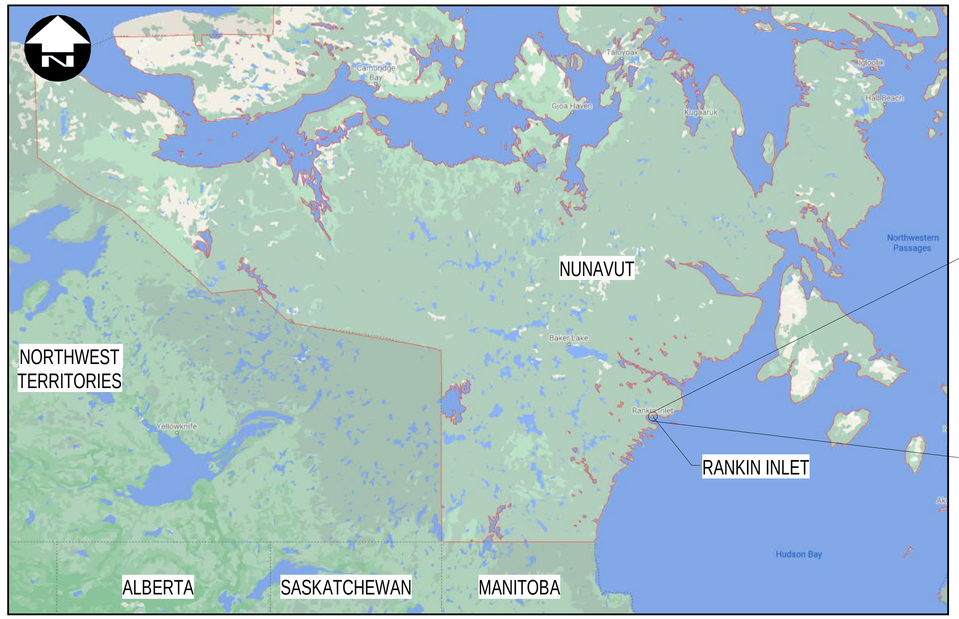


KEY PLAN

Canada

Nunavut

RANKIN INLET UTILIDOR REPLACEMENT

GOVERNMENT OF NUNAVUT

JOHNSTON COVE LIFT STATION

PROJECT NO. 20-3940

DRAWING INDEX

CONSTRUCTION

DILLON CONSULTING

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT
OCTOBER 2021
Project No. 20-3940

PLOT DATE: 2021-10-25 5:39:51 PM FILE NAME: U:\dms7744\8\203940-10-WPMV-CON.rvt

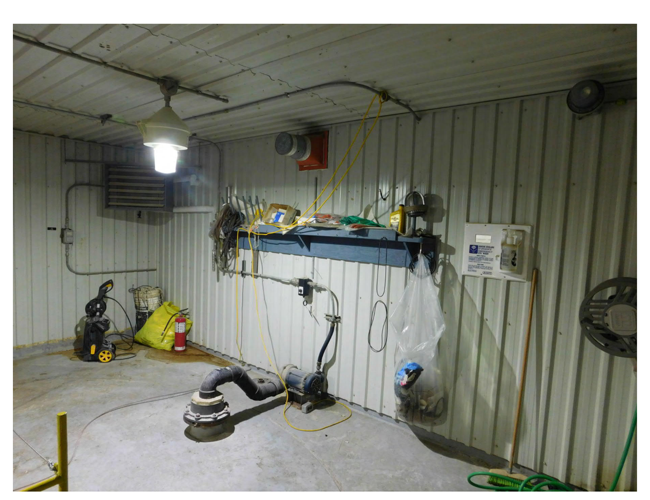
BUILDING EXTERNAL - LOOKING SOUTH

WET WELL ROOM - LOOKING NORTH-EAST

WET WELL ROOM - LOOKING EAST

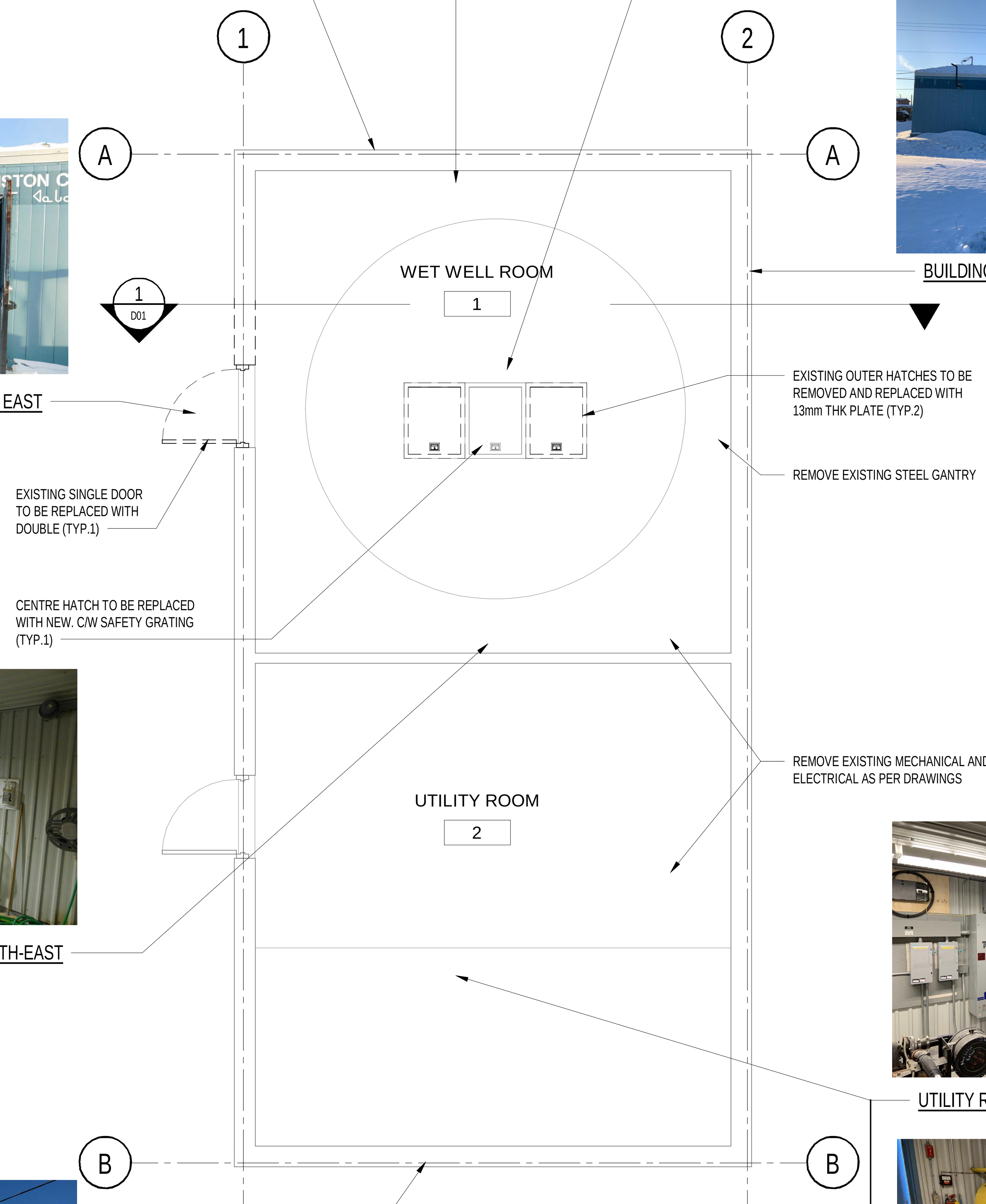
BUILDING EXTERNAL - LOOKING WEST

BUILDING EXTERNAL - LOOKING EAST



WET WELL ROOM - LOOKING SOUTH-EAST

BUILDING EXTERNAL - LOOKING NORTH-WEST

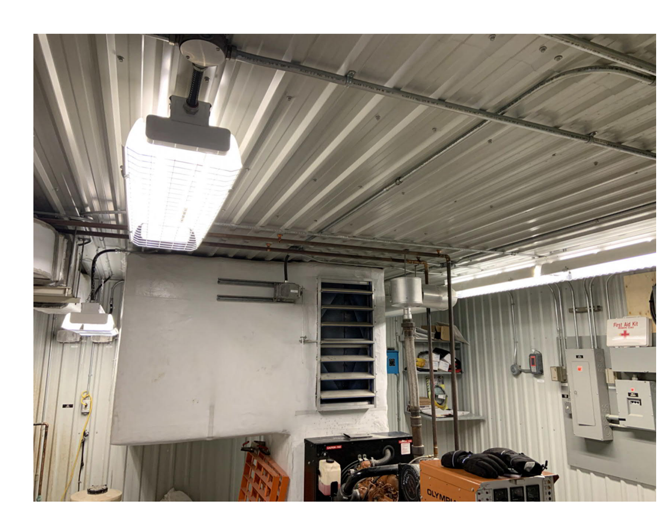


EXISTING PLAN ABOVE SLAB
SCALE: 1 : 50

UTILITY ROOM - LOOKING SOUTH-EAST

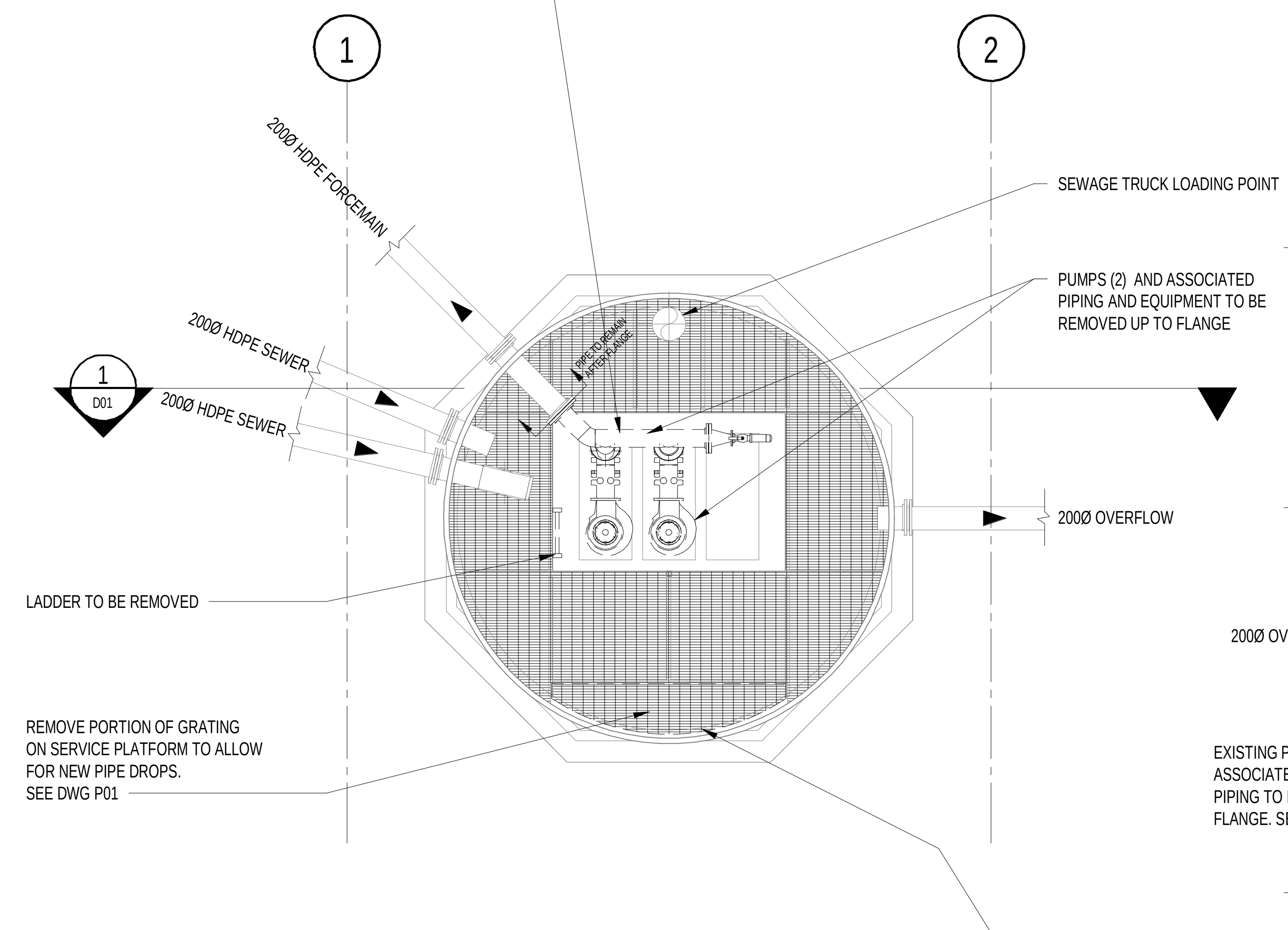
UTILITY ROOM - LOOKING EAST

UTILITY ROOM - LOOKING WEST

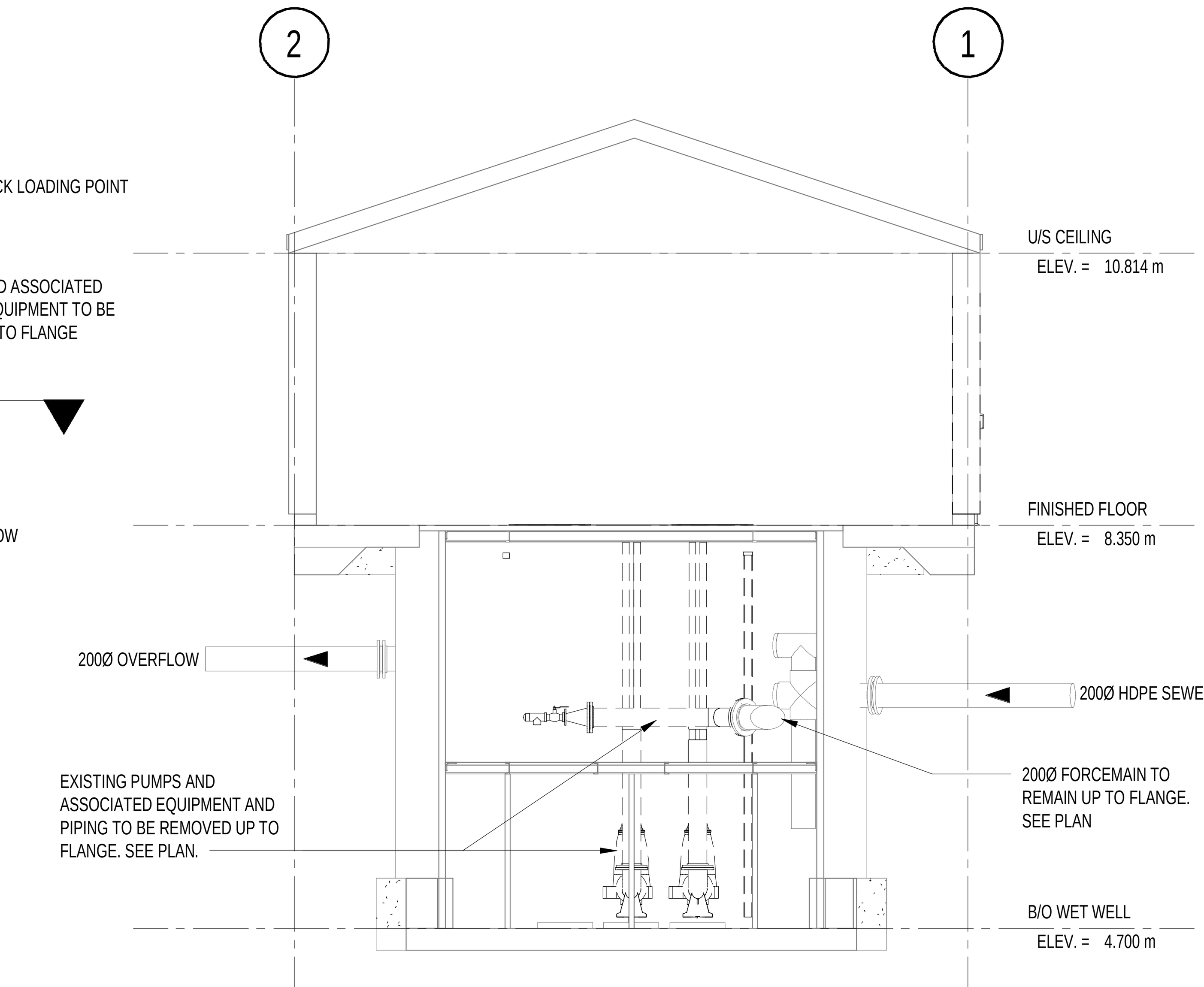


UTILITY ROOM - LOOKING SOUTH-EAST

WET WELL - LOOKING NORTH



EXISTING PLAN BELOW SLAB
SCALE: 1 : 50



SECTION 1
SCALE: 1 : 50

WET WELL - LOOKING SOUTH-WEST

Conditions of Use

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REGISTERED PROFESSIONAL ENGINEER
C.P. WILLETTE
LICENSEE
NT/NU

CONSTRUCTION

Canada

Nunavut

DILLON CONSULTING

NO.	ISSUED FOR	DATE	BY
2	CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN: TGB	REVIEWED BY: TGB
DRAWN: SMZ	CHECKED BY: ASW
DATE: OCTOBER 2021	
SCALE: 1 : 50	

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

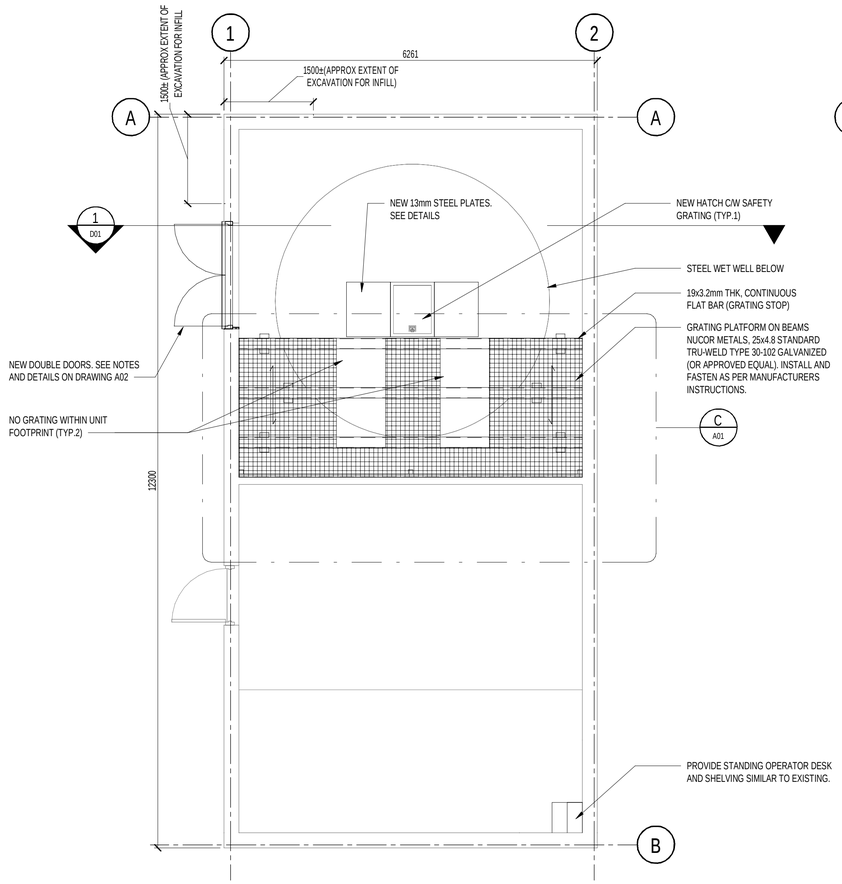
DEMOLITION PLANS

PROJECT NO. 20-3940

SHEET NO. D01

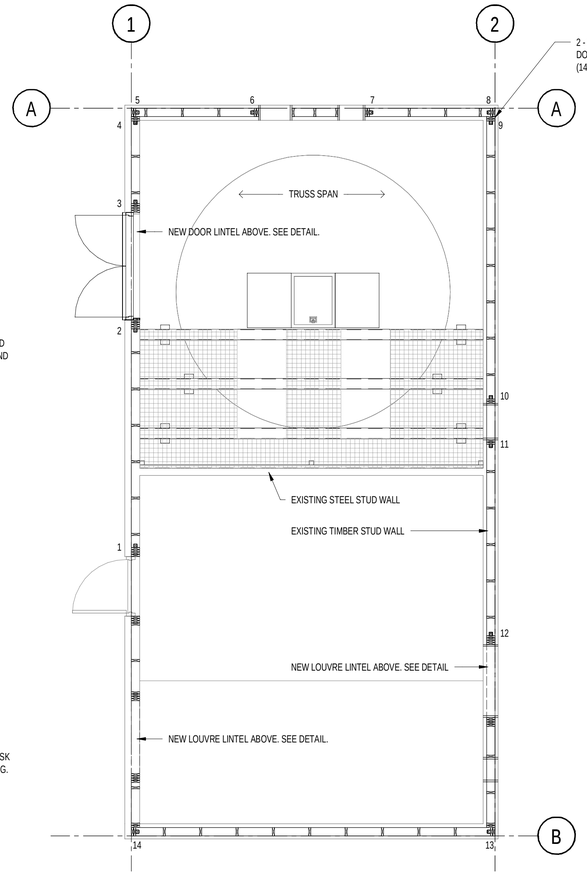
PLOT DATE: 2021-10-26 1:24:45 PM
FILE NAME: U:\Rm\7744\72\203940-01-WPMV-CON.rvt

NOTE: EXTENTS OF EXCAVATION REQUIRING CONCRETE INFILL UNDER CORNER OF BUILDING FLOOR SLAB MAY VARY BASED ON METHODS OF CONSTRUCTION AT THIS LOCATION (SEE DRAWING A03 FOR INFILL DETAIL)



FLOOR PLAN

SCALE: 1 : 50

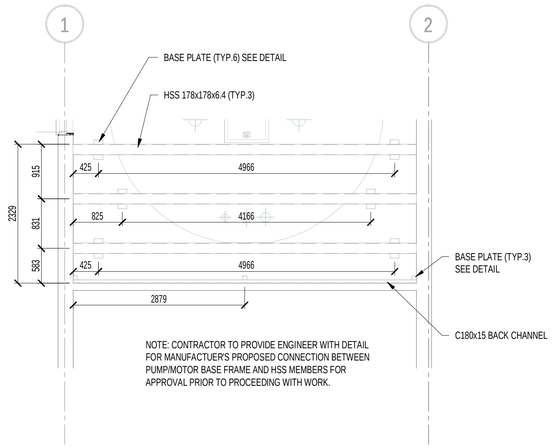


BUILDING FRAMING PLAN

SCALE: 1 : 50

NOTES:

1. LOCATION OF SIMPSON STRONG-TIE HOLD DOWN ANCHORS IS APPROXIMATE. CONTRACTOR TO CONFIRM EXACT STUD LOCATION ON SITE.
2. MINIMUM OF 2 - 38x140 FULL HEIGHT STUDS REQUIRED AT EACH HOLD DOWN ANCHOR LOCATION. ADD MEMBERS AS REQUIRED AND FASTEN TO EXISTING STRUCTURE AS PER NATIONAL BUILDING CODE REQUIREMENTS.
3. WHERE PLYWOOD SHEATHING IS REMOVED TO INSTALL HOLD DOWN ANCHORS FOR SHEAR WALLS, ENSURE MATCHING NEW PLYWOOD SHEATHING IS NAILED TO STUD FRAMING WITH 10d COMMON WIRE NAILS (76mm LONG) AT 150mm C/C AT THE PANEL EDGES, INTERMEDIATE STUDS AND BLOCKING.



NOTE: CONTRACTOR TO PROVIDE ENGINEER WITH DETAIL FOR MANUFACTUER'S PROPOSED CONNECTION BETWEEN PUMP/MOTOR BASE FRAME AND HSS MEMBERS FOR APPROVAL PRIOR TO PROCEEDING WITH WORK.

