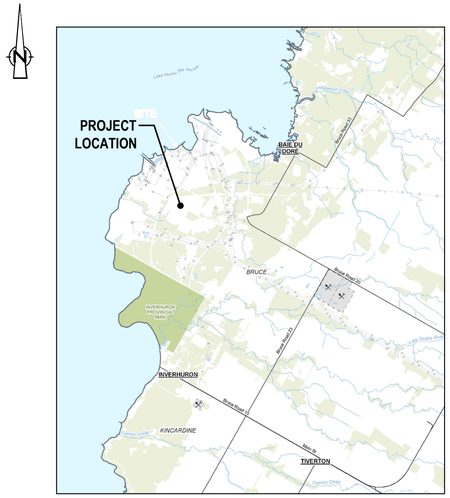
BRUCE POWER
177 TIE ROAD, TIVERTON ON
SEWAGE PROCESSING PLANT NORTH TRAIN
ISSUED FOR RFP
JANUARY 15, 2021
11216493

DRAWING INDEX

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NK37-DRAW-53000-10029	G-003	ELECTRICAL LEGEND
NK37-DRAW-67960-10001	G-004	INSTRUMENTATION AND CONTROLS LEGEND
NK37-DRAW-79600-10003	G-005	HAZARDOUS AREA CLASSIFICATION
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NK37-DRAW-66400-10002	IC-110	TYPICAL DISCREET INPUT MODULE
NK37-DRAW-66400-10003	IC-111	TYPICAL DISCREET OUTPUT MODULE
NK37-DRAW-53000-10062	IC-112	TYPICAL ANALOG INPUT MODULE
NK37-DRAW-53000-10063	IC-113	TYPICAL ANALOG OUTPUT MODULE



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LOCATION MAP



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AREA MAP

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A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn	J. SPENLER	Designer	J. LARMER
Drafting Check	B. PLETZ	Design Check	M. CADACIO
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title
COVER PAGE AND DRAWING INDEX

Sheet No.
NK37-DRAW-79600-10001

Sheet No.
G-001

Sheet **1** of **63**

PIPE AND PIPE FITTING SYMBOLS

	SINGLE LINE	DOUBLE LINE
EXISTING PIPE		
NEW PIPE		
EXISTING PIPE TO BE ABANDONED		
EXISTING PIPE TO BE REMOVED		
WELDED JOINT		
GROOVED JOINT		
FLANGED JOINT		
MECHANICAL JOINT		
BELL AND SPIGOT JOINT (LEADED)		
HUB AND SPIGOT JOINT (RUBBER GASKET)		
BALL JOINT		
PVC JOINT		
GROOVED END ADAPTOR JOINT		
FLANGED COUPLING ADAPTOR		
FLANGED COUPLING ADAPTOR WITH THRUST TIES		
FLEXIBLE COUPLING		
FLEXIBLE COUPLING WITH THRUST TIES		
STEEL BELLOWS EXPANSION JOINT		
ELASTOMER BELLOWS EXPANSION JOINT		
ELBOW UP		
ELBOW DOWN		
TEE UP		
TEE DOWN		
LATERAL UP		
LATERAL DOWN		
CONCENTRIC REDUCER		
EXCENTRIC REDUCER		
UNION		
CAP		
ANCHOR		
ELBOW 90°		
CROSS		
TEE		
ELBOW 45°		
LATERAL		

PROCESS PIPE IDENTIFICATION

AC	ACID
AI	AIR, INSTRUMENT
ALP	AIR, LOW PRESSURE
AHP	AIR, HIGH PRESSURE
AS	AIR SCOUR
BD	BLOWDOWN
CD	CONDENSATE DRAIN
CG	CHLORINE GAS
D	DECANT
DDS	DEWATERED DIGESTED SLUDGE
DG	DIGESTER GAS
DR	DRAIN
DS	DIGESTED SLUDGE
EXH	EXHAUST
EW	EFFLUENT WATER
FC	FERRIC CHLORIDE
GW	GROUNDWATER
HP	HYDROGEN PEROXIDE
M	METHANOL
N	NUTRIENT
O	OXYGEN
OF	OVERFLOW
P	POLYMER
PW	POLISHED WATER
RAS	RETURN ACTIVATED SLUDGE
RW	RAW WATER
S	SUPERNATANT
SA	SAMPLE
SL	SLUDGE
SPD	SUMP PUMP DISCHARGE
TBS	THICKENED BOTTOM SLUDGE
TW	TREATED WATER
TWAS	THICKENED WASTE ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE
WW	WASH WATER
W1	SERVICE WATER, NON-POTABLE

PIPING DESIGNATION — 400-CLDI-RAS

400 - CLDI - RAS

- PIPE USE IDENTIFICATION LEGEND
- PIPE MATERIAL
- NOMINAL PIPE DIAMETER (mm)

VALVE SYMBOLS

- FOUR WAY VALVE
- AIR AND VACUUM VALVE
- ANGLE GATE VALVE
- ANGLE GLOBE VALVE
- GLOBE VALVE
- GATE VALVE
- KNIFE GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- DIAPHRAGM VALVE
- NEEDLE VALVE
- PLUG VALVE
- SEAT PORT — ECCENTRIC PLUG VALVE
- PRV — PRESSURE REDUCING VALVE
- PINCH VALVE
- PRESSURE RELIEF VALVE
- SELF-CONTAINED PRESSURE REGULATOR
- VALVE WITH ACTUATOR
- SOLENOID VALVE OPERATOR
- FI — FLOW INDICATOR
- TI — TEMP. CONTROL VALVE
- CONTROL VALVE
- FLOW DIRECTION — VALVE SYMBOL
- HOSE VALVE OR BIBB
- SP — SAMPLE PORT
- F — FLUSH
- MULTIPORT BALL VALVE (BALL VALVE SHOWN.) ARROWS INDICATE PATTERN, SEAT PORTS ARE IMPLIED

EQUIPMENT SYMBOLS

- SG — SIGHT GLASS
- TRANSDUCER MOUNTING
- DISSOLVED OXYGEN ANALYZER
- INLINE MIXER
- INLINE CIRCULATING PUMP
- DIAPHRAGM PUMP
- CENTRIFUGAL PUMP OR BLOWER
- GEAR PUMP OR POSITIVE DISPLACEMENT BLOWER

LEVEL SENSOR SYMBOLS

- CAPACITANCE LEVEL SWITCH
- ULTRASONIC LEVEL TRANSMITTER
- FLOAT SWITCH

MISCELLANEOUS PIPING SYMBOLS

- BFP — BACKFLOW PREVENTOR
- DIRECTION OF SLOPE
- DIRECTION OF FLOW
- INSULATED LINE
- INSULATED LINE w/STEAM TRACE
- ELEC — INSULATED LINE w/ELECTRICAL TRACE
- F R L — LUBRICATOR, REGULATOR, FILTER

GATE SYMBOLS

EL. VIEW	PLAN VIEW
	SLUICE
	BUTTERFLY
	FLAP
	SHEAR
	FABRICATED SLIDE

PIPE MATERIAL

CS	CARBON STEEL
CI	CAST IRON
CLDI	CEMENT LINED DUCTILE IRON
CPVC	CHLORINATED POLYVINYL CHLORIDE
CU	COPPER
DI	DUCTILE IRON
ELS	EPOXY LINED STEEL
FRP	FIBERGLASS REINFORCED PLASTIC
GALVS	GALVANIZED STEEL
HDPE	HIGH DENSITY POLYETHYLENE
PVC	POLYVINYL CHLORIDE
SST	STAINLESS STEEL

HVAC SYMBOLS

- OED — OPEN END DUCT
- T — ROOM THERMOSTAT
- T G — ROOM THERMOSTAT w/GUARD
- SUPPLY AIR DUCT SECTION UP
- SUPPLY AIR DUCT SECTION DOWN
- RETURN/EXHAUST AIR DUCT SECTION UP
- RETURN/EXHAUST AIR DUCT SECTION DOWN
- FLEXIBLE CONNECTION
- TURNING VANES
- SUPPLY AIR DIFFUSER
- INSULATED DUCT
- OPPOSED BLADE DAMPER
- FD — FIRE DAMPER
- BDD — BACKDRAFT DAMPER
- BD — BALANCING DAMPER
- M — DAMPER MOTOR
- DG — DOOR GRILLE
- UH — UNIT HEATER

BUILDING SERVICES PIPE IDENTIFICATION

	HOT WATER
	HOT WATER RECIRCULATION
	COLD WATER
S	COLD WATER (SOFT)
SAN	SANITARY SEWER
STM	STORM SEWER
RWL	RAIN WATER LEADER
V	VENT
G	GAS
F	FIRE STANDPIPE
SPK	SPRINKLER
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
LPS	LOW PRESSURE STEAM
LPC	LOW STEAM CONDENSATE
FT	FLOAT & THERMOSTATIC TRAP
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN

- RD — ROOF DRAIN
- CO — CLEANOUT
- FD — FLOOR DRAIN
- HD — HUB DRAIN

GENERAL PIPING NOTES

1. SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
2. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
3. ALL FLEXIBLE CONNECTORS OR FLANGED ADAPTERS SHALL BE PROVIDED WITH THRUST TIES, BLOCKS, OR ANCHORS, UNLESS NOTED OTHERWISE. THRUST PROTECTION SHALL BE ADEQUATE FOR PRESSURES SPECIFIED.
4. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.

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177 TIE ROAD, TIVERTON ON

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SPP NORTH TRAIN

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A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn	J. SPENLER	Designer	J. LARMER
Drafting Check	B. PLETZ	Design Check	M. CADACIO
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title
MECHANICAL LEGEND

Sheet No.
NK37-DRAW-79600-10002

Sheet No.
G-002

Sheet **2** of **63**

GROUNDING SYMBOLS

- GROUND ROD
- GROUND CABLE CONNECTION AND GROUND STUB
- ROD ELECTRODE AND GROUND INSPECTION WELL
- ROD GROUNDING ELECTRODE
- CORNER SET GROUNDING ELECTRODES
- GROUND CABLE EMBEDDED OR BURIED, CABLE UP
- GROUND CABLE EXPOSED, CABLE DOWN
- GROUND CABLE CONNECTION TO EQUIPMENT
- GROUND CABLE CONNECTION TO BUILDING STEEL COLUMN

CIRCUIT SYMBOLS

- RECTIFIER BRIDGE
- RESISTOR
- TIME DELAY CAPSULE N/O (15 SECS.)
- TIME DELAY CAPSULE N/C (10 SECS.)
  1. ENTER TIME DELAY REQ'D. (e.g. 10 SECS.)
- NORMALLY OPEN RELAY CONTACT
- NORMALLY CLOSED RELAY CONTACT
- RELAY COIL (CR)
- METER: CTR-COUNTER, AM-AMMETER, VM-VOLTMETER, WHM-WAT (HOURMETER)
- TRANSFORMER (T1)
- PILOT LIGHT (LENS COLOUR) (R)
- POLARIZED CAPACITOR
- FIXED CAPACITOR
- LIGHT EMITTING DIODE
- ZENER DIODE
- DIODE
- ARC SUPPRESSOR
- FUSE (5A)
- BATTERY
- TERMINAL WITH DESIGNATION (1A)
- GROUND
- BREAKER STABS
- THERMAL OVERLOAD
- MOTOR OVERLOAD
- MAGNETIC OVERLOAD
- CIRCUIT BREAKER
- MOTOR (XX)
- MOTOR (100A)
- WIRE LABELING (XX, XX, XX)

SWITCH SYMBOLS

- LIMIT SWITCH N/O
- LIMIT SWITCH N/C
- TIME DELAY N/O DELAY ON CLOSING
- TIME DELAY N/C DELAY ON OPENING
- TIME DELAY N/C DELAY ON CLOSING
- TIME DELAY N/O DELAY ON OPENING
- TIME DELAY COIL
- PROXIMITY LIMIT SWITCH N/O
- PROXIMITY LIMIT SWITCH N/C
- FOOT OPERATED L/S CLOSED
- FOOT OPERATED L/S OPEN
- FLOW OPERATED L/S CLOSED
- FLOW OPERATED L/S OPEN
- FLOAT OPERATED L/S CLOSED
- FLOAT OPERATED L/S OPEN
- PRESSURE OPERATED L/S CLOSED
- PRESSURE OPERATED L/S OPEN
- TEMPERATURE OPERATED L/S CLOSED
- TEMPERATURE OPERATED L/S OPEN
- 2 POSITION SELECTOR SWITCH
- 3 POSITION SELECTOR SWITCH
- SOLENOID
- PUSHBUTTON CLOSED
- PUSHBUTTON OPEN
- DISCONNECT SWITCH N/O
- MAINTAINED EMERGENCY STOP
- HAND-OFF AUTO SELECTOR SWITCH (H O A; X 0 0; 0 0 X; 0 X)

LAYOUT SYMBOLS

- PHOTOCELL EMITTER
- PHOTOCELL RECEIVER
- HORN
- BUZZER
- BELL
- SENSING ELEMENT
- PILOT LIGHT C/W TEST SWITCH (LENS COLOUR)
- SWITCH SINGLE POLE 120V
- SWITCH DOUBLE POLE 120V
- SWITCH THREE WAY 120V
- DUPLEX RECEPTACLE 120V, 20A;
- DUPLEX RECEPTACLE WITH GROUND FAULT PROTECTION, 120V, 20A (GF)
- DUPLEX RECEPTACLE WEATHER PROOF, 120V, 20A (WP)
- TWIST LOCK RECEPTACLE 120V (TW)
- THERMOSTAT (T)
- KW, RATING REQUIRED. 'A' DENOTES ELECTRIC UNIT HEATER, C/W CEILING-MOUNTED BRACKETS. (E.U.H. 2.0 A)
- MOTORIZED DOOR OPERATOR
- POWER TRANSFORMER - T1
- WELDING RECEPTACLE
- TELEPHONE OUTLET MOUNTED 12" ABOVE FINISHED FLOOR LEVEL
- TELEPHONE OUTLET MOUNTED 4'-6" ABOVE FINISHED FLOOR LEVEL
- SINGLE PHASE MANUAL MOTOR STARTER
- THREE PHASE MANUAL MOTOR STARTER/DISCONNECT SWITCH
- START-STOP PUSHBUTTON AND PILOT LIGHT
- LOCKABLE DISCONNECT SWITCH
- FIRE ALARM PULL STATION MOUNTED 4'-6" ABOVE FINISHED FLOOR LEVEL
- PHOTO ELECTRIC SMOKE DETECTOR (P, E)
- SPRINKLER FLOW ALARM SWITCH CONNECTED TO FIRE ALARM SYSTEM
- SOLENOID VALVE CONNECTED TO FIRE ALARM SYSTEM (SV)
- 115V, DUPLEX RECEPTACLE GFI - GROUND FAULT CIRCUIT INTERUPTER WP - WEATHERPROOF (GFI A-1)
- DATA GRADE TELEPHONE OUTLET
- LOCAL CONTROL STATION (CSD1)
- HEAT DETECTOR (H)
- FIRE BELL (F)
- FIRE ALARM STROBE (S)
- FIRE ALARM INTEGRATED BELL AND LIGHT UNIT

LIGHTING SYMBOLS

- STROBE LIGHT - TYPE S
- LIGHTING FIXTURE - TYPE A
- FLUORESCENT LIGHTING FIXTURE - TYPE F
- LIGHTING FIXTURE WALL MOUNTED TYPE A
- EXIT LIGHT AND CEILING MOUNTED OUTLET BOX. DIRECTIONAL ARROWS AS INDICATED. SHADED AREAS DENOTE FACES.
- EMERGENCY BATTERY PACK WITH CHARGER AND SEALED BEAM HEADS
- EMERGENCY BATTERY PACK WITH CHARGER, EXIT LIGHT AND SEALED BEAM HEADS
- EMERGENCY LIGHTING REMOTE HEAD
- EXIT LIGHT - WALL MOUNTED
- FIRE ALARM PANEL
- LIGHTING OR DISTRIBUTION PANEL 208/120V, 3Ø, 4W - PANEL ID NUMBER AS SHOWN (DP01)
- DISTRIBUTION PANEL 240/120V, 1Ø, 3W - PANEL ID NUMBER AS SHOWN (UPS01)

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Project No. **11216493**

Title
ELECTRICAL LEGEND

Sheet No.
NK37-DRAW-53000-10029

Sheet No.
G-003

Sheet **3** of **63**

PRIMARY ELEMENT SYMBOLS

- TURBINE FLOW METER
- MAGNETIC FLOW METER
- POSITIVE DISPLACEMENT FLOW METER
- WEIR
- VORTEX FLOW METER
- ROTAMETER
- ULTRASONIC LEVEL TRANSMITTER
- FLOAT
- OPEN DRAIN OR SEWER
- CLOSED DRAIN OR SEWER
- SPECIFICATION CHANGE
- CAP
- HOSE CONNECTION
- BLIND FLANGE
- STRAINER
- INLINE MIXER
- FLEXIBLE PIPE

PUMP AND COMPRESSOR SYMBOLS

- CENTRIFUGAL PUMP (DRY PIT)
- CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
- CHEMICAL FEED PUMP
- DIAPHRAGM PUMP
- GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
- PISTON PUMP
- PROGRESSIVE CAVITY PUMP
- SUBMERSIBLE SUMP PUMP
- COMPRESSOR (CENTRIFUGAL) BLOWER OR TURBINE
- COMPRESSOR (PISTON)
- EJECTOR

NOTE:

ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)
XX: AS = ADJUSTABLE SPEED
CS-1 = CONSTANT SPEED (SINGLE SPEED)
CS-2 = CONSTANT SPEED (TWO SPEED)

ACTUATOR SYMBOLS

- PNEUMATIC WITH POSITIONER
- PNEUMATIC WITH SOLENOID
- ELECTRIC
- ELECTRIC WITH POSITIONER
- ELECTROHYDRAULIC
- HYDRAULIC
- PNEUMATIC WITH VOLUME BOOSTER
- SOLENOID
- MANUAL

NOTE:

ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)
XX: FD = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

INTERFACE SYMBOLS

- PROCESS INTERFACE
- SIGNAL INTERFACE
- A INTERFACE LETTER
- D DESTINATION DRAWING NUMBER
- S SOURCE DRAWING NUMBER

INTERFACE TO/FROM PROCESS EXTERNAL TO PROJECT

INSTRUMENTATION SYMBOLS

- PROGRAMMABLE LOGIC CONTROL FIELD MOUNTED
- PROGRAMMABLE LOGIC CONTROL NORMALLY ACCESSIBLE (BOARD MOUNTED)
- PROGRAMMABLE LOGIC CONTROL BEHIND BOARD MOUNTED
- PROGRAMMABLE LOGIC CONTROL AUX. LOCATION
- DISCRETE INSTRUMENT/ELECTRICAL DEVICE FIELD MOUNTED
- DISCRETE INSTRUMENT/ELECTRICAL DEVICE NORMALLY ACCESSIBLE (BOARD MOUNTED)
- DISCRETE INSTRUMENT/ELECTRICAL DEVICE BEHIND BOARD MOUNTED
- DISCRETE INSTRUMENT/ELECTRICAL DEVICE AUX. LOCATION
- SHARED DISPLAY/CONTROL DEVICE FIELD MOUNTED
- SHARED DISPLAY/CONTROL DEVICE NORMALLY ACCESSIBLE (BOARD MOUNTED)
- SHARED DISPLAY/CONTROL DEVICE BEHIND BOARD MOUNTED
- SHARED DISPLAY/CONTROL DEVICE AUX. LOCATION
- LOCAL INDICATOR LIGHT R - RED, Y - YELLOW, G - GREEN
- INDICATOR LIGHT NORMALLY ACCESSIBLE
- UNDEFINED COMPLEX INTERCONNECTING LOGIC

INSTRUMENTATION LINES

- ELECTRIC SIGNAL
- PNEUMATIC SIGNAL
- PNEUMATIC BINARY SIGNAL
- INTERNAL SYSTEM LINK

ISA LETTER COMBINATIONS

First-Letters	Initiating or Measured Variable	Controllers: Recording	Controllers: Indicating	Controllers: Blind	Controllers: Self-Actuated Control Valves	Readout Devices: Recording	Readout Devices: Indicating	Switches and Alarm Devices *: High **	Switches and Alarm Devices *: Low	Switches and Alarm Devices *: Comb	Transmitters: Recording	Transmitters: Indicating	Transmitters: Blind	Solenoids, Relays, Computing Devices	Primary Element	Test Point	Well or Probe	Viewing Device, Glass	Safety Device	Final Element
A	Analysis	ARC	AIC	AC		AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW			AV
B	Burner/Combustion	BRC	BIC	BC		BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE		BW	BG		BZ
C	User's Choice																			
D	User's Choice																			
E	Voltage	ERC	EIC	EC		ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE					EZ
F	Flow Rate	FRC	FIC	FC	FCV, FICV	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FP		FG		FV
FQ	Flow Quantity	FQRC	FQIC			FQR	FQI	FQSH	FQSL			FQIT	FQT	FQY	FQE					FQV
FF	Flow Ratio	FFRC	FFIC	FFC		FFR	FFI	FFSH	FFSL						FE					FFV
G	User's Choice																			
H	Hand		HIC	HC						HS										HV
I	Current	IRC	IIC			IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE					IZ
J	Power	JRC	JIC			JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE					JV
K	Time	KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE					KV
L	Level	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL LSHH	LRT	LIT	LT	LY	LE		LW	LG		LV
M	User's Choice																			
N	User's Choice																			
O	User's Choice																			
P	Pressure/Vacuum	PRC	PIC	PC	PCV	PR	PI	PSH	PSL	PSHL	PRT	PIT	PT	PY	PE	PP			PSV, PSE	PV
PD	Pressure, Differential	PDRC	PDIC	PDC	PDCV	PDR	PDI	PDSH	PDSL		PDRT	PDIT	PDT	PDY	PE	PP				PDV
Q	Quantity	QRC	QIC			QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	QY	QE					QZ
R	Radiation	RRC	RIC	RC		RR	RI	RSH	RSL	RSHL	RRT	RIT	RT	RY	RE		RW			RZ
S	Speed/Frequency	SRC	SIC	SC	SCV	SR	SI	SSH	SSL	SSHL	SRT	SIT	ST	SY	SE					SV
T	Temperature	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TP	TW		TSE	TV
TD	Temperature, Differential	TDRC	TDIC	TDC	TDCV	TDR	TDI	TDSH	TDSL		TDRT	TDIT	TDT	TDY	TE	TP	TW			TDV
U	Multivariable					UR	UI							UY						UV
V	Vibration/Machinery Analysis					VR	VI	VSH	VSL	VSHL	VRT	VIT	VT	VY	VE					VZ
W	Weight/Force	WRC	WIC	WC	WCV	WR	WI	WSH	WSL	WSHL	WRT	WIT	WT	WY	WE					WZ
WD	Weight/Force, Differential	WDRC	WDIC	WDC	WDCV	WDR	WDI	WDSH	WDSL		WDRT	WDIT	WDT	WDY	WE					WDZ
X	Unclassified																			
Y	Event/State/Presence		YIC	YC		YR	YI	YSH	YSL				YT	YY	YE					YZ
Z	Position/Dimension	ZRC	ZIC	ZC	ZCV	ZR	ZI	ZSH	ZSL	ZSHL	ZRT	ZIT	ZT	ZY	ZE					ZV
ZD	Gauging/Deviation	ZDRC	ZDIC	ZDC	ZDCV	ZDR	ZDI	ZDSH	ZDSL		ZDRT	ZDIT	ZDT	ZDY	ZDE					ZDV

Note: This table is not all-inclusive.

* A, alarm, the annunciating device, may be used in the same fashion as S, switch, the actuating device.

** The letters H and L may be omitted in the undefined case.

Other Possible Combinations:

FO	(Restriction Orifice)	PFR	(Ratio)
FRK, HIK	(Control Stations)	KQI	(Running Time Indicator)
FX	(Accessories)	QQI	(Indicating Counter)
TJR	(Scanning Recorder)	WKIC	(Rate-of-Weight-Loss Controller)
LLH	(Pilot Light)	HMS	(Hand Momentary Switch)
LCH	(Level Control High)	LCL	(Level Control Low)

VALVE SYMBOLS

- FOUR WAY VALVE
- AIR AND VACUUM VALVE
- ANGLE GATE VALVE
- ANGLE GLOBE VALVE
- GLOBE VALVE
- GATE VALVE
- KNIFE GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- DIAPHRAGM VALVE
- NEEDLE VALVE
- PLUG VALVE
- SEAT PORT — ECCENTRIC PLUG VALVE
- PRV — PRESSURE REDUCING VALVE
- PINCH VALVE
- PRESSURE RELIEF VALVE
- SELF-CONTAINED PRESSURE REGULATOR
- VALVE WITH ACTUATOR
- SOLENOID VALVE OPERATOR
- FI — FLOW INDICATOR
- TEMP. CONTROL VALVE
- CONTROL VALVE — FLOW DIRECTION VALVE SYMBOL
- HOSE VALVE OR BIBB
- SP — SAMPLE PORT
- F — FLUSH
- MULTIPORT BALL VALVE (BALL VALVE SHOWN.) ARROWS INDICATE PATTERN, SEAT PORTS ARE IMPLIED

PIPING DESIGNATION

16-CLDI-RAS

16 - CLDI - RAS

- PIPE USE IDENTIFICATION LEGEND
- PIPE MATERIAL
- NOMINAL PIPE DIAMETER (INCH)

PIPE MATERIAL

CS	CARBON STEEL
CI	CAST IRON
CLDI	CEMENT LINED DUCTILE IRON
CPVC	CHLORINATED POLYVINYL CHLORIDE
CU	COPPER
DI	DUCTILE IRON
ELS	EPOXY LINED STEEL
FRP	FIBERGLASS REINFORCED PLASTIC
GALVS	GALVANIZED STEEL
HDPE	HIGH DENSITY POLYETHYLENE
PVC	POLYVINYL CHLORIDE
SST	STAINLESS STEEL

LEVEL SENSOR SYMBOLS

CAPACITANCE LEVEL SWITCH — ULTRASONIC LEVEL TRANSMITTER — FLOAT SWITCH

GATE SYMBOLS

EL. VIEW — PLAN VIEW

- SLUICE
- BUTTERFLY
- FLAP
- SHEAR
- FABRICATED SLIDE

LEVEL SENSOR SYMBOLS

CAPACITANCE LEVEL SWITCH — ULTRASONIC LEVEL TRANSMITTER — FLOAT SWITCH

GATE SYMBOLS

EL. VIEW — PLAN VIEW

- SLUICE
- BUTTERFLY
- FLAP
- SHEAR
- FABRICATED SLIDE

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Client
BRUCE POWER
177 TIE ROAD, TIVERTON ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	MC	CE	01/15/21
B	100% DESIGN REVIEW	MC	CE	11/12/20
A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn	J. SPENLER	Designer	C. EVEREST
Drafting Check	B. PLETZ	Design Check	M. CADACIO
Project Manager	C. EVEREST	Date	11/12/2020
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Project No. **11216493**

Title
INSTRUMENTATION AND CONTROLS LEGEND

Sheet No.
NK37-DRAW-67960-10001

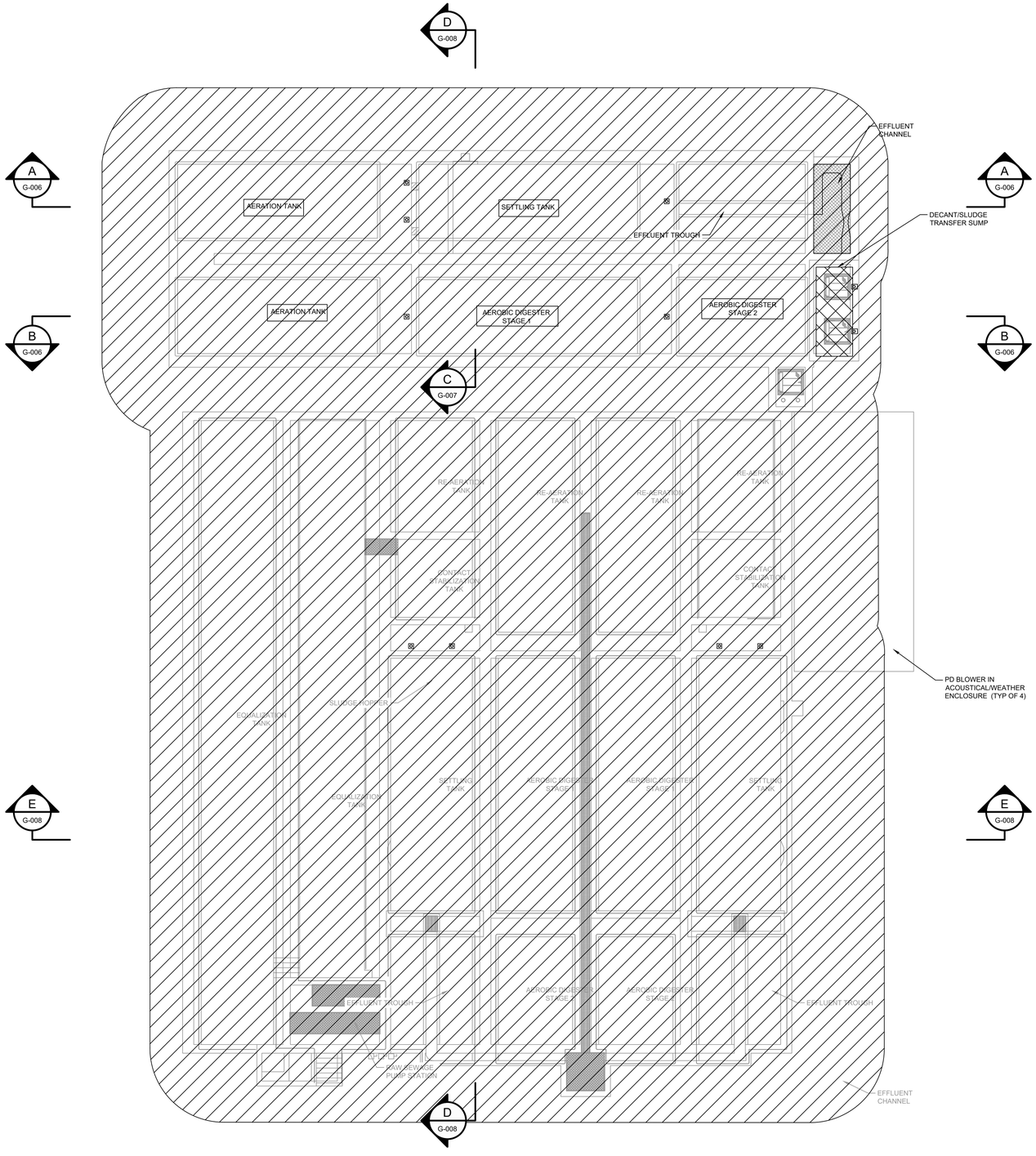
Sheet No.
G-004

Sheet **4** of **63**

HAZARDOUS AREA CLASSIFICATIONS

CLASS 1, ZONE 1, GROUP IIA

CLASS 1, ZONE 2, GROUP IIA



TREATMENT TRAINS HAZARDOUS AREA LAYOUT

1:100

NOTES:

1. EXISTING ELECTRICAL/ CONTROL/ MECHANICAL COMPONENTS OF EXISTING TRAINS (EXCEPTION RAS/WAS PUMPS) ARE NOT INCLUDED IN THE SCOPE OF THIS PROJECT.

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177 TIE ROAD, TIVERTON, ON

Project

SPP NORTH TRAIN

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A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn	J. SPENLER	Designer	C. DURIAS
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title

TREATMENT TRAINS HAZARDOUS AREA CLASSIFICATION

Bruce Power Sheet No.

NK37-DRAW-79600-10003

Sheet No.

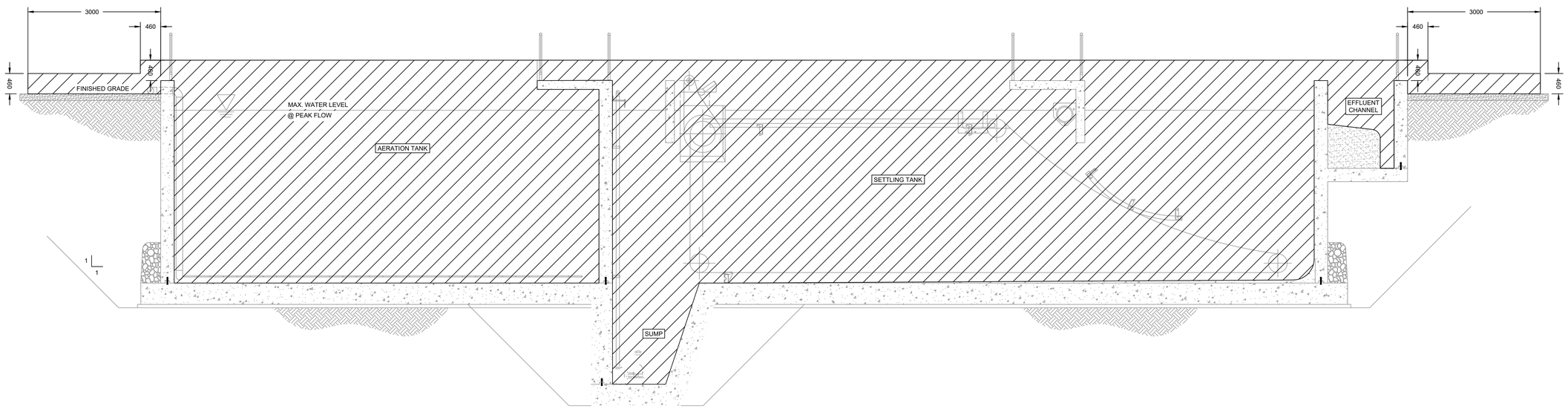
G-005

Sheet 5 of 63

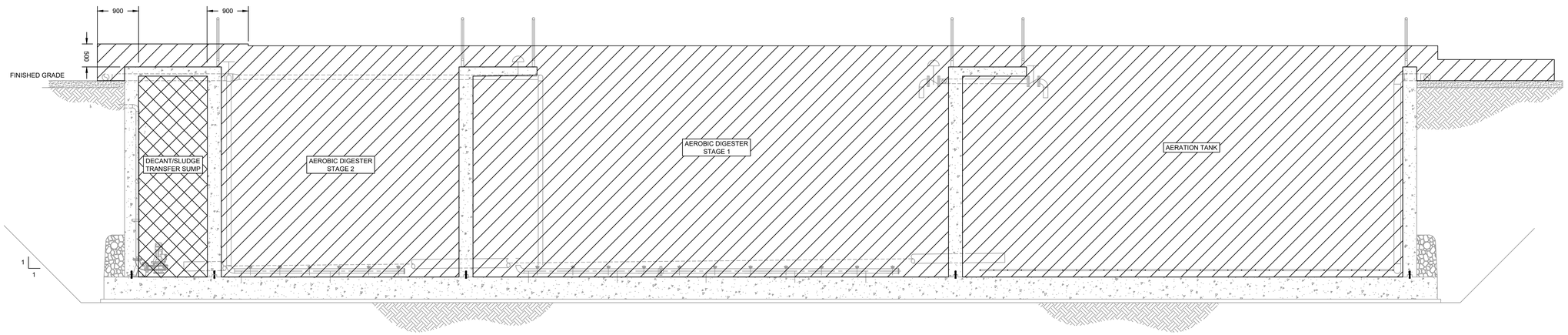
HAZARDOUS AREA CLASSIFICATIONS

CLASS 1, ZONE 1, GROUP IIA

CLASS 1, ZONE 2, GROUP IIA



SECTION A
1:50
G-005



SECTION B
1:50
G-005

NOTES:

1. EXISTING ELECTRICAL/ CONTROL/ MECHANICAL COMPONENTS OF EXISTING TRAINS (EXCEPTION RAS/WAS PUMPS) ARE NOT INCLUDED IN THE SCOPE OF THIS PROJECT.

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0 0.5 1.0 1.5m

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Project

SPP NORTH TRAIN

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Drafting Check	-	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title

HAZARDOUS AREA SECTIONS (1 OF 3)

Sheet No.

NK37-DRAW-79600-10032

Sheet No.

G-006

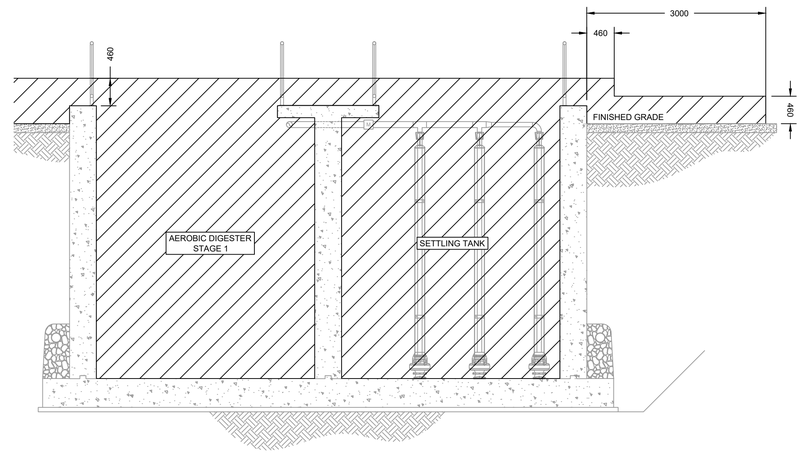
Sheet 6 of 63

Plot Date: 10 March 2021 - 9:34 AM Plotted By: Jason Spenler CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)GN\11216493-01(003)GN-WA006.dwg

HAZARDOUS AREA CLASSIFICATIONS

CLASS 1, ZONE 1, GROUP IIA

CLASS 1, ZONE 2, GROUP IIA



SECTION C
1:50
G-005

NOTES:

1. EXISTING ELECTRICAL/ CONTROL/ MECHANICAL COMPONENTS OF EXISTING TRAINS (EXCEPTION RAS/WAS PUMPS) ARE NOT INCLUDED IN THE SCOPE OF THIS PROJECT.

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Project
SPP NORTH TRAIN

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B	100% DESIGN REVIEW	MC	CE	11/13/20
A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn **J. SPENLER**	Designer **C. DURIAS**
Drafting Check **-**	Design Check **K. PICKERSGILL**
Project Manager **C. EVEREST**	Date **01/15/2021**
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Project No. **11216493**

Title
HAZARDOUS AREA SECTIONS (2 OF 3)

Sheet No.
NK37-DRAW-79600-10033

Sheet No.
G-007

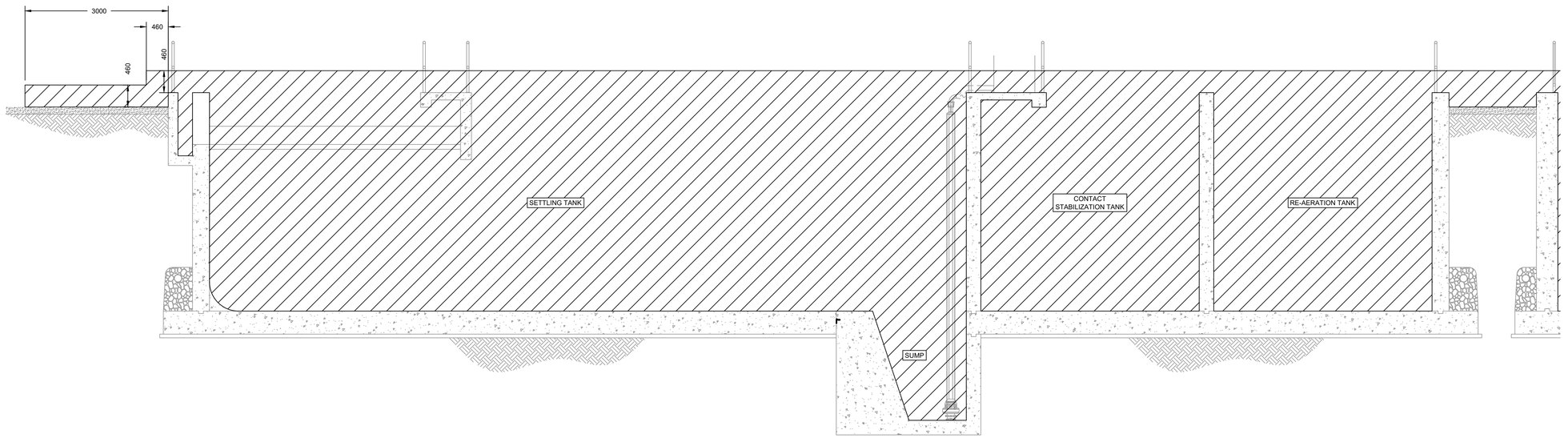
Sheet **7** of **63**

Plot Date: 10 March 2021 - 9:34 AM Plotted By: Jason Spenler CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)GN\11216493-01(003)GN-WA006.dwg

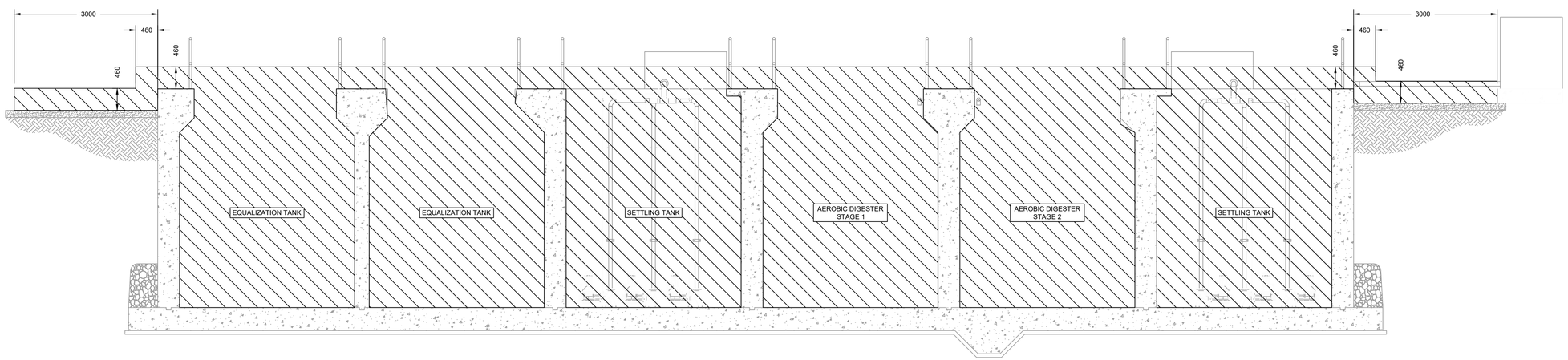
HAZARDOUS AREA CLASSIFICATIONS

CLASS 1, ZONE 1, GROUP IIA

CLASS 1, ZONE 2, GROUP IIA



SECTION D
1:50
G-005



SECTION E
1:50
G-005

NOTES:

1. EXISTING ELECTRICAL/ CONTROL/ MECHANICAL COMPONENTS OF EXISTING TRAINS (EXCEPTION RAS/WAS PUMPS) ARE NOT INCLUDED IN THE SCOPE OF THIS PROJECT.

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177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

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C	ISSUED FOR RFP	MC	CE	01/15/21
B	100% DESIGN REVIEW	MC	CE	11/13/20
A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn	J. SPENLER	Designer	C. DURIAS
Drafting Check	-	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

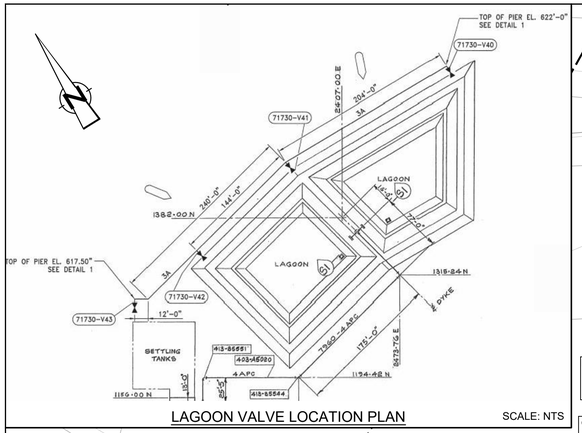
Title
HAZARDOUS AREA SECTION (3 OF 3)

Sheet No.
NK37-DRAW-79600-10034

Sheet No.
G-008

Sheet 8 of 63

Plot Date: 10 March 2021 - 9:34 AM Plotted By: Jason Spenler CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)GN\11216493-01(003)GN-WA006.dwg



LAGOON VALVE LOCATION PLAN SCALE: NTS

BRUCE POWER/OPG PROPERTY BOUNDARY

PR.HEAVY DUTY SILT FENCE AS PER OPSD 219.130

CHAIN LINK FENCE

CONTRACTOR TO COORDINATE WITH BRUCE POWER TO TEMPORARILY CLOSE VALVE 71730 V40 TO V42 FOR THE REMOVAL OF EX. 100mmØ ABOVE GROUND LAGOON DEWATERING LINE AND U/G CONCRETE FOOTING.

BURIED UTILITY TO BE LOCATED IN ACCORDANCE WITH GENERAL NOTE 3.

30m OF EX. CHAIN LINK FENCE TO BE REMOVED

EX. SUSPECTED GROUND WIRE TO BE LOCATED.

MILLING OF EXISTING ASPHALT TO BE COMPLETED WITH A 1m WIDE TRANSITION

CHAIN LINK FENCE TO BE REMOVED

EX. YARD HYDRANT TO BE REMOVED

EX. ASPHALT REMOVALS

EX. ELECTRICAL CABLE TO BE RELOCATED

BURIED UTILITY TO BE LOCATED IN ACCORDANCE WITH GENERAL NOTE 3.

EX. 40mm Ø WATER PIPE CLAMPED TO WALL TO BE TEMPORARILY CAPPED WITH WATER TIGHT FITTING AND REMOVED. ELEV=186.233

ASSUMED LOCATION OF 600-120/208V, 3 DIA., 9KVA EX. ELECTRICAL. BURIED UTILITY TO BE LOCATED IN ACCORDANCE WITH GENERAL NOTE 3

EX. 50mm Ø POTABLE WATER CLAMPED TO WALL C/L EL. 186.23

TEMPORARY LAYDOWN AERA

MAGNESIUM HYDROXIDE CHEMICAL INJECTION LINE FROM UV BUILDING. ASSUMED LOCATION, DEPTH UNKNOWN.

EXISTING DUCT INSTALLED UNDER SEWAGE PROCESSING PLANT CONTROLS UPGRADE PROJECT

SAWCUT AND EX. CONCRETE REMOVAL

EX. 300mm A.C. SEWAGE FORCE MAIN

EX. 150mm SEWAGE MAIN

EX. 250mm A.C. GRAVITY SEWER

EX. 250mm PVC EFFLUENT

EX. 250mm PVC INFLUENT

EX. 150mm Ø AC PERFORATED FOOTING DRAIN. EL 184.25

EX. 100mm PVC TO SLUDGE LAGOONS

EX. 100mm PVC TO SLUDGE LAGOONS

EX. CONCRETE PAD

EX. CONCRETE PAD

EX. PAVEMENT

EX. CONTROL BUILDING FF ELEV: 188.595

EX. GRASSED AREA

HEAVY DUTY SILT FENCE AS PER OPSD 219.130

EX. ELECTRICAL CABLE

EX. ASPHALT

EX. EQUALIZATION TANK

EX. TREATMENT TRAIN

EX. GRANULAR

EX. UV DISINFECTION BUILDING FF ELEV: 188.595

MH1

CB1

W.V.

LEGEND (EXISTING)

- MAJOR CONTOUR
- MINOR CONTOUR
- LIMIT OF CONSTRUCTION
- WATER LINE
- BURIED ELECTRICAL
- SANITARY SEWER
- DEWATERING LINE
- LAGOON DEWATERING
- CHAIN LINK FENCE
- CHEMICAL INJECTION LINE
- CATCHBASIN
- MANHOLE
- WATER VALVE
- YARD HYDRANT
- SPOT ELEVATION (2019)
- CONCRETE PIPE FOOTING
- GRANULAR
- CONCRETE
- ASPHALT

LEGEND (REMOVALS)

- LAGOON DEWATERING PIPE REMOVAL
- CHAIN LINK FENCE REMOVAL
- CLEARING AND GRUBBING
- ASPHALT AND CONCRETE REMOVALS
- REMOVALS

LEGEND

(EROSION AND SEDIMENT CONTROL)

- HEAVY DUTY SILT FENCE BARRIER, OPSD 219.130

GENERAL NOTE:

1. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ALL BENCHMARKS, ELEVATIONS, DIMENSIONS AND GRADES MUST BE CHECKED BY THE CONTRACTOR AND ANY DISCREPANCIES REPORTED TO THE ENGINEER. AT LEAST TWO DIFFERENT BENCHMARKS MUST BE REFERRED TO AT ALL TIMES.
2. THE ACCURACY OF THE EXISTENCE AND POSITION (HORIZONTAL/VERTICAL) OF POWER LINES, CONDUITS, WATERMAINS, SEWERS AND ANY AND ALL OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE NOT GUARANTEED.
3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, CONTRACTOR TO COMPLETE UTILITY LOCATES AND FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMITS OF CONSTRUCTION THAT SHALL BE MARKED AND PROTECTED BY THE CONTRACTOR. ANY UTILITIES DAMAGED OR DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTORS EXPENSE.
4. EXISTING DETAILS AND DIMENSIONS ARE APPROXIMATE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DETAILS AND DIMENSIONS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY PROTECTING AND SUPPORTING EXISTING UTILITIES AND STRUCTURES. THE CONTRACTOR SHALL ASSUME ALL LIABILITY FOR DAMAGE TO ALL EXISTING UTILITIES AND STRUCTURES DURING THE COURSE OF CONSTRUCTION.
6. CLEARING AND GRUBBING SHALL INCLUDE VEGETATION, FALLING AND REMOVAL OF TREES WITHIN THE LIMIT OF CONSTRUCTION.

