STORM SEWER	STRM
FINAL EFFLUENT	FEFF	STORM WATER	STW
FINISHED WATER	FWTR	SULFUR DIOXIDE	SO2
GASEOUS OXYGEN	O2	SULFURIC ACID	H2SO
GASOLINE	GASL	SURFACE WASH SYSTEM	SWS
GREASE	GR	SUPERNATANT	SUP
GRIT	GRT	TERTIARY EFFLUENT	TREF
HELIUM	He	TERTIARY INFLUENT	TRIN
HOT WATER POTABLE	HPW	THICKENED SLUDGE	THSL
HOT WATER RETURN	HPWR	THICKENED WASTE ACTIVATED SLUDGE	TWAS
HOT WATER SUPPLY	HPWS	THICKENER SCUM	TSCM
HOT WATER CIRCULATION	HPWC	THICKENER SLUDGE	TSLG
HOT NON-POTABLE WATER	HNW	THICKENING	THCK
HOT NON-POTABLE WATER RETURN	HNWR	TREATED WATER	TW
HOT NON-POTABLE WATER SUPPLY	HNWS	TRICKLING FILTER	TF
HOT NON-POTABLE WATER CIRCULATION	HNWC	ULTRAVIOLET	UV
HYDRAULIC FLUID	HYFL	VACUUM	VAC
HYDROCHLORIC ACID	HCl	WASH WATER	WW
HYDROFLUOSILIC ACID (FLUORIDE)	HSiF	WASTE ACTIVATED SLUDGE	WAS
HYDROGEN	H	WASTE WASH WATER	WWW
HYDROGEN PEROXIDE	H2O2	WATER - CONDENSATE	CDW
INCINERATION	INC	WATER - COOLING	COLW
INFLUENT	INFL	WATER - DISTILLED WATER	DW
LAND APPLICATION	LAPP	WATER - EFFLUENT	EW
LIME - HYDRATED	CaOH	WATER - FILTERED	FW
LIME - QUICKLIME	CaO	WATER - FILTRATE	FILT
LIME STABILIZATION	LS	WATER - FIRE	FIW
LIQUID OXYGEN	LO2	WATER - IRRIGATION	IRW
LIQUID SLUDGE GAS	LSG	WATER - OZONATED	OZW
LOW PRESSURE SLUDGE GAS	LPSG	WATER - RECYCLED	RCLW
LP GAS OR PROPANE GAS	LPG	WATER - SEAL	SW
MAKE-UP AIR	MKUP	WATER DEIONIZED	DEIW
METHANE GAS	CH4	WET WEATHER TREATMENT	WWT
METHANOL	CH3OH		
MIXED LIQUOR	MQL		
NATURAL GAS	NG		

AERATOR, SURFACE	AES	GAS FLARE	GF	SCUM RAKE ASSEMBLY	SCD
AFTERCOOLER	AFC	GAS WATER HEATER	GWH	SEPARATOR	SEP
AIR DRYER	AID	GATE, FLAP	FLAG	SIGHTGLASS	SG
AIR FILTER	AF	GATE, SLIDE	SLG	SILENCER	SIL
AIR RECEIVER	AR	GATE, SLUICE	SLUG	SLUDGE COLLECTOR, CIRCULAR	SLC
AIR SEPARATOR	AS	GATE, STOP	STG	SLUDGE COLLECTOR, STRAIGHT LINE	SLC
AIR STRIPPER	AST	GATE, WEIR	WRG	SLUDGE GRINDER	SLG
AERATION MEMBRANE/AIR BLOWER	MBB	GENERATOR (BACKUP POWER)	GEN	SLUDGE SCREEN-INLINE	SCR
AIR MIXING BLOWER, GRIT	ABL	GRAVITY BELT THICKENER	GBT	SOLIDS BLENDER-INLINE	SBL
BACKFLOW PREVENTER	GBB	GRAVITY THICKENER	GVT	STRAINER - Y TYPE	STR
BASIN, AERATION	BFP	GRINDER	GDR	STRAINER - BASKET TYPE	STR
BASIN, ANOXIC	BSN	GRIT BASIN, AERATED OR VORTEX TYPE	GRB	SURGE CHAMBER	SRCH
BASIN, CHLORINE CONTACT	BSN	GRIT COLLECTOR, VORTEX	VGC	TANK, AERATION	ATK
BELT FILTER PRESS	BSN	HEAT EXCHANGER	HEX	TANK, BIOSOLIDS STORAGE	BTK
BIN ACTIVATOR	BFPS	HEATING WATER BOILER	BLR	TANK, CHEMICAL DAY TANK	CDT
BIN, CLOSED TOP	BA	HOIST, CHAIN	HST	TANK, CHEMICAL STORAGE	CST
BIN, LIVE BOTTOM	BIN	HOIST, WIRE ROPE	HST	TANK, ELEVATED STORAGE	ELST
BIN, OPEN TOP	BIN	HYDRANT, FIRE	HYD	TANK, GRIT REMOVAL	AGT
BIN, SLIDING FRAME	BIN	HYDRANT, WALL	HYD	TANK, PRESSURE/EXPANSION	PTK
BOILER	BLR	HYDROCYCLONE	HYC	TANK, PRIMARY CLARIFIER	CLT
CALIBRATION COLUMN	CCLM	INJECTOR, CHEMICAL	INJ	TANK, SLUDGE HOLDING	SHT
CENTRIFUGE	CEN	LIME SLAKER	LS	TRAP, DRIP	TRP
CHEMICAL FEEDER	CHF	METER, MAGNETIC FLOW	FE	TRAP, SEDIMENT	TRP
CHEMICAL TRANSFER (PROGRESSIVE CAVITY) PUMP	CFP	METER, WATER	WM	TURBIDIMETER	TB
CHEMICAL FEED (METERING) PUMP	CMP	MEMBRANE, MICROFILTRATION	MB	VACUUM REGULATOR	VRG
CHLORINATOR	CHL	MEMBRANE, NANOFILTRATION	MB	VALVE, ANGLE	ANV
CHLORINE CONTACT CHAMBER	CCC	MEMBRANE, REVERSE OSMOSIS	MB	VALVE, AIR RELEASE	ARV
CHLORINE GAS SCRUBBER	EGS	MEMBRANE, ULTRAFILTRATION	MB	VALVE, AIR-VACUUM	VRV
CLARIFIER, PRIMARY	CLR	MIXER, STATIC INLINE	SMX	VALVE, BALL	BLV
CLARIFIER, SECONDARY	SEC	MIXER	MX	VALVE, BUTTERFLY	BFV
CLASSIFIER, GRIT	GRC	MIXER, POLYMER	PMX	VALVE, CHECK	CHV
CLEARWELL	CW	OVERFLOW ROOF DRAIN	ORD	VALVE, DIAPHRAGM OPERATED OPEN OR CLOSE	V
COMPACTOR	CMPT	OZONE DESTRUCT UNIT	ODU	VALVE, DIAPHRAGM OPERATED WITH POSITIONER	V
COMPRESSOR	CMP	OZONE GENERATOR	OGEN	VALVE, DOUBLE DISC CHECK	DCV
CONTAINER, PROCESS (GRIT, SCREENINGS, ETC.)	CTR	PARTIAL FLUME	PRF	VALVE, EXPLOSION RELIEF	ERV
CONVEYOR, BELT	CON	PARTICLE COUNTER	PCN	VALVE, GATE	GTV
CONVEYOR, SCREW	SSC	PELLETIZER	PLT	VALVE, GLOBE	GLV
CRANE	CR	PLANT SERVICE WATER PUMP	PLP	VALVE, GLOBE SILENT CHECK	CHV
DEWATERING SCREW	DWS	PLATE SETTLER	PSE	VALVE, KNIFE GATE	KNV
DIAPHRAGM SEAL	DPS	POLYMER, DOSING SYSTEM	PPD	VALVE, MIXING	MXV
DIFFUSER	DIF	POLYMER, MAKE-UP SYSTEM	PMS	VALVE, MUD	MDV
DIFFUSER BANK	DC	POWER SUPPLY UNIT	PSU	VALVE, PISTON OPERATED	POV
DIGESTER, AEROBIC	DIG	PRESSURE TANK	PTK	VALVE, PISTON OPERATED WITH POSITIONER	POV
DIGESTER, ANAEROBIC PRIMARY	DIG	PUMP, BACKWASH	BWP	VALVE, PLUG	PLV
DIGESTER, ANAEROBIC SECONDARY	DIG	PUMP, DRAIN	DRP	VALVE, PRESSURE RELIEF	PRV
DIGESTER COVER, FIXED	DC	PUMP, DRAIN PROCESS	PDP	VALVE, PRESSURE/VACUUM RELIEF	PRV
DIGESTER COVER, FLOATING	DC	PUMP, CENTRATE/DECANT	SUP	VALVE, PRESSURE REGULATING	PRV
DIGESTER COVER, MEMBRANE	DC	PUMP, EFFLUENT WATER/SERVICE WATER	EWP	VALVE, SAFETY	SFV
DIGESTER COVER, GAS HOLDER	DC	PUMP, HIGH LIFT	HLP	VALVE, SOLENOID	SOV
DISINFECTION UNIT, UV	UV	PUMP, LOW LIFT	LLP	VALVE, SWING CHECK	SCV
DISINFECTION, UV AUTOMATIC LEVEL CONTROLLER	ALC	PUMP, MIX LIQUOR	MLP	VALVE, THERMAL SHUTOFF	TSV
DISSOLVED AIR FLOTATION THICKENER EQUIPMENT	DAF	PUMP, PERMEATE	RCP	VALVE, THREE WAY	VVR
DUST COLLECTOR	DUC	PUMP, RAW ACTIVATED SLUDGE	RASP	VALVE, VACUUM BREAKER	VBV
ELECTRICAL DOMESTIC HOT WATER TANK	EDWH	PUMP, RAW SLUDGE	RSP	VALVE, VACUUM RELIEF	VRV
EMERGENCY EYE WASH	EEW	PUMP, RECIRC SLUDGE/MIXING	SRP	VALVE, V-PORT BALL	BVV
EMERGENCY SAFETY SHOWER	ESW	PUMP, SCUM	SCP	VAPORIZER	VAP
EMERGENCY SHOWER & EYEWASH (COMBINED UNIT)	ESE	PUMP, SLUDGE FEED	SFP	VICTAULIC FLANGE ADAPTER	VFA
EXPANSION CHAMBER	EXC	PUMP, SLUDGE LOAD-OUT	SLP	VICTAULIC COUPLING	VC
EVAPORATOR	EV	PUMP, SLUDGE TRANSFER	STP	WELL, VERTICAL	WL
FAN SUPPLY OR EXHAUST	FAN	PUMP, SLUDGE PRIMARY	PSP	WELL, HORIZONTAL COLLECTOR	WL
FILTER, DISK	FLT	PUMP, SUMP	SMP	WEIGHT SCALE	WT
FILTER SURFACE WASH	FSW	PUMP, WATER/BOOSTER	WP	WEIR, CIPOLETTI	W
FLAME ARRESTER	FAR	PUMP, WASTE ACTIVATED SLUDGE	WASP	WEIR, RECTANGULAR	W
FLAME CHECK	FC	RESERVOIR	RSV	WEIR, V-NOTCH	W
FLOCCULATOR, HORIZONTAL	FLC	RESIDUAL COLLECTOR	RCO	YARD HYDRANT	YH
FLOCCULATOR, VERTICAL	FLC	ROTAMETER	RM		
FLOOR DRAIN	FD	RUPTURE DISK	RD		
FLOW SPLITTER	FS	SAMPLER	SAMP		
FLUME, PARSHALL	PRF	SCALE	SC		
FILTER SEPARATOR	FTSP	SCREEN, AUGER	AGS		
FOAM SEPARATOR	FMSP	SCREEN, BAR	SCR		
FLOW CONTROL VALVE	FCV	SCREEN, DRUM	DRS		
FLUSHING CONNECTION	FC	SCRUBBER	SCU		
GAS CYLINDER	CYL	SCUM CHAMBER	SCC		
GAS FEEDER	GFD	SCUM WEIR - ROTATING	SCW		

GENERAL NOTES

1. IN GENERAL, THE P & ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA, STANDARD PRACTICE ISA-S5.1 (1988). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
2. SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
3. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
4. PIPING AND EQUIPMENT LEGEND APPLIES TO P & ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.
5. FOR THE FOLLOWING SYMBOLS REFER TO DWG. D001, D002 & D003.
   - LINE SYMBOLS
   - MECHANICAL EQUIPMENT SYMBOLS
   - VALVE AND GATE ACTUATOR SYMBOLS
   - MECHANICAL SYMBOLS
   - WASTE WATER PROCESS EQUIPMENT SYMBOLS
   - CHEMICAL FEED EQUIPMENT SYMBOLS
   - PUMP AND BLOWER SYMBOLS
   - EQUIPMENT IDENTIFICATION DESCRIPTION
   - PIPELINE IDENTIFICATION DESCRIPTION
   - VALVE AND GATE SYMBOLS
   - PRIMARY ELEMENT & FITTING SYMBOLS
   - MATERIAL HANDLING EQUIPMENT SYMBOLS

SECTION TAIL

SECT.

SECTION BUBBLES

1 / 101 | 101 — SECTION 1:1

CAPTION TITLE 1:1

SAMPLE BARSCALES

1 : 50 — 500 0 1000mm

1 : 200 — 2000 0 4000mm

PIPE CONVERSION CHART

METRIC SIZE (mm)	EQUIVALENT SIZE (IN)	METRIC SIZE (mm)	EQUIVALENT SIZE (IN)	METRIC SIZE (mm)	EQUIVALENT SIZE (IN)	METRIC SIZE (mm)	EQUIVALENT SIZE (IN)
3	1/8	65	2-1/2	500	20	1100	44
6	1/4	80	3	550	22	1200	48
10	3/8	90	3-1/2	600	24	1350	54
12	1/2	100	4	650	26	1500	60
18	5/8	150	6	700	28	1650	66
20	3/4	200	8	750	30	1800	72
25	1	250	10	800	32	2000	78
32	1-1/4	300	12	850	34	2100	84
40	1-1/2	350	14	900	36		
45	1-3/4	400	16	1000	40		
50	2	450	18	1050	42		

NORTH ARROW

NORTH NORTH

MISCELLANEOUS SYMBOLS

- FLOW DIRECTION ARROWS
- EXIST. NEW — SPEC CHANGE
- WALL
- GRADE
- FLOOR PENETRATION
- 0000.000 — WATER LEVEL SYMBOL
- FIELD WELD SYMBOL
- LE 1804 — LEVEL INDICATOR
- LSH - — ULTRASONIC LEVEL SENSOR
- LSH - — LEVEL SWITCH
- INSULATION COLD OR PERSONAL PROTECTION
- E — INSULATION TRACE - ELECTRIC
- INSULATION TRACE - STEAM OR GLYCOL

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LICENSED PROFESSIONAL ENGINEER — K. V. VITONE — 100503002 — PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX

WWTP INFRASTRUCTURE DESIGN - GLENCOE INDUSTRIAL PARK SPS UPGRADES

Glencoe ON Canada

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Title
PROCESS LEGEND
SHEET 1

Revision: Sheet: 1 of 9

Drawing No.
DI-001

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ORIGINAL SHEET - ANSI D

PUMP SYMBOLS

CENTRIFUGAL PUMP
GRINDER PUMP
CHOPPER PUMP
VERTICAL CENTRIFUGAL PUMP
CENTRIFUGAL BLOWER FAN OR COMPRESSOR
GEAR PUMP
DIAPHRAGM PUMP
LOW HEAD PROPELLER PUMP
PERISTALTIC PUMP
PISTON PUMP
METERING PUMP
PROGRESSIVE CAVITY PUMP
CHEMICAL FEED PUMP
MACERATOR
ROTARY LOBE PUMP
BOOSTER PUMP
VERTICAL TURBINE PUMP (OPEN SHAFT)
VERTICAL TURBINE PUMP (ENCLOSED SHAFT)
SUBMERSIBLE WELL PUMP
SUMP PUMP
SUBMERSIBLE PUMP
POSITIVE DISPLACEMENT BLOWER
ROTARY LOBE BLOWER

METER SYMBOLS

MAGNETIC FLOW
ROTA FLOW
TURBINE OR PROPELLER FLOW
VORTEX FLOW
PITOT FLOW
DOPPLER FLOW
ULTRASONIC FLOW

GATE SYMBOLS

WRP	WEIR
WRG	WEIR GATE
STL	STOP LOG
STP	STOP PLATE
SLG	SLIDE GATE (N.O.)
SLG	SLIDE GATE (N.C.)
SCG	SLUICE GATE (N.O.)
SCG	SLUICE GATE (N.C.)
	LEVEL CONTROL GATE
	TELESCOPIC GATE VALVE
FGV	FLAP GATE

PIPE CONNECTION SYMBOLS

- CAPPED LINE
- PLUGGED LINE
- UNION
- SLIP ON FLANGE CONNECTION
- BLIND FLANGE
- WELD NECK FLANGE CONNECTION
- INSULATING FLANGE
- WELDED CONNECTION
- SCREWED CONNECTION
- BELL & SPIGOT JOINT
- CLOSURE COUPLING MECHANICAL JOINT
- DRESSER COUPLING
- STRAUB COUPLING
- FLANGE ADAPTOR
- VICTAULIC FLANGE CONNECTION
- VICTAULIC JOINT CONNECTION (RIGID)
- VICTAULIC JOINT CONNECTION (FLEXIBLE)
- VICTAULIC JOINT CONNECTION (FOR POLYETHYLENE PIPE)
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- EXPANSION JOINT

PRESSURE SWITCH SYMBOL

PRESSURE SWITCH

ANALYZER PANEL

ANALYZER PANEL

TRUCK SYMBOLS

TRUCK LOADING 1
TRUCK LOADING 2

SCREEN SYMBOLS

ROTARY SCREEN
MANUAL BAR SCREEN
MECHANICAL BAR SCREEN
DRUM SCREEN

MIXER SYMBOLS

STATIC MIXER
INLINE MIXER
SURFACE MIXER
FLASH MIXER
MECHANICAL FLOCCULATOR
TANK MIXER

PLUMBING SYMBOLS

EMERGENCY EYE WASH/SHOWER
EMERGENCY EYE WASH
FIRE HOSE
HOSE REEL

CALIBRATION COLUMN SYMBOLS

TYPE 1
TYPE 2
TYPE 3

PIPE ACCESORY SYMBOLS

- FLEXIBLE HOSE (TT)
- FLEXIBLE TUBE (CU)
- FLEXIBLE CONNECTOR (SS)
- FLEXIBLE HOSE
- Y-STRAINER
- STRAINER, BASKET TYPE
- STRAINER, DUPLEX BASKET TYPE
- CHEMICAL DIAPHRAGM SEAL
- DIAPHRAGM SEAL
- REMOVABLE SPOOL PIECE
- OPEN DRAIN
- CORPORATION COCK
- SAMPLE DRAIN
- CARTRIDGE FILTER
- SILENCER
- MECHANICAL SEPARATOR
- QUICK DISCONNECT COUPLING
- TRAP
- CHEMICAL INJECTION QUILL
- HOSE CONNECTION (BIBB) UP TO 25 mm DIA.
- HOSE CONNECTION (BIBB) 30 mm DIA. OR LARGER
- CAPPED CONNECTION
- FLUSHING CONNECTION

VALVE SYMBOLS (Cont'd)

- CYLINDER OPERATED VALVE
- CYLINDER SINGLE ACTING
- CYLINDER DOUBLE ACTING
- CYLINDER DOUBLE ACTING WITH POSITIONER
- COMBINATION AIR VALVE
- AIR RELEASE VALVE
- AIR AND VACUUM VALVE
- V/AIR VALVE

VALVE SYMBOLS

FLOW DIRECTION

BPV	BACK PRESSURE VALVE
PDV	PRESSURE REDUCING
DOV	DIAPHRAGM OPERATED PRESSURE BALANCE
DSV	DIAPHRAGM OPERATED SPRING
PRV	PRESSURE RELIEF
GTV	GATE VALVE
KNV	KNIFE GATE VALVE
BLV	BALL VALVE
PLV	PLUG VALVE
GLV	GLOBE VALVE
DHV	DIAPHRAGM VALVE
BFV	BUTTERFLY VALVE
SCV	SWING CHECK VALVE
CHV	SILENT CHECK GLOBE VALVE
PCV	PISTON CHECK VALVE
WCV	WAFER CHECK VALVE
FMV	FLOW MONITOR VALVE
SCV	STOP CHECK VALVE (COCK)
BCV	BALL CHECK VALVE
DLCV	DOUBLE LEAF CHECK VALVE
FGV	FLAP GATE VALVE
BFP	BACK FLOW PREVENTER (BALL)
BFP	BACK FLOW PREVENTER (GATE)
AINV	ANGLE VALVE (AIR RELEASE)
ANV	ANGLE VALVE
PNV	PINCH VALVE
FCV	FLAME CHECK
FAV	FLAME ARRESTER VALVE
FLV	FLOAT VALVE
FTV	FOOT VALVE
ROV	ROTARY VALVE
NEV	NEEDLE VALVE
3WV	THREE-WAY VALVE
4WV	4 - WAY VALVE
	EJECTOR OR EDUCTOR
MDV	MUD VALVE
	NORMALLY CLOSED
	NORMALLY OPEN
M	MOTORIZED VALVE
SOV	SOLENOID VALVE
	SOLENOID VALVE (3 WAY)
	SOLENOID VALVE (4 WAY)
DBV	CHECK VALVE (DUCK BILL)
CPV	PRESSURE RELIEF/ PRESSURE SUSTAINING, CONTRO VALVE
CSV	BACK PRESSURE/ SOLENOID S/O, CONTROL VALVE
CDV	DIFFERENTIAL PRESSURE RELIEF, CONTROL VALVE
CRV	PRESSURE REDUCING/ PRESSURE SUSTAINING, CONTRO VALVE
CRF	RATE OF FLOW, CONTROL VALVE
CAV	ALTITUDE, CONTROL VALVE

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LICENSED PROFESSIONAL ENGINEER
K. V. VITONE
100503002
Jan 30, 2026
PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX

WWTP INFRASTRUCTURE DESIGN - GLENCOE INDUSTRIAL PARK SPS UPGRADES

Glencoe ON Canada

Project No.: 165630252

File Name: N/A

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Title
PROCESS LEGEND
SHEET 2

Revision: Sheet: 2 of 9

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ORIGINAL SHEET - ANSI D

PIPING ARRANGEMENT GUIDELINES

1. FIELD CHECK ALL EXISTING STRUCTURES, EQUIPMENT, PIPING AND APPURTENANCES FOR COMPLETENESS OF DETAIL, LOCATION DIMENSIONS, ETC. PRIOR TO CONSTRUCTION.
2. FIELD CHECK NEW PIPING ROUTING, VALVE LOCATIONS ETC. FOR INTERFERENCE AND COORDINATE WITH OTHER TRADES WHERE REQUIRED. REVIEW ANY LOCAL ADJUSTMENTS WITH ENGINEER PRIOR TO STARTING WORK. USE STANDARD FITTINGS WHENEVER POSSIBLE.
3. ARRANGE PIPING IN TUNNELS AND PUMP HOUSES IN STRAIGHT LINES, PARALLEL TO WALLS AND OTHER STRUCTURES, WITH A MINIMUM OF BENDS AND FITTINGS.
4. USE MITER JOINTS ONLY ON LARGER PIPE.
5. PROVIDE FLANGES, UNIONS, COUPLINGS, OR OTHER CONNECTIONS THAT CAN BE READILY DISASSEMBLED AT THE INTERVALS SPECIFIED TO PROVIDE FOR DISASSEMBLY.
6. ARRANGE PIPING INLETS AND OUTLETS FROM EQUIPMENT SO THAT EQUIPMENT CAN BE REMOVED WHEN NECESSARY FOR REPLACEMENT OR MAINTENANCE WITHOUT DISRUPTING PIPE INSTALLATION. TO THE DEGREE POSSIBLE, DO NOT RUN PIPING OVER EQUIPMENT WHERE IT MAY INTERFERE WITH LIFTING.
7. 7.PROVIDE CLEANOUTS AT INDICATED LOCATIONS AND AT INTERVALS ON PIPING SPECIFIED. PROVIDE A DRAIN CONNECTION AT ALL LOW POINTS AND A VENT CONNECTION AT HIGH POINTS.
8. SUPPORT PIPING IN PIPE RACKS WHEREVER POSSIBLE. ARRANGE PIPE RACKS IN TUNNELS SO THAT THE CLEAR OPEN SPACE IS CONTINUOUS AND A MINIMUM OF 2.5 METRES WIDE. ARRANGE PIPING SO THAT THE BOTTOM OF PIPE RACKS OVER WALKWAYS IS A MINIMUM OF 2.0 METRES ABOVE THE FINISHED FLOOR ELEVATION AND PREFERABLY, 2.5 METRES ABOVE FINISHED FLOOR ELEVATION. IN STAIRWAYS, ENSURE THAT THE PIPING IS A MINIMUM OF 2.35 METRES ABOVE FINISHED FLOOR ELEVATION.
9. LOCATE VALVES, GAUGES, STRAINERS, AND OTHER APPURTENANCES WHERE ACCESSIBLE FOR MAINTENANCE.
10. GENERALLY ARRANGE PIPING SO THAT THERE IS A MINIMUM OF 0.75 METRE CLEAR AROUND EQUIPMENT ON TWO SIDES AND 1.5 METRES ON ONE SIDE. PROVIDE ADDITIONAL SPACE AS REQUIRED FOR SPECIAL EQUIPMENT WHERE THIS SPACE IS NECESSARY TO REMOVE EQUIPMENT PARTS (PERISTALTIC OR PROGRESSIVE CAVITY PUMPS, BOILERS, HEAT EXCHANGERS, ETC.).
11. ALLOW SPACE FOR FUTURE LINES NOTED ON THE DRAWINGS.
12. STAGGER FLANGES IN PIPING, WITH A MINIMUM OF 300 mm CLEARANCE FROM SUPPORTS.
13. ARRANGE SO THAT FIELD WELDS AND OTHER JOINTS ARE AT LEAST 200 mm FROM SUPPORTS, WALLS, OR OTHER STRUCTURAL ELEMENTS THAT OBSTRUCT WORK ON THE PIPELINE.
14. AT WALL PENETRATIONS, EXTEND PIPE A MINIMUM OF 150 mm FROM THE WALL TO ALLOW THE JOINT TO BE MADE.
15. PROVIDE FOR THERMAL EXPANSION OF PIPING IN SUPPORT SYSTEMS AND PIPING DESIGN. REFER TO THE SPECIFICATIONS.
16. 16. IN PIPE RACKS, PLACE SMALLER PIPE ON HIGHER RACKS. GENERALLY PLACE SLUDGE LINES FURTHEST FROM THE WALL AND CLEAN WATER LINES CLOSEST TO THE WALL. ALSO, PLACE LARGEST LIQUID FILLED PIPES CLOSEST TO THE SUPPORTS (WALL OR STANCHIONS) TO REDUCE BENDING STRESS IN STRUCTURAL SUPPORTS.
17. PROVIDE CLEARANCES BETWEEN PIPES ACCORDING TO THE FOLLOWING GUIDELINES:
    - MINIMUM DISTANCE BETWEEN PIPE EXTERIOR (INCLUDING INSULATION) WHERE NEITHER PIPE IS FLANGED OR VICTAULIC COUPLED - 75 mm.
    - MINIMUM DISTANCE BETWEEN PIPE EXTERIOR WHERE ONE OR BOTH PIPES ARE VICTAULIC COUPLED - 50 mm PLUS THE OFFSET DISTANCE OF LARGEST PIPE VICTAULIC COUPLING.
    - MINIMUM DISTANCE BETWEEN PIPE EXTERIOR WHEN PIPE IS FLANGED - 50 mm PLUS THE OFFSET DISTANCE OF THE FLANGE ON THE LARGEST PIPE.
    - INCREASE THIS DISTANCE AS NECESSARY WHERE JUMP OVERS OR RUN UNDERS ARE USED.
18. ENSURE THAT LOWEST POINT OF CROSSING PIPES IS SET AT AN ELEVATION AT LEAST 75 mm ABOVE EXTERIOR WALL OF LOWER PIPE IF NOT FLANGED OR VICTAULIC COUPLED, 50 mm ABOVE TOP OF FLANGE IF FLANGED, OR 50 mm ABOVE TOP OF VICTAULIC COUPLING IF JOINED USING THIS METHOD.
19. ENSURE THAT THERE IS SUFFICIENT VERTICAL ROOM, PLUS 100 mm BETWEEN RACKS TO ALLOW THE LARGEST PIPE TO BE REMOVED FROM THE RACK WITHOUT DISTURBING THE RACK OR PIPES ABOVE.
20. ARRANGE PIPE RACKS WITH DUE CONSIDERATION TO SUPPORT OF ELECTRICAL TRAYS. GENERALLY, ELECTRICAL TRAYS ARE LOCATED ABOVE PIPING. GROUP HOT LINES REQUIRING EXPANSION LOOPS ON ONE SIDE OF A RACK FOR EASE OF SUPPORT.
21. GROUP HOT LINES REQUIRING EXPANSION LOOPS ON ONE SIDE OF A RACK FOR EASE OF SUPPORT.
22. LOCATE UTILITY STATIONS, CONTROL VALVE STATIONS, ETC. ADJACENT TO STANCHIONS FOR SUPPORT.
23. PLACE ISOLATION VALVES IN HORIZONTAL RUNS WHENEVER POSSIBLE.
24. ALWAYS PLACE SWING CHECK VALVES ON HORIZONTAL PIPE RUNS. BALL CHECK VALVES SHOULD BE PLACED IN VERTICAL RUNS.
25. LOCATE VALVES WITHIN 1.8 METRES OF OPERATING FLOOR WHEN EVER POSSIBLE. WHEN LOCATING VALVES IN TRENCH, PROVIDE VALVE STEM EXTENSIONS TO OPERATING FLOOR LEVEL AND TERMINATE IN OPERATING HATCH. WHEN LOCATING VALVES ABOVE 1.8 METER HEIGHT, PROVIDE CHAIN OPERATOR. EXTEND CHAIN TO 1200 mm ABOVE FLOOR LEVEL AND DRAPE OUT OF WAY OF TRAFFIC. DO NOT USE CHAIN OPERATOR ON VALVES 75 mm OR SMALLER.
26. WHERE VALVES MUST BE USED TO ISOLATE A LINE IN THE EVENT OF A FIRE OR OTHER SAFETY INCIDENT, LOCATE CLOSE TO AN AREA ACCESS POINT.
27. PROVIDE ACCESS FOR LIFTING EQUIPMENT FOR LARGE VALVES OVER 50 KG.
28. ARRANGE PIPING AND VALVES OR OTHER APPURTENANCES SO THAT THE UPSTREAM OR DOWNSTREAM PIPING HAS SUFFICIENT PLAY TO ENABLE THE VALVES OR APPURTENANCES TO BE EASILY REMOVED.
29. FOR DIGESTER GAS AND NATURAL GAS, PROVIDE SPECTACLE FLANGES AT ISOLATION POINTS TO ALLOW SAFE POSITIVE SYSTEM SHUTDOWN.
30. FOR PIPES LESS THAN 65mm, SUPPORT ON RACKS OR TRAPEZES, PROVIDE HALF PIPE CRADLES AT SUPPORTS, MANUFACTURED OF MALLEABLE MATERIAL.
31. PROVIDED COVER PLATES FOR ALL OPENINGS IN WALLS OR FLOORS LEFT AFTER REMOVAL OF EQUIPMENT PER PROCESS STANDARD DETAILS.
32. VERIFY ALL PENETRATIONS THROUGH CHANNELS OR WALLS PRIOR TO ANY CORING.
33. ALL ANCHOR BOLTS STAINLESS STEEL.
34. ADHESIVE ANCHOR BOLT SYSTEM, HILTI HVA OR APPROVED EQUAL.
35. AFTER REMOVAL OF EQUIPMENT, APPURTENANCES, ETC. OR MAKING NEW CUTS OR HOLES IN EXISTING CONCRETE STRUCTURES, REFINISH CONCRETE SURFACES, FILL IN OLD BOLT HOLES ETC. PER STRUCTURAL STANDARD DETAILS.