C A01 BEAM PLAN

SCALE: 1 : 50

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF CANADA.
2. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH OCCUPATIONAL HEALTH AND SAFETY ACT OF NUNAVUT.
3. NO ALTERATIONS TO STRUCTURAL DETAILS SHALL BE MADE WITHOUT WRITTEN PERMISSION OF THE STRUCTURAL ENGINEER.
4. THE CONTRACTOR SHALL COORDINATE DETAILS SHOWN ON THE STRUCTURAL DRAWINGS WITH ALL OTHER DISCIPLINE'S DRAWINGS AND SPECIFICATIONS.
5. ALL DIMENSIONS SHOWN ARE APPROXIMATE ONLY. EXISTING CONDITIONS MAY VARY. CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS ON DRAWINGS PRIOR TO COMMENCING WORK. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
6. SAFEGUARD AND PROTECT ALL EXISTING STRUCTURES, SERVICES AND UTILITIES WHICH MAY BE AFFECTED BY THE WORK.
7. ALL STANDARDS REFERENCED ARE TO BE THE MOST RECENT EDITION.
8. DRAWINGS ARE NOT TO BE SCALED.
9. THE CONTRACTOR IS RESPONSIBLE FOR SEQUENCE OF ERECTION, TEMPORARY SUPPORTS AND ALL RELATED SAFETY PROCEDURES.

STEEL

1. SUBMIT DETAILED FABRICATION DRAWINGS FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS TO BEAR THE STAMP OF THE FABRICATORS ENGINEER WHO SHALL BE LICENSED WITH THE NORTHWEST TERRITORIES AND NUNAVUT ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS. IT SHALL BE UNDERSTOOD THAT IN SO STAMPING THE DRAWINGS, THE FABRICATORS ENGINEER IS NOT ACCEPTING RESPONSIBILITY FOR DESIGN OTHER THAN HIS OWN.
2. ALL DETAILING, FABRICATION AND ERECTION TO CONFORM TO CSA CAN3-S16.1.
3. HOLLOW STRUCTURAL SECTIONS TO CAN/CSA G40.21 GRADE 350W, CLASS C.
4. STRUCTURAL CHANNELS AND PLATES TO CAN/CSA G40.21 GRADE 300W.
5. PROVIDE ALL NECESSARY DETAILS, MATERIALS AND CONNECTIONS IN ACCORDANCE WITH CISC STANDARD DETAILS UIN.
6. ALL FABRICATION AND WELDING SHALL CONFORM TO CSA W59-03 AND BE PERFORMED BY A COMPANY CERTIFIED BY AND WELDERS QUALIFIED IN ACCORDANCE WITH CSA W47.1-03 (R2008) FOR DIVISION 1 OR 2.1.
7. WELDING ELECTRODES TO CSA W48 SERIES, COMPATIBLE WITH STEEL TO BE WELDED.
8. ALL STRUCTURAL STEEL AND FASTENERS ARE TO BE CLEANED, PREPARED AND PAINTED. TWO COATS OF SUPER SPEC HP (DTM ACRYLIC SEMI-GLOSS KP29) BY BENJAMIN MOORE, OR APPROVED EQUAL. COLOUR TO BE CHARCOAL. TOUCH UP PAINT AS REQUIRED FOLLOWING STEEL ERECTION.

9. DESIGN ASSUMPTIONS:
   - 9.1. PUMP WEIGHT = 1130 lbs (2 UNITS)
   - 9.2. MOTOR WEIGHT = 834 lbs (2 UNITS)
   - 9.3. OCCUPANCY LOAD = 3.6 kPa
   - 9.4 CLIMACTIC DATA - RANKIN INLET, NUNAVUT
     LOADING CRITERIA - POST DISASTER
     SNOW - Ss = 3.0 kPa
     Sr = 0.2 kPa
     Is = 1.25 (ULS), 0.75 (SLS)
     WIND - Q50 = 0.6 kPa
     Iw= 1.25 (ULS), 0.75 (SLS)

10. NON SHRINK GROUT FOR USE UNDER BASE PLATES TO BE MINIMUM 30MPa AT 7 DAYS.
11. ALL HSS MEMBERS TO BE PROVIDED WITH 9.5mmØ DRAIN HOLE AT MID POINT OF UNDERSIDE.

WOOD

1. ALL WOOD FRAME CONSTRUCTION AND REINFORCEMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING CODE OF CANADA AND CSA 086.
2. LUMBER TO CSA 086 SPECIES SPF#1/2 OR BETTER, STAMPED S-DRY.
3. MATERIAL TO BE SPRUCE, PINE, FIR SPECIES. LUMBER MOISTURE CONTENT SHALL NOT EXCEED 19% AT THE TIME OF CONSTRUCTION.
4. FASTENERS FOR ALL WOOD MEMBERS AS PER DRAWINGS, CSA 086, OR NBC REQUIREMENTS OF PART 9, WHICHEVER IS THE GREATEST REQUIREMENT.
5. BUILT-UP LINTELS SHALL BE NAILED TOGETHER AS PER NATIONAL BUILDING CODE REQUIREMENTS.
6. PLYWOOD TO BE DOUGLAS FIR (DFP) TO CSA 0121 OR CANADIAN SOFTWOOD (CSP) TO CSA 0151.

NEW DOUBLE DOOR

1. REMOVE AND INSTALL NEW LINTELS, JACK AND KING STUDS.
2. REPAIR WALL FOLLOWING LINTEL MODIFICATIONS TO MATCH EXISTING WALL CONDITIONS.
3. INSTALL NEW FRAME, DOORS AND HARDWARE AS FOLLOWS:
   - WELDED FRAME TO BE THERMALLY BROKEN AND INSULATED 14 GAUGE GALVANIZED STEEL FRAME (150mm WIDE) AND SUITABLE FOR (2) - 915x2032mm DOORS. PAINT WITH 2 COATS OF DTM BENJAMIN MOORE PAINT.
   - DOORS TO BE INSULATED (POLYURETHANE) C/W WELDED-IN STEEL STIFFENERS AND EDGE SEAMS AND PREPARED FOR ALL HARDWARE. PAINT WITH (2) COATS OF DTM BENJAMIN MOORE PAINT.
   - FULL LENGTH EXTRA HEAVY DUTY CONTINUOUS GEAR HINGES, 135° SWING.
   - EACH LEAF C/W HAGER 4500 SURFACE VERTICAL RODS C/W PULL PLATE LEVER TRIM AND CYLINDER FUNCTION 08.
   - EACH LEAF C/W LCN 4110 HEAVY DUTY CLOSER.
   - THRESHOLD TO BE PEMKO THERMALLY BROKEN, LATCHING PANIC EXIT SADDLE, MODEL 278x292_FGPK.
   - EACH LEAF C/W PREMIER W-2050S K.N. CROWDER WEATHER STRIPPING.
   - INSTALL ASTRAGAL BETWEEN EACH LEAF, MODEL PEMKO 355_S 'T' ON EXTERIOR FACE AND MODEL S771 PEMKO BETWEEN LEAFS.
   - BOTTOM EXTERIOR DOOR EDGE TO HAVE MODEL PEMKO 57_V DOOR BOTTOM SWEEP.
4. LOCKSET SELECTION SHOULD BE COORDINATED WITH THE CLIENT SO THAT REGIONAL PREFERENCES AND STANDARD KEYING SYSTEMS ARE ACCOMMODATED. DOOR HARDWARE SHOULD BE COMPATIBLE WITH F-KEYWAY SYSTEM.

REGISTERED PROFESSIONAL ENGINEER — C.P. WILLETTE — LICENSEE — NT/NU

CONSTRUCTION

Canada — Nunavut

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2	CONSTRUCTION	10/26/2021	ASW
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DESIGN: CPW	REVIEWED BY: TGB
DRAWN: SMZ	CHECKED BY: ASW
DATE: OCTOBER 2021	
SCALE: 1 : 50	

GOVERNMENT OF NUNAVUT

RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

PLAN, NOTES AND DETAILS

PROJECT NO. 20-3940

SHEET NO. A01

PLOT DATE: 2021-10-26 1:24:35 PM
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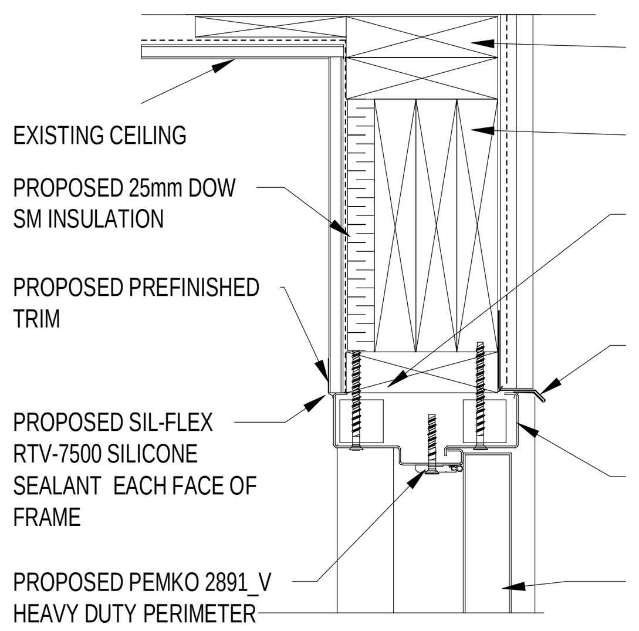
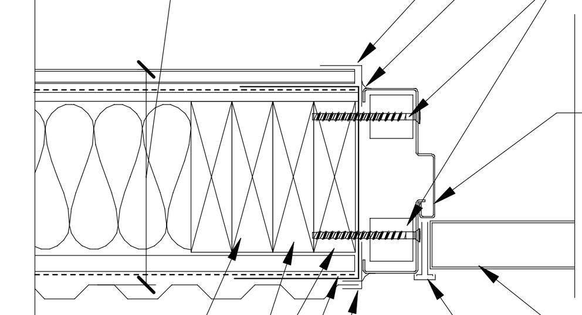
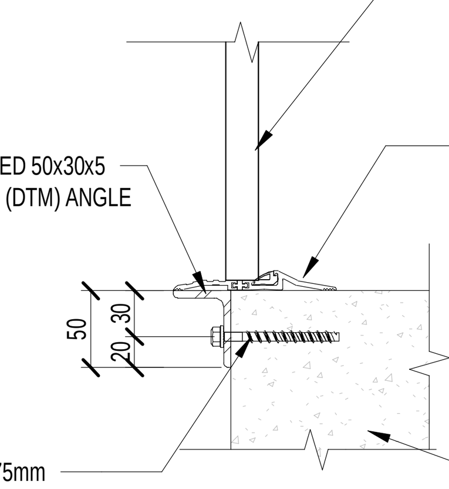


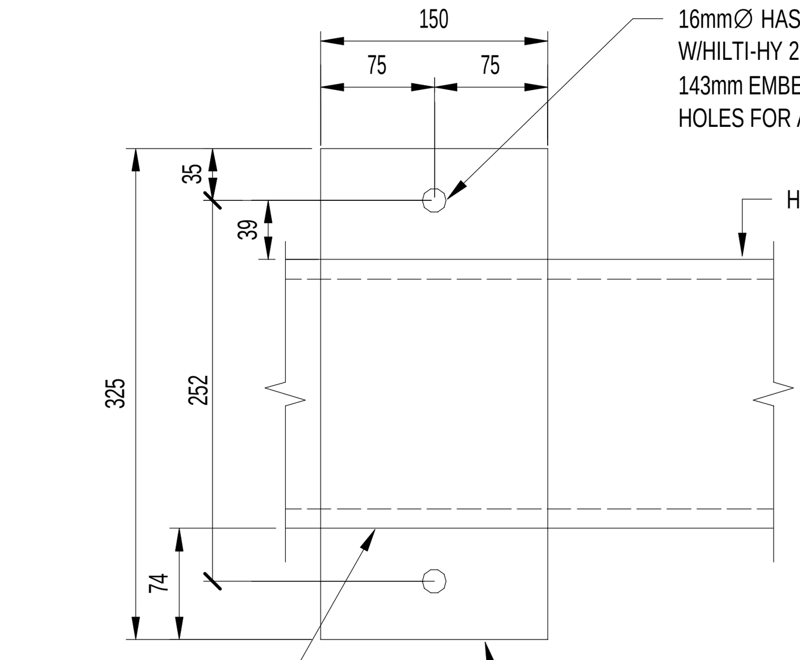
DOOR HEAD DETAIL



DOOR JAMB DETAIL



DOOR SILL DETAIL



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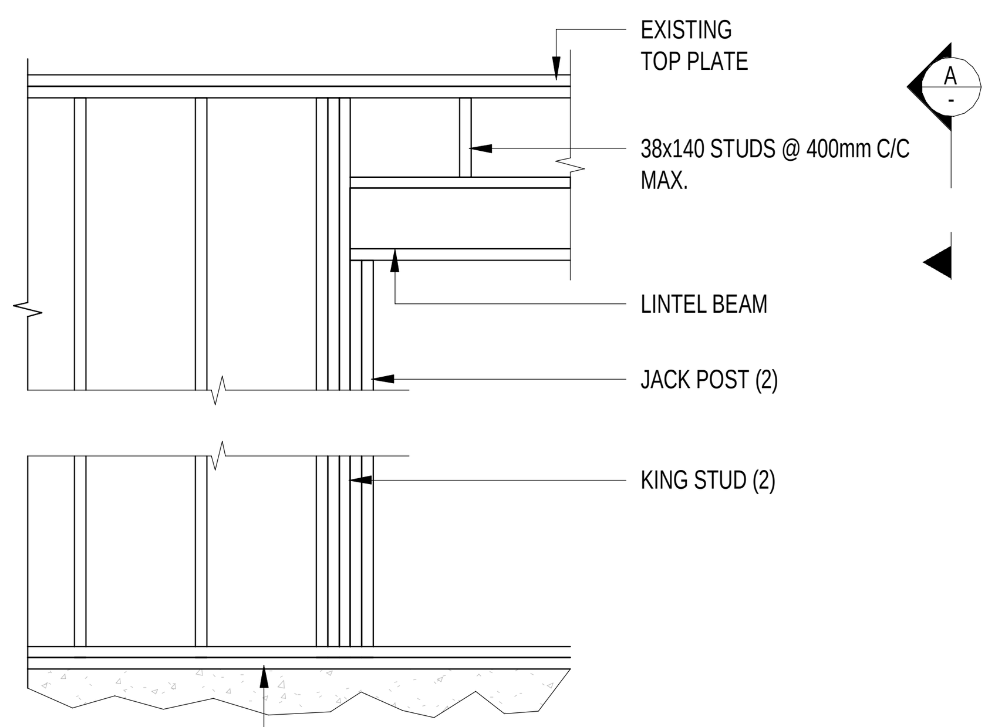
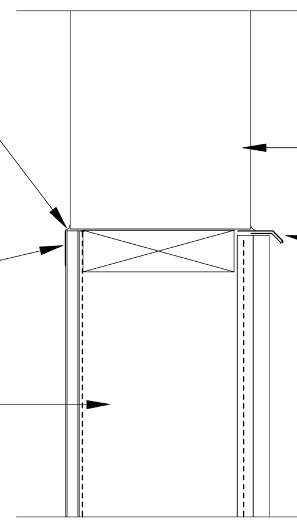
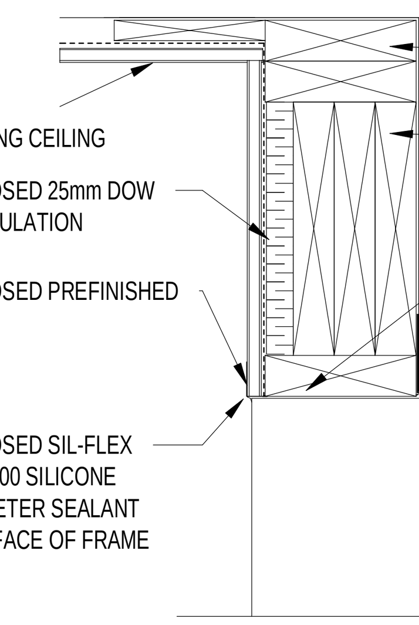




MECHANICAL PENETRATION SILL



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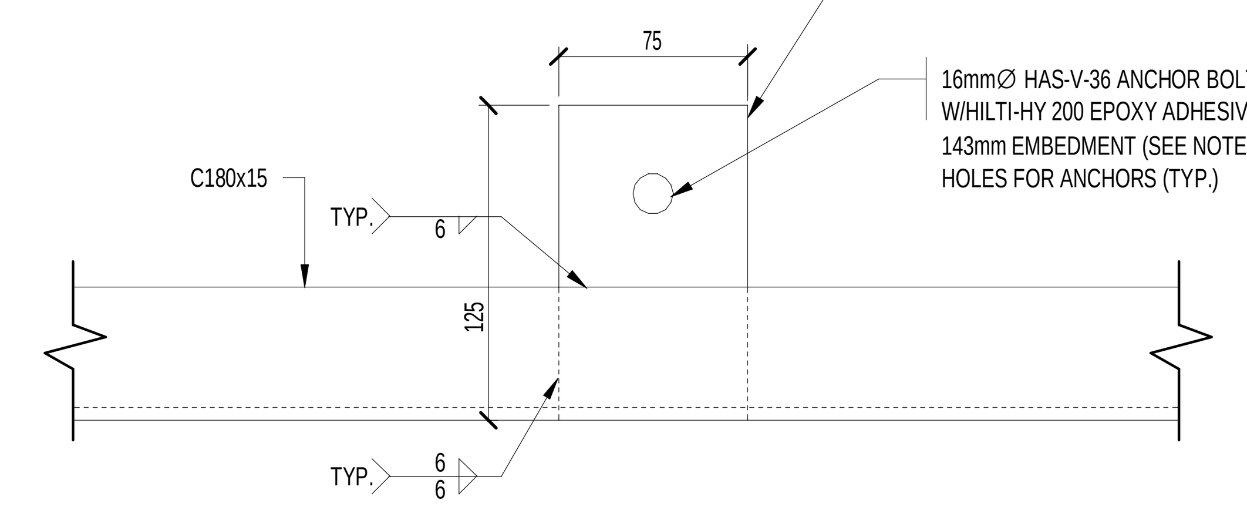

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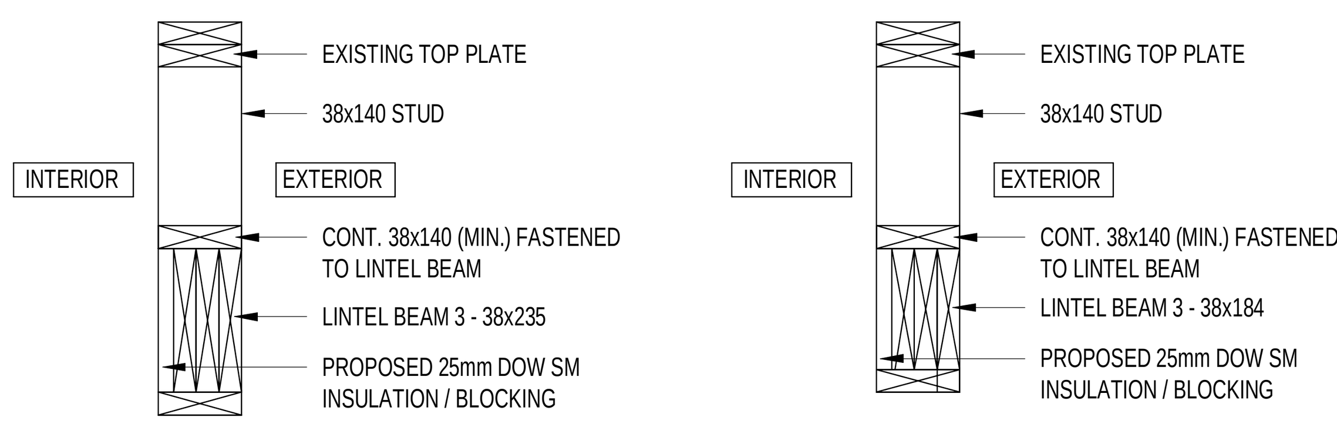
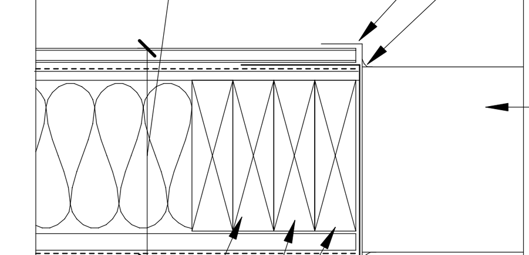


A LINTEL SECTIONS

LINTEL DETAILS



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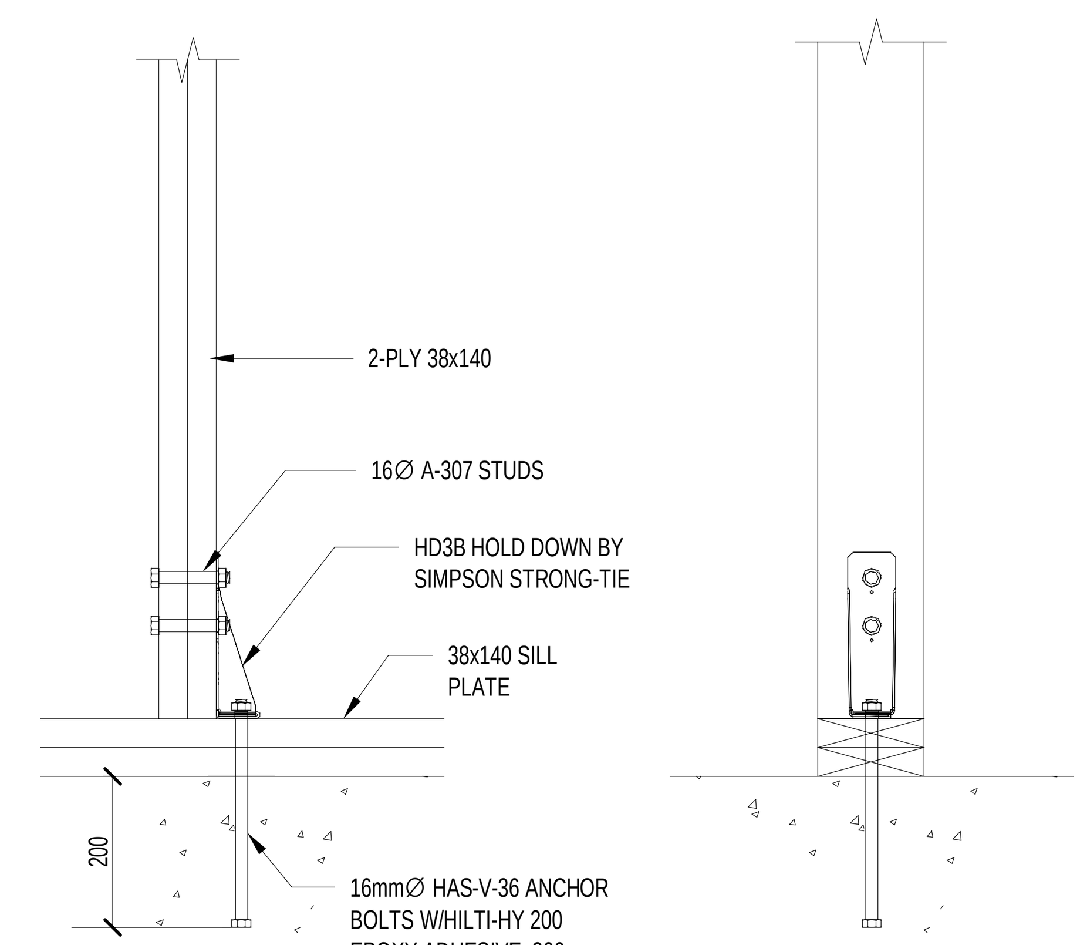
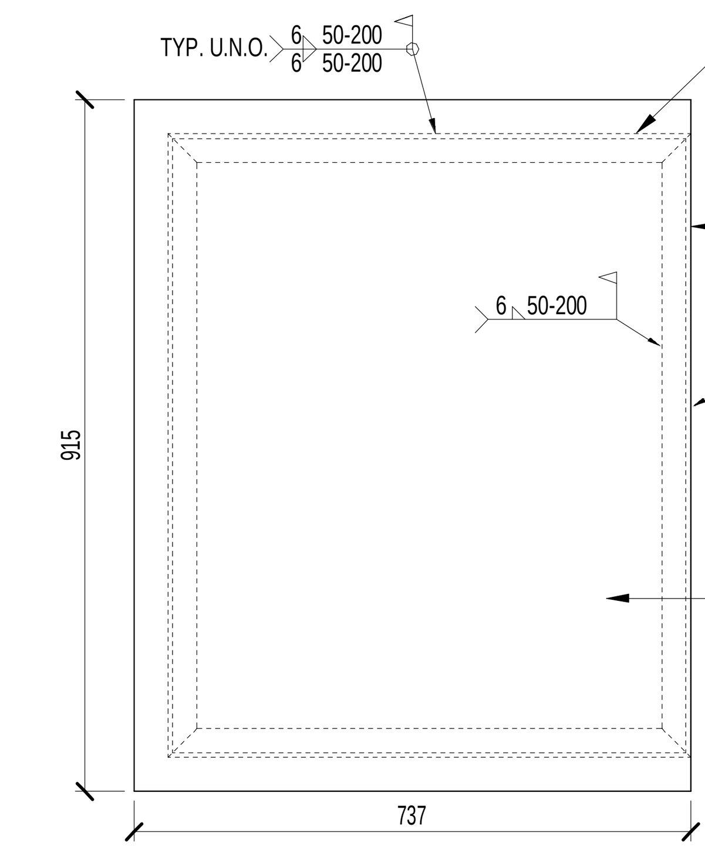