SOURCE:

BENCHMARK "STATION 9" LOCATED AT ROCK POST IN NE CORNER OF SOUTH UTILITY DUCT MANHOLE. COORDINATE SYSTEM NAD83 UTM17, NORTHING: 4907848.095, EASTING: 452809.151, ELEVATION 187.841.

BENCHMARK "STATION 6" LOCATED AT ROCK POST IN NE CORNER OF SOUTH UTILITY DUCT MANHOLE. COORDINATE SYSTEM NAD83 UTM17, NORTHING: 4907979.902, EASTING: 452575.481, ELEVATION 185.987.

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SCALE 1:150

Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SH	CE	01/15/21
B	100% DESIGN SUBMISSION	DA	CE	11/13/20
A	90% DESIGN REVIEW	DA	CE	10/09/20

Drawn	D. AGUDELO	Designer	G. WONG
Drafting Check	B. PLETZ	Design Check	D. PAYNTER
Project Manager	C. EVEREST	Date	01/15/2021
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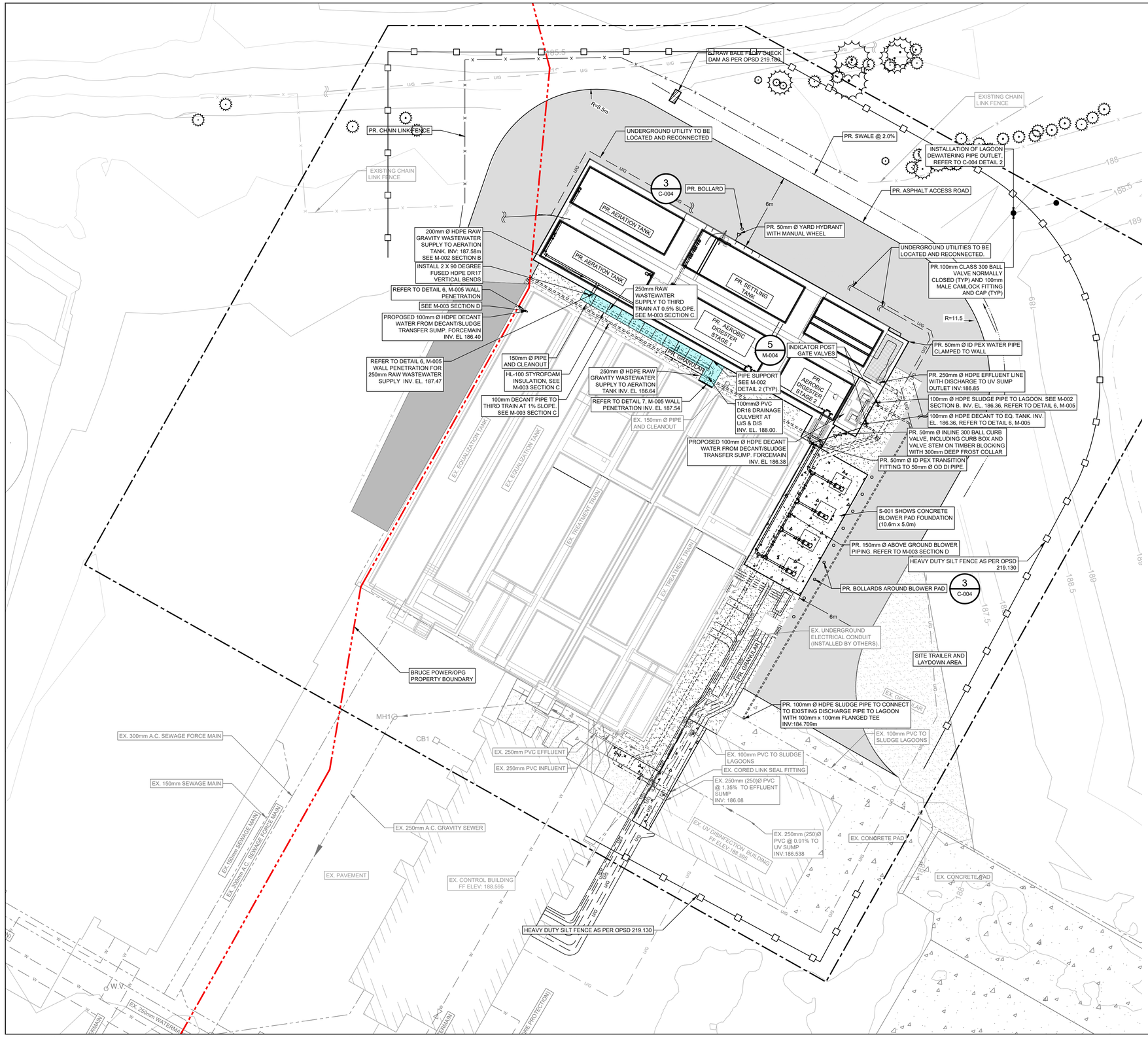
Project No. **11216493**

Title
SITE PLAN - EXISTING CONDITIONS AND REMOVALS

Bruce Power Sheet No.
NK37-DRAW-27610-10001

Sheet No.
C-001
Sheet 9 of 63

Plot Date: 10 March 2021 - 9:48 AM Plotted By: Spencer Holland CAD File: N:\CA\Waterloo\Projects\66211216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)CI\11216493-01(003)-CI-WA001.dwg



LEGEND (EXISTING)

- MAJOR CONTOUR
- MINOR CONTOUR
- LIMIT OF CONSTRUCTION
- WATER LINE
- ELECTRICAL
- SANITARY SEWER
- DEWATERING LINE
- LAGOON DEWATERING
- CHAIN LINK FENCE
- CB1 CATCHBASIN
- M.H.2 MANHOLE
- W.V. WATER VALVE
- YARD HYDRANT
- CONCRETE PIPE FOOTING
- GRANULAR
- CONCRETE
- ASPHALT

LEGEND (PROPOSED)

- FENCE
- HDPE UNDERGROUND UTILITY
- ABOVE GROUND BLOWER PIPE
- ASPHALT

LEGEND (EROSION AND SEDIMENT CONTROL)

- HEAVY DUTY SILT FENCE BARRIER, OPSD 219.130
- STRAW BALE CHECK DAM

SOURCE:

BENCHMARK "STATION 9" LOCATED AT ROCK POST IN NE CORNER OF SOUTH UTILITY DUCT MANHOLE. COORDINATE SYSTEM NAD83 UTM17, NORTHING: 4907848.095, EASTING: 452809.151, ELEVATION 187.841.

BENCHMARK "STATION 6" LOCATED AT ROCK POST IN NE CORNER OF SOUTH UTILITY DUCT MANHOLE. COORDINATE SYSTEM NAD83 UTM17, NORTHING: 4907979.902, EASTING: 452575.481, ELEVATION 185.987.

SEDIMENT AND EROSION CONTROL (SEC):

1. THE FOLLOWING NOTES ARE FOR SEDIMENT AND EROSION CONTROL WORKS ONLY AND SHOULD BE READ IN CONJUNCTION WITH ALL OTHER NOTES AS IDENTIFIED IN THE DRAWINGS.
2. SEC TO BE IN CONFORMANCE WITH BRUCE POWER STANDARDS AND TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR/ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE SURFACE DRAINAGE FOR THE DURATION OF THE CONSTRUCTION PERIOD.
4. THE CONTRACTOR IS TO PROTECT ALL EXPOSED SURFACES AND CONTROL ALL RUN-OFF DURING CONSTRUCTION.
5. ALL REMOVED MATERIALS, INCLUDING SEDIMENTS FROM SEDIMENT CONTROL DEVICES, SHALL BE DISPOSED OFFSITE UNLESS OTHERWISE NOTED. OFFSITE DISPOSAL TO BE AT AN APPROVED LOCATION ACCEPTABLE TO AND IN ACCORDANCE WITH THE REGULATIONS. THE CONTRACTOR SHALL PREPARE AND PROVIDE ALL APPROPRIATE DOCUMENTATION IN ACCORDANCE WITH OPSS 180 - GENERAL SPECIFICATION FOR THE MANAGEMENT OF EXCESS MATERIALS.
6. THE CONTRACTOR SHALL INSTALL CONTROL MEASURES PRIOR TO COMMENCING ANY WORK AND MAINTAIN THESE MEASURES UNTIL CONSTRUCTION HAS BEEN COMPLETED AND UNTIL VEGETATION HAS TAKEN, TO THE SATISFACTION OF BRUCE POWER AND THE CONTRACT ADMINISTRATOR/ENGINEER. All CONTROL MEASURES TO BE REMOVED UPON DIRECTION BY THE CONTRACT ADMINISTRATOR/ENGINEER.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL SEC DEVICES AND STRUCTURES IN GOOD WORKING ORDER AT ALL CONTRACTOR SHALL INSPECT SUCH DEVICES DAILY AND AFTER EACH RAINFALL AND MAKE All NECESSARY REPAIRS AS REQUIRED, CONTRACTOR SHALL BE ON SITE DURING LARGE STORM EVENTS (>30mm WITHIN 24 HOUR PERIOD) TO MONITOR CONTROL DEVICES AND IMMEDIATELY TAKE CORRECTIVE ACTIONS AS REQUIRED.
8. CONTRACTOR SHALL PROTECT All EXISTING CATCHBASINS, MAINTENANCE HOLES, CHAMBERS AND PIPE ENDS FROM SEDIMENT INTRUSION WITH GEOTEXTILE (TERRAFIX 270R) OR APPROVED EQUIVALENT.
9. CONTRACTOR SHALL PREVENT WIND-BLOWN DUST.
10. THE CONTRACT ADMINISTRATOR/ENGINEER MAY MAKE ANY NECESSARY REVISIONS TO THE PROPOSED SEC PLAN AS DEEMED NECESSARY DURING CONSTRUCTION.
11. CONTRACTOR WILL MAINTAIN AN ON-SITE A SUPPLY OF SEC DEVICES TO ALLOW IMMEDIATE REPAIRS AS REQUIRED. SUPPLIES SHALL INCLUDE BUT ARE NOT LIMITED TO STRAW BALES, SANDBAGS, SNOW FENCE, FILTER CLOTH, AND STAKES.
12. THE CONTRACTOR IS RESPONSIBLE FOR CLEANUP OF MUD TRACKING ON A CONSTANT BASIS. SWEEPER TO BE MOBILIZED ON SITE, WHERE REQUIRED BY THE CONTRACT ADMINISTRATOR/ENGINEER TO PROVIDE SWEEPING ON ROADS AND PARKING AREAS.
13. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL SEC DEVICES ONCE THE DISTURBED AREAS DRAINING TO THESE DEVICES HAVE BEEN RE-VEGETATED AND HAVE STABILIZED.

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0 1.5 3 4.5m
SCALE 1:150

Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SH	CE	01/15/21
B	100% DESIGN SUBMISSION	DA	CE	11/13/20
A	90% DESIGN REVIEW	DA	CE	10/09/20

Drawn	D. AGUDELO	Designer	G. WONG
Drafting Check	B. PLETZ	Design Check	D. PAYNTER
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**

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0 20mm

Project No. **11216493**

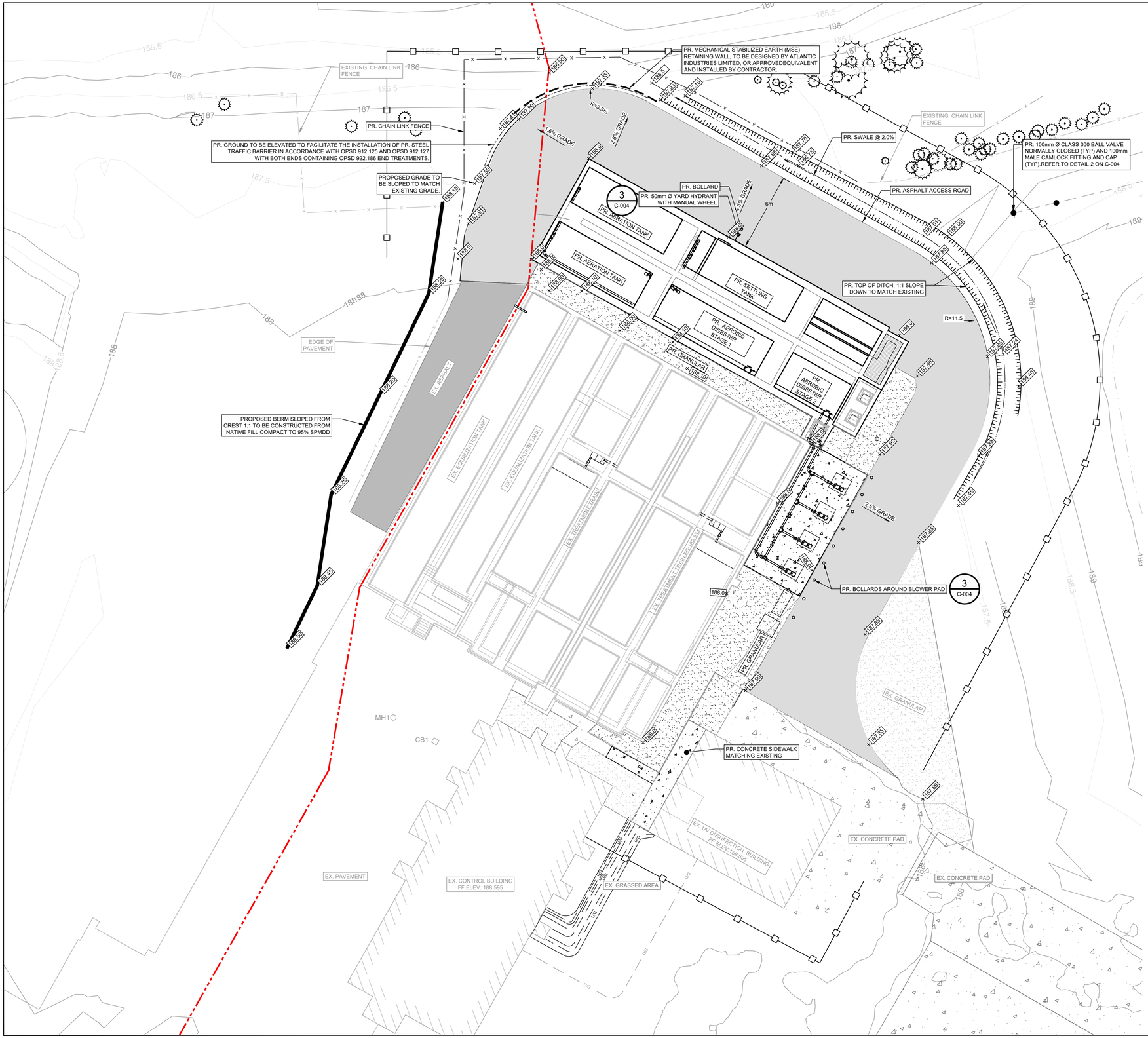
Title
SITE PLAN - UNDERGROUND PIPING, RELOCATIONS, SEDIMENT AND EROSION CONTROL

Bruce Power Sheet No.
NK37-DRAW-27610-10002

Sheet No.
C-002

Sheet **10** of **63**

Plot Date: 11 March 2021 - 4:13 PM Plotted By: Spencer Holland CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)CI\11216493-01(003)-CI-WA002.dwg



LEGEND (EXISTING)

- MAJOR CONTOUR
- MINOR CONTOUR
- WATER LINE
- ELECTRICAL
- SANITARY SEWER
- DEWATERING LINE
- LAGOON DEWATERING
- CHAIN LINK FENCE
- CATCHBASIN
- MANHOLE
- WATER VALVE
- YARD HYDRANT
- CONCRETE PIPE FOOTING
- GRANULAR
- CONCRETE
- ASPHALT

LEGEND (PROPOSED)

- FENCE
- TOP OF BANK
- STEEL TRAFFIC BARRIER
- ASPHALT
- GRANULAR

LEGEND (EROSION AND SEDIMENT CONTROL)

- HEAVY DUTY SILT FENCE BARRIER, OPSD 219.130

ROAD BUILD-UP :

40mm HL3 SURFACE COURSE ASPHALT COMPACTED TO 92% MARSHALL DENSITY
60mm HL8 BASE COURSE ASPHALT COMPACTED TO 92% MARSHALL DENSITY
250mm GRANULAR 'A' ROAD BASE COMPACTED TO 100% SPMDD
300mm GRANULAR 'B' BASE COMPACTED TO 100% SPMDD

PROPOSED GRANULAR BUILD-UP
250mm GRANULAR 'A' ROAD BASE COMPACTED TO 100% SPMDD
300mm GRANULAR 'B' BASE COMPACTED TO 100% SPMDD

SUBGRADE TO BE SLOPED MIN. 2% AWAY FROM TREATMENT TANKS AND GRANULAR TO BE PLACED AT MAX. 150mm LIFTS.

SOURCE:

BENCHMARK "STATION 9" LOCATED AT ROCK POST IN NE CORNER OF SOUTH UTILITY DUCT MANHOLE. COORDINATE SYSTEM NAD83 UTM17, NORTHING: 4907848.095, EASTING: 452809.151, ELEVATION 187.841.

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NOTE:

TO BE COMPLETED UPON RECEIVING TOPOGRAPHICAL INFORMATION.

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Client
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177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SH	CE	01/15/21
B	100% DESIGN SUBMISSION	DA	CE	11/13/20
A	90% DESIGN REVIEW	DA	CE	10/09/20

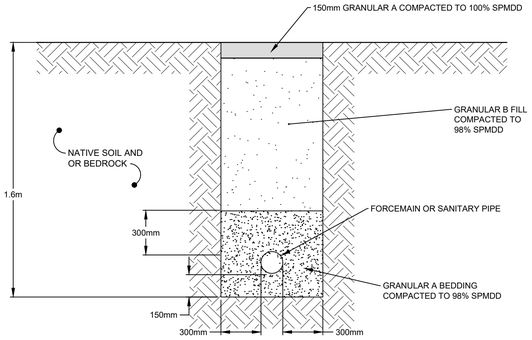
Drawn	D. AGUDELO	Designer	G. WONG
Drafting Check	B. PLETZ	Design Check	D. PAYNTER
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title
GRADING AND DRAINAGE

Bruce Power Sheet No.
NK37-DRAW-27610-10003

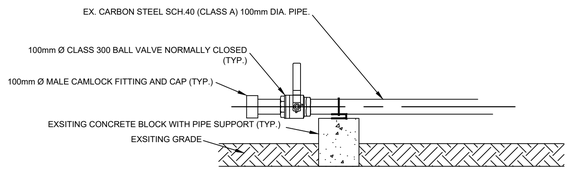
Sheet No.
C-003
Sheet **11** of **63**



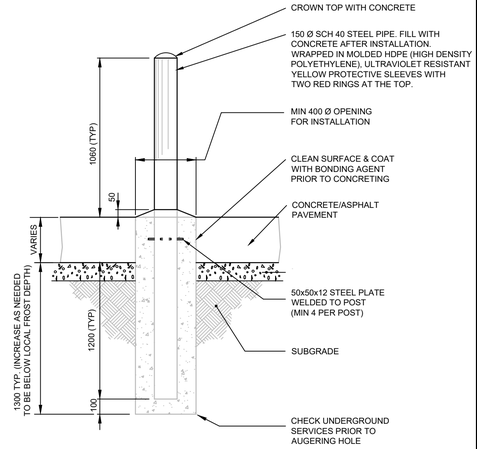
NOTES:

1. NO MECHANICAL COMPACTION EQUIPMENT SHALL BE USED ON TOP OF PIPE PRIOR TO PLACING A MIN. OF 300mm COVER
2. BEDDING MATERIALS SHALL BE PLACED AND COMPACTED IN 150mm LAYERS.
3. FILTER FABRIC SHALL BE USED IF GROUNDWATER TABLE IS ABOVE THE TRENCH BED OR IF GROUNDWATER IS FLOWING INTO TRENCH THROUGH EMBEDMENT ZONE.
4. EXCAVATION SHALL FOLLOW REQUIREMENTS OF OHSA.
5. CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL SHORING FOR TRENCH.

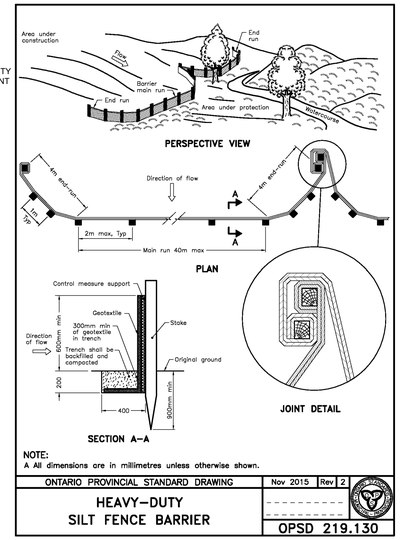
DETAIL 1 (C-002) PIPE TRENCH
NTS



DETAIL 2 (C-002) 100mm Ø LAGOON DEWATERING PIPE OUTLET
NTS

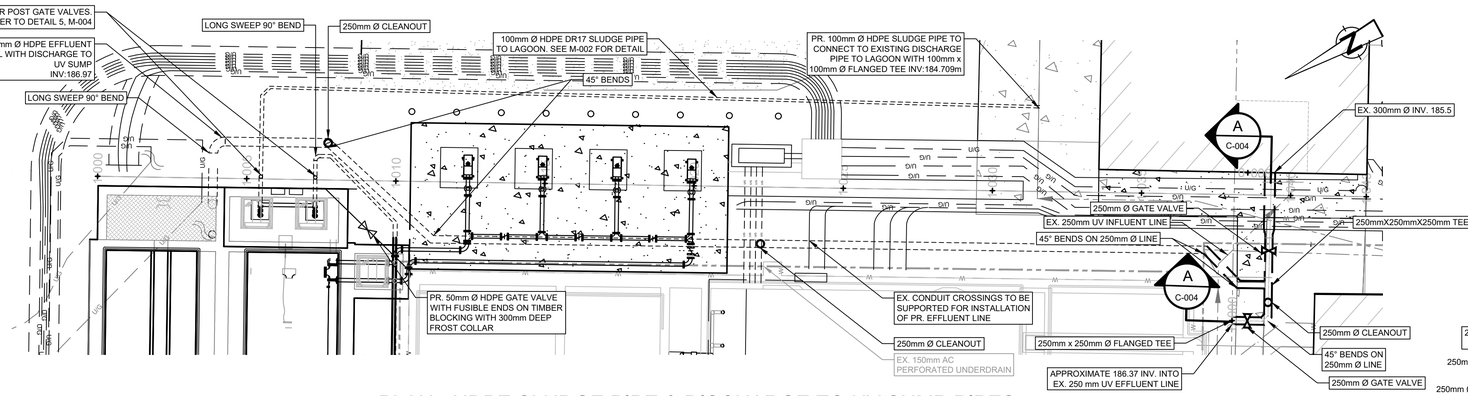


DETAIL 3 (C-002) BOLLARD DETAIL
NTS

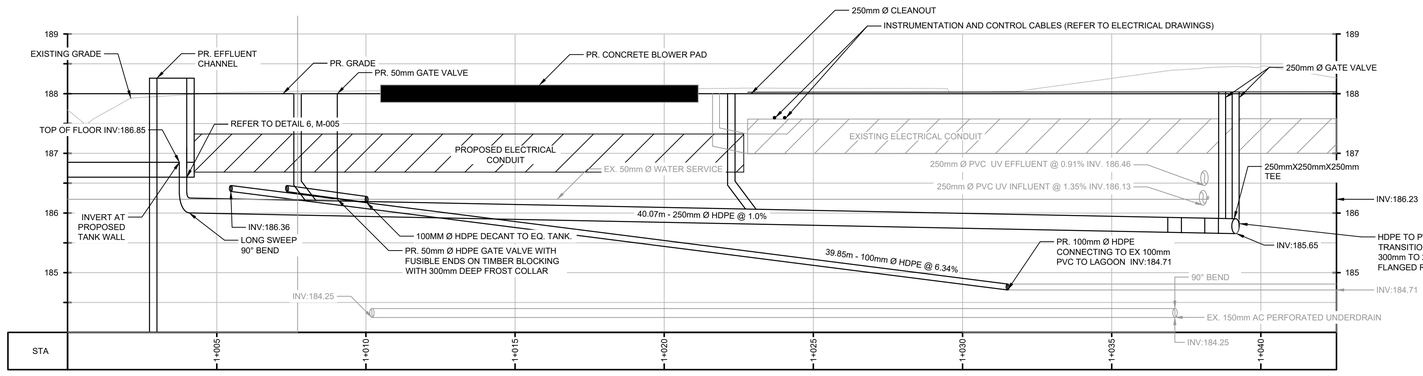


NOTE:
A All dimensions are in millimetres unless otherwise shown.

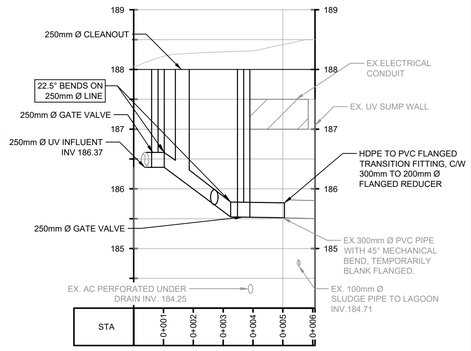
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
HEAVY–DUTY SILT FENCE BARRIER		OPSD 219.130



PLAN - HDPE SLUDGE PIPE & DISCHARGE TO UV SUMP PIPES
REFER TO ELECTRICAL DRAWINGS E-001, E-006 AND E-010 FOR ELECTRICAL ALIGNMENT AND DEPTHS



PROFILE - HDPE SLUDGE PIPE & DISCHARGE TO UV SUMP PIPES
H=1:100
V=1:50



SECTION A (C-004)
H=1:100
V=1:50

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Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SH	CE	01/15/21
B	100% DESIGN SUBMISSION	DA	CE	11/13/20
A	90% DESIGN REVIEW	DA	CE	10/09/20

Drawn	D. AGUDELO	Designer	G. WONG
Drafting Check	B. PLETZ	Design Check	D. PAYNTER
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

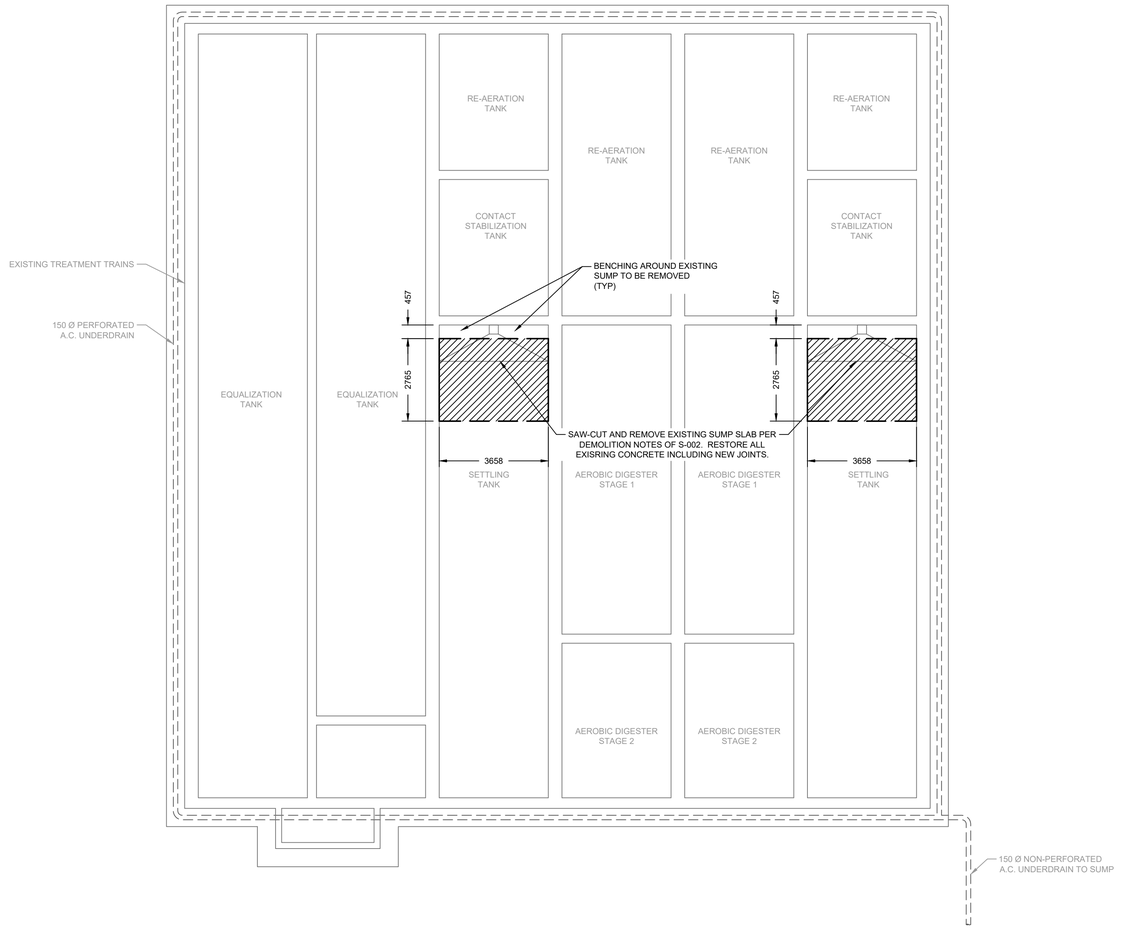
Project No. **11216493**

Title
TYPICAL DETAILS

Bruce Power Sheet No.
NK37-DRAW-27610-10004

Sheet No.
C-004

Sheet 12 of 63



NOT FOR CONSTRUCTION

DRAFT

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177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	JS	CE	01/15/21
B	100% DESIGN REVIEW	JS	CE	11/13/20
A	90% DESIGN REVIEW	JS	CE	10/09/20

Drawn	J. SPENLER	Designer	A. AMEEN
Drafting Check	B. PLETZ	Design Check	T. MORRISON
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**		Bar is 20mm on original size drawing 0 20mm	

Project No. **11216493**

Title
EXISTING CONDITIONS/ REMOVALS (EXISTING TREATMENT TRAINS)

Bruce Power Sheet No.
NK37-DRAW-79600-10025

Sheet No.
S-001R
Sheet **13** of **63**

GENERAL

1. ALL WORK SHALL COMPLY WITH CURRENT PROVISIONS OF THE NATIONAL BUILDING CODE (NBC) 2015 AND ONTARIO BUILDING CODE (OBC) (2012). WORK SHALL COMPLY WITH LOCAL, PROVINCIAL AND NATIONAL REGULATIONS AND WITH APPLICABLE CSA STANDARDS. IN ALL CASES THE LATEST EDITIONS OF CODES AND STANDARDS SHALL APPLY.
2. WORK SHALL COMPLY WITH ALL REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT.
3. LOCATE ALL BURIED AND OVER HEAD SERVICES PRIOR TO EXCAVATION OR DRILLING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING, SHORING AND DEWATERING NECESSARY TO UNDERTAKE THE WORK.
4. READ THESE DRAWINGS IN CONJUNCTION WITH ALL RELATED DRAWINGS AND CONTRACT DOCUMENTS.
5. THE CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND MEASUREMENTS AT THE SITE AND REPORT TO THE ENGINEER ANY DISCREPANCIES OR UNSATISFACTORY CONDITIONS WHICH MAY ADVERSELY AFFECT THE PROPER COMPLETION OF THE JOB BEFORE PROCEEDING WITH THE WORK. ALL KEY STRUCTURAL ELEVATIONS ARE SUBJECT TO ADJUSTMENT PENDING FINAL CONFIRMATORY TOPOGRAPHIC SURVEY. ALL KEY CONSTRUCTION ELEVATIONS ARE BASED ON THE EXISTING SPP TREATMENT TANK TOP OF WALL ELEVATION OF 188.26m. ALL OTHER ELEVATIONS SHOULD NBE CONSIDERED RELATIVE TO THIS ELEVATION.
6. DO NOT SCALE DRAWINGS.
7. CONSTRUCTION, FABRICATION AND SHOP DRAWING REVIEW MUST BE PROVIDED PER CODE.
8. ALL DIMENSIONS ON DRAWINGS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
9. APPROVED SHALL MEAN APPROVED IN WRITING BY THE ENGINEER OF RECORD.
10. DELIVER, HANDLE AND STORE MATERIALS TO AVOID DAMAGE IN ANY MANNER.
11. MAINTAIN A SET OF DRAWINGS ON SITE & UPDATE WEEKLY WITH CONSTRUCTION RECORD INFORMATION.
12. EXECUTE RABAR SCANNING BEFORE CUTTING OR CORING OF ANY EXISTING CONCRETE STRUCTURES. REVIEW SCANNING RESULTS WITH ENGINEER BEFORE PROCEEDING TO CUT REBAR OR CUT/CORE CONCRETE.

MATERIALS

UNLESS NOTED OTHERWISE ON THE DRAWINGS THE FOLLOWING MATERIALS SHALL BE USED FOR CONSTRUCTION:

1. CONCRETE:

TYPE	LOCATION	28 DAY STRENGTH f'c (MPa)	CEMENT TYPE	AGGREG MAX. (mm)	CSA EXPOSURE CLASS	AIR ENTRAINMENT (%)	SUPPLEMENTARY CEMENTING MATERIAL	CONCRETE ADDITIVES
1	TANKS AND SUMPS BASE AND WALLS, CATWALKS AND BENCHING	32 @ 56 DAYS	GU	20	A-2	CAT 2 4-7	NR	NR
2	BLOWER FOUNDATION PAD.	35 @ 28 DAYS	GU	20	C-1	CAT 2 4-7	NR	NR

2. REINFORCING STEEL: CARBON STL. BARS TO CSA G30.18, - GRADE 400R, GRADE 400W WHERE WELDING IS REQUIRED.
3. BEARING GROUT: 50 MPa - 28 DAY MIN. COMP. STRENGTH, NON SHRINK, NON METALLIC.
4. GALVANIZING: ASTM A123/A123M, ASTM A153/A153M, AND ASTM F2329.
5. ADHESIVE ANCHORING: ADHESIVE ANCHORING SYSTEM SHALL BE HILTI HIT-HY 200 ADHESIVE ANCHORING SYSTEM (OR APPROVED EQUIVALENT). ANCHOR RODS SHALL BE HILTI STANDARD STAINLESS STEEL HAS ROD MATERIAL, TO THE REQUIREMENTS OF ASTM F593 (CONDITION CW/CW1). HAS STAINLESS STEEL NUT MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM F594. STAINLESS STEEL WASHERS SHALL MEET THE DIMENSIONAL REQUIREMENTS OF ANSI/ASME B18.21.1 TYPE A PLAIN AND THE REQUIREMENTS OF ASTM A240.
6. WELDING: CSA W59, W55.3, AND W47.1 - SERIES E49XX ELECTRODES.
7. ALUMINUM: ALUMINUM TO CSA S157-05(2015), 6061-T6 ALUMINUM ALLOY. MINIMUM FY = 240 MPa AND REDUCED AT HEAT AFFECTED WELD ZONES PER CSA S157-05(2015)

FOUNDATION

1. REFERENCE GEOTECHNICAL INVESTIGATION NUMBER 11216493, REPORT NUMBER 6, DATED SEP. 6, 2020 BY GHD.
2. FOUND ALL TANK BASE SLABS ON UNDISTURBED NATIVE SOIL OR ON ENGINEERED FILL . REMOVE ALL SOFT MATERIALS OR FILL MATERIALS AND REPLACE WITH ENGINEERED FILL COMPACTED TO 100% SPMDD. ALL FOUNDATION DESIGNS BASED ON A NET BEARING RESISTANCE OF 120 kPa (SLS) AND 180 kPa (ULS). BEARING RESISTANCE SHALL BE CONFIRMED ON SITE BY A QUALIFIED GEOTECHNICAL ENGINEER REGISTERED TO PRACTICE IN ONTARIO AND SUPPLIED BY THE CONTRACTOR.
3. MAINTAIN UNSUPPORTED SIDES OF EXCAVATION ONLY IF SAFE INCLINATION OF THE SIDES OF THE EXCAVATION IS PROVIDED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS AND/OR MUNICIPAL, PROVINCIAL OR NATIONAL REGULATIONS.
4. IF REQUIRED, ERECT, MAINTAIN, AND REMOVE A SUPPORTING SHORING SYSTEM ALONG THE SIDES OF THE EXCAVATION. DETAIL SUCH SYSTEM IN ACCORDANCE WITH THE SOIL REPORT RECOMMENDATIONS.
5. PROTECT SOIL FROM FREEZING ADJACENT TO AND BELOW ALL TANK BASE SLABS, WALLS AND EQUIPMENT PADS.
6. BACKFILL AGAINST WALLS IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND AS SHOWN ON THE DRAWINGS. BACKFILL MATERIAL SHALL BE PLACED IN LOOSE LIFT THICKNESS NOT EXCEEDING 300 mm COMPACTED TO NOT LESS THAN 98% SPMDD.
7. EXCAVATED MATERIAL MAY BE REUSED FOR BACKFILL AGAINST THE WALLS PROVIDED MOISTURE CONTENT IS CONTROLLED, THE SILT CONTENT AND FROST SUSCEPTIBILITY ARE NOT EXCESSIVE, THE MATERIAL IS FREE OF ORGANIC OR OTHER DELETERIOUS MATERIAL AND BACKFILL MATERIAL SHALL BE APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER AND RECOMPACTED TO 98% SPMDD.
8. INSULATION: EXTRUDED POLYSTRENE INSULATION TO CAN/ULC S701 TYPE 4. STANDARD OF ACCEPTANCE SHALL BE STYROFOAM BRAND SM INSULATION, 210 kPA COMPRESSIVE STRENGTH, C/W SHIP-LAPPED EDGES BY DOW BUILDING SOLUTIONS, OR APPROVED EQUIVALENT.

BUILDING DESIGN NBC 2015/OBC 2012 - KINCARDINE, ON DESIGN LOADS (ALL UNFACTORED)

1. SNOW AND RAIN LOADS
   - i) SNOW AND ASSOCIATED RAIN LOAD (1/50 Ss = 2.6 kPa, Sr = 0.4 kPa) — 2.48 kPa
   - ii) IMPORTANCE FACTOR (NORMAL) — 1.0
2. CATWALK
   - i) DEAD LOAD (200 SLAB) — 4.7 kPa
   - ii) LIVE LOAD — 4.8 kPa
3. WIND LOADS
   - $q\frac{1}{50}$ VELOCITY PRESSURE — 0.5k kPa
   - Ce EXPOSURE FACTOR — 0.9
   - IMPORTANCE FACTOR, Iw (NORMAL) — 1.0
4. WALL LOADS
   - SOIL UNIT WEIGHT — 22.0 kN/m^3 , ko = 0.50
   - WATER INSIDE THE TANKS — 11.0 kN/m^3
5. SEASONAL MAXIMUM HIGH WATER TABLE ASSUMED TO BE AT TOP OF THE TANKS BASE SLAB.
6. FOUNDATION AND TANK WALLS HAVE BEEN DESIGNED FOR A LIVE LOAD SURCHARGE EQUIVALENT TO 800mm OF ADDITIONAL FILL MATERIAL ON OUTSIDE OF WALL.
7. SEISMIC LOADS
   - SITE CLASS D
   - IMPORTANCE FACTOR (NORMAL) — 1.0
   - Sa(0.2) — 0.076
   - Sa(0.5) — 0.058
   - Sa(1.0) — 0.037
   - Sa(2.0) — 0.019
   - PGA — 0.043

CAST-IN-PLACE CONCRETE

1. ALL CAST-IN-PLACE CONSTRUCTION SHALL CONFORM TO CSA A23.1-14 (CONCRETE MATERIAL AND METHODS OF CONCRETE CONSTRUCTION) AND CSA A23.3-14 (DESIGN OF CONCRETE STRUCTURES), AS APPLICABLE.
2. MINIMUM CONCRETE COVER SHALL CONFORM TO THE VALUES LISTED IN CSA A23.1-14 - TABLE 17, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
3. ALL REINFORCING BARS SHALL BE SUPPORTED IN THE FORMS AND SPACED WITH STANDARD ACCESSORIES. TIE WIRE USED SHALL BE 16 GAUGE, BLACK ANNEALED WIRE, UNLESS SPECIFIED OTHERWISE. ALL BAR SUPPORTS SHALL CONFORM TO THE BAR SUPPORT STANDARDS AND STANDARD NOMENCLATURE AS SHOWN IN THE RSIC MANUAL OF STANDARD PRACTICE (LATEST EDITION).
4. REINFORCING IS TO BE GENERALLY DETAILED IN ACCORDANCE WITH RSIC MANUAL OF STANDARD PRACTICE (LATEST EDITION).
5. CONCRETE PLACING, CURING AND TESTING SHALL CONFORM TO CSA A23.1-14/A23.2-14 (CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION/TEST METHODS AND STANDARD PRACTICES FOR CONCRETE.)
6. FORMWORK AND TOLERANCES SHALL CONFORM TO CSA A23.1-14
7. NO CUTTING OR DRILLING IN HARDENED CONCRETE IS PERMITTED WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER OF RECORD.
8. ALL EMBEDDED STEEL EXPOSED TO THE EXTERIOR OR EXTERIOR WALL CAVITIES SHALL BE HOT DIP GALVANIZED UNLESS NOTED OTHERWISE.
9. THE REINFORCEMENT STEEL FABRICATOR SHALL SUPPLY PLACING DRAWINGS AND BAR LISTS IN ACCORDANCE WITH THE RSIC MANUAL OF STANDARD PRACTICE. THE ENGINEER SHALL APPROVE WITH CORRECTIONS, OR DISAPPROVE PROPOSED DETAILS. ALL REINFORCING STEEL IN PLACE TO BE REVIEWED BY ENGINEER BEFORE POURING CONCRETE.
10. ALL TANKS, CHAMBERS AND CHANNELS SHALL BE WATER TIGHT AND LEAK TESTED IN ACCORDANCE WITH ACI 350.1-10, SECTION 2, 0.05% PERMISSIBLE LEAKAGE PER DAY. PROVIDE PVC WATERSTOP, CONTINUOUS IN ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS.
11. PROVIDE 20x20 CHAMFERED EDGE ON ALL EXPOSED CONCRETE CORNERS AS REQUIRED.

DEMOLITION NOTES

1. PROTECT EXISTING TANK SURFACES AROUND THE WORKING AREA.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TEMPORARY SHORING/BRACING AND DEWATERING AS REQUIRED.
3. CONDUCT DEMOLITION TO MINIMIZE INTERFERENCE WITH ADJACENT STRUCTURES AND EQUIPMENT..
4. CONDUCT OPERATIONS WITH MINIMUM INTERFERENCE TO ACCESSES. MAINTAIN PROTECTED EGRESS AND ACCESS AT ALL TIMES.
5. DEMOLISH IN AN ORDERLY AND CAREFUL MANNER.
6. AT THE END OF EACH DAY'S WORK, LEAVE WORK IN A SAFE AND SECURE CONDITION SO THAT NO PART IS IN DANGER OF TOPPLING OR FALLING AND UNAUTHORIZED ADMITTANCE IS PROHIBITED.
7. REMOVE MATERIALS AS WORK PROGRESSES. UPON COMPLETION OF WORK, LEAVE AREAS IN CLEAN CONDITION.
8. DISPOSAL OF MATERIAL REMOVED SHALL BE SPECIFIED IN A PLAN TO BE DEVELOPED BY CONTRACTOR.
9. CONFORM TO APPLICABLE CODE FOR THE DEMOLITION, SAFETY OF ADJACENT STRUCTURES, DUST CONTROL, AND DISPOSAL.
10. CUT, REMOVE AND DISPOSE OF CONCRETE SHOWN ON DRAWINGS. CUT EMBEDDED REINFORCEMENT MINIMUM 25mm BELOW THE SURFACE OF THE CONCRETE AND GROUT THE HOLE WITH NON-SHRINK GROUT.
11. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOUR AND EQUIPMENT TO PROVIDE SCANNING OF CONCRETE PRIOR TO ANY CUTTING, CORING, OR DEMOLITION TO CONFIRM LOCATION OF REBAR AND EMBEDDED UTILITIES. NO CUTTING OF REBAR OR EMBEDDED UTILITIES IS PERMITTED UNLESS APPROVED BY THE ENGINEER.