BALLOON SYMBOLS

AE	ANALYZER PRIMARY ELEMENT
AI	ANALYZER INDICATOR
AT	ANALYZER TRANSMITTER
AIT	ANALYZER INDICATOR TRANSMITTER
CV	GENERAL CONTROL VALVE
FAH	FLOW ALARM HIGH
FAL	FLOW ALARM LOW
FC	FLOW CONTROLLER\
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIC	FLOW INDICATOR CONTROLLER
FIT	FLOW INDICATOR TRANSMITTER
FQ	FLOW METER
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
FV	FLOW VALVE
FY	FLOW TRANSDUCER
HS	HAND SWITCH
LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM LOW
LC	LEVEL CONTROLLER
LE	LEVEL ELEMENT
LG	LEVEL GLASS
LI	LEVEL INDICATOR
LS	LEVEL SWITCH
LT	LEVEL TRANSMITTER
LIT	LEVEL INDICATOR TRANSMITTER
LV	LEVEL VALVE
LY	LEVEL TRANSDUCER
MV	MOTORIZED VALVE
PAH	PRESSURE ALARM HIGH
PAL	PRESSURE ALARM LOW
PC	PRESSURE CONTROLLER
PE	PRESSURE ELEMENT
PI	PRESSURE INDICATOR
PIT	PRESSURE INDICATOR TRANSMITTER
PS	PRESSURE SWITCH
PSV	PRESSURE RELIEF VALVE
PT	PRESSURE TRANSMITTER
PV	PRESSURE VALVE
PY	PRESSURE TRANSDUCER
TAHH	TEMPERATURE ALARM HIGH
TAH	TEMPERATURE ALARM HIGH HIGH
TAL	TEMPERATURE ALARM LOW
TC	TEMPERATURE CONTROLLER
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TS	TEMPERATURE SWITCH
TT	TEMPERATURE TRANSMITTER
TV	TEMPERATURE VALVE
TW	THERMOWELL
TY	TEMPERATURE TRANSDUCER
XAH	LIMIT ALARM HIGH
XAL	LIMIT ALARM LOW
XV	SOLENOID VALVE
XY	LIMIT SWITCH
ZA	POSITION ALARM
ZS	POSITION SWITCH

INSTRUMENT SYMBOLS

	CONTROL ROOM PANEL	FIELD MOUNTED	LOCAL PANEL
DISCRETE INSTRUMENTS	SD*		
SHARED DISPLAY SHARED CONTROL eg. DCS = DISTRIBUTED CONTROL SYSTEM			
COMPUTER FUNCTION eg. FLOW METER			
PROGRAMMABLE LOGIC CONTROL (PLC) (RTU)	XXX	XXX	XXX 3 1 4 2 5 6

*SUBSCRIPT ABBREVIATION SPECIFIES INSTRUMENT FUNCTION OR LOCATION.
eg. IP#1 (INSTRUMENT PANEL #1), SD (SHUTDOWN)

INSTRUMENT LINE SYMBOLS

- ELECTRICAL SIGNAL
- PNEUMATIC SIGNAL
- CAPILLARY TUBING
- HYDRAULIC SIGNAL
- CONTROL SYSTEM DATA LINK DEVICENET OR ETHERNET AS NOTED
- DATA LINK OR SYSTEM BUS AND SOFT INTERAL LINK
- ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED AND NON GUIDED)
- INTERLOCK

NOTES:

1. FINAL INTERCONNECTION IS SUBJECT TO PRE-PACKAGED PROCESS EQUIPMENT VENDOR. CONTRACTOR TO PROVIDE ALL POWER, CONTROLS AND SIGNALS REQUIRED TO MEET THE REQUIREMENTS.
2. PANEL MOUNTED EQUIPMENT SHOWN FOR FUTURE FIELD DEVICES SHALL BE PROVIDED.

FIELD MOUNTED INSTRUMENTS MAY BE POST OR WALL MOUNTED

- STATUS LIGHT SHOW COLOUR INSIDE SYMBOL
- I — SYSTEM LOGIC
- R — MANUAL RESET
- E — EMERGENCY SHUTDOWN LOGIC
- P — PURGE OR FLUSHING DEVICE
- ORIFICE PLATE C/W ORIFICE FLANGES
- FLOW INDICATOR ROTAMETER TYPE
- TURBINE OR PROPELLER TYPE PRIMARY ELEMENT
- ANNUBAR OR PITOT TUBE
- M — MAGNETIC FLOW METER
- VORTEX FLOW METER
- U — ULTRASONIC FLOW METER
- V-CONE DIFFERENTIAL
- FIELDBUS INTERFACE INCLUDED IN MCC PACKAGE
- INSTRUMENTS AND/OR CONTROLS INCLUDED IN EQUIPMENT PACKAGE

- VCP — LOCAL CONTROL PANEL INDLUDED IN VENDOR PACKAGE
- ACP — AREA CONTROL PANEL
- DIGITAL INPUT
- DIGITAL OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT
- PULSE INPUT
- MODULATING DIGITAL OUTPUT

RELAY FUNCTION DESIGNATORS

Σ	ADD	>	HIGH SELECT
△	SUBTRACT	<	LOW SELECT
±	BIAS	A/D	ANALOG TO DIGITAL
%	GAIN OR ATTENUATE	REV	REVERSE
√	EXTRACT SQ ROOT	E/P	POTENTIAL TO PNEUMATIC
÷	DIVIDE	I/P	CURRENT TO PNEUMATIC
X	MULTIPLY	E/I	POTENTIAL TO CURRENT
1:1	BOOST		

TAG NUMBERS MEANINGS OF IDENTIFICATION LETTERS

LETTER	FIRST LETTER: MEASURED OR INITIATING VARIABLE	FIRST LETTER: MODIFIER	SUCCEEDING LETTERS: READOUT OR PASSIVE FUNCTION	SUCCEEDING LETTERS: OUTPUT FUNCTION	SUCCEEDING LETTERS: MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)		CONTROLLER	CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL	DIFFERENTIAL		
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW	RATIO (FRACTION)	RATIO		
G	STATUS		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	USER'S CHOICE	MOMENTARY	MOMENTARY		MIDDLE OR INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE, VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE	INTEGRATE OR TOTALIZE		
R	RADIATION		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI-VARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER, OR LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, PRESENCE			RELAY OR COMPUTE	
Z	POSITION, DIMENSION			DRIVE, ACTUATOR OR UNCLASSIFIED FINAL CONTROL ELEMENT	

FUNCTION DESIGNATIONS AND ABBREVIATIONS

INSTRUMENT DESIGNATIONS

K	GAIN OR ATTENUATE (INPUT:OUTPUT)
-K	GAIN AND REVERSE
Σ	ADD OR SUM (ADD AND SUBTRACT)
Δ	SUBTRACT (DIFFERENCE)
√‾	EXTRACT SQUARE ROOT
÷	DIVIDE
F(X)	CHARACTERIZE SIGNAL
>	HIGH-SELECT
<	LOW-SELECT
X	MULTIPLY
∫	INTEGRATE (TIME INTEGRAL)
CH_2	METHANE
CL_2	CHLORINE RESIDUAL
CO_2	CARBON DIOXIDE
DO	DISSOLVED OXYGEN
LEL	LOWER EXPLOSIVE LIMIT
MCC	MOTOR CONTROL CENTRE
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
O_2	OXYGEN (PURITY)
pH	pH CELL
TURB	TURBIDITY
SB	SLUDGE BLANKET

HAND SWITCH DESIGNATIONS

ES	EMERGENCY STOP
FR	FORWARD-REVERSE
FS	FAST-SLOW
HOA	HAND-OFF-AUTO
HORA	HAND-OFF-REMOTE-AUTO
J	JOG
LOR	LOCAL-OFF-REMOVE
LR	LOCAL-REMOTE
OC	OPEN-REMOVE
OO	ON-OFF
OOA	ON-OFF-AUTO
OCR	ON-OFF-REMOTE
OOR	ON-OFF-REMOTE

POWER SUPPLY ABBREVIATIONS

AS	AIR SUPPLY
ES	ELECTRIC SUPPLY
GS	GAS SUPPLY
HS	HYDRAULIC SUPPLY
NS	NITROGEN SUPPLY
SS	STEAM SUPPLY
WS	WATER SUPPLY

AS — POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION.

INSTRUMENT TAG NUMBERS & INDENTIFICATION

725-FCV-0714A

- FUNCTIONAL IDENTIFICATION CODE (SEE ABOVE)
- ADDITIONAL IDENTIFICATION (SEE ABBREVIATION LIST)
- SEQUENTIAL LOOP IDENTIFIER UNIQUE NUMBER ASSIGNMENT
- PROCESS AREA NUMBER

xx FCV xx / xxxx

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Client/Project
SOUTHWEST MIDDLESEX
WWTP INFRASTRUCTURE DESIGN - GLENCOE INDUSTRIAL PARK SPS UPGRADES
Glencoe ON Canada

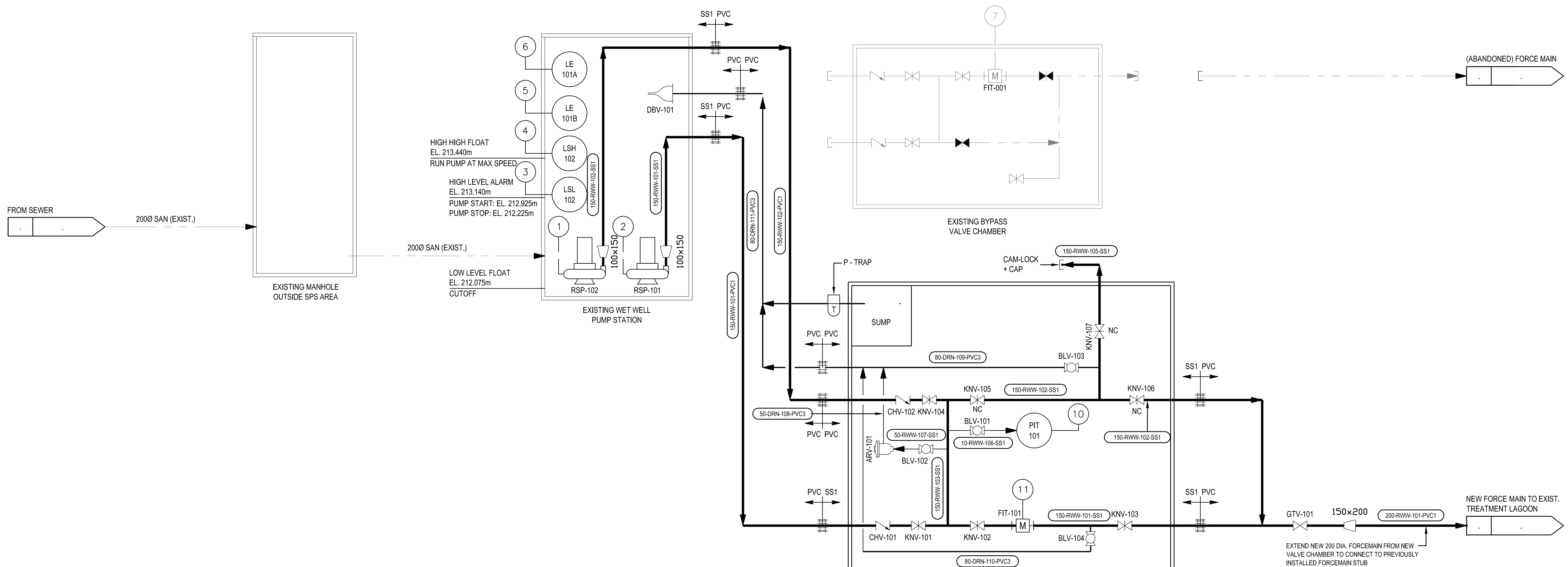
Project No.:165630252
File Name: N/A
Scale: 1 : 1

SP	GA	NO	2025.12.10
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
PROCESS LEGEND
SHEET 3

Revision: Sheet: 3 of 9

Drawing No.
DI-003



SUBMERSIBLE SEWAGE PUMPS - RSP-101, RSP-102
1 DUTY, 1 STANDBY
MODEL: FLYGT NP 3171 HT3~455
DUTY POINT: 44.93 L/s @ 24.57m TDH
IMPELLER: 256mm
MOTOR: 18.6kW

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GLENCOE INDUSTRIAL PARK
SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252

Scale: NTS

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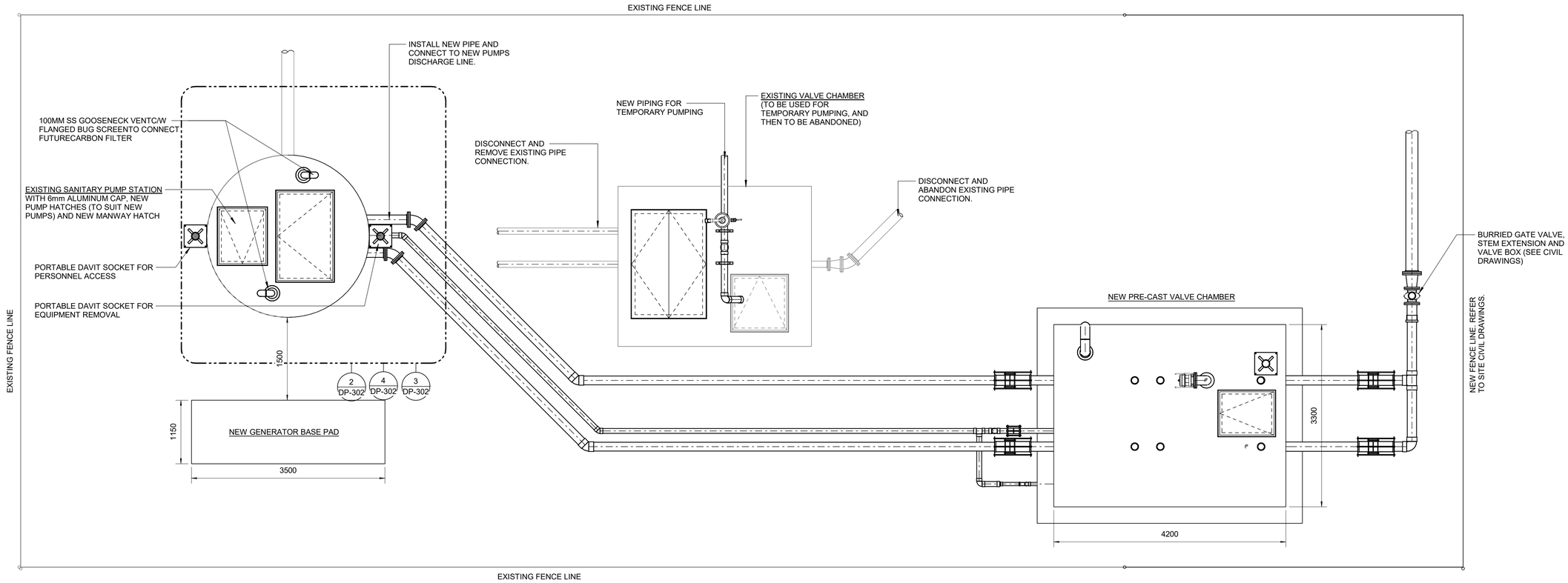
Title
P&ID - NEW PUMPS AND VALVE CHAMBER

Revision: Sheet: 4 of 9

Drawing No.
DI-101

ORIGINAL SHEET - ANSI D



1 PART SITE PLAN
SCALE: 1 : 40

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100503002
Jan 30, 2026
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DESIGN - GLENCOE
INDUSTRIAL PARK SPS
UPGRADES

Glencoe ON Canada

Project No.:165630252
File Name: N/A
Scale: 1 : 40

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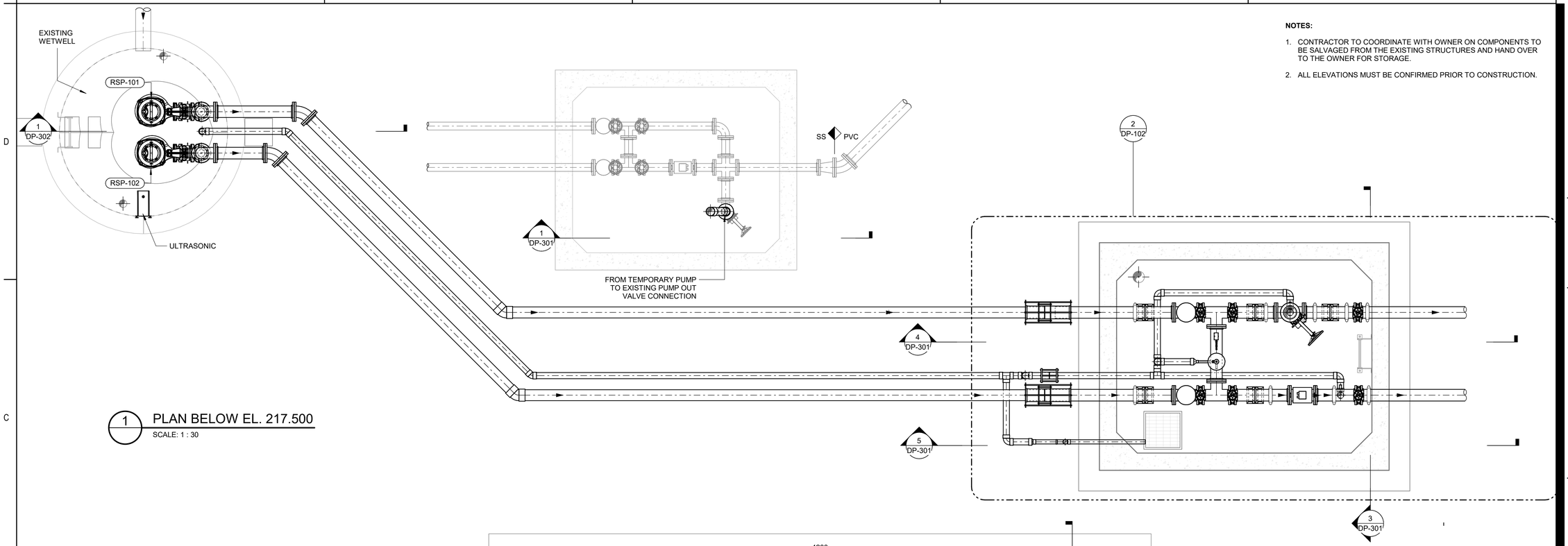
Title
PLAN AT 219.320

Revision: Sheet: 5 of 9
Drawing No.
DP-101

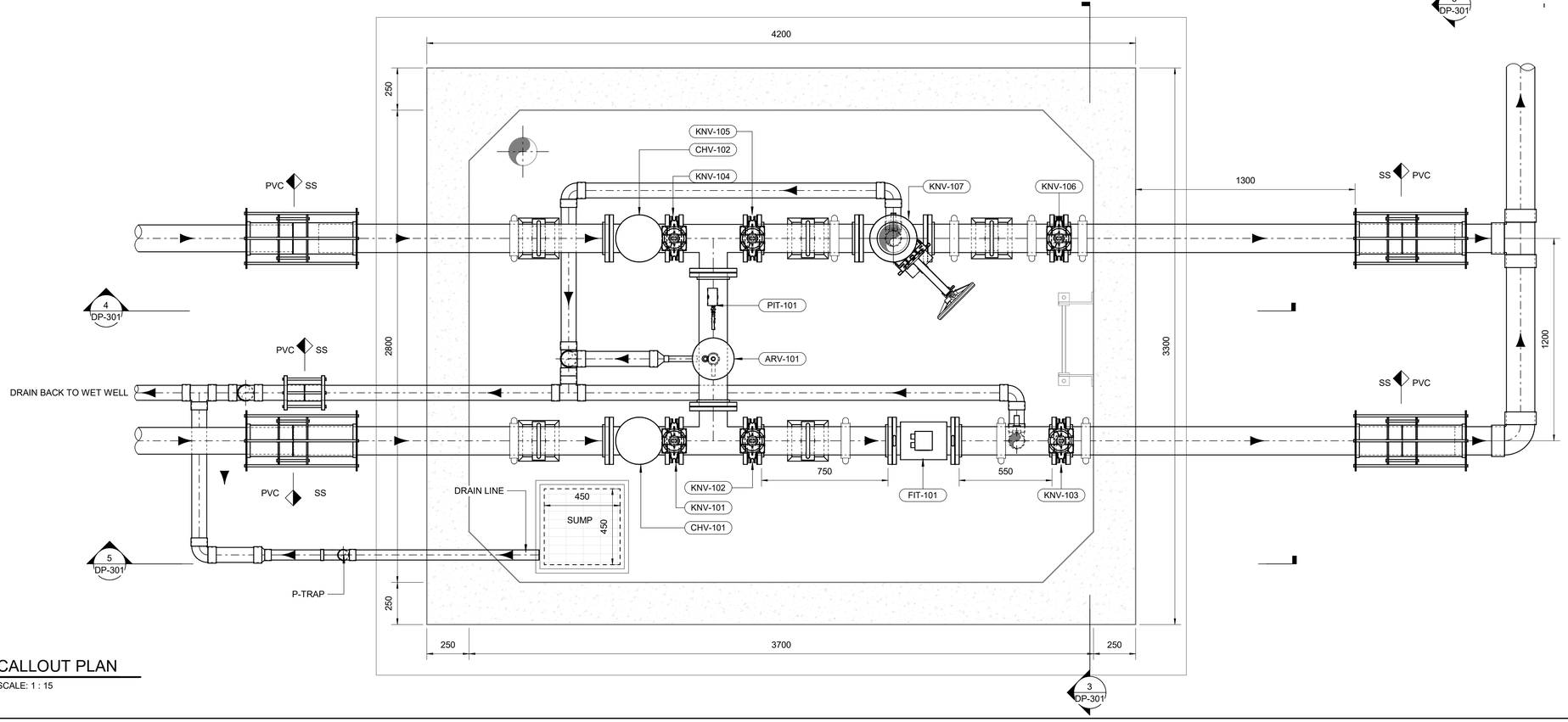
2/4/2026 1:26:36 PM
ORIGINAL SHEET - ANSI D

NOTES:

1. CONTRACTOR TO COORDINATE WITH OWNER ON COMPONENTS TO BE SALVAGED FROM THE EXISTING STRUCTURES AND HAND OVER TO THE OWNER FOR STORAGE.
2. ALL ELEVATIONS MUST BE CONFIRMED PRIOR TO CONSTRUCTION.



1 PLAN BELOW EL. 217.500
SCALE: 1 : 30



2 DP-102 CALLOUT PLAN
SCALE: 1 : 15

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ORIGINAL SHEET - ANSI D

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Glencoe ON Canada

Project No.: 165630252

File Name: N/A

Scale: As indicated

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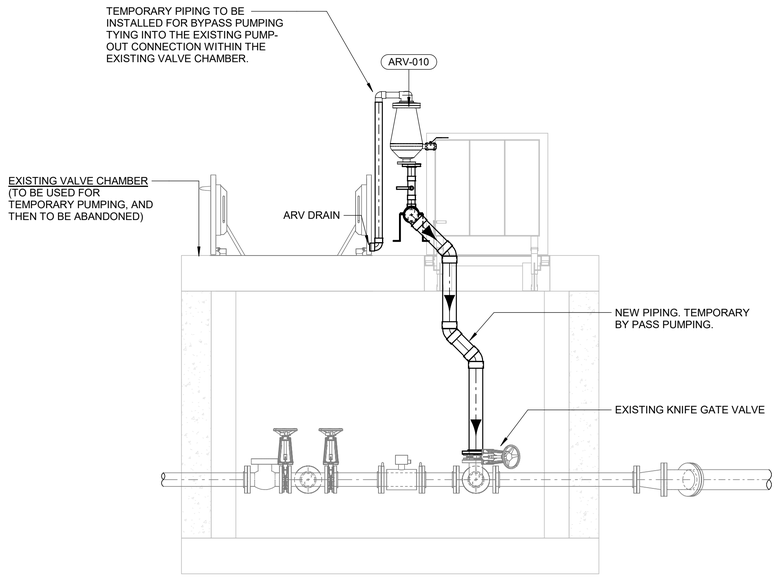
SP	GA	NO	2026.01.30

Title
PLAN AT 217.500

Revision: Sheet: 6 of 9

Drawing No.
DP-102



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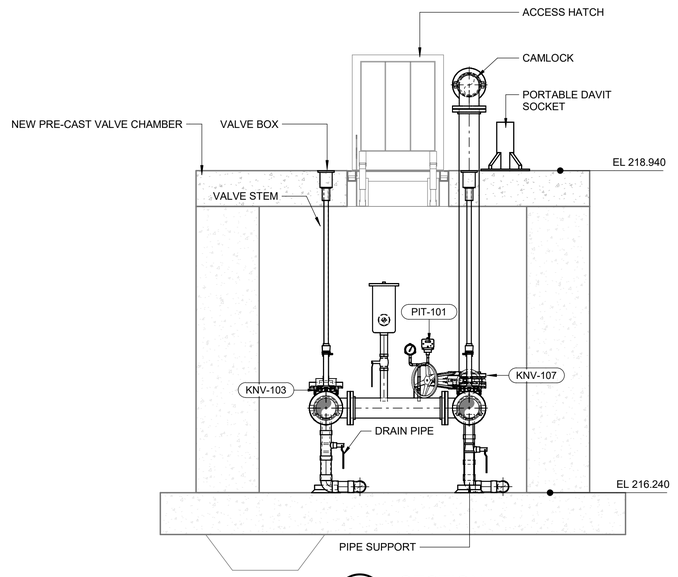
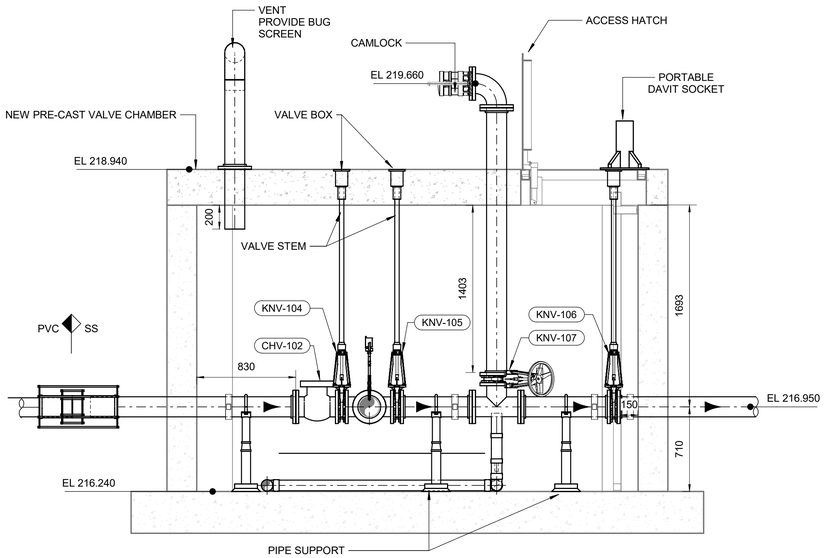
SCALE: 1 : 25



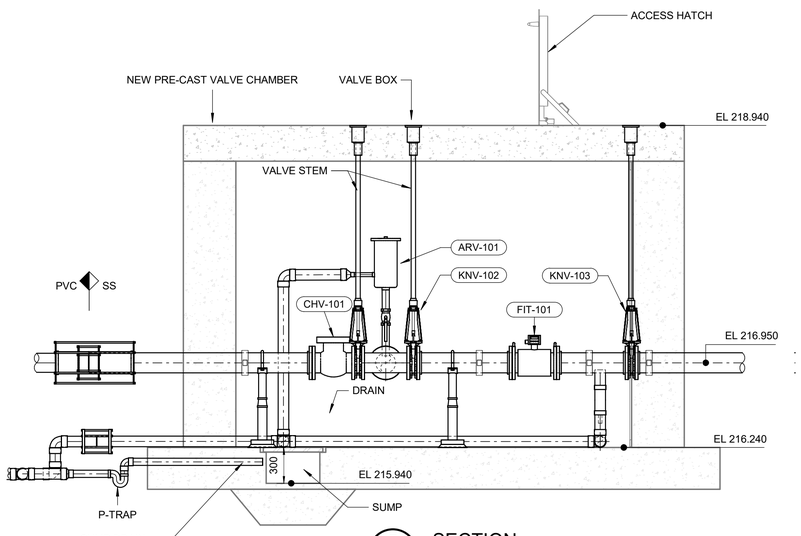
3 DP-102 SECTION
SCALE: 1 : 25

NOTE:

1. CONTRACTOR TO COORDINATE WITH OWNER ON COMPONENTS TO BE SALVAGED FROM THE EXISTING STRUCTURES AND HAND OVER TO THE OWNER FOR STORAGE.



4 DP-102 SECTION
SCALE: 1 : 25



5 DP-102 SECTION
SCALE: 1 : 25

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Glencoe ON Canada

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Scale: 1 : 25

SP	KV	NO	2025.12.10
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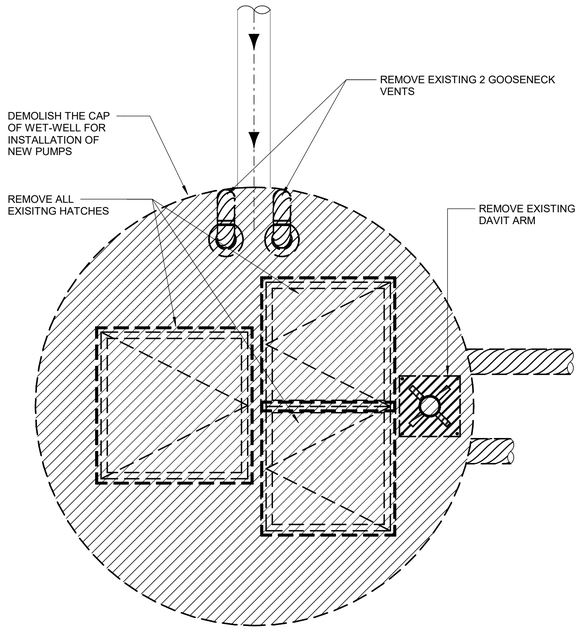
Title
SECTIONS - EXISTING AND NEW VALVE CHAMBERS

Revision: Sheet: 7 of 9

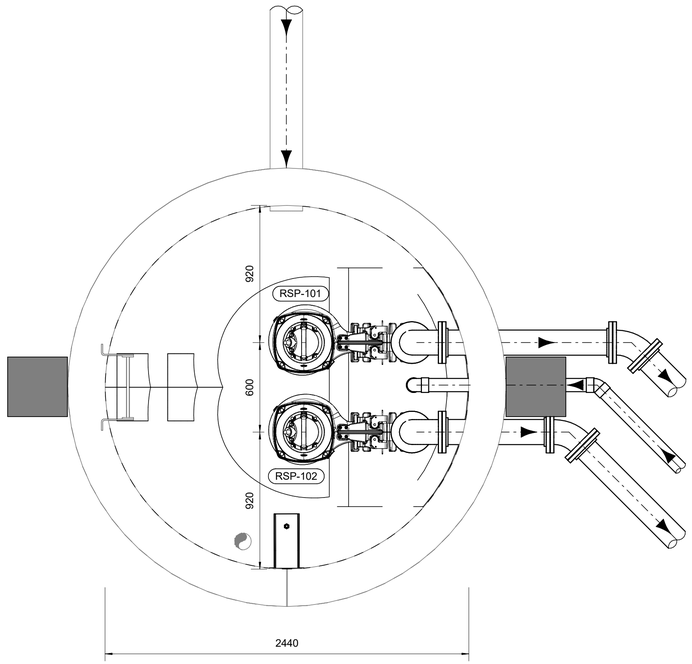
Drawing No.
DP-301

24/4/2026 1:28:07 PM

ORIGINAL SHEET - ANSI D



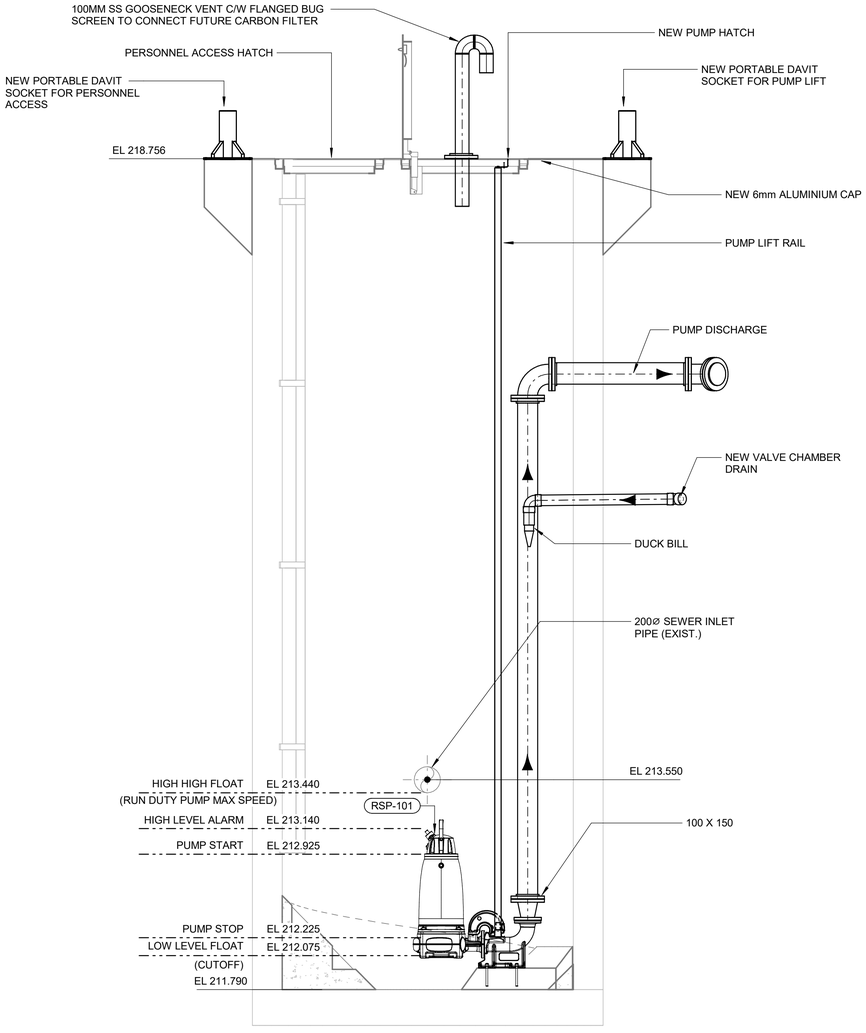
3 DP-101 WET WELL - DEMO PLAN
SCALE: 1 : 20



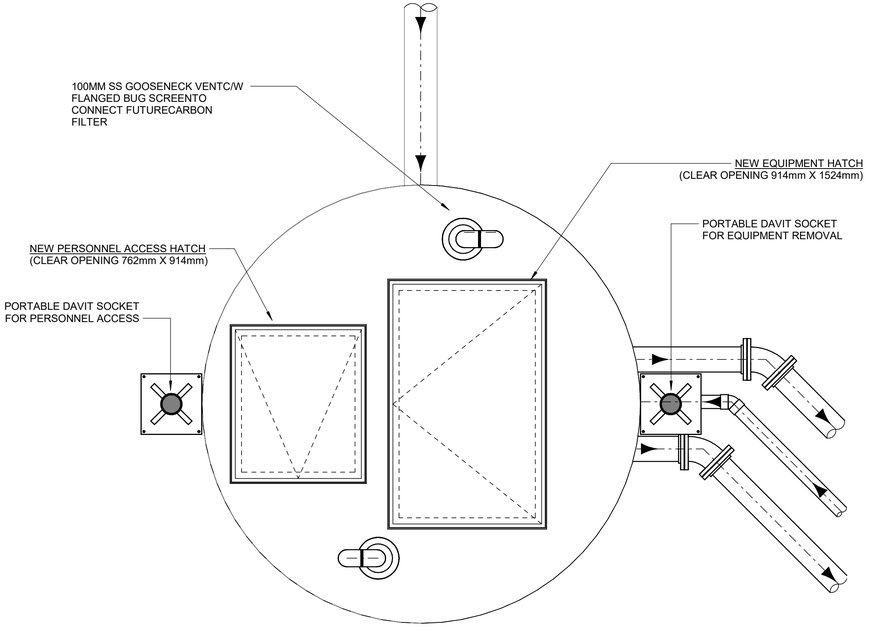
2 DP-101 WET WELL PLAN AT LVL 217.500
SCALE: 1 : 20

NOTES:

1. CONTRACTOR TO COORDINATE WITH OWNER ON COMPONENTS TO BE SALVAGED FROM THE EXISTING STRUCTURES AND HAND OVER TO THE OWNER FOR STORAGE.