HOLD DOWN DETAIL



HATCH REPLACEMENT PLATE

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CONSTRUCTION

Canada

Nunavut

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1	TENDER	07/16/2021	ASW

DESIGN: TGB/CPW	REVIEWED BY: TGB
DRAWN: SMZ	CHECKED BY: ASW
DATE: OCTOBER 2021	
SCALE: As indicated	

GOVERNMENT OF NUNAVUT

RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

MISCELLANEOUS DETAILS

PROJECT NO. 20-3940

SHEET NO. A02

PLOT DATE: 2021-10-26 1:24:36 PM
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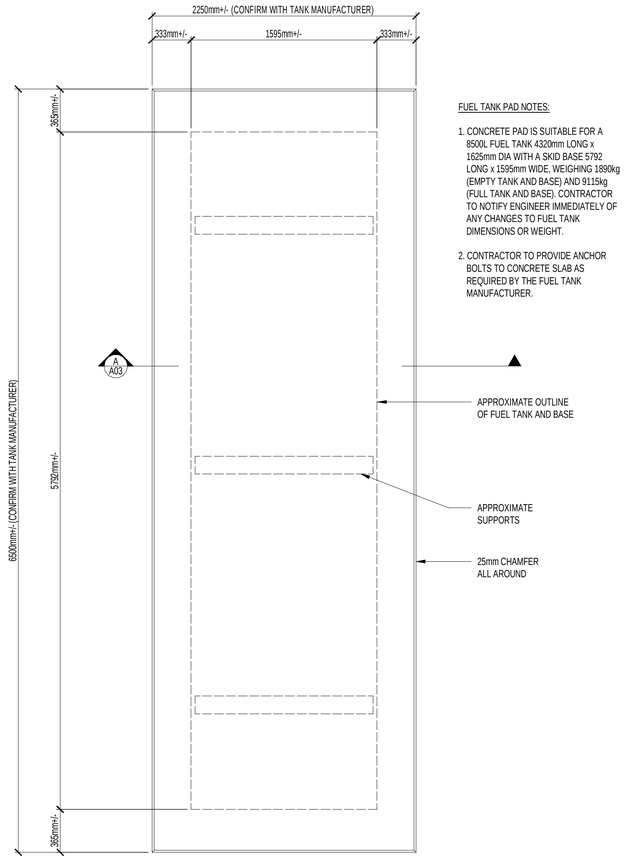
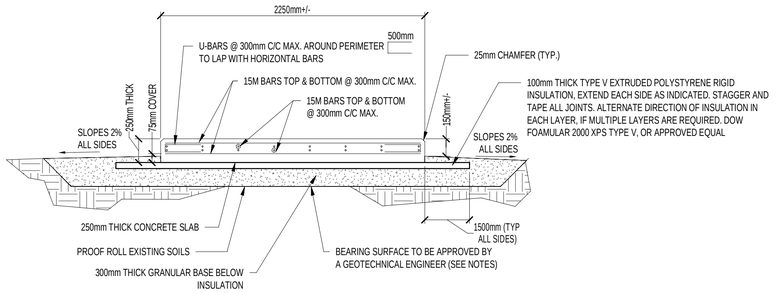


FUEL TANK PAD NOTES:

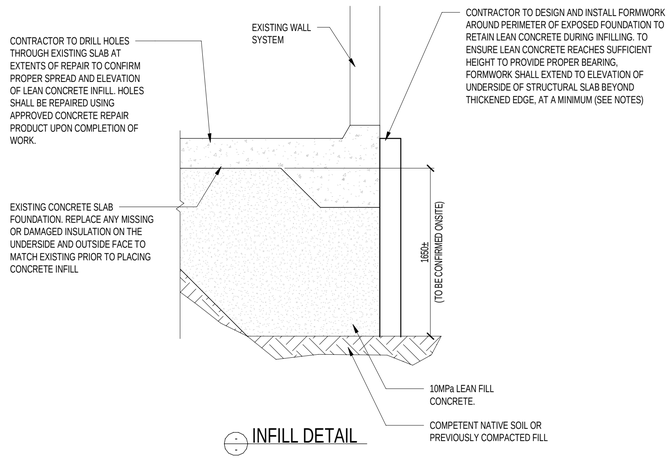
1. CONCRETE PAD IS SUITABLE FOR A 8500L FUEL TANK 4320mm LONG x 1625mm DIA WITH A SKID BASE 5792 LONG x 1595mm WIDE, WEIGHING 1890kg (EMPTY TANK AND BASE) AND 9115kg (FULL TANK AND BASE). CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY CHANGES TO FUEL TANK DIMENSIONS OR WEIGHT.

2. CONTRACTOR TO PROVIDE ANCHOR BOLTS TO CONCRETE SLAB AS REQUIRED BY THE FUEL TANK MANUFACTURER.

FUEL TANK FOUNDATION



A - TYPICAL EQUIPMENT PAD - SECTION



INFILL DETAIL

GENERAL NOTES:

1. THE EQUIPMENT FOUNDATION HAS BEEN DESIGNED FOR LOADS IN ACCORDANCE WITH THE NATIONAL BUILDING CODE OF CANADA, LATEST EDITION FOR EACH OF THE FOLLOWING:
   - FUEL TANK: 8500L HFV-8500 S5050 FUEL VAULT - 4320mm LONG x 1625mm DIA. WEIGHING 1500kg (EMPTY) AND 8725kg (FULL).
   - FUEL TANK SKID BASE: 264922HD SKID BASE - 5792mm LONG x 1595mm DIA. x 1357mm HIGH WEIGHING 390kg.

FOUNDATION, EXCAVATION & BACKFILLING:

1. EXCAVATE AND REMOVE ALL TOPSOIL, FILL AND ANY DELETERIOUS MATERIALS DOWN TO UNDISTURBED NATIVE SOIL.
2. THE NATIVE SUBGRADE SHOULD BE APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER LICENSED TO PRACTICE IN THE NORTHWEST TERRITORIES AND NUNAVUT PRIOR TO PLACEMENT OF FOOTINGS AND CONCRETE INFILL.
3. ANY SOFT AREAS NOTED ON THE SUBGRADE MUST BE EXCAVATED AND REPLACED WITH APPROVED STRUCTURAL FILL PLACED IN LIFTS OF 300mm MAXIMUM AND COMPACTED TO 100% STANDARD PROCTOR DRY DENSITY (ASTM D-698).
4. GRANULAR FILL PAD PLACED BENEATH THE SLAB SHOULD BE FROST STABLE, SAND AND GRAVEL CONFORMING TO THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING
25mm	100
19mm	85-100
12.5m	65-90
9.5mm	50-73
4.75mm	35-55
1.8mm	15-40
0.300mm	5-22
0.0075mm	2-8

5. GRANULAR FILL PAD MUST BE PLACED IN MAXIMUM 150mm LIFTS AND COMPACTED TO MINIMUM 100% STANDARD PROCTOR DRY DENSITY.
6. THE GENERAL CONTRACTOR SHALL ENSURE THAT COMPACTION TESTS BE PERFORMED BY AN APPROVED QUALIFIED INDEPENDENT TESTING COMPANY DURING THE INSTALLATION OF ALL GRANULAR MATERIAL.
7. THE FUEL TANK SLAB IS DESIGNED FOR SERVICEABILITY LIMIT STATE BEARING PRESSURE OF 50kPa.
8. THE MODULUS OF SUBGRADE REACTION OF THE GRANULAR FILL PAD IS 40MPa/m.
9. THE GROUND SURFACE AROUND EXCAVATIONS SHALL BE GRADED TO DIRECT SURFACE WATER FLOW AWAY FROM THE EXCAVATION.
10. KEEP EXCAVATIONS FREE OF WATER. DISPOSE OF WATER IN ACCORDANCE WITH NUNAVUT ENVIRONMENT'S GUIDELINES.

CAST-IN-PLACE CONCRETE

1. ALL CONCRETE WORK AND METHODS OF CONSTRUCTION TO CONFORM TO CSA-A23.1 AND TO CSA A23.3, LATEST EDITION.
2. ALL CONCRETE TO CONFORM TO CSA A23.1 AND TO BE READY-MIX, IN ACCORDANCE WITH THE MIX DESIGN AS APPROVED BY THE CONCRETE MIX DESIGN ENGINEER.
3. CONTRACTOR TO ENSURE ALL COLD WEATHER REQUIREMENTS OF CSA-A23.1 ARE FOLLOWED.
4. THE CONCRETE PRODUCTION FACILITIES TO BE CURRENTLY CERTIFIED TO INDUSTRY STANDARDS SATISFACTORY TO THE OWNER'S REPRESENTATIVE.
5. MINIMUM TANK SLAB CONCRETE COMPRESSIVE STRENGTH TO BE 35 MPa AT 28 DAYS AND HAVE THE FOLLOWING SPECIFICATIONS FOR EXPOSURE CLASS C-1 CONCRETE:
   a. AIR CONTENT: 5-8%
   b. MAXIMUM WATER CONTENT: 0.4
   c. MAXIMUM SIZE AGGREGATE: 19mm
   d. MAXIMUM SLUMP AT POINT OF DISCHARGE: 100mm
6. CONCRETE PROTECTIVE COVER FOR REINFORCING STEEL TO BE 50mm UNLESS NOTED OTHERWISE.
7. REINFORCING STEEL SHALL BE DEFORMED HARD GRADE BILLET STEEL CONFORMING TO THE LATEST EDITION OF CSA G30.18-09, GRADE 400 MPa.
8. REINFORCING STEEL TO BE FREE FROM LOOSE MILL SCALE, LOOSE RUST AND FROM DIRT AND FOREIGN MATERIAL BEFORE CONCRETE IS PLACED.
9. REINFORCING STEEL TO BE PROVIDED WITH A CLASS 'B' TENSION LAP TO CSA A23.3 LATEST EDITION AT ALL SPLICE LOCATIONS UNLESS NOTED OTHERWISE.
10. ALL HOOKED BARS USE STANDARD HOOKS UNLESS NOTED OTHERWISE.
11. SUBMIT REINFORCING SHOP DRAWINGS TO THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO FABRICATION.
12. ALL EXPOSED CORNERS AND EDGES OF CONCRETE TO BE CHAMFERED 45 DEG. AND 25mm.
13. PRIOR TO PLACING CONCRETE, OBTAIN APPROVAL FROM THE OWNER'S REPRESENTATIVE FOR MATERIAL PLACEMENT PROCEDURES INCLUDING THE USE OF VIBRATORY FORMS AND HOARDING PROTECTION DUE TO COLD TEMPERATURES (IF EXPECTED) AND THE LOCATION AND SECUREMENT OF THE FORMED AREA AND EMBEDDED PARTS. NOTIFY ENGINEER AT LEAST 24 HOURS PRIOR TO THE CONCRETE PLACEMENT TO ALLOW FOR REVIEW OF THE STEEL REINFORCEMENT.
14. ALL FOUNDATIONS TO HAVE THE CONCRETE PLACED MONOLITHICALLY AND CURED IN ACCORDANCE WITH THE WRITTEN PROCEDURES OF THE CONCRETE MIX DESIGN ENGINEER. THERE MUST BE NO COLD AND/OR CONSTRUCTION JOINTS EXCEPT AS INDICATED ON THE DRAWINGS.
15. ALL CONCRETE TO RECEIVE INITIAL HAND SCREEDING OPERATIONS FOLLOWED BY FINAL FINISHING FOR EXPOSED TOPS OF FOUNDATION SURFACES COMPRISING OF TROWELLING AS SPECIFIED IN TABLE 21 OF CSA A23.1 TO PRODUCE A HARD, SMOOTH, DENSE TROWELED SURFACE FREE FROM BLEMISHES. THE EXPOSED TOP SURFACE OF SLABS TO HAVE A LIGHT BROOM FINISH.
16. LEAN CONCRETE (MUD MAT) TO HAVE THE FOLLOWING PROPERTIES:
   a. TYPE GU PORTLAND CEMENT
   b. MINIMUM COMPRESSIVE STRENGTH = 10MPa
   c. CLASS EXPOSURE = N
   d. MAXIMUM SIZE AGGREGATE = 19mm
   e. SLUMP AT TIME AND POINT OF DISCHARGE = 75mm ± 19mm

17. FORMWORK TO BE DESIGNED, STAMPED AND SEALED BY ENGINEER LICENSED TO PRACTICE IN THE NORTHWEST TERRITORIES AND NUNAVUT.

CONCRETE TESTING NOTES:

1. ALL CONCRETE TO BE TESTED IN ACCORDANCE WITH CSA A23.2 LATEST EDITION BY A TESTING LABORATORY SATISFACTORY TO THE OWNER'S REPRESENTATIVE. MINIMUM TESTING TO INCLUDE 4 COMPRESSION STRENGTH TESTS FOR POUR OF THE CONCRETE SLAB FOR COMPRESSIVE STRENGTH AT 7 DAYS (2) AND 28 DAYS (2).
2. TEST RESULTS TO BE FORWARDED TO THE PROJECT ENGINEER FOR REVIEW.

REGISTERED PROFESSIONAL ENGINEER — C.P. WILLETTE — LICENSEE — NT/NU

CONSTRUCTION

Canada — Nunavut

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN	CPW
REVIEWED BY	TGB
DRAWN	SCC
CHECKED BY	ASW
DATE	OCTOBER 2021
SCALE	As indicated

GOVERNMENT OF NUNAVUT

RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

FUEL TANK PAD DETAILS

PROJECT NO. 20-3940

SHEET NO. A03

PLOT DATE: 2021-10-26 1:24:36 PM
FILE NAME: U:\dms7\447\103940-01-WRMV-CON.rvt

PROCESS LEGEND – MISCELLANEOUS

EQUIPMENT FRAGMENT No. DESIGNATION

LLLL-S-PPP-EEE##

- LOCATION ELEMENT
- SECTION ELEMENT
- PROCESS
- EQUIPMENT

NOTE:
- EQUIPMENT No.'s RESTART AT 1 FOR EACH SECTION.

NON PROCESS RELATED EQUIPMENT

(ie. PANEL, SUMP PUMP, ELT.)

LLL-B##-EEE##

- LOCATION ELEMENT
- BUILDING
- EQUIPMENT
- BUILDING LEVEL
  1 – LOWEST
  R – ROOF
- EQUIPMENT # (120/240)
- LETTER
  600V

PIPING LINE DESIGNATION

50-PAC-CS#+C+E+I

- DIAMETER (mm)
- SERVICE
- PIPE SPECIFICATION
- MULTIPLE PIPE SPECIFICATION No.
- CONTAINMENT OR CARRIER PIPE
- ELECTRIC TRACED AND INSULATED

PIPE SIZE CONVERSION

IMPERIAL(in)	METRIC(mm)	IMPERIAL(in)	METRIC(mm)
1/8	3	14	350
1/4	6	15	380
3/8	10	16	16"
1/2	12	18	450
3/4	20	20	500
1	25	24	600
1-1/4	32	30	750
1-1/2	40	36	900
2	50	42	1050
2-1/2	65	48	1200
3	75	54	1350
4	100	60	1500
5	125	66	1650
6	150	72	1800
8	200	78	2000
10	10"	84	2100
12	300		

NOTE:
- PIPE SIZES ARE NOMINAL
- PIPE SIZES FROM 2" TO 60" CONVERSION BASED ON CSA STANDARD Z245.1
- PIPE SIZES FROM 2" AND SMALLER CONVERSION BASED ON EUROPEAN ISO STANDARD
- OTHER PIPE SIZES ARE CONVERSIONS ROUNDED TO THE NEAREST ARBITRARILY ASSIGNED WHOLE NUMBER

PIPE MATERIAL ABBREVIATIONS

SYMBOL	MATERIAL
ABS	ACRYLONITRILE BUTADIENE STYRENE
AL	ALUMINUM
AC	ASBESTOS CEMENT
CONC	CONCRETE GRAVITY
CPP	CONCRETE PRESSURE
CS#	CARBON STEEL
CU#	COPPER
DI	DUCTILE IRON
FRP	FIBREGLASS REINFORCED PLASTIC
GALV	GALVANIZED STEEL
RR	REINFORCED RUBBER
PE	POLYETHYLENE
PPL	POLYPROPYLENE LINED CARBON STL.
PVC#	POLYVINYL CHLORIDE
SS#	STAINLESS STEEL
TUB#	TUBING

FOLLOWING SYMBOL INDICATES PIPING WITH MULTIPLE MATERIAL SPECIFICATIONS
EXAMPLE : SS1 (SCH. 40 316SS) SS2 (SCH. 80 316SS)

PROCESS LEGEND – SERVICE ABBREVIATIONS

SYMBOL	COMMODITY	SYMBOL	COMMODITY
AA	AQUEOUS AMMONIA	NaOCl	SODIUM HYPOCHLORITE
AAS	AERATION AIR SUPPLY	NaOH	SODIUM HYDROXIDE
ACTSI	ACTIVATED SILICA	NaSi	SODIUM SILICATE
AMG	AMMONIA GAS (ANHYDROUS)	NG	NATURAL GAS
AML	AMMONIA LIQUID (ANHYDROUS)	OCL	HYPOCHLORITE
AMS	AMMONIA SOLUTION	OF	OVERFLOW
ALUM	ALUMINUM SULPHATE	OZNE	OZONE TANK EFFLUENT
AS	AERATED SEWAGE	OZNI	OZONE TANK INFLUENT
CBD	CLARIFIER BLOWDOWN	OZ	OZONE
CEN	CENTRIFUGE CENTRATE WATER	PA	PROCESS AIR
CHW	CHEMICAL WASTE	PACL	POLYALUMINUM CHLORIDE
CLD	CHLORINE DIOXIDE	PLY	POLYELECTROLYTE
CLG	CHLORINE GAS	PLYPH	POLYPHOSPHATE
CLS	CHLORINE SOLUTION	PS	PRIMARY SLUDGE
CO2	CARBON DIOXIDE	PSW	PLANT SERVICE WATER
CUS	COPPER SULPHATE	PW	POTABLE WATER
CW	COLD WATER	RAS	RETURN ACTIVATED SLUDGE
CWR	COOLING WATER RETURN	RSD	RECIRCULATED SLUDGE DISCHARGE
CWS	COOLING WATER SUPPLY	RSS	RECIRCULATED SLUDGE SUCTION
CWW	COOLING WASTE WATER	RSW	RAW SEWAGE
DHW	DOMESTIC HOT WATER	RW	RAW WATER
DIS	DIGESTED SLUDGE	RWW	RAW WASTE WATER
DR	DRAIN	RWAS	RAW WASTE ACTIVATED SLUDGE
EE	ENGINE EXHAUST	RWL	RAINWATER LEADER
EW	EFFLUENT WATER	SA	SCOURING AIR
F	FLUORIDE	SAM	SAMPLE
FA	FLUOSILICIC ACID	SAN	SANITARY
FBW	FILTER BACKWASH SUPPLY	SCE	SECONDARY CLARIFIER EFFLUENT
FEC	FERRIC CHLORIDE	SCS	SCRUBBING SOLUTION
FEFF	FILTER EFFLUENT	SCUM	SCUM
FESU	FERRIC SULPHATE	SDG	SULPHUR DIOXIDE GAS
FHS	HYDROFLUOSILICIC ACID	SDS	SULPHUR DIOXIDE SOLUTION
FILW	FILTER TO WASTE	SETW	SETTLED WATER
FINF	FILTER INFLUENT	SG	SLUDGE GAS (DIGESTER)
FLW	FLOCCULATED WATER	SGC	SLUDGE GAS CIRCULATED (DIGESTER)
FLS	FLUORIDE SOLUTION	SGF	SLUDGE GAS FUEL (DIGESTER)
FO	FUEL OIL	SGH	SLUDGE GAS (HIGH PRESSURE)
FOF	FUEL OIL FILL	SLD	SETTLED SLUDGE
FOR	FUEL OIL RETURN	SLG	MIXED SLUDGE
FOS	FUEL OIL SUPPLY	SLU	SLUDGE UNLOADING
FOV	FUEL OIL VENT	SQW	SQUEEZE WATER (FILTER PRESS)
FSW	FILTER SURFACE WASH	STM	STORM
FW	FILTERED WATER	SUP	SUPERNATANT
GT	GRIT	TRW	TREATED WATER
HCL	HYDROCHLORIC ACID	TS	THICKENED SLUDGE
HSO	SULPHURIC ACID	TWAS	TREATED WASTE ACTIVATED SLUDGE
HWR	HOT WATER RETURN (HEATING)	TWW	TREATED WASTE WATER
HWS	HOT WATER SUPPLY (HEATING)	V	VENT
IA	INSTRUMENT AIR	VA	VENT (AIR)
KMnO	POTASSIUM PERMANGANATE	VP	VENT (PUMPING)
LPG	LIQUID PROPANE GAS	VT	VENT (TANK)
ML	MIXED LIQUOR	WAS	WASTE ACTIVATED SLUDGE
NaCO	SODIUM CARBONATE	WD	WASTE DRAIN
NaHCO	SODIUM BICARBONATE	WBW	WASTE BACKWASH WATER

PROCESS LEGEND – VALVE SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
VGA	GATE	VGL	GLOBE
VTW	THREE-WAY	VAN	ANGLE
VBA	BALL	VPL	PLUG
VBU	BUTTERFLY	VSQ	STOP COCK
VKG	KNIFE GATE	VNE	NEEDLE
VDM	DIAPHRAGM	VPN	PINCH
VMU	MUD	SQC	SQUARE HEAD COCK
VSC	SWING CHECK	VSC	SPRING CHECK
VSC	WEIGHTED CHECK	VEO	ELECTRIC CHECK
VDC	DOUBLE DOOR CHECK	VBC	BALL CHECK
VFP	FLAP	VFS	FOOT VALVE/ STRAINER
VAC	AIR VACUUM	VAV	AIR & VACUUM
VAR	AIR RELEASE	VSR	SAFETY RELIEF
PRV	PRESSURE REDUCING (SELF CONTAINED)	PRV	PRESSURE REDUCING
BPV	BACK PRESSURE (SELF CONTAINED)	BPV	BACK PRESSURE
SG	STOP GATE	AWG	ADJUSTABLE WEIR GATE
SLG	SLIDE GATE	STL	STOP LOGS
VRO	ROTARY	SCG	SLUICE GATE
DMP	DAMPER	VDB	DUCKBILL CHECK
INJQ	INJECTION QUILL WITH CORPORATION STOP	SHG	SHEAR GATE
VHYD	YARD HYDRANT	EDV	ENERGY DISSIPATING VALVE

1. DIRECTION OF FLOW FOR THE ABOVE SYMBOLS IS FROM LEFT TO RIGHT.
2. STATUS MAY BE SHOWN- N.O.=NORMALLY OPEN, N.C.=NORMALLY CLOSED.
3. (VKG*) VKG INDICATES VALVE TYPE AND * INDICATES SPECIFICATION No..
4. ADD ACTUATORS TO VALVES FROM VALVE ACTUATOR TABLE.