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177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	JS	CE	01/15/21
B	100% DESIGN REVIEW	JS	CE	11/13/20
A	90% DESIGN REVIEW	JS	CE	10/09/20

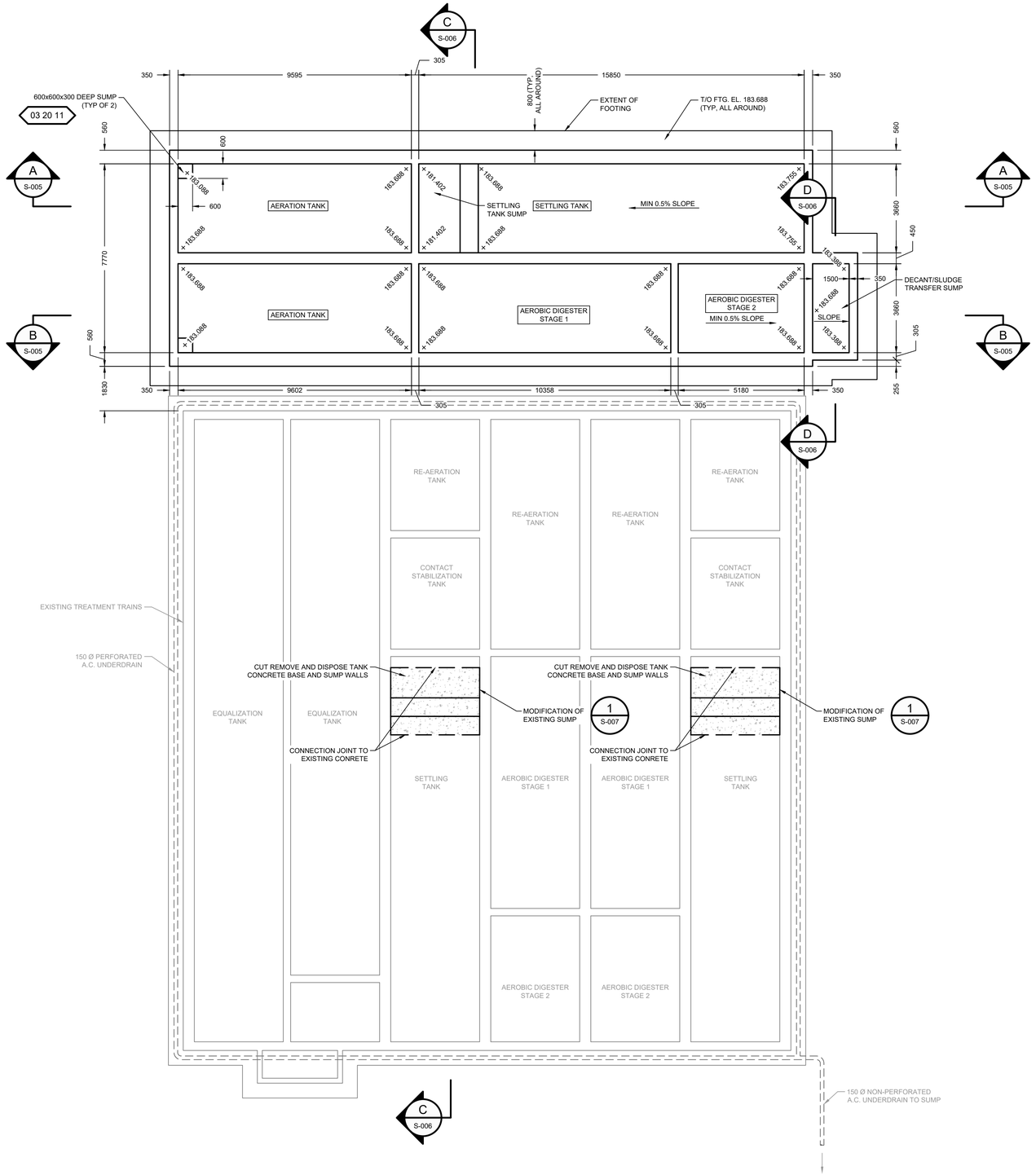
Drawn	J. SPENLER	Designer	A. AMEEN
Drafting Check	B. PLETZ	Design Check	T. MORRISON
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

Project No. **11216493**

Title
STRUCTURAL NOTES

Bruce Power Sheet No.
NK37-DRAW-79600-10019

Sheet No.
S-002
Sheet **14** of **63**



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0 1 2 3m

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Project No. **11216493**

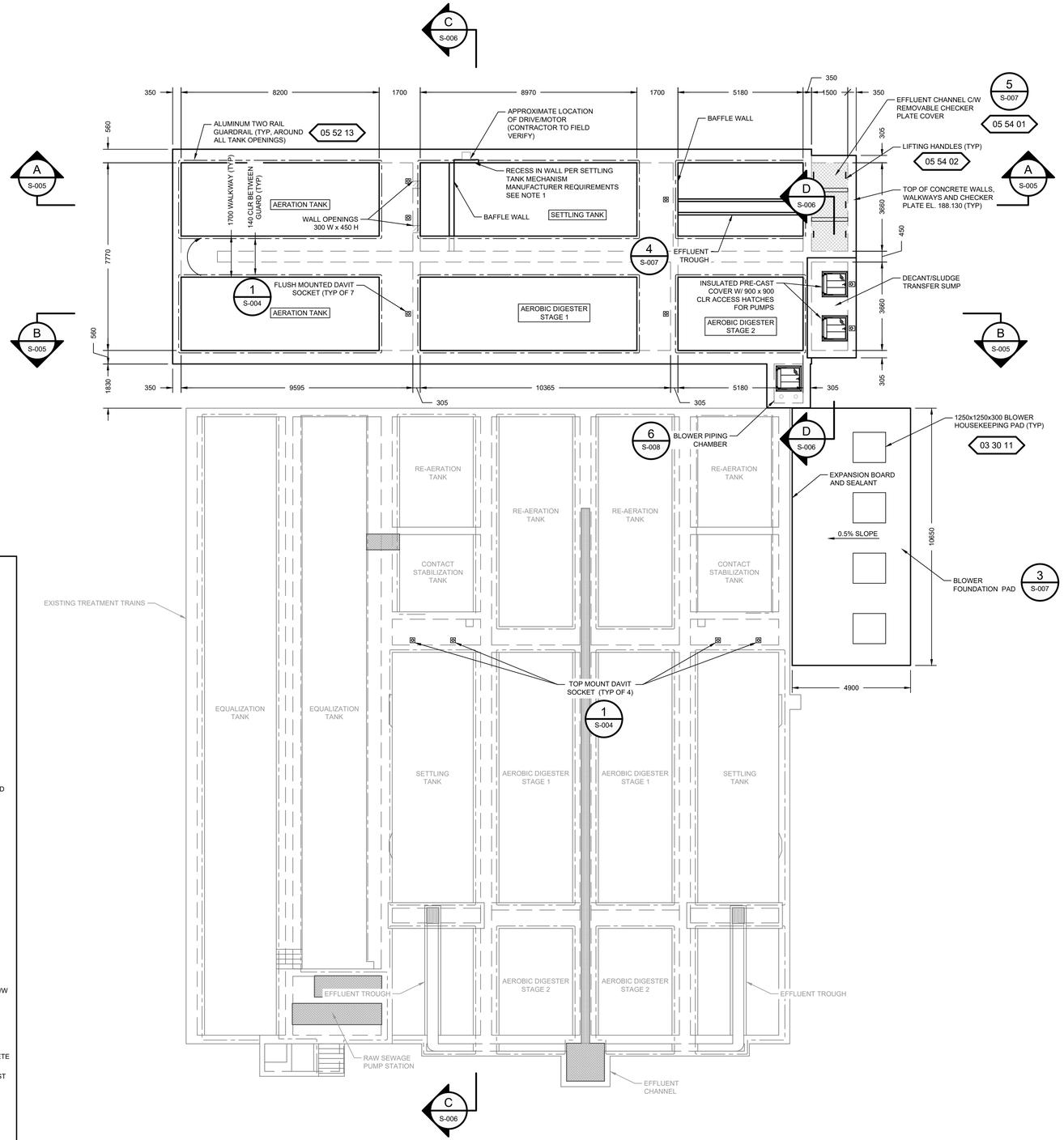
Title
FOUNDATION PLAN AT EL. 185.000

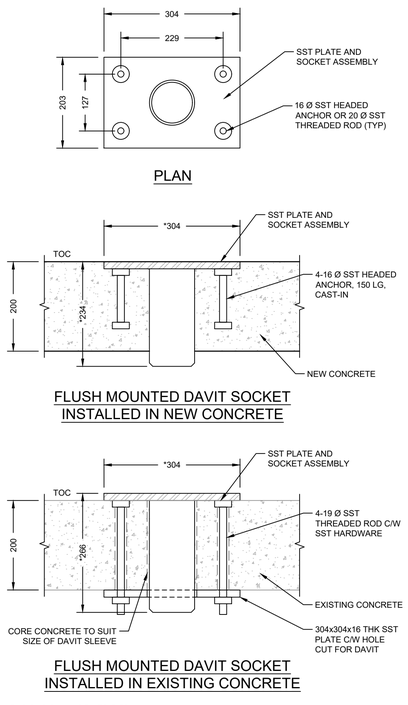
Bruce Power Sheet No.
NK37-DRAW-79600-10020

Sheet No.
S-003

Sheet **15** of **63**

NOTES:
1. SHOP DRAWINGS DETAILING STRUCTURAL REQUIREMENTS OF THE FINAL SETTLING TANKS ARE TO BE FINALIZED PRIOR TO INITIATION OF CONSTRUCTION OF THE THIRD (NORTH) TRAIN.





NOTE: *DIMENSIONS SHALL BE VERIFIED BY DAVIT SOCKET SUPPLIER.

DETAIL 1 S-004 DAVIT SOCKET
NTS

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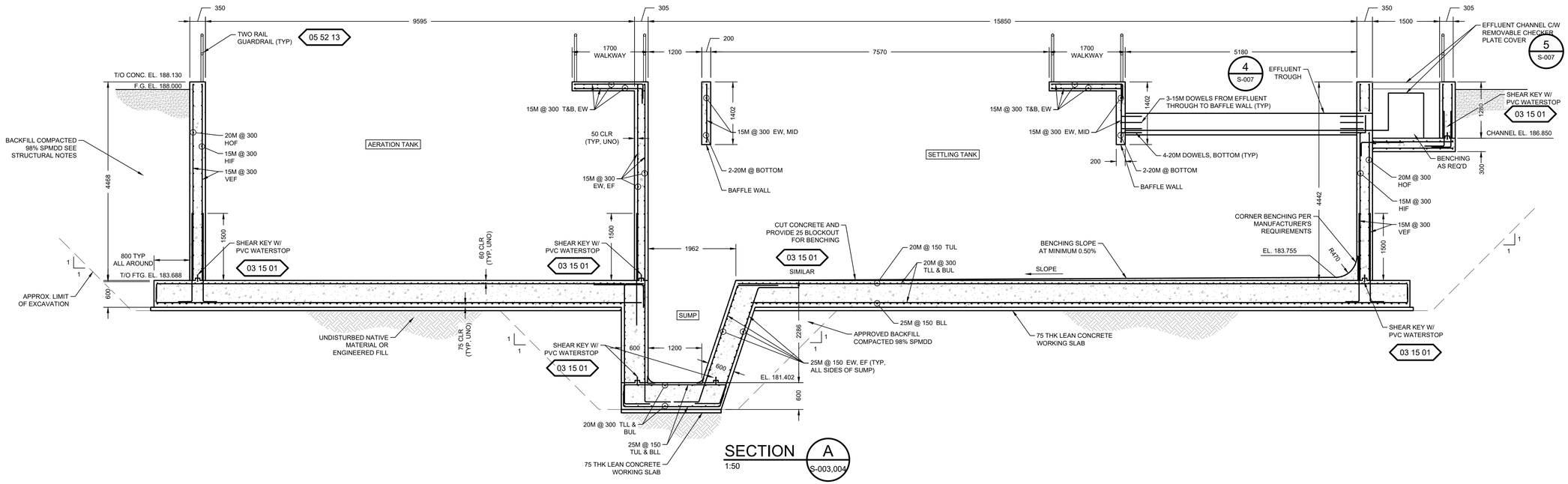
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T/O CONCRETE PLAN AT EL. 190.000

Bruce Power Sheet No.
NK37-DRAW-79600-10021

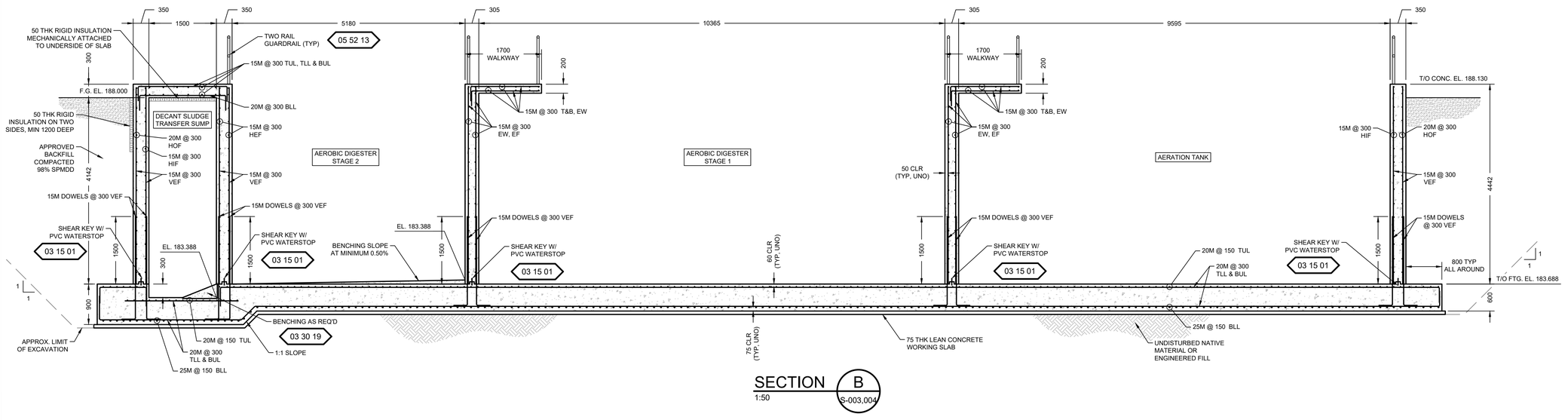
Sheet No.
S-004
Sheet 16 of 63

Plot Date: 8 March 2021 - 8:54 PM Plotted By: Jason Spenler CAD File: N:\CA\Waterloo\Projects\66\21\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)ST\11216493-01(003)ST-WA001.dwg

NOTE:
REINFORCING NOT SHOWN
IS SECTION 'A' FOR CLARITY.



SECTION A
1:50
S-003,004



SECTION B
1:50
S-003,004

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0 0.5 1.0 1.5m

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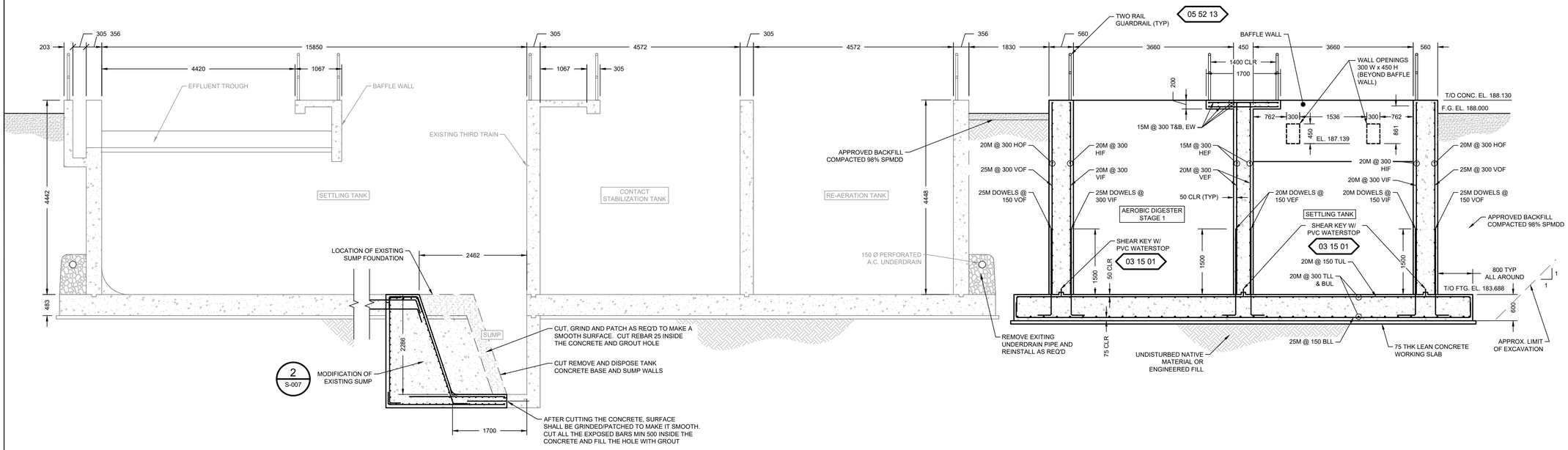
Project No. **11216493**

Title
TANK SECTIONS (1 OF 2)

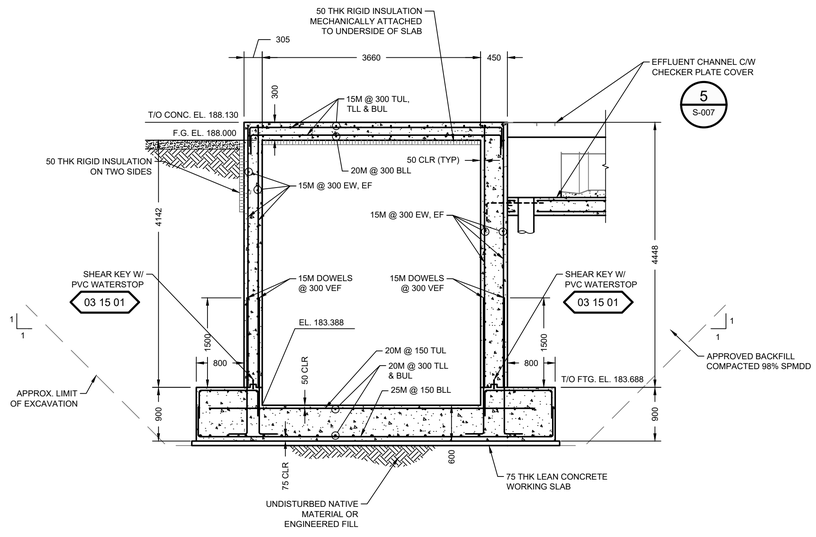
Bruce Power Sheet No.
NK37-DRAW-79600-10022

Sheet No.
S-005

Sheet 17 of 63



SECTION C
1:50
S-003,004



SECTION D
1:50
S-003,004

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0 0.5 1.0 1.5m

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Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

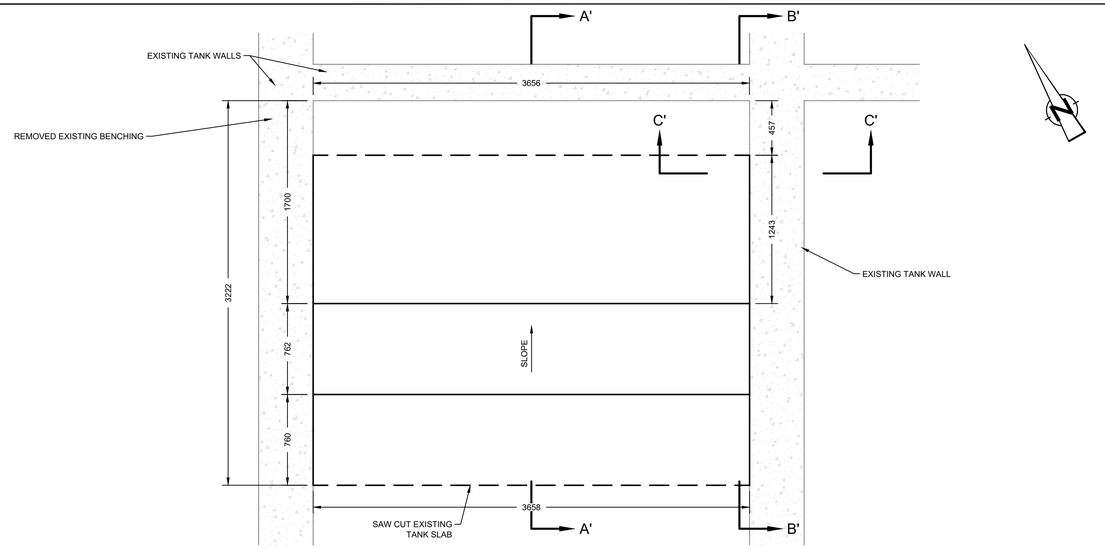
Project No. **11216493**

Title
TANK SECTIONS (2 OF 2)

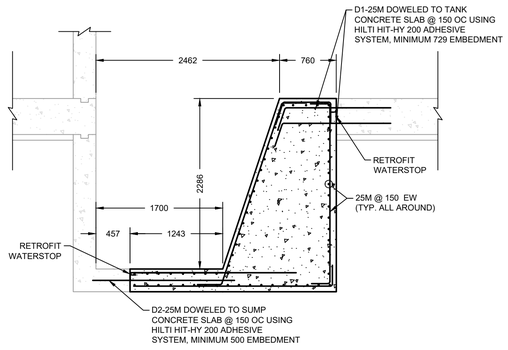
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NK37-DRAW-79600-10023

Sheet No.
S-006

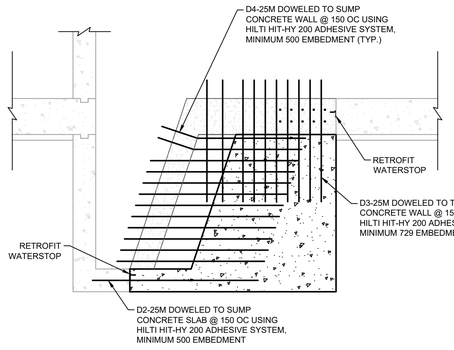
Sheet **18** of **63**



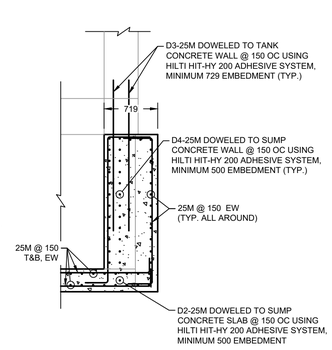
ENLARGED PLAN - EXISTING SUMP
1:25



SECTION A'-A'
1:40



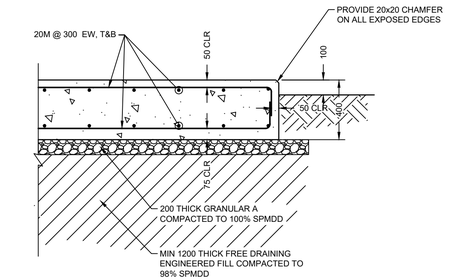
SECTION B'-B'
1:40



SECTION C'-C'
1:40

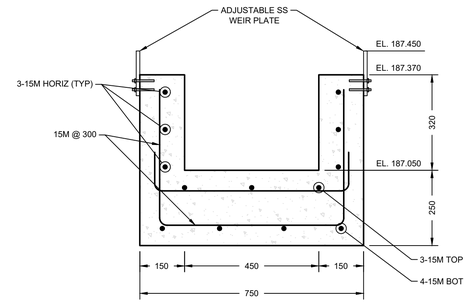
NOTE:
D1 = DOWEL TYPE 1
D2 = DOWEL TYPE 2
D3 = DOWEL TYPE 3
D4 = DOWEL TYPE 4

DETAIL 2 — EXISTING SUMP MODIFICATIONS
AS SHOWN — S-003,006

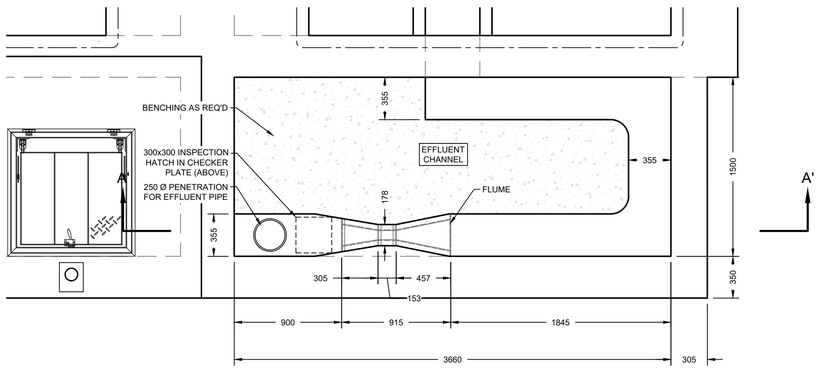


DETAIL 3 — BLOWER PAD
N.T.S. — S-004

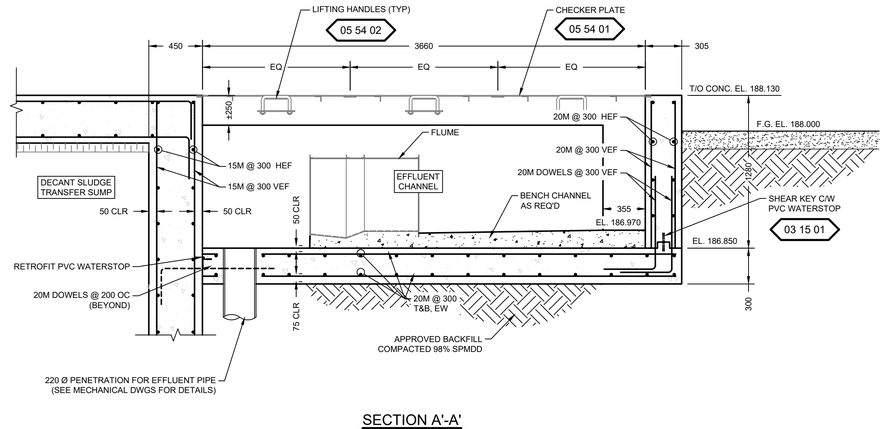
NOTE: ADJUSTABLE SS WEIR PLATE RUNS FULL LENGTH OF EITHER SITE EFFLUENT TROUGH.



DETAIL 4 — EFFLUENT TROUGH
AS SHOWN — S-005



PLAN



SECTION A'-A'

DETAIL 5 — EFFLUENT CHANNEL
1:25 — S-004

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Drafting Check	B. PLETZ	Design Check	T. MORRISON
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size
ANSI D

Bar is 20mm on original size drawing
0 20mm

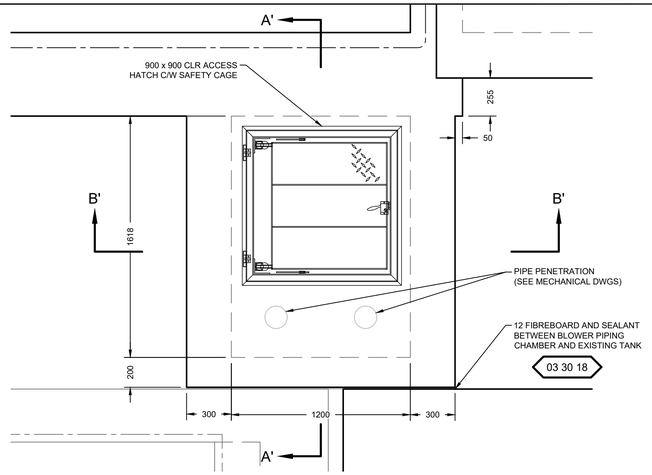
Project No. **11216493**

Title
STRUCTURAL DETAILS (1 OF 5)

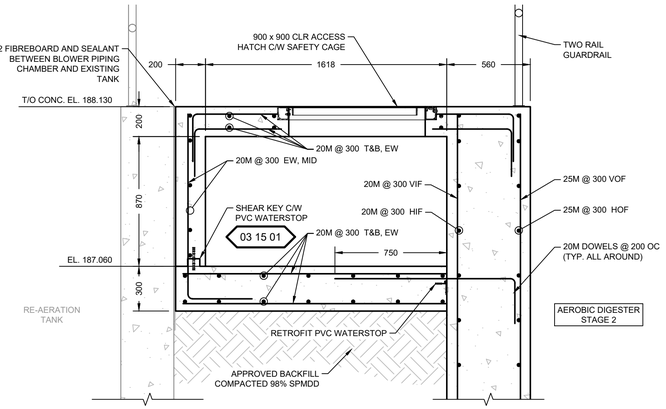
Bruce Power Sheet No.
NK37-DRAW-79600-10026

Sheet No.
S-007

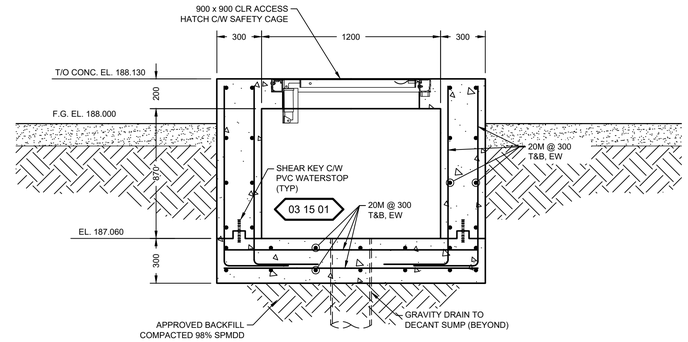
Sheet **19** of **63**



PLAN



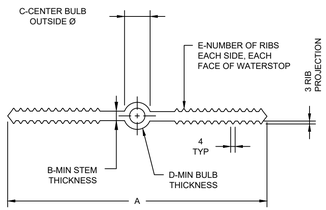
SECTION A'-A'

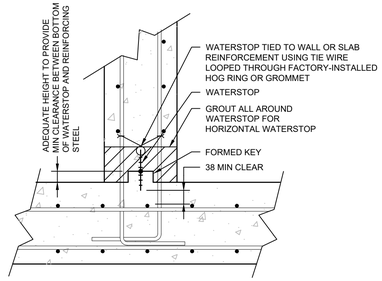


SECTION B'-B'

NOTE:
REFER TO MECHANICAL DRAWINGS FOR GRAVITY DRAIN LOCATION AND DETAILS.

DETAIL 6 BLOWER PIPING CHAMBER
1:20
S-004





RIBBED WATERSTOP

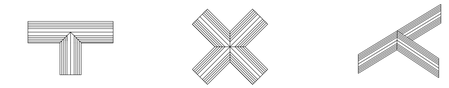
VERTICAL AND HORIZONTAL
WATERSTOP

NOTES:

1. MATERIAL QUALITY PER SPECIFICATIONS. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
2. INSTALL WATERSTOP AT VERTICAL AND HORIZONTAL CONSTRUCTION JOINTS LOCATED IN: LIQUID CONTAINING STRUCTURES AND STRUCTURES WITH BASEMENTS AND SECONDARY CONTAINMENT STRUCTURES (OR AT LOCATIONS SPECIFIED IN THE DRAWINGS).
3. SECURE WATERSTOP IN PLACE USING SPLIT FORMS OR OTHER APPROVED METHODS, TO ENSURE CORRECT POSITIONING AND PROPER EMBEDMENT OF THE WATERSTOP IN CONCRETE.
4. CENTER BULB OF WATERSTOP SHALL BE CENTERED ALONG CONSTRUCTION JOINT AND SHALL BE SUPPORTED SUFFICIENTLY ALONG THE LENGTH TO HOLD IT IN PLACE DURING CONCRETE PLACEMENT.
5. FOR WALLS WITH ONE LAYER REINFORCEMENT, PLACE WATERSTOP ON WET SIDE OF REINFORCEMENT AND TIE IN PLACE TO PROVIDE MIN 38mm CLEARANCE OF WATERSTOP TO REINFORCING.
6. GROUT AROUND WATERSTOP TO BE CAST MONOLITHIC WITH WALL CONCRETE. VIBRATE GROUT AND CONCRETE AROUND WATERSTOP THOROUGHLY TO ELIMINATE VOIDS OR HONEYCOMBING.

SIZE	A	B	C	D	E
150 x10	150	10	22	6	8
230 x10	230	10	25	6	8

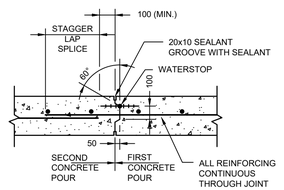
WATERSTOP 03 15 01



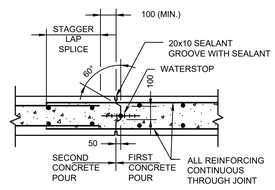
NOTES:

1. PROVIDE FACTORY WELDED WATERSTOP CORNERS AND TRANSITIONS LEAVING ONLY STRAIGHT BUTT JOINT SPLICES FOR FIELD FABRICATION.
2. EMBEDDED WATERSTOPS MAY NOT BE WELDED OR JOINED TO OTHER WATERSTOPS OF DIFFERENT SIZE, CONFIGURATION OR MATERIAL.
3. USE ONLY A SPLICING IRON RECOMMENDED BY THE MANUFACTURER FOR HEAT FUSED WELDING.
4. SPLICES ARE TO BE HEAT WELDED WITH THE CENTER BULB AND RIBS ALIGNED. THE WELD SHALL PENETRATE FULL DEPTH OF THE WATERSTOP MATERIAL.
5. ADHESIVES, SOLVENTS, LAP JOINTS AND EDGE WELDING ARE NOT ACCEPTABLE.
6. ALLOW FOR INSPECTION OF ALL WATERSTOP INSTALLATIONS, CONNECTIONS AND SPLICES PRIOR TO PLACING CONCRETE.

EMBEDDED PVC WATERSTOP
JOINTING DETAILS 03 15 02



SINGLE MAT REINFORCEMENT
TOP ELEVATION



DOUBLE MAT REINFORCEMENT
TOP ELEVATION

NOTES:

1. CONSTRUCTION JOINTS SHALL BE PLACED AS SHOWN OR NOTED ON THE DRAWINGS. WALL CONSTRUCTION JOINT OR CONTROL JOINT SHALL BE PLACED AT A MAXIMUM SPACING OF 15 METRES IN WALLS MORE THAN 25 METRES LONG.
2. WATERSTOPS AND SEALANT GROOVES SHALL BE INSTALLED IN ALL LIQUID RETAINING AND SECONDARY CONTAINMENT WALLS.
3. FOR JOINTS WITH WATERSTOPS: APPLY 2 COATS OF BOND BREAKER TO FACE OF JOINT. DO NOT COAT WATERSTOP AND SEALANT GROOVE.
4. FOR WALLS WITH ONE LAYER OF REINFORCEMENT, PLACE WATERSTOP ON WET SIDE OF REINFORCEMENT AND TIE IN PLACE TO PROVIDE MINIMUM 38mm CLEARANCE BETWEEN WATERSTOP AND REINFORCING STEEL.

VERTICAL CONSTRUCTION JOINT 03 20 04

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Drawn	J. SPENLER	Designer	A. AMEEN
Drafting Check	B. PLETZ	Design Check	T. MORRISON
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

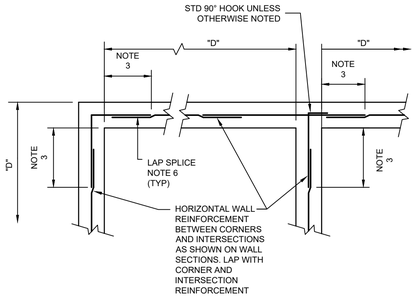
Project No. **11216493**

Title
STRUCTURAL DETAILS (2 OF 5)

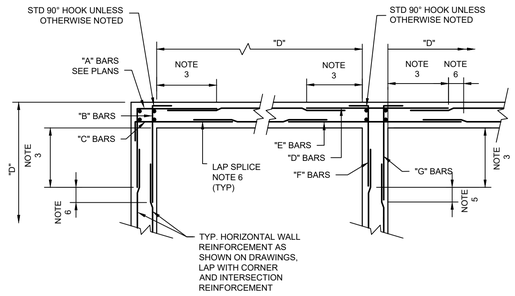
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NK37-DRAW-79600-10027

Sheet No.
S-008

Sheet **20** of **63**



SINGLE MAT CORNER AND INTERSECTION REINFORCEMENT



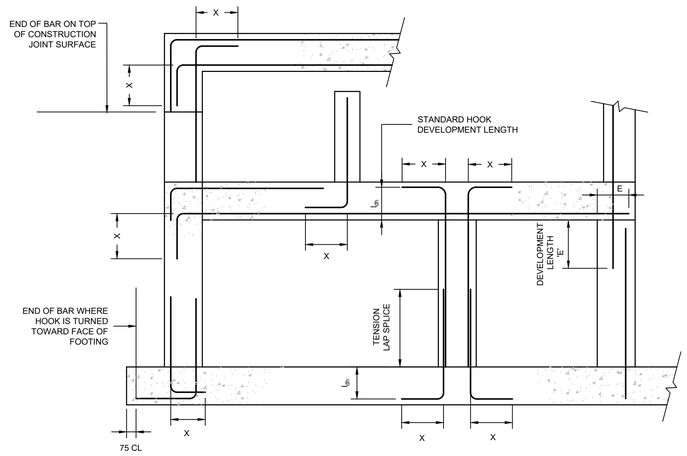
DOUBLE MAT CORNER AND INTERSECTION REINFORCEMENT

NOTES:

1. TYPICAL HORIZONTAL WALL CORNER AND INTERSECTION REINFORCEMENT LAYOUT IS SHOWN TO AVOID CONGESTION AND PERMIT PROPER PLACEMENT. FOR SIZE AND SPACING SEE PLANS.
2. WHERE THE CORNER OR INTERSECTION REINFORCEMENT SIZE AND SPACING IS NOT SHOWN, NOTED OR TABULATED ON THE DRAWINGS THE SIZE AND SPACING SHALL BE THE SAME AS THE WALL HORIZONTAL REINFORCEMENT SHOWN ON THE WALL SECTIONS OR AS NOTED FOR THE REINFORCEMENT BETWEEN THE CORNERS OR INTERSECTION.
3. FOR WALLS WHERE D IS LESS THAN THE HEIGHT OF THE WALL, UNLESS OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 3" SHALL BE D/4, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN 600.
4. FOR CASES WHERE D ≥ THE HEIGHT OF THE WALL, CORNER AND INTERSECTION WALLS MAY USE CONTINUOUS STANDARD HOOKED BARS OR THE SPLICE BAR METHOD WITHOUT THE NEED TO SHIFT THE LAP AS NOTED IN 3. ABOVE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
5. D = LENGTH OF WALL PARALLEL TO THE BAR LENGTH IN QUESTION.
6. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 6" SHALL BE EQUAL TO ONE TENSION LAP SPLICE LENGTH AS REQUIRED BY THE GENERAL STRUCTURAL NOTES. USE THE LAP SPLICE LENGTH AS REQUIRED FOR THE SMALLER OF THE TWO REINFORCEMENT BARS BEING SPLICED.
7. UNLESS OTHERWISE NOTED, "B" AND "C" BARS ARE THE SAME SIZE AND SPACING AND, "F" AND "G" BARS ARE THE SAME SIZE AND SPACING.

CONCRETE WALL REINFORCEMENT

03 20 01



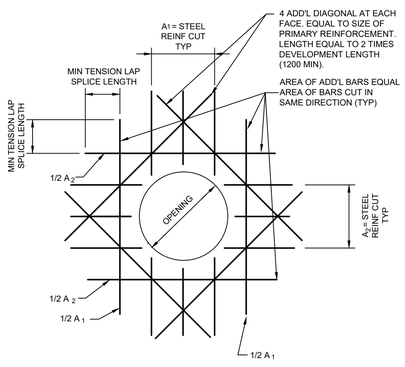
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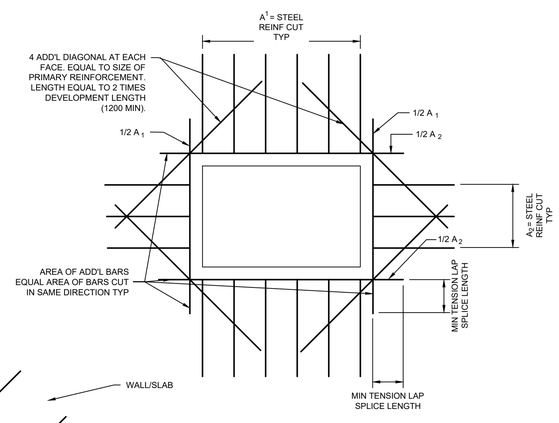
1. USE DEVELOPMENT LENGTHS AND LAP SPLICE LENGTHS BASED ON CSA STANDARD A23.3, AND USING APPROPRIATE FACTORS AS APPLICABLE, UNLESS OTHERWISE SHOWN.
2. THE TABLE BELOW IS FOR f'_c=25 MPa AND f_y=400 MPa, UNCOATED REINFORCEMENT, NORMAL DENSITY CONCRETE, CLEAR COVER TO BARS IS > BAR DIAMETER, AND BAR SPACING IS > TWO BAR DIAMETERS.
3. MULTIPLY THE LAP SHOWN IN THESE TABLES BY 1.3 FOR HORIZONTAL BARS CAST WITH GREATER THAN 300 FRESH CONCRETE UNDERNEATH. MULTIPLY THE LAP & DEVELOPMENT LENGTH SHOWN BY 1.5 FOR EPOXY COATED REINFORCEMENT. FOR BOTH TOP BARS AND EPOXY COATED REINFORCEMENT, MULTIPLY BY 1.7.
4. WHEN BARS OF DIFFERENT SIZE ARE LAP SPLICED, LAP LENGTH SHALL BE THE LARGER OF:
   - EMBEDMENT LENGTH OF LARGER BAR
   - LAP LENGTH OF SMALLER BAR
5. ALL DOWEL BARS SHALL EXTEND A DEVELOPMENT LENGTH E INTO ANOTHER MEMBER OR ACROSS A CONSTRUCTION JOINT UNLESS SHOWN TO SPLICE WITH OTHER BARS OR TO EXTEND TO THE FAR FACE OF THE MEMBER AND END WITH A STANDARD HOOK.
6. l_{dh} = STANDARD HOOK DEVELOPMENT LENGTH, IN ACCORDANCE WITH CSA A23.3, SECTION 12.5

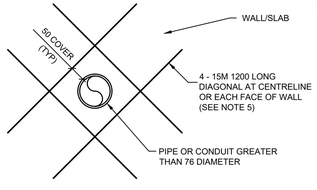
BAR SIZE	HOOK 'X'	TENSION LAP SPLICE (CLASS B)	DEVELOPMENT LENGTH 'E'	HOOK EMBEDMENT l_{dh}
10M	180	380	300	150
15M	260	570	440	210
20M	310	750	580	280
25M	400	1170	900	350
30M	510	1410	1080	420
35M	610	1640	1260	490

STANDARD 90° BAR HOOKS, EMBEDMENT LENGTHS AND LAP LENGTHS

03 20 02







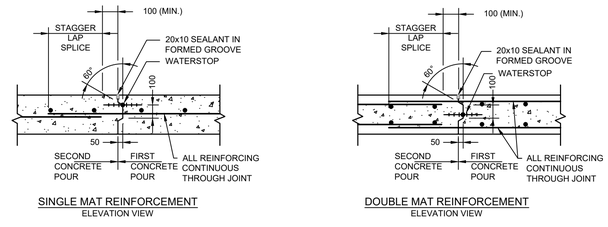
NOTES:

1. TYPICAL FOR ALL OPENINGS IN WALLS AND SLABS UNLESS INDICATED OTHERWISE ON PLANS.
2. FOR PIPE SLEEVE REQUIREMENTS AND DETAILS SEE MECHANICAL DRAWING. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.
3. FOR SMALL DIAMETER PIPE OPENINGS WHICH DO NOT REQUIRE CUTTING OF THE REINFORCEMENT AND ARE >76Ø SUPPLY 4 DIAGONAL BARS AS SHOWN IN DETAIL (SEE ALSO NOTE 5 FOR BAR LOCATIONS)
4. AREA OF ADDITIONAL BARS PER EACH SIDE OF OPENING EQUALS 1/2 AREA OF BARS CUT IN SAME DIRECTION.
5. ADDITIONAL BARS TO BE PLACED:
   a) AT CENTERLINE OF WALLS OR SLABS WHERE ONE LAYER OF REINFORCEMENT IS PROVIDED.
   b) AT EACH FACE OF WALLS OR SLABS WHERE TWO LAYERS OF REINFORCEMENT ARE REQUIRED.
6. INCREASE SIZE OF ADDITIONAL BARS AS NEEDED TO FIT WITHIN A DISTANCE OF 2X WALL/SLAB THICKNESS FROM OPENING. PROVIDE 50 MIN CLEAR DISTANCE BETWEEN BARS.

NO WALL/SLAB REINFORCING INTERRUPTED FOR SMALL DIAMETER PIPE OPENING REINFORCEMENT (GREATER THAN 76 DIAMETER)

CONCRETE OPENING REINFORCEMENT

03 20 03



SINGLE MAT REINFORCEMENT
ELEVATION VIEW

DOUBLE MAT REINFORCEMENT
ELEVATION VIEW

NOTES:

1. CONSTRUCTION JOINTS SHALL BE PLACED AS SHOWN OR NOTED ON THE DRAWINGS.
2. WATERSTOPS AND SEALANT GROOVES SHALL BE INSTALLED IN ALL LIQUID RETAINING AND SECONDARY CONTAINMENT SLABS.
3. FOR JOINTS WITH WATERSTOPS, APPLY 2 COATS OF BOND BREAKER TO FACE OF JOINT. DO NOT COAT WATERSTOP AND SEALANT GROOVE.
4. FOR SLABS WITH ONE LAYER OF REINFORCEMENT, PLACE WATERSTOP ON WET SIDE OF REINFORCEMENT AND TIE IN PLACE TO PROVIDE MINIMUM 38mm CLEARANCE BETWEEN WATERSTOP AND REINFORCING STEEL.

SLAB CONSTRUCTION JOINT

03 20 05

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177 TIE ROAD, TIVERTON, ON

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SPP NORTH TRAIN

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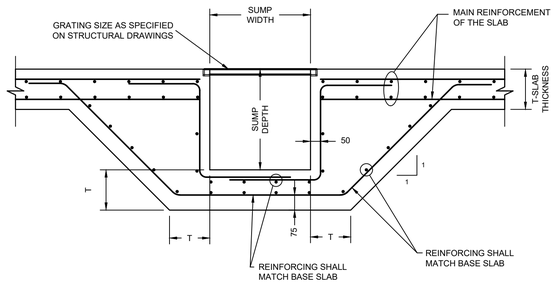
Project No. **11216493**

Title
STRUCTURAL DETAILS (3 OF 5)

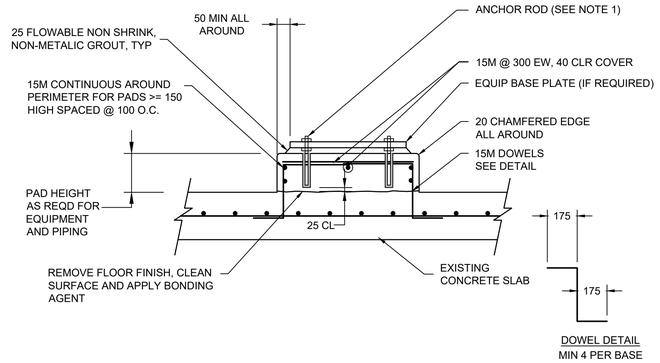
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Sheet No.
S-009

Sheet 21 of 63

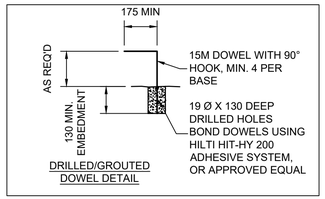


SUMP 03 20 11



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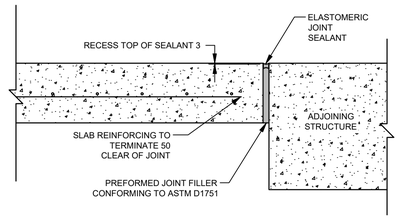
1. THE SIZE, NUMBER, TYPE, LOCATION AND THREAD PROJECTION OF THE ANCHOR RODS SHALL BE AS REQUIRED BY THE EQUIPMENT MANUFACTURER. ADHESIVE ANCHORS, DRILLED AND GROUTED SHALL BE USED.
2. IF REQUIRED ANCHOR ROD EMBEDMENT EXCEEDS PAD THICKNESS, CAST ANCHOR INTO CONCRETE SLAB.
3. EQUIPMENT BASES SHALL BE INSTALLED LEVEL. WEDGES OR SHIMS SHALL BE USED TO SUPPORT THE BASE WHILE THE NON-SHRINK GROUT IS PLACED. TEMPORARY LEVELING NUTS SHALL BE BACKED OFF ONCE SHIMS ARE IN PLACE. THE WEDGES OR SHIMS SHALL NOT BE EXPOSED TO VIEW.



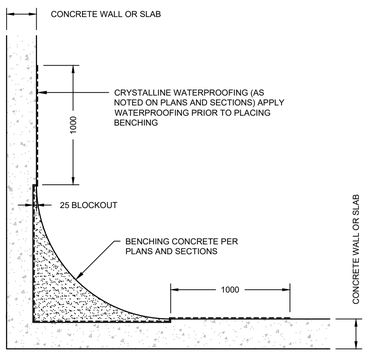
EQUIPMENT PAD 03 30 11

NOTES:

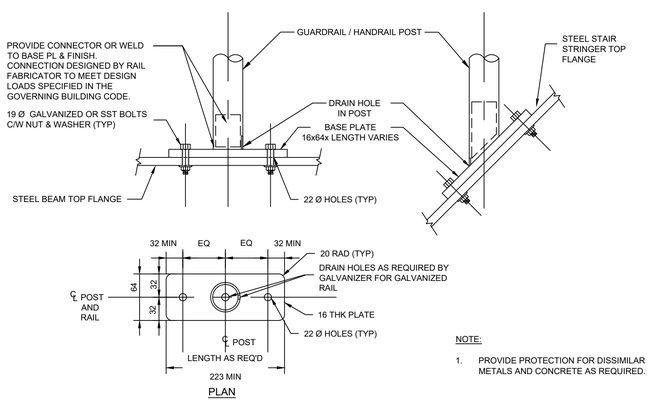
1. PREFORMED JOINT FILLER TO EXTEND FULL DEPTH OF SLAB.
2. TOP OF SEALANT SHALL BE FORMED TO A CONCAVE SHAPE, 6-8 THICK AT THE MIDDLE.
3. ISOLATION JOINTS ARE TO BE PLACED IN LOCATIONS SPECIFIED ON THE SERIES DRAWINGS.



ISOLATION JOINT 03 30 18



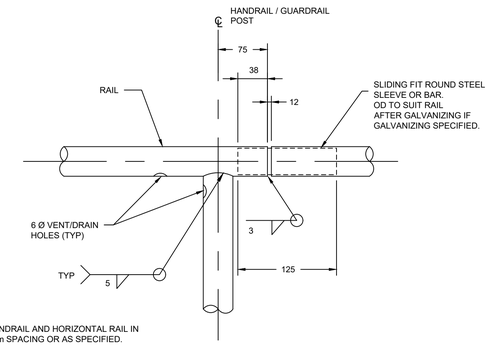
CONCRETE BENCHING CORNER 03 30 19



NOTE:

1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE AS REQUIRED.

GUARDRAIL/HANDRAIL POST ANCHORAGE TO STEEL 05 52 05



NOTES:

1. PROVIDE JOINTS AT HANDRAIL AND HORIZONTAL RAIL IN GUARDS, MAXIMUM 9.0m SPACING OR AS SPECIFIED.
2. FOR GALVANIZED RAIL, PROVIDE VENT/DRAIN HOLES AS REQUIRED BY GALVANIZER.