1 DP-102 SECTION
SCALE: 1 : 25



4 DP-101 WET WELL - PLAN
SCALE: 1 : 20

2/4/2026 1:29:15 PM

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WWTP INFRASTRUCTURE DESIGN - GLENCOE INDUSTRIAL PARK SPS UPGRADES

Glencoe ON Canada

Project No.: 165630252

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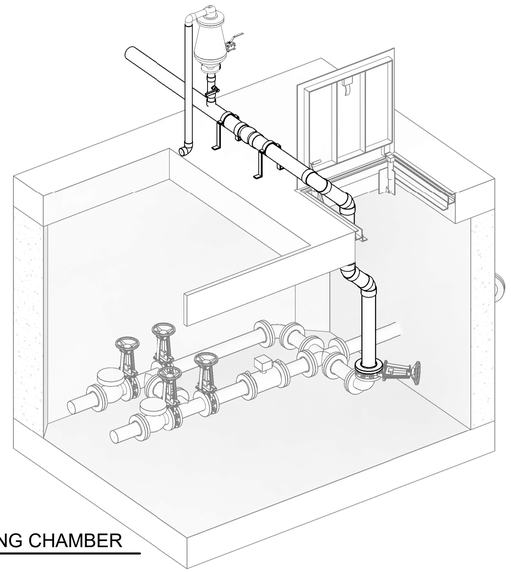
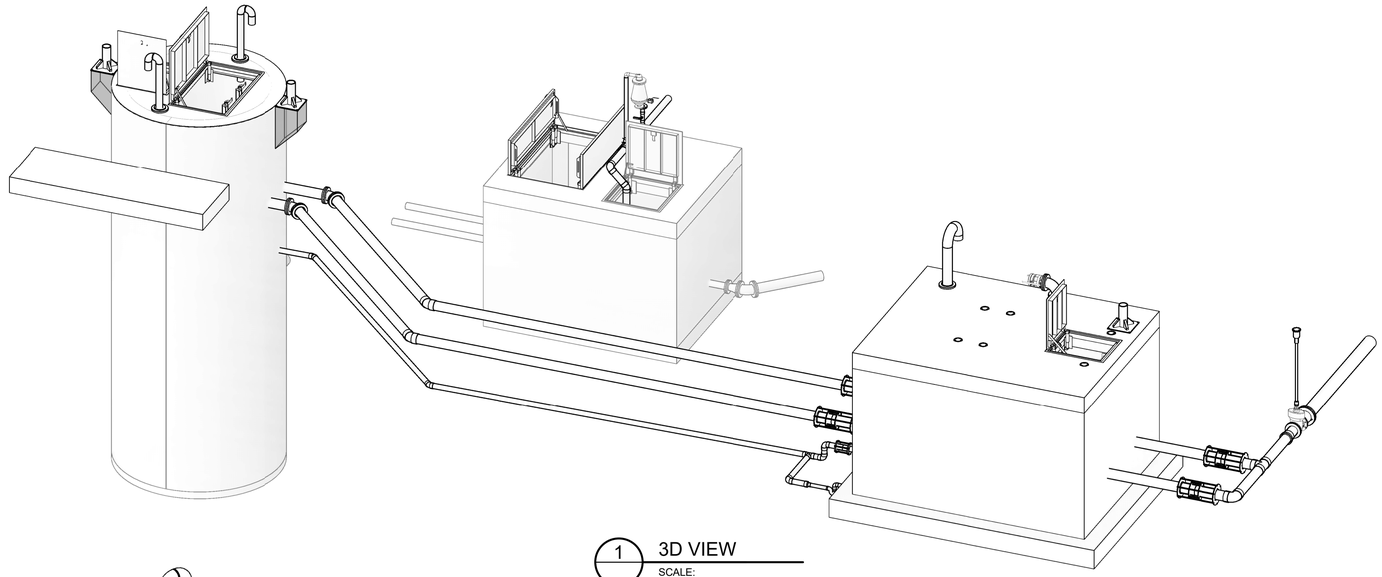
Title
SECTIONS - WET WELL & PLAN VIEWS

Revision: Sheet: 8 of 9

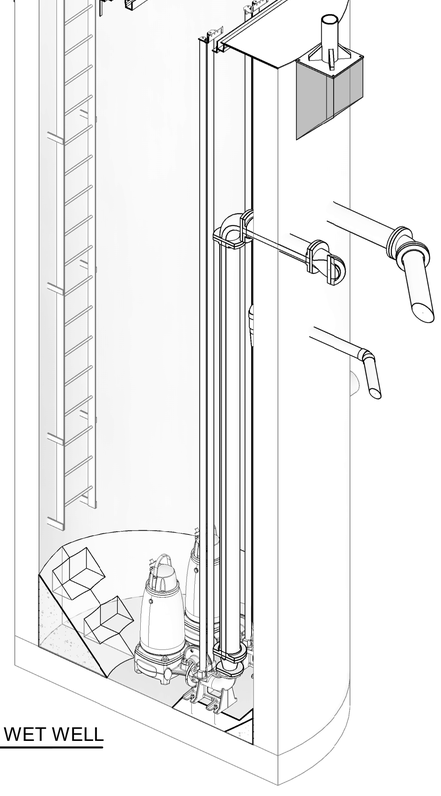
Drawing No.
DP-302



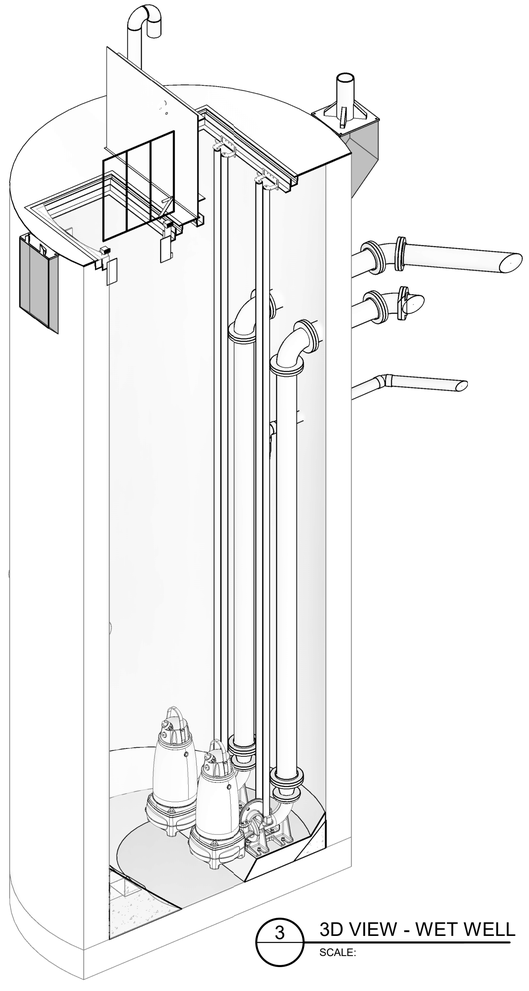
5 3D VIEW - EXISTING CHAMBER
SCALE:



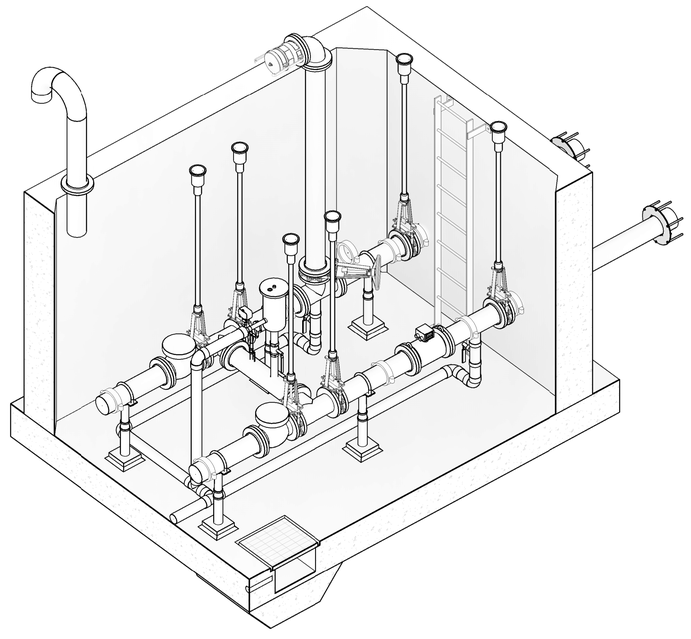
1 3D VIEW
SCALE:



4 3D VIEW - WET WELL
SCALE:



3 3D VIEW - WET WELL
SCALE:



2 3D VIEW - NEW CHAMBER
SCALE:

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100503002
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Client/Project
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WWTP INFRASTRUCTURE DESIGN - GLENCOE INDUSTRIAL PARK SPS UPGRADES
Glencoe ON Canada

Project No.:165630252
File Name: N/A
Scale:

SP	KV	NO	2025.12.10
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Title
3D ISOMETRIC VIEW

Revision: Sheet: 9 of 9
Drawing No.
DP-901

2/4/2026 1:29:05 PM
ORIGINAL SHEET - ANSI D

DESIGN NOTES

1 **GENERAL**

1.1 DESIGN SHALL BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE, 2012 EDITION AND BASED ON THE MMAH SUPPLEMENTARY STANDARD SB-1, TABLE 1.2 FOR THE 'GLENCOE' REGION OF ONTARIO.

1.2 CONCRETE MEMBERS SHALL BE DESIGNED IN ACCORDANCE WITH CSA STANDARD A23.3. STRUCTURAL STEEL SHALL BE DESIGNED IN ACCORDANCE WITH CSA STANDARD CAN/CSA-S16.

2 **LOADS AND FORCES**

2.1 UNIT FLOOR & ROOF LOADINGS GIVEN ON DRAWINGS ARE UNFACTORED UNLESS NOTED OTHERWISE. MEMBER FORCES GIVEN ON DRAWINGS ARE FACTORED.

2.2 SEE NOTES, PLANS AND LOAD TABLES ON FLOOR AND ROOF PLANS.

2.3 BUILDING IMPORTANCE CATEGORY: POST-DISASTER.

3 **LATERAL FORCES ON FOUNDATION WALLS**

3.1 WALLS RETAINING EARTH ARE DESIGNED TO RESIST HORIZONTAL PRESSURES AT ANY DEPTH, h, AND DEPTH BELOW THE GROUNDWATER LEVEL, hw, GIVEN BY THE FOLLOWING EXPRESSION:

p = k ((g-gw)h+q)+gw hw
k = 0.55
q = 12 kPa
g = 21 kN / m^3
gw = 9.81 kN / m^3

3.2 DESIGN GROUNDWATER PRESSURE ON FOUNDATION WALLS TO GRADE LEVEL.

4 **SNOW LOADING**

4.1 ROOFS HAVE BEEN DESIGNED FOR THE FOLLOWING 1 IN 50 YEAR GROUND SNOW AND ASSOCIATED RAIN LOAD CRITERIA.

Is	=	1.25 FOR ULTIMATE LIMIT STATES (ULS)
Is	=	0.90 FOR SERVICEABILITY LIMIT STATES (SLS)
Ss	=	1.5 kPa
Sr	=	0.4 kPa
Cb	=	0.8

5 **SOIL BEARING CAPACITY**
FOUNDATIONS ARE ASSUMED TO BEAR ON NATURAL SOIL OR ENGINEERED FILL AND THE FOLLOWING MINIMUM NET BEARING CAPACITY HAS BEEN ASSUMED FOR DESIGN AND SHALL BE CONFIRMED BY A GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION OF THE FOUNDATIONS

SLS = 60 kPa
ULS = 90 kPa

GENERAL NOTES

1 **GENERAL**

1.1 GENERAL NOTES SHALL BE READ IN CONJUNCTION WITH SPECIFICATIONS AND CONTRACT DOCUMENTS. GENERAL NOTES ARE FOR REFERENCE ONLY AND DO NOT REPLACE CONTRACT SPECIFICATIONS.

1.2 STRUCTURAL DRAWINGS SHALL BE COORDINATED AND READ IN CONJUNCTION WITH CIVIL, ELECTRICAL AND PROCESS DRAWINGS. REPORT ANY DEFICIENCIES TO ENGINEER FOR CLARIFICATION.

1.3 DO NOT USE DRAWINGS FOR CONSTRUCTION UNLESS MARKED "ISSUED FOR CONSTRUCTION" AND SEALED BY ENGINEER.

1.4 DESIGN, DETAILING, AND CONSTRUCTION, SHALL CONFORM TO ONTARIO BUILDING CODE, NATIONAL BUILDING CODE, OCCUPATIONAL HEALTH AND SAFETY ACT, LOCAL REGULATIONS AND BYLAWS AND OTHER CODES AND STANDARDS LISTED. LATEST AVAILABLE EDITIONS SHALL BE USED.

1.5 CHECK DIMENSIONS ON STRUCTURAL DRAWINGS AGAINST CIVIL, PROCESS, AND ELECTRICAL DRAWINGS.

1.6 DIMENSIONS OF EXISTING CONDITIONS ARE PLUS OR MINUS REGARDLESS OF WHETHER SHOWN ON DRAWINGS OR NOT. VERIFY THAT ALL DIMENSIONS AND EXISTING CONDITIONS ARE AS SHOWN ON DRAWINGS. REPORT ANY INCONSISTENCIES AND DOUBTFUL CONDITIONS TO ENGINEER BEFORE PROCEEDING WITH THE WORK.

1.7 DRAWINGS SHALL NOT BE SCALED.

1.8 INDUSTRY ACCEPTABLE STRUCTURAL DETAILS SHALL BE USED WHERE SPECIFIC DETAILS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.

1.9 NO PROVISION HAS BEEN MADE FOR CONDITIONS OCCURRING DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE ALL NECESSARY BRACING AND SHORING REQUIRED TO SAFEGUARD NEW AND EXISTING STRUCTURES, SERVICES AND UTILITIES, AND FOR THE LOADS AND INSTABILITY OCCURRING DURING CONSTRUCTION. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR SAID TEMPORARY WORKS.

1.10 DESIGN LOADS, AS INDICATED SHALL NOT BE EXCEEDED DURING CONSTRUCTION.

1.11 DO NOT CUT OPENINGS THROUGH STRUCTURAL ELEMENTS UNLESS APPROVED BY ENGINEER.

1.12 ATTACHMENT FOR PROCESS, ELECTRICAL AND OTHER SERVICES SHALL BE MADE BY APPROVED METHODS. NO DRILLING, CUTTING OR ALTERING OF MEMBERS SHALL BE DONE UNLESS APPROVED BY ENGINEER.

2 **EXCAVATION, FOUNDATIONS AND BACKFILL**

2.1 ENSURE THAT REQUIREMENTS OUTLINED ARE READ AND UNDERSTOOD PRIOR TO COMMENCING FOUNDATION WORK. THIS INFORMATION IS GIVEN SOLELY AS A GUIDE. NO RESPONSIBILITY IS ACCEPTED BY OWNER OR ENGINEER FOR ITS CORRECTNESS. NOR SHALL ITS ACCURACY OR ANY OMISSIONS AFFECT THE PROVISION OF THIS CONTRACT.

2.2 REMOVE ALL UNSUITABLE FILL AND ORGANIC MATERIAL FROM CONSTRUCTION AREA AND REPLACE WITH MATERIAL APPROVED BY GEOTECHNICAL ENGINEER.

2.3 NATURAL, UNDISTURBED SOIL OR ENGINEERED FILL BEARING SURFACES SHALL BE APPROVED BY GEOTECHNICAL ENGINEER IN WRITING PRIOR TO FOUNDATION CONSTRUCTION TO ENSURE THAT CONDITIONS CORRESPOND TO THOSE ASSUMED IN DESIGN.

2.4 PRIOR TO CONSTRUCTION BACKFILL MATERIAL, COMPACTION, AND LIFT THICKNESS SHALL BE APPROVED BY GEOTECHNICAL ENGINEER. SLAB SUB-BASE MATERIAL, COMPACTION AND THICKNESS SHALL BE APPROVED.

2.5 REMOVE UNSUITABLE MATERIALS BELOW SLAB-ON-GRADE AS DIRECTED BY THE GEOTECHNICAL ENGINEER. PROOF-ROLL SUB-GRADE AND PLACE SUB-BASE MATERIAL WITH PROPER COMPACTION.

2.6 THE LINE OF SLOPE BETWEEN ADJACENT FOOTINGS, OR EXCAVATIONS AND ALONG STEPPED FOOTINGS SHALL NOT EXCEED A RISE OF 1 IN A RUN OF 2 UNLESS APPROVED BY GEOTECHNICAL ENGINEER. MAXIMUM STEP SHALL NOT EXCEED 600mm (24").

2.7 DO NOT PLACE BACKFILL AGAINST WALLS RETAINING EARTH (OTHER THAN CANTILEVER RETAINING WALLS) UNTIL ROOF OR FLOOR CONSTRUCTION AT TOP AND BOTTOM OF WALLS IS POURED AND HAS ATTAINED 75% OF ITS DESIGN STRENGTH. PROVIDE SUPPORT AT TOP AND BOTTOM OF WALLS WHERE SLABS CANNOT BE POURED UNTIL BACKFILL HAS BEEN PLACED.

2.8 DO NOT START BACKFILLING AROUND PRECAST VALVE CHAMBER UNTIL ALL PRECAST CONCRETE RISER SECTIONS ARE IN PLACE.

2.9 WHERE SLAB ON GRADE IS REQUIRED TO LATERALLY RESTRAIN TOP OF WALLS RETAINING EARTH, ADEQUATELY SHORE WALL UNTIL THE SLAB IS POURED AND HAS ATTAINED 75% OF ITS DESIGN STRENGTH.

2.10 WHERE BACKFILL IS PLACED ON EACH SIDE OF FOUNDATION WALLS, DO NOT EXCEED A GRADE DIFFERENCE OF 600mm (24").

2.11 BOTTOMS OF EXTERIOR FOOTINGS, AND OTHER FOOTINGS SUSCEPTIBLE TO FROST DAMAGE, SHALL HAVE A MINIMUM 1200mm (48") COVER TO EXTERIOR FINISHED GRADE. PROTECT FOOTINGS EXPOSED TO FROST DURING CONSTRUCTION WITH A MINIMUM 1200mm (48") OF EARTH OR ITS EQUIVALENT TO PREVENT FREEZING OF SOIL UNDER FOOTINGS.

2.12 INSULATION IS SHOWN WHERE REQUIRED FOR FROST PROTECTION ONLY.

2A **DEWATERING, EXCAVATION PROTECTION AND STRUCTURE MONITORING**

2A.1 PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT AN EXCAVATION DEWATERING PLAN TO THE ENGINEER FOR REVIEW. A METHOD FOR MONITORING THE MOVEMENT AND/OR DISTURBANCE OF THE EXISTING STRUCTURE ON SITE DUE TO DEWATERING OPERATIONS AND CONSTRUCTION ACTIVITIES SHALL ALSO BE SUBMITTED FOR REVIEW AND APPROVAL. A PRE-CONSTRUCTION CONDITION SURVEY OF THE EXISTING FACILITIES ON SITE SHALL BE CONDUCTED. A SURVEY REPORT SHALL BE SUBMITTED TO THE OWNER AND ENGINEER FOR THEIR RECORDS. THE COSTS FOR DEWATERING, STRUCTURE MONITORING AND PRE-CONSTRUCTION SURVEY SHALL BE INCLUDED IN THE TOTAL TENDER PRICE.

2A.2 ANY DAMAGE TO EXISTING FACILITIES DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED AT THE CONTRACTOR'S OWN EXPENSES TO THE SATISFACTION OF THE OWNER.

2A.3 THE CONTRACTOR MAY CHOOSE TO USE A TEMPORARY EXCAVATION PROTECTION SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION AND REMOVAL OF THE SYSTEM . THE CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS AND DRAWINGS AS WELL AS METHOD OF CONSTRUCTION FOR REVIEW. THE SUBMISSION MUST BE CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER IN ONTARIO. EXCAVATION MUST CONFORM TO THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS. THE COST FOR THIS WORK SHALL BE INCLUDED IN THE TOTAL TENDER PRICE.

2A.4 IF A BRACED SHEET PILE COFFERDAM IS TO BE CONSTRUCTED, THE CONTRACTOR SHALL MINIMIZE THE EFFECTS OF VIBRATION DUE TO DRIVING OF STEEL SHEETING TO THE SATISFACTION OF THE ENGINEER.

3 **CONCRETE AND REINFORCEMENT**

3.1 CONCRETE 28 DAY COMPRESSIVE STRENGTH OF 35 MPa.

3.2 CONCRETE COVER TO REINFORCEMENT SHALL CONFORM TO THE GREATER VALUES OF NOTES BELOW, AND ON PLANS AND TYPICAL DETAILS.

LOCATION	COVER mm (in)	
	EXPOSED TO EARTH, WATER OR WEATHER	NOT EXPOSED
CAST AGAINST EARTH	75 (3)	-
CLASS A OR C EXPOSURE	60 (2 3/8)	60 (2 3/8)

3.3 CONCRETE SHALL BE TYPE GU OR MS (LIQUID HOLDING STRUCTURE) PORTLAND CEMENT UNLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATIONS.

3.4 REFER TO SPECIFICATIONS FOR EXPOSED CONCRETE FINISHES. APPLY FLOOR HARDENERS TO FLOOR SLABS AS SPECIFIED IN SPECIFICATIONS.

3.5 REFER TO PROCESS AND ELECTRICAL DRAWINGS FOR SIZES AND LOCATIONS OF EQUIPMENT BASES, HOUSEKEEPING PADS, PITS, SUMPS, TRENCHES, DEPRESSIONS, CURBS, CHAMFERS AND SLOPES NOT SHOWN ON STRUCTURAL DRAWINGS.

3.6 COORDINATE INSTALLATION OF OPENINGS, SLEEVES, CONDUITS AND OTHER CAST-IN INSERTS WITH SIZES AND LOCATIONS SHOWN ON MECHANICAL, ELECTRICAL AND PROCESS DRAWINGS. OBTAIN APPROVAL OF ENGINEER FOR ANY OPENINGS, SLEEVES, CONDUITS OR INSERTS REQUIRED, BUT NOT SHOWN ON STRUCTURAL DRAWINGS.

3.7 DO NOT PLACE SLEEVES OR OPENINGS THROUGH STRUCTURAL ELEMENTS UNLESS APPROVED BY ENGINEER.

3.8 CAST IN PLACE SLEEVES AND FORMED OPENINGS ARE THE ONLY ACCEPTABLE METHODS OF PROVIDING OPENINGS IN WALLS AND SLABS, WHERE INDICATED ON STRUCTURAL DRAWINGS.

3.9 PIPES AND CASTINGS THROUGH WALLS AND SLABS SHALL BE CAST IN PLACE. BOX OUT FOR PIPES AND CASTINGS THROUGH WALLS AND SLABS NOT PERMITTED UNLESS SHOWN OTHERWISE.

3.10 REFER TO TYPICAL DETAILS FOR CONSTRUCTION JOINT DETAILS. FOR JOINTS LOCATIONS OTHER THAN THOSE SHOWN ON DRAWINGS, SUBMIT PROPOSED JOINT LOCATIONS TO ENGINEER FOR APPROVAL.

3.11 DO NOT PROVIDE HORIZONTAL CONSTRUCTION JOINTS IN BEAMS UNLESS APPROVED BY ENGINEER.

3.12 SLABS ON GRADE SHALL BE PLACED ON COMPACTED GRANULAR MATERIAL IN STRICT ACCORDANCE WITH GEOTECHNICAL REPORT.

3.13 MAINTAIN SLAB THICKNESS AT SLOPES, DEPRESSIONS AND CHANGES IN ELEVATION.

3.14 SAWCUTS TO BE 1/4 OF SLAB THICKNESS AND IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS. FILL SAWCUTS WITH SPECIFIED NON-METALLIC, SEMI-RIGID EPOXY JOINT FILLER 30 DAYS AFTER CONCRETE PLACEMENT. PROTECT JOINTS FROM DAMAGE AT SLAB EDGES DURING CONSTRUCTION.

3.15 REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO CSA G30.18, Fy = 400MPa. (58 ksi) WELDED WIRE FABRIC SHALL CONFORM TO CSA G30.5, Fy = 450MPa (65 ksi).

3.16 REINFORCING STEEL SHALL BE DETAILED, SHOP FABRICATED AND FIELD PLACED IN ACCORDANCE WITH RSIC MANUAL OF STANDARD PRACTICE, CSA A23.1 AND A23.3.

3.17 REINFORCING STEEL SPLICES AND EMBEDMENT SHALL BE IN ACCORDANCE WITH RSIC MANUAL OF STANDARD PRACTICE, CSA A23.1 AND A23.3. SPLICES SHALL BE CLASS B TENSION LAP SPLICE UNLESS NOTED OTHERWISE.

3 **CONCRETE AND REINFORCEMENT CONTINUED**

3.18 PROVIDE DOWELS TO WALLS AND COLUMNS OF SAME SIZE, NUMBER AND SPACING AS WALL AND COLUMN BARS, UNLESS NOTED OTHERWISE.

3.19 INSTALL EPOXY ANCHORS TO MANUFACTURER INSTRUCTIONS. FULL PULL OUT CAPACITY SHALL BE DEVELOPED PRIOR TO LOADING.

3.20 NON-SHRINK GROUT SHALL BE AN APPROVED PRE-MIXED PROPRIETARY PRODUCT. COMPRESSIVE STRENGTH SHALL BE 50MPa (7.3 ksi) AT 28 DAYS.

3.21 DRY-PACK GROUT SHALL BE 1 PART PORTLAND CEMENT TO 1.5 PARTS SAND TO 2 PARTS 9mm (3/8") PEA GRAVEL WITH ONLY SUFFICIENT WATER TO DAMPEN MIXTURE. COMPRESSIVE STRENGTH SHALL BE 50MPa (7.3 ksi) AT 28 DAYS.

4 **STRUCTURAL STEEL**

4.1 STRUCTURAL STEEL SHALL CONFORM TO:

CAN/CSA G40.20 GRADE 350W (50 ksi) OR ASTM A992 GRADE 50 FOR W SECTIONS.
CAN/CSA G40.21 GRADE 350W (50 ksi) FOR WWF SECTIONS.
CAN/CSA G40.21 GRADE 350W (50 ksi), CLASS C FOR HOLLOW STRUCTURAL SECTIONS (HSS).
CAN/CSA G40.21 GRADE 300W (44 ksi) FOR ALL OTHER STEEL.

4.2 PRIMER SHALL CONFORM TO CISC STANDARD 1-73A OR 2-75. STEEL SHALL BE TREATED WITH ONE SHOP COAT AND FIELD TOUCH UP OF PRIMER EXCEPT STEEL TO BE HOT DIP GALVANIZED. PAINT TO CONTRACT SPECIFICATION.

4.3 EXTERIOR STEEL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH CSA G164.

4.4 BOLTS SHALL BE ASTM A325 HIGH STRENGTH BOLTS IN BEARING TYPE CONNECTION. ANCHOR BOLTS SHALL BE ASTM A36 OR G40.21 300W (44 ksi).

4.5 SHOP CONNECTIONS SHALL BE WELDED AND FIELD CONNECTIONS SHALL BE WELDED OR BOLTED WITH A MINIMUM OF TWO M20 (3/4") BOLTS. CONNECTIONS SHALL BE DOUBLE ANGLE, UNLESS NOTED OTHERWISE.

4.6 LATERAL LOAD RESISTING SYSTEM CONNECTIONS SHALL BE DESIGNED TO MEET SEISMIC DESIGN REQUIREMENTS OF CSA S16, CLAUSE 27.

4.7 DESIGN BEAM CONNECTIONS FOR 50% OF THE SHEAR STRENGTH OF THE BEAM UNLESS THE MEMBER FORCE IS INDICATED ON DRAWINGS.

4.8 BRACING CONNECTIONS SHALL BE DESIGNED FOR 50% OF MEMBER TENSILE STRENGTH UNLESS THE MEMBER FORCE IS INDICATED ON DRAWINGS.

4.9 BEAMS CANTILEVERED OR CONTINUOUS OVER A COLUMN OR SUPPORT SHALL HAVE 10mm (3/8") STIFFENERS EACH SIDE UNLESS NOTED OTHERWISE.

5 **ALUMINUM**

5.1 ALL GRATING, PLATFORMS, RAILINGS AND LADDERS FOR MECHANICAL AND PROCESS MAINTENANCE AND ROOF ACCESS. PLATFORM SHOWN IS CONCEPTUAL DESIGN ONLY. CONTRACTOR TO RETAIN A LICENSED PROFESSIONAL ENGINEER IN ONTARIO TO DESIGN AND SUBMIT CERTIFIED SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO FABRICATION. PLATFORM TO BE COMPLETED WITH 1070mm HIGH ALUMINUM GUARDRAIL WITH KICKPLATE, SERRATED ALUMINUM GRATING, AND ALUMINUM STRUCTURAL SUPPORTS. TO BE COMPLETED WITH STAINLESS STEEL TYPE 316 BOLTS, NUTS, WASHERS AND GRATING CLIPS.

5.2 DESIGN TO MEET ONTARIO BUILDING CODE REQUIREMENTS.
DESIGN SPECIFIED SUPERIMPOSED LIVE LOAD = 7.2 kPa (SLS).

5.3 CONTRACTOR TO FIELD VERIFY EXISTING DIMENSIONS AND ELEVATIONS PRIOR TO DESIGN AND FABRICATION OF PLATFORMS.

5.4 CONTRACTOR TO COORDINATE PLATFORM LAYOUT WITH PROCESS MECHANICAL DRAWINGS AND APPROVED EQUIPMENT SHOP DRAWINGS.

5.5 ALUMINUM SURFACES SHALL BE PREVENTED FROM COMING IN DIRECT CONTACT WITH CONCRETE OR WITH METALS NOT COMPATIBLE WITH ALUMINUM. PROVIDE SEPARATION BETWEEN ALUMINUM AND CONCRETE, MINIMUM 2 COATS OF BITUMINOUS PAINT OR EQUAL.