PROCESS LEGEND – VALVE ACTUATORS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLOAT		DIAPHRAGM
	GEAR		SOLENOID
	LEVER		CHAIN WHEEL
	MOTORIZED VALVE		VALVE BOX (C/W EXTENSION STEM)
	NON RISING STEM (HANDWHEEL)		QUICK OPENING
	RISING STEM (HANDWHEEL)		DOUBLE ACTION PISTON (FAIL CLOSE)
	SINGLE ACTION PISTON (FAIL OPEN)		THERMAL CONTROL VALVE

NOTE: GATE VALVES ARE USED FOR ILLUSTRATION PURPOSES ONLY

PROCESS LEGEND – EQUIPMENT

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CENTRIFUGAL PUMP		ROTARY PUMP
	METERING PUMP		DUPLEX METERING PUMP
	VERTICAL TURBINE PUMP		CIRCULATING PUMP/INLINE PUMP
	SUBMERSIBLE PUMP		PROGRESSIVE CAVITY PUMP
	SUMP PUMP		RECIPROCATING PUMP
	RECIPROCATING COMPRESSOR		BLOWER (LOBE TYPE)
ENG	COMBUSTION ENGINE	GEN	GENERATOR
	CENTRIFUGAL COMPRESSOR		BLOWER (CENTRIFUGAL)
VAC	VACUUM PUMP		CENTRIFUGE
	INLINE MIXER		TRAVELING WATER SCREEN
	MIXER		HEAT EXCHANGER
	TANK (OPEN)		PRESSURE TANK OR ACCUMULATOR
OR	TANK (CLOSED)		GAS CYLINDER (INDICATE CONTENTS)
	SWAB LAUNCHER		SWAB CATCHER
	ULTRAVIOLET MODULE		PROPELLER PUMP
	INLINE GRINDER		ROTARY ROTARY SCREEN

- DENOTES CONSTANT SPEED DRIVE
VFD * – DENOTES VARIABLE SPEED DRIVE (* M FOR MECHANICAL, E FOR ELECTRICAL)
CONSTANT SPEED DRIVES ARE USED FOR ILLUSTRATION PURPOSES ONLY.

PROCESS LEGEND – P & ID SYMBOL DESIGNATIONS

SYMBOL	DESCRIPTION
	PRIMARY FLOW LINE
	SECONDARY FLOW LINE
	TERTIARY LINE
	EXISTING PRIMARY FLOW LINE
	EXISTING SECONDARY FLOW LINE
	EXISTING TERTIARY LINE
	FUTURE PRIMARY FLOW LINE
	FUTURE SECONDARY FLOW LINE
	FUTURE TERTIARY FLOW LINE
	DIRECTION OF FLOW
SLOPE 2%	DIRECTION OF SLOPE (ARROW DOWN GRADE)
	CONNECTION LINE
	LINES CROSSING OVER (BREAK LESSER LINE)
	CHANNEL
INJECTION POINT #1 PD##	LINE CONTINUATION– TO ANOTHER DRAWING
OUTSIDE	LINE CONTINUATION– FROM ANOTHER DRAWING
	LINE SPECIFICATION CHANGE
	PNEUMATIC LINE
	ELECTRICAL SIGNAL
	HYDRAULIC LINE
	DATA LINK/FIELDBUS
	INSULATED LINE WITH ELECTRIC TRACING
	FLEXIBLE LINE

PROCESS LEGEND – INSTRUMENTATION

INSTRUMENTATION DESIGNATION – (ISA–S5.4 1991)

LETTER	FIRST LETTER: INITIATING OR MEASURED VARIABLE	FIRST LETTER: MODIFIER	SUCCEEDING LETTERS: READOUT OR PASSIVE FUNCTION	SUCCEEDING LETTERS: OUTPUT FUNCTION	SUCCEEDING LETTERS: MODIFIER
*** A	ANALYSIS (2)		ALARM		
B	BURNER, COMBUSTION			CLOSE/STOP/DECREASE (1)	
C				CONTROL	
D		DIFFERENTIAL		OPEN/START/INCREASE (1)	
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			FAIL (1)
G			GLASS/VIEWING DEVICE		
****H	HAND				HIGH (OPENED)
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW (CLOSED)
M	MOTOR, MOTION (1)	MOMENTARY		MOTOR (1)	MIDDLE OR INTERMEDIATE
N					ON OR OPERATE (1)
O			ORRIFICE/RESTRILTION		OVERLOAD (1)
P	PRESSURE/VACUUM		POINT (TEST) CONNECTION	PUMP (1)	
Q	QUANTITY	INTEGRATE/TOTALIZE			
R	RADIATION		RECORD		
S	SPEED/FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (2)		MULTIFUNCTION	MULTIFUNCTION (2)	MULTIFUNCTION (2)
V	VIBRATION, MECHANICAL ANALYSIS			VALVE/DAMPER/LOUVRE	
W	WEIGHT/FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED (2)	UNCLASSIFIED (2)	UNCLASSIFIED (2)
Y	EVENT/STATE/PRESSENCE			RELAY/COMPUTER/CONVERT	
Z	POSITION/DIMENSION			DRIVER/ACTUATOR/UNCLASSIFIED FINAL/CONTROL ELEMENT	

WATER TREATMENT / WASTEWATER

*** (WATER TREATMENT)	DESCRIPTION	*** (WASTEWATER)	DESCRIPTION
ALU	ALUMINUM	ALU	ALUMINUM
F	FLUORIDE	CB	COMBUSTION GAS
CLC	CHLORINE LEAK	CH4	METHANE
CLR	CHLORINE RESIDUAL	CLC	CHLORINE LEAK
COL	COLOUR	CLR	CHLORINE RESIDUAL
CON	CONDUCTIVITY	CO	CARBON MONOXIDE
OZL	OZONE LEAK	DO	DISSOLVED OXYGEN
OZR	OZONE RESIDUAL	H2S	HYDROGEN SULPHIDE
pH	pH	pH	pH
SCD	STREAMING CURRENT DETECTOR	SS	SUSPENDED SOLIDS
Tu	TURBIDITY	Tu	TURBIDITY
SBI	SLUDGE BLANKET INTERFACE		
****	HAND SWILTH ANNOTATIONS		
FR	FORWARD/REVERSE	RLT	REMOTE-LOCAL-TEST/JOG
LOA	LOCAL-OFF-AUTO (VENDOR RPU)	RST	RESET
LOR	LOCAL-OFF-REMOTE (FACILITY PLC/SCADA)	SS	START/STOP
LOS	LOCKOUT/STOP		

NOTE: THIS TABLE IS NOT ALL-INCLUSIVE.
*A, ALARM, THE ANNUNCIATING DEVICE, MAY BE USED IN THE SAME FASHION AS S, SWILTH, THE ACTUATING DEVICE.
**THE LETTERS H AND L MAY BE OMITTED IN THE UNDEFINED CASE.
1) USER'S CHOICE
2) WHEN USED, SYMBOL OR SIGNAL LINE IS ANNOTATED

GENERAL INSTRUMENTATION

SYMBOL	DESCRIPTION	GROUP	SYMBOL	DESCRIPTION	GROUP
INST LOOP	MOUNTED LOCALLY	INSTRUMENT SYMBOLS	AND	LOGIC GATE – AND (INTERLOCK IS EFFECTIVE ONLY IF ALL INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
INST LOOP	MOUNTED ON FACE OF PANEL	INSTRUMENT SYMBOLS	OR	LOGIC GATE – OR (INTERLOCK IS EFFECTIVE IF ONE OR MORE INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
INST LOOP	MOUNTED BEHIND PANEL DOOR	INSTRUMENT SYMBOLS		LOGIC GATE – OR (INTERLOCK IS EFFECTIVE IF ONE OR MORE INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
	SCADA INPUT/OUTPUT	SCADA SYMBOL	I	COMPLEX OR UNDEFINED INTERLOCK	INTERLOCK SYMBOLS
I/O ADR	NOT ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL OR SHARED INSTRUMENTS SYMBOLS	n	PANEL NUMBER n	AUTOMATION SYMBOLS
I/O ADR	ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL OR SHARED INSTRUMENTS SYMBOLS	n	MOTOR CONTROL CENTRE NUMBER n	AUTOMATION SYMBOLS
I/O ADR	AUXILIARY LOCATION	DISTRIBUTED CONTROL OR SHARED INSTRUMENTS SYMBOLS	n	PROGRAMASWLE CONTROLLER I/O RACK NUMBER n	AUTOMATION SYMBOLS
I/O ADR	NOT ACCESSIBLE TO OPERATOR	PROGRAMASWLE CONTROLLER SYMBOLS		SUPPLIED AND INSTALLED BY OTHER DIVISIONS. CONNECTED BY THIS DIVISION.	AUTOMATION SYMBOLS
I/O ADR	ACCESSIBLE TO OPERATOR	PROGRAMASWLE CONTROLLER SYMBOLS	R	RESET FOR LALTH TYPE ACTUATOR	MISCELLANEOUS SYMBOLS
INST	PILOT LIGHT		P	PURGE OR FLUSHING DEVICE	MISCELLANEOUS SYMBOLS

PROCESS LEGEND – PRIMARY FLOW ELEMENTS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	WEIR	F	SNAP-ON FLOW METER		THERMAL WELL
	INSERT VENTURI		SONIC FLOW METER		GAUGE INDICATOR
	PITOT TUBE (SINGLE)	M	MAGNETIC FLOW METER	LE	ULTRASONIC LEVEL METER
	PILOT TUBE (AVERAGING)		ORIFICE PLATE		
	FLUME	FG	FLOW SIGHT GLASS		
	TURBINE / PROPELLER	FI	ROTAMETER		
	POSITIVE DISPLACEMENT		STATIC INLINE MIXER		

PROCESS LEGEND – MISCELLANEOUS SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
S.P.	SAMPLE POINT (12mm)		TRENCH DRAIN		STRAINER
D.P.	DRAIN POINT (MIN. 12mm)		UNION	VC	VICTAULIC COUPLING
D.T.	DRIP TAP		HOSE CONNECTION		BLIND FLANGE
	IN LINE STRAINER		EYEWASH		WASH BASIN
	DRAIN / OVERFLOW		AERATION SYSTEM FINE OR COARSE BUBBLE		CLEANOUT
	PIPE MATERIAL CHANGE		DIAPHRAGM SEAL	FA	FLAME ARRESTOR
FA	THERMAL TRAP ASSEMBLY (FLAME ARRESTER + THERMAL CONTROL VALVE)				

REGISTERED PROFESSIONAL ENGINEER
A.S. WILLIAMS
LICENSEE
2021-10-26
NT/NU

FOR CONSTRUCTION

Canada
Nunavut

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN	REVIEWED BY
ASW	INV
DRAWN	**CHECKED BY**
SMZ	ASW

DATE: OCTOBER 2021
SCALE: NTS

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

PROCESS LEGEND

PROJECT NO. 20-3940
SHEET NO. PD00

NOTE:
I/O SHOWN ON PLC PANEL SHALL BE INCLUDED IN SCADA EXCEPT WHERE NOTED OR SHOWN SYMBOLICALLY.

SCADA

PLC PANEL

LOCAL OR MCC PANEL

SPACE TEMP TI 227 AI

LEL AI 143A AI

H2S AI 143B AI

LEVEL LI 141 AI

AUTO HS 120 DI | START MD 120 DO | RUNNING MN 120 DI | FAULT MA 120 DI

AUTO HS 110 DI | START MD 110 DO | RUNNING MN 110 DI | FAULT MA 110 DI

CO AI 144A AI

NO2 AI 144B AI

SPACE TEMP TI 228 AI

FUEL DAY TANK LAL 304 DI

FUEL TANK LAL 305 DI

HS 120 I

HS 120 I

LSHH 142

LSH 142

LSL 142

WET WELL ROOM

UTILITY ROOM

TIT 227

AIT 143

AIT 144

TIT 228

LSL 304

LSL 305

M 110

PG 107

NEW PUMP P-110 VENDOR SUPPLIED

200-SAN-DI

VSC 111

150-SAN-DI

VAR 132

VTW 131

150-SAN-DI

M 120

PG 106

NEW PUMP P-120 VENDOR SUPPLIED

200-SAN-DI

150-SAN-DI

VSC 121

TRUCK FILL

OUTSIDE BUILDING | INSIDE BUILDING

LT 142

VPL 133

LIT 141

LE 141

100-SAN-DI

HLL 1.9m

LLL 1.05m

150x200

WET WELL

200-OF-CS

EXISTING OVERFLOW

EXISTING SANITARY INLET

200-SAN-HDPE

HDPE

CS

CS

HDPE

200-SAN-HDPE

EXISTING FORCEMAIN

EXISTING SANITARY INLET

200-SAN-HDPE

HDPE

CS

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

REGISTERED PROFESSIONAL ENGINEER
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GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

PROCESS FLOW DIAGRAM

PROJECT NO. 20-3940

SHEET NO. PD01

FILENAME: C:\PW WORKING DIRECTORY\PROJECTS 2020\1SMZ\DM77448\203940-10-PRO-CON.DWG PLOTTED BY: ZORGRAGER, SHANNON
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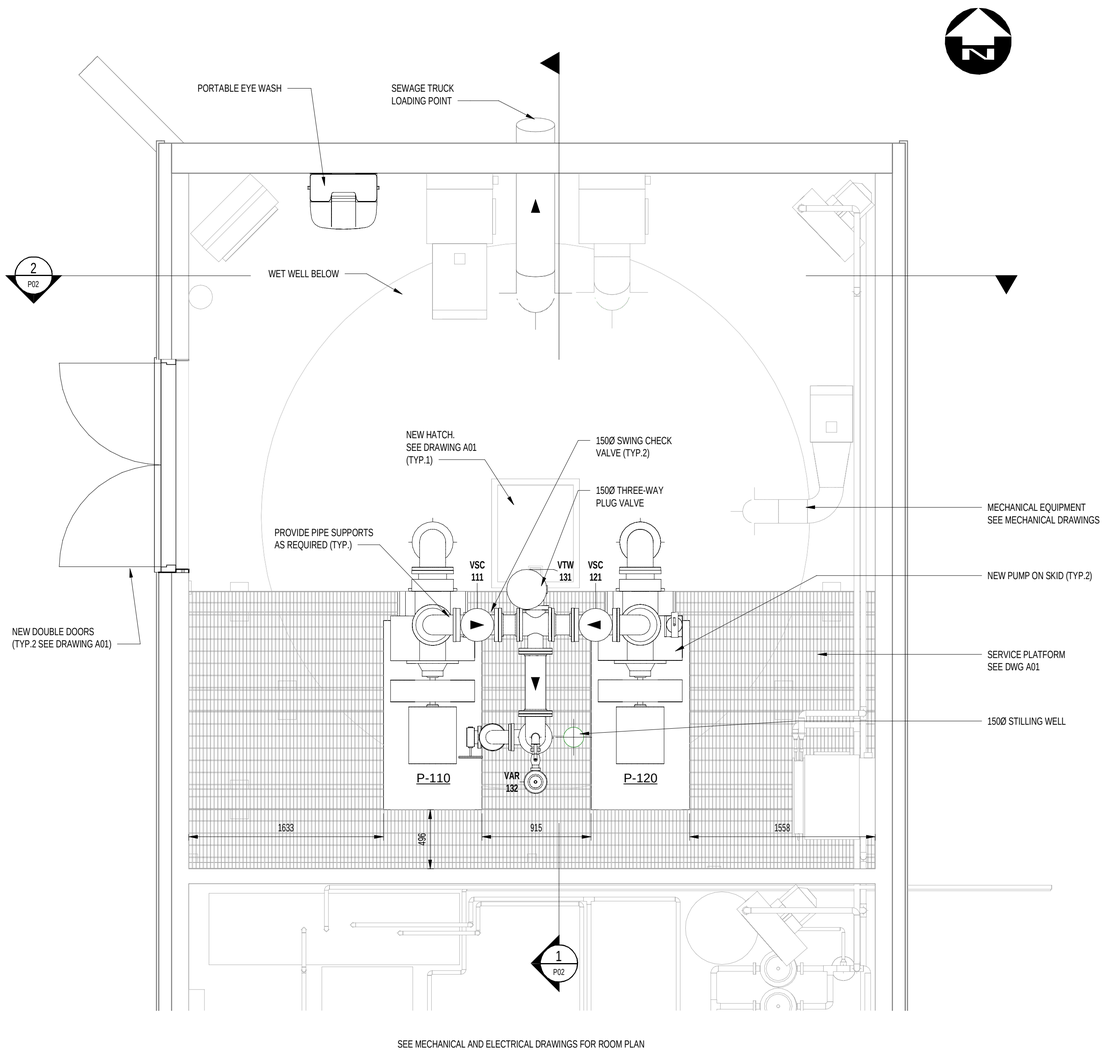
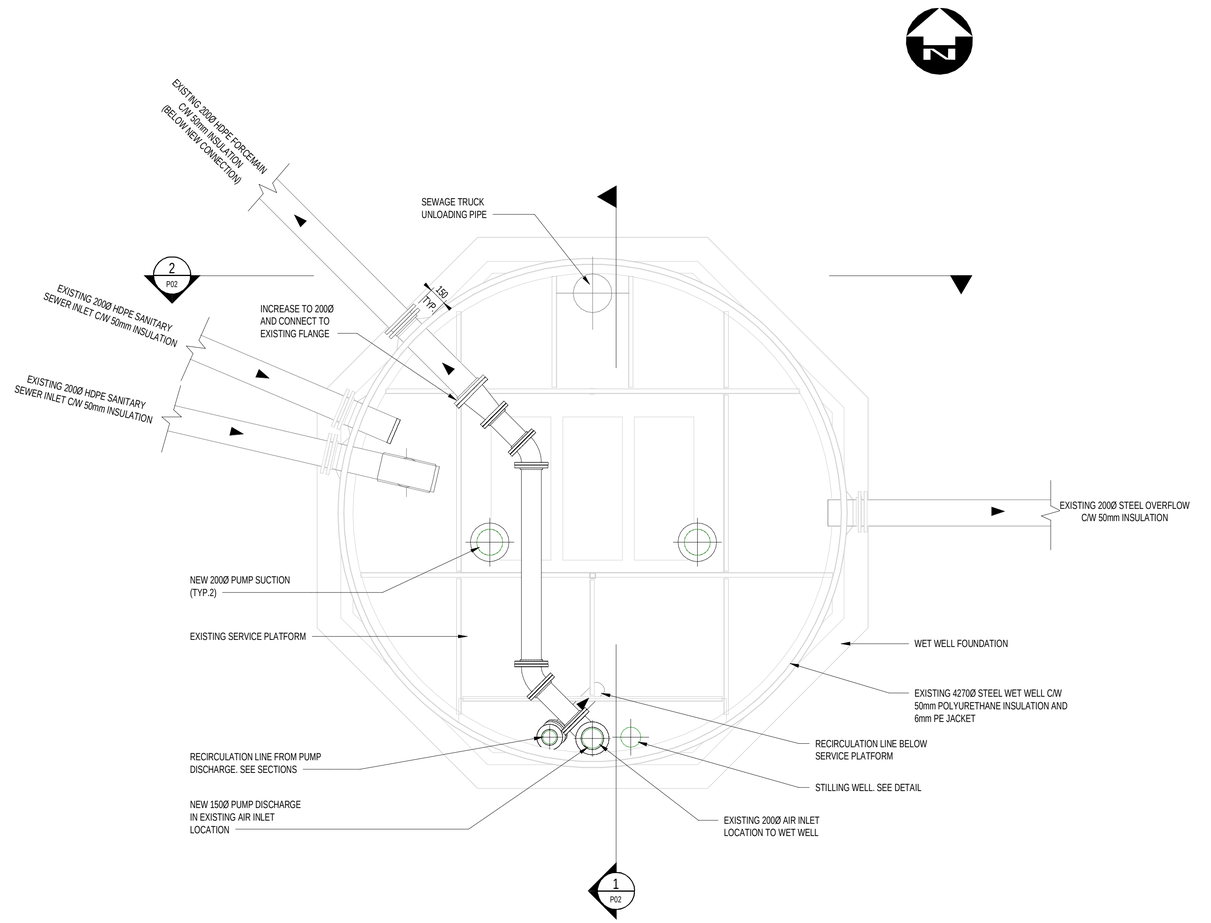


SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ROOM PLAN

FINISHED FLOOR PLAN

SCALE: 1 : 25



PLAN BELOW SLAB

SCALE: 1 : 25

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CONSTRUCTION

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GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