HANDRAIL/GUARDRAIL JOINT 05 52 09

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SPP NORTH TRAIN

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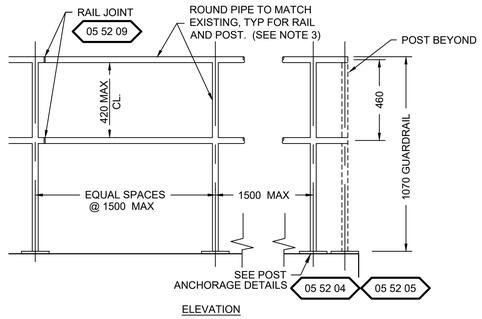
Project No. **11216493**

Title
STRUCTURAL DETAILS (4 OF 5)

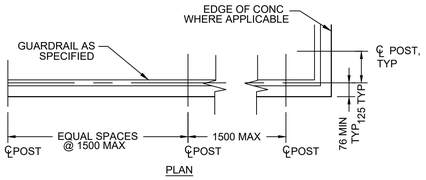
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Sheet No.
S-010

Sheet **22** of **63**



ELEVATION



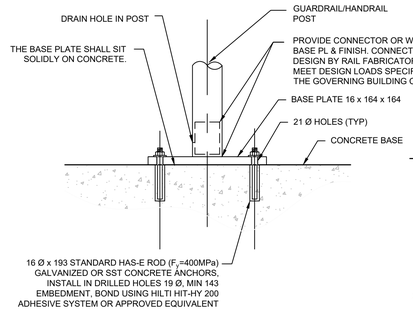
PLAN

NOTES:

1. FOR METAL TYPE AND FINAL FINISH SEE DRAWINGS AND/OR SPECIFICATIONS
2. PROVIDE ISOLATION PROTECTION FOR DISSIMILAR METALS AND CONCRETE AS REQUIRED.
3. GUARDRAIL DIMENSIONS, PIPE SIZES, WALL THICKNESS AND ALL CONNECTIONS SHALL BE DESIGNED BY THE RAIL FABRICATOR TO MEET THE REQUIREMENTS OF THE GOVERNING BUILDING CODE. USE OF THIS RAIL SYSTEM MAY BE LIMITED BASED ON OCCUPANCY, LOCATION AND PARTICULAR HAZARD.

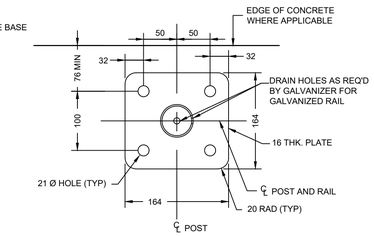
TWO RAIL GUARDRAIL

05 52 13



NOTE:

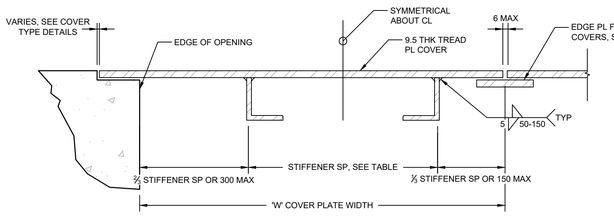
1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE AS REQUIRED.



PLAN

GUARDRAIL/HANDRAIL POST ANCHORAGE TO CONCRETE

05 52 04

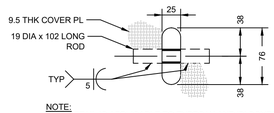


COVER STIFFENERS TABLE			
OPENING SPAN LENGTH 'L'	STIFFENER SIZE	MAX STIFFENER SPACING	MAX PLATE WIDTH 'W'
L < 600	NONE	-	1524
600 ≤ L < 1650	L51x38x6.4	450	1220
1650 ≤ L < 1800	L64X38X6.4	450	1220
1800 ≤ L < 1950	L64X38X6.4	380	1220
1950 ≤ L < 2100	L76x51x6.4	450	1220
2100 ≤ L < 2250	L76x51x6.4	380	914
2250 ≤ L < 2400	L89x64x6.4	450	914
2400 ≤ L < 2550	L89x64x6.4	380	762
2550 ≤ L < 2700	L102x76x6.4	380	762
2700 ≤ L < 2850	L102x76x6.4	305	610

NOTES:

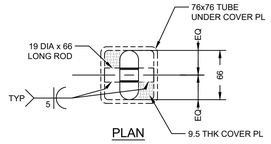
1. STIFFENERS SHALL BE PLACED LONG LEG VERTICAL.
2. SPAN DIRECTION OF PLATE IS PARALLEL TO STIFFENERS, AND SHALL BE IN THE SHORT DIMENSION OF OPENING UNLESS NOTED OTHERWISE ON PLANS.
3. MAXIMUM ALLOWABLE UNIFORM DESIGN LOAD = 4.8kPa.
4. MAXIMUM WEIGHT OF COVER PLATE SHALL BE 55kg, 20kg FOR PLATES THAT OFTEN REQUIRE REMOVAL.
5. COVER PLATES AND STIFFENERS ARE ALUMINUM ALLOY TREAD PLATE TO ASTM B632/B632M, ALLOY 6061-T6 (240 MPa YIELD STRENGTH). STIFFENER ANGLES ARE ALUMINUM ALLOY TO ASTM B308/B308M. ALUMINUM FLAT PLATE TO ASTM B209M, ALLOY 6061-T6.
6. STAINLESS STEEL BAR ROUND AND ANGLE TO ASTM A276/A276M. FLAT BAR TO ASTM A666. SCREWS TO ASTM F-593, CONDITION CW AND NUTS TO ASTM F-594. ALL STAINLESS STEEL SHALL BE TYPE 316/316L.
7. ALL COVER PLATES TO HAVE A MINIMUM OF TWO LIFTING EYES AS SHOWN IN THE DETAIL.

COVER STIFFENERS

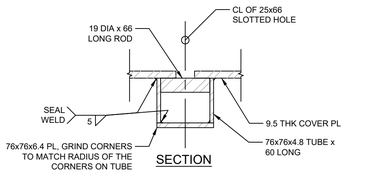


NOTE:
THIS DETAIL IS APPLICABLE TO TYPES 'A' AND 'B' COVERS AND OTHER COVERS NOT INTENDED TO BE AIRTIGHT.

LIFTING EYE TYPE 'A'



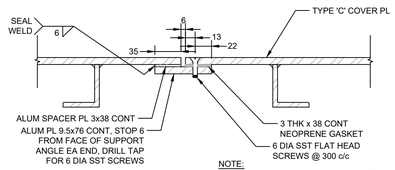
PLAN



SECTION

NOTE:
DETAIL IS APPLICABLE TO TYPE 'C' COVER AND OTHER COVERS INTENDED TO BE AIRTIGHT, AND ARE LOCATED INDOORS.

LIFTING EYE TYPE 'B'



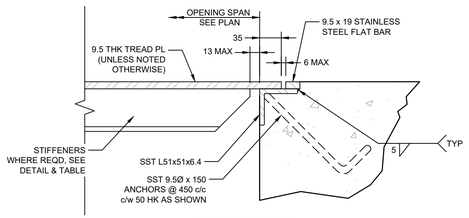
NOTE:
DETAIL IS APPLICABLE TO TYPE 'C' COVER AND OTHER COVERS INTENDED TO BE AIRTIGHT.

EDGE PLATE DETAIL

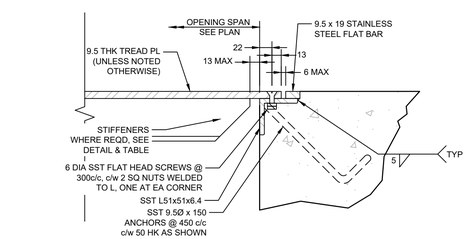
COVER PLATE

(4.8 kPa UNIFORM DESIGN LOAD)

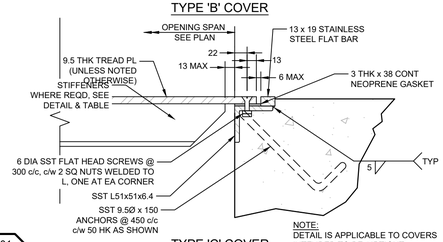
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TYPE 'A' COVER

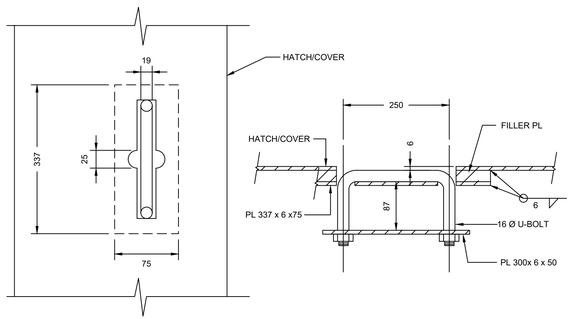


TYPE 'B' COVER



TYPE 'C' COVER

NOTE:
DETAIL IS APPLICABLE TO COVERS INTENDED TO BE AIRTIGHT.



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Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216493**

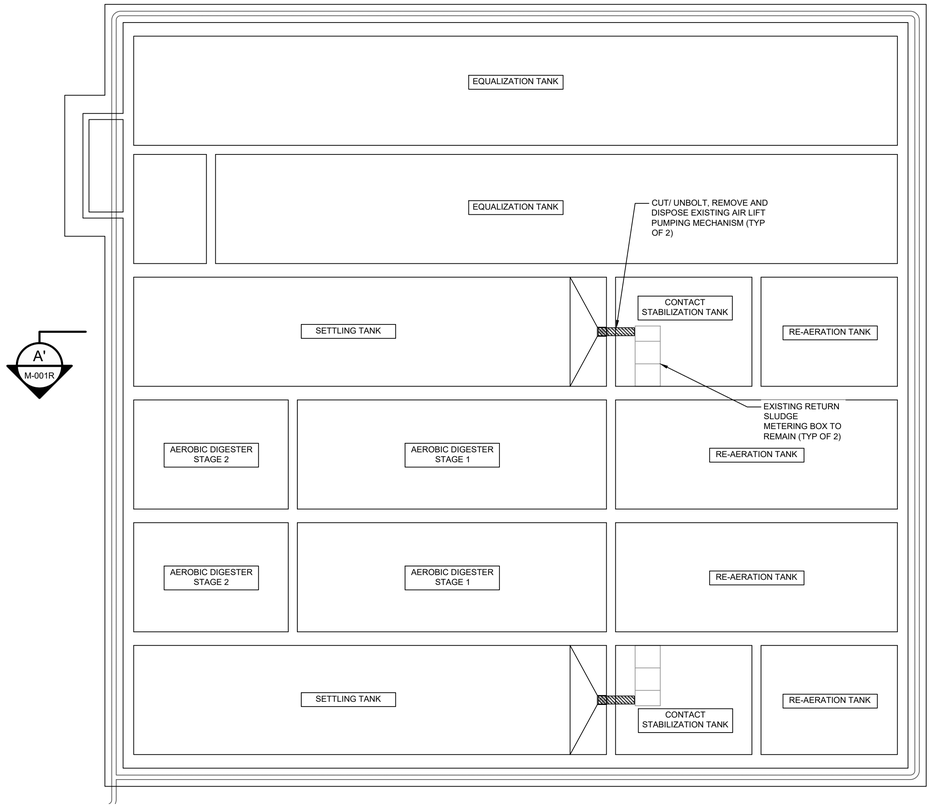
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STRUCTURAL DETAILS (5 OF 5)

Bruce Power Sheet No.
NK37-DRAW-79600-10031

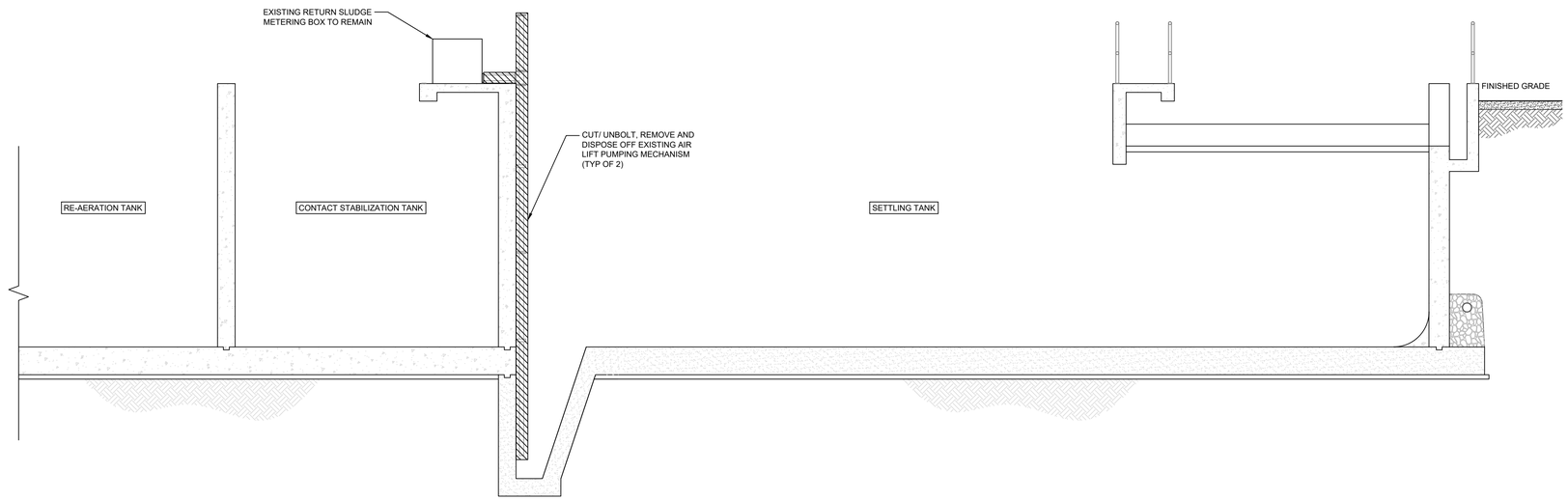
Sheet No.
S-011

Sheet **23** of **63**

NOTES:
1. EXECUTE REMOVALS IN A ORDERLY AND CAREFUL MANNER.
2. REMOVE MATERIALS AS WORK PROGRESSES. UPON CONNECTION OF WORK, LEAVE AREAS IN CLEAN CONDITION.
3. DISPOSAL OF MATERIALS AND EQUIPMENT (NOT RETAINED BY BRUCE POWER) SHALL BE SPECIFIED IN A PLAN TO BE DEVELOPED BY CONTRACTOR.
4. REFER TO CORRESPONDING STRUCTURAL REMOVAL DRAWING (S-001R).
5. ALL MATERIALS REMOVED FROM SITE AND CONTRACTOR VEHICLES WILL NEED TO GO THROUGH THE EXPLORANIUM.



PLAN



SECTION A' (M-001R)
1:50

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0 0.5 1.0 1.5m

Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	MC	RH	01/15/21
B	100% DESIGN REVIEW	MC	RH	11/13/20
A	90% DESIGN REVIEW	MC	RH	10/09/20

Drawn	M. CORREALE	Designer	B. MADHVANI
Drafting Check	B. PLETZ	Design Check	R. HANKE
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216493**

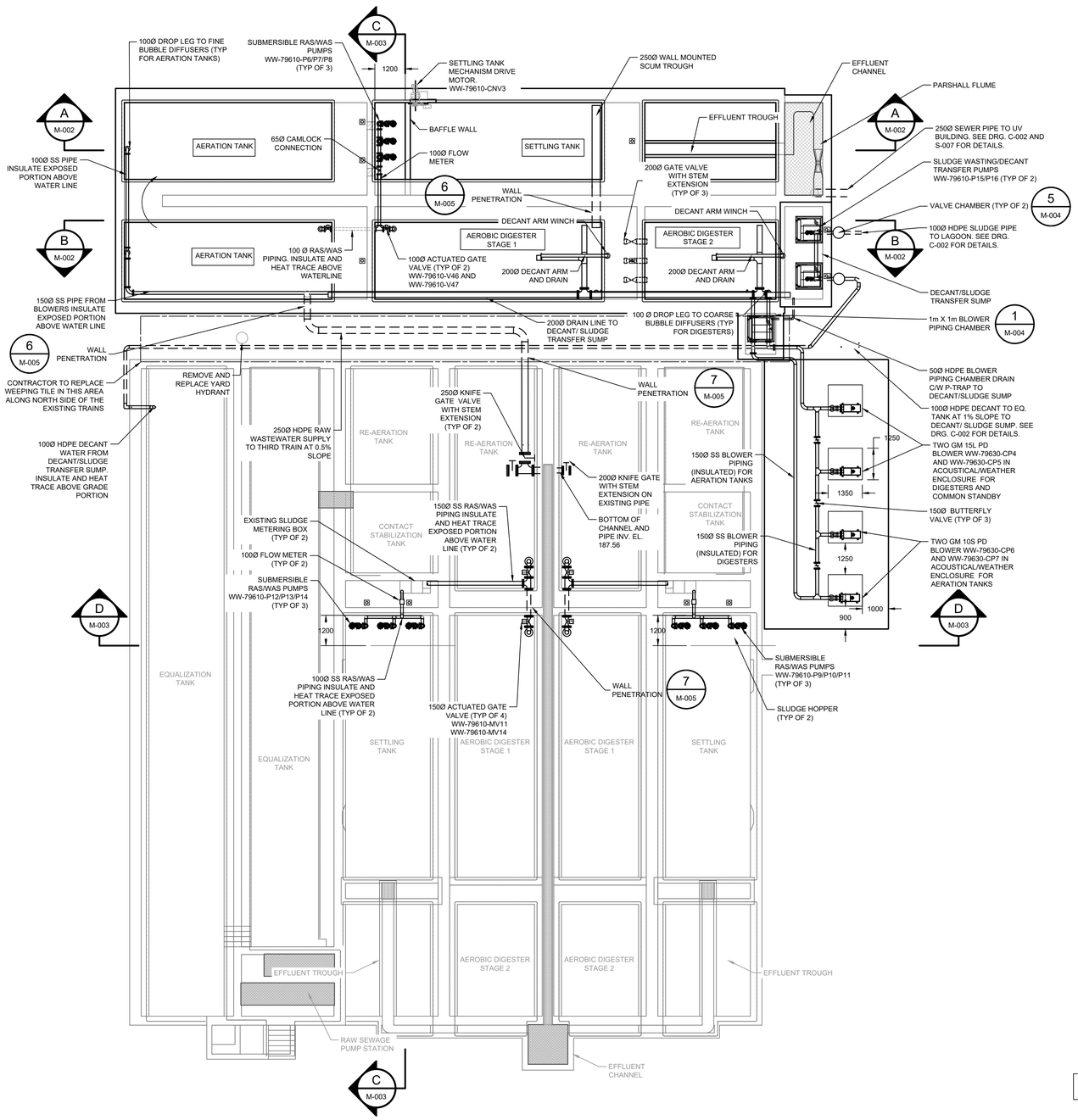
Title
MECHANICAL REMOVALS

Bruce Power Sheet No.
NK37-DRAW-79600-10024

Sheet No.
M-001R

Sheet **24** of **63**

NOTES:
1. STRUCTURAL ITEMS ARE NOT SHOWN FOR CLARITY.
2. INSULATE AND HEAT TRACE ALL EXPOSED PORTIONS OF RAS/WAS PIPING ABOVE WATER LINE. SEE P&ID AND ELECTRICAL DRAWING FOR MORE DETAILS.
3. INSULATE (NO HEAT TRACING) ALL EXPOSED PORTIONS OF BLOWER PIPING ABOVE WATER LINE
4. PROVIDE STEM EXTENSION TO THE VALVES WHEREVER REQUIRED TO FACILITATE OPERATION WITHOUT STRETCHING BEYOND HANDRAILS. THE LENGTH OF STEM EXTENSION SHALL BE SUCH THAT THE HANDWHEEL IS AT LEAST 100 MM ABOVE THE TOP OF HANDRAILS. SUPPORT THE STEM EXTENSION AT SPACING RECOMMENDED BY MANUFACTURER. THE HANDWHEEL DIAMETER SHALL BE MINIMUM 300 MM FOR 150 MM DIAMETER VALVES AND MINIMUM 350 MM FOR 200 MM DIAMETER VALVES
5. ALL PIPING RUNNING ALONG THE INSIDE OF TANK WALL SHALL BE SUPPORTED FROM THE WALL WITH KNEE BRACE. SEE DETAIL 2 ON M-004. SEE SPECIFICATION 15201 FOR SUPPORT SPACING.
6. REFER TO SPECIFICATION 15060 FOR PIPING SCHEDULE.
7. ALL PIPING, SUPPORT, AND HARDWARE SHALL BE SS316 GRADE.
8. EXISTING CONCRETE IS TO BE SCANNED FOR REBAR LOCATIONS PRIOR TO CORING FOR ROUTING OF NEW PIPES. REVIEW REBAR SCAN RESULTS WITH ENGINEER PRIOR TO CORING/CUTTING OF EXISTING REBAR.
9. ALL KEY MECHANICAL ELEVATIONS ARE SUBJECT TO ADJUSTMENT PENDING FINAL CONFIRMATORY TOPOGRAPHIC SURVEY. ALL KEY CONSTRUCTION ELEVATIONS ARE BASED ON THE EXISTING SPP TREATMENT TANK TOP OF WALL ELEVATION OF 188.26m. ALL OTHER ELEVATIONS SHOULD BE CONSIDERED RELATIVE TO THIS ELEVATION.



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0 1 2 3m

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Project
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C	ISSUED FOR RFP	MC	RH	01/15/21
B	100% DESIGN REVIEW	MC	RH	11/13/20
A	90% DESIGN REVIEW	MC	RH	10/09/20
No.	Issue	Drawn	Approved	Date

Drawn M. CORREALE	Designer B. MADHVANI
Drafting Check B. PLETZ	Design Check R. HANKE
Project Manager C. EVEREST	Date 01/15/2021
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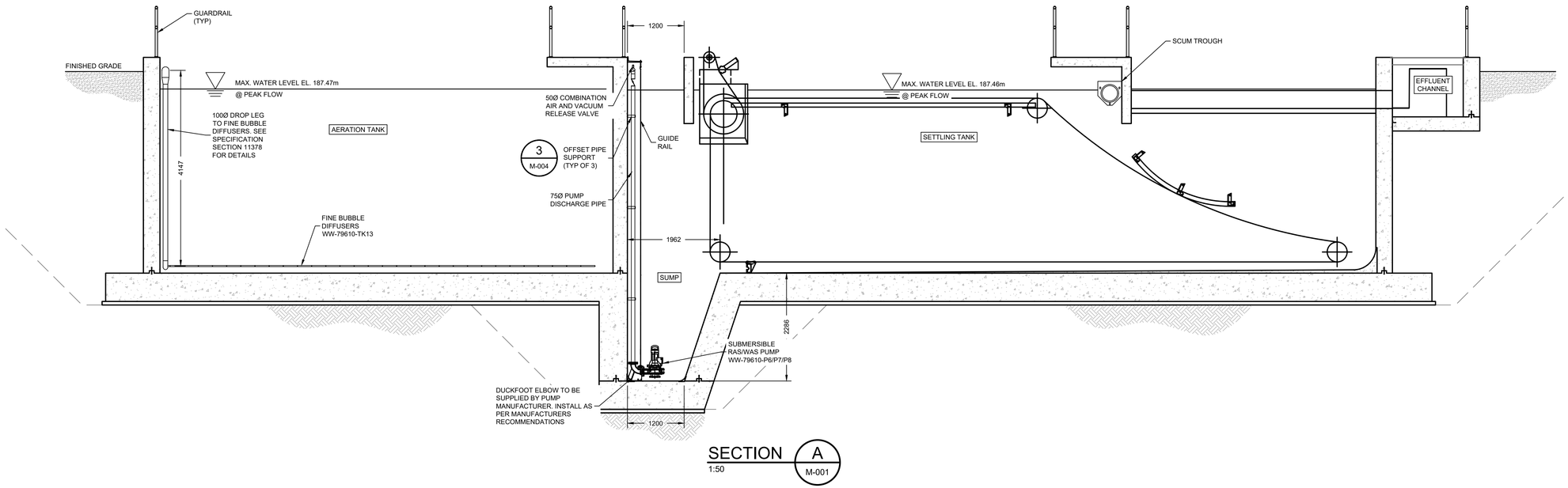
Project No. **11216493**

Title
PROCESS PIPING PLAN

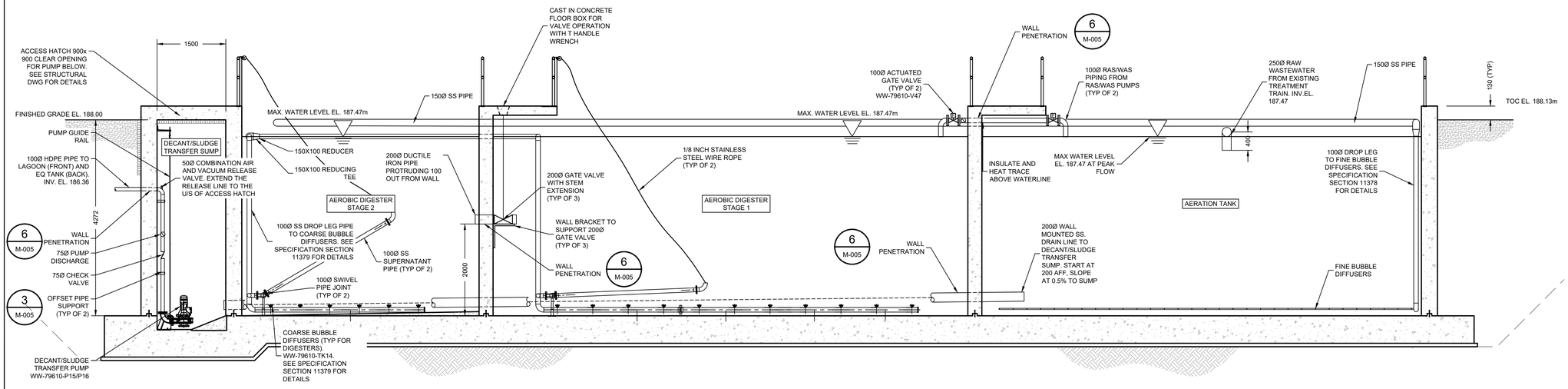
Bruce Power Sheet No.
NK37-DRAW-79600-10004

Sheet No.
M-001

Sheet 25 of 63



SECTION A
1:50
M-001



SECTION B
1:50
M-001

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0 0.5 1.0 1.5m

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Project
SPP NORTH TRAIN

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C	ISSUED FOR RFP	MC	RH	01/15/21
B	100% DESIGN REVIEW	MC	RH	11/13/20
A	90% DESIGN REVIEW	MC	RH	10/09/20

Drawn	M. CORREALE	Designer	B. MADHVANI
Drafting Check	B. PLETZ	Design Check	R. HANKE
Project Manager	C. EVEREST	Date	01/15/2021

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Scale 1:50

Original Size **ANSI D**

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Project No. **11216493**

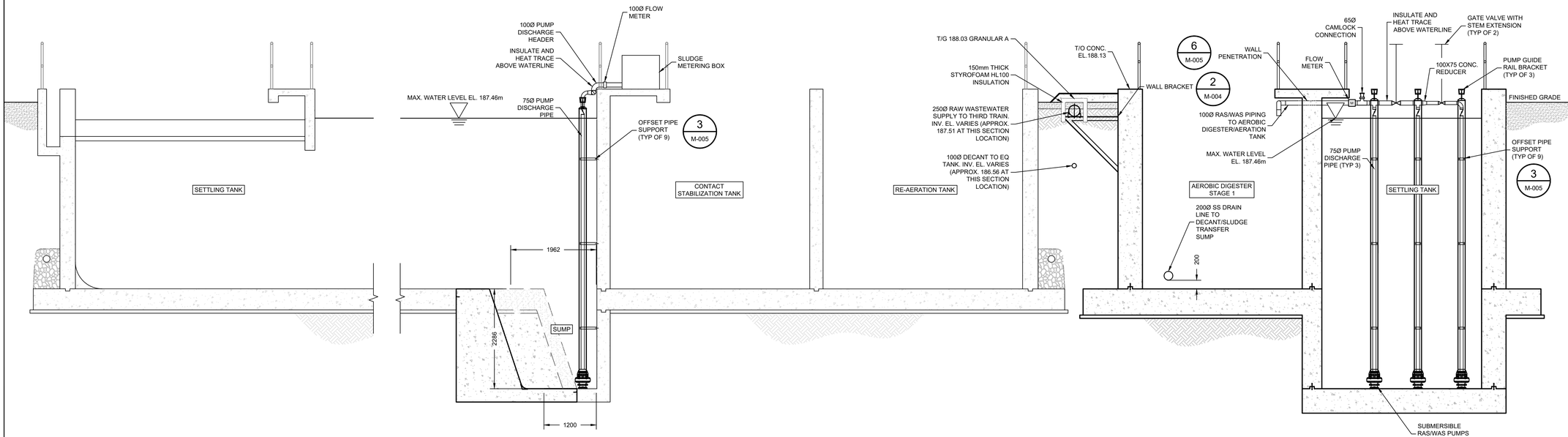
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PROCESS PIPING SECTIONS (1 OF 2)

Bruce Power Sheet No.
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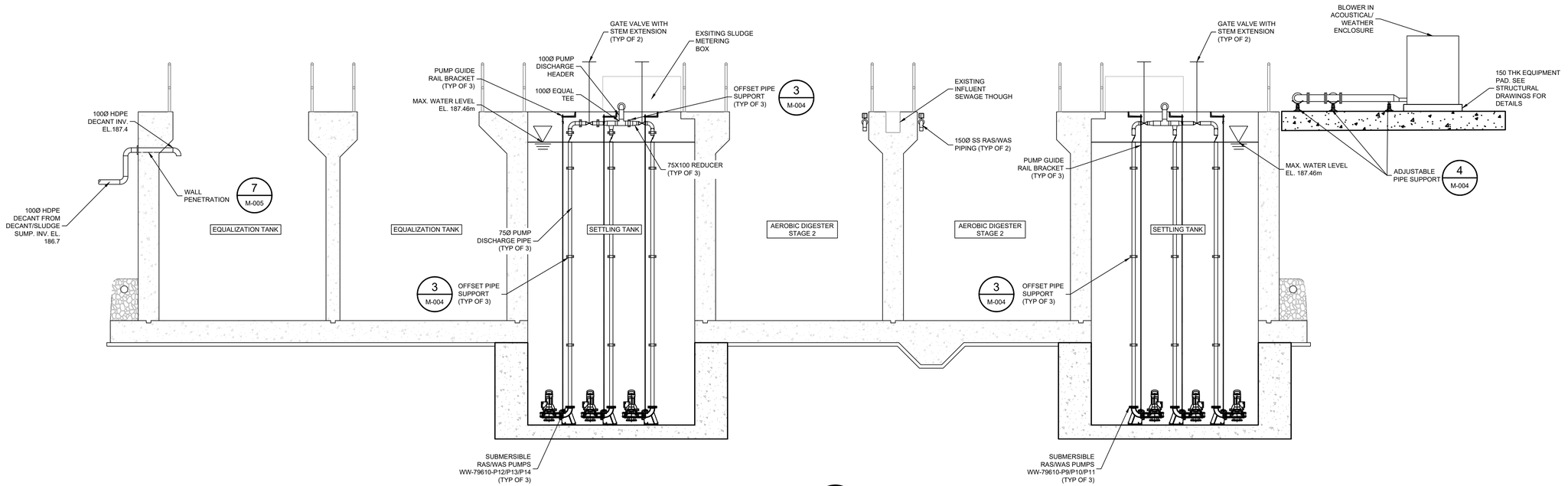
Sheet No.
M-002

Sheet **26** of **63**

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SECTION C
1:50
M-001



SECTION D
1:50
M-001

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0 0.5 1.0 1.5m

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A	90% DESIGN REVIEW	MC	RH	10/09/20

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Drafting Check	B. PLETZ	Design Check	R. HANKE
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

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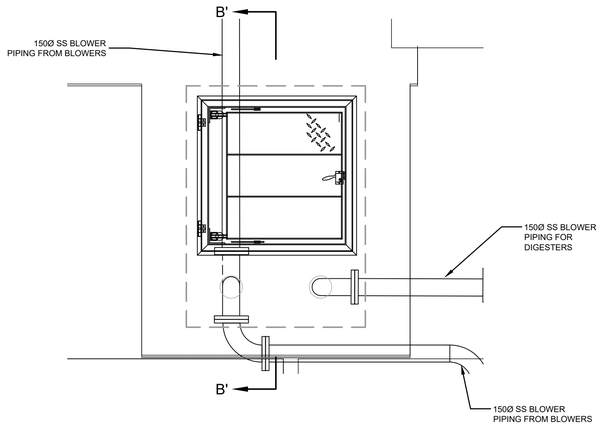
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PROCESS PIPING SECTION (2 OF 2)

Bruce Power Sheet No.
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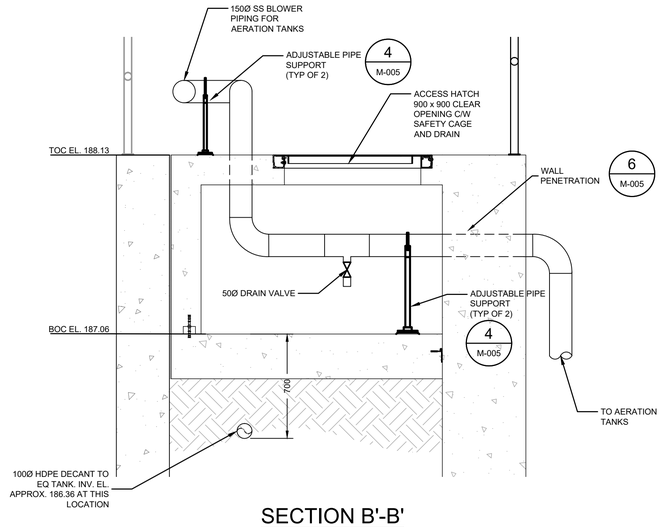
Sheet No.
M-003

Sheet **27** of **63**

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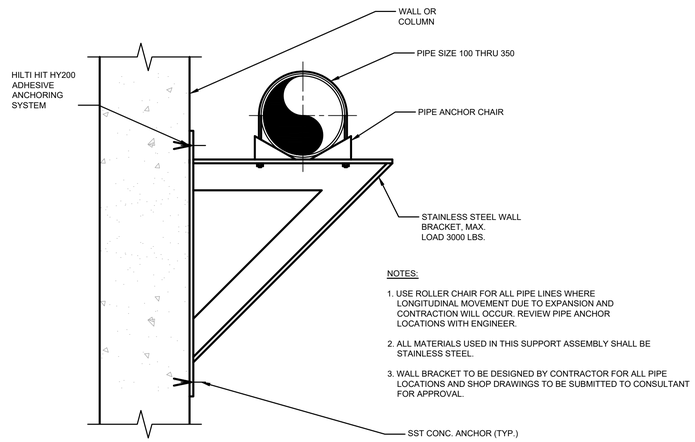


PLAN
1:20



SECTION B'-B'
1:20

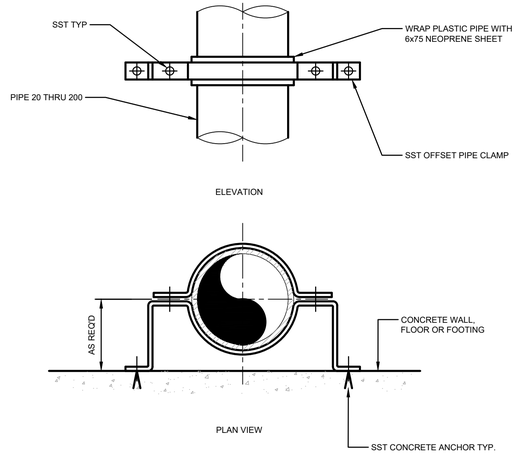
DETAIL 1 M-001 BLOWER PIPING CHAMBER



NOTES:

1. USE ROLLER CHAIR FOR ALL PIPE LINES WHERE LONGITUDINAL MOVEMENT DUE TO EXPANSION AND CONTRACTION WILL OCCUR. REVIEW PIPE ANCHOR LOCATIONS WITH ENGINEER.
2. ALL MATERIALS USED IN THIS SUPPORT ASSEMBLY SHALL BE STAINLESS STEEL.
3. WALL BRACKET TO BE DESIGNED BY CONTRACTOR FOR ALL PIPE LOCATIONS AND SHOP DRAWINGS TO BE SUBMITTED TO CONSULTANT FOR APPROVAL.

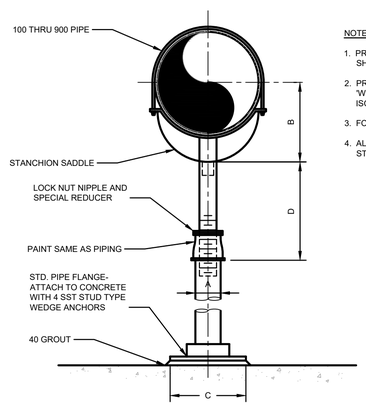
DETAIL 2 M-001 PIPE SUPPORT
NTS



ELEVATION

PLAN VIEW

DETAIL 3 VARIOUS OFFSET PIPE SUPPORT
NTS

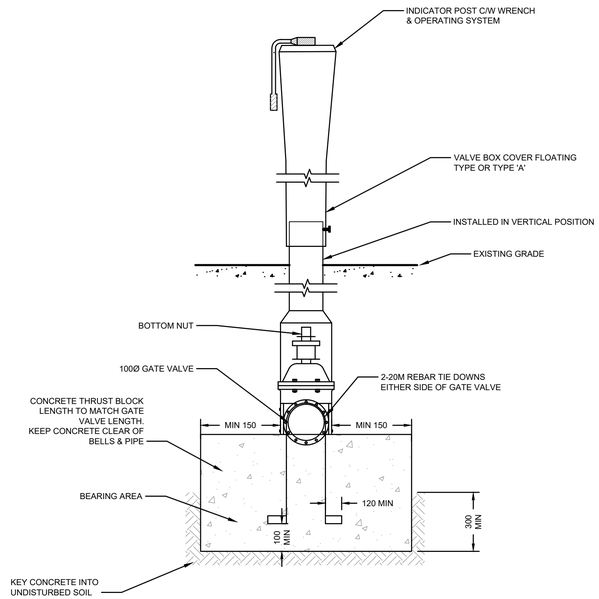


NOTES:

1. PROVIDE HALF RIGID INSULATION AND INSULATION PROTECTION SHIELD, WHERE PIPING IS INSULATED.
2. PROVIDE NEOPRENE WAFFLE ISOLATION PAD SIMILAR TO MASON TYPE 'W' OR KORFUND KORPAD 40, UNDER SUPPORT FOOT WHEN PIPING IS ISOLATED OR SUPPORT IS ADJACENT TO MECHANICAL EQUIPMENT.
3. FOR BASE HEIGHT AND FLANGE DIMENSIONS, SEE TABLE.
4. ALL MATERIALS USED IN THIS SUPPORT ASSEMBLY SHALL BE STAINLESS STEEL.

PIPE SIZE	A (MIN.)	B (MAX.)	C	D (MIN.)	D (MAX.)
100-300	75	250	225	200	225
350-450	100	350	275	400	525
500-900	150	575	325	525	650

DETAIL 4 M-003 ADJUSTABLE PIPE SUPPORT
NTS



DETAIL 5 M-001 INDICATOR POST GATE VALVE
NTS

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Client
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177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	MC	RH	01/15/21
B	100% DESIGN REVIEW	MC	RH	11/13/20
A	90% DESIGN REVIEW	MC	RH	10/09/20

Drawn	M. CORREALE	Designer	B. MADHVANI
Drafting Check	B. PLETZ	Design Check	R. HANKE
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

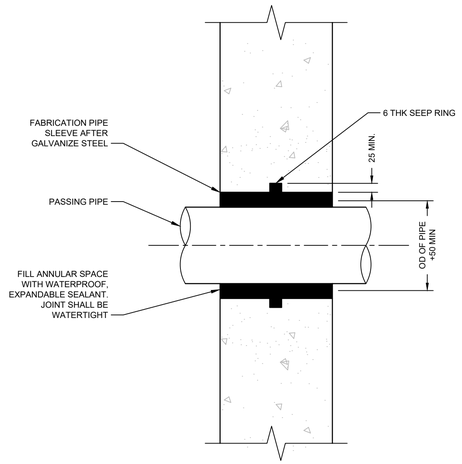
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Bruce Power Sheet No.
NK37-DRAW-79600-10010

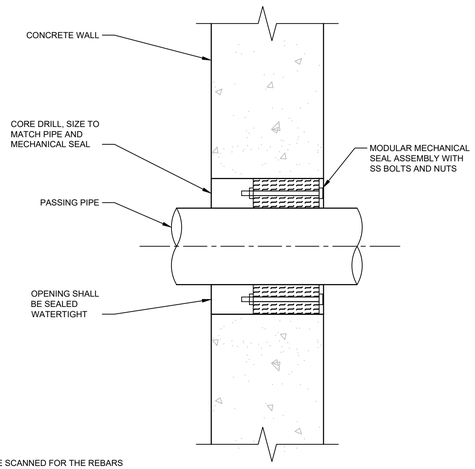
Sheet No.
M-004

Sheet 28 of 63

Plot Date: 8 March 2021 - 9:52 AM Plotted By: Max Correale CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)ME\11216493-01(003)ME-WA004.dwg



DETAIL 6 WALL PENETRATION
NTS VARIOUS



NOTE:
WALLS SHALL BE SCANNED FOR THE REBARS PRIOR TO CORING AND REPORT SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. AFTER CORING, THE CUT REBARS SHALL BE PAINTED WITH EPOXY TO AVOID ANY RUST.

DETAIL 7 WALL PENETRATION
NTS VARIOUS

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B	100% DESIGN REVIEW	MC	RH	11/13/20
A	90% DESIGN REVIEW	MC	RH	10/09/20

Drawn	M. CORREALE	Designer	B. MADHVANI
Drafting Check	B.MADHVANI	Design Check	R. HANKE
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

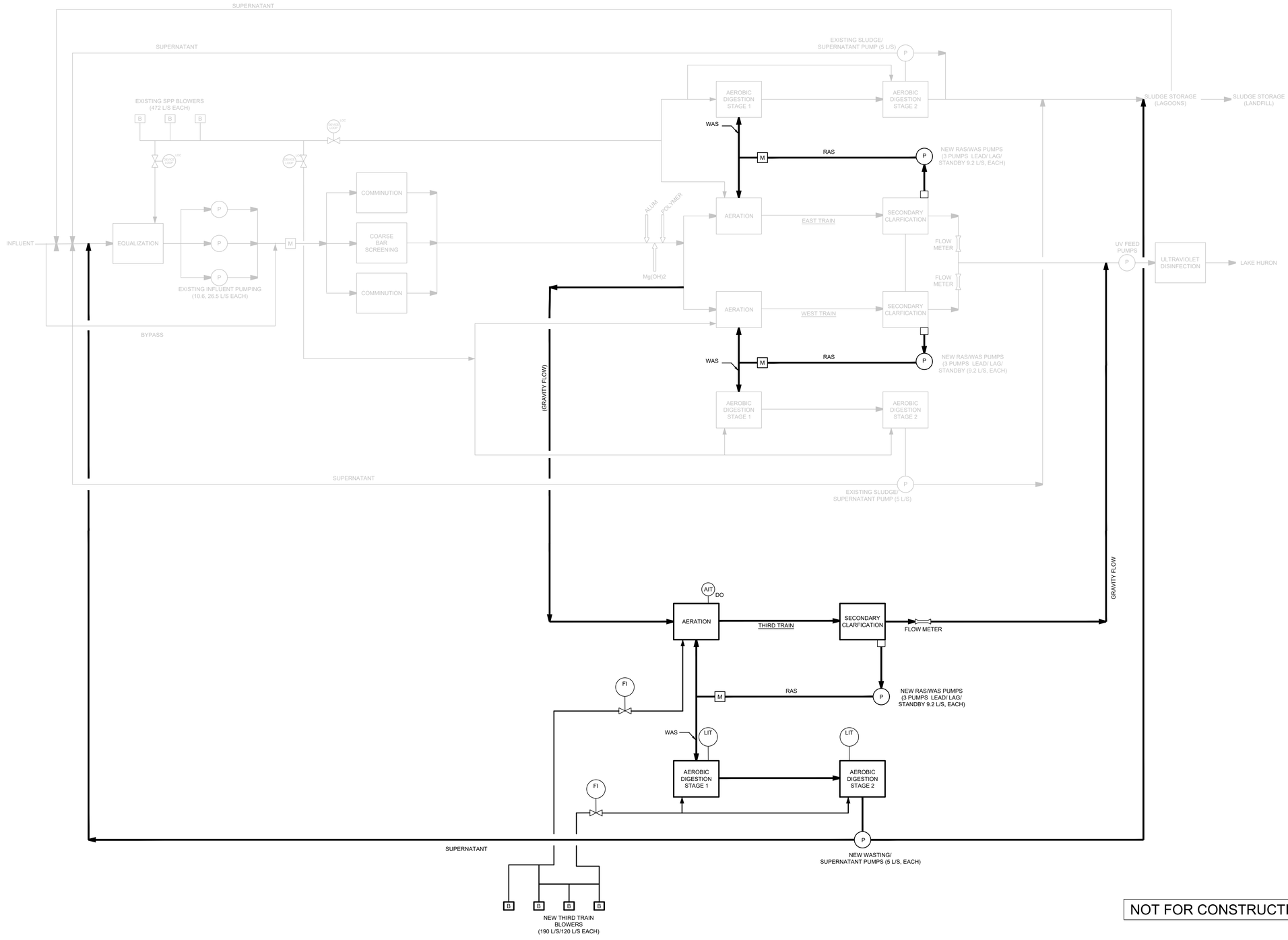
Project No. **11185554-01**

Title
DETAILS
(2 OF 2)

Bruce Power Sheet No.
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Sheet No.
M-005
Sheet **29** of **63**

Plot Date: 8 March 2021 - 9:53 AM Plotted By: Max Correale CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)ME\11216493-01(003)ME-WA004.dwg



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SPP NORTH TRAIN

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Drafting Check	B. PLETZ	Design Check	H. BREWER
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size
ANSI D

Bar is 20mm on original size drawing
0 20mm

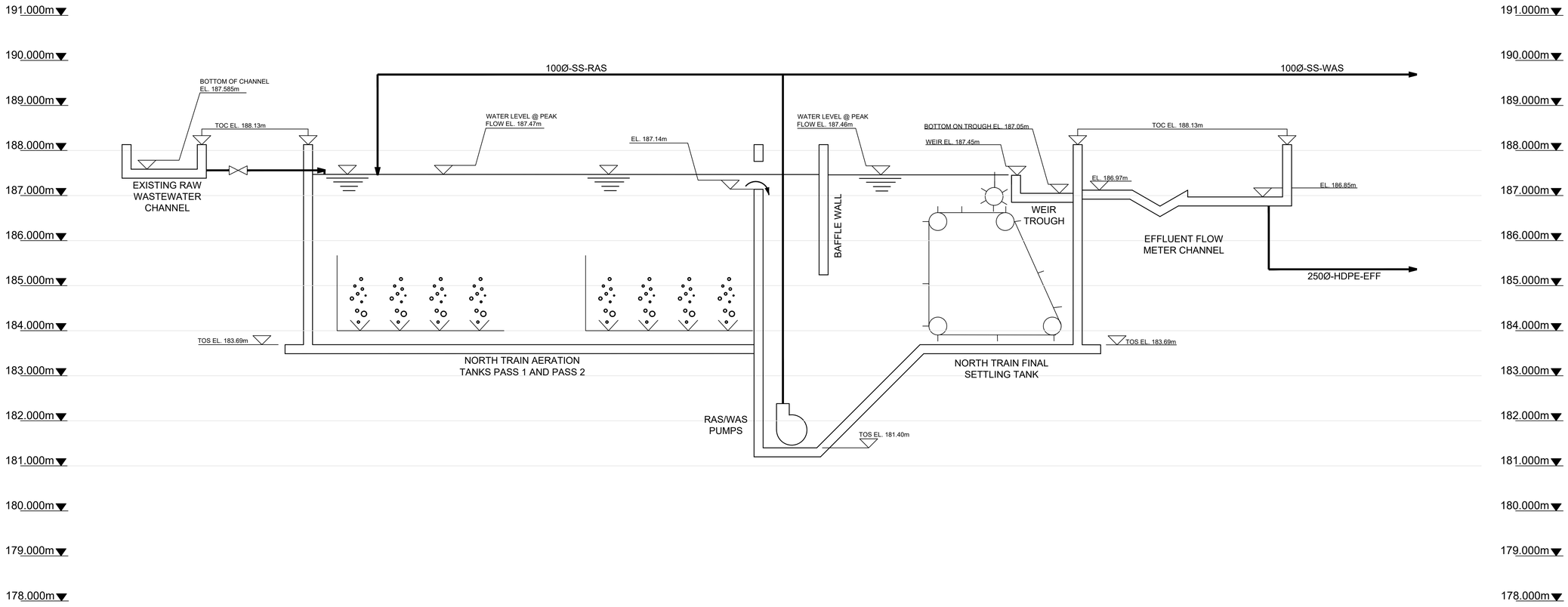
Project No. **11216493**

Title
PROCESS FLOW DIAGRAM

Bruce Power Sheet No.
NK37-DRAW-79600-10012

Sheet No.
P-001
Sheet **30** of **63**

NOTES:
1. ALL KEY ELEVATIONS ARE SUBJECT TO ADJUSTMENT PENDING FINAL CONFIRMATORY TOPOGRAPHIC SURVEY. ALL KEY CONSTRUCTION ELEVATIONS ARE BASED ON THE EXISTING SPP TREATMENT TANK TOP OF WALL ELEVATION OF 188.13 m. ALL OTHER ELEVATIONS SHOULD BE CONSIDERED RELATIVE TO THIS ELEVATION.
2. UV SUMP RECORD DRAWINGS - SUMP FINISHED FLOOR = 184.07, ELEVATION FROM FIELD DATA = 183.98.