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Revision

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Permit/Seal

LICENSED PROFESSIONAL ENGINEER
165630252
2026-02-13
C. K. Y. YAU
100538066
PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX
WWTP INFRASTRUCTURE
DESIGN - GLENCOE
INDUSTRIAL PARK SPS
UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165640381_S001-3

Scale:

SP	CY	CY	2026.02.13
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
DESIGN AND
GENERAL NOTES

Revision: Sheet: 1 of 3

Drawing No.
S-001

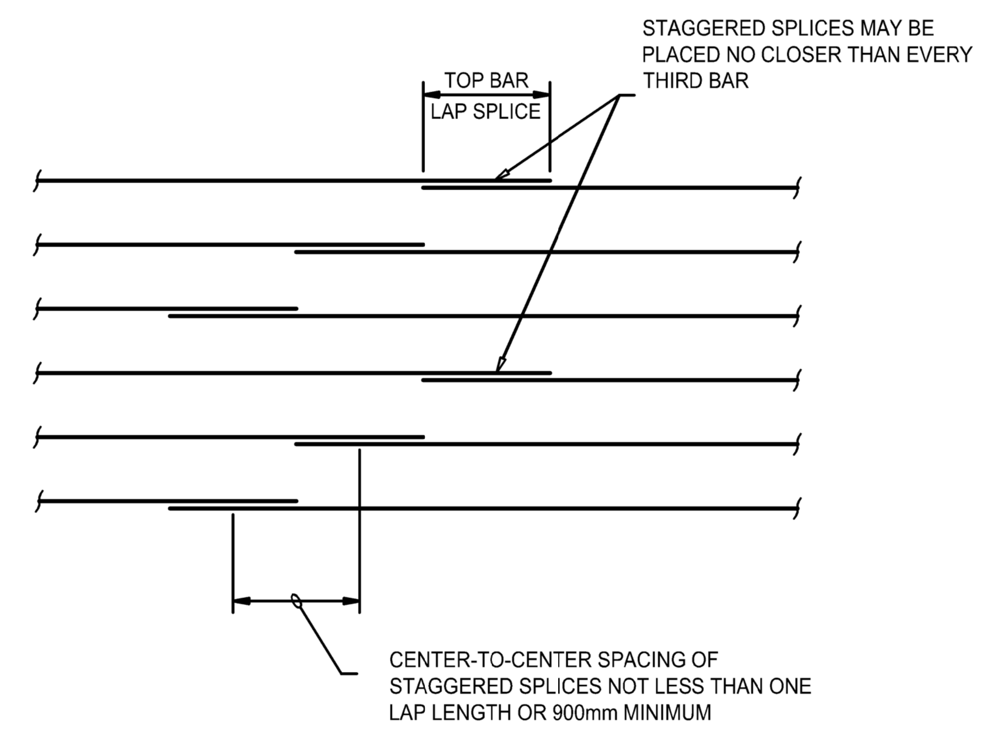
ORIGINAL SHEET - ANSI D

ONLY FOR :	35 MPa CONCRETE , NORMAL WEIGHT 400 MPa REINFORCING BAR			
BAR SIZE	TOP BARS (mm)		OTHER BARS (mm)	
	CLASS A	CLASS B	CLASS A	CLASS B
10M	350	450	300	350
15M	520	670	400	520
20M	690	890	530	690
25M	1070	1380	830	1070
30M	1290	1670	990	1290
35M	1500	1950	1180	1500

NOTES:

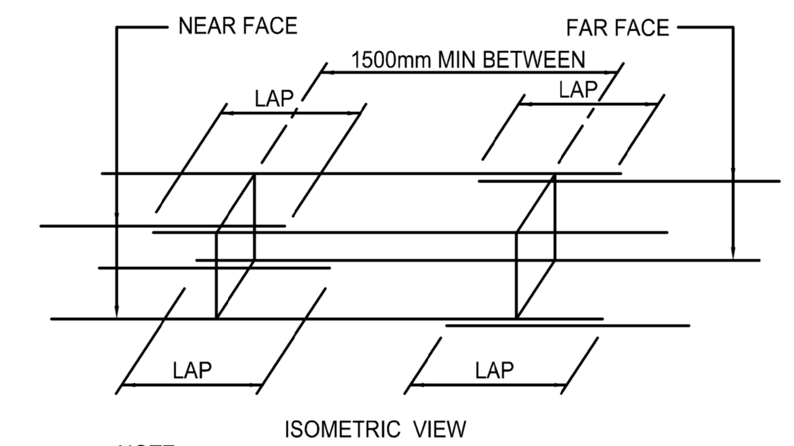
1. PROVIDE CLASS B LAP UNLESS OTHERWISE NOTED.
2. LAP SPLICE LENGTHS SHOWN IN THE TABLE ARE BASED ON HEAVIER CONFINED BARS.
3. TABLE APPLIES UNLESS SHOWN OTHERWISE.
4. DEVELOPMENT LENGTHS ARE EQUAL TO CLASS A LAP SPLICES.

REBAR LAP TABLE
NOT TO SCALE



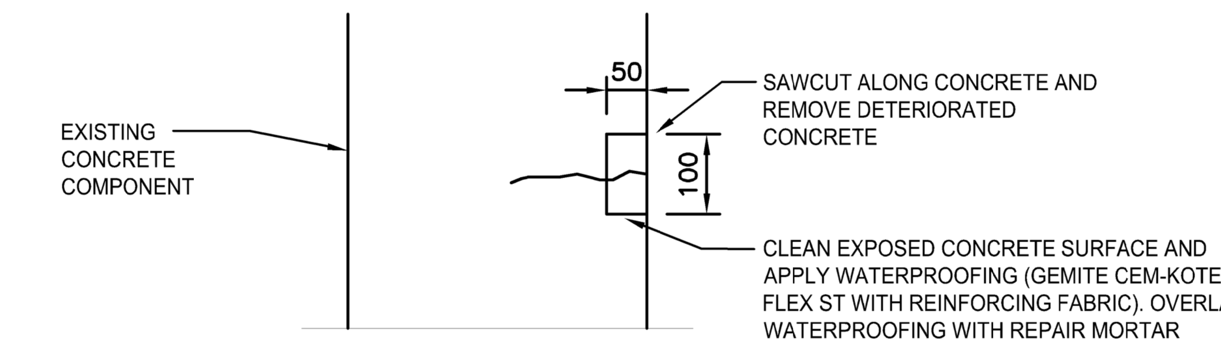
NOTE:
1. VERTICAL BARS NOT SHOWN FOR CLARITY
2. SPLICES AT EACH FACE OF WALL MAY OCCUR AT SAME LOCATION

CIRCULAR TANK HORIZONTAL WALL REINFORCING STAGGERED SPLICES
NOT TO SCALE

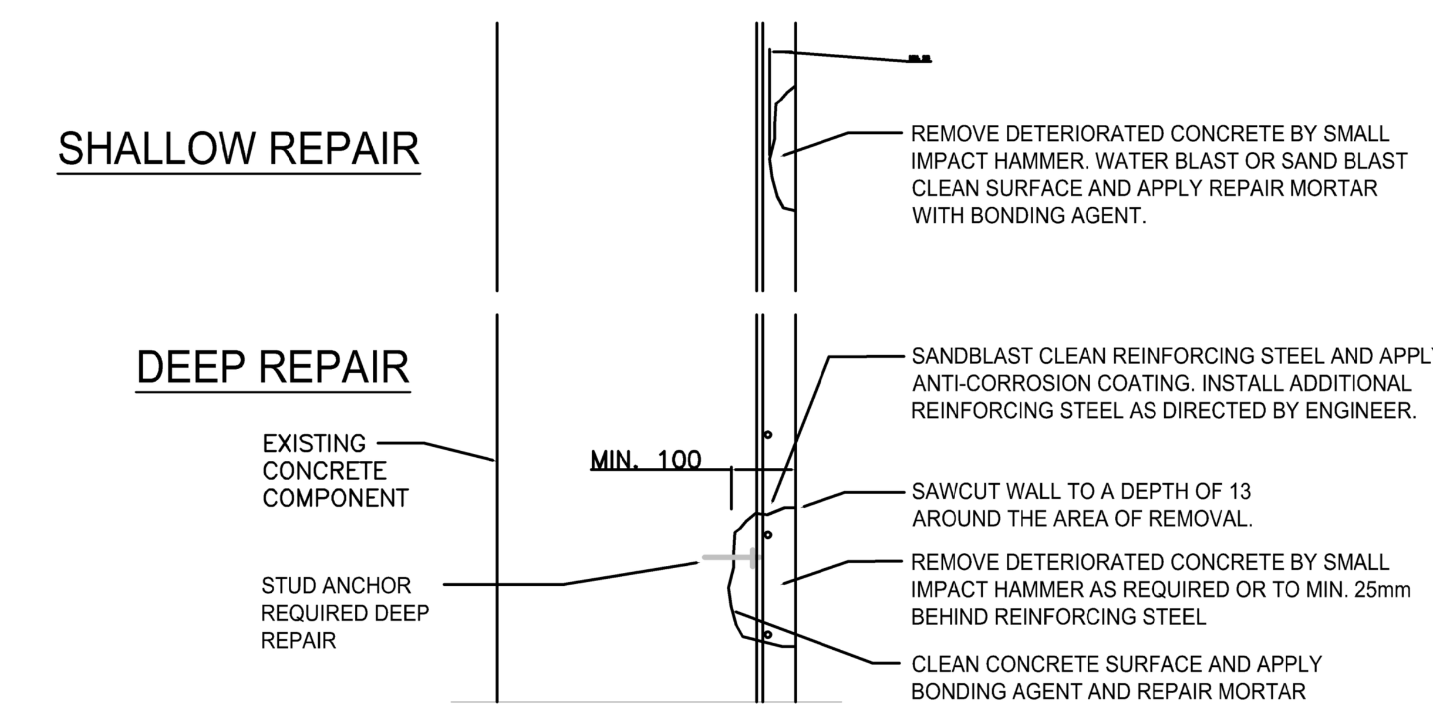


NOTE:
LAP LENGTH CLASS B UNLESS NOTED OTHERWISE

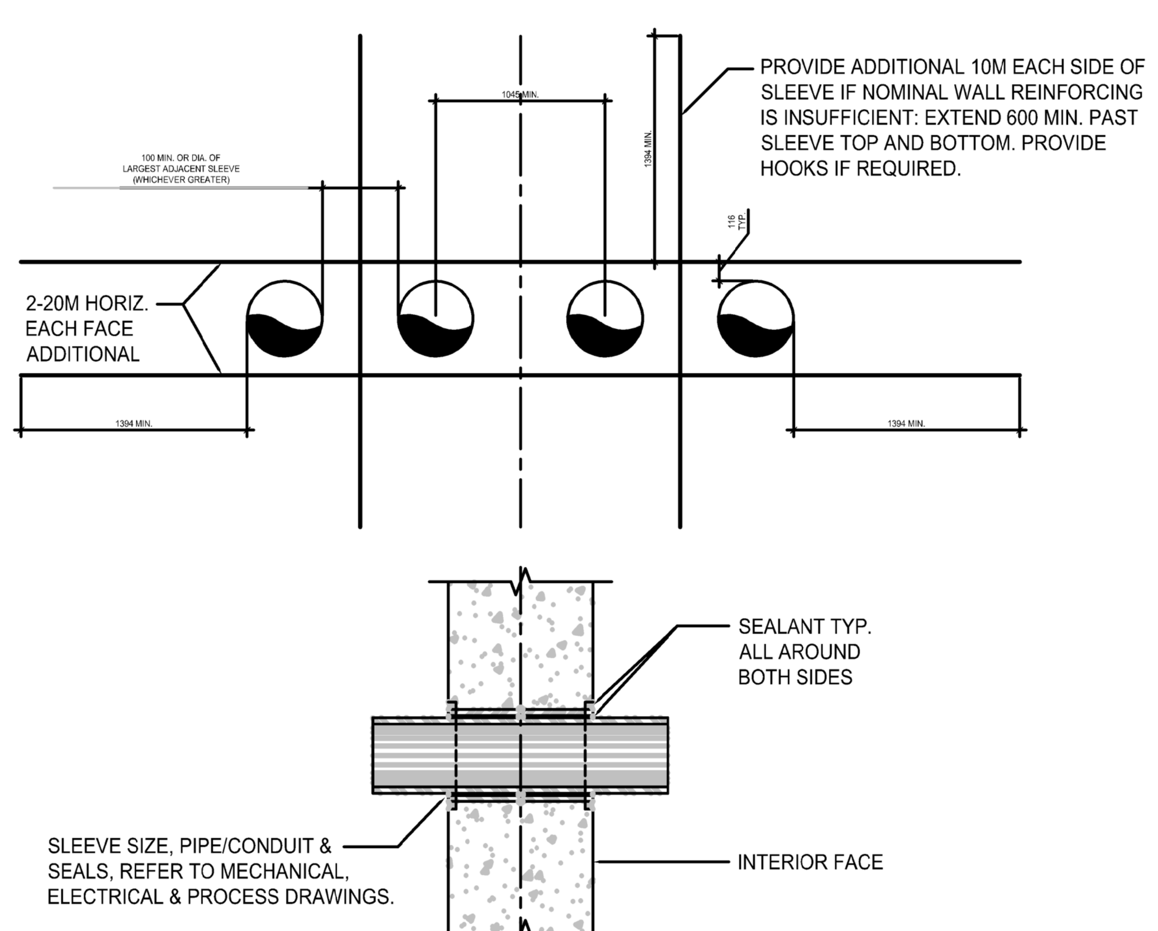
TYPICAL LAP ARRANGEMENT FOR HORIZONTAL REINFORCING BARS
NOT TO SCALE



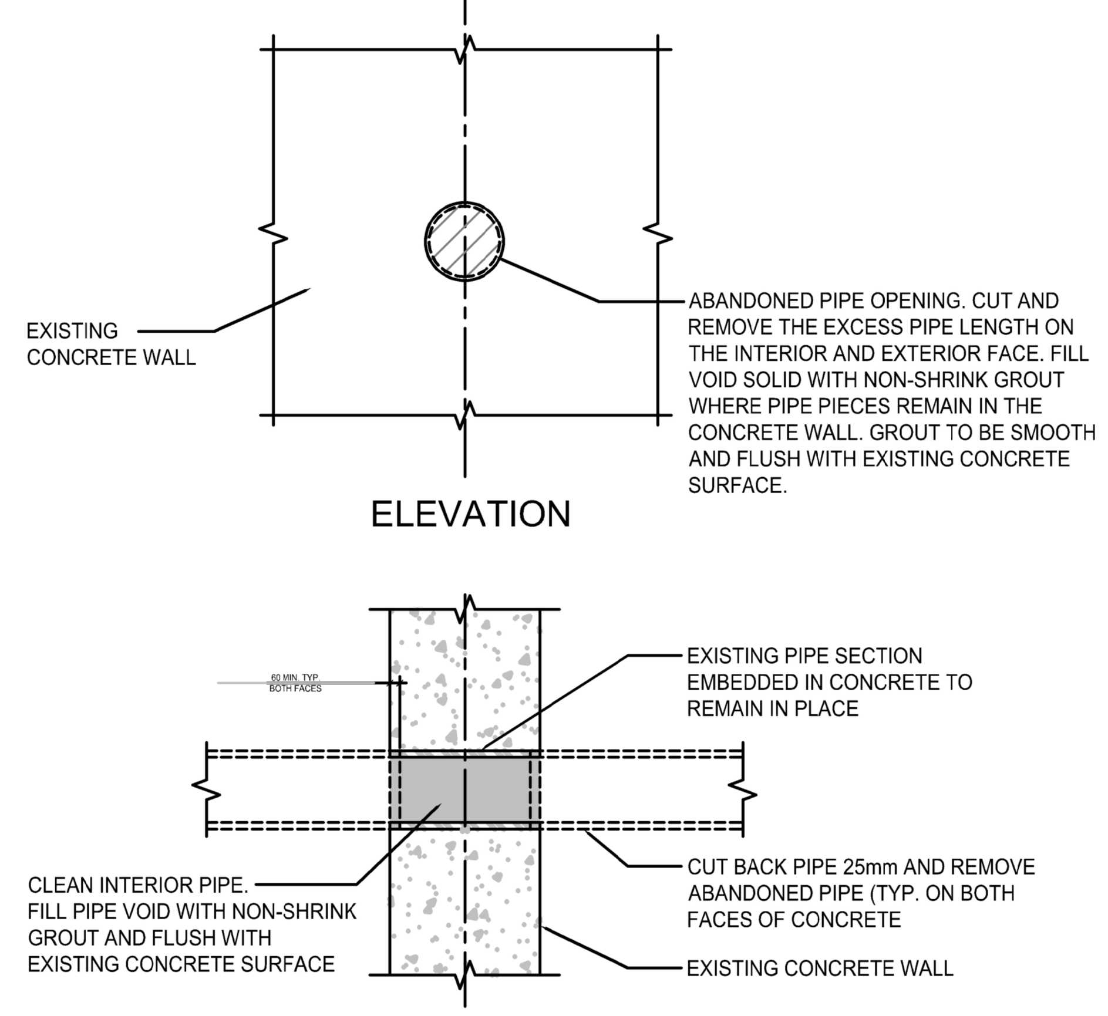
DETAILS OF CRACK REPAIR
NOT TO SCALE



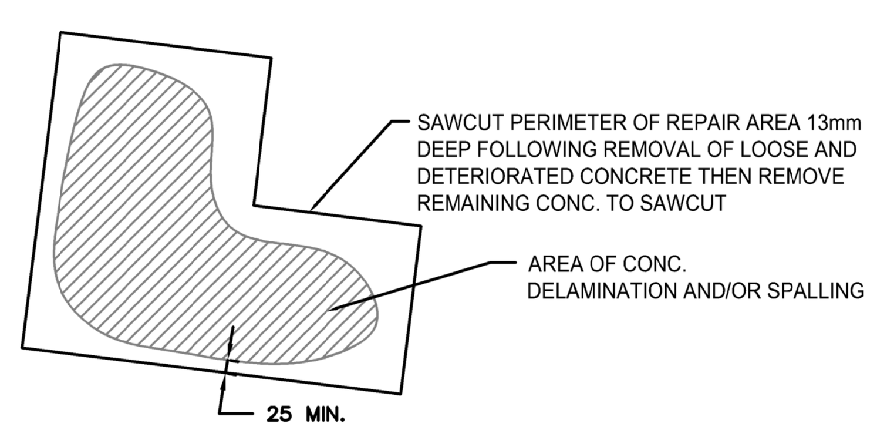
DETAILS OF CONCRETE SURFACE REPAIR
NOT TO SCALE



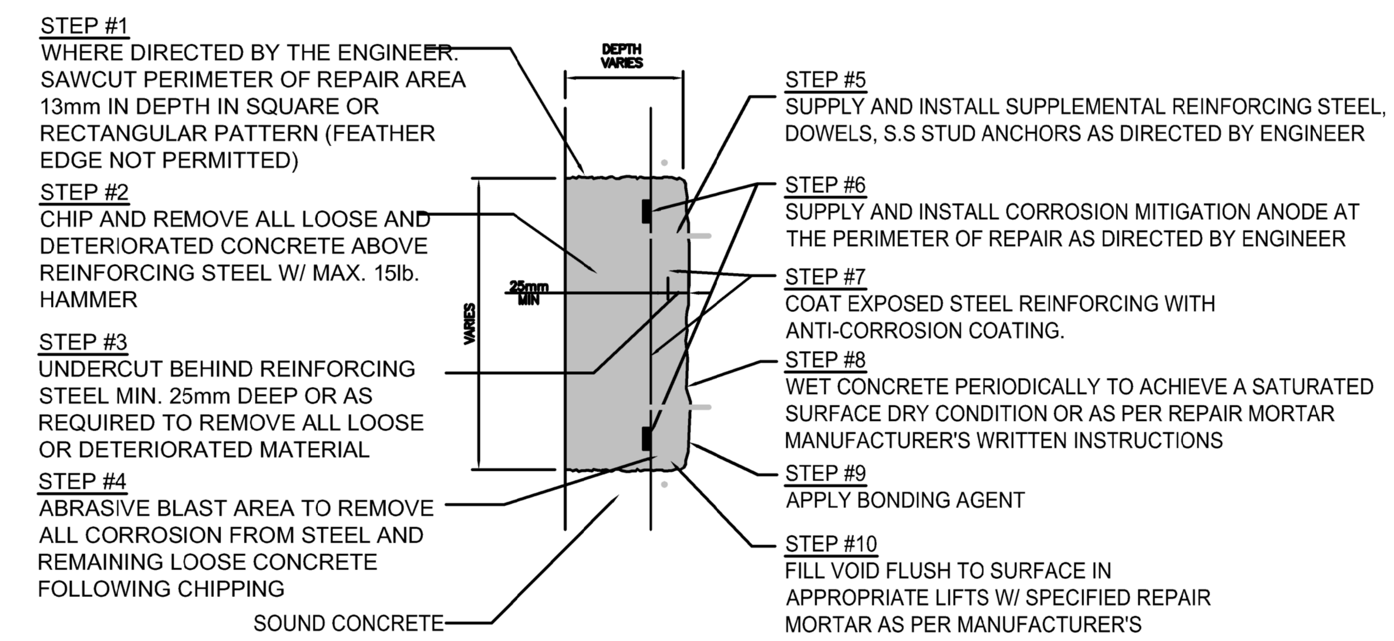
SLEEVES THROUGH WALLS
NOT TO SCALE



PIPE REMOVAL DETAIL FOR WET WELL
NOT TO SCALE



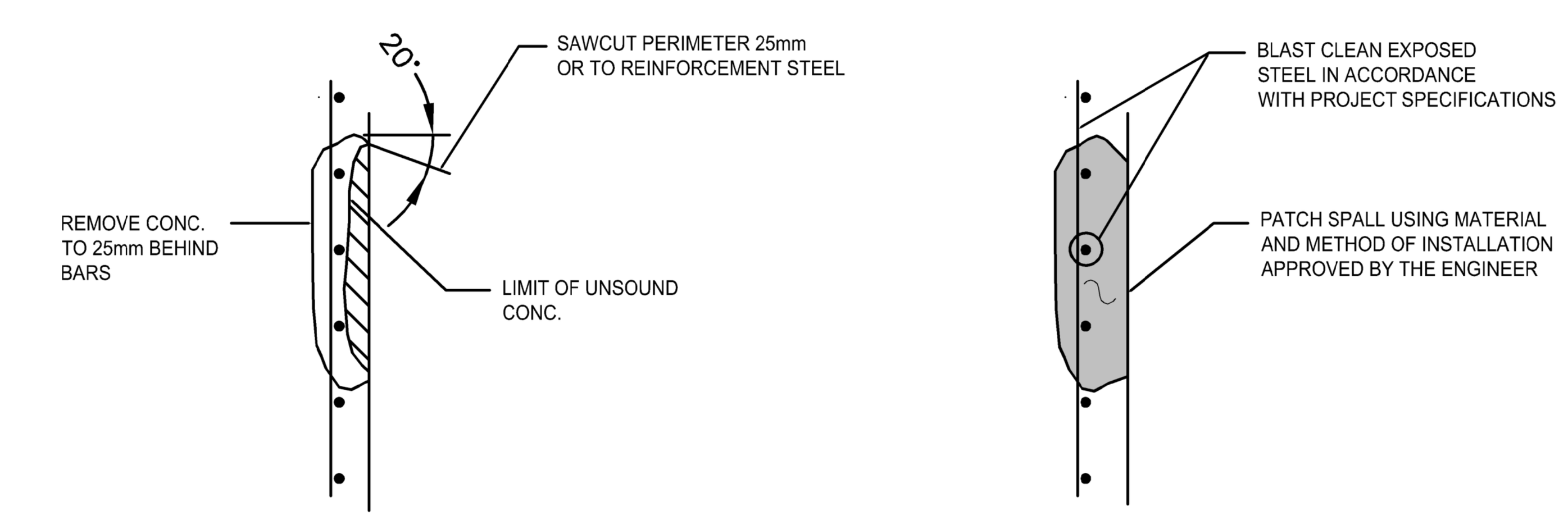
ELEVATION OR PLAN
NOT TO SCALE



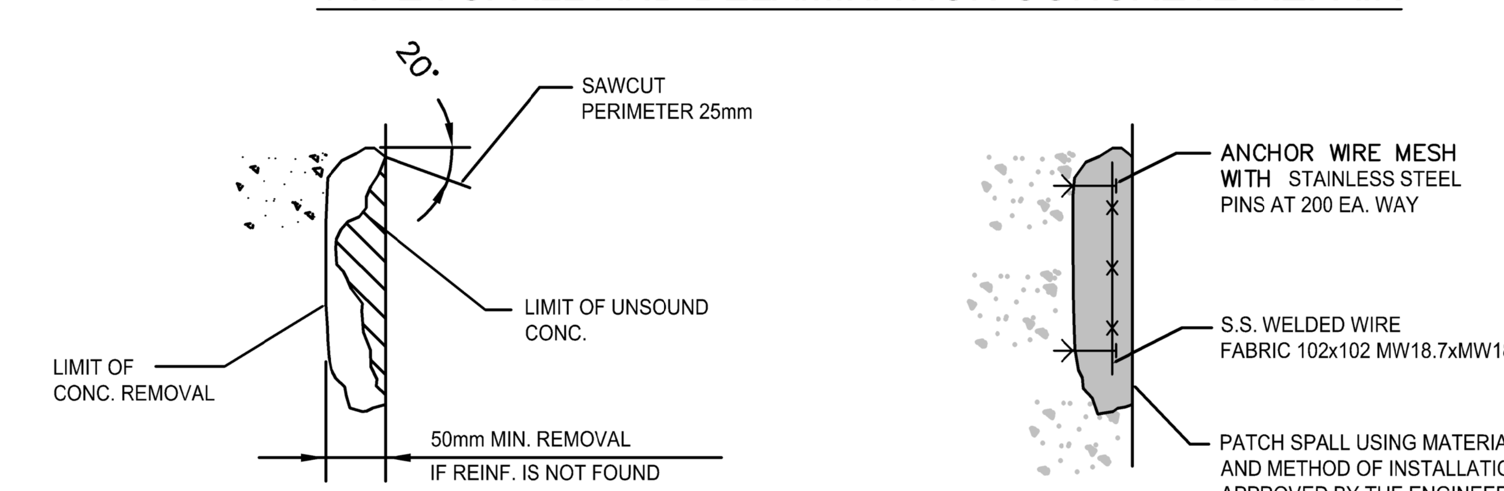
TYPICAL GENERAL REPAIR OF DETERIORATED CONCRETE

DETAIL NOTES:

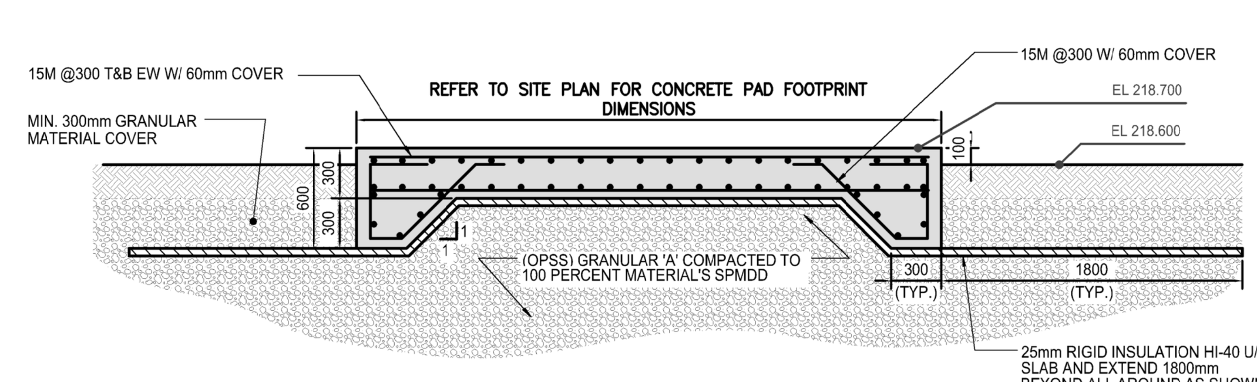
1. REMOVE DETERIORATED CONCRETE AND REPAIR ONLY WHERE SPECIFICALLY DIRECTED BY THE ENGINEER. PAYMENT FOR THIS WORK WILL BE BY MEASURED QUANTITY USING THE UNIT PRICE PROVIDED IN THE SCHEDULE OF ADDITIONAL UNIT PRICES WITH THE EXCEPTION OF REPAIRS ALREADY INDICATED IN THE DRAWINGS.
2. CONTRACTOR IS TO SUPPLY AND INSTALL CORROSION MITIGATION ANODE AT THE EACH REPAIR LOCATION AS DIRECTED BY ENGINEER. CORROSION MITIGATION ANODES TO BE EMBEDDED GALVANIC ANODES, GALVANSHIELD XP+ AVAILABLE FROM VECTOR CORROSION TECHNOLOGIES (DISTRIBUTED BY SIKA CANADA) OR APPROVED EQUAL.
3. REPAIR MORTAR TO BE SIKATOP 123 PLUS, BONDING AGENT AND ANTI-CORROSION COATING TO BE SIKATOP ARMATEC 110 OR APPROVED EQUALS. ALTERNATE SUPPLIERS WILL BE CONSIDERED HOWEVER ALL REPAIR SYSTEMS MATERIALS SHALL BE SUPPLIED FROM A SINGLE MANUFACTURER.
4. ALLOW A MINIMUM OF TWO - 12mm DIA. STAINLESS STEEL STUD ANCHORS PER LOCATION FOR SHALLOW REPAIRS OF DETERIORATED CONCRETE WHERE THE EXISTING REINFORCING STEEL HAS NOT BEEN EXPOSED. IN LARGER REPAIR AREAS THAT ARE SHALLOW AND EXISTING REINFORCING STEEL HAS NOT BEEN COMPLETELY EXPOSED THE MAXIMUM SPACING BETWEEN STUD ANCHORS IS NOT TO EXCEED 200mm. STUD ANCHORS BY POWER RAWL OR HILTI.



TYPE I SPALL AND DELAMINATION CONCRETE REPAIR

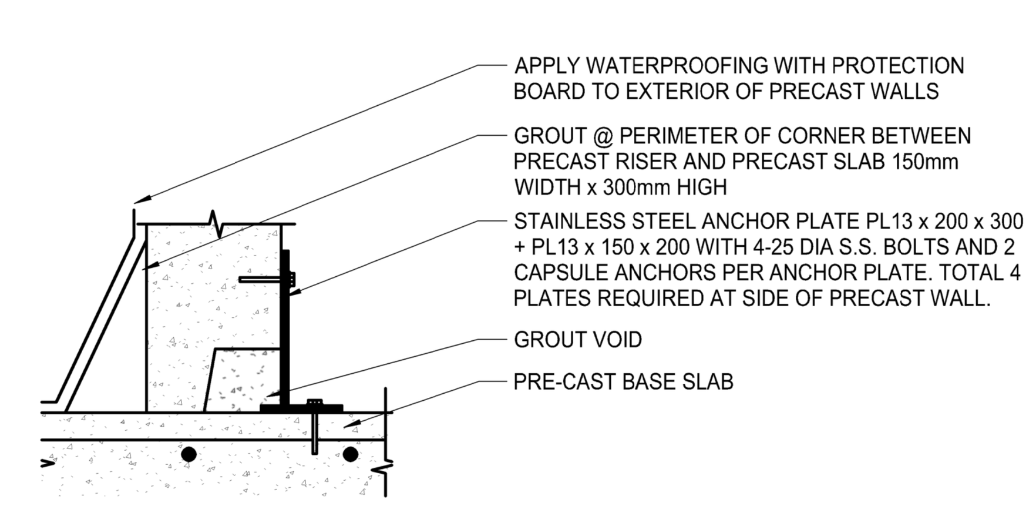


TYPE II SPALL AND DELAMINATION CONCRETE REPAIR
REFER TO FORM OF TENDER FOR QUANTITY OF CONCRETE REPAIR.



CONCRETE GENERATOR PAD DETAILS
NOT TO SCALE

NOTE:
1. THE EXISTING GROUND SURFACE MUST BE STRIPPED OF ALL TOPSOIL, ORGANIC OR ORGANIC BEARING MATERIAL.
2. THE NATIVE FILL OR NATIVE SAND SUBGRADE SHOULD BE VISUALLY INSPECTED BY THE GEOTECHNICAL ENGINEER, COMPACTED IF REQUIRED, AND PROOF ROLLED USING LARGE AXIALLY LOADED EQUIPMENT.
3. ANY LOOSE, ORGANIC, OR UNACCEPTABLE AREAS SHOULD BE SUBEXCAVATED AND REMOVED AS DIRECTED BY THE GEOTECHNICAL ENGINEER AND REPLACED WITH SUITABLE FILL MATERIALS TO 100 PERCENT SPMDD.