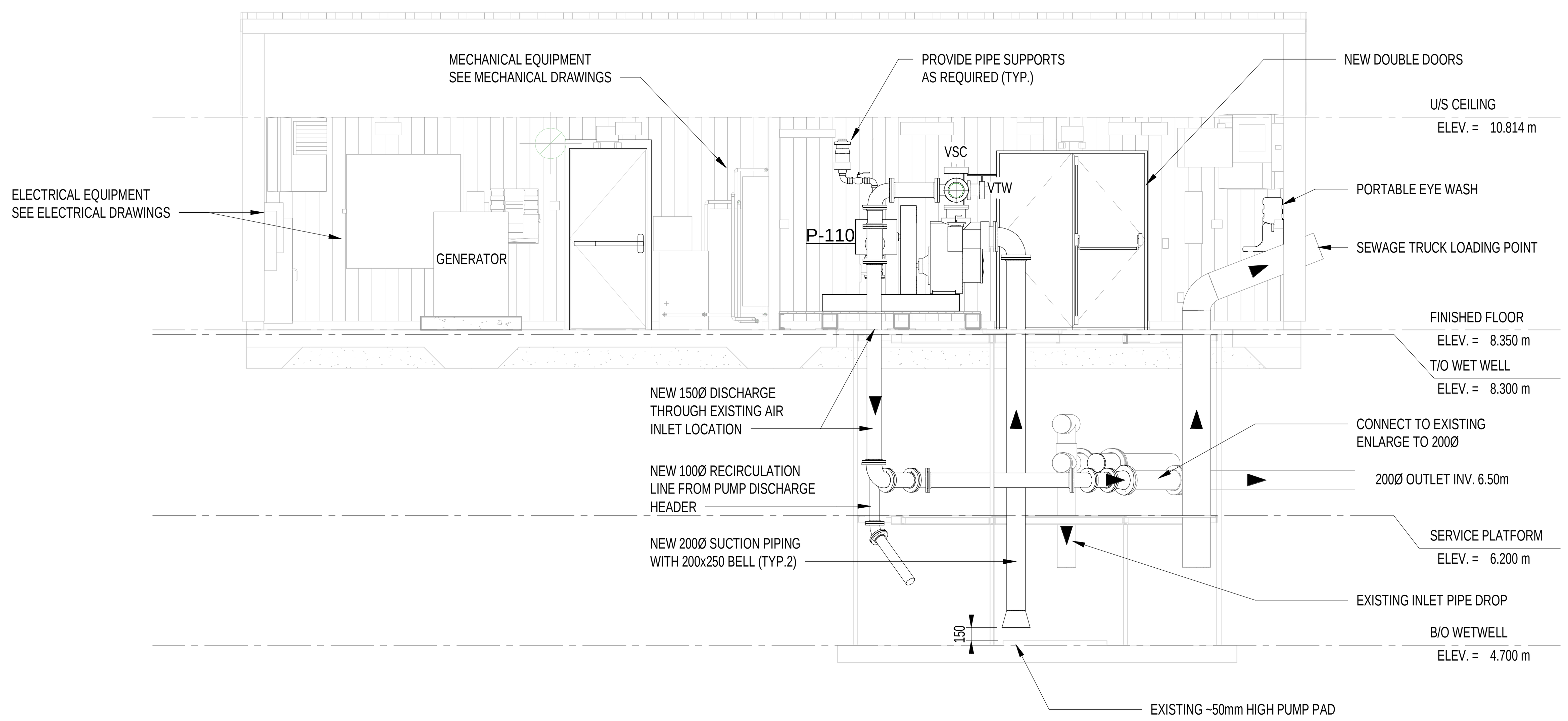
JOHNSTON COVE LIFT STATION

LIFT STATION PLANS

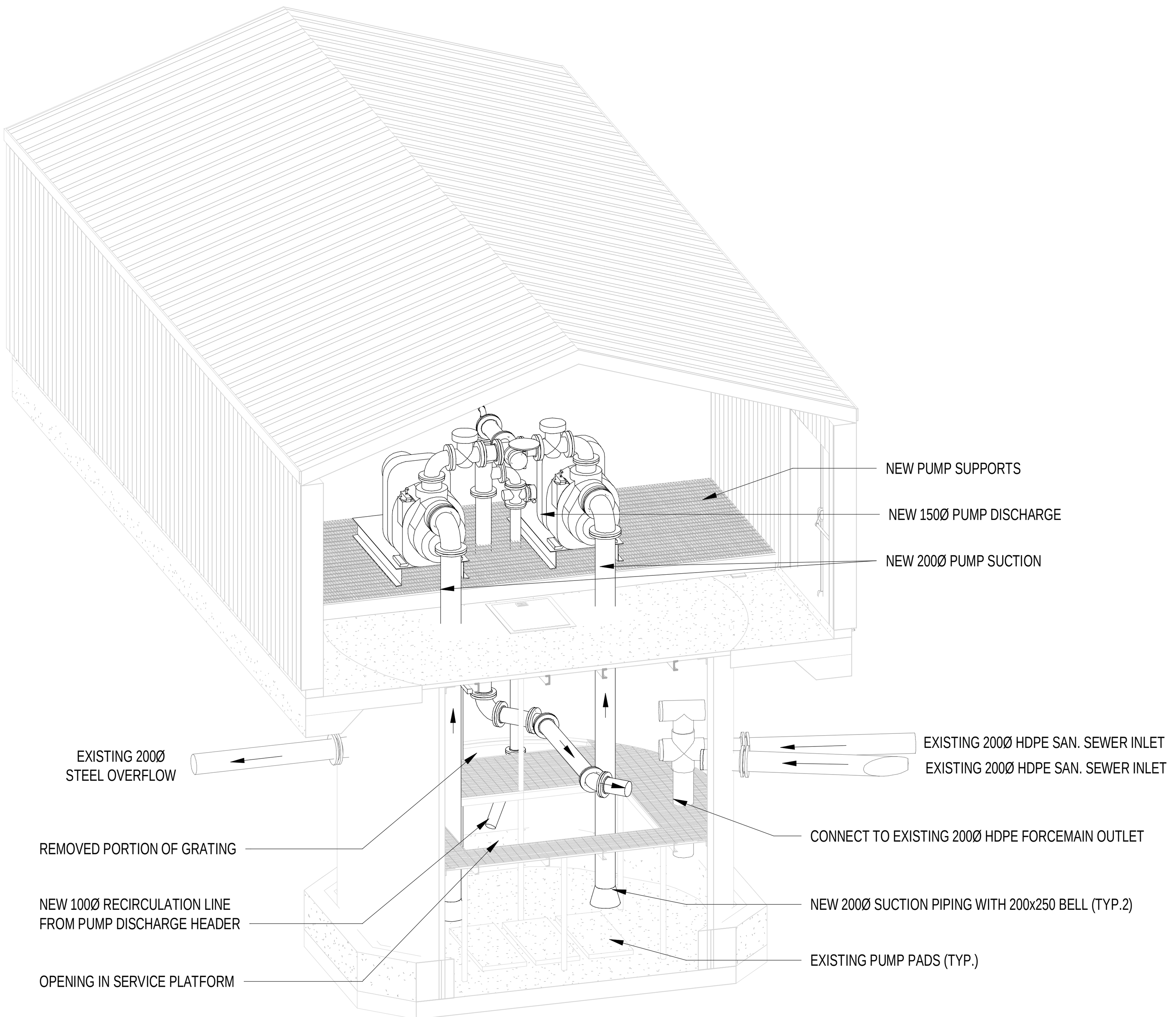
PROJECT NO. 20-3940

SHEET NO. P01

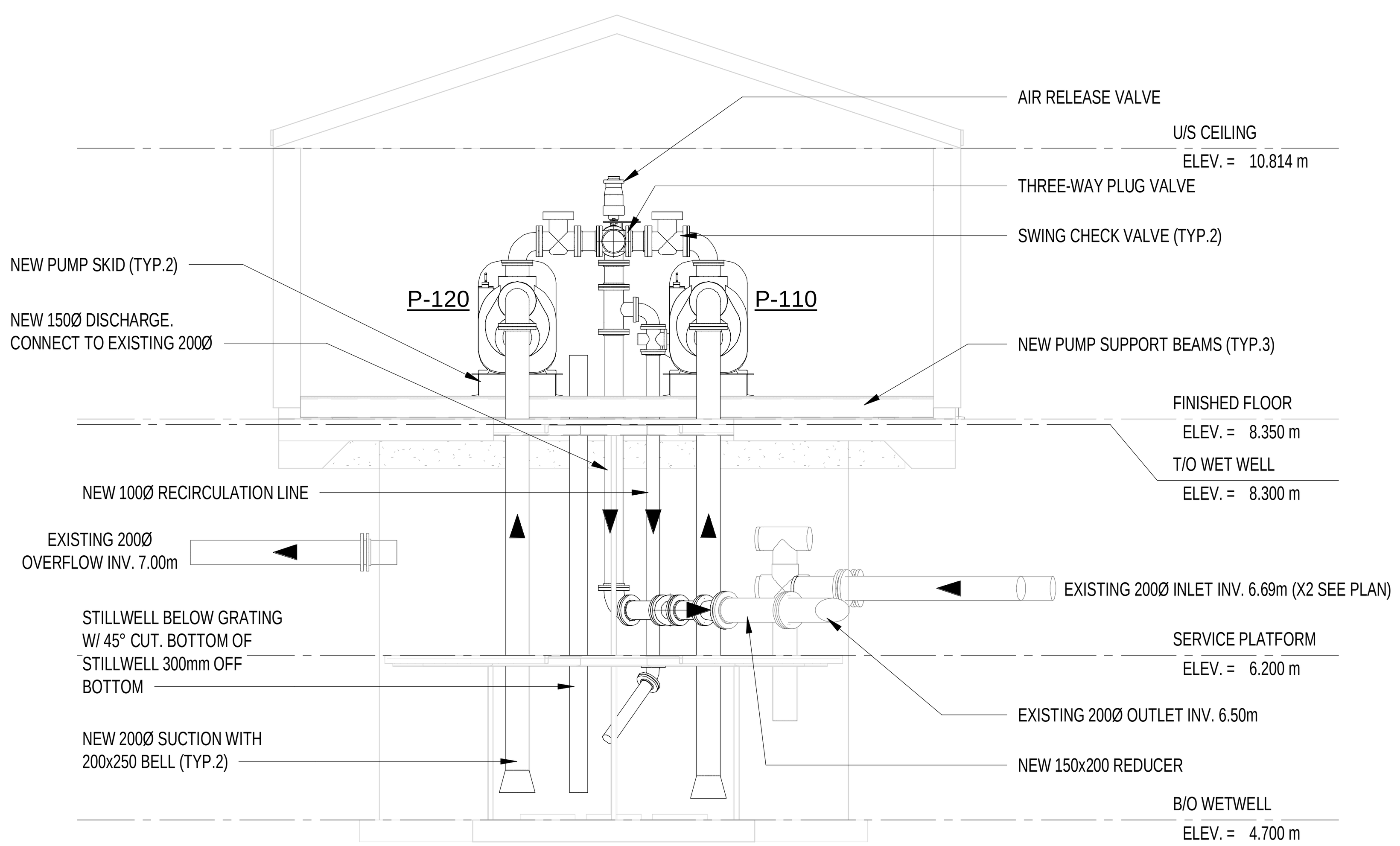
PLOT DATE: 2021-10-25 5:39:11 PM
FILE NAME: U:\dms7\449\203940-10-WRMV-CON.rvt



SECTION 1
SCALE: 1 : 50



ISO VIEW
SCALE:



SECTION 2
SCALE: 1 : 50

PROCESS NOTES:

1. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
2. NEW GATE VALVES SHALL BE IRON BODY WITH EPOXY FINISH, CLASS 125 FLANGED ENDS AND SHALL MEET AWWA C-501.
3. ALL NEW PIPING SHALL BE AT MINIMUM CLASS 53 DUCTILE IRON OR SCH 10 STAINLESS STEEL PRESSURE RATED FOR 150 PSI AND CEMENT MORTAR LINED TO AWWA C151 AND AWWA C104. ALL PIPES SHALL BE CONSTRUCTED AS "SPOOLS" HAVING FIXED FLANGED JOINTS WHEN USING DUCTILE IRON.
4. ALL FITTINGS AND APPURTENANCES SHALL BE FLANGED DUCTILE IRON. RADIUS OF CURVATURE TO CONFORM TO AWWA C-110 OR AWWA C-153. CEMENT LINING TO CONFORM TO AWWA C-104. MINIMUM PRESSURE RATING OF 150 PSI.
5. CHECK VALVES TO BE SWING FLEX STYLE CHECK VALVE MANUFACTURED BY "VAL-MATIC" OR APPROVED EQUAL.
6. AIR RELEASE VALVE TO BE "VAL-MATIC" WITH AT MINIMUM A 2" INLET, 1/2" OUTLET, OR APPROVED EQUAL.
7. ALL WORK SHALL CONFORM WITH APPLICABLE CODES AND STANDARDS
8. THE CONTRACTOR SHALL CONDUCT A HYDROSTATIC PRESSURE AND LEAKAGE TEST ON ALL FORCEMAIN PIPING IN ACCORDANCE WITH ASME B31.3 WHICH INCLUDES TESTING AT 1.5 TIMES THE MAXIMUM OPERATING PRESSURE OR A MINIMUM OF 125 PSI, WHICHEVER IS GREATER OVER A PERIOD OF 2 HOURS, UNLESS A SHORTER PERIOD COMPLIES WITH ASME B31.3.
9. ALL HARDWARE TO BE STAINLESS STEEL.
10. HATCHES SHALL BE SUPPLIED BY MSU OR APPROVED EQUAL WITH SAFETY GRATING. OPENINGS AS SHOWN ARE CLEAR OPENINGS. ACCESS HATCHES TO BE LOCKED AND HAVE 316 SS HARDWARE.
11. PUMPS TO BE SUPPLIED BY OWNER AND INSTALLED BY CONTRACTOR.

PIPE SUPPORT AND RESTRAINT NOTES

1. CONTRACTOR SHALL PROVIDE PIPING LAYOUT DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ENSURE FINAL LAYOUT SATISFIES THE REQUIREMENTS OF THE EQUIPMENT.
2. PROVIDE PIPE SUPPORTS TO THE SATISFACTION OF THE ENGINEER. DESIGN HANGARS AND SUPPORTS TO PROVIDE SUFFICIENT SUPPORT TO RETAIN THE PIPING SYSTEM WITHOUT EXERTING UNDO STRAIN ON THE PIPE, ATTACHED EQUIPMENT, OR THE SUPPORTING STRUCTURE. DESIGN HANGARS AND SUPPORTS TO THE BUILDING CODE AND ASME 31.3 AT PIPE PRESSURE RATING.
3. CONNECT TO FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
4. CAREFULLY POSITION PIPE AND FITTINGS WITHOUT STRAIN OR DEFLECTION AND USING PROPER APPLIANCES.
5. THE DETAILED LAYOUT OF THE PIPING AND THEIR SUPPORTS IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. RESTRAINED PIPE JOINTS ARE REQUIRED AT ALL FITTINGS AND VALVES. SUBMIT DESIGN CALCULATIONS AND RESTRAINT DETAILS TO THE ENGINEER PRIOR TO CONSTRUCTION IN ACCORDANCE WITH CONTRACT DOCUMENTS.
8. ALL BENDS, TEES AND CHANGES IN FLOW DIRECTION REQUIRE SUPPORTS TO RESTRAIN MOVEMENT. NO FORCES SHALL BE SUPPORTED BY THE PUMP FLANGES.

REGISTERED PROFESSIONAL ENGINEER
A.S. WILLIAMS
LICENSEE
2021-10-26
NT/NU

CONSTRUCTION

Canada

Nunavut

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN	REVIEWED BY
INV	INV
DRAWN: SMZ	CHECKED BY: ASW
DATE: OCTOBER 2021	
SCALE: 1 : 50	

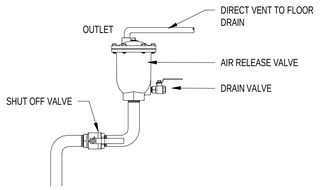
GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

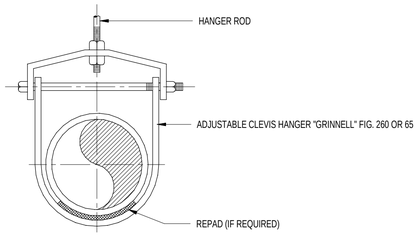
LIFT STATION SECTIONS AND ISO VIEW

PROJECT NO. 20-3940

SHEET NO. P02



AIR RELEASE VALVE

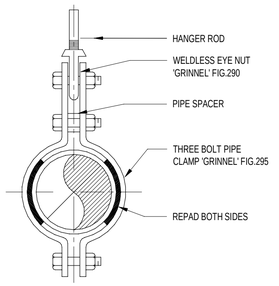


PIPE HANGER SCHEDULE			
PIPE SIZE (Ø)	ROD SIZE (Ø)	MAXIMUM SPACING	MAXIMUM LOAD (kg)
THRU 25	9	2440	180
32 THRU 50	9	3050	180
63 THRU 89	13	3660	475
100 & 125	16	4875	650
150	19	4875	880
200 THRU 300	22	6100	1360
350 & 400	25	6100	1475
450 & 500	32	6100	2180
600 & 900	38	7620	2180

NOTE:

1. CONTRACTOR SHALL DETERMINE APPROPRIATE METHOD OF ATTACHMENT TO CEILING.
2. SCHEDULED DATA MAY ALSO BE USED FOR TRAPEZE HANGER SELECTION WITH EACH ROD NOT TO EXCEED MAXIMUM LOAD.
3. CONTRACTOR SHALL ENSURE THAT EACH LINE IS ADEQUATELY SUPPORTED BEFORE COMMENCING TRIAL OPERATION.

CLEVIS PIPE HANGER

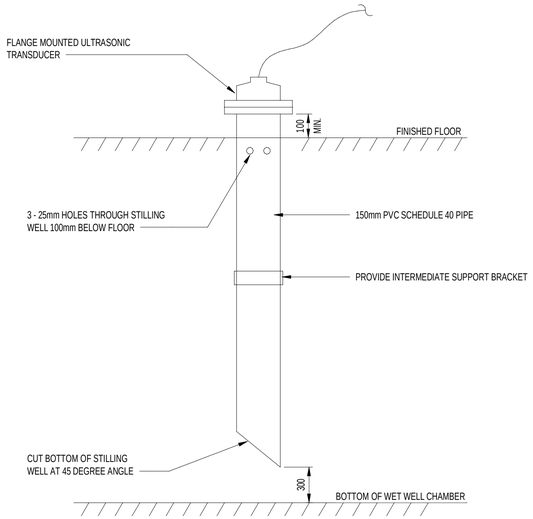


PIPE HANGER SCHEDULE STEEL PIPE (STANDARD WEIGHT)			
PIPE SIZE (Ø)	ROD SIZE (Ø)	MAXIMUM SPACING	MAXIMUM LOAD (kg)
THRU 25	9	2440	180
32 THRU 50	9	3050	180
63 THRU 89	13	3660	475
100 & 125	16	4875	650
150	19	4875	880
200 THRU 300	22	6100	1360
350 & 400	25	6100	1475
450 & 500	32	6100	2180
600 & 900	38	7620	2180

NOTE:

1. CONTRACTOR SHALL DETERMINE APPROPRIATE METHOD OF ATTACHMENT TO CEILING.
2. SCHEDULED DATA MAY ALSO BE USED FOR TRAPEZE HANGER SELECTION WITH EACH ROD NOT TO EXCEED MAXIMUM LOAD.
3. CONTRACTOR SHALL ENSURE THAT EACH LINE IS ADEQUATELY SUPPORTED BEFORE COMMENCING TRIAL OPERATION.

THREE BOLT PIPE HANGER



STILLING WELL

REGISTERED PROFESSIONAL ENGINEER
A.S. WILLIAMS
LICENSEE
2021-10-26
NT/NU

CONSTRUCTION

Canada
Nunavut

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN: INV	REVIEWED BY: INV
DRAWN: SMZ	CHECKED BY: ASW
DATE: OCTOBER 2021	
SCALE: 1 : 25	

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

MISCELLANEOUS DETAILS

PROJECT NO. 20-3940

SHEET NO. P03

PLOT DATE: 2021-10-25 5:29:14 PM
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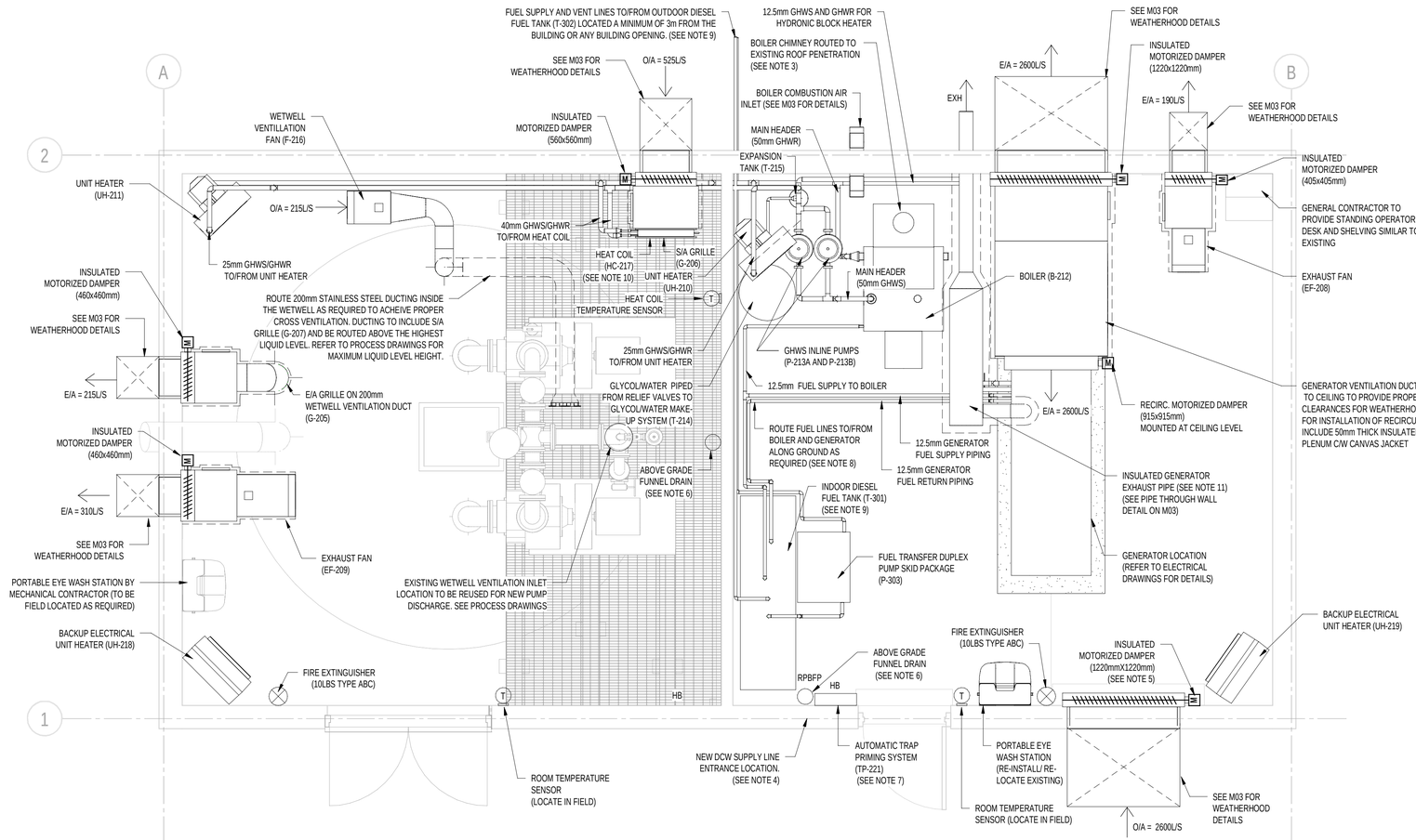

MECHANICAL PLANS

SCALE: 1 : 30

LEGEND

E/A	-	EXHAUST AIR
O/A	-	OUTSIDE AIR
BD	-	BALANCING DAMPER
FC	-	FLEXIBLE CONNECTION
GHWS	-	GLYCOL HOT WATER SUPPLY
GHWR	-	GLYCOL HOT WATER RETURN
HWS	-	HOT WATER SUPPLY
HWR	-	HOT WATER RETURN
DCW	-	DOMESTIC COLD WATER
C.B.V	-	CIRCUIT BALANCING VALVE
C.V	-	CONTROL VALVE
V.B	-	VAPOUR BARRIER
RPBFP	-	REDUCED PRESSURE BACKFLOW PREVENTER
HB	-	HOSE BIBB

NOTES:

1. THE EQUIPMENT LAYOUT PROVIDES A GENERAL ARRANGEMENT OF THE MECHANICAL HVAC AND PLUMBING EQUIPMENT LOCATED WITHIN THE UPGRADED STATION. THE CONTRACTOR IS RESPONSIBLE FOR FINALIZING THE ARRANGEMENT OF ALL MECHANICAL HVAC AND PLUMBING EQUIPMENT TO ENSURE ALL EQUIPMENT FITS WITHIN THE ROOM WHILE MAINTAINING APPROPRIATE OPERATING ROOM AND SPACING, AS PER THE MANUFACTURER REQUIREMENTS.

2. NOT ALL FITTINGS AND PIPING CONNECTION ARE SHOWN BETWEEN EQUIPMENT. CONTRACTOR TO REFER TO EQUIPMENT DETAILS AND EQUIPMENT MANUFACTURER INSTRUCTIONS FOR ADDITIONAL REQUIREMENT.

3. HORIZONTAL PORTION OF BOILER CHIMNEY VENT TO BE SLOPED TOWARDS THE BOILER SYSTEM AT A MINUMUM OF 5% GRADE. THE CONNECTION TO THE EXISTING VERTICAL CHIMENY STACK SHALL BE MADE VIA A 45 DEGREE ENTRY CONNECTION. THE BASE OF THE VERTICAL CHIMNEY STACK TO INCLUDE A BASE TEE C/W STAINLESS STEEL P-TRAP AND DRAIN PIPED TO THE NEAREST FUNNEL DRAIN. CHIMNEY AND FLUE/BREECHING SIZES AS WELL AS OVERALL CHIMENY HEIGHT TO BE BASED ON MANUFACTURER RECOMMENDATIONS.

4. SEE APPLICABLE DETAIL ON M02 FOR ADDITIONAL WATER SUPPLY LINE REQUIREMENTS. MOUNT ALL REQUIRED PUMPS/VALVES/APPURTENANCES/METERS ALONG THE WALL IF SPACE PERMITS, OTHERWISE SUPPORT OFF THE FLOOR AS REQUIRED. PROVIDE DCW HOSE BIB CONNECTIONS IN THE WETWELL ROOM, AND UTILITY ROOM. ALSO PROVIDE DCW CONNECTION TO TRAP SEAL PRIMING SYSTEM IN UTILITY ROOM.

5. GENERATOR VENTILATION INTAKE LOUVRE TO BE MODULATED VIA TWO (2) DAMPERS. A SMALL SECTION OF THE LOUVRE TO BE CONTROLLED VIA AN ON/OFF DAMPER FOR COMBUSTION AIR. THE REMAINING SECTION OF THE LOUVRE TO BE MODULATED FOR GENERATING COOLING AIR AS REQUIRED. SEE GENERATOR VENTILATION CONTROL DETAIL ON DRAWING M04.