BRUCE POWER SPP - NORTH TRAIN HYDRAULIC PROFILE
NTS

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Project
SPP NORTH TRAIN

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B	100% DESIGN REVIEW	MC	CE	11/13/20
A	90% DESIGN REVIEW	MC	CE	10/09/20

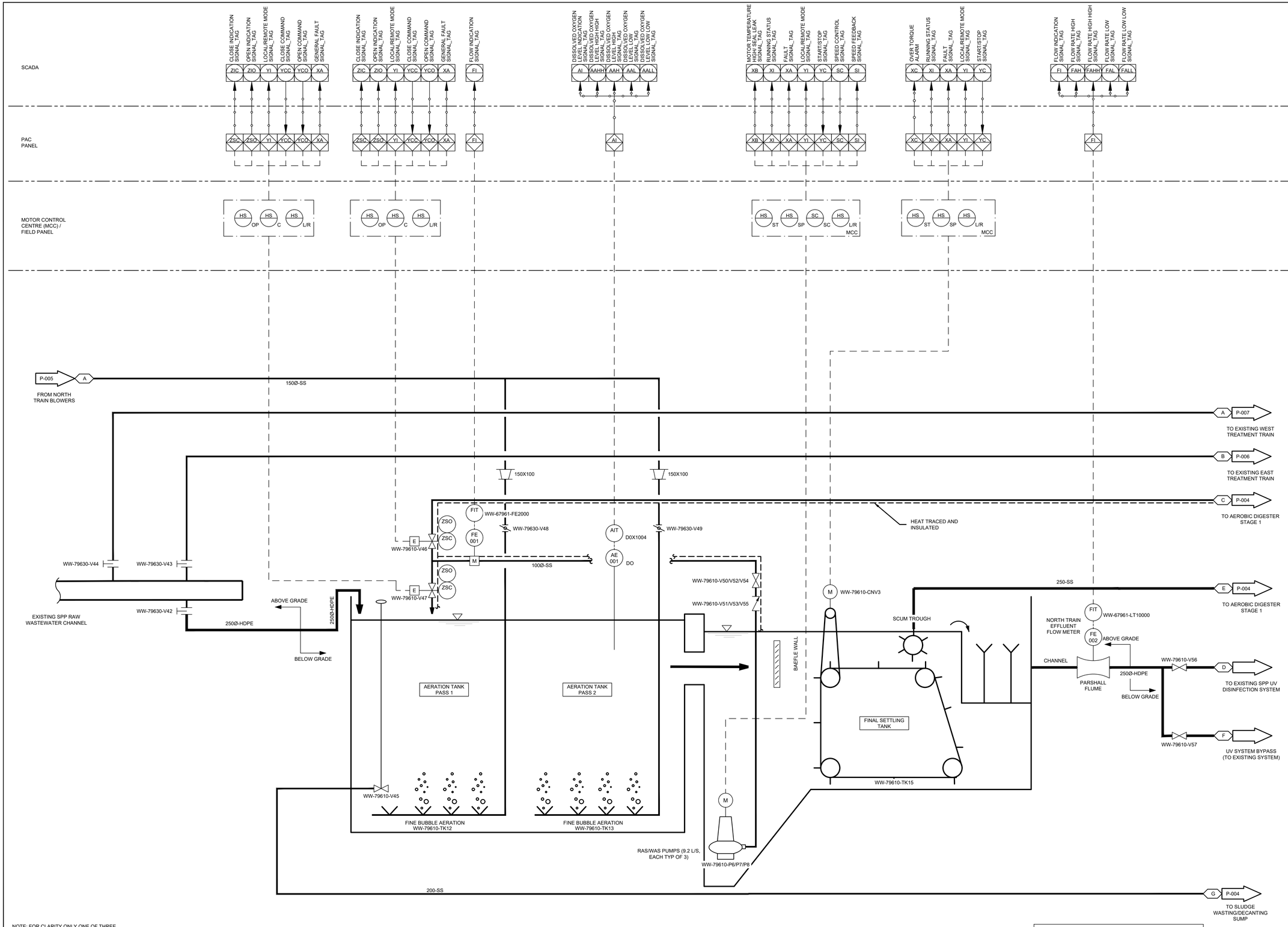
Drawn	M. CORREALE	Designer	C. EVEREST
Drafting Check	B. PLETZ	Design Check	H. BREWER
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title
HYDRAULIC PROFILE

Bruce Power Sheet No.
NK37-DRAW-79600-10013

Sheet No.
P-002
Sheet **31** of **63**



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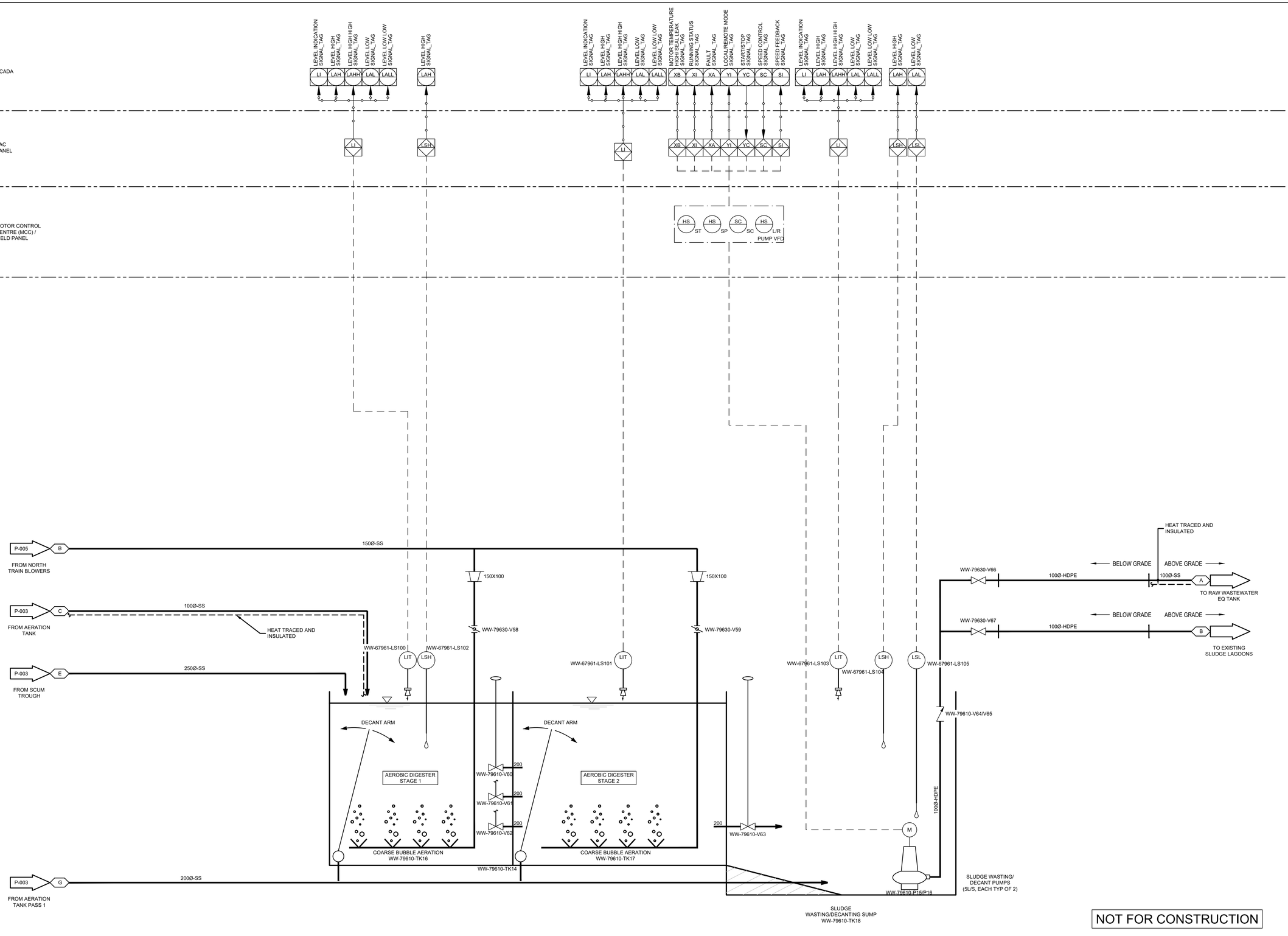
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Project No. **11216493**

Title
NORTH TREATMENT TRAIN AERATION, CLARIFIER & DIGESTER P&ID (1 OF 2)

Bruce Power Sheet No.
NK37-DRAW-79600-10014

Sheet No.
P-003
Sheet 32 of 63



NOTE: FOR CLARITY ONLY ONE OF TWO SLUDGE WASTING DECANT PUMPS IS SHOWN.

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Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	MC	CE	01/15/21
B	100% DESIGN REVIEW	MC	CE	11/13/20
A	90% DESIGN REVIEW	MC	CE	10/09/20

Drawn	M. CORREALE	Designer	C. EVEREST
Drafting Check	B. PLETZ	Design Check	H. BREWER
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size ANSI D		Bar is 20mm on original size drawing 0 — 20mm	

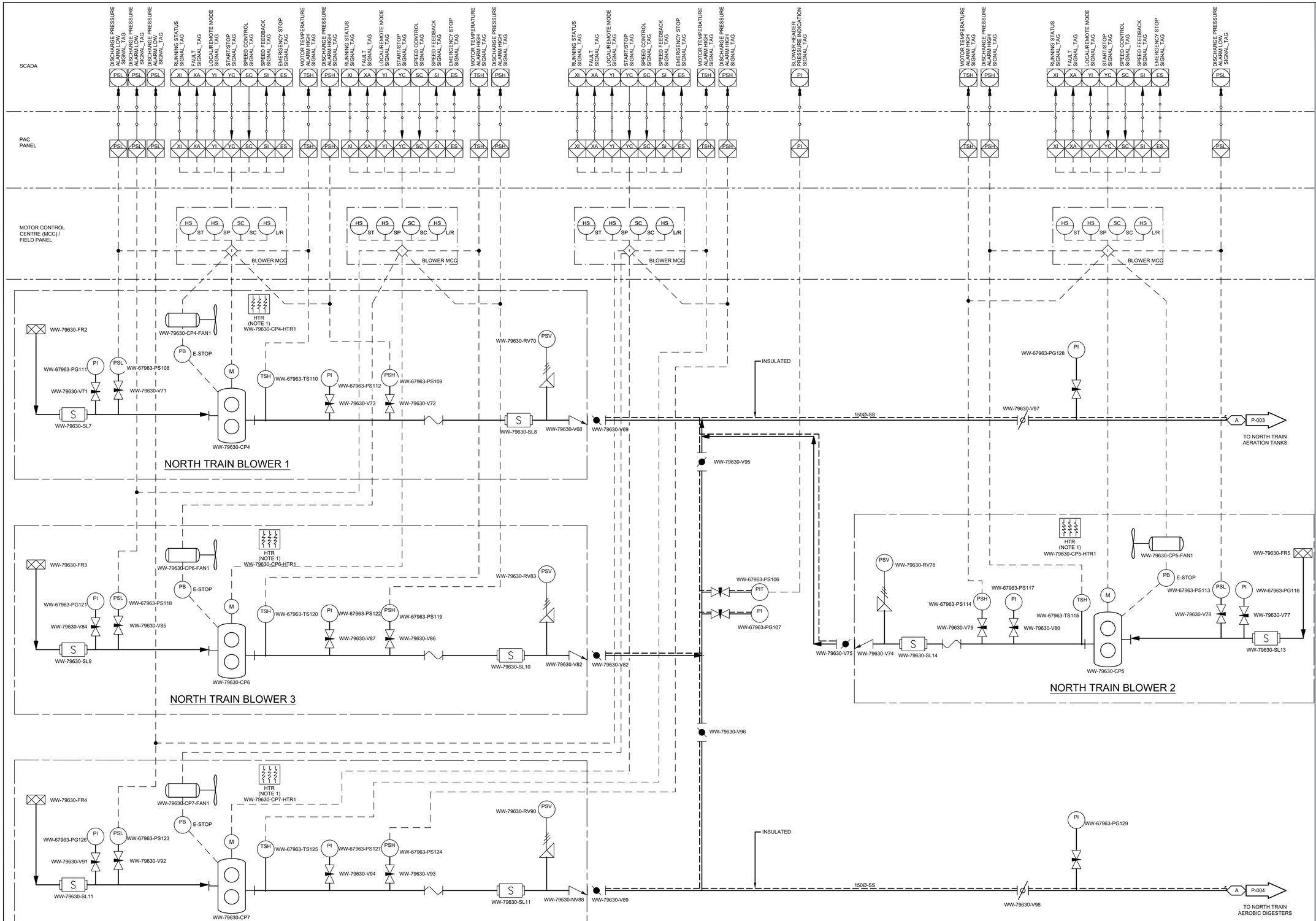
Project No. **11216493**

Title
NORTH TREATMENT TRAIN AERATION, CLARIFIER & DIGESTER P&ID (2 OF 2)

Bruce Power Sheet No.
NK37-DRAW-79600-10015

Sheet No.
P-004
Sheet **33** of **63**

Plot Date: 11 March 2021 - 2:35 PM Plotted By: Jason Spenler CAD File: N:\CA\Waterloo\Projects\66211216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA001.dwg



NOTES:

1. SUPPLIED BY A 120V FEEDER FROM THE LIGHTING PANEL.

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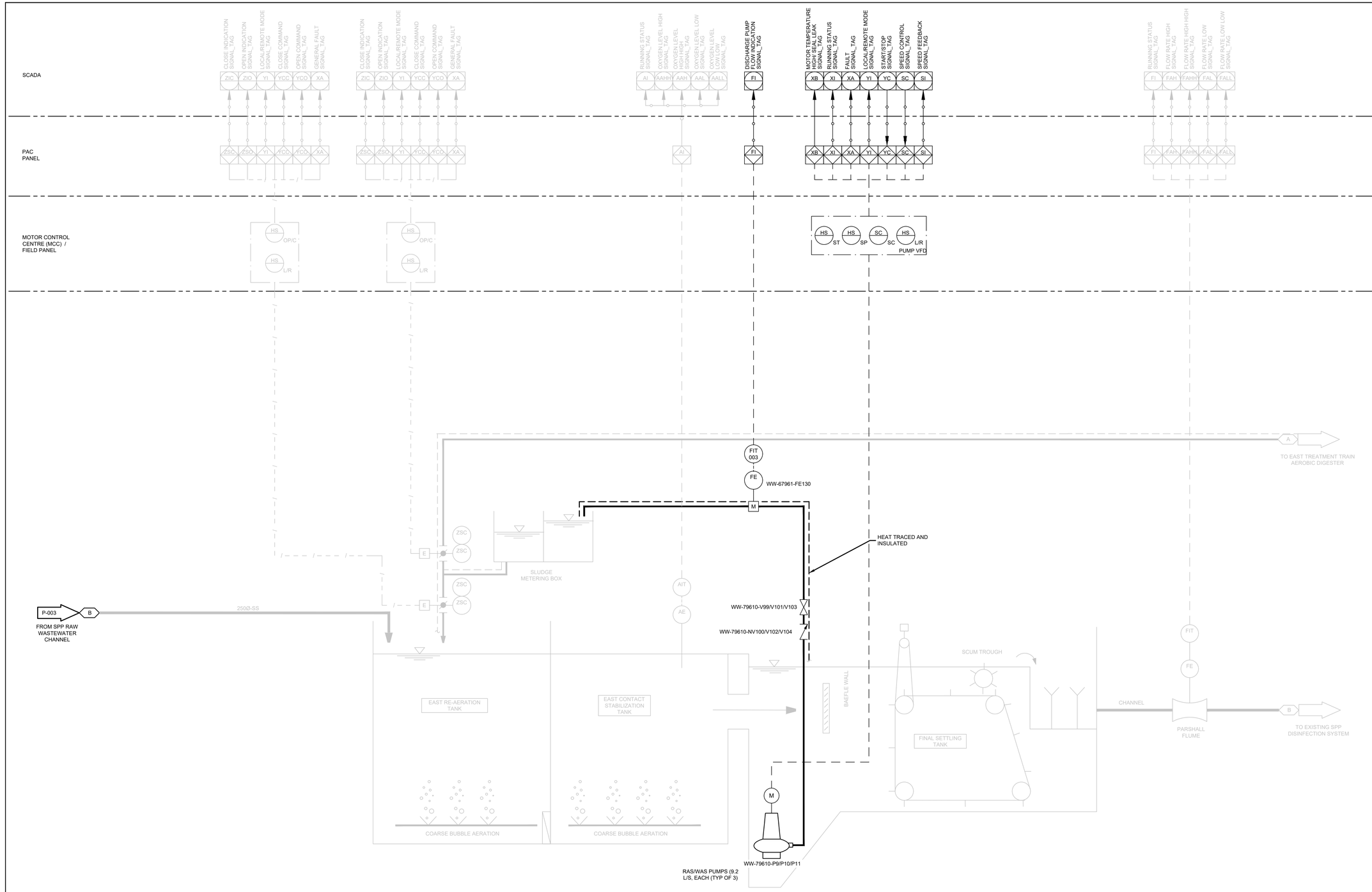
Drawn	M. CORREALE	Designer	C. EVEREST
Drafting Check	B. PLETZ	Design Check	H. BREWER
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title
NORTH TRAIN BLOWERS P&ID

Bruce Power Sheet No.
NK37-DRAW-79600-10016

Sheet No.
P-005
Sheet **34** of **63**



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NOTE: FOR CLARITY ONLY ONE OF THREE RAS/WAS PUMPS IS SHOWN.

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SPP NORTH TRAIN

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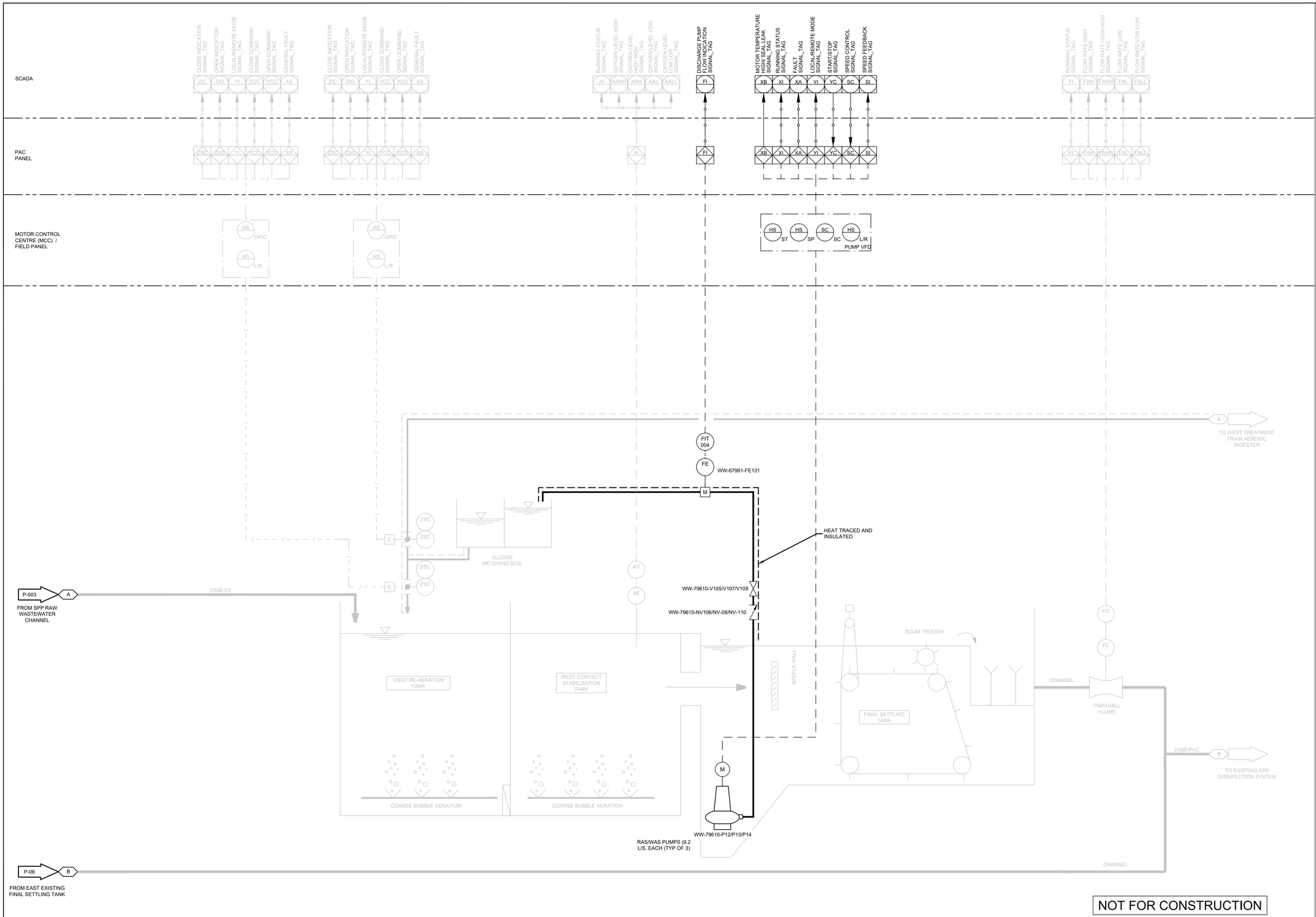
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Drafting Check	B. PLETZ	Design Check	H. BREWER
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216493**

Title
EAST RAS/WAS SYSTEM P&ID (1 OF 2)

Bruce Power Sheet No.
NK37-DRAW-79600-10017

Sheet No.
P-006
Sheet **35** of **63**



NOTE: FOR CLARITY ONLY ONE OF THREE RAS/WAS PUMPS IS SHOWN.

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Drafting Check	B. PLETZ	Design Check	H. BREWER
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

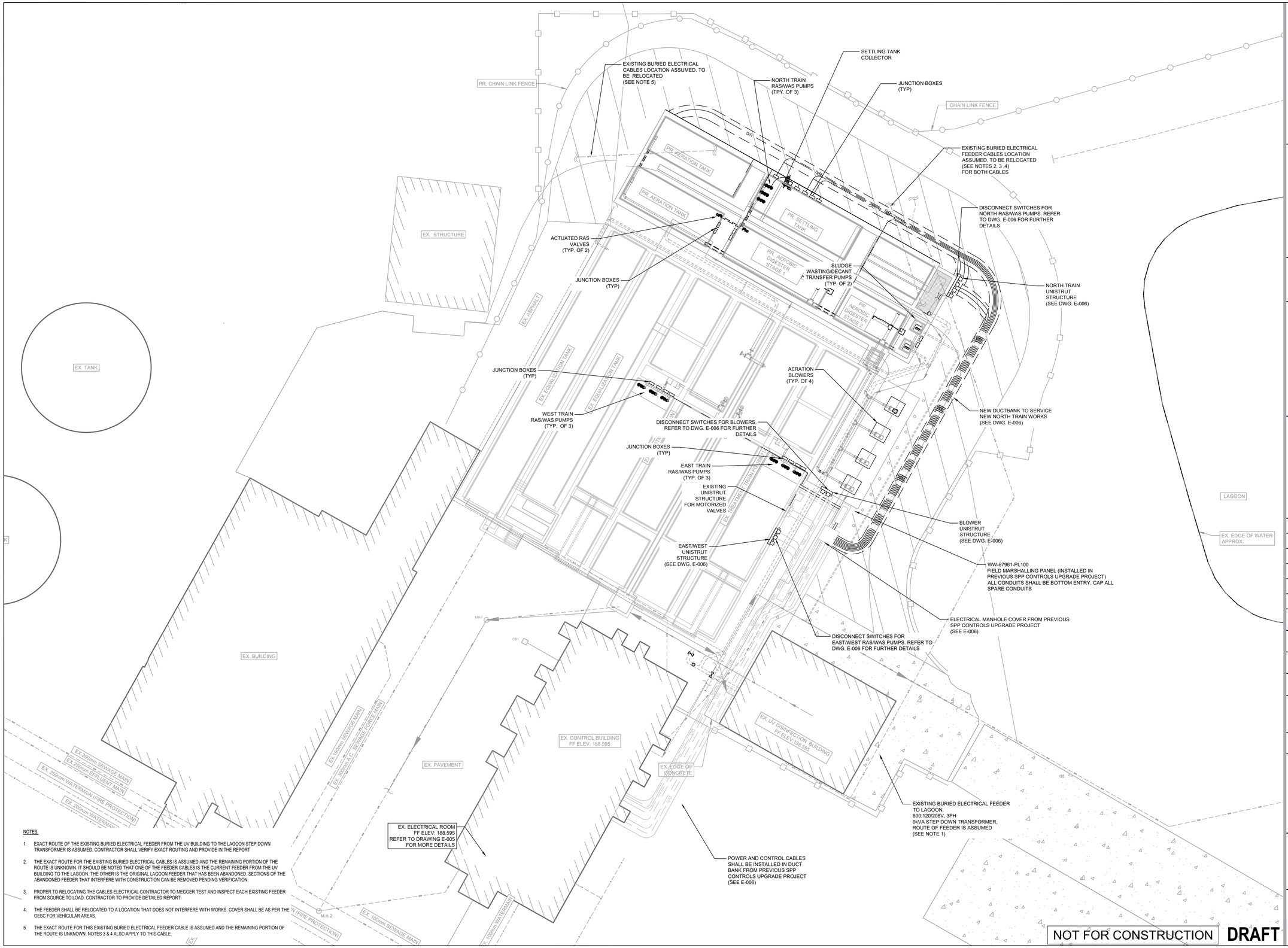
Project No. **11216493**

Title
WEST
RAS/WAS SYSTEM
P&ID (2 OF 2)

Bruce Power Sheet No.
NK37-DRAW-79600-10018

Sheet No.
P-007
Sheet **36** of **63**

Plot Date: 11 March 2021 - 2:36 PM Plotted By: Jason Spenler CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA003.dwg



NOTES:

1. EXACT ROUTE OF THE EXISTING BURIED ELECTRICAL FEEDER FROM THE UV BUILDING TO THE LAGOON STEP DOWN TRANSFORMER IS ASSUMED. CONTRACTOR SHALL VERIFY EXACT ROUTING AND PROVIDE IN THE REPORT
2. THE EXACT ROUTE FOR THE EXISTING BURIED ELECTRICAL CABLES IS ASSUMED AND THE REMAINING PORTION OF THE ROUTE IS UNKNOWN. IT SHOULD BE NOTED THAT ONE OF THE FEEDER CABLES IS THE CURRENT FEEDER FROM THE UV BUILDING TO THE LAGOON. THE OTHER IS THE ORIGINAL LAGOON FEEDER THAT HAS BEEN ABANDONED. SECTIONS OF THE ABANDONED FEEDER THAT INTERFERE WITH CONSTRUCTION CAN BE REMOVED PENDING VERIFICATION.
3. PROPER TO RELOCATING THE CABLES ELECTRICAL CONTRACTOR TO MEGGER TEST AND INSPECT EACH EXISTING FEEDER FROM SOURCE TO LOAD. CONTRACTOR TO PROVIDE DETAILED REPORT.
4. THE FEEDER SHALL BE RELOCATED TO A LOCATION THAT DOES NOT INTERFERE WITH WORKS. COVER SHALL BE AS PER THE OESC FOR VEHICULAR AREAS.
5. THE EXACT ROUTE FOR THIS EXISTING BURIED ELECTRICAL FEEDER CABLE IS ASSUMED AND THE REMAINING PORTION OF THE ROUTE IS UNKNOWN. NOTES 3 & 4 ALSO APPLY TO THIS CABLE.

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0 1.5 3 4.5m
SCALE 1:150

Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	NH	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	C. DURIAS
Drafting Check	B. PLETZ	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**		Bar is 20mm on original size drawing 0 20mm	

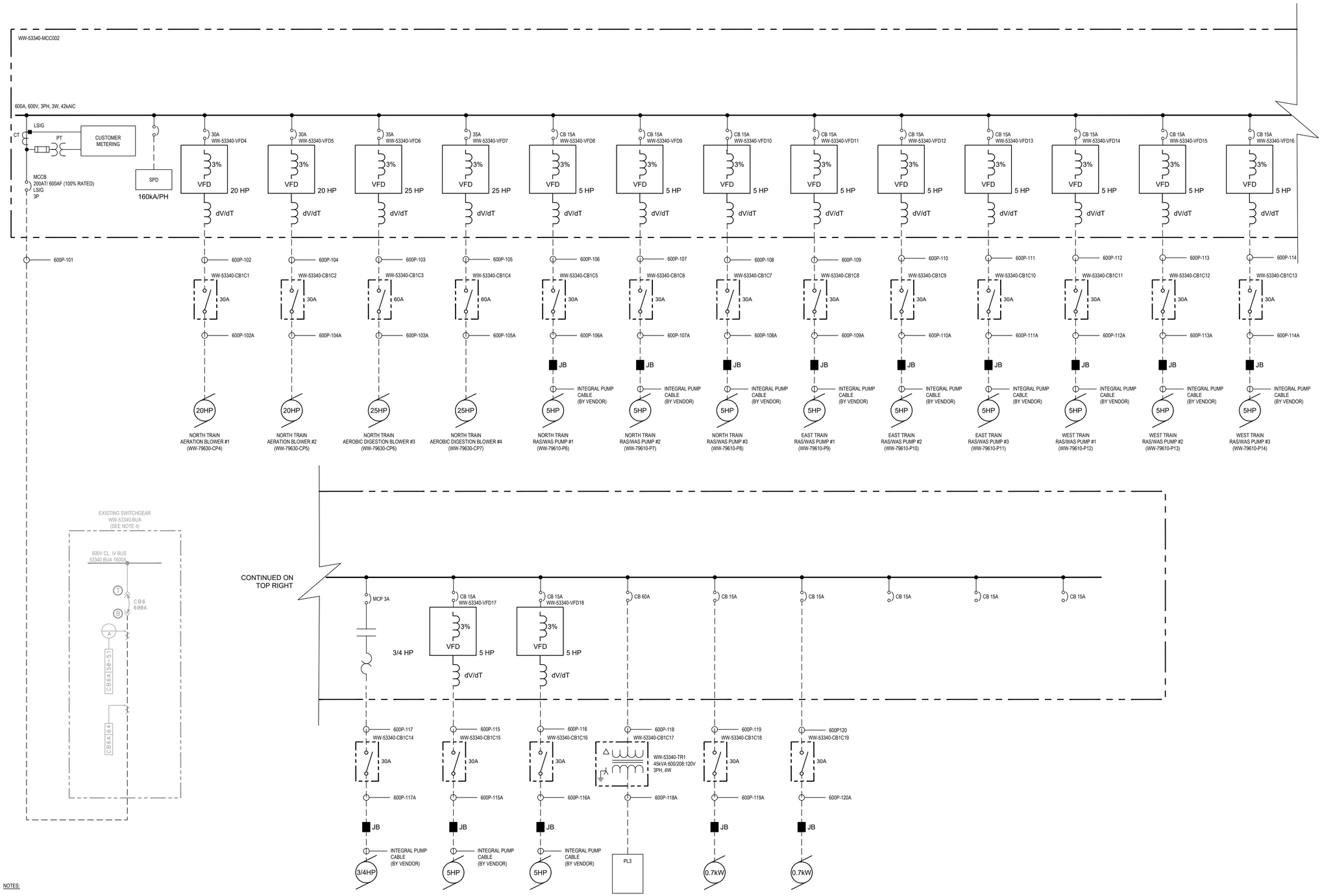
Project No. **11216493**

Title
ELECTRICAL SITE PLAN

Bruce Power Sheet No.
NK37-DRAW-52000-10001

Sheet No.
E-001

Sheet **37** of **63**



NOTES:

1. ELECTRICAL STUDIES MUST BE COMPLETED AND APPROVED PRIOR TO APPROVAL OF ELECTRICAL EQUIPMENT.
2. ALL DISCONNECT SWITCHES TO BE NEMA 4X AND WILL BE INSTALLED IN UNCLASSIFIED AREAS, UNLESS INDICATED OTHERWISE. ALL DISCONNECT SWITCH FRONT PANELS SHALL BE EQUIPPED WITH WINDOWS.
3. ONLY CABLE TAGS ARE SHOWN ON THIS DRAWING. REFER TO THE CABLE SCHEDULE FOR THE CORRESPONDING CABLE TYPE AND INSTALLATION DETAILS.
4. FOR SWITCHGEAR DETAIL REFER TO DRAWING E-104(NK37-DRAW-53000-10052) FROM SPP CONTROLS UPGRADE PROJECT.

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Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

Project No. **11216493**

Title
NORTH TRAIN
SINGLE LINE DIAGRAM

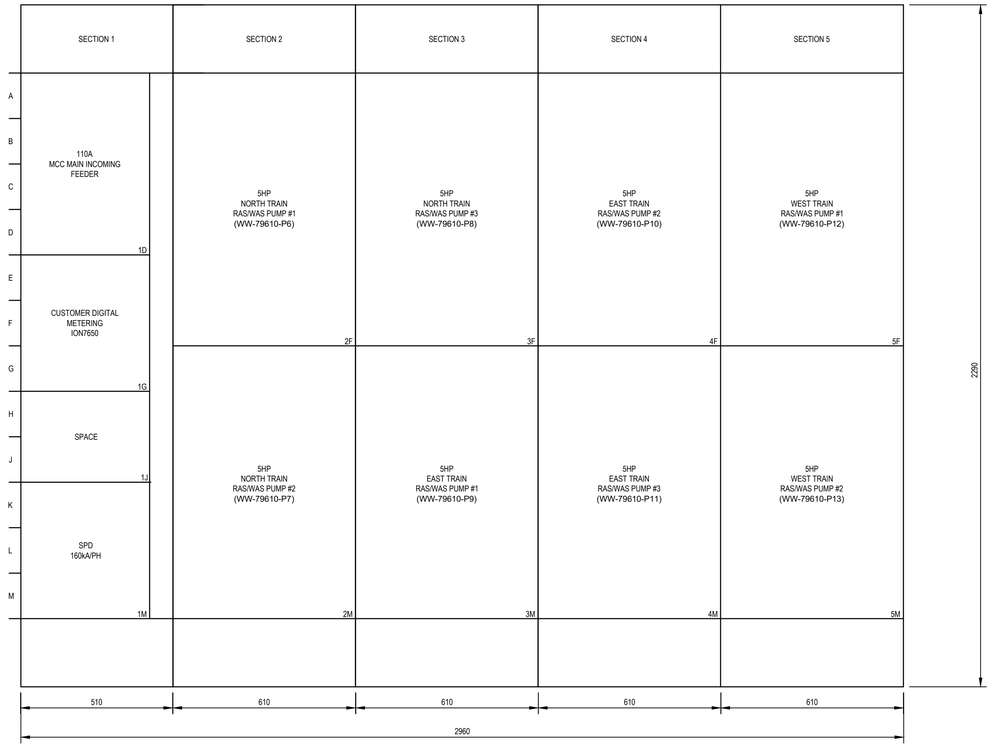
Bruce Power Sheet No.
NK37-DRAW-53000-10030

Sheet No.
E-002

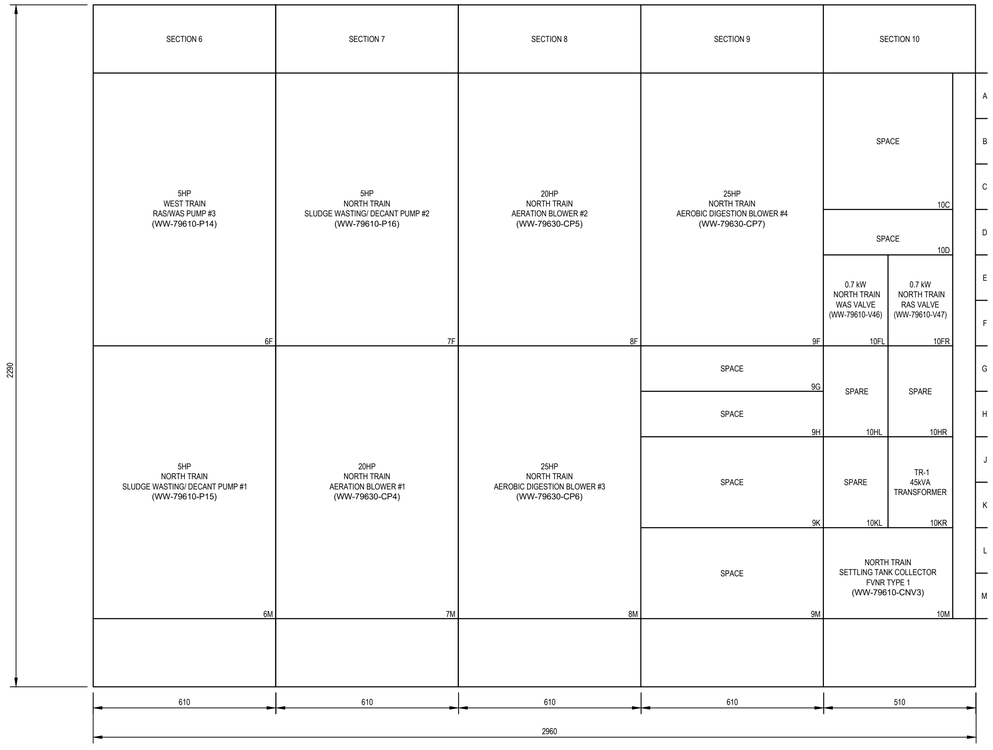
Sheet **38** of **63**

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
2. MCC CELL SECTIONS WILL BE MOUNTED BACK TO BACK AND CONNECTED VIA MCC MANUFACTURER SUPPLIED BUS CONNECTION.
3. THE DEPTH OF THE MCC ENCLOSURE SHALL BE 530mm.



MCC CELL SECTIONS 1 TO 5
NTS



MCC CELL SECTIONS 6 TO 10
NTS

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Drawn **S. PARK**	Designer **C. DURIAS**
Drafting Check **B. PLETZ**	Design Check **A. PARSONS**
Project Manager **C. EVEREST**	Date **01/15/2021**
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Original Size **ANSI D**	Bar is 20mm on original size drawing 0 20mm

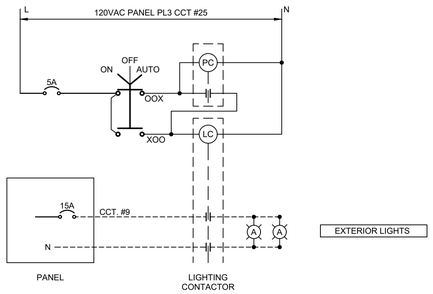
Project No. **11216493**

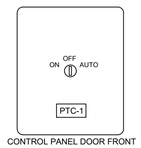
Title
NORTH TRAIN
MCC-2 ELEVATION

Bruce Power Sheet No.
NK37-DRAW-53000-100031

Sheet No.
E-003

Sheet **39** of **63**





CONTROL PANEL DOOR FRONT

PHOTOCELL LIGHTING CONTROL SCHEMATIC

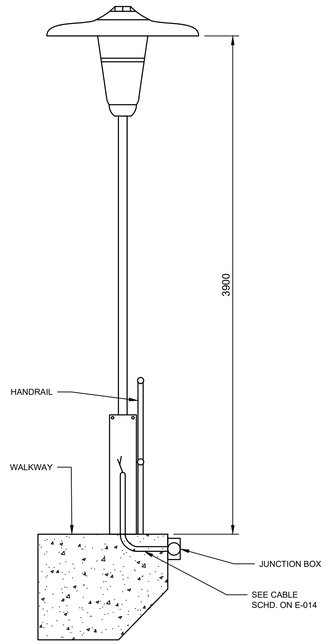
SERVICE DESCRIPTION	WATTS	WIRE	CKT. NO.	BRANCH CB	A B C	BRANCH CB	CKT. NO.	WIRE	WATTS	SERVICE DESCRIPTION
RAS/WAS PIPING EAST TRAIN HEAT TRACE	-	10	1	20A-GFEP		20A-GFEP	2	10	-	RAS/WAS WEST TRAIN PIPING HEAT TRACE
	-	10	3			20A-GFEP	4	10	-	
EQUILIZATION TANK PIPING HEAT TRACE	-	10	5	15A-GFEP		20A-GFEP	6	10	-	RAW WASTEWATER SUPPLY LINE HEAT TRACE
	-	10	7	15A		20A-GFEP	8	10	-	
OUTDOOR LIGHTING	500	12	9	15A		15A	10	12	-	NORTH TRAIN AEROBIC DIGESTER STAGE 1 LEVEL SENSOR
NORTH TRAIN RAS/WAS FLOW METER	-	12	11	15A		15A	12	12	-	NORTH TRAIN AEROBIC DIGESTER STAGE 2 LEVEL SENSOR
NORTH TRAIN AERATION TANK DO METER	-	12	13	15A		15A	14	12	-	SLUDGE WASTING/DECANT SUMP LEVEL SENSOR
NORTH TRAIN FINAL EFFLUENT FLOW METER (PARSHALL FLUME)	-	12	15	15A		15A	16	12	-	NORTH TRAIN AERATION BLOWER #1 HEATER
EAST TRAIN RAS/WAS FLOW METER	-	12	17	15A		15A	18	12	-	NORTH TRAIN AERATION BLOWER #1 FAN
WEST TRAIN RAS/WAS FLOW METER	-	10	19	15A		15A	20	12	-	NORTH TRAIN AERATION BLOWER #2 HEATER
NORTH TRAIN AERATION BLOWER #4 HEATER	-	10	21	15A		15A	22	12	-	NORTH TRAIN AERATION BLOWER #2 FAN
NORTH TRAIN AERATION BLOWER #4 FAN	-	10	23	15A		15A	24	12	-	NORTH TRAIN AERATION BLOWER #3 HEATER
LIGHTING CONTROL PANEL	-	10	25	15A		15A	26	12	-	NORTH TRAIN AERATION BLOWER #3 FAN
SPARE	-	12	27	20A		15A	28	12	-	SPARE
SPARE	-	12	29	15A		15A	30	12	-	SPARE
SPARE	-	12	31	15A		15A	32	12	-	SPARE
SPARE	-	12	33	15A		20A-GFEP	34	10	-	RAS/WAS NORTH TRAIN PIPING HEAT TRACE
SPARE	-	12	35	15A			36	10	-	
SPARE	-	10	37	20A		20A	38	12	-	SPARE
	-	10	39				40	12	-	
SPARE	-	12	41	15A		15A	42	12	-	SPARE

N
GND

PANEL MTD.:	WALL MOUNTED	ENCLOSURE:	NEMA 4X
MANUFACTURER:	EATON ELECTRICAL OR APPROVED EQUAL	TYPE:	POW-R-LINE 1A OR APPROVED EQUAL
MAIN BREAKER:	N/A	MAIN LUGS:	225A
FEEDER SIZE:	-	FEEDER ENTRY:	TOP OR BOTTOM

PANEL BRANCH BREAKERS			PANEL LOADING SCHEDULE	
No.	POLES	AMPS	PHASE	WATTS (CONNECT.)
-	-	-	A	-
-	-	-	B	-
-	-	-	B	-

225A, 120/208V, 3-PH, 4-WIRE, 42CCT LIGHTING PANEL PL3 SCHEDULE



LIGHTING FIXTURE POLE DETAIL

LUMINARIE SCHEDULE							
TYPE	DESCRIPTION	MANUFACTURERS	CATALOGUE NUMBER	RATING	MOUNTING	HEIGHT	NOTES
A	LED POST MOUNTED FIXTURE	HOLOPHANE OR APPROVED EQUIVALENT	245 25S RN 120 R5 GL	120 VAC	POLE MOUNTED: 3900(13FT) AFF, SWIVELPOLE F2 OR APPROVED EQUIVALENT.	4877 AFG	WET LOCATION RATED, ENCLOSED AND GASKETED, CORROSION RESISTANT, CSA CERTIFIED, COLD WEATHER RATED, CONTRACTOR TO SUPPLY THE LIGHTS WITH ALL REQUIRED MOUNTING ACCESSORIES.

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Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	NH	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
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Drafting Check	**B. PLETZ**	Design Check	**A. PARSONS**
Project Manager	**C. EVEREST**	Date	**01/15/2021**
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Original Size **ANSI D**		Bar is 20mm on original size drawing 0 20mm	

Project No. **11216493**

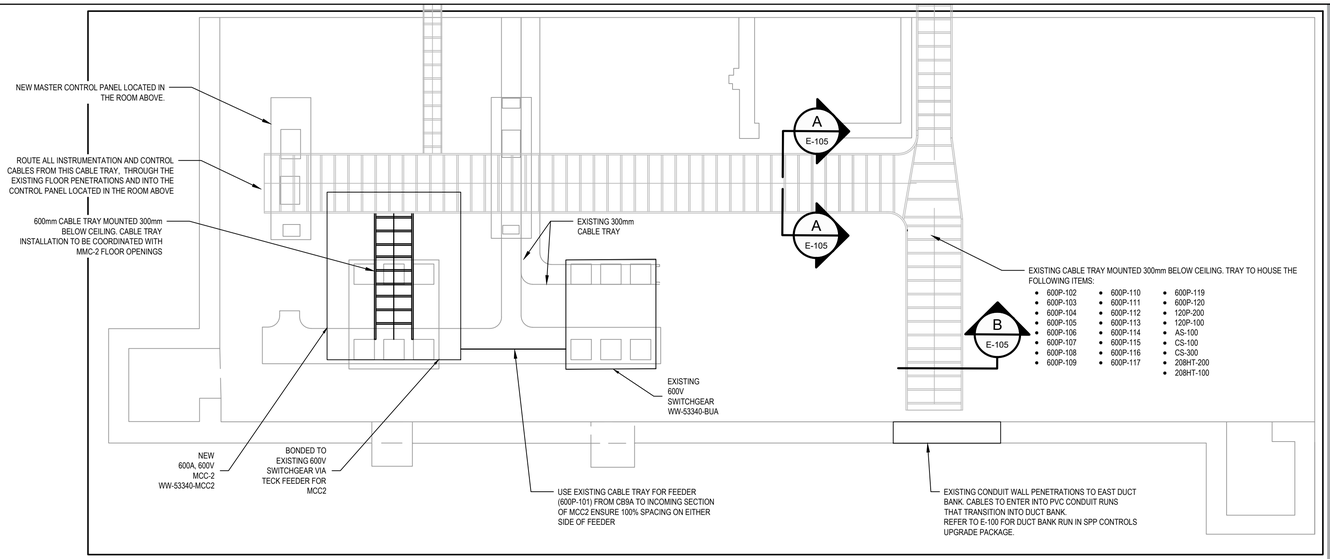
Title
NORTH TRAIN PANEL AND LUMINAIRE SCHEDULE

Bruce Power Sheet No.
NK37-DRAW-53000-10034

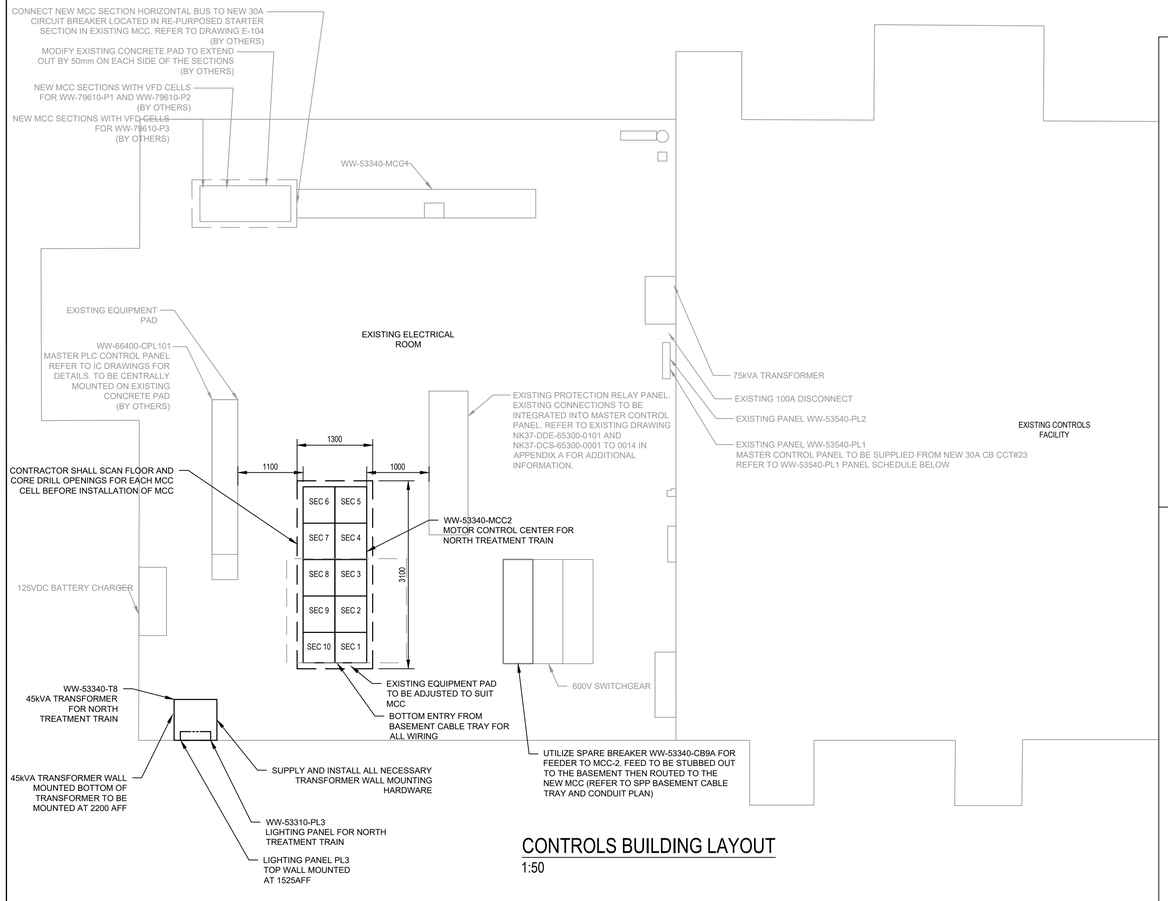
Sheet No.
E-004
Sheet **40** of **63**

NOTES:

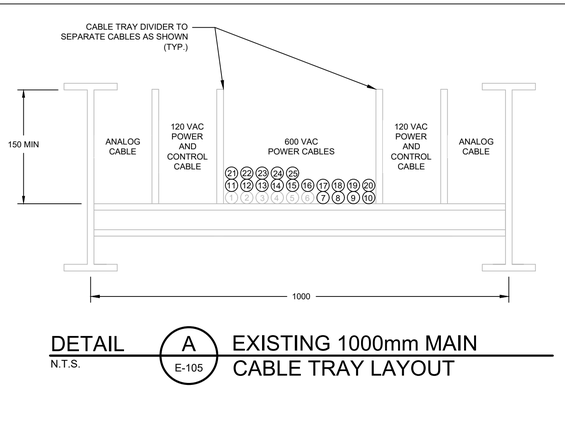
1. OUTPOST 5 PANELS PL-1002 AND 1003 WILL BE REMOVED IN CONTROLS UPGRADE PROJECT.