PRE-CAST RISER AND PRE-CAST SLAB CONNECTION
NOT TO SCALE

ORIGINAL SHEET - ANSI D

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Revision

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Permit/Seal

Client/Project
SOUTHWEST MIDDLESEX
WWTP INFRASTRUCTURE DESIGN - GLENCOE INDUSTRIAL PARK SPS UPGRADES
Glencoe ON Canada

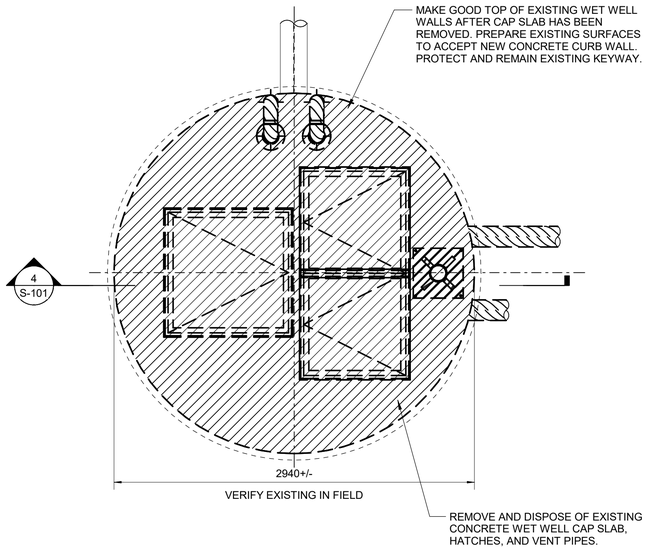
Project No.: 165630252
File Name: 165640381_S001-3

Scale:

SP	CY	CY	2026.02.13
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

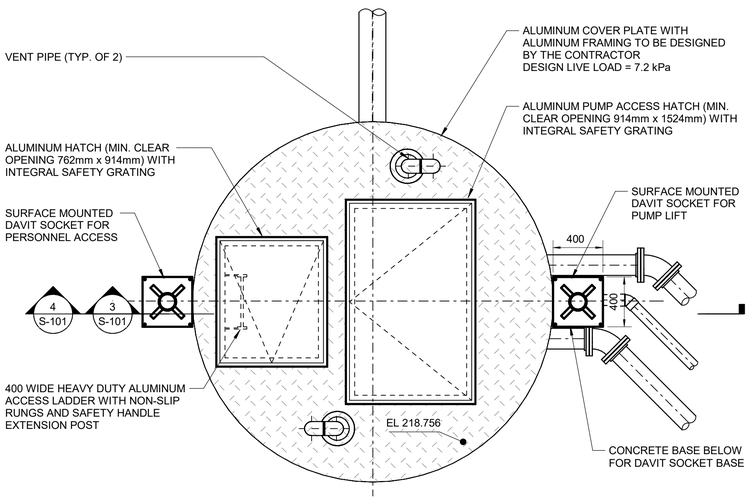
Title
STANDARD DETAILS

Revision: Sheet: 2 of 3
Drawing No.
S-002



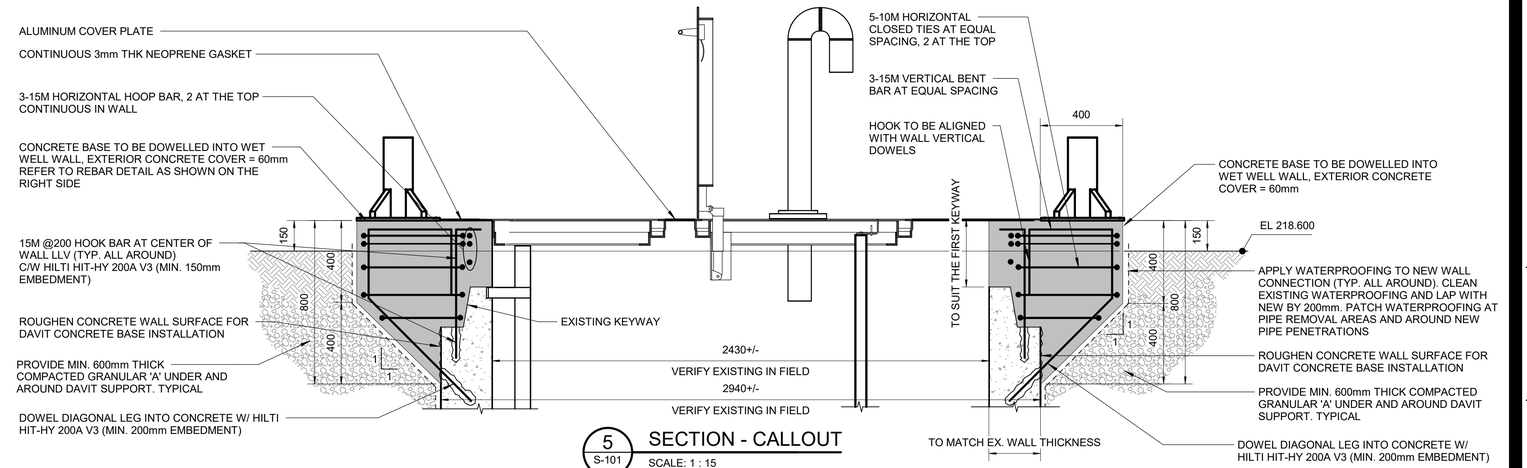
1 EXISTING PUMPING STATION ROOF PLAN - DEMOLITION

SCALE: 1 : 25



2 T/O PLATFORM PLAN - NEW CONSTRUCTION

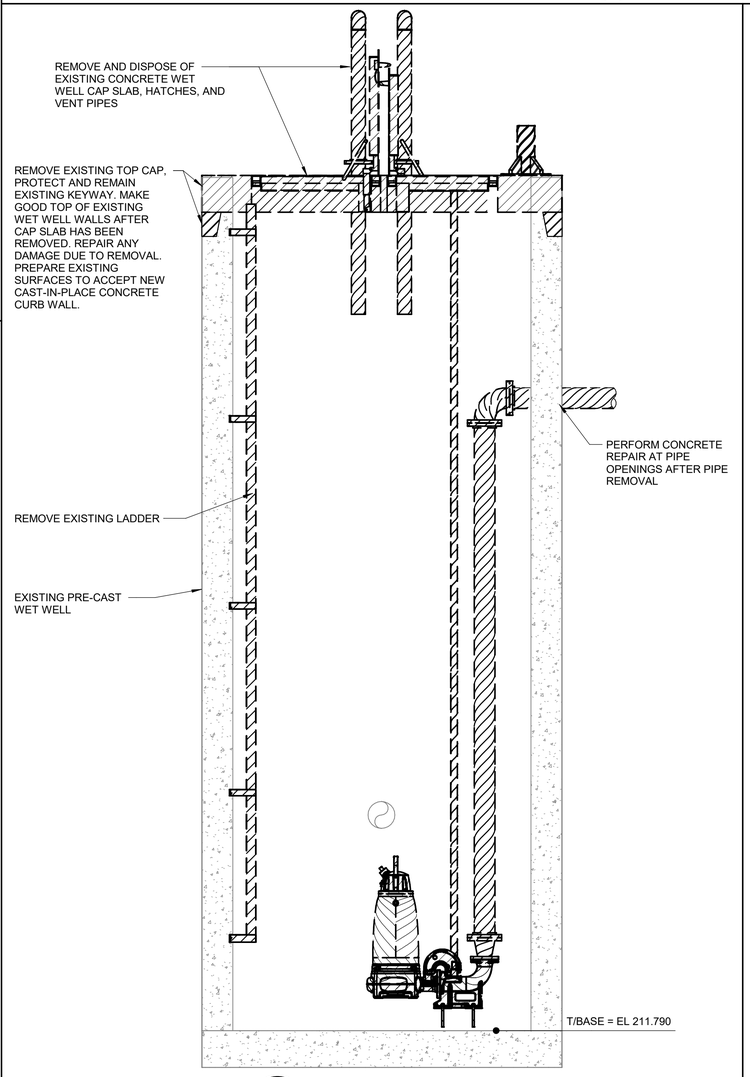
SCALE: 1 : 25



5 SECTION - CALLOUT

S-101

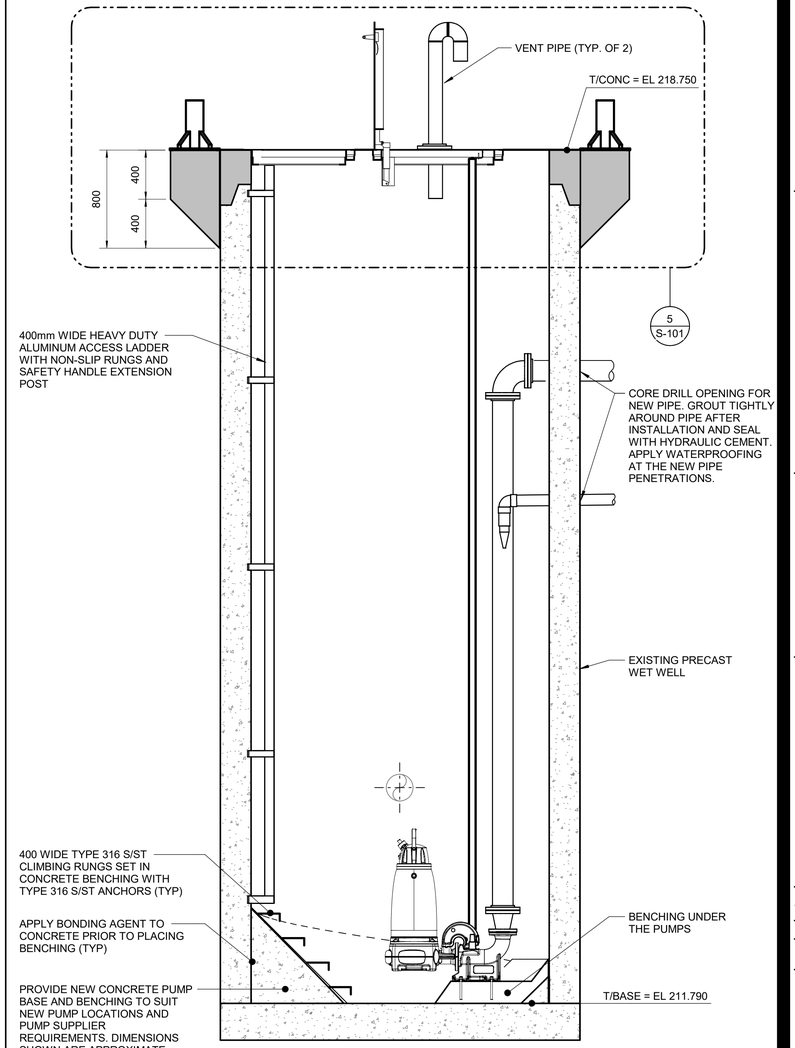
SCALE: 1 : 15



3 DEMO SECTION

S-101

SCALE: 1 : 25



4 SECTION - NEW CONSTRUCTION

S-101

SCALE: 1 : 25

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LICENSED PROFESSIONAL ENGINEER
165630252
2026-02-13
C. K. Y. YAU
100538066
PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX

WWTP INFRASTRUCTURE DESIGN - VICTORIA ST. SPS UPGRADES

Glencoe ON Canada

Project No.:165630252

File Name: N/A

Scale: As indicated

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Title
WET-WELL PLAN - NEW AND REMOVAL STRUCTURES PLAN

Revision: Sheet: 1 of 3

Drawing No.
S-101

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ORIGINAL SHEET - ANSI D

LAYOUT & PLANS

POWER

- Motor
- Disconnect switch
- Fused disconnect switch
- Combination motor starter or VFD
- Enclosed circuit breaker
- Control station
- Ann — Line voltage switch
- M — Manual motor starter
- MP — Manual motor starter c/w pilot light
- P — Switch c/w pilot light
- JBX — Junction box
- Lighting/ panel board
- A:nn — Duplex receptacle
- A:nn — Fourplex receptacle
- A:nn — Special purpose plug & receptacle disconnect rated

STREET LIGHTING

- Utility pole
- Control cabinet assembly
- Handhole
- Pole mounted luminaire (Single-Head/Double head)

LINE TYPES

- New Power Wiring
- Existing Power Wiring
- New Control Wiring
- New Field Control Wiring
- Existing Control Wiring
- New Comm. Wiring
- Existing Comm. Wiring
- Ground/Bonding
- Electrical Removals

SECURITY & SENSORS

- K — Security keypad
- OS — Motion / occupancy sensor
- DP — Door position switch
- T — Thermostat

COMMUNICATION

- Telephone outlet
- Combined telephone and ethernet outlet

EMERG.LIGHTING AND FIRE PROTECTION

- Ann — Emergency/exit lighting combination unit
- Ann — Emergency luminaire
- Smoke alarm

LIGHTING

- A:nn — Surface mount or suspended luminaire
- Ann — Wall mount luminaire
- Ann — Recessed mount luminaire
- Ceiling mount or suspended strip luminaire
- Recessed mount strip luminaire
- Wall mount strip luminaire

A: Lighting Panel Tag
nn: Circuit Number

TAGGING

- TAG-xxx / TAG-xxx — Electrical equipment tag
- TAG-xxx / TAG-xxx — Instrumentation equipment tag

MISCELLANEOUS

- # — Revision triangle
- # — Keynote

SINGLE-LINE DIAGRAMS & POWER SCHEMATICS

BREAKERS, SWITCHES, FUSES

- 52 — Power circuit breaker
- 52 — Draw-out power circuit breaker
- LSIG 52 — Power circuit breaker (<1kV) /w electronic trip unit
  - L Long-time I Instant.
  - S Short-time G Ground
- LSIG — Moulded case circuit breaker /w electronic trip unit
- Moulded case circuit breaker /w thermal magnetic trip unit
- Draw-out moulded case circuit breaker
- MCP — Magnetic-only moulded case circuit breaker, motor circuit protector (MCP)
- MCS — Moulded case switch (MCS)
- CS — Circuit switcher (>1kV)
- Disconnect switch (<1kV)
- Fused disconnect switch (<1kV)
- Isolation switch (>1kV)
- Isolation switch (>1kV), grounded in open position
- Motorized isolation switch (>1kV)
- Grounding switch (>1kV)
- Loadbreak switch (>1kV)
- Loadbreak switch (>1kV), grounded in open position
- Fuse cutout (>1kV)
- Fuse (FU)
- Fuse, switched holder
- Disconnect-rated plug & receptacle
- 52/a — NO auxiliary contact (a) 52-breaker, 89/DS-disconnect
- 52/b — NC auxiliary contact (b) 52-breaker, 89/DS-disconnect

MISCELLANEOUS

- Grounding, bonding

MOTOR CONTROL, CONVERTERS

- Manual motor starter (MS)
- Contactor (C, 42C)
  FVC Full-voltage contactor
- Motor starter /w O/L relay
  - FVNR Full-voltage non-revers.
  - FVR Full-voltage reversing
  - TS1W 2-speed, 1-winding
  - TS2W 2-speed, 2-winding
- VFD — Generic combination motor controller (FVC, FVNR, FVR, TS1W, TS2W, RVSS, VFD)
- Reduce voltage soft starter (RVSS) /w internal bypass switch
- Variable frequency drive(VFD)
  - LD: Light/Normal Duty
  - HD: Heavy Duty
  - CT: Constant Torque
- Automatic harmonic filter (AHF)
- Power converter, AC/DC, AC/DC, DC/DC (AC ~, DC =)
- Power converter, UPS, 2-inputs/1-output or, 1-input/2-outputs

LOADS, SOURCES

- M — Induction motor (M), Synchronous motor (S), Generator (G)
- Unit heater (UH)
- VFD — Generic Equipment
- M — Power actuated valve
- Battery

TRANSFORMERS, REACTORS, CAPCITORS

- Power transformer (T)
- Power transformer (T) w/ load tap changer (LTC)
- Autotransformer (AT)
- Grounding transformer (GT)
- Delta winding
- Wye grounded winding

REACTORS, CAPACITORS, RESISTORS

- Capacitor
- Inductor / reactor
- De-tuned capacitor bank, single-tuned harmonic filter
- dV/dt filter (RL filter)
- Resistor

SUPPRESSORS, ARRESTERS

- Surge protective device (SPD), surge suppressor
- Surge arrester (>1kV)

INSTRUMENT TRANSFORMERS

- Current transformer (CT)
- Bushing current transformer (BCT)
- Voltage transformer (VT)
- Capacitive voltage transformer (CVT) (>1kV)
- Digital relay, meter, controller
- Analog relay, meter, controller

NOTE: Number indicates quantity, polarity marks as shown.

DISTRIBUTION

- Panelboard (PB), lighting panelboard (LP/LPL), distribution panelboard (DP/DPL)
- Motor control center (MCC)

INSTRUMENTATION

- X,Y,Z #2 — COMMUNICATION NODE (MOTOR O/L,VFD,RVSS,INTRUMENT)
- 120Vac mA — INSTRUMENTATION TRANSMITTER 4-WIRE DEVICE
- 2-WIRE TRANSMITTER
- TSL xx — INSTRUMENTATION ELEMENT

CABLES NOMENCLATURE

3C#500	Three-conductor cable, 500kcmil size;
2-4#4/0	Two runs of four single-conductor cables, 4/0AWG size;
3#12	Three single-conductor cables, 12AWG size
2P18	Two-pair cable, 18AWG size
2-1P#16	Two runs of single-pair cables, 16AWG size
1T#16	One-triad cable, 16AWG size

CONTROL SCHEMATICS

MOTOR STARTERS & CONTACTORS

- M — Motor starter (M, 42M) coil, Contactor (C, 42C) coil
- 42M — Power contact
- 42M — Power contact, vacuum
- 42M/a — NO auxiliary contact (a)
- 42M/b — NC auxiliary contact (b)
- Overload relay (OL, 49M)
- Electronic O/L relay (49M), or motor protection relay (11M), current/voltage coil

CONTROL & TIME DELAY RELAYS

- CR — Control relay (CR) TIme-delay relay (TD)
- Control or time-delay relay, normally open contact
- Control or time delay relay, normally closed contact
- On-time-delay relay, normally open contact, timed closed
- On-time-delay relay, normally closed contact, timed open
- Off-time-delay relay, normally open contact, timed open
- Off-time-delay relay, normally closed contact, timed closed
- 10K — Potentiometer

PUSH BUTTONS

- Momentary push-button, NO
- Momentary push button, NC
- Maintained push button, NO
- Maintained push button, NC

SELECTOR SWITCHES

- X0 L R — 2-position selector switch, maintained, NO
- X0 L R — 2-position selector switch, maintained, NC
- X00 H O A — 3-position selector switch, maintained, NO
- X00 H O A — 3-position selector switch, maintained, NC
- 2- or 3-position selector switch, spring returned from left, NC
- 2- or 3-position selector switch, spring returned from right, NC
- 3-position selector switch, spring returned, NC

CONTACT INDICATION

X	Closed contact
0	Open contact

POSITION TAG

F/O/R	Forward / Off / Reverse
F/O/S	Fast/Off / Slow
F/R	Forward / Reverse
F/S	Fast / Slow
O/O/C	Open / Off / Close
O/C	Open / Close
H/O/A	Hand / Off / Auto
L/R	Local / Remote
O/O	On / Off

INDICATING LIGHTS

- A — Indicating light (letter indicates colour)
- R — Indicating light, push-to-test (letter indicates colour)

A	Amber	R	Red
B	Blue	W	White
G	Green	Y	Yellow

PROCESS ACTUATED SWITCHES

- Temperature actuated switch (TS), normally open
- Temperature actuated switch (TS), normally closed
- Pressure actuated switch (PS), normally open
- Pressure actuated switch (PS), normally closed
- Flow actuated switch (FS), normally open
- Flow actuated switch (FS), normally closed
- Level actuated switch, Float (LS), normally open
- Level actuated switch, Float (LS), normally closed
- Limit actuated switch (ZS), normally open
- Limit actuated switch (ZS), normally closed

NOTE: All process actuated switches change state on a rising or end of the process condition.

PLC, CONTROLLERS I/Os

- DI — DI Discrete inputs; AI Analog inputs; PI Pulse inputs
- DO — DO Discrete outputs; AO Analog outputs; PO Pulse outputs
- PLC discrete relay output, normally open
- PLC discrete relay output, normally closed

TERMINALS, TEST BLOCKS

- Feed-through terminal blocks (shape and hatch indicates location)
- Terminal blocks in MCC/Control Panel
- Terminal blocks in Local Control Station
- Terminal block in PLC/SCADA Control Panel
- Grounding terminal block
- Disconnect terminal block, or potential FT switch
- Shorting terminal block, or current shorting FT switch
- Fused terminal block
- Supplementary circuit breakers, DIN rail mounted
- Potential FT switch
- Current non-shorting FT switch /w test jack
- Current shorting FT switch

PLC I/O TERMINALS

- Fused terminal block
- Disconnect terminal block
- Feed-through terminal block
- SH — Grounding terminal block

FUNCTION NUMBERS AND ACRONYMS

2	Time-delay starting or closing relay
11	Multi-function relay
21	Distance or impedance relay
25	Synchronizer
25C	Synch-check relay
26	Thermal device (T-transformer winding, Q-oil)
27	Undervoltage relay
42	Contactor
43	Selector switch
46	Reverse Phase or Phase Balance Relay
47	Phase Sequence Voltage Relay
49	Machine or Transformer Thermal Relay
50	Instantaneous Overcurrent
51	Time Overcurrent Relay
52	AC Circuit Breaker
59	Overvoltage Relay
62	Time-delay Stopping or Opening Relay
63	Pressure switch (SP-sudden pressure or Buchholz relay, PR-pressure relief device)
67	Directional Overcurrent Relay
69	Permissive control device
71	Level switch
77	Telemetering relay
79	Reclosing relay
81	Frequency relay
85	Pilot relay
86	Lockout relay
87	Differential relay
89	Line Switch
90	Voltage regulator
94	Tripping relay
97	Gas in oil relay
a	Aux. contact, opened when main device opened
b	Aux. contact, closed when main device opened
A	Alternate, Auto
ATS	Automatic transfer switch
ATC	Automatic transfer controller
B	Bus, bypass
BF	Breaker failure
BL	Block
C	Contactor
CB	Circuit breaker
CL	Close
CLS	Closed limit switch
CM	Customer multi-function power meter
CPL	Control panel
CPP	Control power panel
CS	Control switch/station, circuit switcher
DP DPL	Distribution panelboard / panel
DS	Disconnect switch
DFR	Disturbance fault recorder
ES	Emergency stop
FU	Fuse
FVNR FVN	Full-voltage non-reversing starter
FVR	Full-voltage reversing starter
G	Ground
G GEN	Generator
GC	Generator controller
GEO	Generator-end-open

FUNCTION NUMBERS AND ACRONYMS

HH	Handhole
HS / HMS	Hand switch (PB or SS), Hand momentary switch (PB)
ICP	Instrumentation panel
IS	Isolation switch
JB(X)	Junction box
L	Line, Lower, Local
LBS	Load-break switch
LEO	Line-end-open
LP LPL	Lighting panel / panelboard
LT	Light
LTC	Load Tap Changer
M	Motor, Manual
MC	Media Converter
MCC	Motor Control Centre
MCP	Motor Control Panel
MH	Manhole
MOC	Mechanism-operated auxiliary switch
N	Neutral
ND	Normal Duty
NC	Normally closed
NO	Normally open
O	Over
O/H	Overhead
OLS	Opened limit switch
OP	Open
P/Ø	Phase
PB	Push-button, Panelboard
PB(X)	Pull box
PLC	Programmable logic controller
PM	Power Meter
POT	Potentiometer
Q	Negative sequence, oil
QC	Reactive power controller
R	Remote, Raise
RC	Remote close
RM	Revenue metering (1-main, 2-alternate)
RO	Remote open
RPU	Remote programmable unit
RT	Remote trip
RTU	Remote terminal unit
RVSS RVS	Reduced-voltage soft-starter
SCADA	System control and data acquisition
SCP	SCADA control panel
SP	Stop
ST	Start
SWB	Switchboard
SWG	Switchgear
T/TXR	Transformer
TB(X)	Terminal Box
TR	Trip
TS1W	Two-speed one-winding starter
TS2W	Two-speed two-winding starter
TT	Transfer trip
TTR	Transfer trip received
TTS	Transfer trip sent
TOC	Truck-operated auxiliary switch
U	Under
U/G	Underground
VFD	Variable frequency drive

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100504764
2026-02-13
PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX

WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_E-001

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Title
LEGEND & ABBREVIATIONS

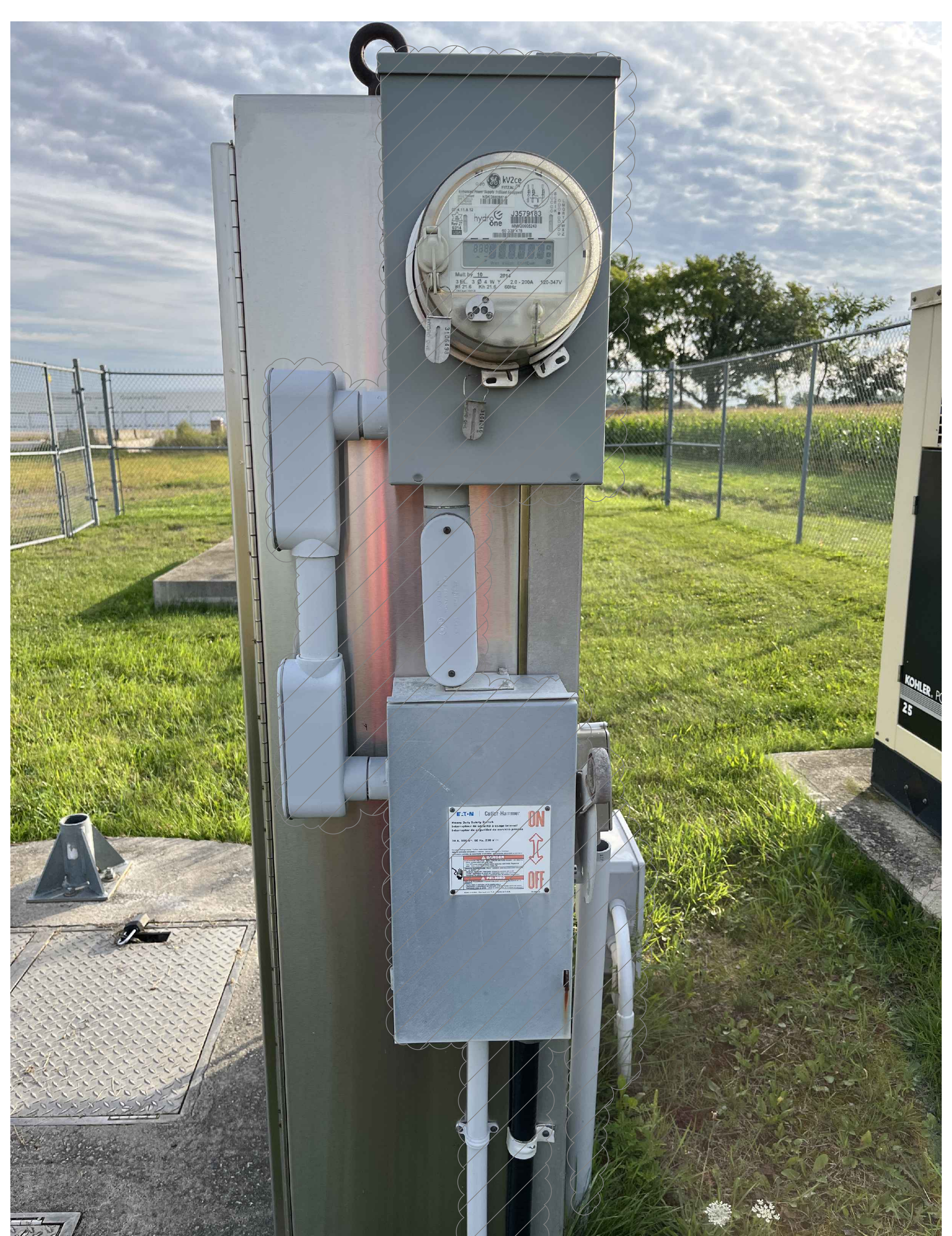
Revision: Sheet: of

Drawing No.
E-001

ORIGINAL SHEET - ANSI D

NATURAL GAS LINE TO BE MAINTAINED AND FITTED TO NEW GENERATOR

DEMOLISH EXISTING GENERATOR PAD.



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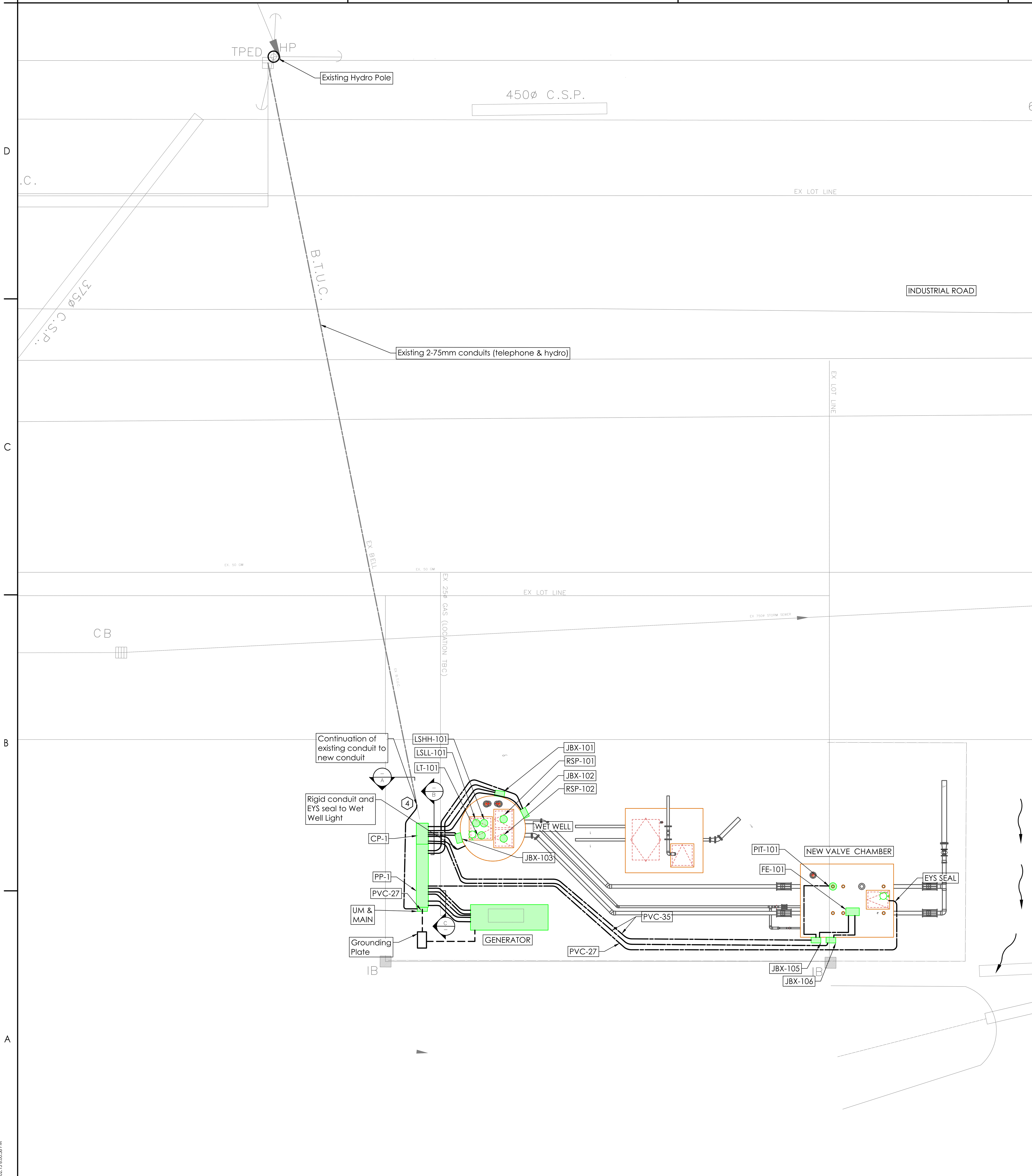
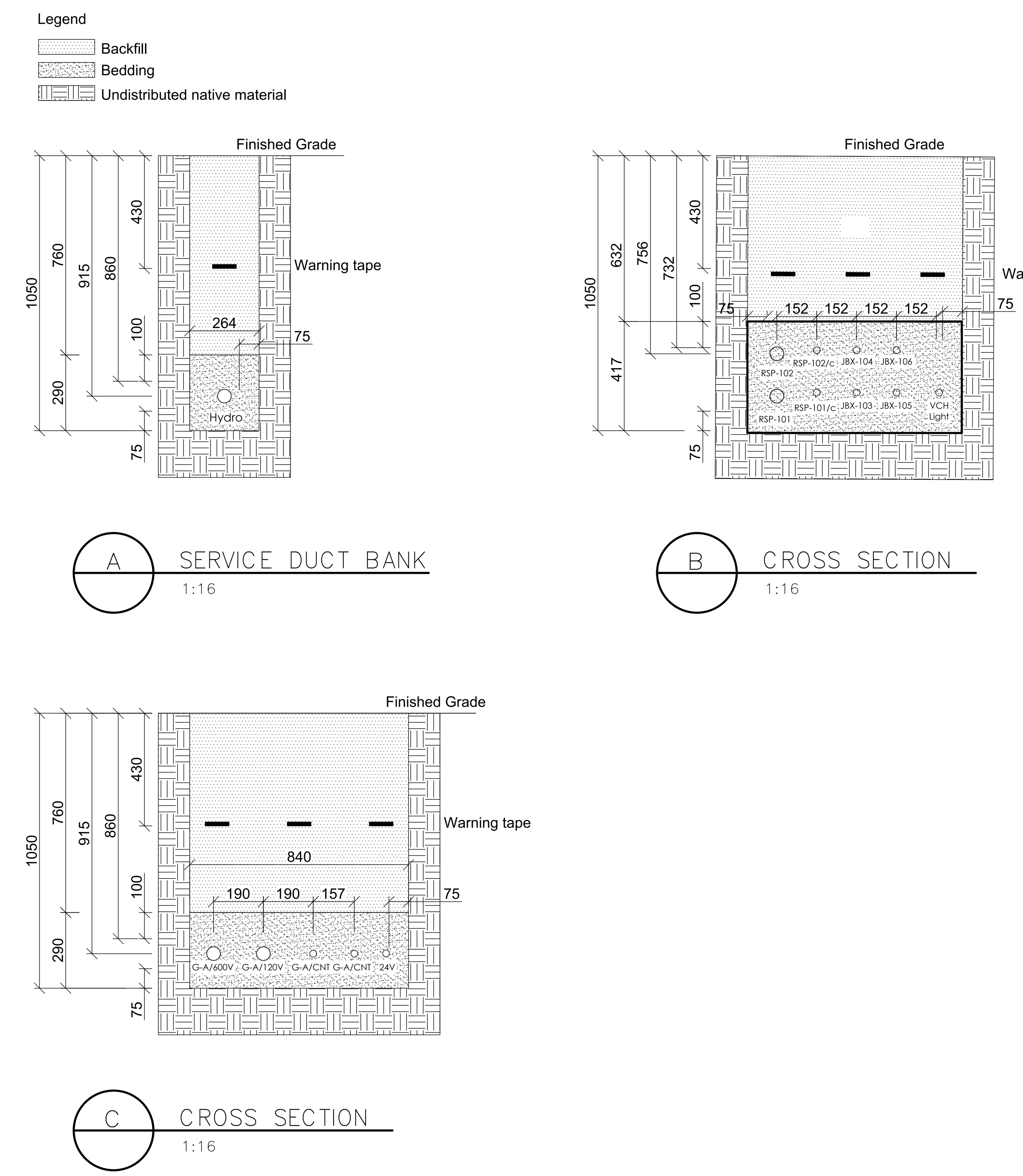
Title
DEMOLITION PLAN

Revision: Sheet: of

Drawing No.
ED-101

ORIGINAL SHEET - ANSI D





A SERVICE DUCT BANK 1:16

B CROSS SECTION 1:16

C CROSS SECTION 1:16

Notes

1. All dimensions are in millimeters unless otherwise noted.
2. Bedding shall be sand, unless native is suitable. Compact to 95% SPD.
3. Place and compact native backfill, screened where particle size exceeds 26.5mm material free of debris, sharp, organic, or frozen material. Install back fill in lifts of 150mm compacted to 90% SPD, 95% SPD in vehicular areas.
4. Where native soil is not suitable for backfill, supply granular 'A' material.
5. Provide warning tape 75mm wide, reading "CAUTION: BURIED ELECTRIC LINE BELOW", Brady Identonline or approved equal.
6. In sodden areas, supply and place 150mm of topsoil; sod or seed as indicated on the drawings. In vehicular areas, supply, place and compact granular sub-base / base / surface material to match existing conditions.
7. All materials are to be PVC unless noted.