6. ABOVE GRADE FUNNEL TYPE DRAINS TO INCLUDE INDIVIDUAL P-TRAPS AND BE ROUTED ALONG THE WALLS TO A COMMON CONNECTION POINT PRIOR TO ROUTING TO WETWELL. ABOVE GRADE FUNNEL DRAIN IN THE WETWELL ROOM TO BE LOCATED BENEATH THE WATER SUPPLY ENTRANCE LOCATION. SEE APPLICABLE DETAIL ON M03 FOR ADDITIONAL INFORMATION REGARDING THE FUNNEL DRAIN.

7. AUTOMATIC TRAP SEAL PRIMING SYSTEM TO BE ROUTED TO EACH ABOVE GRADE FUNNEL DRAIN P-TRAP TO ENSURE PROPER GAS SEAL IS MAINTAINED. SEE APPLICABLE DETAILS ON M03.

8. PROVIDE PIPING PROTECTION FOR FUEL LINES ROUTED ALONG THE GROUND TO THE BOILER SYSTEM AND TO/FROM THE GENERATOR SYSTEM AS REQUIRED. ALSO, PROVIDE PIPE GUARDS TO PROTECT AGAINST INCIDENTAL CONTACT WITH FUEL LINE CONNECTIONS AT THE GENERATOR.

9. INDOOR AND OUTDOOR FUEL TANKS TO INCLUDE ADDITIONAL CONNECTION PORTS TO FACILITATE A COMPLETE AND PROPER INSTALLATION OF THE ULTRASONIC LEVEL SENSORS AS WELL AS ALL OTHER REQUIRED GAUGES, PORTS, AND VENT/SUPPLY/RETURN LINES.

10. HEAT COIL TO COME EQUIPPED WITH O/A MERV FILTER WHICH SHALL BE EASILY ACCESSIBLE FOR INSPECTION AND REPLACEMENT. MERV 8 FILTER OR APPROVED EQUAL.

11. GENERATOR EXHAUST PIPE TO BE SIZED PER MANUFACTURER'S RECOMMENDATIONS. CONNECT EXHUAST PIPE TO THE GENERATOR MUFFLE/SILENCER AND FLEXIBLE CONNECTION ASSEMBLY. PROVIDE INSULATED WALL THIMBLE THRGOUT THE WALL CUT PIPE AT 45DEG AND PROVIDE PIPE SUPPORTS/HANGERS AS NEEDED.

REGISTERED PROFESSIONAL ENGINEER J.C.L. YABLECKI LICENSEE 10/26/2021 NT/NU

ISSUED FOR CONSTRUCTION

Canada Nunavut

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	ISSUED FOR CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN: SMC | REVIEWED BY: JY
DRAWN: SMC | CHECKED BY: SM
DATE: OCTOBER 2021
SCALE: 1 : 30

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

HVAC AND PLUMBING I

PROJECT NO. 20-3940

SHEET NO. M01

PLOT DATE: 2021-10-25 4:28:09 PM
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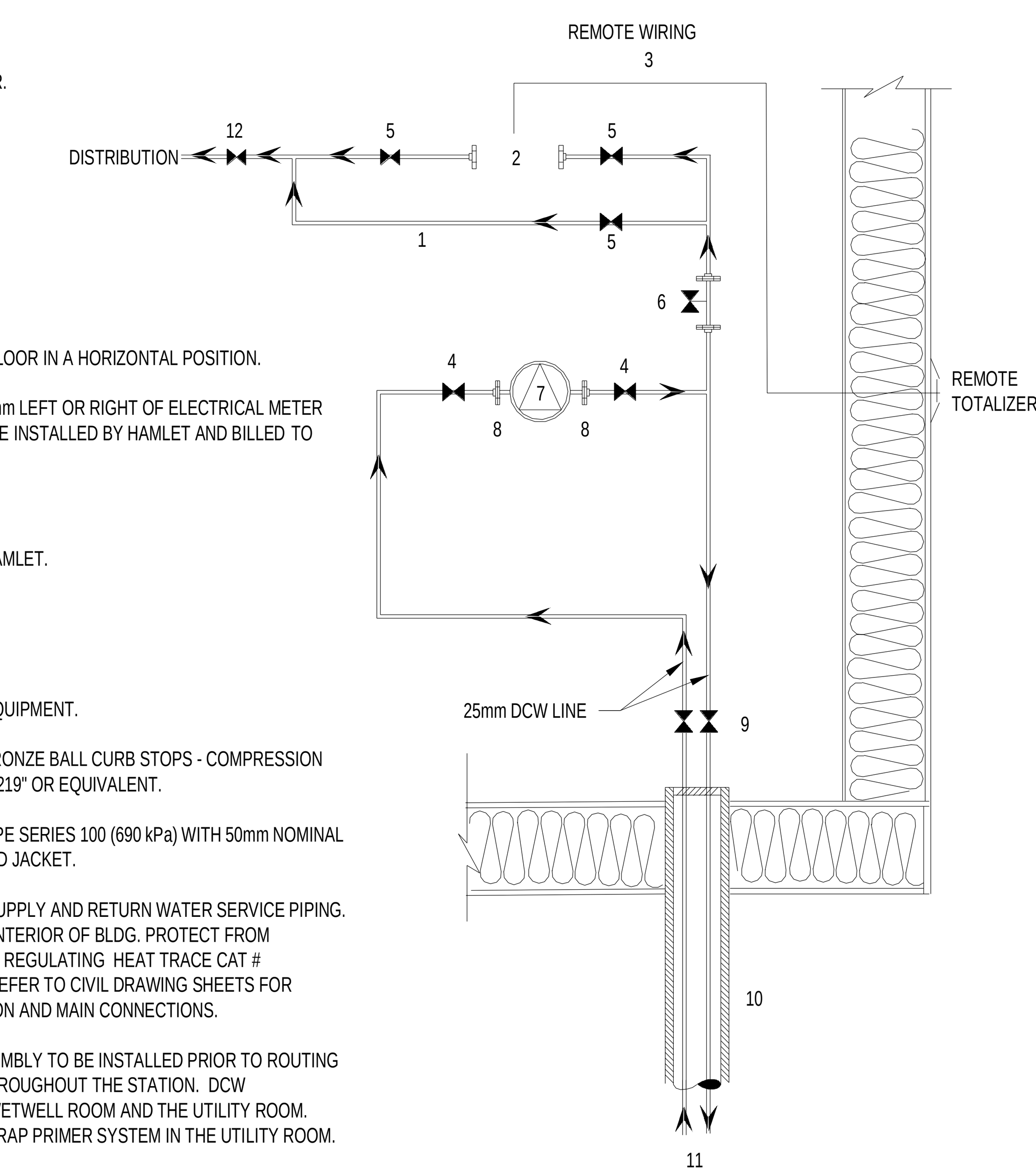
MECHANICAL EQUIPMENT SCHEDULE											
TAG	TYPE	MANUFACTURER (1)	MODEL/SERIES	SIZE	SPEED	FLOW RATE	ESP (FAN SYSTEMS) / TDH (PUMP SYSTEMS)	ELECTRICAL			DESCRIPTION
								VOLTAGE	PHASE	Hz	
G-205	GRILLE	NAILOR INDUSTRIES INC.	67EC	300mmX300mm	-	215L/S (450CFM)	0.1"W.C (25Pa)	-	-	-	STAINLESS STEEL EXHAUST AIR GRILLE INSTALLED ON EXHAUST AIR VENTILATION DUCT WITHIN THE WETWELL. C/W TRANSITION TO ROUND DUCT CONNECTION
G-206	GRILLE	NAILOR INDUSTRIES INC.	67EC	533mmX533mm	-	520L/S (1100CFM)	0.05"W.C (12Pa)	-	-	-	STAINLESS STEEL SUPPLY AIR GRILLE ON THE HEAT COIL OUTLET IN THE WETWELL ROOM
G-207	GRILLE	NAILOR INDUSTRIES INC.	67EC	300mmX300mm	-	215L/S (450CFM)	0.1"W.C (25Pa)	-	-	-	STAINLESS STEEL SUPPLY AIR GRILLE INSTALLED ON SUPPLY AIR VENTILATION DUCT WITHIN THE WETWELL. C/W TRANSITION TO ROUND DUCT CONNECTION
EF-208	EXHAUST FAN	GREENHECK	SQ-85-VG	FRAC. HP	1725RPM	190L/S (400CFM)	0.2"W.C (50Pa)	120	1	60	DIRECT DRIVE PROPELLER EXHAUST FAN C/W VARI-GREEN MOTOR, DISCONNECT SWITCH, AND INLET GUARDS
EF-209	EXHAUST FAN	GREENHECK	BSQ-80-5	FRAC. HP	2310RPM	310L/S (650CFM)	1.2"W.C (300Pa)	120	1	60	STAINLESS STEEL NEMA 4X CONSTRUCTION, NON-METALLIC ELECTRICAL ENCLOSURE, SPARK RESISTANT FAN, CLASS 1 DIV 1 RATED, COMPLETE VARI-GREEN MOTOR, DISCONNECT SWITCH, AND INLET GUARDS
UH-210	UNIT HEATER	ENGINEERED AIR	H5	15kW (51.5MBH)	1075RPM	AIR: 585L/S (1240CFM) FLUID: 0.4L/S (6.3USGPM)	-	120	1	60	HYDRONIC UNIT HEATER COMPLETE WITH DISCONNECT SWITCH, AND MOUNTING BRACKET. 50% WATER AND PROPYLENE GLYCOL SOLUTION, FLUID SIDE PRESSURE DROP ALLOWANCE OF 0.25m. 180°F (82°C) ENTERING WATER/GLYCOL TEMPERATURE, 160°F (71°C) LEAVING WATER/GLYCOL TEMPERATURE
UH-211	UNIT HEATER	ENGINEERED AIR	H5	15kW (51.5MBH)	1075RPM	AIR: 585L/S (1240CFM) FLUID: 0.4L/S (6.3USGPM)	-	120	1	60	HYDRONINC UNIT HEATER, STAINLESS STEEL NEMA 4X CONSTRUCTION RATED FOR CLASS 1 DIV 1 USE, NON-METALLIC ELECTRICAL ENCLOSURE, COMPLETE WITH DISCONNECT SWITCH, AND MOUNTING BRACKET. 50% WATER AND PROPYLENE GLYCOL SOLUTION, FLUID SIDE PRESSURE DROP ALLOWANCE OF 0.25m. 180°F (82°C) ENTERING WATER/GLYCOL TEMPERATURE, 160°F (71°C) LEAVING WATER/GLYCOL TEMPERATURE.
B-212	BOILER	WEIL-MCLAIN	WGO-8	INPUT: 95kW (322MBH) OUTPUT: 72kW (245MBH)	-	113.5L/MIN (30USGPM)	-	120	1	60	DIESEL FUEL OIL-FIRED, HOT WATER/GLYCOL, SECTIONAL FORCED DRAFT, HIGH EFFICIENCY BOILER C/W TWO STAGE BURNER, ACCESSORIES AND CONTROLS. SUITED FOR USE WITH 50% PROPYLENE GLYCOL/WATER SOLUTION. FLUID SIDE PRESSURE DROP ALLOWANCE OF 1.1m. 160°F (71°C) ENTERING WATER/GLYCOL TEMPERATURE, 180°F (82°C) LEAVING WATER/GLYCOL TEMPERATURE
P-213A	CIRC. PUMP	GRUNDFOS	UPS 50-240 F	1.7kW (2.25Hp)	-	113.5L/MIN (30USGPM)	16.8m (55ft)	208	3	60	BOILER SYSTEM CIRCULATION PUMP SUITED FOR USE WITH 60% PROPYLENE GLYCOL SOLUTION
P-213B	CIRC. PUMP	GRUNDFOS	UPS 50-240 F	1.7kW (2.25Hp)	-	113.5L/MIN (30USGPM)	16.8m (55ft)	208	3	60	BOILER SYSTEM CIRCULATION PUMP SUITED FOR USE WITH 60% PROPYLENE GLYCOL SOLUTION
T-301	FUEL TANK	WESTEEL	ULC-FOSC-250	300USGAL (1135L)	-	-	-	-	-	-	ULC LISTED, HEAVY GAUGE, DOUBLE WALL, DIESEL FUEL STORAGE TANK C/W EMERGENCY RELIEF VENT FITTING AND PRESSURE RELIEF VENT KIT, NORMAL VENT FITTING, MECHANICAL FUEL GAUGE, INTERSTITIAL LEAK INDICATOR, ADDITIONAL CONNECTIONS TO SUIT INSTALLATION OF ULTRASONIC LEVEL SENSOR FOR LEVEL MEASUREMENT AND ALL REQURIED ALARMS, AND HIGH LEVEL FUEL INDICATION VIA VENT WHISTLE
T-302	FUEL TANK	WESTEEL	HFV8500	2265USGAL (8575L)	-	-	-	-	-	-	ULC LISTED, HEAVY GAUGE, DOUBLE WALL, DIESEL FUEL STORAGE TANK C/W EMERGENCY RELIEF VENT FITTING AND PRESSURE RELIEF VENT KIT, NORMAL VENT FITTING, MECHANICAL FUEL GAUGE, INTERSTITIAL LEAK INDICATOR, ADDITIONAL CONNECTIONS TO SUIT INSTALLATION OF AN ULTRASONIC LEVEL TRANSMITTER FOR LEVEL MEASUREMENT AND ALL REQURIED ALARMS, AND HIGH LEVEL FUEL INDICATION VENTALARM VIA VENT WHISTLE. PROVIDE FUEL TANK SUPPORT STRUCTURE, FUEL FILL STATION AND ACCESS STEPS AS REQUIRED
T-214	MAKEUP TANK	AXIOM	SF100	55USGAL (208L)	-	-	-	120	1	60	GLYCOL/WATER FILL PACKAGE C/W TANK, COVER, PUMP SUCTION HOSE, INLET STRAINER, PRESSURE PUMP W/ THERMAL CUT-OUT, INTEGRAL PRESSURE SWITCH, INTEGRAL CHECK VALVE, CORD AND PLUG, PRE-CHARGED ACCUMULATOR TANK WITH EPDM DIAPHRAGM, MANUAL DIVERTER VALVE, PRESSURE REGULATING VALVE WITH PRESSURE GAUGE, BUILT-IN CHECK VALVE, UNINON CONNECTION, FLEXIBLE HOSE CONNECTION W/ CHECK VALVE, LOW LEVEL PUMP CUT-OUT, ADDITIONAL CONNECTION FOR GLYCOL/WATER RELIEF DRAIN LINES
T-215	EXPANSION TANK	TACO	CX-30	8USGAL (30L)	-	-	-	-	-	-	GLYCOL/WATER EXPANSION TANK SUITED FOR A 46USGAL (174L) SYSTEM VOLUME, 40°F (4°C) MIN TEMP, 190°F (88°C) MAX TEMP, 12PSIG (83kPa) MIN OPERATING PRESSURE, 30PSIG (207kPa) MAX DESIGN PRESSURE, AND MINIMUM EXPANSION VOLUME OF 2.58USGAL (9.77L)
F-216	INLINE FAN	GREENHECK	BSQ-80-3	FRAC. HP	2018RPM	215L/S (450CFM)	1.2"W.C (300Pa)	120	1	60	STAINLESS STEEL NEMA 4X CONSTRUCTION, NON-METALLIC ELECTRICAL ENCLOSURE, SPARK RESISTANT FAN, CLASS 1 DIV 1 RATED, COMPLETE VARI-GREEN MOTOR, DISCONNECT SWITCH, AND INLET GUARDS
HC-217	HEAT COIL	GREENHECK	HW58S02H12-21x21-LH	23.5kW (136MBH)	-	AIR: 520L/S (1100CFM) FLUID: 1L/S (16.5USGPM)	-	-	-	-	WETWELL ROOM OUTSIDE AIR HEATING COIL SUITED FOR INSTALLATION IN CLASS 1 DIV 1 ENVIRONMENT. 50% WATER AND PROPYLENE GLYCOL SOLUTION, FLUID SIDE PRESSURE DROP ALLOWANCE OF 2.9m. 180°F (82°C) ENTERING WATER/GLYCOL TEMPERATURE, 160°F (71°C) LEAVING WATER/GLYCOL TEMPERATURE. -43.5°F (-42°C) ENTERING AIR TEMPERATURE, 70°F (21°C) LEAVING AIR TEMPERATURE
UH-218	UNIT HEATER	TRANE	UHXA153F1B	15kW (51.5MBH)		1156L/S (2450CFM)	-	600	3	60	ELECTRIC UNIT HEATER, RATED FOR CLASS 1 DIV 1 USE, EXPLOSION PROOF CONSTRUCTION, NON-METALLIC ELECTRICAL ENCLOSURE, COMPLETE WITH DISCONNECT SWITCH, AND MOUNTING BRACKET
UH-219	UNIT HEATER	OUELLET	OAS15036AM	15kW (51.5MBH)	-	661L/S (1400CFM)	-	600	3	60	ELECTRIC UNIT HEATER COMPLETE WITH DISCONNECT SWITCH, AND MOUNTING BRACKET
P-220	RECIRC. PUMP	GRUNDFOS	UPS15-35SFC	FRAC. HP	-	72L/MIN (19USGPM) MAX	3.5m (11.5ft) MAX	120	1	60	INLINE WATER RE-CIRCULATION PUMP
TP-221	TRAP PRIMER	PRECISION PLUMBING	PTS-4	-	-	-	-	120	1	60	AUTOMATIC TRAP SEAL PRIMING SYSTEM
P-303	PUMP PACKAGE	WEBSTER	SPM-135-DA	1/2HP	1725	510L/HR (135USGPH)	-	120	1	60	COMPLETE DUPLEX FUEL TRANSFER PUMP SKID PACKAGE C/W AUTOMATIC CONTROL PANEL

(1) APPROVED EQUIVALENTS FOR EQUIPMENT SELECTIONS ARE PERMITTED TO BE SUBMITTED FOR REVIEW

NOTES:

1. BYPASS REQ'D FOR ALL METERS 19mm AND LARGER.
2. WATER METER (FM-224)
   METER SIZES / SPOOL PIECE SPACING
   10mm - - - - 191mm
   19mm - - - - 191mm
   25mm - - - - 273mm
   38mm - - - - 330mm
   51mm - - - - 431mm
   54mm - - - - 489mm
   75mm - - - - 489mm
   METERS TO BE LOCATED 90 TO 120mm FROM THE FLOOR IN A HORIZONTAL POSITION.
3. REMOTE 2-PAIR WIRE FROM WATER METER TO 150mm LEFT OR RIGHT OF ELECTRICAL METER ON EXTERIOR OF BLDG. WATER METER AND REMOTE INSTALLED BY HAMLET AND BILLED TO APPLICANT.
4. ISOLATION GATE VALVES.
5. SEALABLE ISOLATION GATE VALVES - SEALED BY HAMLET.
6. PRESSURE REDUCING VALVE.
7. CIRCULATION PUMP (P-220).
8. UNION FITTING ON BOTH SIDES OF SERVICEABLE EQUIPMENT.
9. SYSTEM MAIN VALVES MIN 300mm FROM FLOOR - BRONZE BALL CURB STOPS - COMPRESSION FITTING WITH SEAMLESS S.S INSERT. "MULLER H-15219" OR EQUIVALENT.
10. WATER SERVICE CARRIER PIPE 100mm DIA. MIN. HDPE SERIES 100 (690 kPa) WITH 50mm NOMINAL POLYURETHANE INSULATION AND FACTORY APPLIED JACKET.
11. FIELD INSTALLED CTS HDPE SERIES 160 (1100kPa) SUPPLY AND RETURN WATER SERVICE PIPING. CONTINUOUS LENGTH COIL STACK FROM MAIN TO INTERIOR OF BLDG. PROTECT FROM FREEZING USING TWO RUNS OF "PYROTENAX" SELF REGULATING HEAT TRACE CAT # 5USR1CT-120V-16W/M-CSA 75284 OR EQUIVALENT. REFER TO CIVIL DRAWING SHEETS FOR DETAILS REGARDING THE HEAT TRACE INSTALLATION AND MAIN CONNECTIONS.
12. REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY TO BE INSTALLED PRIOR TO ROUTING INDIVIDUAL DCW LINES TO CONNECTION POINTS THROUGHOUT THE STATION. DCW HOSE BIB CONNECTIONS TO BE PROVIDED IN THE WETWELL ROOM AND THE UTILITY ROOM. ALSO PROVIDE DCW CONNECTION TO AUTOMATIC TRAP PRIMER SYSTEM IN THE UTILITY ROOM.