SPP BASEMENT CABLE TRAY AND CONDUIT PLAN
N.T.S



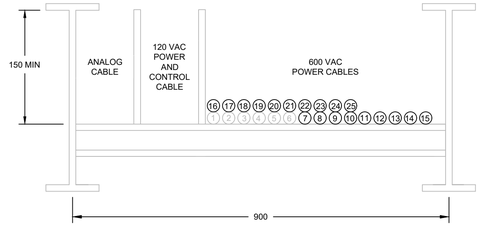
CONTROLS BUILDING LAYOUT
1:50



DETAIL A E-105 EXISTING 1000mm MAIN CABLE TRAY LAYOUT
N.T.S.

600 VAC POWER CABLE LEGEND

1. 600P-002
2. 600P-003
3. 600P-004
4. 600P-005
5. 600P-006
6. 600P-007
7. 600P-008
8. 600P-102
9. 600P-103
10. 600P-104
11. 600P-105
12. 600P-106
13. 600P-107
14. 600P-108
15. 600P-109
16. 600P-110
17. 600P-111
18. 600P-112
19. 600P-113
20. 600P-114
21. 600P-115
22. 600P-116
23. 600P-117
24. 600P-119
25. 600P-120



DETAIL B E-105 EXISTING 900mm EAST CABLE TRAY LAYOUT
N.T.S.

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0 0.5 1 1.5m

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177 TIE ROAD, TIVERTON, ON

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SPP NORTH TRAIN

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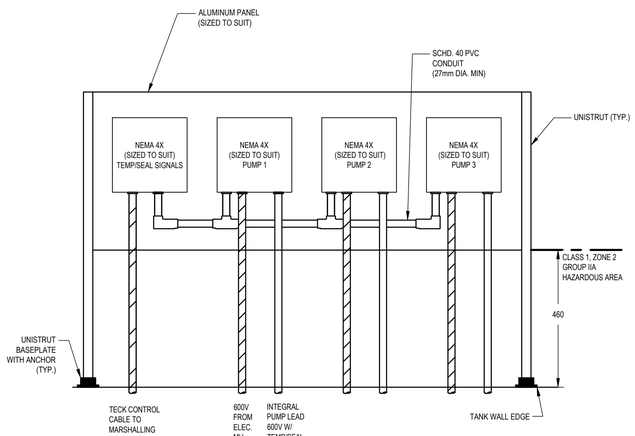
Project No. **11216493**

Title
CONTROL BUILDING ELECTRICAL ROOM POWER LAYOUT

Bruce Power Sheet No.
NK37-DRAW-53000-10032

Sheet No.
E-005

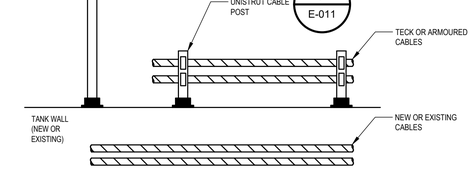
Sheet **41** of **63**



NOTES:

1. CONTRACTOR TO DESIGN AND FASTEN UNISTRUT STRUCTURE TO EXISTING SETTLING TANK, DO NOT MOUNT ON GUARDRAIL.
2. CONTRACTOR SHALL SUBMIT BRACKET, MOUNTING, BASEPLATE, UNISTRUT, ANCHORS AND FASTENING DETAILS FOR UNISTRUT STRUCTURE TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION
3. THE BOTTOM OF THE LOWEST MOUNTED DISCONNECT SWITCH OR JUNCTION BOX SHALL BE 250mm (MIN.) ABOVE THE HAZARDOUS ARE

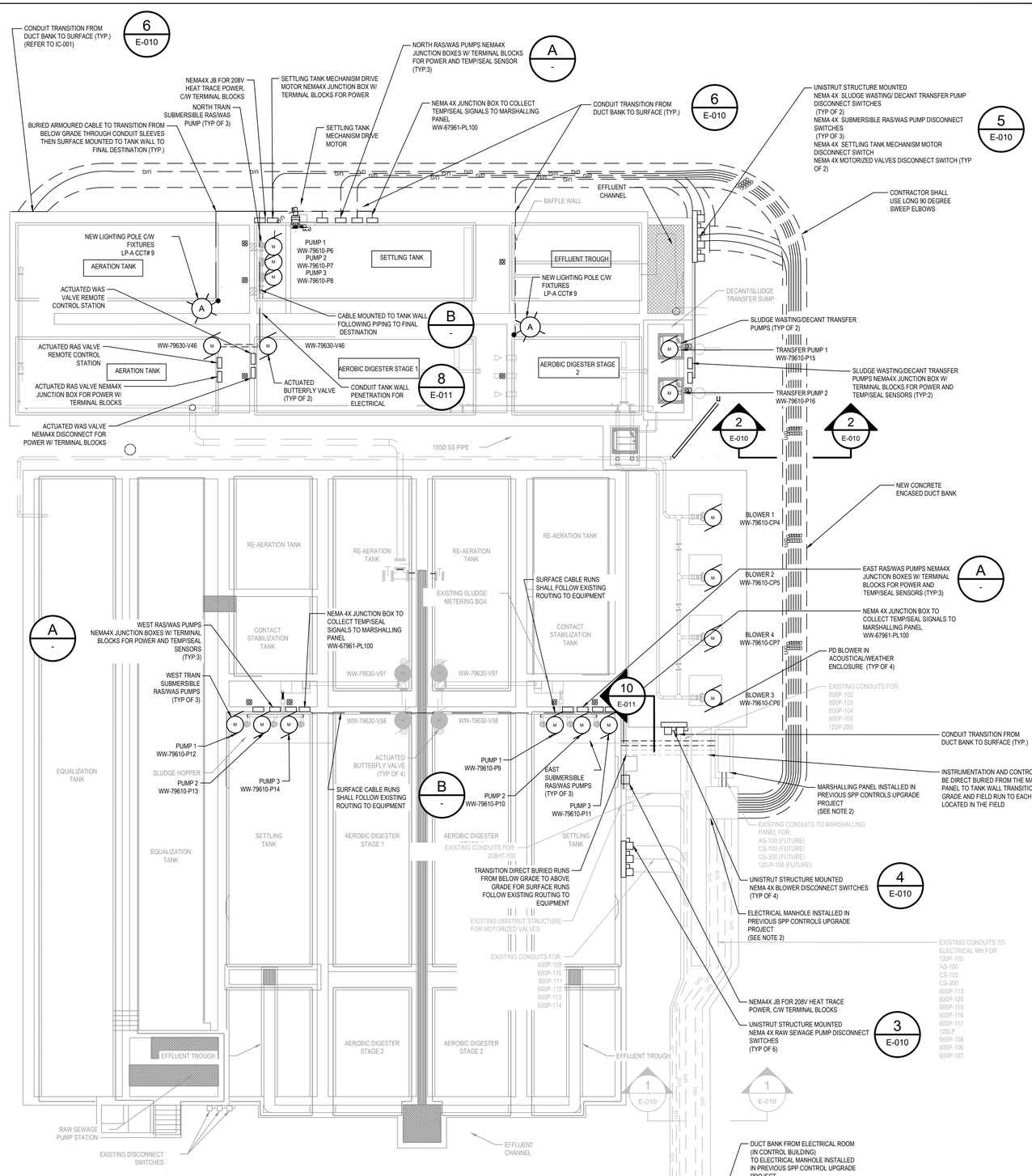
DETAIL A / E-006 — TYPICAL RAS/WAS PUMP OR RAS VALVE JUNCTION BOX MOUNTING



NOTES:

1. USE UNISTRUT CABLE POST DETAIL FOR TANK WALL AREAS WITH THERE IS NO ROOM TO MOUNT TECK OR ARMOURER AREAS.
2. THE UNISTRUT CABLE POSTS SHALL BE SPACED TO PROVIDE PROPER SUPPORT FOR ARMOURED CABLE AS PER THE OESC.
3. REFER TO THE UNISTURT CABLE POST DETAIL AND ASSOCIATED NOTES.

DETAIL B / E-006 — ADDITIONAL CABLE MOUNTING DETAIL FOR TANK AREAS (NEW AND EXISTING)



TREATMENT TRAINS POWER EQUIPMENT LAYOUT

1:100

NOTES:

1. REFER TO DRAWING FOR HAZARDOUS AREA CLASSIFICATION.
2. REFER TO DETAILS 17 & 19 ON DRAWING E-109(NK37-DRAW-53000-10080), FROM DETAIL SPP CONTROLS UPGRADE FOR ELECTRICAL MANHOLE AND MARSHALLING PANEL DETAILS.
3. PROVIDE HAZARDOUS AREA RATED, GAS TIGHT TECK CABLE SEALS FOR ALL TECK CABLES THAT ENTER DISCONNECT SWITCHES AT A LEVEL OF 800mm AFG AND BELOW. ALL ENTRIES SHALL BE BOTTOM ENTRY.

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0 1 2 3m

Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	NH	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	C. DURIAS
Drafting Check	B. PLETZ	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

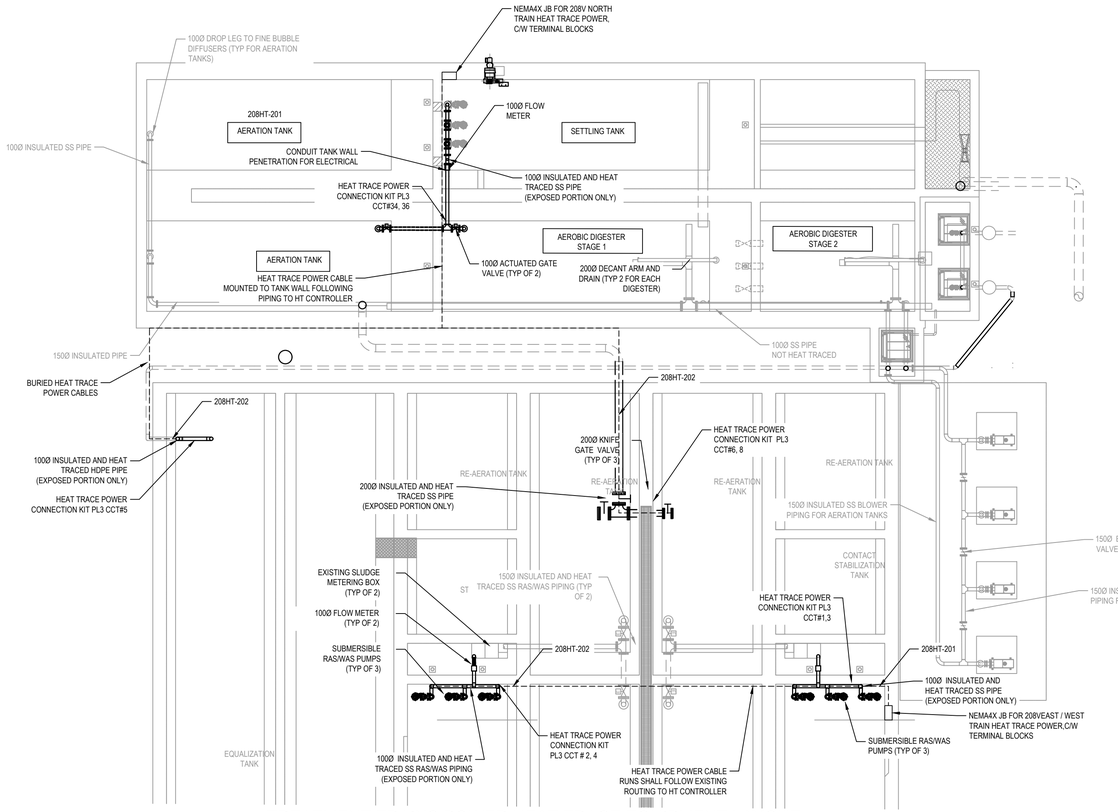
Project No. **11216493**

Title
TREATMENT TRAINS POWER PLAN AND EQUIPMENT LAYOUT

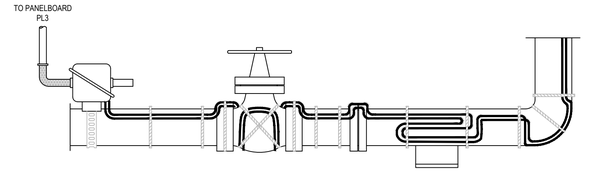
Bruce Power Sheet No.
NK37-DRAW-53000-10033

Sheet No.
E-006

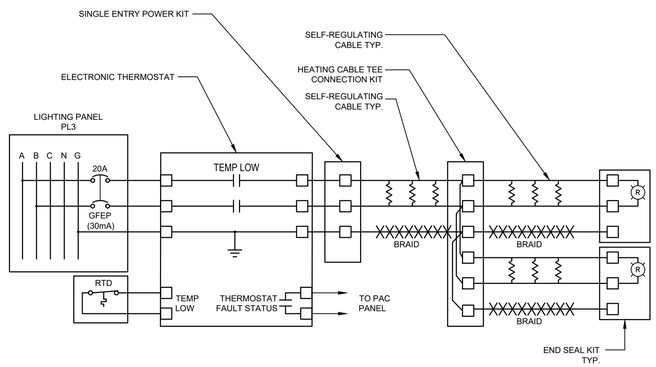
Sheet 42 of 63



TREATMENT TRAINS POWER HEAT TRACE EQUIPMENT LAYOUT
1:100



TYPICAL HEAT TRACING CONFIGURATION
NTS



TYPICAL HEAT TRACING WIRING SCHEMATIC
NTS

NOTES:

1. ALL EQUIPMENT TO BE RATED FOR THE HAZARDOUS AREAS IN WHICH THEY ARE PLACED.
2. REFER TO P&IDs FOR ALL FOR PIPING THAT REQUIRES HEAT TRACING.
3. REFER TO DRAWING E-011 FOR ADDITIONAL DETAILS FOR HEAT TRACE WIRING CONFIGURATIONS .
4. ADD HEAT TRACING END SEALS AS REQUIRED.
5. CIRCUIT BREAKER SIZE TO BE SIZED BASED ON REQUIREMENTS OF SPECIFIC HEAT TRACING CIRCUIT AMP RATING AND NUMBER OF POLES, SHALL BE SUBJECT TO CHANGE ON A CASE BY CASE BASES. REFER TO DP-A PANEL SCHEDULE FOR ADDITIONAL DETAILS.
6. PARENT HEAT TRACE CABLES TO BE SIZED AS APPROPRIATE TO HANDLE FULL LOAD OF ALL BRANCH CIRCUITS AND THEIR INRUSH CURRENT.

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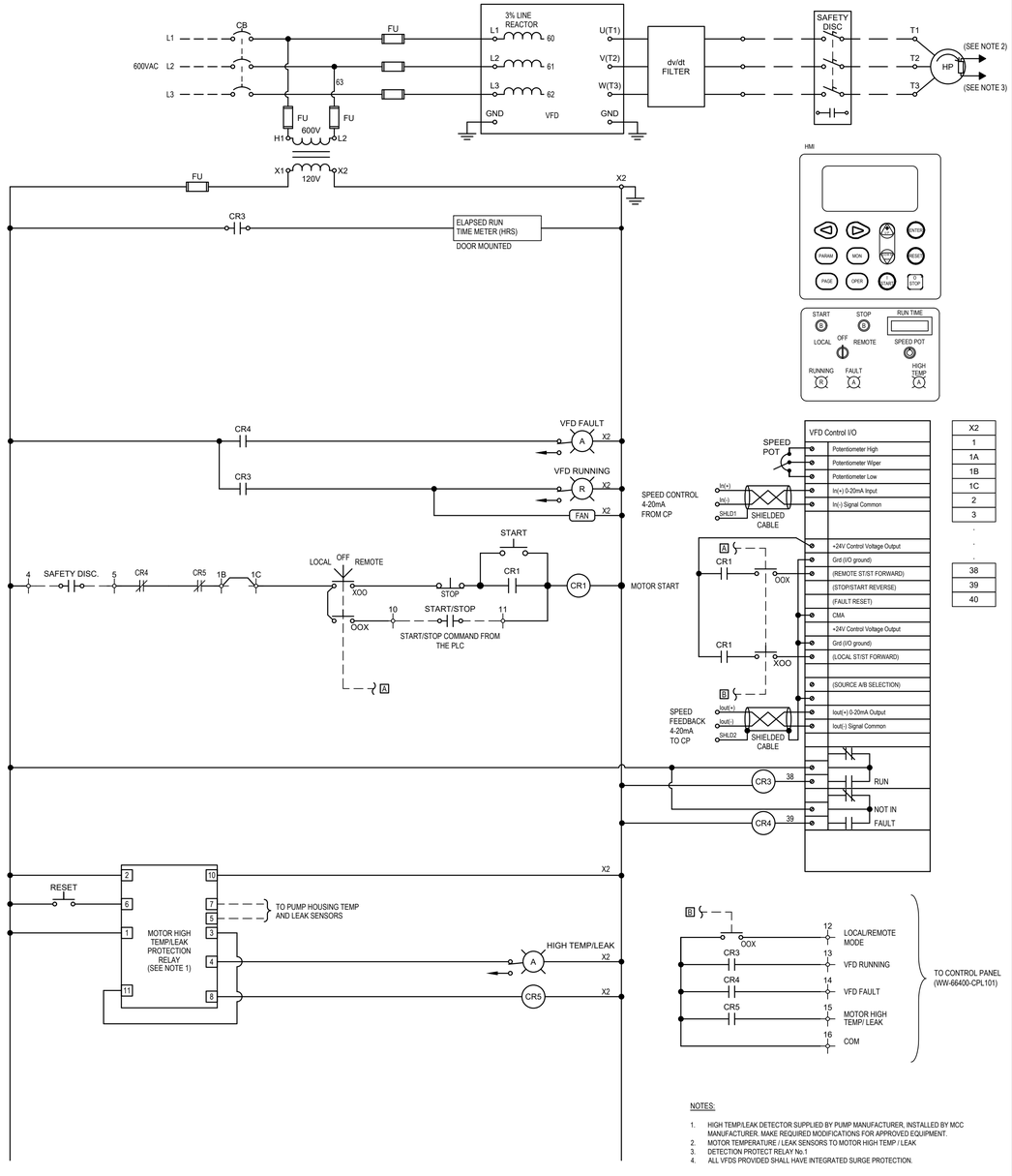
Drawn	S. PARK	Designer	C. DURIAS
Drafting Check	B. PLETZ	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

Title
ELECTRICAL PIPING HEAT TRACE PLAN

Bruce Power Sheet No.
NK37-DRAW-53000-10037

Sheet No.
E-007
Sheet **43** of **63**



TYPICAL VFD CONTROLLED PUMP WIRING SCHEMATIC

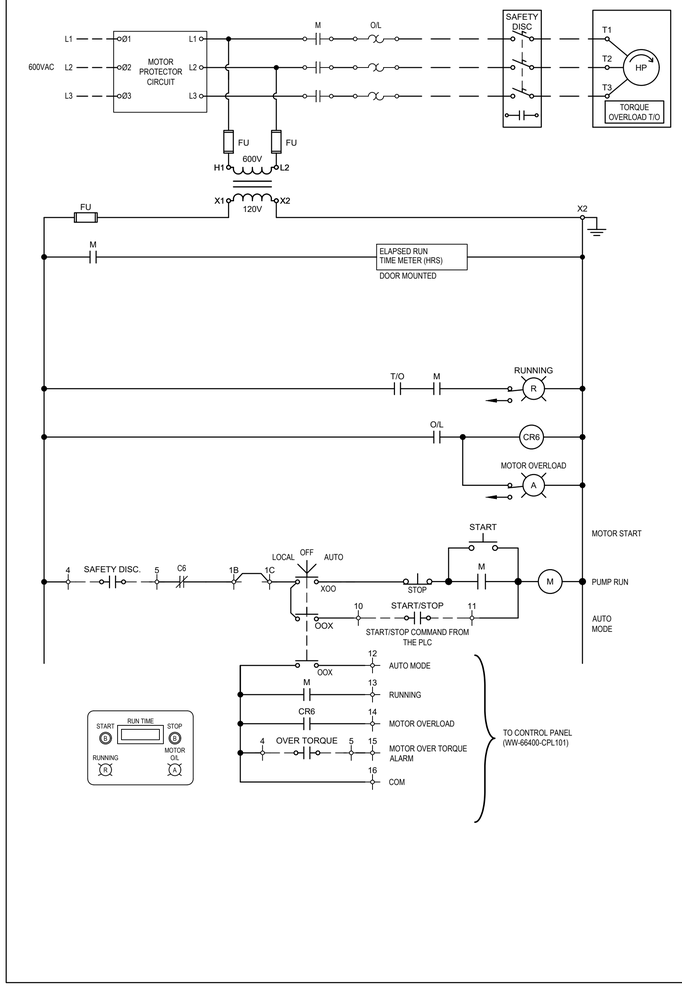
TYPICAL OF:
- SLUDGE WASTING/ DECANT PUMPS 1 AND 2:
  (WW-79610-P15)
  (WW-79610-P16)
- NORTH TRAIN RAS/WAS PUMPS 1 TO 3:
  (WW-79610-P6)
  (WW-79610-P7)
  (WW-79610-P8)
- EAST TRAIN RAS/WAS PUMPS 1 TO 3:
  (WW-79610-P9)
  (WW-79610-P10)
  (WW-79610-P11)
- WEST TRAIN RAS/WAS PUMPS 1 TO 3:
  (WW-79610-P12)
  (WW-79610-P13)
  (WW-79610-P14)

NOTES:

1. ELECTRICAL STUDIES MUST BE COMPLETED AND APPROVED PRIOR TO APPROVAL OF ELECTRICAL EQUIPMENT.
2. ALL DISCONNECT SWITCHES TO BE NEMA 4X AND WILL BE INSTALLED IN UNCLASSIFIED AREAS, UNLESS INDICATED OTHERWISE.

NOTES:

1. HIGH TEMP/LEAK DETECTOR SUPPLIED BY PUMP MANUFACTURER, INSTALLED BY MCC MANUFACTURER. MAKE REQUIRED MODIFICATIONS FOR APPROVED EQUIPMENT.
2. MOTOR TEMPERATURE / LEAK SENSORS TO MOTOR HIGH TEMP / LEAK
3. DETECTION PROTECT RELAY No.1
4. ALL VFDS PROVIDED SHALL HAVE INTEGRATED SURGE PROTECTION.



SETTLING TANK COLLECTOR FVNR WIRING SCHEMATIC

TYPICAL OF:
- NORTH TRAIN SETTLING TANKS COLLECTOR:
  (WW-79610-CNV3)

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Drafting Check	B. PLETZ	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

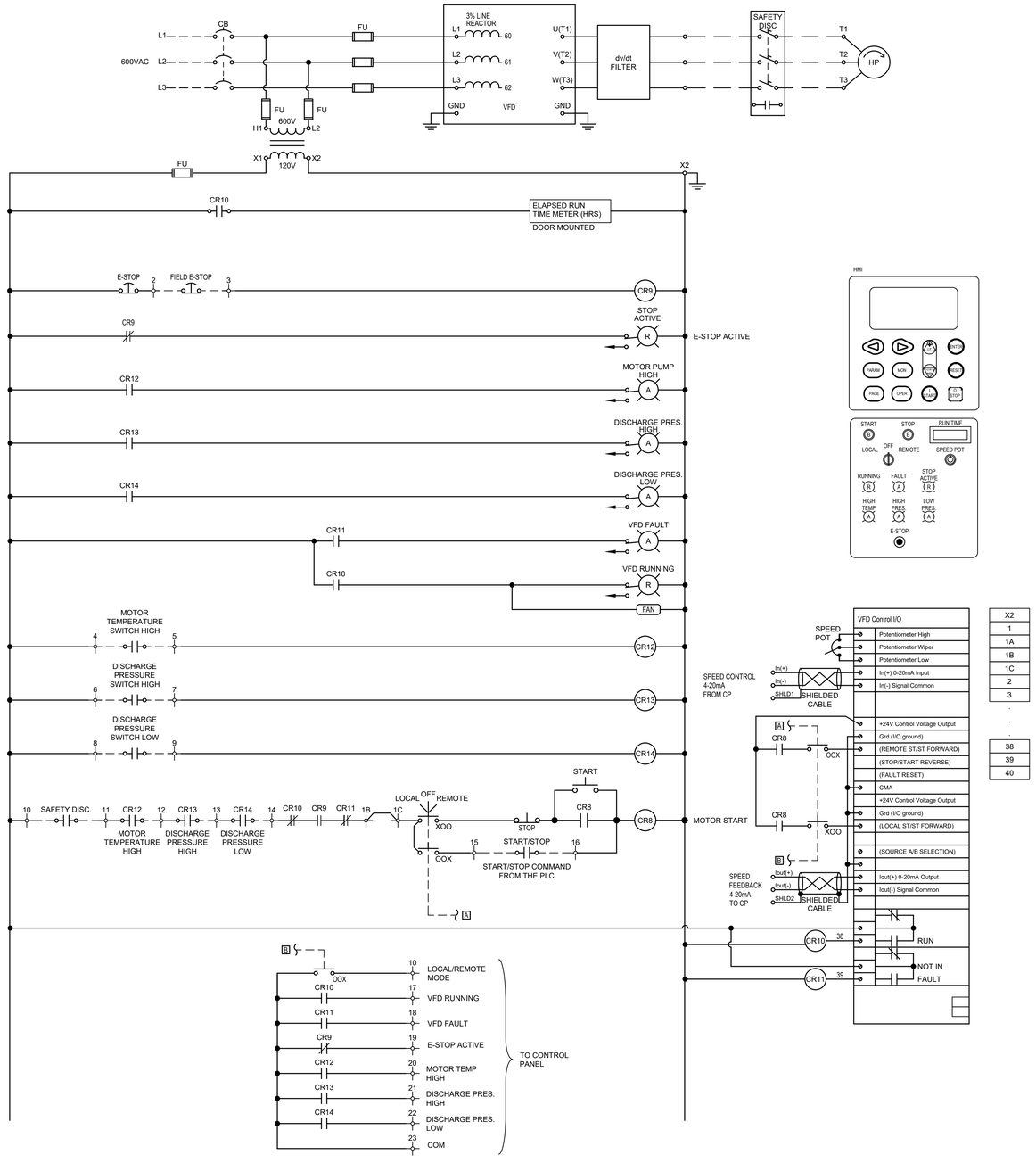
Project No. **11216493**

Title
MOTOR CONTROL SCHEMATIC (1 OF 2)

Bruce Power Sheet No.
NK37-DRAW-53000-10035

Sheet No.
E-008

Sheet **44** of **63**



NOTES:

1. ALL VFDS PROVIDED SHALL HAVE INTEGRATED SURGE PROTECTION.

TYPICAL VFD CONTROLLED AERATION BLOWERS WIRING SCHEMATIC

TYPICAL OF:

- NORTH TRAIN BLOWER 1 (WWW-79630-CP4)
- NORTH TRAIN BLOWER 2 (WWW-79630-CP5)
- NORTH TRAIN BLOWER 3 (WWW-79630-CP6)
- NORTH TRAIN BLOWER 4 (WWW-79630-CP7)

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Drawn	**S. PARK**	Designer	**C. DURIAS**
Drafting Check	**B. PLETZ**	Design Check	**A. PARSONS**
Project Manager	**C. EVEREST**	Date	**01/15/2021**
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Original Size **ANSI D**

Bar is 20mm on original size drawing
0 20mm

Project No. **11216493**

Title

MOTOR CONTROL SCHEMATIC (2 OF 2)

Bruce Power Sheet No.

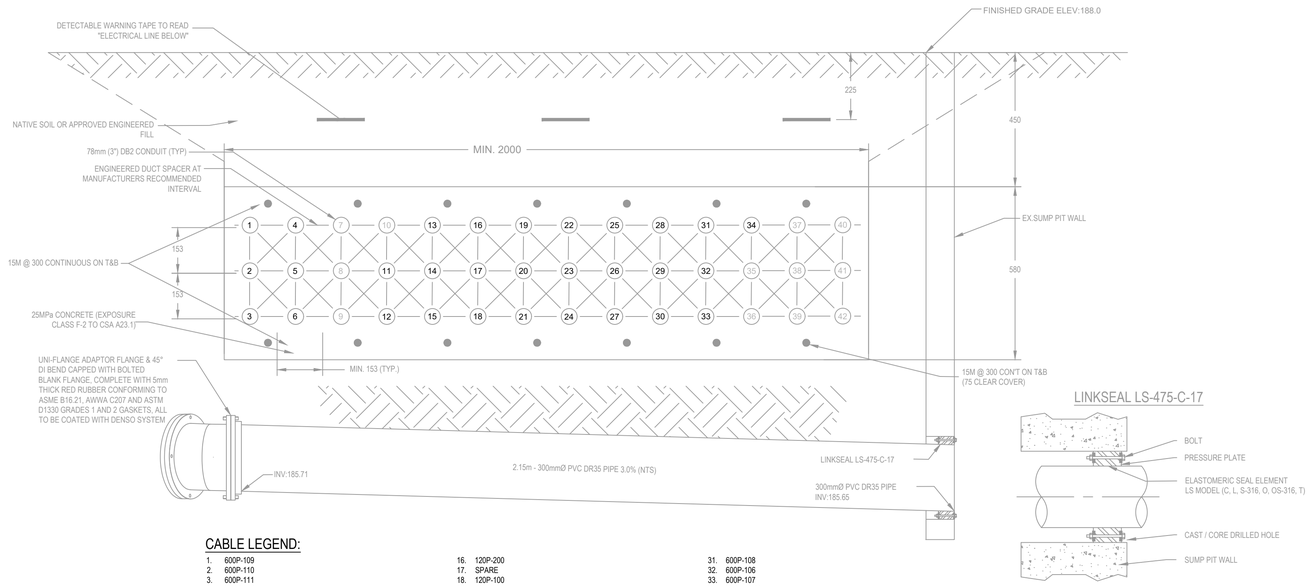
NK37-DRAW-53000-10036

Sheet No.

E-009

Sheet **45** of **63**

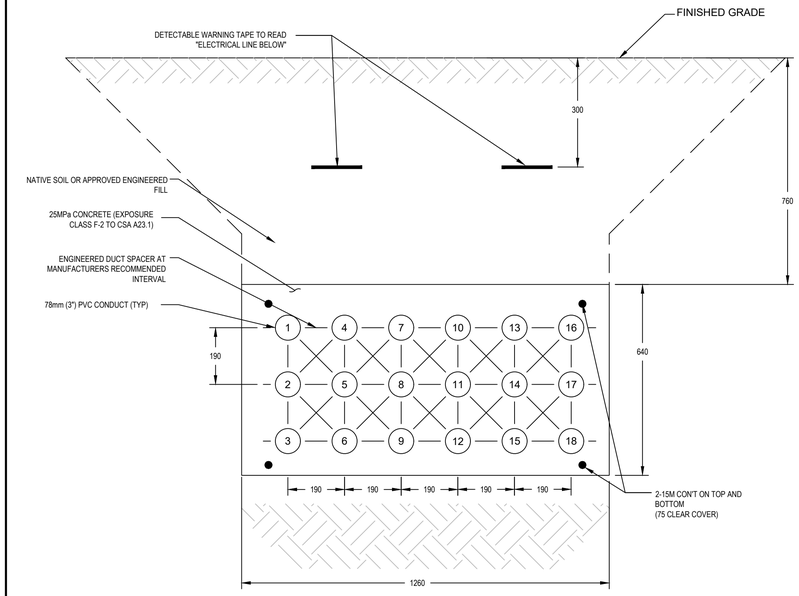
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CABLE LEGEND:

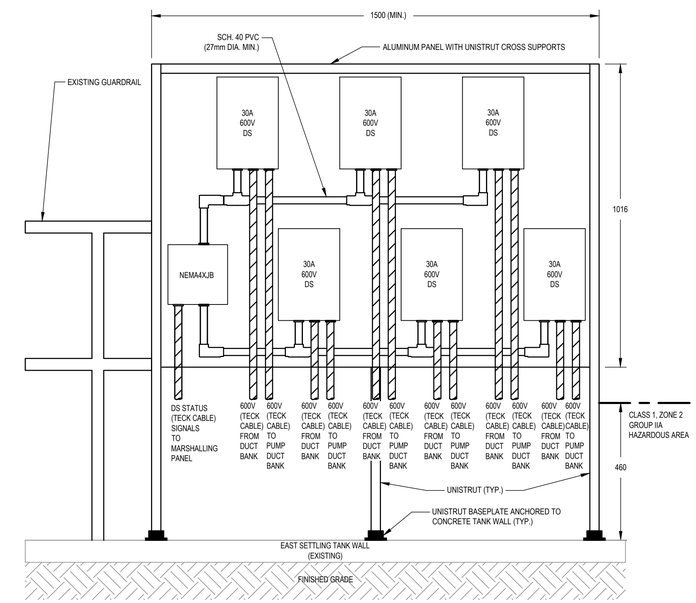
1. 600P-109
2. 600P-110
3. 600P-111
4. 600P-112
5. 600P-113
6. 600P-114
7. 600P-005
8. 600-P-006
9. 600-P-007
10. 600-P-008
11. 208HT-100
12. 600P-102
13. 600P-103
14. 600P-104
15. 600P-105
16. 120P-200
17. SPARE
18. 120P-100
19. AS-100
20. CS-100
21. CS-300
22. AS-022
23. CS-015
24. 120-P005
25. 600P-119
26. 600P-120
27. 600P-115
28. 600P-116
29. 600P-117
30. 120LP
31. 600P-108
32. 600P-106
33. 600P-107
34. 208HT-200
35. SPARE
36. SPARE
37. AS-026, AS-027 (UV BLD.)
38. 120-P-007, 120-P-008 (UV BLD.)
39. AS-002,AS-003 (UV BLD.)
40. CS-027, CS-028 BETWEEN CONTROL BUILDING AND UV BUILDING; 120-P-015 AND 120-P-016 BETWEEN UV BUILDING AND MARSHALLING PANEL
41. SPARE (UV BLD.)
42. COM-005(UV BLD.)

SECTION 1 N.T.S. — CONCRETE ENCASED DUCT BANK SECTION (INSTALLED IN SPP CONTROLS UPGRADE PROJECT)



1. 600P-115
2. 600P-116
3. 600P-117
4. 208HT-200
5. SPARE
6. 600P-106
7. 600P-107
8. 600P-108
9. 120LP
10. 600P-119
11. 600P-120
12. AS-103, AS-104, AS-105, AS-106, AS-107
13. 120P-101, 120P-102, 120P-103
14. CS-315, CS-316
15. DS-315, DS-316
16. SPARE
17. SPARE
18. SPARE

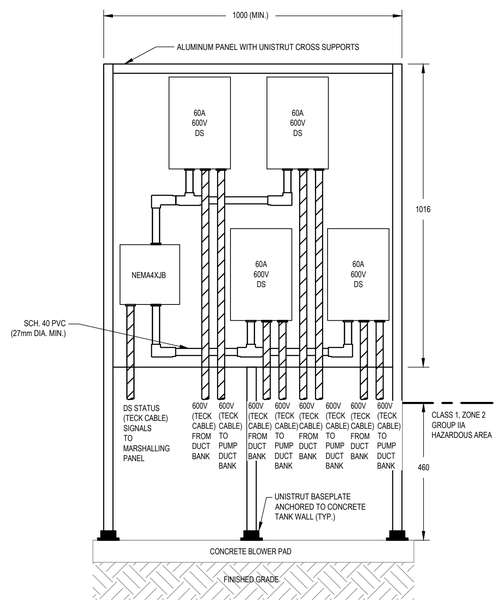
SECTION 2 N.T.S. — CONCRETE ENCASED DUCT BANK



NOTES:

1. CONTRACTOR TO DESIGN AND FASTEN UNISTRUT STRUCTURE TO EXISTING SETTLING TANK, DO NOT MOUNT ON GUARDRAIL.
2. CONTRACTOR SHALL SUBMIT BRACKET, MOUNTING, BASEPLATE, UNISTRUT, ANCHORS AND FASTENING DETAILS FOR UNISTRUT STRUCTURE TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION
3. THE BOTTOM OF THE LOWEST MOUNTED DISCONNECT SWITCH OR JUNCTION BOX SHALL BE 250mm (MIN.) ABOVE THE HAZARDOUS AREA

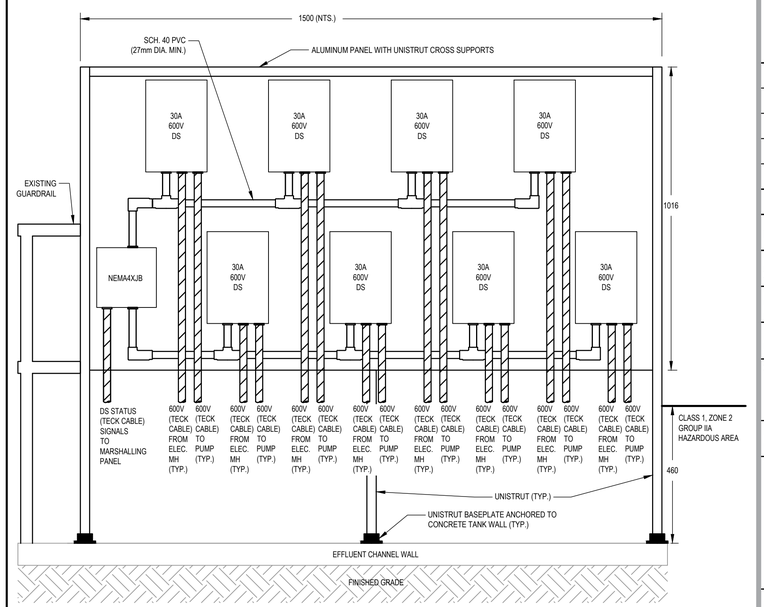
DETAIL 3 N.T.S. — EAST/ WEST TRAIN UNISTRUT STRUCTURE



NOTES:

1. CONTRACTOR TO DESIGN AND FASTEN UNISTRUT STRUCTURE TO EXISTING SETTLING TANK, DO NOT MOUNT ON GUARDRAIL.
2. CONTRACTOR SHALL SUBMIT BRACKET, MOUNTING, BASEPLATE, UNISTRUT, ANCHORS AND FASTENING DETAILS FOR UNISTRUT STRUCTURE TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION
3. THE BOTTOM OF THE LOWEST MOUNTED DISCONNECT SWITCH OR JUNCTION BOX SHALL BE 250mm (MIN.) ABOVE THE HAZARDOUS AREA

DETAIL 4 N.T.S. — BLOWER UNISTRUT STRUCTURE



NOTES:

1. CONTRACTOR TO DESIGN AND FASTEN UNISTRUT STRUCTURE TO EXISTING SETTLING TANK, DO NOT MOUNT ON GUARDRAIL.
2. CONTRACTOR SHALL SUBMIT BRACKET, MOUNTING, BASEPLATE, UNISTRUT, ANCHORS AND FASTENING DETAILS FOR UNISTRUT STRUCTURE TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION
3. THE BOTTOM OF THE LOWEST MOUNTED DISCONNECT SWITCH OR JUNCTION BOX SHALL BE 250mm (MIN.) ABOVE THE HAZARDOUS AREA

DETAIL 5 N.T.S. — NORTH TRAIN UNISTRUT STRUCTURE

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SPP NORTH TRAIN

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B	100% DESIGN REVIEW	SP	CE	11/13/2020
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Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

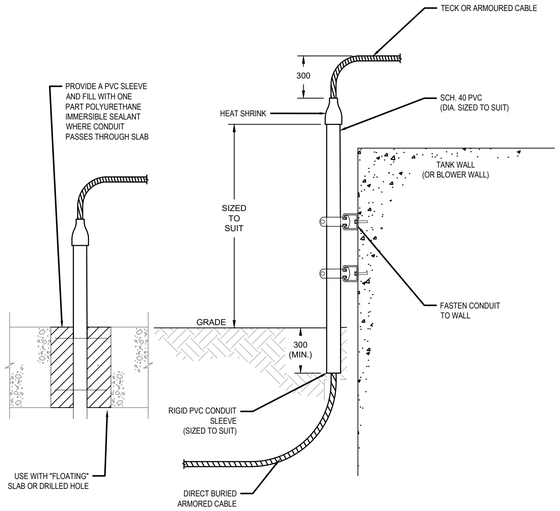
Project No. **11216493**

Title
ELECTRICAL DETAILS (1 OF 3)

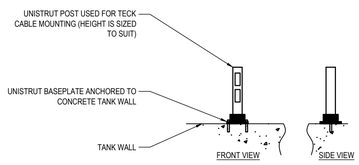
Bruce Power Sheet No.
NK37-DRAW-53000-10039

Sheet No.
E-010

Sheet **46** of **63**



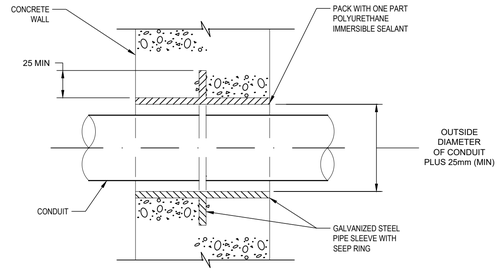
DETAIL N.T.S. 6 E-006 CONDUIT TRANSITION AND SUPPORT



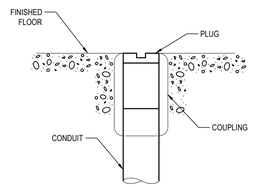
NOTE:

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DETAIL N.T.S. 7 E-006 UNISTRUT CABLE POST



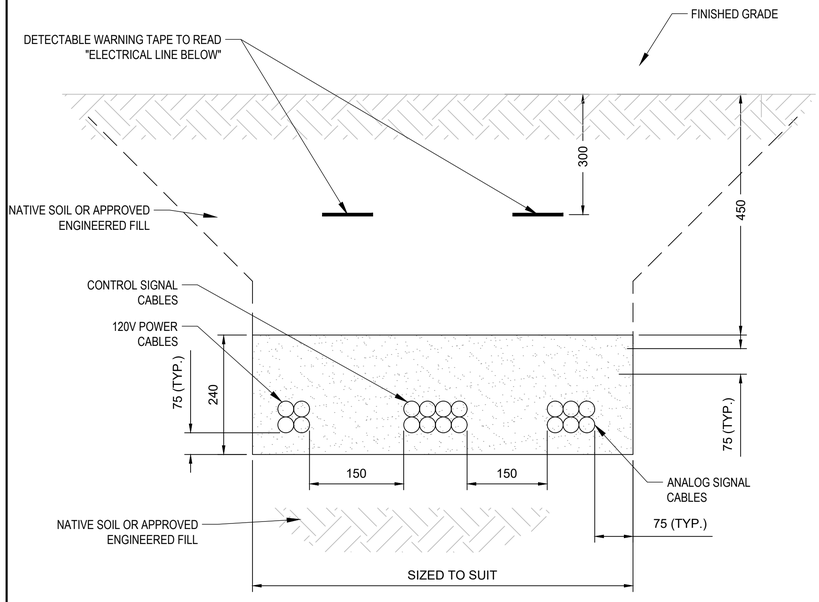
DETAIL N.T.S. 8 E-006 CONDUIT PENETRATION FOR TANK WALLS



NOTE:

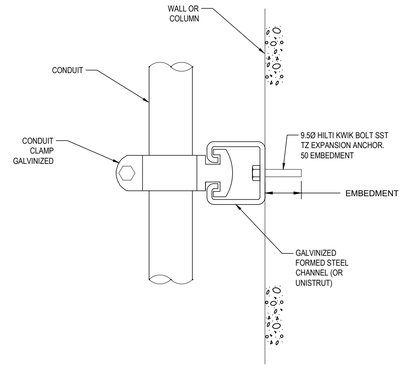
CONDUITS WHICH ARE STUBBED UP IN A CONCRETE SLAB FOR FUTURE EXTENSION SHALL BE INSTALLED IN ACCORDANCE WITH THIS DETAIL.

DETAIL N.T.S. 9 - FLUSH CONDUIT STUB



CABLE LEGEND:

REFER TO CABLE SCHEDULE ON E-013 AND E-014



NOTE:

SUPPORT ALL EXPOSED CONDUITS ON FORMED STEEL CHANNELS.

DETAIL N.T.S. 11 - CONDUIT SUPPORT ON STRUCTURE

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A	90% DESIGN REVIEW	SP	CE	10/09/2020

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Drafting Check	B. PLETZ	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
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Project No. **11216493**

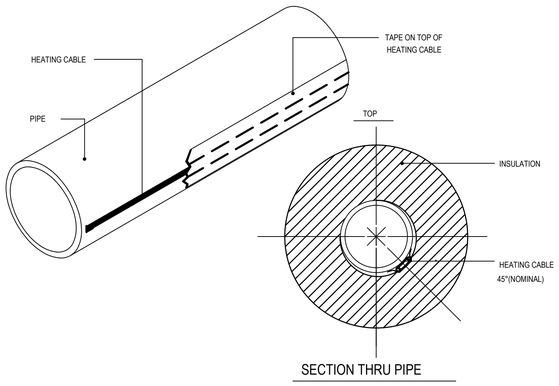
Title
ELECTRICAL DETAILS (2 OF 3)

Bruce Power Sheet No.
NK37-DRAW-53000-10040

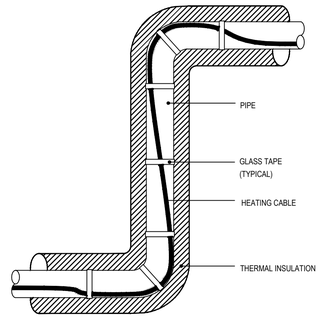
Sheet No.
E-011

Sheet **47** of **63**

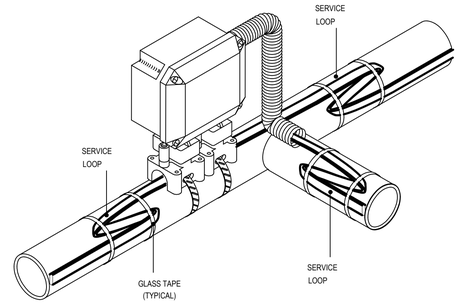
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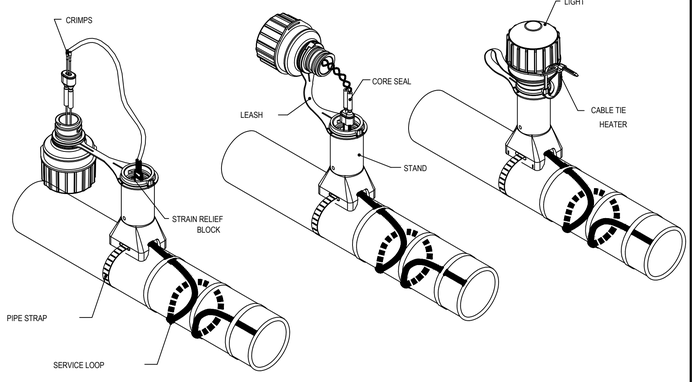
DETAIL 12 E-007 TYPICAL PLACEMENT OF TAPE OVER HEAT TRACING CABLE
N.T.S.