Notes

1. Wet well is a classified area, Class 1 Zone 1. Valve Chamber is rated Class 1, Zone 2.
2. Core-drill conduit openings to valve chamber and wet well as required. Seal openings water-tight once cables have been installed.
3. Light in wet well and valve chamber to be waterproof and fed from GFI breakers. Complete with light switches inside PP-1.
4. Open cut and expose existing hydro and telephone conduits. Extend conduits to new control panel PP-1 and CP-1. Replace cables from their respective demarcation point.
5. Provide grounding plate per OESC.
6. JBX-105 and JBX-106 used to run cables from CP-1 to valve chamber. JBX to be Stainless Steel CSA 4X, min 250x250.
7. Wiring to Wet Well and Valve Chamber to be complete with EYS seals at junction boxes.

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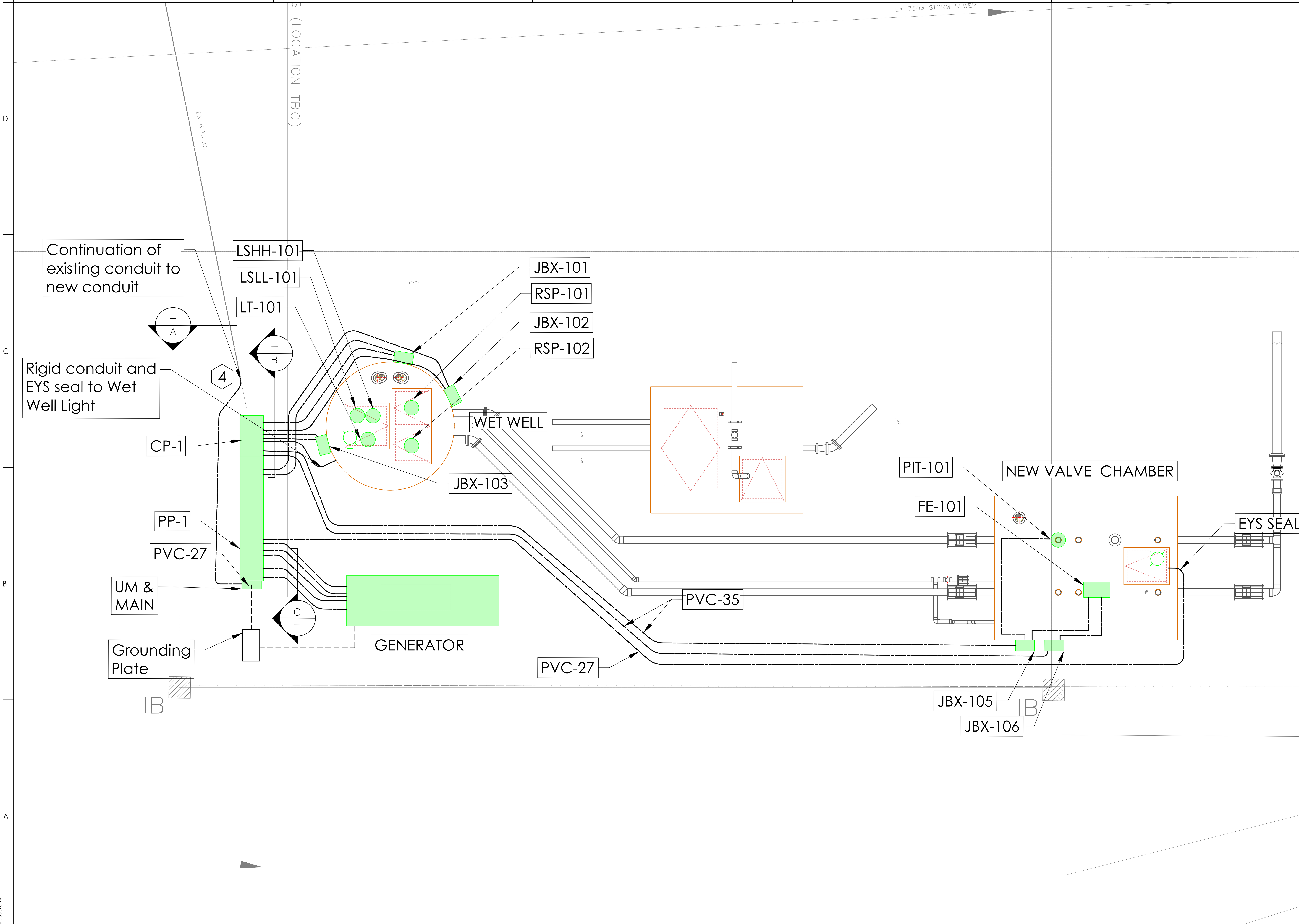
Title
SITE PLAN

Revision: Sheet: of

Drawing No.
E-101

ORIGINAL SHEET - ANSI D



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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
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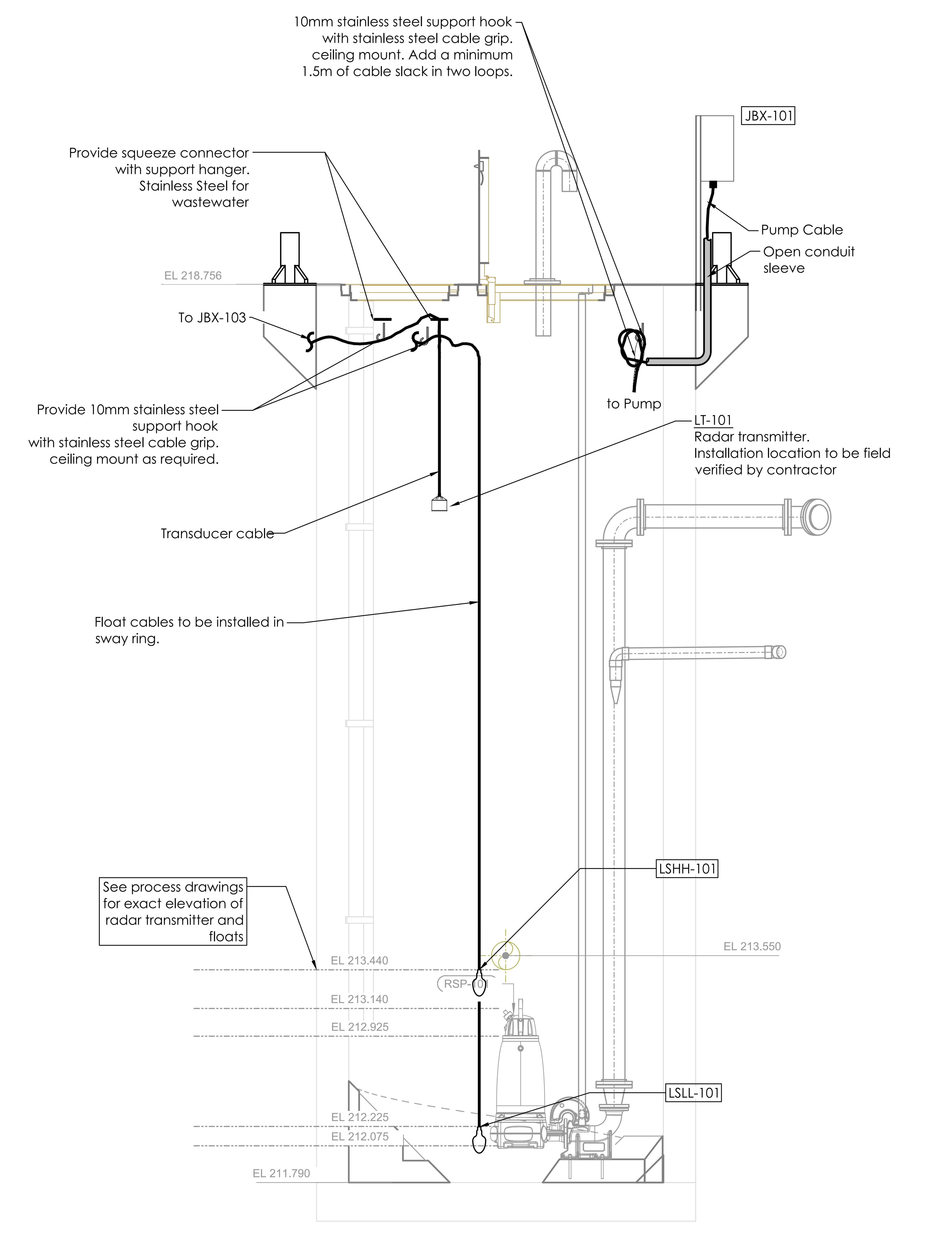
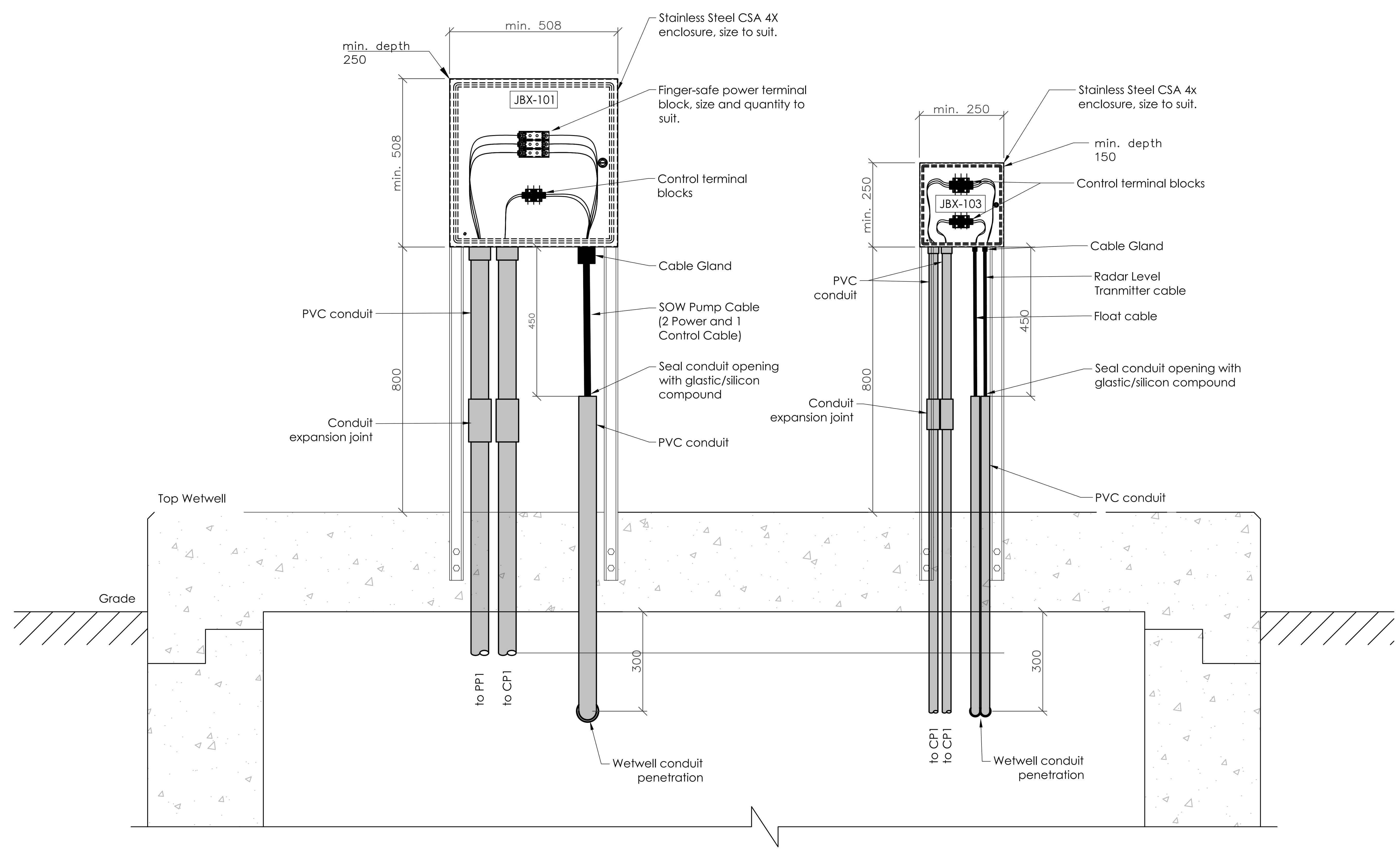
Title
SITE PLAN

Revision: Sheet: of

Drawing No.
E-102



A WETWELL INSTALLATION
SCALE 1:10



B PUMP TERMINAL BOX DETAIL
1:10 | TYP. JBX-101 & JBX-102

C INSTRUMENTATION TERMINAL BOX DETAIL
1:10 | TYP. JBX-103

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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

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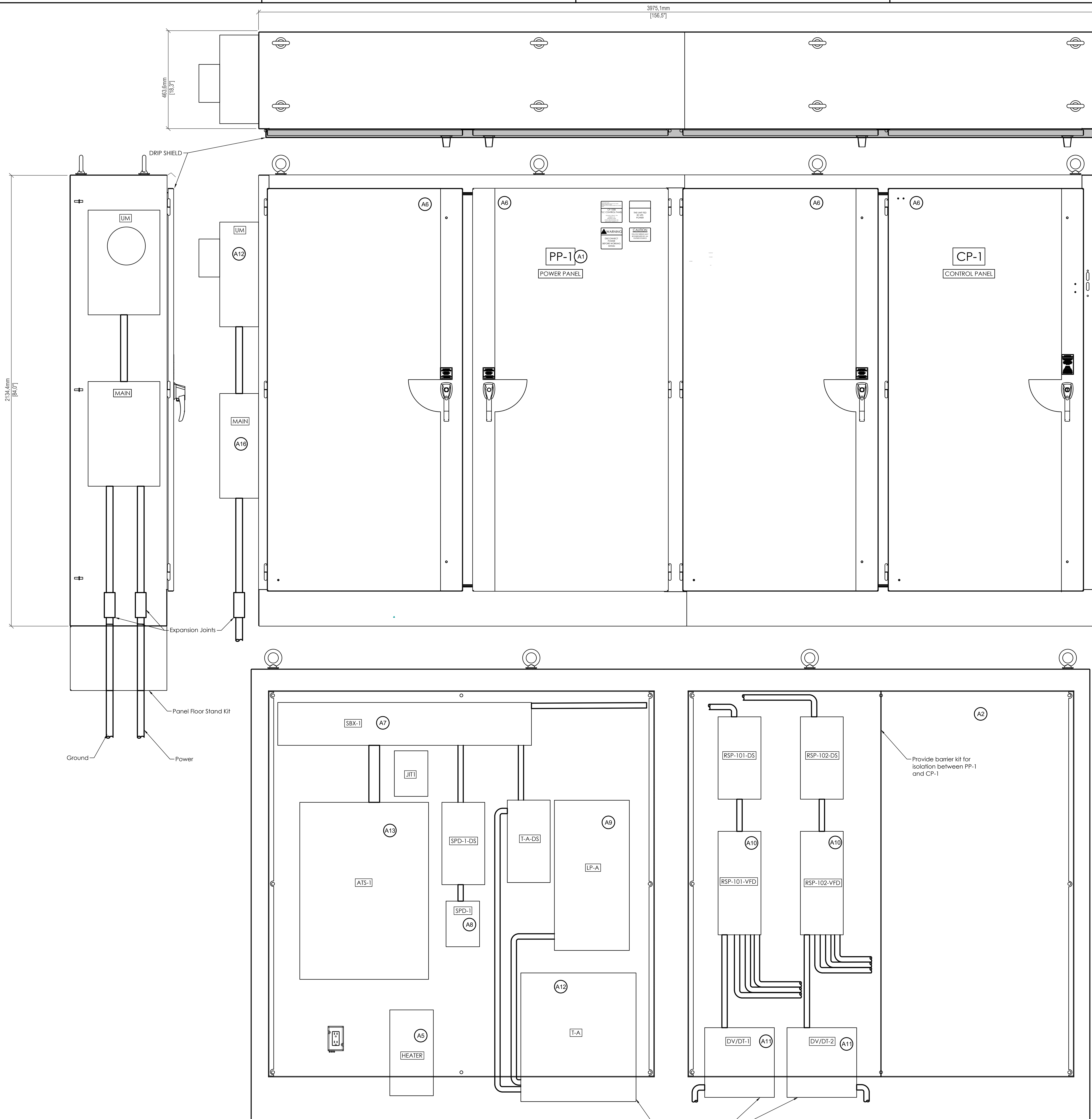
Title
WET WELL DETAILS

Revision: Sheet: of
Drawing No.
E-210

ORIGINAL SHEET - ANSI D



Bill of Material: PP-1 Panel Components

Item	Tags	Description	Specification
A1	PP-1	Freestanding Enclosure, Type 4X Stainless Steel Multi-door continuous hinge, handle, inner & side backplate, complete with panel floor stand kit, isolation barriers and drip shield 84"H x 156"W x 18"D	Hammond 4UHD8415718N4SS
A2	CP-1	Inner Panel	Hammond
A4		LED Panel Light 12", 120VAC	Hammond FLK7LED
A5		Fan Heater with Thermostat 120VAC, 1000W	Ouellet OVS1002BL-TB6
A6	ZSH-1, ZSH-2, ZSH-3, ZSH-4	Door-Operated Switch for alarms	
A7	SBX-1	Splitter, 600V, 3Ø/3w, 200A, 24"x8"X5" (HxWxD), CSA 1 Enclosure	Hammond Type 1 Mild Steel Splitter Trough CST2203
A8	SPD-1	Surge Protective Device to CSA C22.2 No. 269 CSA 4X Enclosure 120kA, 600V, 3Ø/3W	Surge Pure MATCH 4 M4-1120-3
A9	LP-A	Panelboard to CSA C22.2 No. 29, CSA 1 Enclosure 100A, 240/120V 1Ø/3w	
A10	RSP-101-VFD RSP-102-VFD	Variable Frequency Drive Wall-mounted CSA1, light/normal duty	
A11	DV/DT-1 DV/DT-2	dV/dt Output Filter CSA 1 Enclosure, 600V, 3Ø	
A12	T-A	15kVA, ANN Dry-Type Transformer 600-208Y/120V	
A13	UM	600Y/347V, 3Ø/4W 100A, 7-JAW, CSA 3R Utility Metering Base	
A14	ATS-1	Automatic Transfer Switch 600V, 3Ø, 200A, NEMA 1	Thompson Power System TS973A0100A
A16	MAIN	100A Service Entrance Disconnect 100A Class J Fuse	

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Glencoe ON Canada

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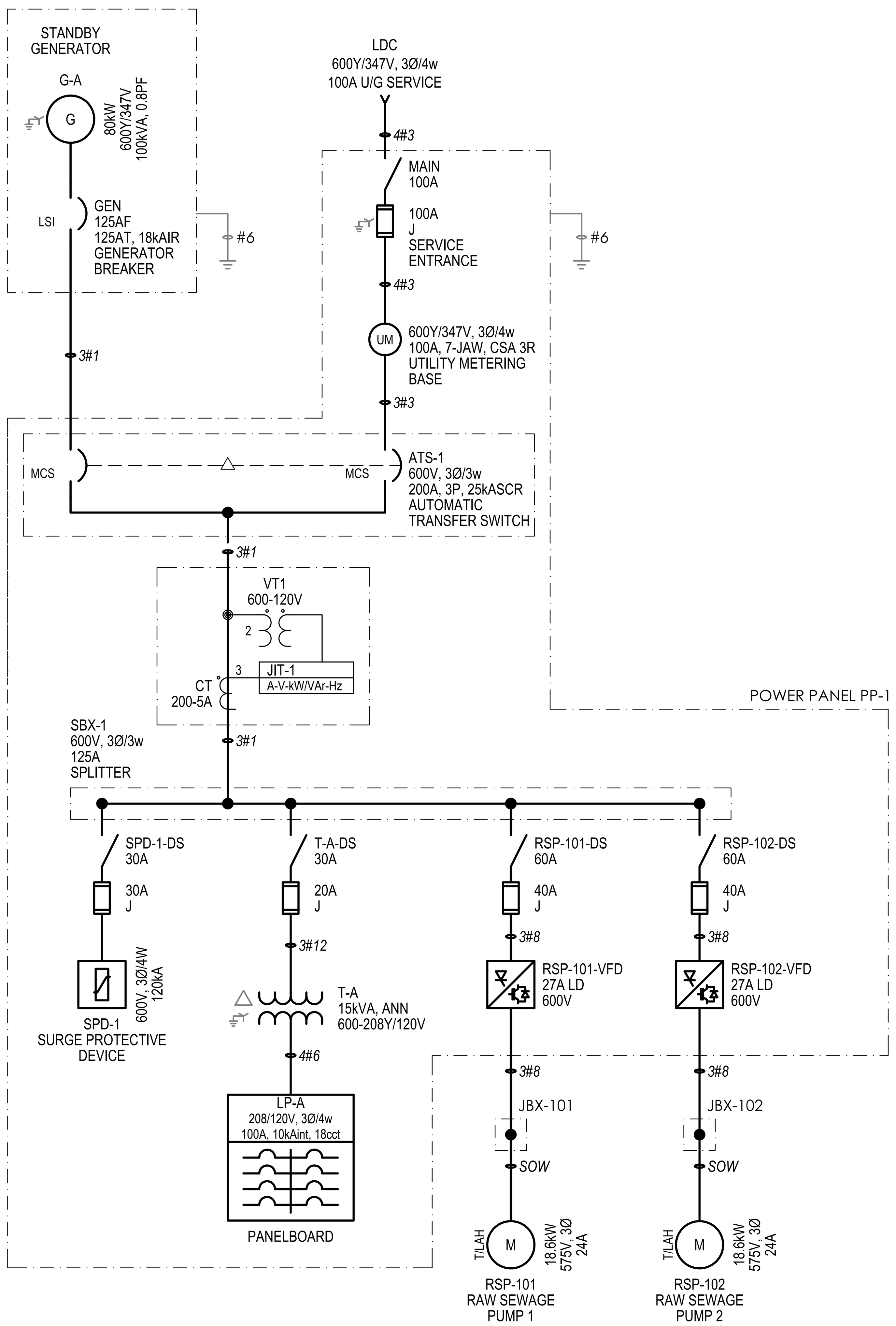
Title
GENERAL ARRANGEMENT PP-1

Revision: Sheet: of

Drawing No.
E-501

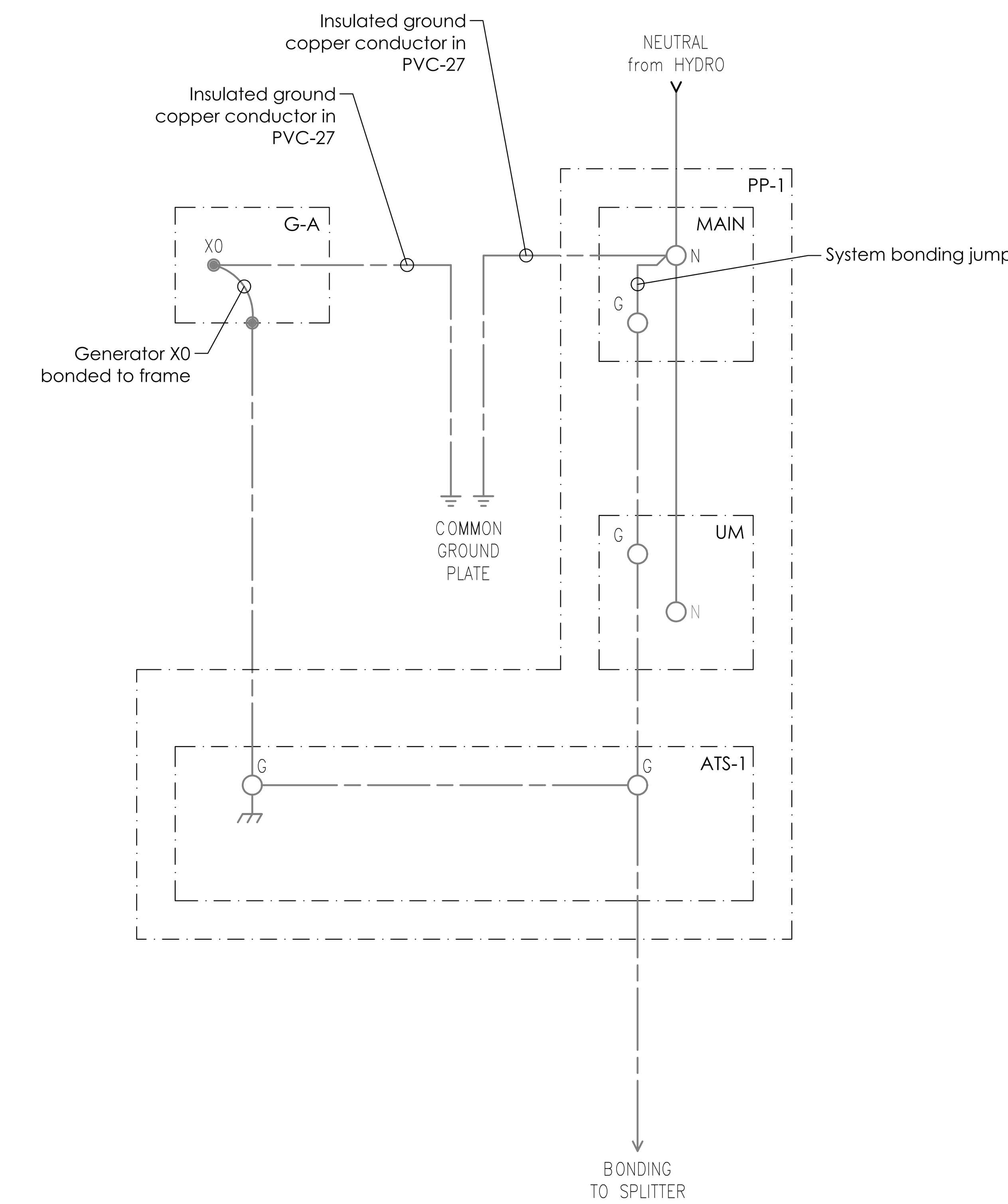
ORIGINAL SHEET - ANSI D

ELECTRICAL RATINGS	
SERVICE VOLTAGE	600Y/347V, 3Ø/4w
INSTALLED LOAD	37.2kW/15 kVA
DEMAND LOAD	18.6 kW/ 15 kVA
AVAILABLE SHORT CIRCUIT	2.4 kA



LIGHTING PANEL LP-A
208Y/120V, 3Ø/4W
100A, 10kAint, 18cct

DESCRIPTION		CCT	LOAD [VA] A		B		C		CCT		DESCRIPTION
Control Panel CP-1 Heater	15A	1	400	50					2	15A	Wet Well Light
Power Panel PP-1 Receptacle	15A	3			300	1000			4	15A	Control Panel CP-1
Power Panel PP-1 Heater	20A	5					1200	50	6	15A	Valve Chamber Light
Power Panel PP-1 Lighting	15A	7	100	15					8	15A	Autodialer
	15A	9							10		
	15A	11							12		
Generator Auxiliaries	40A	13	2000						14		
		15			2000				16		
		17					2000		18		
TOTAL LOAD / PHASE [A]			21.4		27.5		27.1				
TOTAL LOAD [kVA]					9.1						
COMMENTS:											



GROUNDING BLOCK DIAGRAM

CABLE SCHEDULE	
TAGS	DESCRIPTION
4#3	4-1/C, #3AWG, Cu, RWU90
3#1	3-1/C, #1AWG, Cu, RW90
3#12	3-1/C, #3AWG, Cu, RW90
4#6	4-1/C, #6AWG, Cu, RW90
3#8	4-1/C, #8AWG, Cu, RW90
1#6	1C, #6AWG, Cu, RW90G

Bonding not shown. Bonding required in each conduit. Bonding to be #6AWG. Transformer T-A secondary XO to be grounded to system ground.

All power and control wiring to be copper, Thermoset Insulated RW90 cables to CSA C22.2 No. 38, with required number of conductors, including bonding conductor sized to CSA C22.1/OESC, installed in the conduit; or armored TECK90 cables to CSA C22.2 No. 131.

All analog and instrumentation wiring to be Canadian Instrumentation Cable to CSA C22.2 No. 239, armored or non-armored installed in the conduit.

All conduit is to be rigid PVC conduit to CSA C22.2 No. 211.2, and Flexible liquid-tight corrugrated non-metallic conduit to CSA C22.2 No. 227.2.1 as Required. Size based on CSA C22.1/OESC unless otherwise indicated.