TYPICAL WATER METER AND RECIRCULATION PUMP SCHEMATIC
SCALE: NOT TO SCALE

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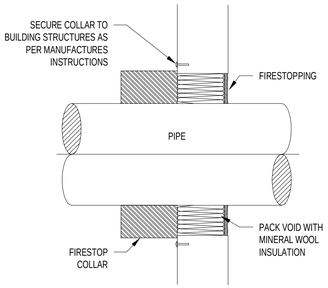
GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

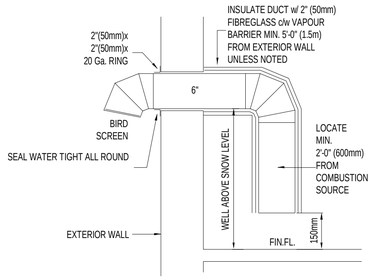
HVAC AND PLUMBING II

PROJECT NO. 20-3940

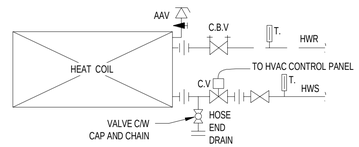
SHEET NO. M02



FIRE STOP COLLAR



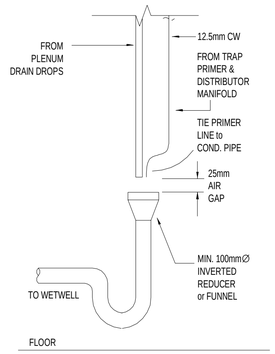
BOILER COMBUSTION AIR INLET



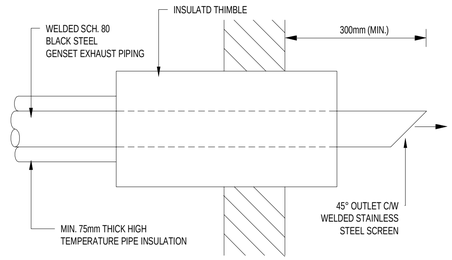
HOT WATER/GLYCOL HEATING COIL

PLUMBING LEGEND

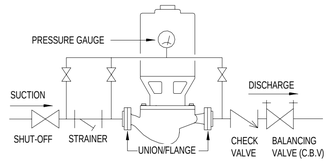
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SHUT-OFF VALVE		STRAINER
	BALLVALVE		BACKFLOW PREVENTER
	GLOBE VALVE		THERMOMETER
	PRESS. REDUCING VALVE (PRV)		AUTOMATIC AIR VENT (AAV)
	SOLENOID VALVE		CIRCULATOR /PUMP
	TEMP. & PRESS. RELIEF (T&P) ANGLE		CIRCUIT BALANCING VALVE
	CHECK VALVE		



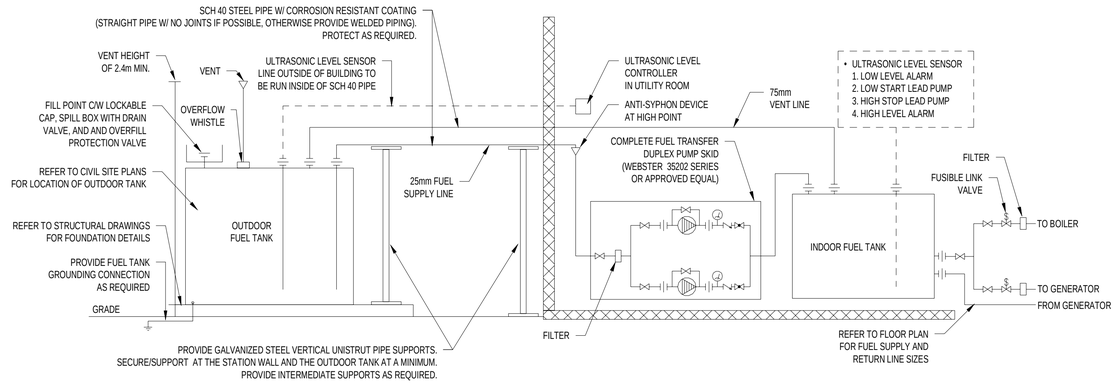
FUNNEL DRAIN AND CONNECTIONS



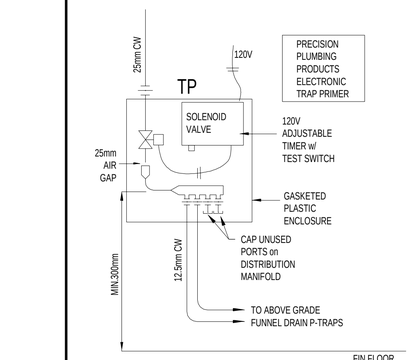
GENSET EXHAUST PIPE DETAIL



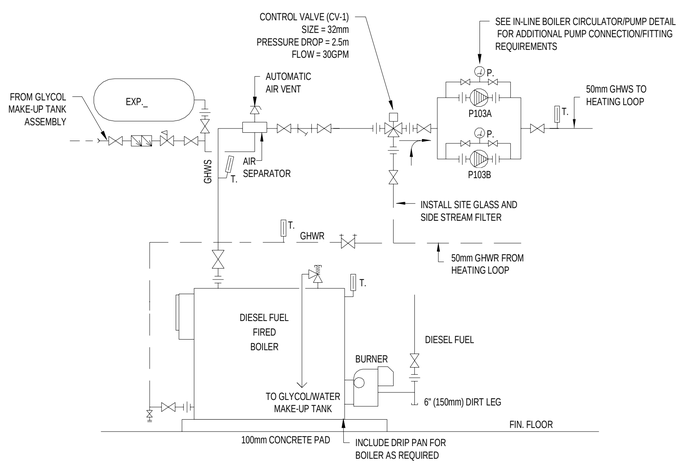
IN-LINE BOILER CIRCULATOR/PUMP



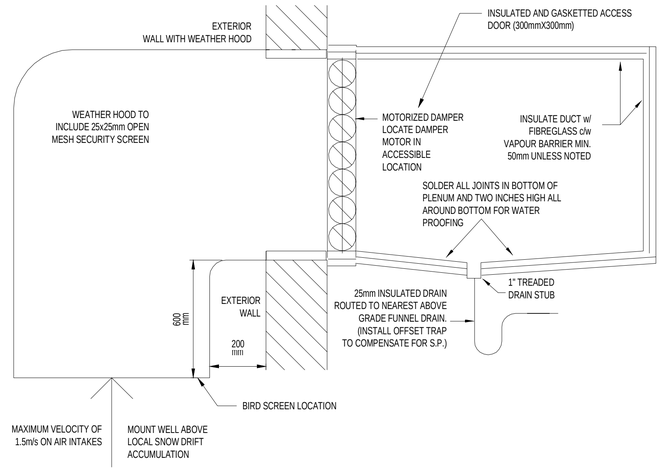
DIESEL FUEL PIPING SCHEMATIC



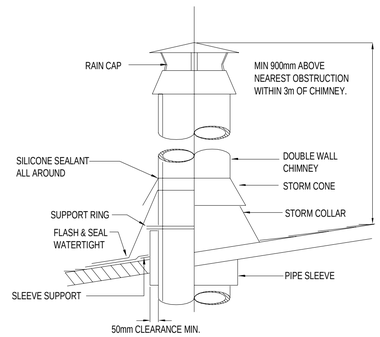
ELECTRONIC TRAP PRIMER



BOILER PIPING SCHEMATIC



WEATHERHOOD AND LOUVRE PLENUM DRAIN



DOUBLE WALL CHIMNEY

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GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

HVAC AND PLUMBING DETAILS

PROJECT NO. 20-3940

SHEET NO. M03

PLOT DATE: 2021-10-25 4:28:10 PM
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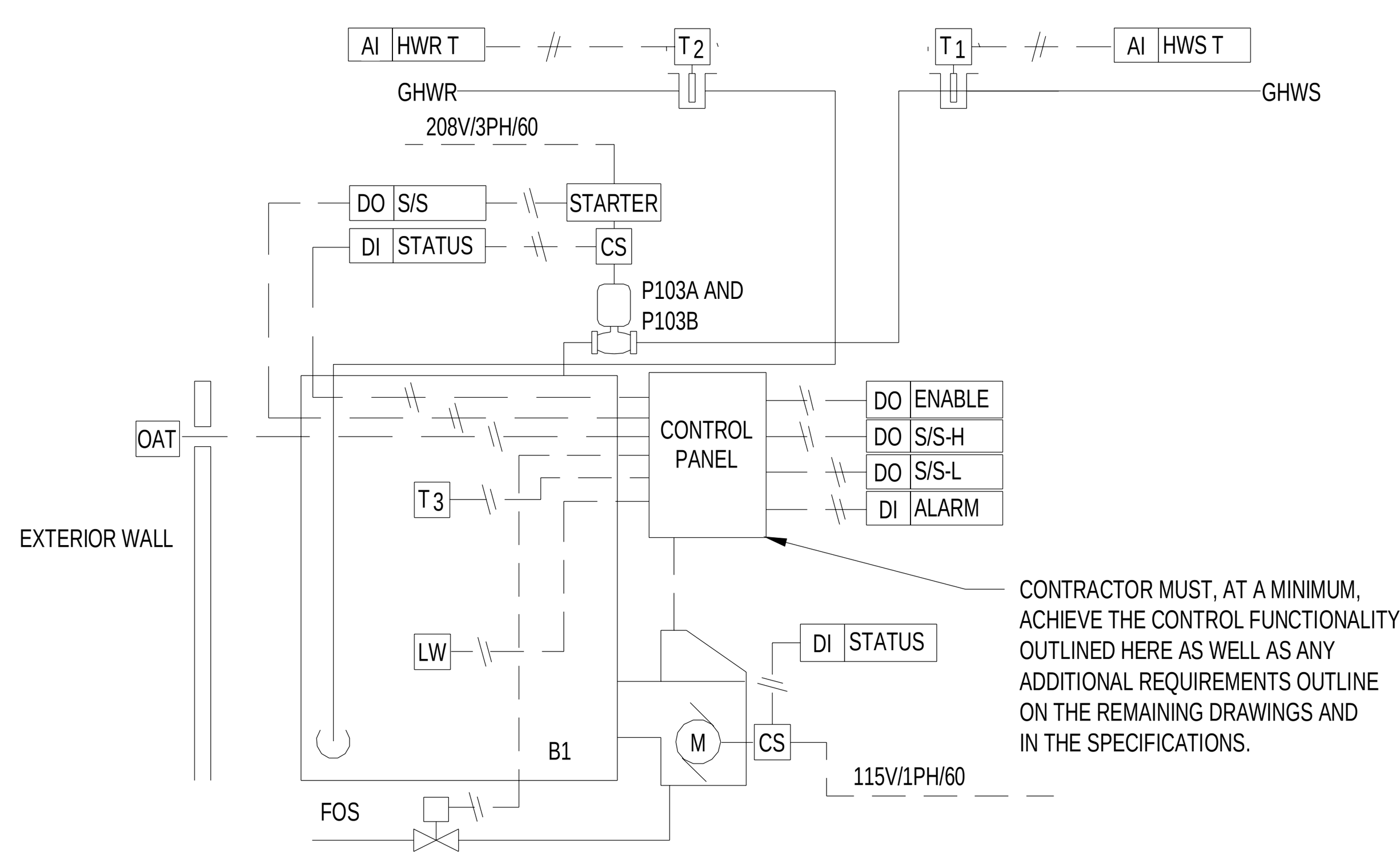
BOILER CONTROL

LEGEND

TAG	SYMBOL	CONTROL POINT	PNEU.(P) ELEC.(E)	POWER	DESCRIPTION
AI	AI (******)	-	E	LV	CONTROL POINT (ANALOG IN)
AO	AO (******)	-	E	LV	CONTROL POINT (ANALOG OUT)
DI	DI (******)	-	E	LV	CONTROL POINT (DIGITAL IN)
DO	DO (******)	-	E	LV	CONTROL POINT (DIGITAL OUT)
.		-	-	-	HEATING/COOLING SUPPLY PIPE
.		-	E	-	ELECTRICAL WIRING
.	STARTER	S/S	E	-	ELECTRICAL MOTOR STARTER
.	CS	STATUS	E	-	ELECTRICAL CURRENT SENSOR
	T1	GHWS T	E	24V	HOT WATER SUPPLY TEMPERATURE
	T2	GHWR T	E	24V	HOT WATER RETURN TEMPERATURE
	T3	-	E	-	HIGH LIMIT AQUASTAT (SUPPLIED w/BOILER)
	LW	-	E	-	LOW WATER CUT OUT (SUPPLIED w/BOILER)
	M	S/S L S/S H	E E	24V 24V	BURNER STOP/START LOW FIRE BURNER STOP/START HIGH FIRE
P#		-	-	-	CIRCULATOR or PUMP

SCHEMATIC



SEQUENCE

BOILER WILL OPERATE TO MAINTAIN HOT WATER/GLYCOL SUPPLY TEMPERATURE AT TEMPERATURE SENSOR 'T1' SET AT THE VALUE INDICATED IN THE TEMPERATURE SETPOINT TABLE. ON A DROP IN HOT WATER/GLYCOL TEMPERATURE BELOW SET POINT, BURNER IS TO START ON LOW FIRE AND BOILER INJECTION PUMP IS TO START. IF TEMPERATURE SET POINT IS NOT MAINTAINED AFTER 5 MIN. (CONFIRM & COORDINATE TIME PERIOD W/ BURNER SUPPLIER CONTROL STRATEGIES) BURNER IS TO SWITCH TO HIGH FIRE. REVERSE SEQUENCE AFTER HOT WATER/GLYCOL SUPPLY TEMPERATURE IS MAINTAINED FOR 5 MIN. OR BEGINS TO RISE ABOVE SET POINT. OAT SENSOR TO ALLOW FOR A RESET OF THE OPERATING TEMPERATURE CONTROLLER.

SAFETY: IF BOILER HIGH LIMIT IS REACHED, BOILER BURNER IS TO SHUT DOWN. IF LOW WATER CUT OFF SWITCH CONTACTS ARE OPENED THE BURNER SHALL BE SHUT DOWN. FAILURE OF THE BURNERS TO OPERATE AFTER COMMANDED TO START SHALL TRIGGER AN ALARM REPORT AT THE STATION CONTROL PANEL.

TEMPERATURE SETPOINT TABLE	
OUTSIDE AIR TEMPERATURE	HOT WATER/GLYCOL SUPPLY TEMPERATURE
-42°C	82°C
10°C	38°C

GENERATOR VENTILATION CONTROL

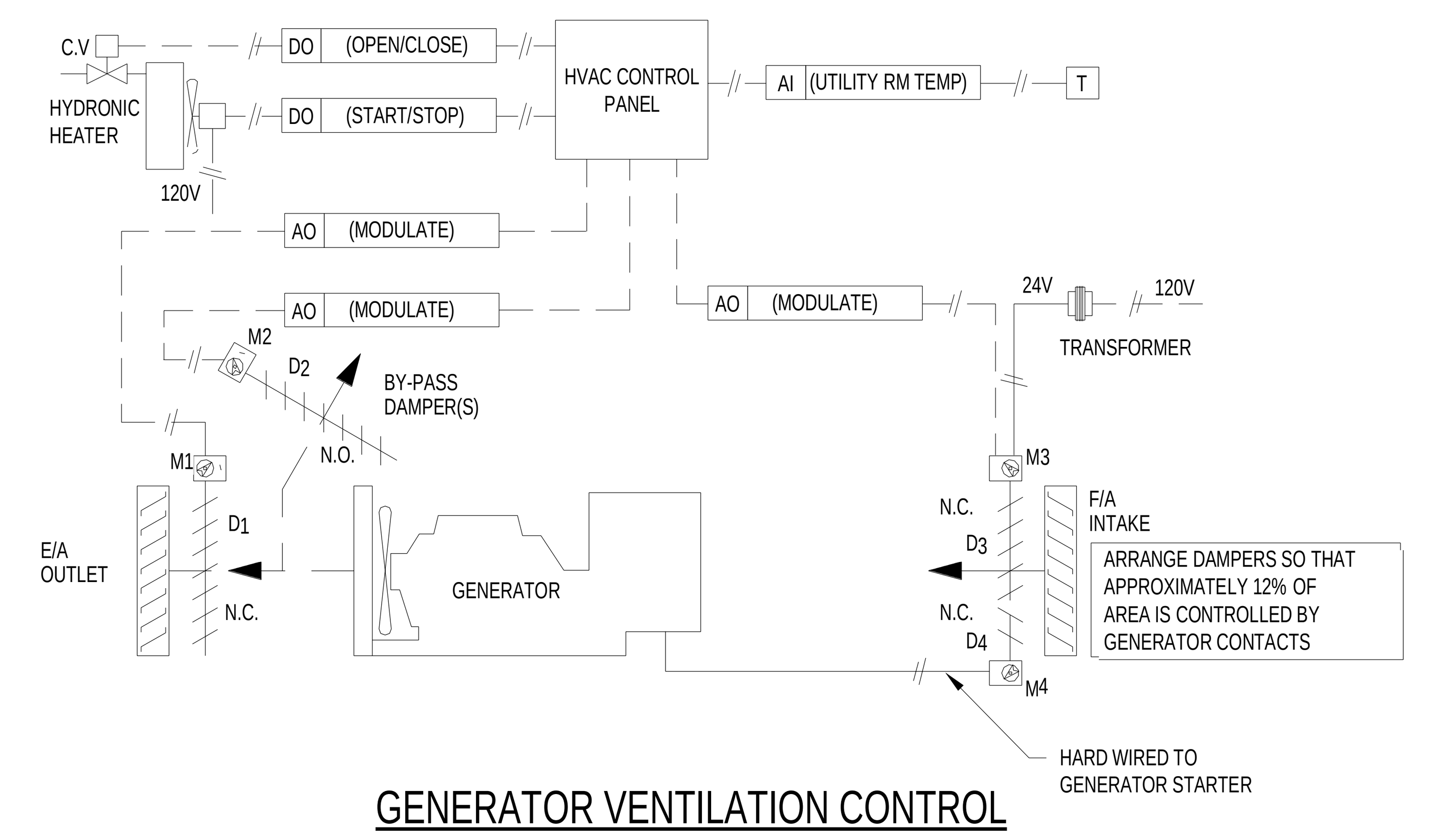
LEGEND

TAG	SYMBOL	CONTROL POINT	PNEU.(P) ELEC.(E)	POWER	DESCRIPTION
AO	AO (******)	-	E	LV	CONTROL POINT (ANALOG OUT)
AI	AI (******)	-	E	LV	CONTROL POINT (ANALOG IN)
DO	DO (******)	-	E	LV	CONTROL POINT (DIGITAL OUT)
.		-	E	-	WIRING BY ELECTRICAL TRADE CONTRACTOR
.		-	E	-	WIRING BY MECHANICAL TRADE CONTRACTOR
D1		-	-	-	EXHAUST AIR LOW LEAKAGE DAMPER, PARALLEL
D2		-	-	-	BYPASS AIR LOW LEAKAGE DAMPER, PARALLEL
D3		-	-	-	OUTSIDE AIR LOW LEAKAGE DAMPER, PARALLEL
D4		-	-	-	COMBUSTION AIR LOW LEAKAGE DAMPER, PARALLEL
M1		-	E	24V	ELECTRIC DAMPER MOTOR, MODULATING
M2		-	E	24V	ELECTRIC DAMPER MOTOR, MODULATING
M3		-	E	24V	ELECTRIC DAMPER MOTOR, MODULATING
M4		-	E	24V	ELECTRIC DAMPER MOTOR, TWO POSITION
T	T	-	E	24V	ROOM/SPACE TEMPERATURE SENSOR
.		-	E	-	ELECTRICAL TRANSFORMER 120V-24V

SEQUENCE

WHEN THE DIESEL GENERATOR STARTS, THE COMBUSTION AIR DAMPER OPENS FOR COMBUSTION AIR INTAKE. INCLUDE PROVING SWITCH TO ENSURE GENERATOR DOES NOT START BEFORE DAMPER IS CONFIRMED OPEN. THE REMAINING INTAKE AND DISCHARGE DAMPERS REMAIN CLOSED. THE BYPASS DAMPER(S) IS OPEN. AS THE ROOM TEMPERATURE RISES ABOVE THE SET POINT OF 21°C (ADJUSTABLE), THE INTAKE AND DISCHARGE DAMPERS MODULATE OPEN AND THE BYPASS DAMPER(S) MODULATES CLOSED TO MAINTAIN THE SET TEMPERATURE. IF THE INTAKE AND DISCHARGE DAMPERS ARE CLOSED AND THE TEMPERATURE CONTINUES TO DROPS BELOW 21°C (ADJUSTABLE), THE HYDRONIC UNIT HEATER IS STARTED AS A SECONDARY HEAT SOURCE. IF THE SPACE TEMPERATURE RISES ABOVE 24°C (ADJUSTABLE), THE INTAKE AND DISCHARGE DAMPERS MODULATE OPEN AND THE BYPASS DAMPER(S) MODULATE CLOSED. THE GENERATOR ROOM CONTROL SHALL BE POWERED FROM EMERGENCY POWER.

SCHEMATIC

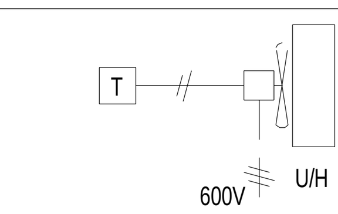


ELECTRIC UNIT HEATER CONTROL

LEGEND

TAG	SYMBOL	CONTROL POINT	PNEU.(P) ELEC.(E)	POWER	DESCRIPTION
.		-	E	-	WIRING BY ELECTRICAL TRADE CONTRACTOR
.		-	E	-	WIRING BY MECHANICAL TRADE CONTRACTOR
T	T	-	E	24V	ROOM/SPACE TEMPERATURE SENSOR

SCHEMATIC



SEQUENCE

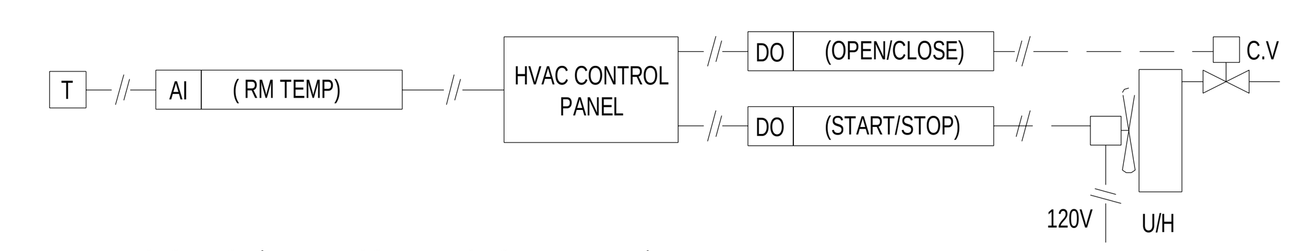
THE ELECTRIC UNIT HEATERS ARE A BACKUP HEAT SOURCE IN EACH ROOM AND SHALL ONLY BE TURNED ON WHEN THE ROOM TEMPERATURE DROPS BELOW 10°C (ADJUSTABLE).

HYDRONIC UNIT HEATER CONTROL

LEGEND

TAG	SYMBOL	CONTROL POINT	PNEU.(P) ELEC.(E)	POWER	DESCRIPTION
AI	AI (******)	-	E	LV	CONTROL POINT (ANALOG IN)
DO	DO (******)	-	E	LV	CONTROL POINT (DIGITAL OUT)
.		-	E	-	WIRING BY ELECTRICAL TRADE CONTRACTOR
T	T	-	E	24V	ROOM/SPACE TEMPERATURE SENSOR

SCHEMATIC



SEQUENCE (UTILITY ROOM HYDRONIC UNIT HEATER)

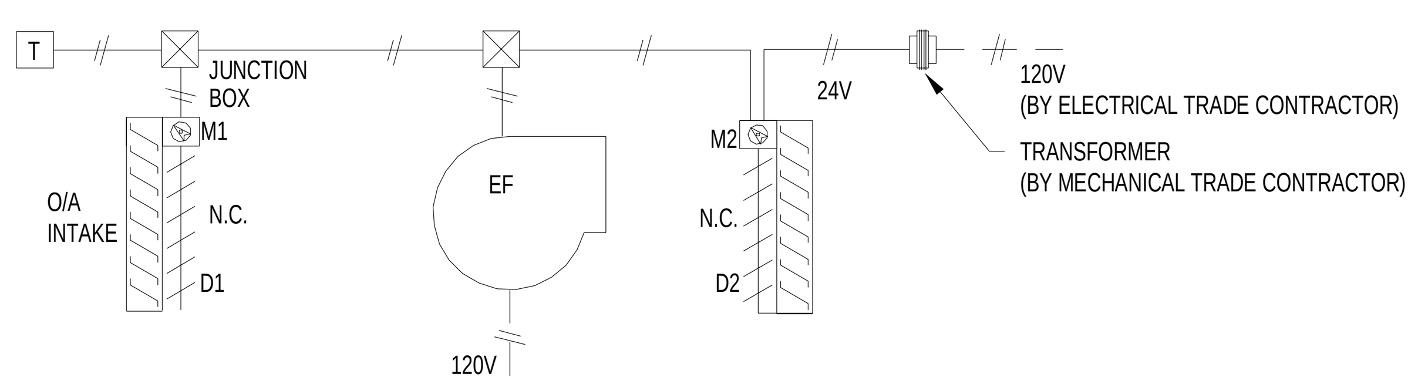
THE UNIT HEATER FAN IS CYCLED AND THE CONTROL VALVE IS OPENED/CLOSED TO MAINTAIN THE 21°C ROOM TEMPERATURE SETPOINT (ADJUSTABLE). AS INDICATED IN THE GENERATOR CONTROL SEQUENCE, THE HYDRONIC UNIT HEATER IN THE UTILITY ROOM SHALL BECOME THE SECONDARY SOURCE OF HEAT WHEN THE GENERATOR IS ON AND SHALL ONLY OPERATE IF THE ROOM TEMPERATURE CONTINUES TO DROP BELOW THE 21°C ROOM TEMPERATURE SETPOINT (ADJUSTABLE) EVEN WITH THE GENERATOR RECIRCULATING HEAT.

SEQUENCE (PUMP ROOM HYDRONIC UNIT HEATER)

THE UNIT HEATER FAN IS CYCLED AND THE CONTROL VALVE IS OPENED/CLOSED TO MAINTAIN THE 21°C ROOM TEMPERATURE SETPOINT (ADJUSTABLE).