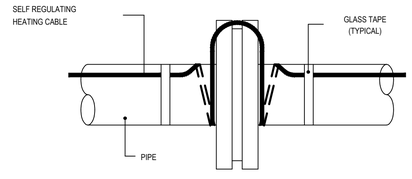
DETAIL 13 E-007 TYPICAL ELBOW INSTALLATION
N.T.S.



DETAIL 14 E-007 TYPICAL HEAT TRACING TEE KIT INSTALLATION
N.T.S.

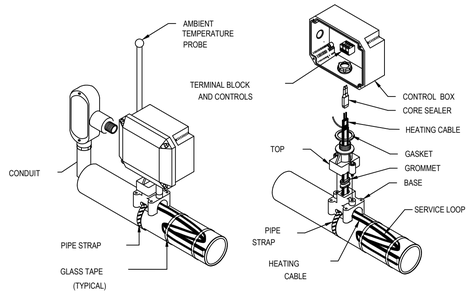


DETAIL 15 E-007 TYPICAL HEAT TRACING END SEAL KIT
N.T.S.



TYPICAL HEAT TRACING ON FLANGE
N.T.S.

DETAIL 16 E-007 TYPICAL HEAT TRACING ON FLANGE
N.T.S.



DETAIL 17 E-007 HEAT TRACING POWER CONNECTION KIT
N.T.S.

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Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	NH	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	C. DURIAS
Drafting Check	B. PLETZ	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216493**

Title
ELECTRICAL DETAILS (3 OF 3)

Bruce Power Sheet No.
NK37-DRAW-53000-10041

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E-012

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Control Cables

Equipment Tag	Description	From	Signal Type	Cable Type	Cable Tag	Comment	To
WW-67961-FE2000	North Train RAS/WAS Flow Meter	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-101		WW-67961-FE2000
		MASTER PLC, WW_66400_CPL101	120V Power	30C #14 TECK90	120P-100	See Note 1)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Power	2C #14 TECK90	120P-101		WW-67961-FE2000
WW-67961-D0X1004	North Train Aeration Tank DO Meter	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-102		WW-67961-D0X1004
		MASTER PLC, WW_66400_CPL101	120V Power	30C #14 TECK90	120P-100	See Note 1)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Power	2C #14 TECK90	120P-102		WW-67961-D0X1004
WW-67961-LT10000	North Train Final Effluent Flow Meter (Parshall Flume)	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-103		WW-67961-LT10000
		MASTER PLC, WW_66400_CPL101	120V Power	20C #14 TECK90	120P-100	See Note 1)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Power	2C #14 TECK90	120P-103		WW-67961-LT10000
WW-67961-LS100	North Train Aerobic Digester Stage 1 Level Sensor	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-104		WW-67961-LS100
WW-67961-LS101	North Train Aerobic Digester Stage 2 Level Sensor	MASTER PLC, WW_66400_CPL101	4-20mA	30pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-105		WW-67961-LS101
WW-67961-LS102	North Train Aerobic Digester Stage High Level Switch	MASTER PLC, WW_66400_CPL101	120V Control	40C #14 TECK90	CS-100	See Note 1)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-101		WW-67961-LS102
WW-67961-LS103	Sludge Wasting/Decant Sump Level Sensor	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-106		WW-67961-LS103
WW-67961-LS104	Sludge Wasting/Decant Sump High Level Switch	MASTER PLC, WW_66400_CPL101	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-102		WW-67961-LS104
WW-67961-LS105	Sludge Wasting/Decant Sump Low Level Switch	MASTER PLC, WW_66400_CPL101	120V Control	20C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-103		WW-67961-LS105
WW-67963-PS106	Blower Header Pressure Sensor	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-107		WW-67963-PS106
WW-67963-PS108	North Train Blower #1 Intake Pressure Switch	WW-53340-MCC-2 VFD CP4	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-104		WW-67963-PS108
WW-67963-PS109	North Train Blower #1 Discharge Pressure Switch	WW-53340-MCC-2 VFD CP4	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-105		WW-67963-PS109
WW-67963-TS110	North Train Blower #1 Motor Overtemp	WW-53340-MCC-2 VFD CP4	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-106		WW-67963-PS110
WW-67963-PS113	North Train Blower #2 Intake Pressure Switch	WW-53340-MCC-2 VFD CP5	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-107		WW-67963-PS113
WW-67963-PS114	North Train Blower #2 Discharge Pressure Switch	WW-53340-MCC-2 VFD CP5	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-107		WW-67963-PS114
WW-67963-TS115	North Train Blower #2 Motor Overtemp	WW-53340-MCC-2 VFD CP5	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-107		WW-67963-TS115
WW-67963-PS118	North Train Blower #3 Intake Pressure Switch	WW-53340-MCC-2 VFD CP6	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-109		WW-67961-PS118
WW-67963-PS119	North Train Blower #3 Discharge Pressure Switch	WW-53340-MCC-2 VFD CP6	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-110		WW-67963-PS119
WW-67963-TS120	North Train Blower #3 Motor Overtemp	WW-53340-MCC-2 VFD CP6	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-111		WW-67963-TS120
WW-67963-PS123	North Train Blower #4 Intake Pressure Switch	WW-53340-MCC-2 VFD CP7	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-113		WW-67963-PS123
WW-67963-PS124	North Train Blower #4 Discharge Pressure Switch	WW-53340-MCC-2 VFD CP7	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-114		WW-67963-PS124
WW-67963-TS125	North Train Blower #4 Motor Overtemp	WW-53340-MCC-2 VFD CP7	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-115		WW-67963-TS125
WW-67961-FE130	East Train RAS/WAS Flow Meter	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-108		WW-67961-FE130
		MASTER PLC, WW_66400_CPL101	120V Power	30C #14 TECK90	120P-100	See Note 1)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Power	2C #14 TECK90	120P-104		WW-67961-FE130
WW-67961-FE131	West Train RAS/WAS Flow Meter	MASTER PLC, WW_66400_CPL101	4-20mA	20pr tw.shld #16 ACIC	AS-100	See Note 1), 3)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	4-20mA	1pr tw.shld #16 ACIC	AS-109		WW-67961-FE131
		MASTER PLC, WW_66400_CPL101	120V Power	30C #14 TECK90	120P-100	See Note 1)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Power	2C #14 TECK90	120P-105		WW-67961-FE131
WW-79630-CP4	North Train Aeration Blower #1 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-202	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD CP4
			4-20mA	2 pair twisted pair ACIC	AS-202		
WW-79630-CP5	North Train Aeration Blower #2 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-203	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD CP5
			4-20mA	2 pair twisted pair ACIC	AS-203		
WW-79630-CP6	North Train Aerobic Digestion Blower #3 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-204	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD CP6
			4-20mA	2 pair twisted pair ACIC	AS-204		
WW-79630-CP7	North Train Aerobic Digestion Blower #4 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-205	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD CP7
			4-20mA	2 pair twisted pair ACIC	AS-205		
WW-79610-P6	North Train RAS/WAS Pump #1 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-206	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P6
			4-20mA	2 pair twisted pair ACIC	AS-206		
WW-79610-P7	North Train RAS/WAS Pump #2 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-207	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P7
			4-20mA	2 pair twisted pair ACIC	AS-207		
WW-79610-P8	North Train RAS/WAS Pump #3 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-208	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P8
			4-20mA	2 pair twisted pair ACIC	AS-208		
WW-79610-P9	East Train RAS/WAS Pump #1 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-209	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P9
			4-20mA	2 pair twisted pair ACIC	AS-209		
WW-79610-P10	East Train RAS/WAS Pump #2 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-210	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P10
			4-20mA	2 pair twisted pair ACIC	AS-210		
WW-79610-P11	East Train RAS/WAS Pump #3 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-211	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P11
			4-20mA	2 pair twisted pair ACIC	AS-211		
WW-79610-P12	West Train RAS/WAS Pump #1 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-212	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P12
			4-20mA	2 pair twisted pair ACIC	AS-212		
WW-79610-P13	West Train RAS/WAS Pump #2 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-213	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P13
			4-20mA	2 pair twisted pair ACIC	AS-213		
WW-79610-P14	West Train RAS/WAS Pump #3 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-214	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P14
			4-20mA	2 pair twisted pair ACIC	AS-214		
WW-79610-P15	North Train Sludge Wasting/Decant Pump #1 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-215	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P15
			4-20mA	2 pair twisted pair ACIC	AS-215		
WW-79610-P16	North Train Sludge Wasting/Decant Pump #2 VFD Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-216	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 VFD P16
			4-20mA	2 pair twisted pair ACIC	AS-216		
WW-79610-CNV3	North Train Sludge Collection Mechanism Controls	MASTER PLC, WW_66400_CPL101	Control Signal	12C #14AWG TECK CABLE	CS-117	Electrial Room, SPP Basement Cable Tray	WW-53340-MCC-2 FVNR CNV3
WW-79610-P6	North Train RAS/WAS Pump #1 Over Temp/Leak	WW-53340-MCC-2 VFD P6	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-306		WW-79610-P6 JB
		WW-79610-P6 JB	Control Signal	Integral Pump Cable			WW-79610-P6
WW-79610-P7	North Train RAS/WAS Pump #2 Over Temp/Leak	WW-53340-MCC-2 VFD P7	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-307		WW-79610-P7 JB
		WW-79610-P7 JB	Control Signal	Integral Pump Cable			WW-79610-P7
WW-79610-P8	North Train RAS/WAS Pump #3 Over Temp/Leak	WW-53340-MCC-2 VFD P8	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-308		WW-79610-P8 JB
		WW-79610-P8 JB	Control Signal	Integral Pump Cable			WW-79610-P8
WW-79610-P9	East Train RAS/WAS Pump #1 Over Temp/Leak	WW-53340-MCC-2 VFD P9	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-309		WW-79610-P9 JB
		WW-79610-P9 JB	Control Signal	Integral Pump Cable			WW-79610-P9
WW-79610-P10	East Train RAS/WAS Pump #2 Over Temp/Leak	WW-53340-MCC-2 VFD P10	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-310		WW-79610-P10 JB
		WW-79610-P10 JB	Control Signal	Integral Pump Cable			WW-79610-P10
WW-79610-P11	East Train RAS/WAS Pump #3 Over Temp/Leak	WW-53340-MCC-2 VFD P11	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-311		WW-79610-P11 JB
		WW-79610-P11 JB	Control Signal	Integral Pump Cable			WW-79610-P11
WW-79610-P12	West Train RAS/WAS Pump #1 Over Temp/Leak	WW-53340-MCC-2 VFD P12	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-312		WW-79610-P12 JB
		WW-79610-P12 JB	Control Signal	Integral Pump Cable			WW-79610-P12
WW-79610-P13	West Train RAS/WAS Pump #2 Over Temp/Leak	WW-53340-MCC-2 VFD P13	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-313		WW-79610-P13 JB
		WW-79610-P13 JB	Control Signal	Integral Pump Cable			WW-79610-P13
WW-79610-P14	West Train RAS/WAS Pump #3 Over Temp/Leak	WW-53340-MCC-2 VFD P14	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-314		WW-79610-P14 JB
		WW-79610-P14 JB	Control Signal	Integral Pump Cable			WW-79610-P14
WW-79610-P15	North Train Sludge Wasting/Decant Pump #1 Over Temp/Leak	WW-53340-MCC-2 VFD P15	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-315		WW-79610-P15 JB
		WW-79610-P15 JB	Control Signal	Integral Pump Cable			WW-79610-P15

NOTES:
1) CABLE TO BE ROUTED IN THE DUCT BANK INSTALLED IN PREVIOUS SPP CONTROLS UPGRADE PROJECT
2) MULTI-CONDUCTOR CABLE FOR CONTROL SIGNALS FROM SEVERAL DEVICES.
3) MULTI-PAIR CONDUCTOR CABLE FOR ANALOG SIGNALS FROM SEVERAL DEVICES.
4) ALL CONDUCTORS ARE COPPER(CU) UNLESS STATED OTHERWISE.
5) ALL ARMOURED CONTROL SIGNAL CABLES SHALL BE RATED FOR 600V.
6) ALL 208/120V POWER CABLES SHALL BE RATED FOR 600V.
7) ALL ARMOURED 4-20mA INSTRUMENTATION CABLES SHALL BE #16AWG AND RATED FOR 300V.

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BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	NH	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	C. DURIAS
Drafting Check	K. PICKERSGILL	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021

This document shall not be used for construction unless signed and sealed for construction.

Scale **N.T.S.**

Original Size **ANSI D**

Bar is 20mm on original size drawing
0 20mm

Project No. **11216493**

Title
CABLE SCHEDULE (1 OF 2)

Bruce Power Sheet No.
NK37-DRAW-53000-10088

Sheet No.
E-013
Sheet **49** of **63**

Control Cables

Equipment Tag	Description	From	Signal Type	Cable Type	Cable Tag	Comment	To
WW-79610-P16	North Train Sludge Wasting/Decant Pump #2 Over Temp/Leak	WW-53340-MCC-2 VFD P16	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	CS-316		WW-79610-P16 JB
		WW-79610-P16 JB	Control Signal	Integral Pump Cable			WW-79610-P16
WW-79610-P6	North Train RAS/WAS Pump #1 DS Status	WW-53340-MCC-2 VFD P6	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-306		WW-79610-P6 DS
WW-79610-P7	North Train RAS/WAS Pump #2 DS Status	WW-53340-MCC-2 VFD P7	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-307		WW-79610-P7 DS
WW-79610-P8	North Train RAS/WAS Pump #3 DS Status	WW-53340-MCC-2 VFD P8	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-308		WW-79610-P8 DS
WW-79610-P9	East Train RAS/WAS Pump #1 DS Status	WW-53340-MCC-2 VFD P9	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-309		WW-79610-P9 DS
WW-79610-P10	East Train RAS/WAS Pump #2 DS Status	WW-53340-MCC-2 VFD P10	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-310		WW-79610-P10 DS
WW-79610-P11	East Train RAS/WAS Pump #3 DS Status	WW-53340-MCC-2 VFD P11	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-311		WW-79610-P11 DS
WW-79610-P12	West Train RAS/WAS Pump #1 DS Status	WW-53340-MCC-2 VFD P12	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-312		WW-79610-P12 DS
WW-79610-P13	West Train RAS/WAS Pump #2 DS Status	WW-53340-MCC-2 VFD P13	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-313		WW-79610-P13 DS
WW-79610-P14	West Train RAS/WAS Pump #3 DS Status	WW-53340-MCC-2 VFD P14	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-314		WW-79610-P14 DS
WW-79610-P15	North Train Sludge Wasting/Decant Pump #1 Over Temp/Leak	WW-53340-MCC-2 VFD P15	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-315		WW-79610-P15 DS
WW-79610-P16	North Train Sludge Wasting/Decant Pump #2 Over Temp/Leak	WW-53340-MCC-2 VFD P16	Control Signal	40C #14 TECK90	CS-300	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	Control Signal	2C #14 TECK90	DS-316		WW-79610-P16 DS
WW-67963-ES001	North Train Blower #1 E-STOP	WW-53340-MCC-2 VFD CP4	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-131		WW-67963-ES001
WW-67963-ES002	North Train Blower #2 E-STOP	WW-53340-MCC-2 VFD CP5	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-132		WW-67963-ES001
WW-67963-PS003	North Train Blower #3 E-STOP	WW-53340-MCC-2 VFD CP6	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-133		WW-67961-ESS01
WW-67963-PS004	North Train Blower #4 E-STOP	WW-53340-MCC-2 VFD CP7	120V Control	40C #14 TECK90	CS-100	See Note 1), 2)	WW-67961-PL100 -MARSH. PANEL
		WW-67961-PL100 -MARSH. PANEL	120V Control	2C #14 TECK90	CS-134		WW-67963-ES001

Power Cables

Equipment Tag	Description	From	Signal Type	Cable Type	Cable Tag	Comment	To
WW-53340-MCC-2	Main Feeder for MCC-2	Switchgear WW-53340-BUZ	600V Power	3C 300MCM TECK90	600P-101		MCC-2, Section 1D
WW-79630-CP4	North Train Aeration Blower #1	WW-53340-MCC-2 VFD CP4	600V Power	3C #6 TECK90 VFD	600P-102	See Note 1)	WW-79630-CP4 DS
		WW-79630-CP4 DS	600V Power	3C #6 TECK90 VFD	600P-102A		WW-79630-CP4
WW-79630-CP5	North Train Aeration Blower #2	WW-53340-MCC-2 VFD CP5	600V Power	3C #6 TECK90 VFD	600P-104	See Note 1)	WW-79630-CP5 DS
		WW-79630-CP5 DS	600V Power	3C #6 TECK90 VFD	600P-104A		WW-79630-CP5
WW-79630-CP6	North Train Aerobic Digestion Blower #3	WW-53340-MCC-2 VFD CP6	600V Power	3C #4 TECK90 VFD	600P-103	See Note 1)	WW-79630-CP6 DS
		WW-79630-CP6 DS	600V Power	3C #4 TECK90 VFD	600P-103A		WW-79630-CP6
WW-79630-CP7	North Train Aerobic Digestion Blower #4	WW-53340-MCC-2 VFD CP7	600V Power	3C #4 TECK90 VFD	600P-105	See Note 1)	WW-79630-CP7 DS
		WW-79630-CP7 DS	600V Power	3C #4 TECK90 VFD	600P-105A		WW-79630-CP7
WW-79610-P6	North Train RAS/WAS Pump #1	WW-53340-MCC-2 VFD P6	600V Power	3C #12 TECK90 VFD	600P-106	See Note 1)	WW-79610-P6 DS
		WW-79610-P6 DS	600V Power	3C #12 TECK90 VFD	600P-106A		WW-79610-P6 JB
		WW-79610-P6 JB	600V Power	Integral Pump Cable			WW-79610-P6
WW-79610-P7	North Train RAS/WAS Pump #2	WW-53340-MCC-2 VFD P7	600V Power	3C #12 TECK90 VFD	600P-107	See Note 1)	WW-79610-P7 DS
		WW-79610-P7 DS	600V Power	3C #12 TECK90 VFD	600P-107A		WW-79610-P7 JB
		WW-79610-P7 JB	600V Power	Integral Pump Cable			WW-79610-P7
WW-79610-P8	North Train RAS/WAS Pump #3	WW-53340-MCC-2 VFD P8	600V Power	3C #12 TECK90 VFD	600P-108	See Note 1)	WW-79610-P8 DS
		WW-79610-P8 DS	600V Power	3C #12 TECK90 VFD	600P-108A		WW-79610-P8 JB
		WW-79610-P8 JB	600V Power	Integral Pump Cable			WW-79610-P8
WW-79610-P9	East Train RAS/WAS Pump #1	WW-53340-MCC-2 VFD P9	600V Power	3C #12 TECK90 VFD	600P-109	See Note 1)	WW-79610-P9 DS
		WW-79610-P9 DS	600V Power	3C #12 TECK90 VFD	600P-109A		WW-79610-P9 JB
		WW-79610-P9 JB	600V Power	Integral Pump Cable			WW-79610-P9
WW-79610-P10	East Train RAS/WAS Pump #2	WW-53340-MCC-2 VFD P10	600V Power	3C #12 TECK90 VFD	600P-110	See Note 1)	WW-79610-P10 DS
		WW-79610-P10 DS	600V Power	3C #12 TECK90 VFD	600P-110A		WW-79610-P10 JB
		WW-79610-P10 JB	600V Power	3C #12 TECK90 VFD			WW-79610-P10
WW-79610-P11	East Train RAS/WAS Pump #3	WW-53340-MCC-2 VFD P11	600V Power	3C #12 TECK90 VFD	600P-111	See Note 1)	WW-79610-P11 DS
		WW-79610-P11 DS	600V Power	3C #12 TECK90 VFD	600P-111A		WW-79610-P11 JB
		WW-79610-P11 JB	600V Power	Integral Pump Cable			WW-79610-P11
WW-79610-P12	West Train RAS/WAS Pump #1	WW-53340-MCC-2 VFD P12	600V Power	3C #12 TECK90 VFD	600P-112	See Note 1)	WW-79610-P12 DS
		WW-79610-P12 DS	600V Power	3C #12 TECK90 VFD	600P-112A		WW-79610-P12 JB
		WW-79610-P12 JB	600V Power	Integral Pump Cable			WW-79610-P12
WW-79610-P13	West Train RAS/WAS Pump #2	WW-53340-MCC-2 VFD P13	600V Power	3C #12 TECK90 VFD	600P-113	See Note 1)	WW-79610-P13 DS
		WW-79610-P13 DS	600V Power	3C #12 TECK90 VFD	600P-113A		WW-79610-P13 JB
		WW-79610-P13 JB	600V Power	Integral Pump Cable			WW-79610-P13
WW-79610-P14	West Train RAS/WAS Pump #3	WW-53340-MCC-2 VFD P14	600V Power	3C #12 TECK90 VFD	600P-114	See Note 1)	WW-79610-P14 DS
		WW-79610-P14 DS	600V Power	3C #12 TECK90 VFD	600P-114A		WW-79610-P14 JB
		WW-79610-P14 JB	600V Power	Integral Pump Cable			WW-79610-P14
WW-79610-P15	North Train Sludge Wasting/Decant Pump #1	WW-53340-MCC-2 VFD 6M	600V Power	3C #12 TECK90 VFD	600P-115	See Note 1)	WW-79610-P15 DS
		WW-79610-P15 DS	600V Power	3C #12 TECK90 VFD	600P-115A		WW-79610-P15 JB
		WW-79610-P15 JB	600V Power	Integral Pump Cable			WW-79610-P15
WW-79610-P16	North Train Sludge Wasting/Decant Pump #2	WW-53340-MCC-2 VFD 7F	600V Power	3C #12 TECK90 VFD	600P-116	See Note 1)	WW-79610-P16 DS
		WW-79610-P16 DS	600V Power	3C #12 TECK90 VFD	600P-116A		WW-79610-P16 JB
		WW-79610-P16 JB	600V Power	Integral Pump Cable			WW-79610-P16
WW-79610-CNV3	North Train Sludge Collection Mechanism	WW-53340-MCC-2 FVNR CNV3	600V Power	3C #12 TECK90	600P-117	See Note 1)	WW-79610-CNV3 DS
		WW-79610-CNV3 DS	600V Power	3C #12 TECK90	600P-117A		WW-79610-CNV3
TR-1	45kVA Transformer 600/208/120V, 3PH	WW-53340-MCC-2 CB TR1	600V Power	3C #4 TECK90	600P-118	Electrical Room	TR-1
WW-79630-V46	North Train WAS Valve	WW-53340-MCC-2 CB V46	600V Power	3C #12 TECK90	600P-119	See Note 1)	WW-79630-V46 DS
		WW-79630-V46 DS	600V Power	3C #12 TECK90	600P-119A		WW-79630-V46 JB
		WW-79630-V46 JB	600V Power	3C #12 TECK90	600P-119A		WW-79630-V46
WW-79630-V47	North Train RAS Valve	WW-53340-MCC-2 CB V47	600V Power	3C #12 TECK90	600P-120	See Note 1)	WW-79630-V47 DS
		WW-79630-V47 DS	600V Power	3C #12 TECK90	600P-120A		WW-79630-V47 JB
		WW-79630-V47 DS	600V Power	3C #12 TECK90	600P-120A		WW-79630-V47
DP-A	PROCESS DIST. PANEL 208/120V. 3PH, 42CCCTS	TR-1	208V Power	3C #3/0 RW90 + #6 Bond IN 53mmC		Electrical Room	DP-A
	120V BLOWER ENCL. POWER JUNCTION BOX 120V	DP-A	120V Power	24C#12TECK90	120P-200	120V Power for Blower Enclosure Services	120V Blower Encl. Power Junction Box
WW-79630-CP4-HTR1	North Train Aeration Blower #1 Heater	DP-A, CB16	120V Power	2C #12 TECK90	120P-201H	Blower Enclosure	WW-79630-CP4-HTR1 (Via above JB)
WW-79630-CP4-FAN1	North Train Aeration Blower #1 Fan	DP-A, CB18	120V Power	2C #12 TECK90	120P-201F	Blower Enclosure	WW-79630-CP4-FAN1 (Via above JB)
WW-79630-CP5-HTR2	North Train Aeration Blower #2 Heater	DP-A, CB20	120V Power	2C #12 TECK90	120P-202H	Blower Enclosure	WW-79630-CP5-HTR1 (Via above JB)
WW-79630-CP5-FAN2	North Train Aeration Blower #2 Fan	DP-A, CB22	120V Power	2C #12 TECK90	120P-202F	Blower Enclosure	WW-79630-CP5-FAN2 (Via above JB)
WW-79630-CP6-HTR3	North Train Aeration Blower #3 Heater	DP-A, CB24	120V Power	2C #12 TECK90	120P-203H	Blower Enclosure	WW-79630-CP6-HTR3 (Via above JB)
WW-79630-CP6-FAN3	North Train Aeration Blower #3 Fan	DP-A, CB26	120V Power	2C #12 TECK90	120P-203F	Blower Enclosure	WW-79630-CP6-FAN3 (Via above JB)
WW-79630-CP7-HTR4	North Train Aeration Blower #4 Heater	DP-A, CB21	120V Power	2C #12 TECK90	120P-204H	Blower Enclosure	WW-79630-CP7-HTR4 (Via above JB)
WW-79630-CP7-FAN4	North Train Aeration Blower Fan #4	DP-A, CB23	120V Power	2C #12 TECK90	120P-204F	Blower Enclosure	WW-79630-CP7-FAN4 (Via above JB)
	EAST/WEST Heat Trace Junction Box 208V	DP-A	208V Power	12C #10 TECK90	208HT-100	208V Power for Heat Tracing	208V East/West Heat Trace Junction Box
HEAT TRACE	RAS/WAS Piping East Train	DP-A, CB1,3	208V Power	2C #10 TECK90	208HT-101	E-007	RAS/WAS PIPING EAST AND WEST TRAINS
HEAT TRACE	RAS/WAS Piping West Train	DP-A, CB2,4	208V Power	2C #10 TECK90	208HT-102	E-007	RAS/WAS PIPING EAST AND WEST TRAINS
	208V North Heat Trace Junction Box	DP-A	208V Power	12C #10 TECK90	208HT-200	208V Power for Heat Tracing	208V North Heat Trace Junction Box
HEAT TRACE	Equilization Tank	DP-A, CB5,7	208V Power	2C #10 TECK90	208HT-201	E-007	DIGESTER TANK BLOWERS PIPING
HEAT TRACE	RAW Wastewater Supply Line	DP-A, CB6,8	208V Power	2C #10 TECK90	208HT-204	E-007	AERATION TANK BLOWER PIPING
HEAT TRACE	RAS/WAS Piping North Train	DP-A, CB34,36	208V Power	2C #12 TECK90	120HT-004	E-007	RAW WASTEWATER SUPPLY LINE
OUTDOOR LIGHTING	NORTH TRAIN LIGHTING POLES	DP-A, CB9	120V Power	2C #12 TECK90	120LP	Control by PTC-1 Lighting Control Panel	OUTDOOR LIGHTING

NOTES:
1) CABLE TO BE ROUTED IN THE DUCT BANK INSTALLED IN PREVIOUS SPP CONTROLS UPGRADE PROJECT
2) ALL CONDUCTORS ARE COPPER(CU) UNLESS STATED OTHERWISE.
3) ALL 600V POWER CABLES TO BE ROUTED FOR 1000V.

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Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	NH	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	C. DURIAS
Drafting Check	C. DURIAS	Design Check	A. PARSONS
Project Manager	C. EVEREST	Date	01/15/2021
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

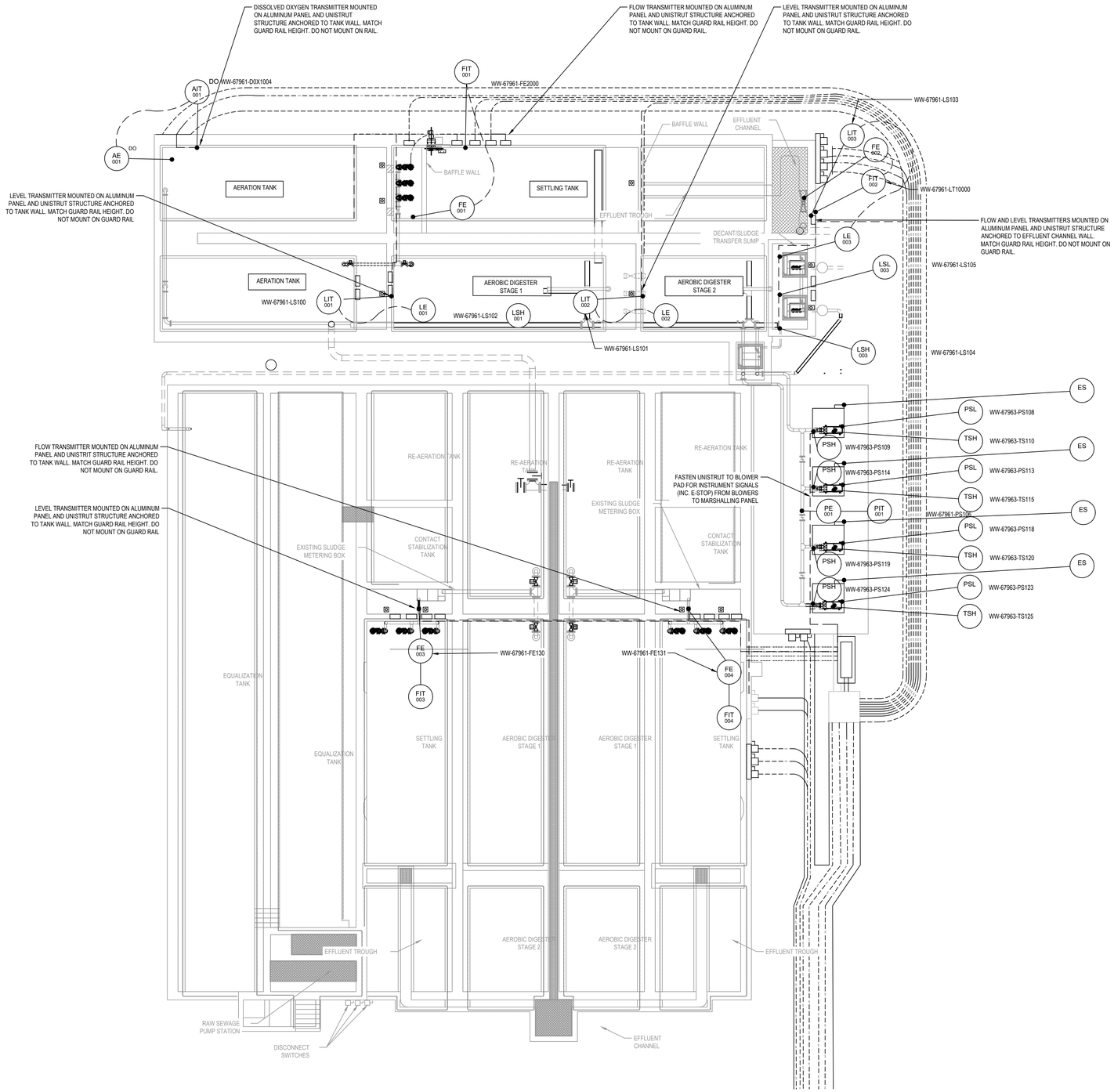
Project No. **11216493**

Title
CABLE SCHEDULE
(2 OF 2)

Bruce Power Sheet No.
NK37-DRAW-53000-10088

Sheet No.
E-014

Sheet **50** of **63**



NOTES:

1. REVIEW DWG. IC-002 FOR ADDITIONAL INSTRUMENT MOUNTING DETAILS

TREATMENT TRAINS INSTRUMENTATION LAYOUT

1:100

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Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

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SPP NORTH TRAIN

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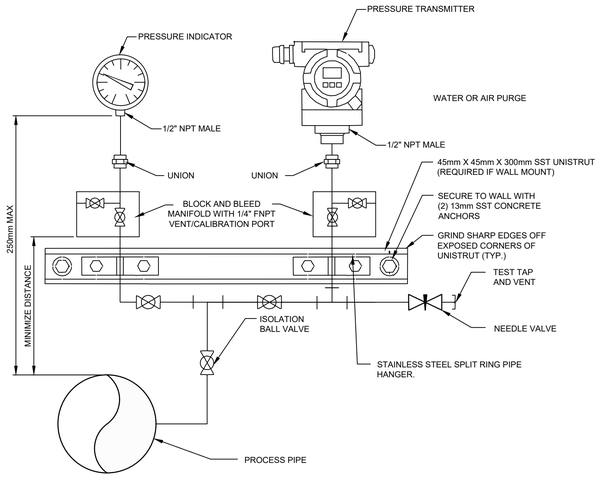
Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
This document shall not be used for construction unless signed and sealed for construction.		Scale	1:100
Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216493**

Title
TREATMENT TRAINS PLOT PLAN OF INSTRUMENTATION

Bruce Power Sheet No.
NK37-DRAW-53000-10038

Sheet No.
IC-001
Sheet **51** of **63**

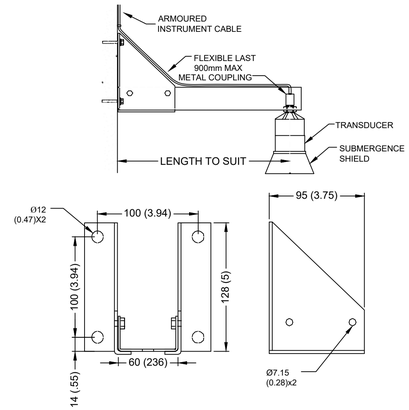


DIRECT MOUNTING WITH DIAPHRAGM SEAL

NOTES:

1. PRESSURE INDICATOR AND TRANSMITTER INSTALLATION SHOWN FOR SINGLE INSTRUMENT INSTALLATIONS, MOUNT DEVICE DIRECTLY ABOVE DIAPHRAGM SEAL.
2. SIZE ACCORDING TO APPLICATION, 20mm MIN FOR FLUIDS WITH SOLIDS.
3. PROVIDE MECHANICAL SUPPORT FOR INSTRUMENTS. STAINLESS STEEL PIPE HANGERS ARE TO BE INSTALLED EVERY 0.5m MIN.
4. PIPE NIPPLES SHALL BE SCHEDULE 40 STAINLESS STEEL, MAXIMUM 30mm FROM PROCESS PIPE OR PIPE LAGGING.
5. CONDUIT (AND CABLE) ENTRY CONNECTION TO THE INSTRUMENT SHALL BE 900mm FLEXIBLE, THE BALANCE IN RIGID CONDUIT.
6. SENSE LINES TO BE 25mm SEAMLESS PIPE, NOT TUBING.
7. ALL PRESSURE TAPS FOR SENSING LINES MUST BE OFF SIDE OF PROCESS PIPE.

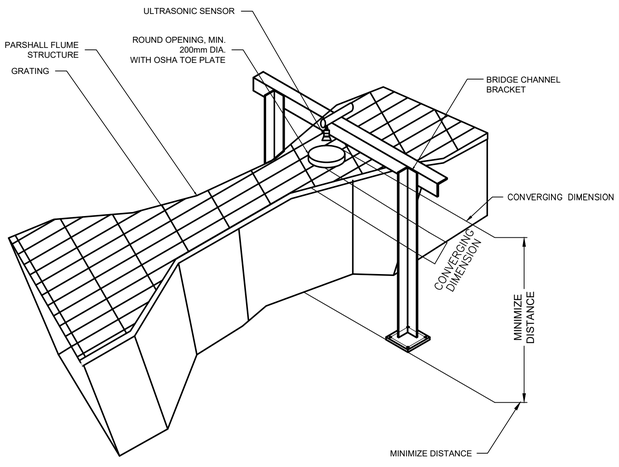
DETAIL 2 (I-001) PRESSURE TRANSMITTER DIRECT MOUNT CLEAN WATER/AIR
N.T.S.



NOTES:

1. ALL DIMENSIONS ARE IN mm, () DENOTE DIMENSION IN INCHES.
2. TRANSDUCER TO BE MOUNTED ABOVE THE MAXIMUM MATERIAL BY MORE THAN THE BLANKING VALUE.
3. TRANSDUCER TO BE MOUNTED SO THAT THE AXIS OF TRANSMISSION IS PERPENDICULAR TO SURFACE OF LIQUID. SUBMERGENCE SHIELD TO BE INSTALLED ONLY IF POSSIBILITY OF TRANSDUCER SUBMERGENCE EXISTS.
4. ALL FASTENERS TO BE STAINLESS STEEL.
5. MOUNTING BRACKET TO BE ALUMINUM.

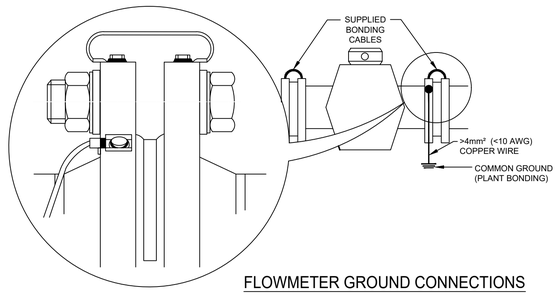
DETAIL 3 (I-001) ULTRASONIC LEVEL WALL MOUNT APPLICATION
N.T.S.



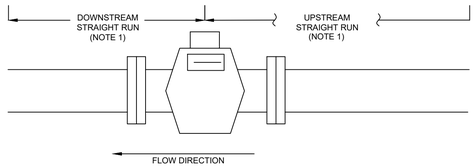
NOTES:

1. INSTALL IN STRICT ACCORDANCE WITH INSTRUMENT AND PARSHALL FLUME MANUFACTURERS REQUIREMENTS
2. SIZE OPENING TO CLEAR SENSOR BEAM
3. CONDUIT (AND CABLE) ENTRY CONNECTION TO THE INSTRUMENT SHALL BE 300mm FLEXIBLE, THE BALANCE IN RIGID CONDUIT

DETAIL 4 (I-001) OPEN CHANNEL, PARASHALL FLUME FLOW METER
N.T.S.



FLOWMETER GROUND CONNECTIONS

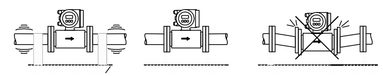


FLOWMETER TYPICAL INSTALLATION

NOTES:

1. PIPE DIAMETER STRAIGHT RUN LENGTH, AS PER MANUFACTURER'S SPECIFICATIONS.
2. INSTALL SUCH THAT FLOWMETER IS ALWAYS IN FLOODED CONDITION.
3. INSTRUMENT ELECTRONICS NOT MOUNTED/INSTALLED INDOORS MUST BE INSTALLED WITHIN A
4. HEATED FIBERGLASS ENCLOSURE WITH VIEWING WINDOW.
5. GROUNDING IS TO BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. GROUNDING RINGSARE TO BE USED FOR METALLIC PIPES WITH INTERNAL COATING OR NON-CONDUCTIVE PIPES.

DETAIL 5 (I-001) MAGNETIC FLOW METER
N.T.S.

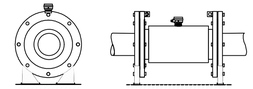


VIBRATIONS

SECURE THE PIPING AND THE SENSOR IF VIBRATION IS SEVERE.

CAUTION:

INSTALL SENSOR AND TRANSMITTER SEPARATELY IF VIBRATION IS EXCESSIVELY SEVERE.

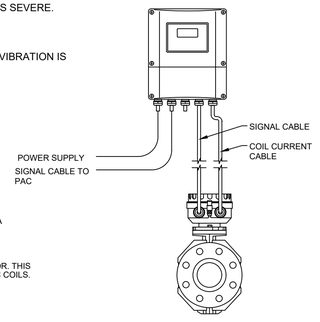


FOUNDATIONS, SUPPORTS

IF THE NOMINAL DIAMETER IS 14", MOUNT THE TRANSMITTER ON A FOUNDATION OF ADEQUATE LOAD-BEARING STRENGTH.

CAUTION:

DO NOT ALLOW THE CASING TO TAKE THE WEIGHT OF THE SENSOR. THIS CAN BUCKLE THE CASING AND DAMAGE THE INTERNAL MAGNETIC COILS.



DETAIL 6 (I-001) MAGNETIC FLOWMETER MOUNTING DETAILS
N.T.S.

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Client
BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SP	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

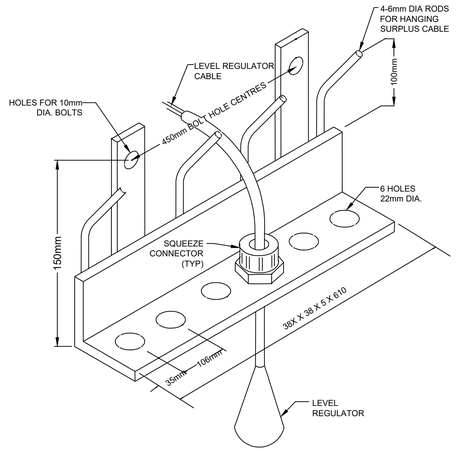
Project No. **11216493**

Title
INSTRUMENTATION INSTALLATION DETAILS (1 OF 2)

Bruce Power Sheet No.
NK37-DRAW-53000-10042

Sheet No.
IC-002

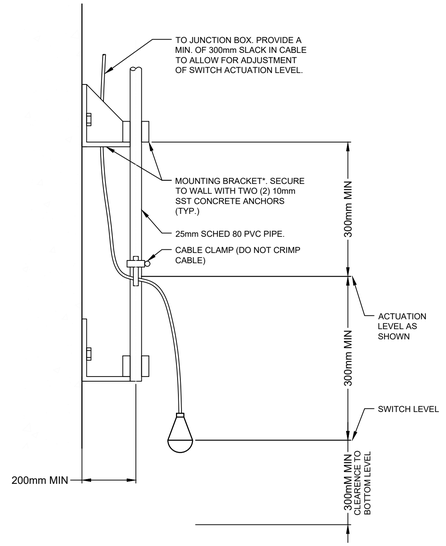
Sheet **52** of **63**



NOTES:

1. THIS UNIT TO BE SUPPLIED HOT DIPPED GALVANIZED 316 STAINLESS STEEL.
2. PROVIDE STAINLESS STEEL SWAY RINGS ON ALL FLOATS, MINIMUM 1.0m INTERVALS.
3. ALL MOUNTING HARDWARE TO BE STAINLESS STEEL.
4. CABLE ANCHORING POINT TO BE PROTECTED BY STRAIN RELIEF.

DETAIL 7 — LEVEL FLOAT SWITCH MOUNTING DETAILS
N.T.S. — I-001



NOTES:

1. ALL BRACKETS AND BOLTS ARE TO BE STAINLESS STEEL.
2. INSTALL STAINLESS STEEL CABLE STRAIN RELIEVER TO PROTECT CABLE.
3. PIPE NIPPLES SHALL BE SCHEDULE 40 STAINLESS STEEL MAX. 30mm FROM PROCESS PIPE OR PIPE LAGGING.
4. CONDUIT (AND CABLE) ENTRY CONNECTION TO THE INSTRUMENT SHALL BE 900mm FLEXIBLE. THE BALANCE IN RIGID CONDUIT.
5. SWAY RINGS TO BE INSTALLED EVERY 1.0m.

DETAIL 8 — LEVEL FLOAT SWITCH FOR SUMPS
N.T.S. — I-001

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Project
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C	ISSUED FOR RFP	SP	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**		Bar is 20mm on original size drawing 0 — 20mm	

Project No. **11216493**

Title
INSTRUMENTATION INSTALLATION DETAILS (2 OF 2)

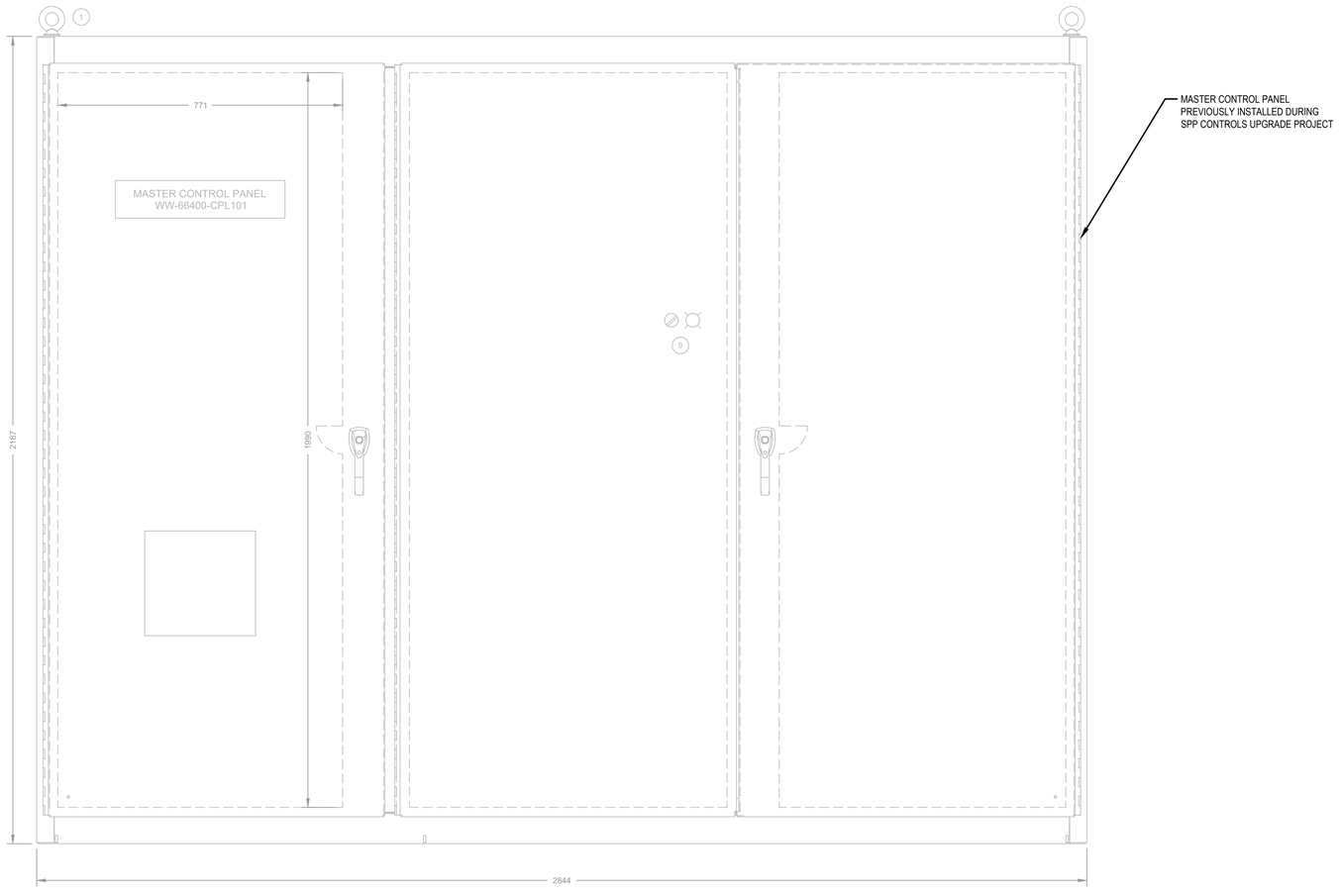
Bruce Power Sheet No.
NK37-DRAW-53000-10043

Sheet No.
IC-003
Sheet **53** of **63**

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GENERAL NOTES:

1. REFER TO XXXX-XXXX-XXXXX-XXXXX FOR BILL OF MATERIALS



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Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216492**

Title
CONTROL PANEL LAYOUT (1 OF 2)

Bruce Power Sheet No.
NK37-DRAW-66400-10005

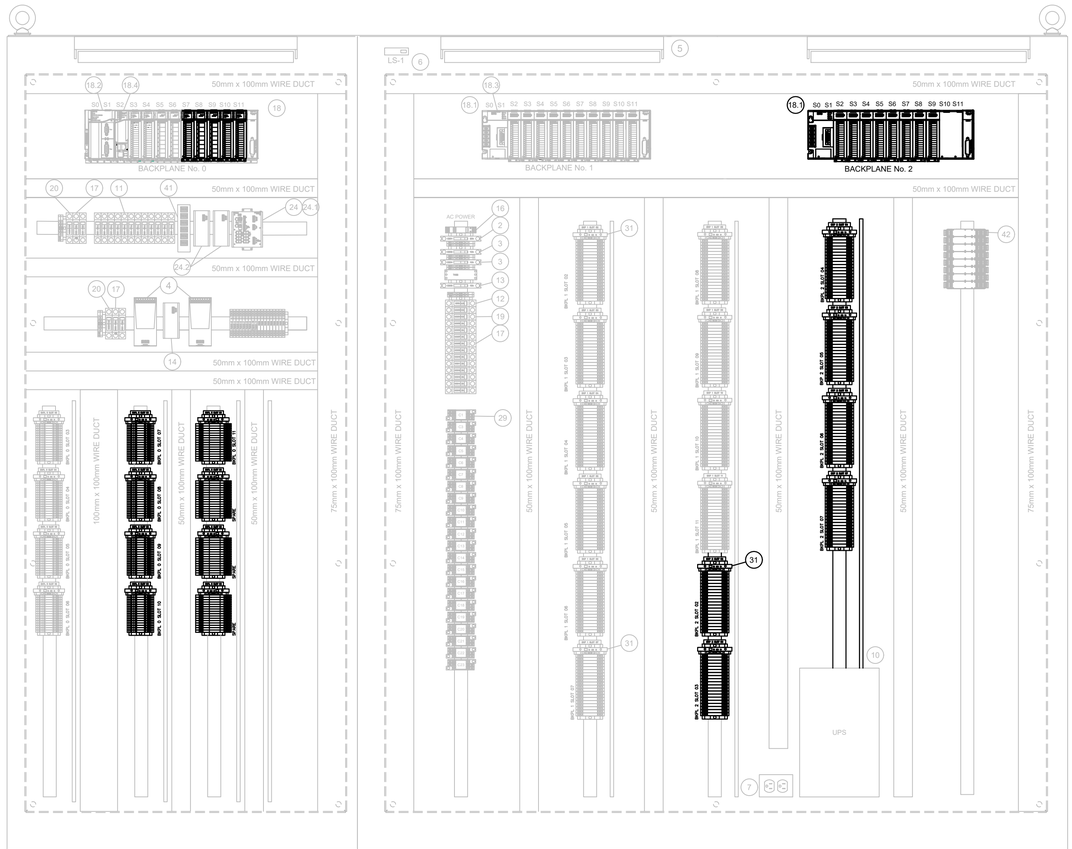
Sheet No.
IC-104
Sheet **54** of **63**

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Plot Date: 10 March 2021 - 4:54 PM Plotted By: Neil Hamilton CAD File: N:\CA\Waterloo\Projects\66\21116493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA006.dwg

GENERAL NOTES:

1. REFER TO IC-106 FOR BILL OF MATERIALS
2. WIRING TO INTRINSICALLY SAFE RELAYS TO BE ROUTED SEPARATELY FROM OTHER WIRING IN CONTROL PANEL.
3. THIS COLUMN OF THE CONTROL PANEL HAS BEEN RESERVED FOR INTRINSICALLY SAFE BARRIERS AND WIRING.