\\ca0217-ppfss01\01656\active\165630252\drawing\current\industrial ps\electrical\165630252_e-601
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ORIGINAL SHEET - ANSI D

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100504764
2026-02-13
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Client/Project
SOUTHWEST MIDDLESEX

WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_E-601

Scale:

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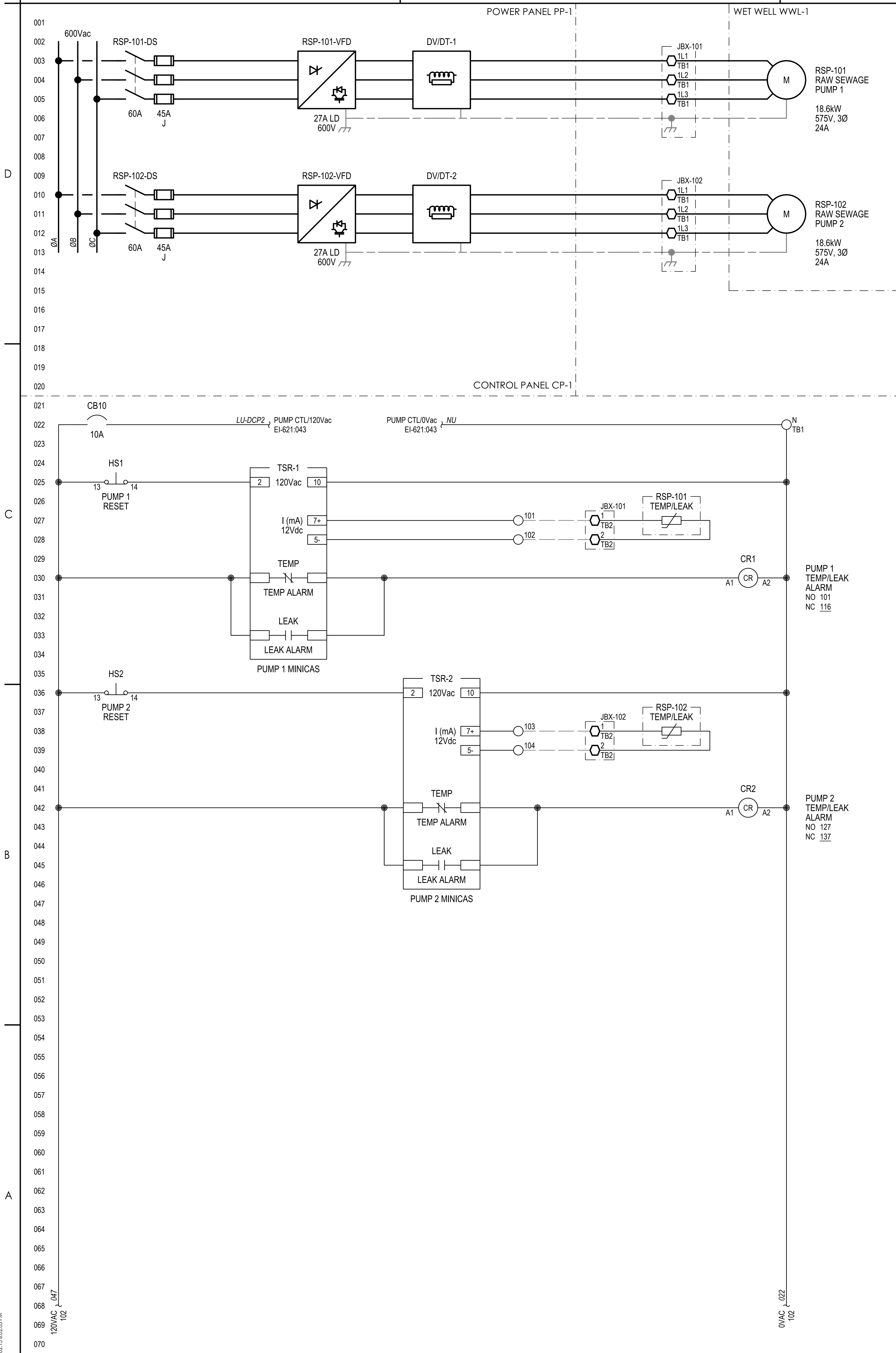
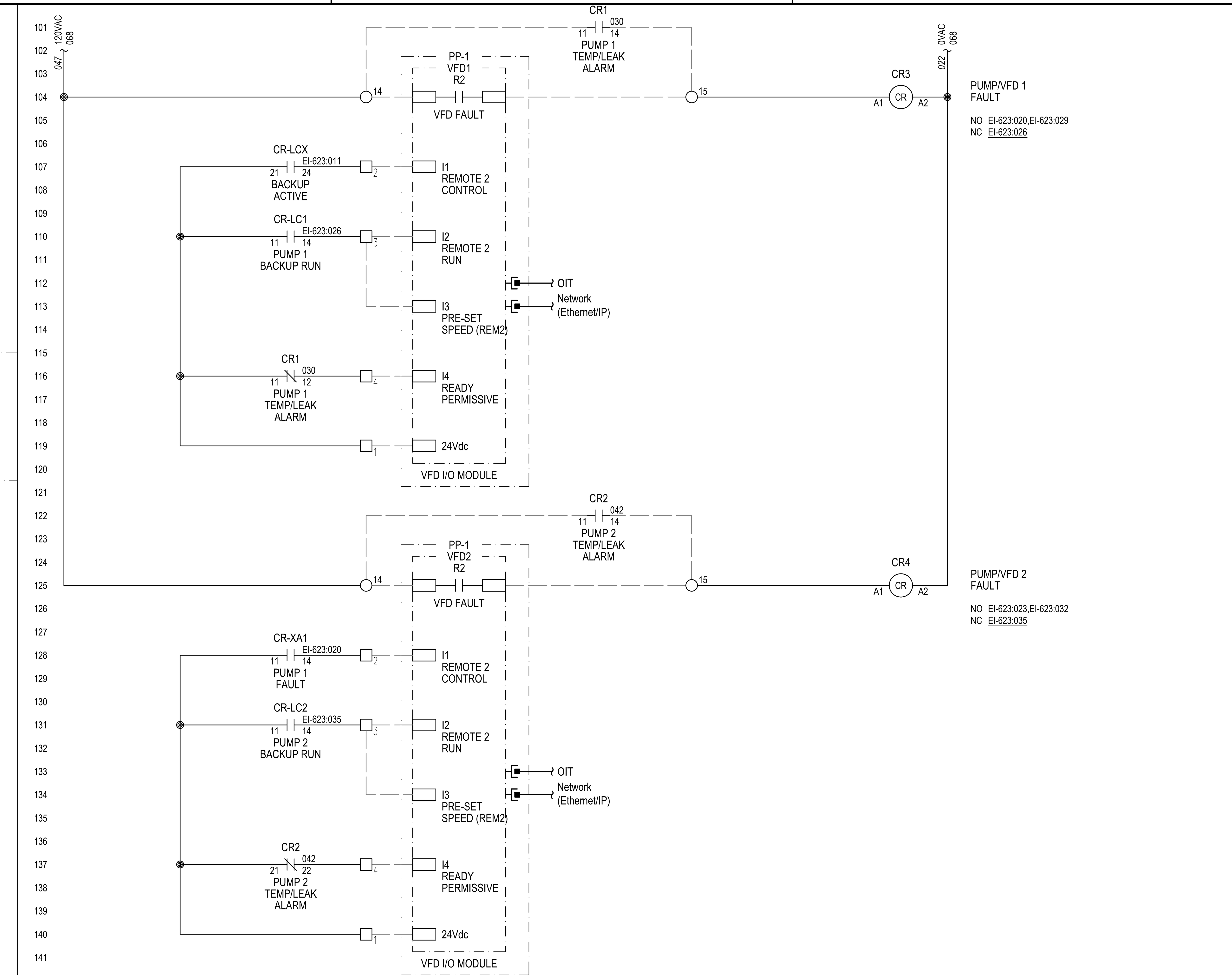
Title
SINGLE LINE DIAGRAM

Revision: Sheet: of

Drawing No.
E-601





Notes

1. VFD Settings:
   - 1.1. L/R Selection: OIT;
   - 1.2. Local Control: OIT;
   - 1.3. Local Reference: OIT;
   - 1.4. Remote Control: Network;
   - 1.5. Remote Reference: Network;
   - 1.6. Remote 2 Selection: I/O;
   - 1.7. Remote 2 Control: I/O;
   - 1.8. Remote 2 Reference: 100%

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Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_E-631

Scale:

AK	ME	SSS	2025.11.25
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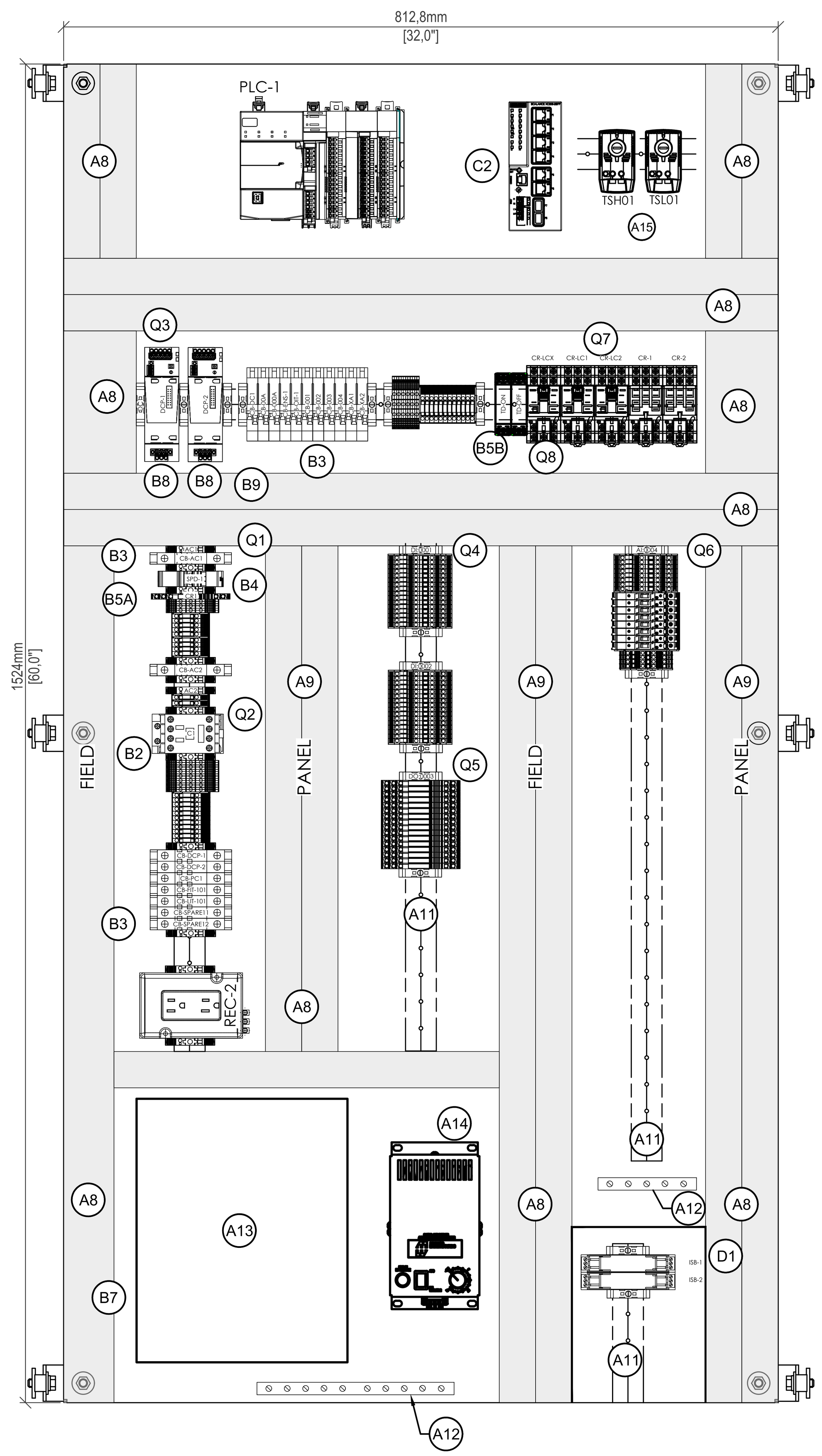
Title
CNTRL SCH. DIAGRAM
RSP-101 & RSP-102

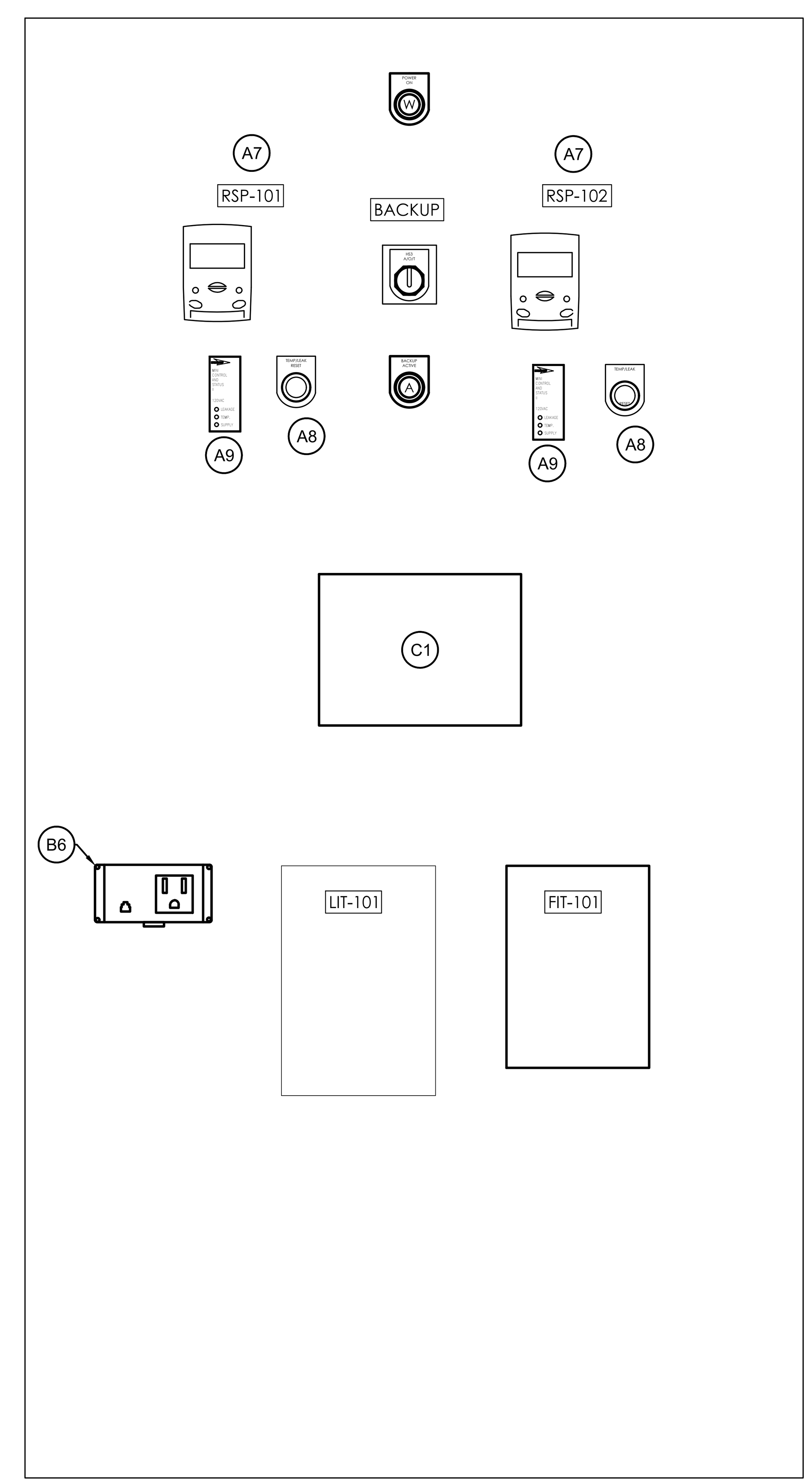
Revision: Sheet: of

Drawing No.
E-631

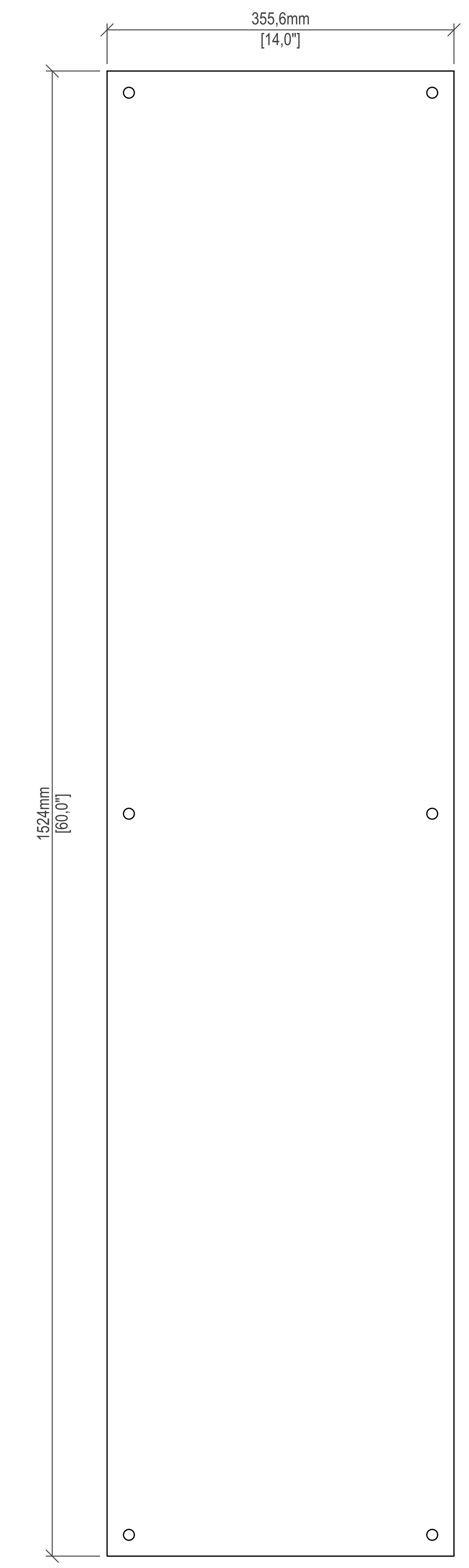
ORIGINAL SHEET - ANSI D



A CP-1 BACK PANEL VIEW
1:5



B INNER PANEL DOOR VIEW
1:5



B INNER SIDE PANEL DOOR VIEW
1:5

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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_EI-521

Scale:

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Title
GENERAL ARRANGEMENT CP-1

Revision: Sheet: of

Drawing No.
EI-521

ORIGINAL SHEET - ANSI D

Bill of Material: Panel Components

Item	Tags	Qty.	Description	Specification
A1	CP-1	1	See BOM of PP-1 on E-501	
A3		1	Literature Pocket	Hammond PKT99
A4		1	LED Panel Light 12", 120VAC	Hammond FLK7LED
A7		6	LED Pilot Light 30.5mm, NEMA 4/13, glass lense, white 12-130Vac/Vdc	AB 800T-QBTH2W
A8		As Req.	Wiring Duct, Narrow Slot /w Cover 1.5"W x 3"H, 2"W x 3"H, 4"W x 3"H	Panduit F1.5X3LG6 /w C1.5LG6 F2x3LG6 /w C2LG6 F3x3LG6 /w C3LG6
A9		As Req.	EMI Noise Shield Kit 3" height wiring duct, bonding clip, and anti-oxidizing paste	Panduit SD3EMI
A10		As Req.	Support Bracket 70mm height, max spacing 300mm	Weidmueller TST
A11		As Req.	DIN-rail 35mm x 7.5mm, perforated, galvanized steel, zinc plated	Phoenix Contact NS 35/7.5 Weidmueller TS 35X7.5
A12		As Req.	Ground Bar Aluminum, dual-rated, 4 large / 10 small ports, length 4.609"	ILSCO NBAE-0410-1
A13		1	Autodialer 4 Digital Alarm Inputs + 8 Optional Digital Alarm Inputs	Verbatim Autodialer
A14		1	Fan Heater with Thermostat 120VAC, 400W	Hammond FLHTF400A115
A15	TSH01 TSL01	2	Thermostat Heating & cooling, 120VAC	Hammond SKT011409NC-C (heating) SKT011419NO-C (cooling)

Bill of Material: Electrical Components

Item	Tags	Qty.	Description	Specification
B1	UPS-1	1	Uninterruptible Power Supply c/w Optional Relay Communication card (RELAY-MS) 120VAC Output Output 6-15R, Receptacles, 700VA/630W, 120VAC Input	Eaton 9SX
B2	C1	1	Control Power Relay (UL508/CSA C22.2 No.14) 120Vac, 4 Pole, 20A, 120VAC, 2NO/2NC+1AUX-1NO/1NC	Allen Bradley 700-CF220D, 100-SA11
B3	CBxxx	As Req.	Branch Circuit Breaker (UL489/CSA C22.2 No.5) 120Vac/60Vdc, 1P, 5kAIR, Curve B, rating as indicated	Weidmueller 9926 Series
B4	SPD-1	1	Type 2/3 Pluggable Surge Protection Device Integrated surge-proof fuse w/ indication contact, 120Vac, 5kA	Phoenix Contact PLT-SEC-T3-120-FM-UT Weidmueller VPU AC II US 2 R 120/50
B5A	CR	As Req.	Relay Terminal Block, LED Indication 120Vac/dc coil, 6A 120Vac/24Vdc 1CO contact, #26-14AWG	Phoenix Contact PLC-RSC-120UC/21 Weidmueller TRS 120VUC 1CO
B5B	TD	As Req.	Timer Relay, Multi-function, Selectable, LED Indication 120Vac/dc coil, 8A 120Vac/24Vdc 1CO contact, #20-12AWG	Phoenix Contact TBC Weidmueller TFIS 12-240VUC 1CO
B6	REC-1	2	Door Mounted Rec/Comm Receptacle 15A, 125Vac Power; RJ45 Ethernet Port	Graceport P-R62-F3R0
B7	REC-2	1	Compact Receptacle, DIN-rail mounted 120VAC, 20A, 2-20R	Weidmueller DPAC DP 20
B8	DCP-1 DCP-2	2	24VDC Power Supply, DIN-rail mounted, redundant config. 24VDC, 10A	Phoenix Contact QUINT POWER Weidmueller PRO TOP

Bill of Material: Networking and OIT Components

Item	Tags	Qty.	Description	Specification
C1	OIT-1	1	Operator Interface Touch Screen 10.4" Colour, 120VAC	AB 2711P-T10C4A8
C2	ENS-1	1	Industrial Unmanaged Switch 12-10/100TX RJ45 24Vdc power supply	Siemens SCALANCE

Bill of Material: Intrinsically Safe Components

Item	Tags	Qty.	Description	Specification
D1	ISB-1	1	Isolated Barrier Switch Amplifier 2-channel, 24Vdc power supply	Pepperl + Fuchs KFD2-SR2-Ex2.W
D1	ISB-2	1	Intrinsically Safe Signal Isolator 4-20mA, 1 Channel	STAHL 9001/01-280-110-101

Bill of Material: Connection Components

Item	Tags	Qty.	Description	Specification
Q1	AC1	As Req.	Feed-Thru Terminal Block Gray or Beige, 20A 600V, #26-12AWG	Phoenix Contact UT 2.5 Weidmueller WDU 2.5
		As Req.	Ground Terminal Block Yellow / Green, #26-10AWG	Phoenix Contact UT 2.5-PE Weidmueller WPE 2.5
Q2	AC2	As Req.	Feed-Thru Terminal Block Gray or Beige, 20A 600V, #26-12AWG	Phoenix Contact UT 2.5 Weidmueller WDU 2.5
		As Req.	Ground Terminal Block Yellow / Green, #26-10AWG	Phoenix Contact UT 2.5-PE Weidmueller WPE 2.5
Q3	DC1	As Req.	Feed-Thru Terminal Block Gray or Beige, 20A 600V, #26-12AWG	Phoenix Contact UT 2.5 Weidmueller WDU 2.5
		As Req.	Ground Terminal Block Yellow / Green, #26-10AWG	Phoenix Contact UT 2.5-PE Weidmueller WPE 2.5
Q4	DI:0001 DI:0002	16	2-Level Disconnect / Feed-Thru Modular Terminal Block Gray or Beige, 20A 300V, #26-14AWG	Phoenix Contact UTTB 4-MT Weidmueller WDK 2.5/TR-DU
Q5	DO:0003	16	Relay Terminal Block, LED Indication 24Vdc coil, 6A 120Vac/24Vdc 1CO contact, #26-14AWG	Phoenix Contact PLC-RSC-24VDC/21 Weidmueller TRS 24VDC 1CO
Q6	AI:0004	8	2-Level Disconnect / Feed-Thru Modular Terminal Block Gray or Beige, 20A 300V, #26-14AWG	Phoenix Contact UTTB 4-MT Weidmueller WDK 2.5/TR-DU
		8	2-Level Fused / Feed-Thru Modular Terminal Block Black, 20A 24V, #26-12AWG Fuse G / 5x20, GLASS, 100mA	Phoenix Contact UT 4-L/HESILED 24 Weidmueller KDKS 1EN/LLC 10-36V AC/DC
		4	2-level Modular Ground Terminal Block Yellow / Green, #26-10AWG	Phoenix Contact UTTB 2.5-PE Weidmueller WDK 2.5N PE
Q7	CR-LCX CR-LC1 CR-LC2 CR-1 CR-2	3	Control Relay Integrated test button and status LED, 120Vac coil, 4-Form C contacts 120Vac/24Vdc, 10A rated c/w relay socket	
Q8	TD-ON TD-OFF	2	Time Delay Relay ON-Delay 1c/o, 24-240VAC, 24-48VDC	ABB 1SVR500100R0000

Notes:
(1) Provide accessories including end brackets, end cover/plates, space plates, etc. in quantities and types as required.
(2) Provided shortening bars for all common 120Vac/24Vdc and 0Vac/0Vdc terminals; use of control wiring is not acceptable.

Cable Specification

Item	Description	Specification
120Vac Power and Control	#12AWG (20A), #14AWG (15A) or #16AWG (10A), Cu, SIS or TEW; red for local power source, yellow for external power source, white for neutral.	CSA C22.2 No. 38 (SIS 90C, 600V) CSA C22.2 No. 127 (TEW 105C, 600V)
24Vdc Power and Control	#12AWG (20A), #14AWG (15A) or #16AWG (10A), Cu, SIS or TEW; blue for positive, white/blue stripe for negative.	
Analog Signals	1P, 2P, 4P, 8P or 16P, #18AWG, shielded twisted pair(s), gray cable insulation, black and white conductor insulation.	CSA C22.2 No. 239 (CIC 105C, 300V)

Bill of Material: PLC

Tags	Qty.	Description	Specification
X1	1	Compactlogix controller USB port type b, two(2) built-in Ethernet ports, user memory 5MB,	Allen Bradley 5380-L35
	2	Compactlogix PLC digital DC input module. 24Vdc 16	Allen Bradley 5069-IB16
	1	Compactlogix PLC digital relay output module. 16 relays	Allen Bradley 5069-OW16
	1	Compactlogix PLC analog Input module 8 Channel Current/Voltage	Allen Bradley 5069-IF8
	1	1756 Controllogix right end cap	Allen Bradley 5069-ECR

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2026-02-13
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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES

Glencoe ON Canada

Project No.: 165630252

File Name: 165630252_EI-522

Scale:

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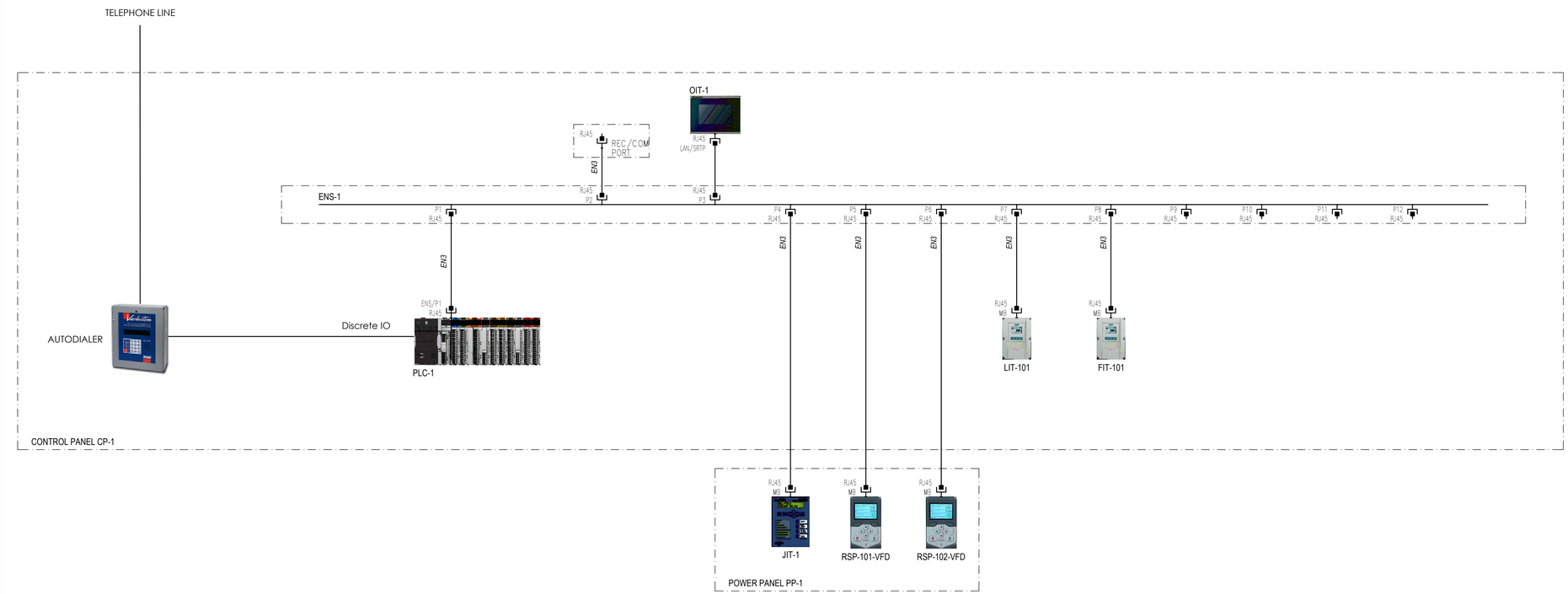
Title
BILL OF MATERIALS
CP-1

Revision: Sheet: of

Drawing No.
EI-522

ORIGINAL SHEET - ANSI D



Cable Schedule	
EN3	Ethernet CAT6a patch cable, RJ45-RJ45, length to suit, 4/P, #24AWG, TC, STP, 300V, CSA CM/AWM, installed in PVC-27 Conduit

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DESIGN - INDUSTRIAL SPS
UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_EI-601

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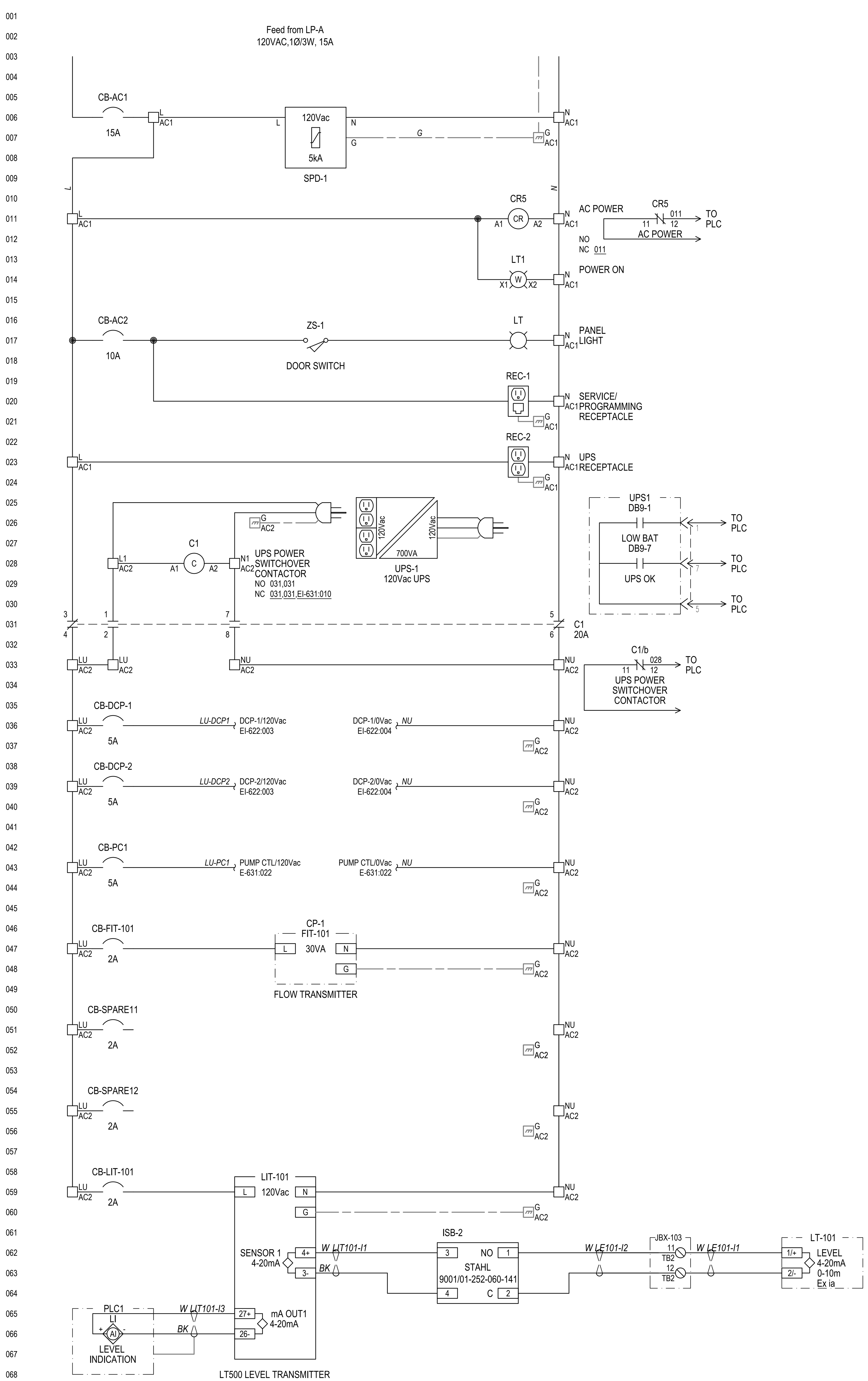
AK	ME	SSS	2025.11.25

Title
NETWORK ARCHITECTURE

Revision: Sheet: of

Drawing No.
EI-601



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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES

Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_EI-621

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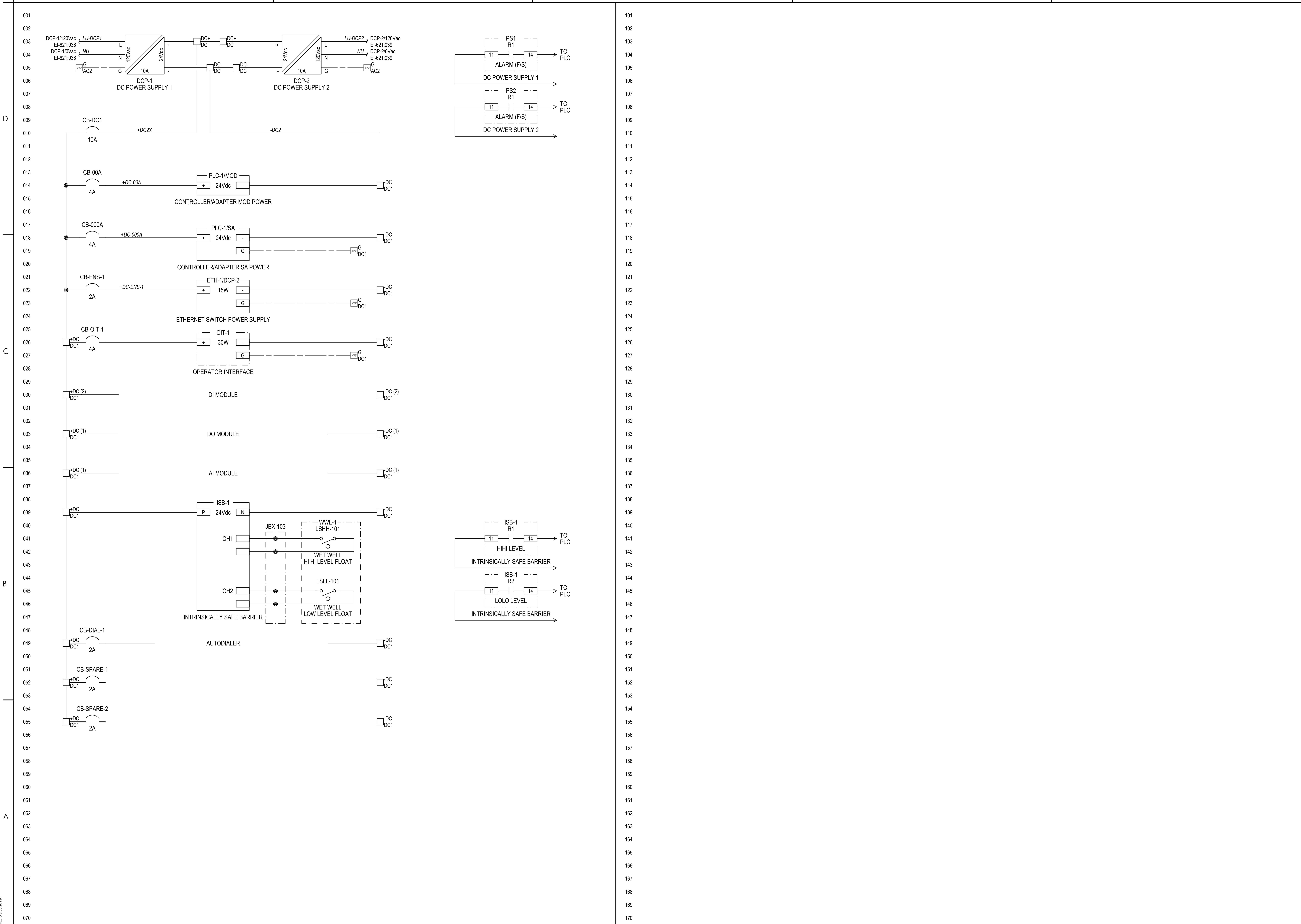
Title
120VAC POWER DISTRIBUTION

Revision: Sheet: of

Drawing No.
EI-621

ORIGINAL SHEET - ANSI D



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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252

File Name: 165630252_EI-622

Scale:

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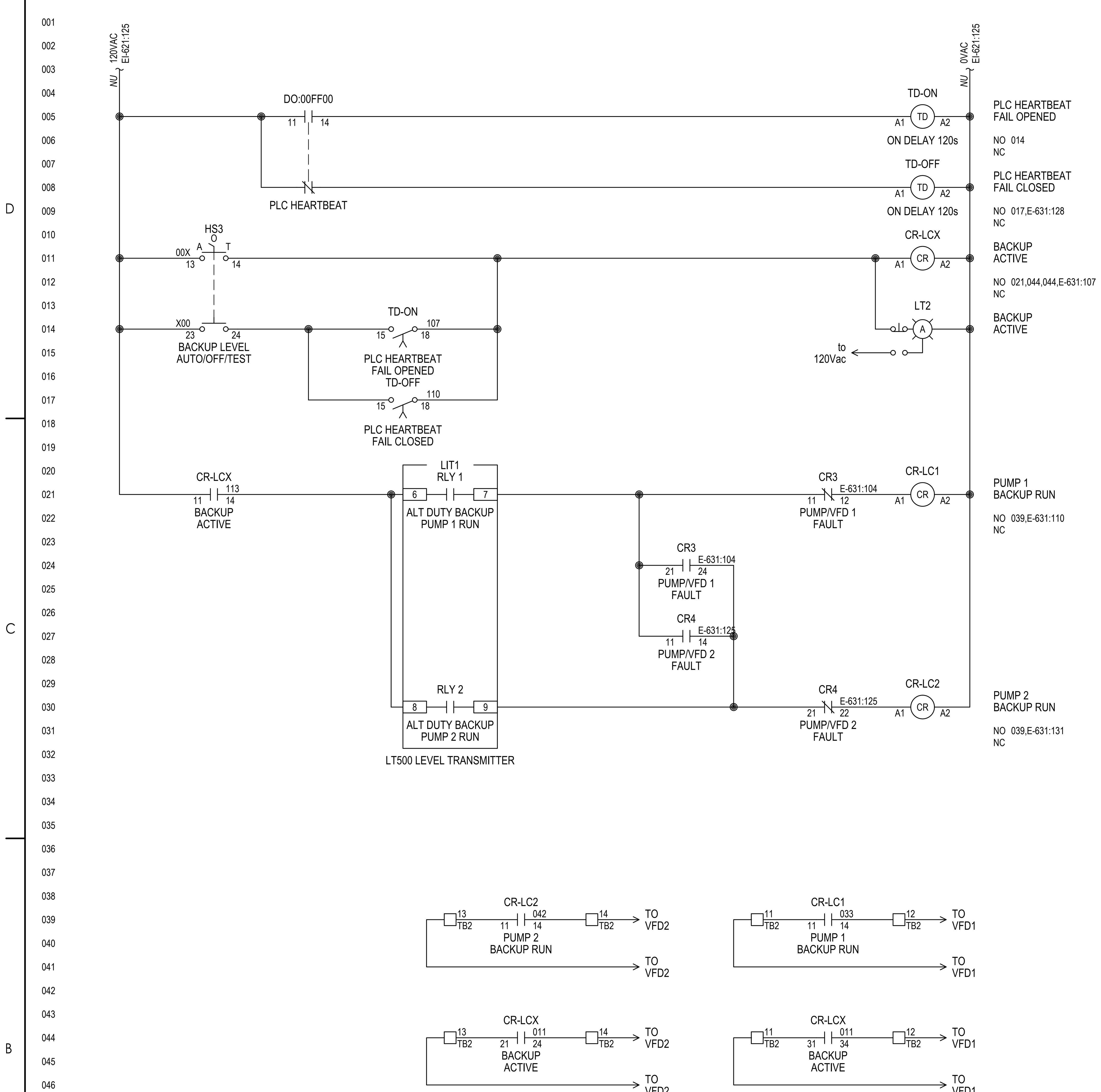
Title
24VDC POWER DISTRIBUTION

Revision: Sheet: of

Drawing No.
EI-622

ORIGINAL SHEET - ANSI D



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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_EI-623
Scale:

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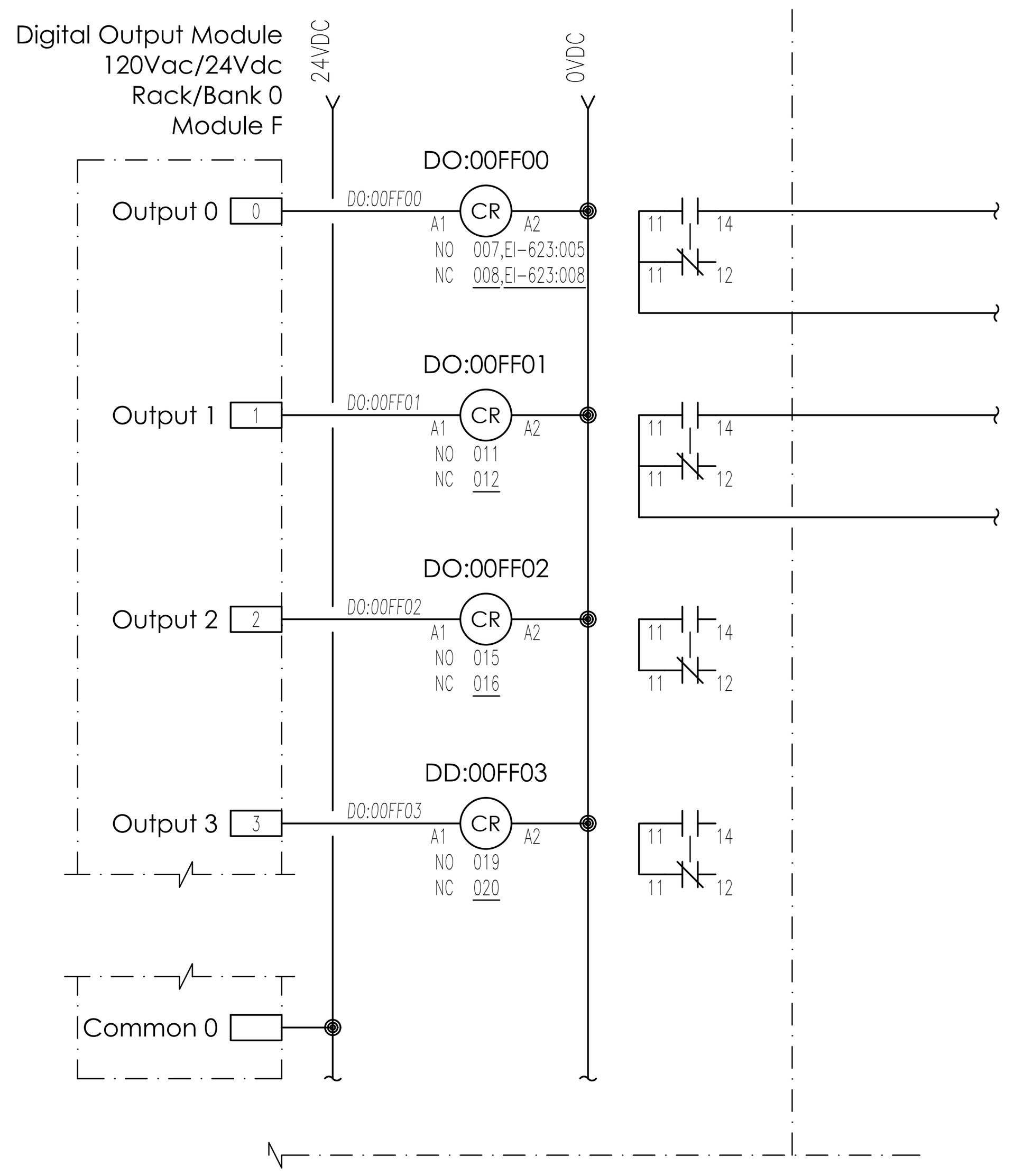
Title
CP-1 BACKUP LEVEL CONTROL

Revision: Sheet: of

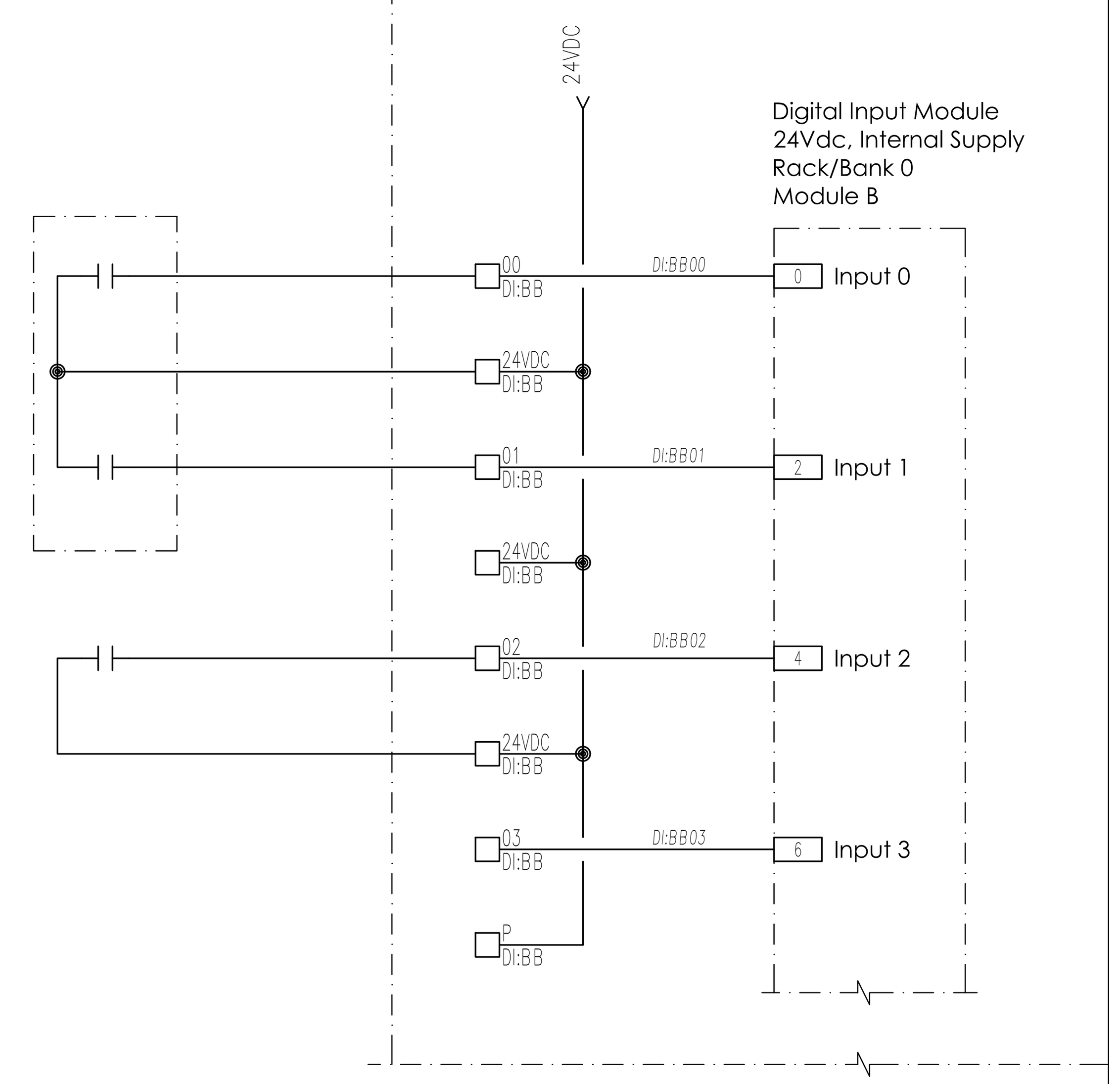
Drawing No.
EI-623

ORIGINAL SHEET - ANSI D



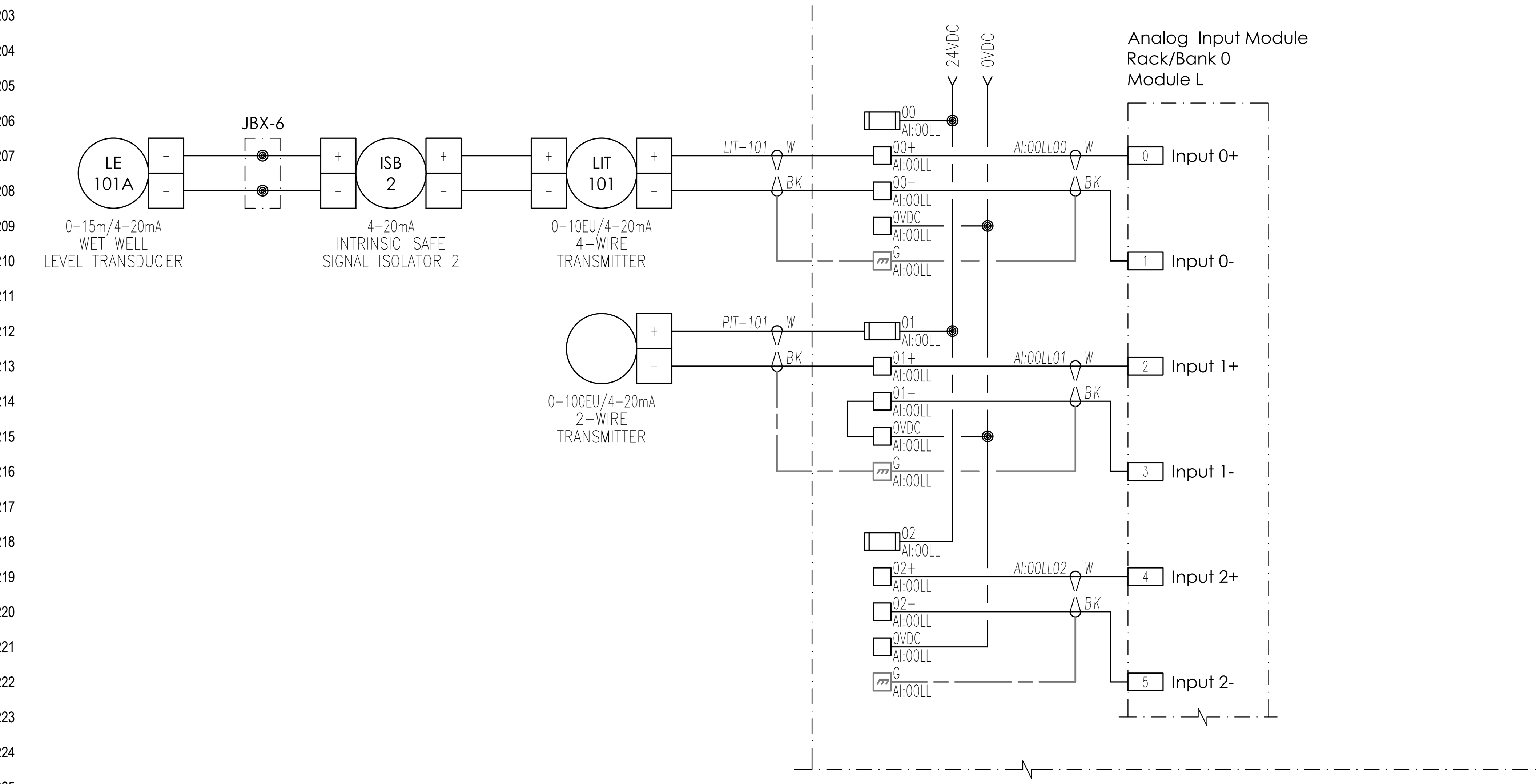
TYPICAL 120Vac DISCRETE OUTPUT CARD WIRING

1. Panel wiring to be #16AWG, Cu, SIS or TEW, red for 120Vac, white for 0Vac, blue for 24Vdc, gray for 0Vdc.
2. Control relays to be narrow style, din-rail mounted, mechanical relay type, with 120Vac/24Vdc coils 120Vac/24Vdc/6A Form-C SPDT contacts.
3. Common control relay 0Vac/0Vdc terminals to be connected using shorting bars.



Typical 120Vac Digital Input Module Wiring

1. Panel wiring to be #16AWG, Cu, SIS or TEW, red, white for neutral where required.
2. Terminals to be two-level terminal block, quantity as required, with bottom feed-through terminal for common 120Vac/24Vdc power supply, and top level disconnect terminal for signal input.



Typical Analog Input Card Wiring

1. Panel wiring to be 1/P or multi-pair, #18AWG, Cu, CIC, shielded twisted-pair(s) stranded wire.
2. Signal terminals to be two-level terminal block, quantity as required, with bottom feed-through terminal for negative signal input, and top level disconnect terminal for positive signal input; one per analog input
3. Fused terminal blocks to be double-level, quantity as required, with top level fused terminal, and bottom level feed-through terminal; one per analog input.
4. Shield terminal blocks to be two-level grounding type, one per two inputs.
5. Common 0Vdc terminals and common fuse 24Vdc terminals to be connected using shorting bars.

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WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_EI-630

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Title
TYPICAL LOOP DIAGRAM

Revision: Sheet: of

Drawing No.
EI-630

ORIGINAL SHEET - ANSI D

Module	Point	PLC Address	PLC Tag	Description	Range/Units	Comments
1	-	-	**5069-IB16**	**Digital 16-point 24Vdc Input Module**		
1	0	1:I.Pt00	CP-1_EAL1	Utility AC Power Failure	1=alarm	
1	1	1:I.Pt01	CP-1_EAL2	UPS AC Power Failure	1=alarm	
1	2	1:I.Pt02	DCP-1_XA1	DC Power Supply 1 Alarm	0=alarm	
1	3	1:I.Pt03	DCP-2_XA1	DC Power Supply 2 Alarm	0=alarm	
1	4	1:I.Pt04	UPS-1_EAL	UPS Battery Low Alarm	1=alarm	
1	5	1:I.Pt05	UPS-1_XA	UPS General Alarm	0=alarm	
1	6	1:I.Pt06	CP-1_ZAH	Control Panel Door Open Alarm	0=alarm	
1	7	1:I.Pt07	PP-1_ZAH	Power Panel Door Open Alarm	0=alarm	
1	8	1:I.Pt08	LSHH-101_LAHH	Wet Well Hi Hi Level Alarm	1=alarm	
1	9	1:I.Pt09	LSLL-101_LALL	Wet Well Low Low Level Alarm	1=alarm	
1	10	1:I.Pt10	TS01_TAL	CP-1 Control Panel Lo Temp Alarm	1=alarm	
1	11	1:I.Pt11	TS02_TAH	CP-1 Control Panel Hi Temp Alarm	1=alarm	
1	12	1:I.Pt12	-	Spare		
1	13	1:I.Pt13	-	Spare		
1	14	1:I.Pt14	-	Spare		
1	15	1:I.Pt15	-	Spare		
2	**-**	-	**5069-IB16**	**Digital 16-point 24Vdc Input Module**		
2	0	2:I.Pt00	ATS-1_EAH1	Utility Power Status	1=on, 0=off/alarm	
2	1	2:I.Pt01	ATS-1_EAH2	Generator Power Status	1=on, 0=off/alarm	
2	2	2:I.Pt02	ATS-1_JSL1	Utility Switch Connected	1=closed, 0=opened	
2	3	2:I.Pt03	ATS-1_JSL2	Generator Switch Connected	1=closed, 0=opened	
2	4	2:I.Pt04	ATS-1_XA	ATS General Alarm	1=alarm	
2	5	2:I.Pt05	ATS-1_YN	ATS Auto Status	1=auto	
2	6	2:I.Pt06	G-A_MN	Generator Running Status	1=on, 0=off	
2	7	2:I.Pt07	G-A_XA	Generator General Alarm	1=alarm, 0=ok	
2	8	2:I.Pt08	G-A_YN	Generator Auto Status	1=auto, 0=manual	
2	9	2:I.Pt09	G-A_LAL	Generator Low Fuel Alarm	1=alarm	
2	10	2:I.Pt10	-	Spare		
2	11	2:I.Pt11	-	Spare		
2	12	2:I.Pt12	-	Spare		
2	13	2:I.Pt13	-	Spare		
2	14	2:I.Pt14	-	Spare		
2	15	2:I.Pt15	-	Spare		
3	**-**	**-**	**5069-OW16**	**Digital 16-point Relay Output Module**		
3	0	3:I.Pt00	PLC-1_HEART	PLC Heartbeat	1=on, 0=off	
3	1	3:I.Pt01	G-A_XA	Generator General Alarm	1=alarm, 0=ok	To Autodialer
3	2	3:I.Pt02	G-A_MN	Generator Running Status	1=alarm, 0=ok	To Autodialer
3	3	3:I.Pt03	RSP-101_XA	Raw Sewage Pump 1 Fault	1=alarm, 0=ok	To Autodialer
3	4	3:I.Pt04	RSP-102_XA	Raw Sewage Pump 2 Fault	1=alarm, 0=ok	To Autodialer
3	5	3:I.Pt05	ATS1-EAL1	Utility AC Power Failure	1=alarm, 0=ok	To Autodialer
3	6	3:I.Pt06	LSHH-101_LAHH	Wet Well Hi Hi Level Alarm	1=alarm, 0=ok	To Autodialer
3	7	3:I.Pt07	STN1-XA	Pump Station Common Alarm	1=alarm, 0=ok	To Autodialer
3	8	3:I.Pt08	-	Spare		To Autodialer
3	9	3:I.Pt09	-	Spare		To Autodialer
3	10	3:I.Pt10	-	Spare		To Autodialer
3	11	3:I.Pt11	-	Spare		
3	12	3:I.Pt12	-	Spare		
3	13	3:I.Pt13	-	Spare		
3	14	3:I.Pt14	-	Spare		
3	15	3:I.Pt15	-	Spare		

Module	Point	PLC Address	PLC Tag	Description	Range/Units	Comments
4	**-**	**-**	**5069-IF8**	**Analog 8-channel Current/Voltage Input Module**		
4	0	3:I.Ch00	PIT-101_PI	Discharge Pressure Transmitter Pressure		
4	1	3:I.Ch01	-	Spare		
4	2	3:I.Ch02	-	Spare		
4	3	3:I.Ch03	-	Spare		
4	4	3:I.Ch04	-	Spare		
4	5	3:I.Ch05	-	Spare		
4	6	3:I.Ch06	-	Spare		
4	7	3:I.Ch07	-	Spare		

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LICENSED PROFESSIONAL ENGINEER
M. R. EVERITT
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2026-02-13
PROVINCE OF ONTARIO

Client/Project
SOUTHWEST MIDDLESEX
WWTP INFRASTRUCTURE DESIGN - INDUSTRIAL SPS UPGRADES
Glencoe ON Canada

Project No.: 165630252
File Name: 165630252_EI-631
Scale:

AK	ME	SSS	2025.11.25
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
CONTROL PANEL CP-1
PLC I/O

Revision: Sheet: of
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EI-631

ORIGINAL SHEET - ANSI D

PLC-1 Communication I/O Schedule

Address	Type	Variable	Description	Comments
192.168.1.100	**Ethernet IP**	**5069-AEN2TR**	**Ethernet Interface Module**	
192.168.1.101	**Ethernet IP**	**RSP-101**	**Raw Sewage Pump 1**	
	Bool	RSP-101_MN	Raw Sewage Pump 1, Running	
	Bool	RSP-101_YN	Raw Sewage Pump 1, Remote	
	Bool	RSP-101_XA	Raw Sewage Pump 1, Fault	
	Bool	RSP-101_XN	Raw Sewage Pump 1, Ready	
	Bool	RSP-101_YA	Raw Sewage Pump 1, Comm	
	Bool	RSP-101_MD	Raw Sewage Pump 1, Run Command	
	Real	RSP-101_JI	Raw Sewage Pump 1, Power [kW]	
	Real	RSP-101_II	Raw Sewage Pump 1, Current [A]	
	Real	RSP-101_SI	Raw Sewage Pump 1, Speed [%]	
	Real	RSP-101_SC	Raw Sewage Pump 1, Speed Reference [%]	
192.168.1.102	**Ethernet IP**	**RSP-102**	**Raw Sewage Pump**	
	Bool	RSP-102_MN	Raw Sewage Pump, Running	
	Bool	RSP-102_YN	Raw Sewage Pump, Remote	
	Bool	RSP-102_XA	Raw Sewage Pump, Fault	
	Bool	RSP-102_XN	Raw Sewage Pump, Ready	
	Bool	RSP-102_YA	Raw Sewage Pump, Comm	
	Bool	RSP-102_MD	Raw Sewage Pump, Run Command	
	Real	RSP-102_JI	Raw Sewage Pump, Power [kW]	
	Real	RSP-102_II	Raw Sewage Pump, Current [A]	
	Real	RSP-102_SI	Raw Sewage Pump, Speed [%]	
	Real	RSP-102_SC	Raw Sewage Pump, Speed Reference [%]	
192.168.1.103	**Ethernet IP**	**FIT-101**	**Flow Transmitter**	
	Real	FIT-101_FI	Flow Transmitter, Flow Status	
	Real	FIT-101_FQI	Flow Transmitter, Total Flow Status	
	Bool	FIT-101_XA	Flow Transmitter, Transmitter Fault Status	
	Bool	FIT-101_YA	Flow Transmitter, Comm Fault Status	
192.168.1.104	**Ethernet IP**	**LIT-101**	**Wet Well Level Transmitter**	
	Real	LIT-101_LI1	Wet Well Level Transmitter, Level 1	
	Bool	LIT-101_XA	Wet Well Level Transmitter, Transmitter Fault	
	Bool	LIT-101_YA	Wet Well Level Transmitter, Comm Fault	
192.168.1.105	**Ethernet IP**	**JIT-1**	**Power Meter**	
	Real	EI	Voltage	
	Real	II	Current	
	Real	JIA1	Phase A kW	
	Real	JIA2	Phase A kVA	
	Real	JIA3	Phase A PF	
	Real	JIA4	Phase A kWH	
	Real	JIA5	Line A kW	
	Real	JIA6	Line A kVA	
	Real	JIA7	Line A kWH	
	Real	JIA8	Line A kWH	
	Real	JIB1	Phase B kW	
	Real	JIB2	Phase B kVA	
	Real	JIB3	Phase B PF	
	Real	JIB4	Phase B kWH	
	Real	JIB5	Line B kW	
	Real	JIB6	Line B kVA	
	Real	JIB7	Line B kWH	
	Real	JIB8	Line B kWH	
	Real	JIC1	Phase C kW	
	Real	JIC2	Phase C kVA	
	Real	JIC3	Phase C PF	
	Real	JIC4	Phase C kWH	
	Real	JIC5	Line C kW	
	Real	JIC6	Line C kVA	
	Real	JIC7	Line C kWH	
	Real	JIC8	Line C kWH	
	Real	SI	Frequency	
	Real	JQI	Energy	
	Real	IIN	Neutral Current	
	Real	IIA	Line A Current	
	Real	IIB	Line B Current	
	Real	IIC	Line C Current	
	Real	IIA1	Phase A Current	
	Real	IIB2	Phase B Current	
	Real	IIC2	Phase C Current	

PLC Autodialer I/O Schedule

Point	Address	Tag	Description	Range/Units	Comments
-	**-**				
0	**Pt00**		Wet Well Hi Hi Level Alarm		
1	**Pt01**		Raw Sewage Pump 1 Fault		
2	**Pt02**		Raw Sewage Pump 2 Fault		
3	**Pt03**		Generator General Alarm		
4	**Pt04**		Generator Running Status		
5	**Pt05**		Pump Station Common Alarm		
6	**Pt06**		Utility AC Power Failure		
7	**Pt07**				

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Title
CP1 NETWORK AND AUTODIALER I/O

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Drawing No.
EI-632

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