NOTE 1

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A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

Project No. **11216493**

Title
CONTROL PANEL LAYOUT (2 OF 2)

Bruce Power Sheet No.
NK37-DRAW-66400-10006

Sheet No.
IC-105
Sheet **55** of **63**

ITEM NO.	NAME/TAG	MANUFACTURER	MODEL/PART NO.	DESCRIPTION	QUANTITY
1	WW-66400-CPL101	HAMMOND	1422MD320	NEMA 12 2187mmH x 2845mmW x 511mmD (86.12"x112"x20.12") ENCLOSURE	2
2	CB	ABB	S201U-Z20	20A 120VAC CIRCUIT BREAKER	1
3	CB, UCB	ABB	S201U-Z10	10A 120VAC CIRCUIT BREAKER	2
4	PS1, PS2	PHOENIX	2866750	24VDC 5A POWER SUPPLY, UNIT-PS/1AC/24DC/3.5	2
5	LED	HAMMOND	FLK10LED	26" 120VAC LED LIGHT KIT	1
6	SW	OMRON	A20GQ-B7-K	PANEL LIGHT SWITCH	1
7	SURGE SUPPRESSOR	HUBBELL	HBL5260ISA	125VAC 15A DUPLEX RECEPTACLE WITH SURGE PROTECTION	1
8	REC	HUBBELL	RR20I	125VAC 20A DUPLEX RECEPTACLE	1
9	P.T.T	ALLEN BRADLEY	800TCQTH2 WAP	PUSH TO TEST LAMPS	1
10	UPS	EATON	9SX3000	120VAC UPS 3000VA TOWER MOUNTED UPS	1
11	UCB	ALLEN BRADLEY	1492-SPM1B010	CIRCUIT BREAKER, SUPPLEMENTARY, 1.0A	AS REQ'D
12	CB, UCB	ALLEN BRADLEY	1492-SPM1B005	CIRCUIT BREAKER, SUPPLEMENTARY, 0.5A	AS REQ'D
13	CB	ABB	S201U-Z15	15A 120VAC CIRCUIT BREAKER	1
14	PS3	PHOENIX	2868606	24VDC 2x5A REDUNDANCY MODULE STEP DIODE	
15	DIN RAIL	PHOENIX CONTACT	1201730	STEEL 35x7.5mm DIN RAIL	AS REQ'D
16	SURGE PROTECTOR	PHOENIX CONTACT	2856812	120VAC IN/OUT SURGE PROTECTOR, 26A	1
17	UCB	ALLEN BRADLEY	1492-SPM1B020	CIRCUIT BREAKER, SUPPLEMENTARY, 2A	AS REQ'D
18	PAC-BACKPLANE	GE AUTOMATION	IC695CHS012	RX3I 12 SLOT UNIVERSAL BACKPLANE	1
18.1	PAC- EXPANSION BACKPLANE	GE AUTOMATION	IC64CHS392	RX3I 10 SLOT EXPANSION BACKPLANE	2
18.2	PAC-PS	GE AUTOMATION	IC694-PSA040	RX3I POWER SUPPLY	1
18.3	PAC- EXPANSION PS	GE AUTOMATION	IC694-PWR321	RX3I EXPANSION POWER SUPPLY	2
18.4	PAC- CPU	GE AUTOMATION	IC695-CPE305	RX3I CPU MODULE	1
18.5	PAC- EXPANSION MODULE	GE AUTOMATION	IC695LRE001	RX3I EXPANSION MODULE	1
18.6	EXPANSION IO BUS TERMINAROR PLUG	GE AUTOMATION	IC693ACC307	RX3I IO BUS TERMINATOR	AS REQ'D
18.7	EXPANSION CABLE	GE AUTOMATION	IC693CBL302	CABLE, I/O BASE EXPANSION, 2 METER, SHIELDED	AS REQ'D
18.9	PAC- DI	GE AUTOMATION	IC694-MDL240	RX3I 16 PT, 120VAC DIGITAL INPUT MODULE	13
18.10	PAC- DO	GE AUTOMATION	IC694-MDL916	RX3I 16 PT DIGITAL OUTPUT MODULE	5
18.11	PAC- AI	GE AUTOMATION	IC694-ALG626	RX3I 16 PT ANALOG INPUT MODULE	5
18.12	PAC- AO	GE AUTOMATION	IC694-ALG808	RX3I 8 PT ANALOG OUTPUT MODULE	4
19	UCB	ALLEN BRADLEY	1492-SPM1B100	CIRCUIT BREAKER, SUPPLEMENTARY, 10A	AS REQ'D
20	UCB	ALLEN BRADLEY	1492-SPM1B150	CIRCUIT BREAKER, SUPPLEMENTARY, 15A	AS REQ'D

ITEM NO.	NAME/TAG	MANUFACTURER	MODEL/PART NO.	DESCRIPTION	QUANTITY
21	TB	WEIDMULLER	1020100000	TERMINAL BLOCK, WDU 4	AS REQ'D
22	TB	WEIDMULLER		TERMINAL BLOCK ENO BRACKET WEW 35, 2	AS REQ'D
23	TB	WEIDMULLER	1806120000	TERMINAL BLOCK END BRACKET MARKER, EM 8/30	AS REQ'D
24	ETH SW	CISCO	IE-2000-16TC-G-E	INDUSTRIAL ETHERNET SWITTCH, 16-10/100 BASE-TX RJ-45 DOWNLINK PORTS, 2-GIGABIT COMBO (SFP/RJ-45) UPLINK PORTS, 2-100 SFP UPLINK SLOTS	1
24.1	TRANSCEIVER	CISCO	GLC-SX-MM-RGD	SFP TRANSCEIVER, 1000BASE-FX, MMF	2
24.2	PS1, PS2	CISCO	PWR-IE50W-AC	INDUSTRIAL IE-2000 SERIES POWER SUPPLY, 50W, 100-240VAC, 24VDC OUTPUT	2
25	CB	ALLEN BRADLEY	1492-SPM1B030	CIRCUIT BREAKER, SUPPLEMENTARY, 30A	AS REQ'D
26	FU	WEIDMULLER	1880410000	FUSED TERMINAL BLOCK, 10-60V AC/DC, LED INDICATOR, WSI 4/2/LD	AS REQ'D
27	FU	WEIDMULLER	1880450000	FUSED TERMINAL BLOCK END PLATE, WAP WSI 4/2	AS REQ'D
28	FU	BUSSMAN	GMA-500-R	FUSE, 0.5A, FAST ACTING, FOR AI FUSED TERMINALS (INCLUDES 20 SPARES)	AS REQ'D
29	CR	WEIDMULLER	1122770000	RELAY & BASE, 120VAC COIL, 3PDT, 6A CONTACT RATING, LED STATUS INDICATION	AS REQ'D
30	TB	WEIDMULLER	1909120000	PLUG IN CROSS CONNECTION FOR DO RELAYS	AS REQ'D
31	TB	WEIDMULLER	1041100000	DI TERMINAL BLOCK, TWO LEVEL, SCREW CLAMPS, WDK 2.5 ZQV	AS REQ'D
32	TB	WEIDMULLER	1059100000	END PLATE FOR DI TERMINAL BLOCK, TWO LEVEL, WDK 2.5 ZQV	AS REQ'D
33	TB	WEIDMULLER	1909000000	PLUG IN JUMPERS, 20-POLE, FOR WDK 2.5 ZQV	AS REQ'D
34	INTERPOSING RELAY	ALLEN BRADLEY	700 HLT1U24	24VDC, 6A INTERPOSING RELAY	AS REQ'D
35	TB	WEIDMULLER	9532440000	AI TERMINAL BLOCK, TWO LEVEL FUSED, SCREW CLAMPS, KDKS 1/35 DB	AS REQ'D
36	TB	WEIDMULLER	9532470000	END PLATE FOR AI TERMINAL BLOCK, TWO LEVEL FUSED, SCREW CLAMPS, KDKS 1/35 DB	AS REQ'D
37	FU	BUSSMAN	GMA-500-R	FUSE, 0.5A, FAST ACTING, FOR AI FUSED TERMINALS (INCLUDES 20 SPARES)	AS REQ'D
38	TB	WEIDMULLER		AO TERMINAL BLOCK, TWO LEVEL, DISCONNECTING, SCREW CLAMPS, DKT4	AS REQ'D
39	TB	WEIDMULLER		END PLATE FOR AO TERMINAL BLOCK, TWO LEVEL, DISCONNECTING, SCREW CLAMPS, DKT5	AS REQ'D
40	TB	ALLEN BRADLEY	1492-SPM1B020	W SERIES TERMINAL BLOCK MARKER, WS 12/6 MC, 12mm LENGTH, WHITE	AS REQ'D
41	PP#A	WEIDMULLER	1880410000	OPTICOM PANEL MOUNTED FIBER PATCH PANEL	AS REQ'D
42	SR	PEPPERL + FUCHS	KFA5-SR2-EX2.W	SAFETY RELAY RAIL MOUNTED	AS REQ'D
43	INTERPOSING RELAY	ALLEN BRADLEY	700 HLT1U1	120VAC, 6A INTERPOSING RELAY	AS REQ'D

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Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SP	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size
ANSI D

Bar is 20mm on original size drawing
0 20mm

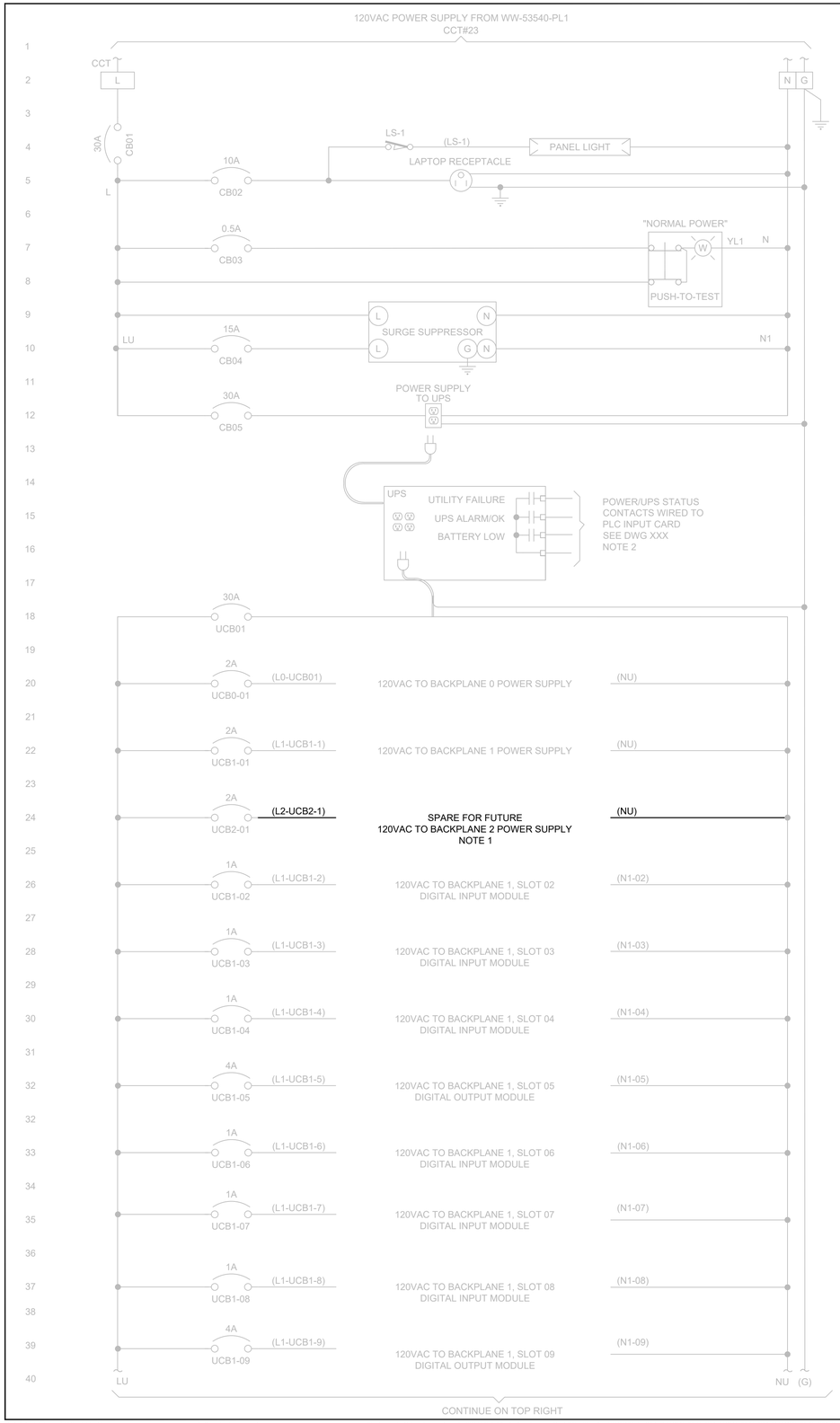
Project No. **11216493**

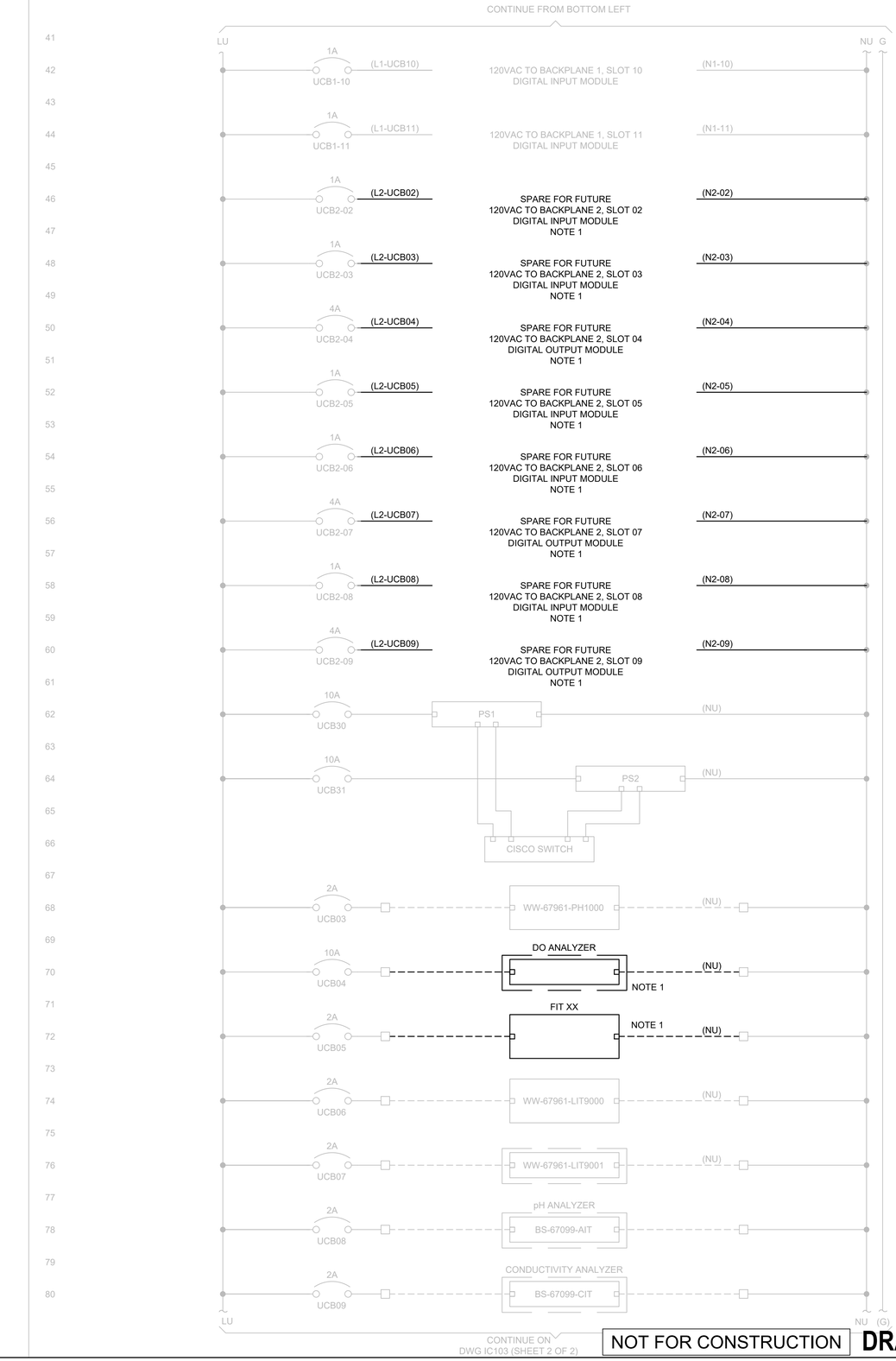
Title
CONTROL PANEL BILL OF MATERIALS

Bruce Power Sheet No.
NK37-DRAW-53000-10059

Sheet No.
IC-106

Sheet **56** of **63**





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NOTES:

1. THESE SECTIONS BELONG TO FUTURE EXPANSION PROJECT AND SHOULD BE CONSIDERED AS SPARES ONLY.
2. REFER TO IO LIST. CONTROL PANELS' BUILDER SHALL ISSUE DETAILS DRAWING.

Client

BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project

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Title

120VAC POWER DISTRIBUTION (1 OF 2)

Bruce Power Sheet No.

NK37-DRAW-53540-10046

Sheet No.

IC-107

Sheet **57** of **63**

Plot Date: 10 March 2021 - 4:55 PM
Plotted By: Neil Hamilton
CAD File: N:\CA\Waterloo\Projects\66211216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA008.dwg

CONTINUED FROM DRAWING
IC103 (SHEET 1 OF 2)

CCT
2A
UCB10
LIT XX
NOTE 1
(NU)
2A
UCB11
LIT XX
NOTE 1
(NU)
LSH001
FIELD
IS-JB
NOTE 1
2A
UCB12
L
ISR1
L
N
CR1
LEVEL HIGH
LSH003
LSL003
FIELD
IS-JB
2A
UCB13
L
ISR1
ISR2
L
N
CR3
LEVEL HIGH
CR4
LEVEL LOW
WW_67961_LS1
WW_67961_LS2
FIELD
2A
UCB14
L
ISR1
ISR2
CR5
LS1
CR6
LS2
WW_67961_LS3
WW_67961_LS4
FIELD
2A
UCB15
L
ISR1
ISR2
CR7
LS3
CR8
LS4
LU
NU (G)

CONTINUE ON TOP RIGHT

CONTINUED FROM
BOTTOM LEFT

CCT
WW_67961_LS5
WW_67961_LS6
FIELD
2A
UCB16
L
ISR1
ISR2
CR9
LS5
CR10
LS6
10A
UCB17
WW-67961-JB100
NOTE 3
1A
UCB18
INLET FLOW RATE TO SPP
WW-67961-FIT1000
1A
UCB19
CHEM ALUM TANK1 LEVEL
WW-67966-LIT1001
NOTE 2
1A
UCB20
CHEM ALUM TANK2 LEVEL
WW-67966-LIT1002
NOTE 2
WW_67961_LS7
WW_67961_LS9
FIELD
2A
UCB21
L
ISR1
ISR2
CR11
LS7
CR12
LS9
WW_67961_LS10
FIELD
2A
UCB22
L
ISR1
CR13
LS10
24VDC
0VDC (G)

CONTINUE ON IC-104

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A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**		Bar is 20mm on original size drawing 0 20mm	

Project No. **11216493**

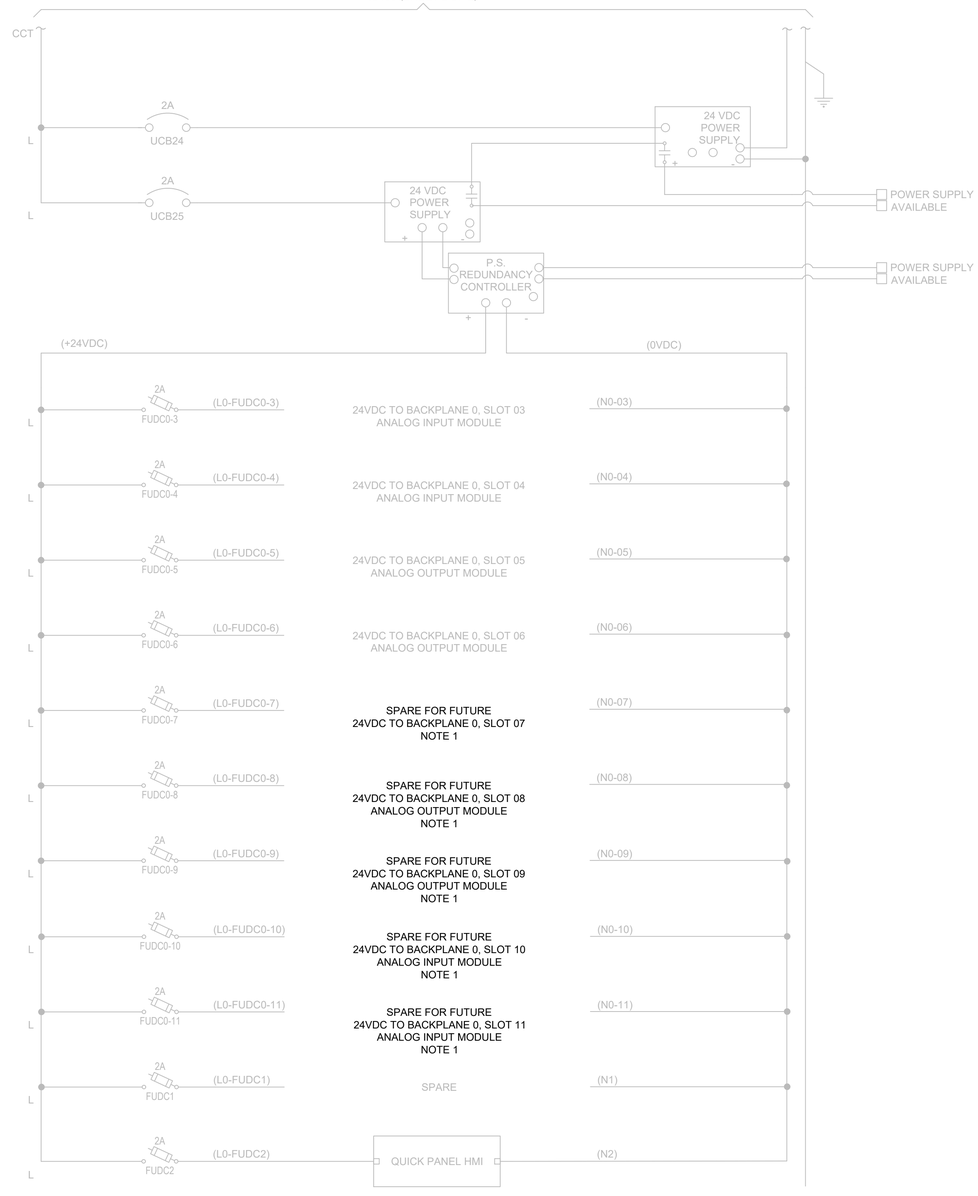
Title
120VAC POWER DISTRIBUTION (2 OF 2)

Bruce Power Sheet No.
NK37-DRAW-53540-10047

Sheet No.
IC-108
Sheet **58** of **63**

Plot Date: 10 March 2021 - 4:55 PM Plotted By: Neil Hamilton CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA008.dwg

CONTINUED FROM DRAWING
IC103 (SHEET 2 OF 2)



NOTE:

1. THESE SECTIONS BELONG TO FUTURE EXPANSION PROJECT AND SHOULD BE CONSIDERED AS SPARED ONLY.

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Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SP	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size
ANSI D

Bar is 20mm on original size drawing
0 20mm

Project No. **11216493**

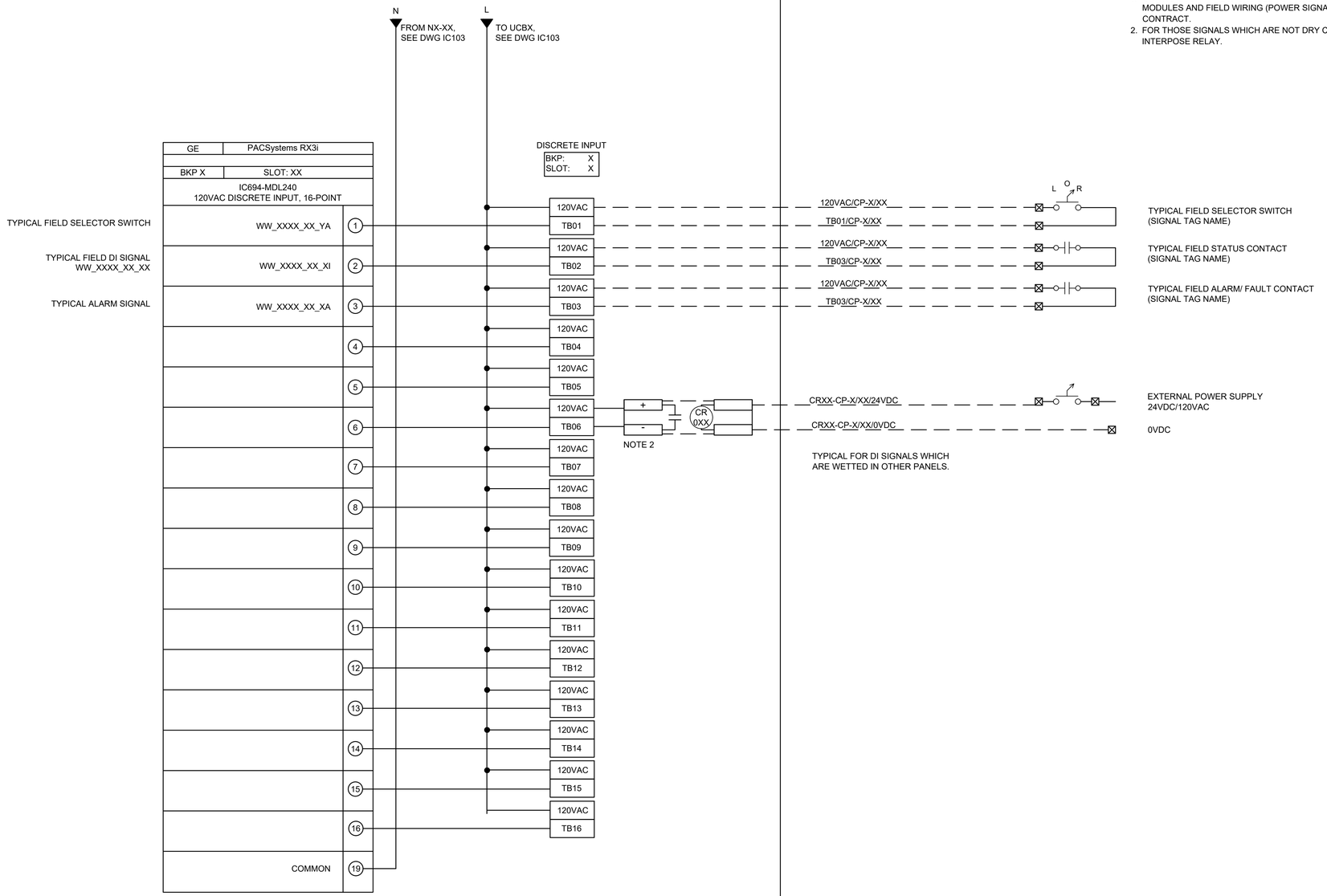
Title
120VAC AND 24VDC POWER DISTRIBUTION

Bruce Power Sheet No.
NK37-DRAW-66400-10001

Sheet No.
IC-109
Sheet **59** of **63**

CONTROL PANEL

FIELD



GENERAL NOTES:

1. CONTRACTOR IS RESPONSIBLE TO PRODUCE COMPLETE PANEL DRAWINGS FOR ALL INTERNAL MODULES AND FIELD WIRING (POWER SIGNALS AND COMMUNICATION) INSTALLED UNDER THIS CONTRACT.
2. FOR THOSE SIGNALS WHICH ARE NOT DRY CONTACT AND ALREADY WETTED IN OTHER PANELS, USE INTERPOSE RELAY.

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Project
SPP NORTH TRAIN

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Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**		Bar is 20mm on original size drawing 0 20mm	

Project No. **11216493**

Title
TYPICAL DISCRETE INPUT MODULE

Bruce Power Sheet No.
NK37-DRAW-66400-10002

Sheet No.
IC-110

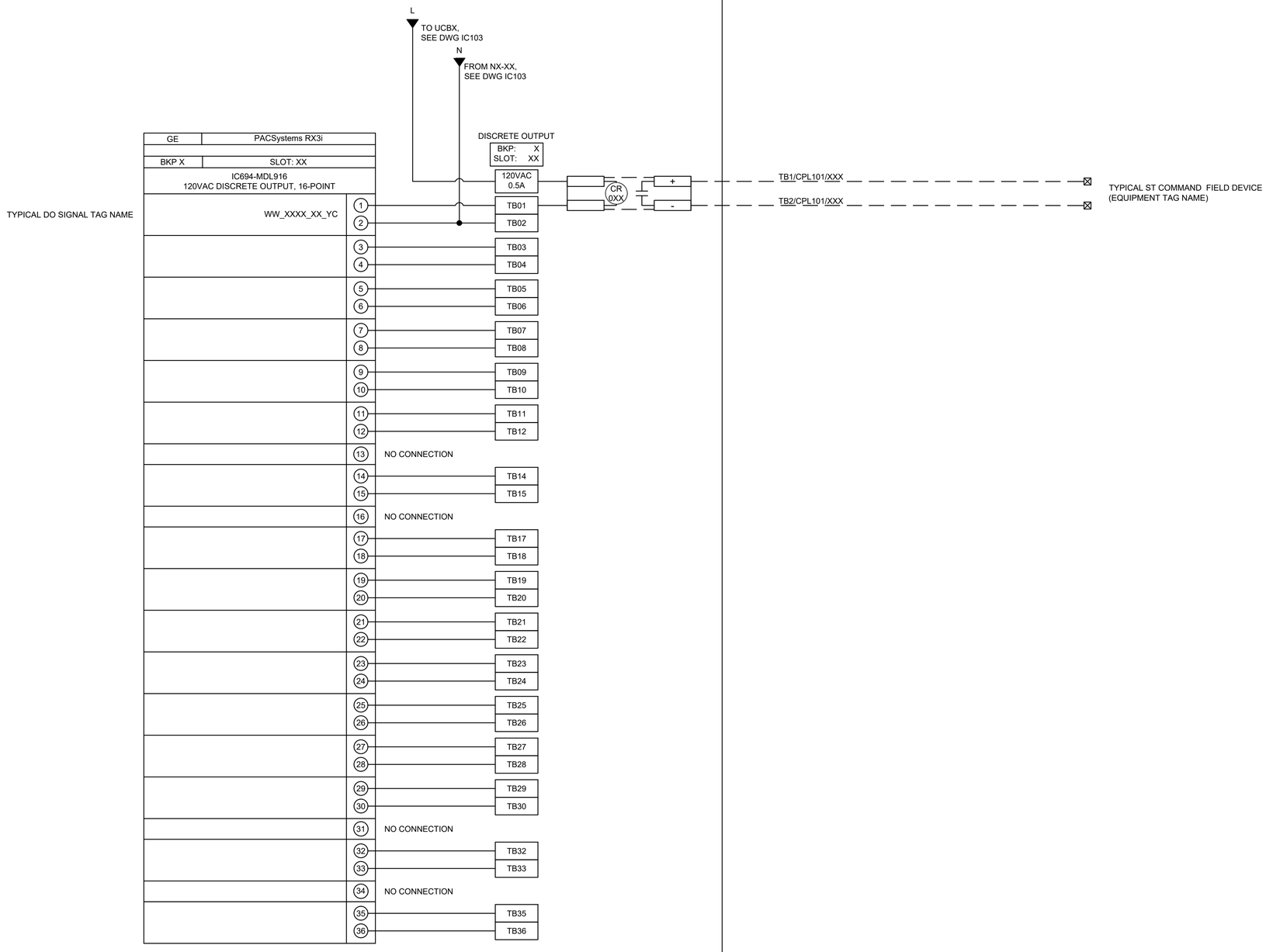
Sheet **60** of **63**

Plot Date: 10 March 2021 - 4:55 PM Plotted By: Neil Hamilton CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA010.dwg

CONTROL PANEL

FIELD

COM



GENERAL NOTES:

1. CONTRACTOR IS RESPONSIBLE TO PRODUCE COMPLETE PANEL DRAWINGS FOR ALL INTERNAL MODULES AND FIELD WIRING (POWER SIGNALS AND COMMUNICATION) INSTALLED UNDER THIS CONTRACT.
2. USING NO OR NC CONTACTS OF CRXX RELAY DEPENDS ON FIELD CIRCUIT DEVICE.

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Project
SPP NORTH TRAIN

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B	100% DESIGN REVIEW	SP	CE	11/13/2020
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Drawn	S. PARK	Designer	L. MONSHIZADEH
Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size **ANSI D**		Bar is 20mm on original size drawing: 0 — 20mm	

Project No. **11216493**

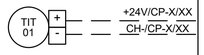
Title
TYPICAL DISCRETE OUTPUT MODULE

Bruce Power Sheet No.
NK37-DRAW-66400-10003

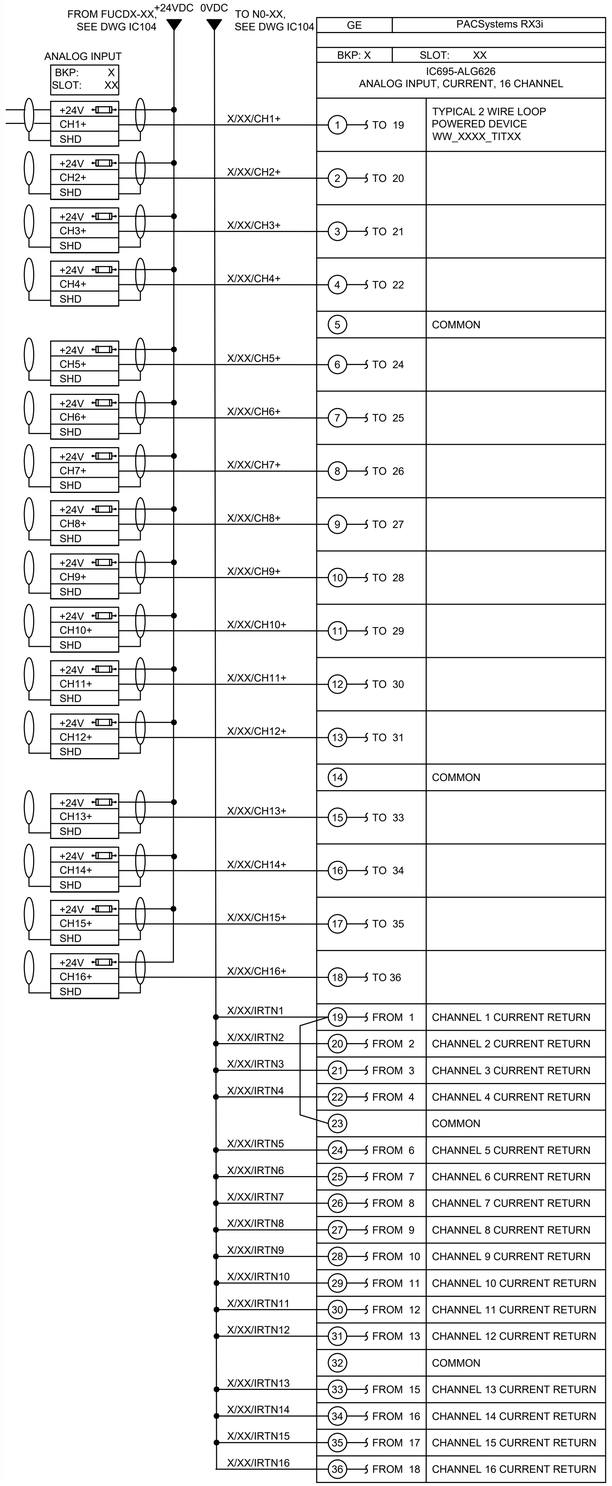
Sheet No.
IC-111
Sheet **61** of **63**

Plot Date: 10 March 2021 - 4:55 PM Plotted By: Neil Hamilton CAD File: N:\CA\Waterloo\Projects\66211216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA011.dwg

FIELD



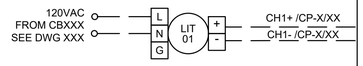
CONTROL PANEL



GE	PACSystems RX3i
BKP: X	SLOT: XX
IC695-ALG626 ANALOG INPUT, CURRENT, 16 CHANNEL	
1 → TO 19	TYPICAL 2 WIRE LOOP POWERED DEVICE WW_XXXX_TITXX
2 → TO 20	
3 → TO 21	
4 → TO 22	
5	COMMON
6 → TO 24	
7 → TO 25	
8 → TO 26	
9 → TO 27	
10 → TO 28	
11 → TO 29	
12 → TO 30	
13 → TO 31	
14	COMMON
15 → TO 33	
16 → TO 34	
17 → TO 35	
18 → TO 36	
19 → FROM 1	CHANNEL 1 CURRENT RETURN
20 → FROM 2	CHANNEL 2 CURRENT RETURN
21 → FROM 3	CHANNEL 3 CURRENT RETURN
22 → FROM 4	CHANNEL 4 CURRENT RETURN
23	COMMON
24 → FROM 6	CHANNEL 5 CURRENT RETURN
25 → FROM 7	CHANNEL 6 CURRENT RETURN
26 → FROM 8	CHANNEL 7 CURRENT RETURN
27 → FROM 9	CHANNEL 8 CURRENT RETURN
28 → FROM 10	CHANNEL 9 CURRENT RETURN
29 → FROM 11	CHANNEL 10 CURRENT RETURN
30 → FROM 12	CHANNEL 11 CURRENT RETURN
31 → FROM 13	CHANNEL 12 CURRENT RETURN
32	COMMON
33 → FROM 15	CHANNEL 13 CURRENT RETURN
34 → FROM 16	CHANNEL 14 CURRENT RETURN
35 → FROM 17	CHANNEL 15 CURRENT RETURN
36 → FROM 18	CHANNEL 16 CURRENT RETURN

TYPICAL 2-WIRE ANALOG INPUT TERMINATION LAYOUT

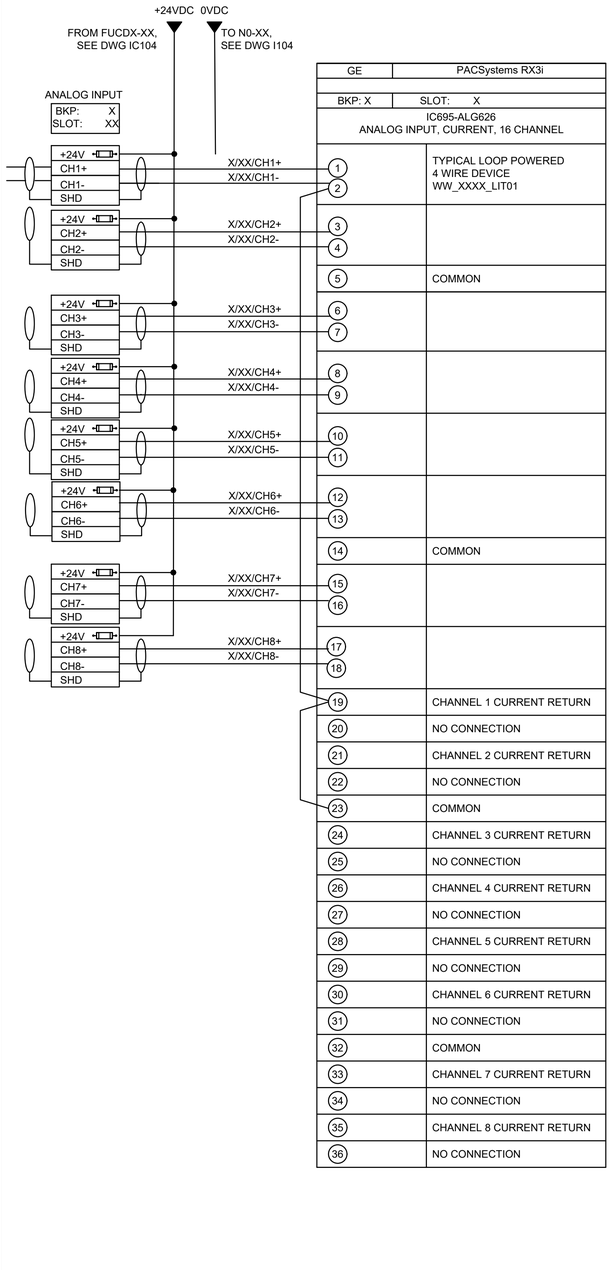
FIELD



CONTROL PANEL

GENERAL NOTES:

1. CONTRACTOR IS RESPONSIBLE TO PRODUCE COMPLETE PANEL DRAWINGS FOR ALL INTERNAL MODULES AND FIELD WIRING (POWER SIGNALS AND COMMUNICATION) INSTALLED UNDER THIS CONTRACT.
2. ALL CABLE SHIELDS WILL BE CONNECTED TO A GROUND BAR.
3. +24VDC IS NOT REQUIRED FOR 4-WIRE TRANSMITTER



GE	PACSystems RX3i
BKP: X	SLOT: X
IC695-ALG626 ANALOG INPUT, CURRENT, 16 CHANNEL	
1, 2	TYPICAL LOOP POWERED 4 WIRE DEVICE WW_XXXX_LIT01
3, 4	
5	COMMON
6, 7	
8, 9	
10, 11	
12, 13	
14	COMMON
15, 16	
17, 18	
19	CHANNEL 1 CURRENT RETURN
20	NO CONNECTION
21	CHANNEL 2 CURRENT RETURN
22	NO CONNECTION
23	COMMON
24	CHANNEL 3 CURRENT RETURN
25	NO CONNECTION
26	CHANNEL 4 CURRENT RETURN
27	NO CONNECTION
28	CHANNEL 5 CURRENT RETURN
29	NO CONNECTION
30	CHANNEL 6 CURRENT RETURN
31	NO CONNECTION
32	COMMON
33	CHANNEL 7 CURRENT RETURN
34	NO CONNECTION
35	CHANNEL 8 CURRENT RETURN
36	NO CONNECTION

TYPICAL 4-WIRE ANALOG INPUT TERMINATION LAYOUT

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BRUCE POWER
177 TIE ROAD, TIVERTON, ON

Project
SPP NORTH TRAIN

No.	Issue	Drawn	Approved	Date
C	ISSUED FOR RFP	SP	CE	01/15/2021
B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

Drawn	S. PARK	Designer	L. MONSHIZADEH
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Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 — 20mm

Project No. **11216493**

Title
TYPICAL ANALOG INPUT MODULE

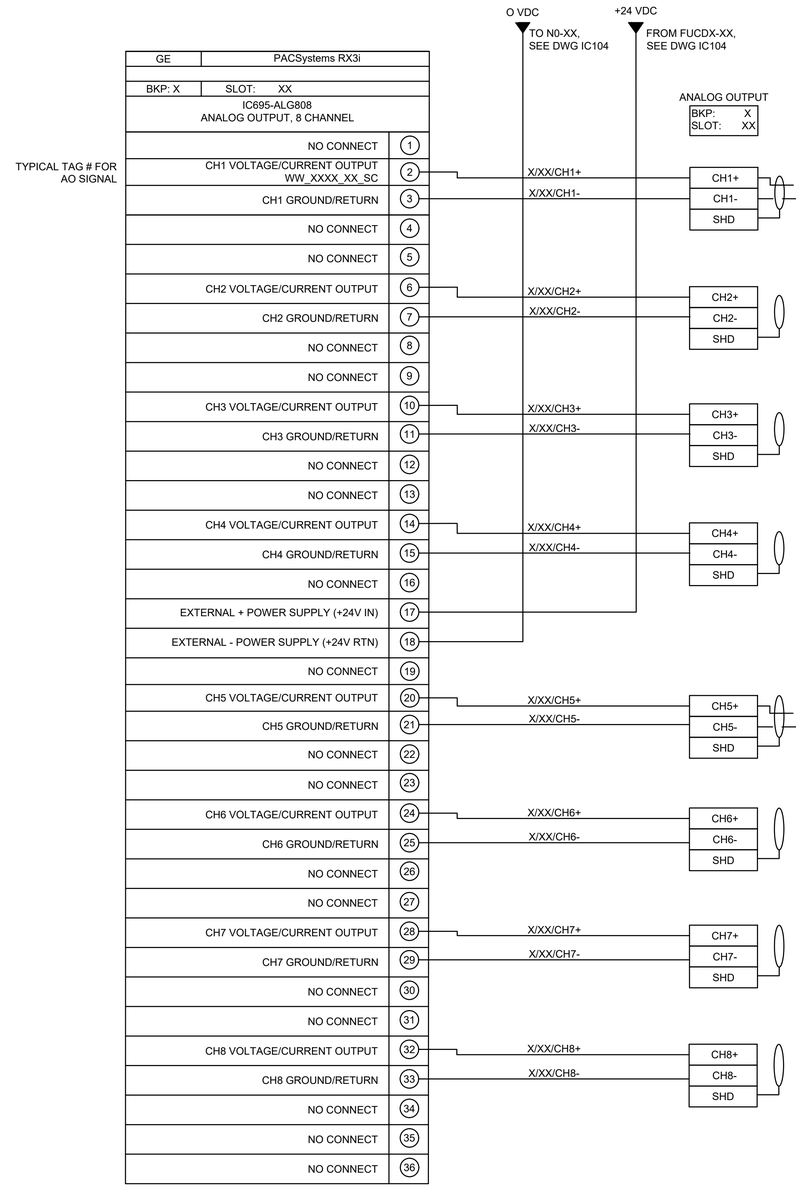
Bruce Power Sheet No.
NK37-DRAW-53000-10062

Sheet No.
IC-112

Plot Date: 10 March 2021 - 4:55 PM Plotted By: Neil Hamilton CAD File: N:\CA\Waterloo\Projects\662\11216493\Digital_Design\ACAD 2017\Sheets\11216493-REPORTS\11216493-01(003)\11216493-01(003)IC\11216493-01(003)IC-WA012.dwg

CONTROL PANEL

FIELD



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B	100% DESIGN REVIEW	SP	CE	11/13/2020
A	90% DESIGN REVIEW	SP	CE	10/09/2020

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Drafting Check	B. PLETZ	Design Check	K. PICKERSGILL
Project Manager	C. EVEREST	Date	01/15/2021
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Original Size	ANSI D	Bar is 20mm on original size drawing	0 20mm

Project No. **11216493**

Title
TYPICAL ANALOG OUTPUT MODULE

Bruce Power Sheet No.
NK37-DRAW-53000-10063

Sheet No.
IC-113
Sheet **63** of **63**