EXHAUST FAN CONTROL

SCHEMATIC - UTILITY ROOM EXHAUST FAN



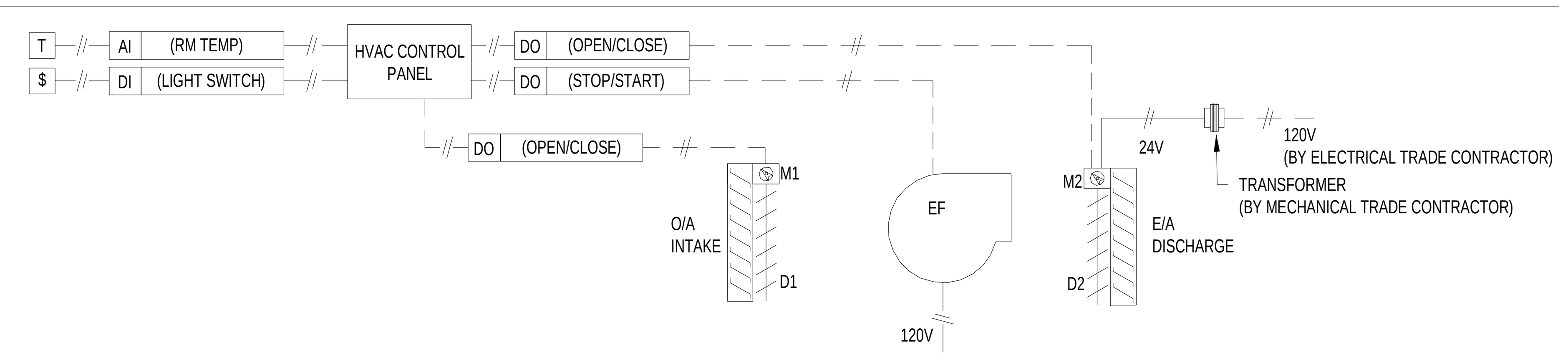
SEQUENCE

THE EXHAUST FAN IN THE UTILITY ROOM IS SWITCHED ON/OFF BY THE TEMPERATURE SENSOR TO PROVIDE SPACE COOLING AS REQUIRED. EXHAUST FAN TO BE SWITCHED ON WHEN THE ROOM TEMPERATURE RISES ABOVE THE 26°C SETPOINT (ADJUSTABLE). EXHAUST FANS SHALL NOT START UNTIL THE MOTORIZED DAMPERS ARE CONFIRMED OPEN. PROVIDE END SWITCHES AS REQUIRED TO FACILITATE PROPER CONTROL CONNECTIONS. UTILITY ROOM EXHAUST FAN O/A INTAKE TO BE THE SAME INTAKE USED FOR GENERATOR COMBUSTION AIR.

LEGEND

TAG	SYMBOL	CONTROL POINT	PNEU.(P) ELEC.(E)	POWER	DESCRIPTION
.		-	E	-	WIRING BY ELECTRICAL TRADE CONTRACTOR
.		-	E	-	WIRING BY MECHANICAL TRADE CONTRACTOR
T	T	-	E	24V	ROOM TEMPERATURE SENSOR
.		-	E	-	ELECTRICAL TRANSFORMER 120V-24V
D1		-	-	-	OUTSIDE AIR LOW LEAKAGE DAMPER, PARALLEL
M1		-	E	24V	ELECTRIC DAMPER MOTOR, MODULATING
D2		-	-	-	EXHAUST AIR LOW LEAKAGE DAMPER, PARALLEL
M2		-	E	24V	ELECTRIC DAMPER MOTOR, MODULATING
AI	AI (******)	-	E	LV	CONTROL POINT (ANALOG IN)
DI	DI (******)	-	E	LV	CONTROL POINT (DIGITAL IN)
DO	DO (******)	-	E	LV	CONTROL POINT (DIGITAL OUT)
$	$	-	E	120V	TOGGLE SWITCH BY ELEC. CONTRACTOR

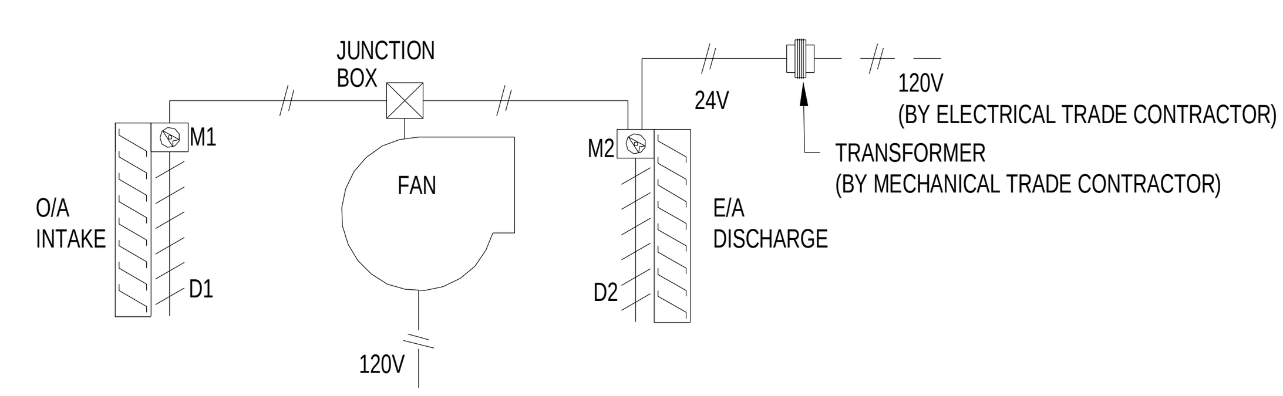
SCHEMATIC - PUMP ROOM EXHAUST FAN



SEQUENCE

THE EXHAUST FAN IN THE PUMP ROOM IS SWITCHED ON/OFF BY A LIGHT SWITCH TO PROVIDE VENTILATION WHILE THE ROOM IS OCCUPIED. THE PUMP ROOM EXHAUST FAN SHALL ALSO BE SWITCHED ON/OFF BY THE TEMPERATURE SENSOR IN THE ROOM TO PROVIDE COOLING AS REQUIRED. EXHAUST FAN TO BE SWITCHED ON WHEN THE ROOM TEMPERATURE RISES ABOVE THE 24°C SETPOINT (ADJUSTABLE). EXHAUST FAN SHALL NOT START UNTIL THE MOTORIZED DAMPERS ARE CONFIRMED OPEN. PROVIDE END SWITCHES AS REQUIRED TO FACILITATE PROPER CONTROL CONNECTIONS.

SCHEMATIC - WETWELL VENTILATION FAN



SEQUENCE

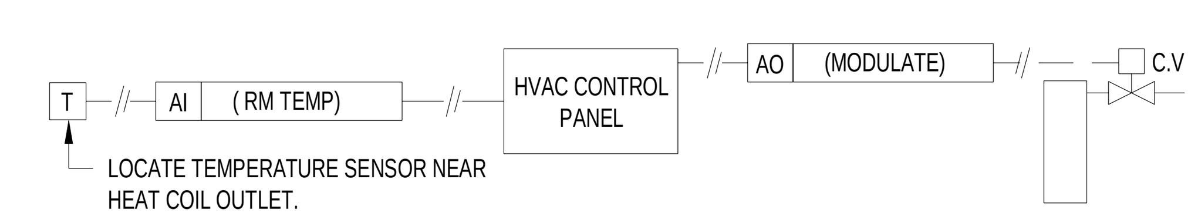
THE WETWELL VENTILATION FAN IN THE PUMP ROOM SHALL RUN CONTINUOUSLY TO PROVIDE ADEQUATE WETWELL VENTILATION. UPON VENTILATION FAILURE, THE WETWELL EXHAUST FAN SHALL NOT START UNTIL THE MOTORIZED DAMPERS ARE CONFIRMED OPEN. PROVIDE END SWITCHES AS REQUIRED TO FACILITATE PROPER CONTROL CONNECTIONS.

HYDRONIC HEAT COIL CONTROL

LEGEND

TAG	SYMBOL	CONTROL POINT	PNEU.(P) ELEC.(E)	POWER	DESCRIPTION
AO	AO (******)	-	E	LV	CONTROL POINT (ANALOG IN)
AI	AI (******)	-	E	LV	CONTROL POINT (ANALOG IN)
DO	DO (******)	-	E	LV	CONTROL POINT (DIGITAL OUT)
.		-	E	-	WIRING BY ELECTRICAL TRADE CONTRACTOR
T	T	-	E	24V	ROOM/SPACE TEMPERATURE SENSOR

SCHEMATIC



SEQUENCE

THE HEAT COIL CONTROL VALVE IS MODULATED TO MAINTAIN THE 21°C TEMPERATURE SETPOINT (ADJUSTABLE) AT THE OUTPUT OF THE HEAT COIL.

REGISTERED PROFESSIONAL ENGINEER — J.C.L. YABLECKI — LICENSEE 10/26/2021 — NT/NU

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GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

CONTROLS

PROJECT NO. 20-3940

SHEET NO. M04

PLOT DATE: 2021-10-26 4:28:10 PM
FILE NAME: U:\dms\7743\203940-07-M\PMV-CON.rvt

PART 1 - GENERAL

1.1 DRAWINGS AND SPECIFICATIONS

.1 NOT INTENDED TO SHOW STRUCTURAL DETAILS OR ARCHITECTURAL FEATURES. EXCEPT WHERE DIMENSIONED, INDICATES GENERAL MECHANICAL LAYOUTS ONLY. DO NOT SCALE.

.2 THE MECHANICAL TRADE CONTRACTOR SHALL CHECK THE CONTENT OF ALL ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS, AND REVIEW THESE DOCUMENTS FOR COORDINATION OF CLEARANCES AVAILABLE FOR EQUIPMENT AND SERVICES, REQUIRED EQUIPMENT POWER SUPPLIES AND EQUIPMENT QUANTITIES. BEFORE PROCEEDING, REPORT TO THE CONSULTANT ANY ERROR OR OMISSION, OR LACK OF COORDINATION BETWEEN THE PLANS AND SPECIFICATIONS.

.3 ALL MECHANICAL TRADE CONTRACTORS SHALL MAKE THEMSELVES FAMILIAR WITH THE OVERALL INTENDED OPERATION OF THE MECHANICAL SYSTEMS PRIOR TO INSTALLATION SO THAT ALL NECESSARY ACCESSORIES SUCH AS DAMPERS, VENTS, VALVES, CONTROLS, ETC., CAN BE INSTALLED DURING THE NORMAL PROGRESS OF THE WORK. FAILURE TO DO SO WILL RESULT IN MECHANICAL TRADE CONTRACTOR'S RESPONSIBILITY IN PROVIDING SUCH DEVICES, AT HIS EXPENSE WHEN THE NEED OF SUCH DEVICES BECOMES APPARENT DURING START-UP.

1.2 WARRANTEE

.1 THIS MECHANICAL TRADE CONTRACTOR SHALL WARRANTEE ALL HIS WORK FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR, UNLESS NOTED OTHERWISE, AFTER FINAL ACCEPTANCE OF WORK BY THE OWNER. THIS MECHANICAL TRADE CONTRACTOR SHALL WARRANTEE ALL WORK AND EQUIPMENT SUPPLIED BY HIM TO WORK QUIETLY AND SATISFACTORILY AND TO ACCOMPLISH THE WORK FOR WHICH IT WAS INSTALLED DURING THE LIFE OF THE ABOVE WARRANTEE. AT ANY TIME DURING THIS PERIOD, HE SHALL MAKE ANY NECESSARY CHANGES AND ADJUSTMENTS OR REPLACEMENTS, TO ACCOMPLISH THIS AT HIS OWN EXPENSE.

.2 SUBMIT MANUFACTURERS' WRITTEN WARRANTEE'S TO OWNER AND CONSULTANT.

1.3 PERMITS AND REGULATIONS

.1 ALL MECHANICAL TRADE CONTRACTORS SHALL COMPLY WITH ALL REGULATIONS OF AUTHORITIES HAVING JURISDICTION (AHJ), WHERE APPLICABLE, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- TERRITORIAL DEPARTMENT OF LABOUR
- TERRITORIAL FIRE MARSHAL AND OR LOCAL MUNICIPAL FIRE MARSHAL
- MUNICIPAL PLUMBING INSPECTOR

.2 THE MECHANICAL TRADE CONTRACTOR SHALL OBTAIN AND PAY FOR ANY PERMITS REQUIRED BY LOCAL CODES AND REGULATIONS AND ARRANGE FOR INSPECTIONS.

.3 IT IS NOT THE INTENTION OF THESE DRAWINGS AND SPECIFICATIONS TO REITERATE THE CODE. IT IS EXPECTED THAT THE CONTRACTOR BE KNOWLEDGEABLE OF ALL CODES AND LOCAL AHJ REQUIREMENTS. NOTIFY THE CONSULTANT OF ANY ERRORS OR OMISSIONS PRIOR TO SUBMISSION OF TENDER. OTHERWISE, NO ADDITIONAL COMPENSATION WILL BE GIVEN FOR CODE ITEMS OVERLOOKED BY THE CONTRACTOR.

1.4 CO-ORDINATION

.1 CO-ORDINATE WORK WITH OTHER TRADES TO AVOID CONFLICT.

.2 LOCATE DISTRIBUTION SYSTEMS, EQUIPMENT AND MATERIALS TO PROVIDE MINIMUM INTERFERENCE AND MAXIMUM USEABLE SPACE.

.3 CO-ORDINATE LOCATION OF DUCT DROPS, PIPE DROPS AND RISERS WITH TRADES ERECTING WALLS AND CEILINGS TO ENSURE THAT ALL PIPES AND DUCTS ARE CONCEALED IN WALLS OR CEILINGS SPACES. IF SPACE IS NOT AVAILABLE, LOCATE DUCTS AND PIPES SO THAT THEY CAN BE EASILY BOXED IN WITH COORDINATION WITH ARCHITECT AND CONSULTING CONSULTANT.

.4 EACH MECHANICAL TRADE CONTRACTOR SHALL CONSULT WITH STRUCTURAL REQUIREMENTS AND SHALL RE-ROUTE PIPES OR DUCTS OR RE-LOCATE EQUIPMENT AS REQUIRED SUBJECT TO THE APPROVAL OF THE STRUCTURAL CONSULTANT.

1.5 SHOP DRAWINGS

.1 THIS MECHANICAL TRADE CONTRACTOR SHALL PREPARE CLEAR AND CONCISE ELECTRONIC PDF SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT AND SYSTEMS FOR THIS PROJECT. ALL SHOP DRAWINGS MUST BE FIRST QUALITY REPRODUCTIONS WITH ALL DETAILS, LETTERING, ETC. DISTINCT AND LEGIBLE. MODEL NUMBERS, ITEMS AND OPTIONS MUST BE CLEARLY IDENTIFIED.

.2 THE CONSULTANTS REVIEW OF THESE DRAWINGS IS GENERAL. IT IS NOT INTENDED TO RELEASE THE MECHANICAL TRADE CONTRACTOR FROM NECESSITY OF FURNISHING SYSTEMS/EQUIPMENT OF ADEQUATE CAPACITY AND POWER SUPPLY AND PERFORMING THE WORK AS REQUIRED BY THE PLANS AND SPECIFICATIONS.

.3 ALL SHOP DRAWINGS MUST BE CHECKED AGAINST THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS BY THIS MECHANICAL TRADE CONTRACTOR PRIOR TO FORWARDING THEM TO THE CONSULTANT.

.4 SHOP DRAWINGS SHALL BE SUBMITTED IN SAME MEASUREMENT FORMAT AS THE PLANS. COMBINED METRIC AND IMPERIAL WILL BE ACCEPTABLE.

1.6 PACKAGED EQUIPMENT

.1 THE MECHANICAL TRADE CONTRACTOR SHALL NOTE THAT WHENEVER PACKAGE EQUIPMENT IS SPECIFIED, THAT THIS EQUIPMENT SHALL BE A COMPLETE PACKAGE WITH ALL NECESSARY ACCESSORIES TO ALLOW FOR SAFE AUTOMATIC OPERATION. THESE ACCESSORIES SHALL INCLUDE STARTERS, DISCONNECTS, RELAYS, TRANSFORMERS, PRESSURE SWITCHES, SENSORS, TIMERS, ETC.. WHERE SUBJECT TO THE WEATHER, THE DEVICE SHALL BE ENCLOSED IN A "WEATHERPROOF" ENCLOSURE.

.2 THE MECHANICAL TRADE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING WITH THE SUPPLIER OF THE EQUIPMENT TO ENSURE THAT THE PACKAGED EQUIPMENT IS COMPLETE WITH ALL NECESSARY ACCESSORIES. IF ACCESSORIES ARE NOT FACTORY MOUNTED AND WIRED, TRADE CONTRACTOR SHALL INCLUDE IN HIS TENDER AN AMOUNT FOR ALL NECESSARY WIRING AND PIPING, ETC.. AT NO ADDITIONAL COST TO THE OWNER.

1.7 ELECTRICAL CONNECTIONS, MOTORS AND STARTERS

.1 ELECTRICAL EQUIPMENT SHALL BEAR CSA LABEL. OBTAIN SPECIAL INSPECTION LABELS REQUIRED BY PROVINCIAL AUTHORITY HAVING JURISDICTION.

.2 THE MECHANICAL TRADE CONTRACTOR IS TO REVIEW ELECTRICAL DRAWINGS AND ENSURE THAT EQUIPMENT POWER SUPPLIES MATCH THOSE INDICATED ON THE ELECTRICAL TRADE CONTRACTORS DRAWINGS AND SPECIFICATION. BRING ALL DISCREPANCIES TO THE ATTENTION OF THE CONSULTANT PRIOR TO ORDERING EQUIPMENT.

.3 USE 1750 RPM, OPEN DRIP-PROOF, BALL BEARING MOTORS MANUFACTURED TO CEMA STANDARD FOR 70F/40C TEMPERATURE RISE AND DESIGNED FOR CONTINUOUS SERVICE AND VIBRATION FREE, QUIET OPERATION.

.4 CONFORM TO REQUIREMENTS OF CANADIAN ELECTRICAL CODE, ELECTRICAL SPECIFICATIONS, LOCAL AND MUNICIPAL AND PROVINCIAL AUTHORITIES, AND SPECIFIED STANDARDS.

1.8 CUTTING AND PATCHING

.1 CUTTING AND PATCHING TO BE PERFORMED BY THE MECHANICAL TRADE CONTRACTOR.

.2 MAKE EVERY EFFORT TO MINIMIZE CUTTING AND PATCHING AND PROVIDE DIMENSIONS, LOCATIONS AND OTHER DATA FOR BASES, SLEEVES, BOXES, ETC., TO BE BUILT IN AS CONSTRUCTION PROCEEDS. SET SLEEVES AND MAKE OPENINGS IN CONCRETE FORMS AND MASONRY BEFORE PLACING CONCRETE AND MASONRY.

1.9 ESCUTCHEONS

.1 ESCUTCHEONS AND PLATES:

.1 PROVIDE ON ALL PIPES (INCLUDING SANITARY PIPING) PASSING THROUGH FINISHED WALLS, PARTITION FLOORS AND CEILINGS.

.2 USE CHROME OR NICKEL PLATED BRASS, EITHER SPLIT OR SOLID TYPE, WITH SET SCREWS FOR CEILING OR WALL MOUNTED.

.3 INSIDE DIAMETER SHALL FIT AROUND FINISHED PIPE INSULATION OR UNINSULATED PIPE. OUTSIDE DIAMETER SHALL COVER SLEEVE AND OPENING.

1.10 PENETRATIONS of FIRE SEPARATIONS

.1 WHERE PIPES OR DUCTS PASS THROUGH WALLS OR FLOORS WHICH PROVIDE FIRE SEPARATIONS, SEAL AROUND OPENINGS WITH ULC CLASSIFIED FIRE STOP MATERIAL. MATERIAL SHALL BE INSTALLED TO MANUFACTURERS' RECOMMENDATIONS AND SHALL PROVIDE A FIRE RATING EQUAL TO THAT OF THE SEPARATION WHICH HAS BEEN PENETRATED.

.2 ACCEPTABLE PRODUCTS: DOW CORNING FIRE STOP SYSTEM; 3M FIRE BARRIER PENETRATION SEALING SYSTEM; BIO-FIRE BIOTHERM OR BIO-K10 (SUPPLIED BY WORMALD); HILTI FIRE STOP SYSTEM.

1.11 BASES AND SUPPORTS

.1 CONCRETE BASES ARE BY THE GENERAL CONTRACTOR.

.2 CONCRETE BASES WILL BE REQUIRED UNDER ALL FLOOR MOUNTED EQUIPMENT INCLUDING EQUIPMENT WITH ATTACHED SKIDS AND BASES UNLESS OTHERWISE NOTED. ALL SUCH BASES WILL BE 4" / 100 MM DEEP AND WILL BE MIN. 4" / 100 MM LARGER IN ALL DIRECTIONS THAN THE EQUIPMENT BEING SUPPORTED UNLESS NOTED.

.3 WHERE EQUIPMENT IS RAISED ABOVE THE FLOOR IT WILL BE SUPPORTED BY MEANS OF ANGLE IRON, I BEAMS OR PIPE STAND. ALL SUCH SUPPORTS SHALL BE ANCHORED TO THE FLOOR AND SHALL HAVE A METAL BASE TO SPREAD THE LOAD. THESE SUPPORTS SHALL BE CROSS-BRACED WITH DIAGONAL MEMBERS AND SIZED TO SUPPORT THE OPERATIONAL LOAD OF EQUIPMENT.

.4 WHERE EQUIPMENT IS SUSPENDED FROM THE STRUCTURE PROVIDE APPROPRIATELY SIZED HANGER RODS, CHANNEL IRON OR ANGLE IRON HANGERS. DISTRIBUTE THE WEIGHT OF THE UNITS UNIFORMLY ACROSS THE STRUCTURE, CONSISTENT WITH THE DESIGN LOADING FOR THE STRUCTURE AND AS APPROVED BY THE STRUCTURAL CONSULTANT.

.5 WHERE STRUCTURE HAS NOT BEEN DESIGNED TO SUPPORT EQUIPMENT, THIS MECHANICAL TRADE CONTRACTOR SHALL PROVIDE PIPE STANDS OR ANGLE IRON SUPPORTS TO SUPPORT THE EQUIPMENT FROM THE FLOOR.

.6 UNLESS SPECIFICALLY NOTED OTHERWISE, PROVIDE SPRING ISOLATORS UNDER ALL FLOOR MOUNTED VIBRATING, ROTATING OR OSCILLATING EQUIPMENT DESIGNED TO ELIMINATE 90% OF THE VIBRATION FROM BEING TRANSMITTED TO THE STRUCTURE. FOR SIMILAR SUSPENDED EQUIPMENT, PROVIDE SPRING HANGERS.

1.12 PAINTING

.1 PIPING, DUCTWORK AND EQUIPMENT IDENTIFICATION, GLUE AND SIZING AND TOUCH-UP PAINTING IS THE RESPONSIBILITY OF MECHANICAL TRADE CONTRACTORS.

.2 TOUCH-UP DAMAGED FINISH SURFACES TO SATISFACTION OF CONSULTANT. USE PRIMER OR ENAMEL TO MATCH ORIGINAL. DO NOT PAINT OVER NAMEPLATES.

1.13 SPECIAL TOOLS AND SPARE PARTS

.1 FURNISH SPARE PARTS AS FOLLOWS:

.1 ONE SET OF V-BELTS FOR EACH PIECE OF MACHINERY.

.2 ONE SPARE SET OF FILTERS FOR EACH FILTER BANK.

.3 TWO PRESSURE GAUGES AND TWO THERMOMETERS FOR EACH TYPE AND RANGE USED ON THE JOB.

.4 ONE SET OF PACKING OR SEAL FOR EACH PUMP.

.2 PROVIDE ONE SET OF SPECIALTIES TOOLS REQUIRED TO SERVICE EQUIPMENT AS RECOMMENDED BY MANUFACTURERS.

.3 UPON HANDOVER OF SPARE PARTS TO THE OWNER, OBTAIN THE SIGNATURE OF THE OWNER'S REPRESENTATIVE ON THE LIST OF SPARE PARTS CONFIRMING RECEIPT OF THE SPARE PARTS.

1.14 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

.1 PROVIDE FACTORY TRAINED PERSONNEL TO INSTRUCT OPERATING STAFF ON MAINTENANCE, ADJUSTMENT AND OPERATION OF MECHANICAL AND CONTROL EQUIPMENT.

.2 PROVIDE INSTRUCTION DURING REGULAR WORK HOURS PRIOR TO ACCEPTANCE AND TURN OVER TO OPERATING STAFF FOR REGULAR OPERATION.

.3 PREPARE A MAINTENANCE SCHEDULE WHICH WILL ADVISE THE OWNER'S STAFF WHAT MAINTENANCE MUST BE DONE AND THE SUGGESTED INTERVALS AT WHICH IT SHOULD BE DONE.

.4 PROVIDE THREE (3) HARD COPIES TO THE OWNER OF THE MAINTENANCE MANUAL SUITABLY BOUND WITH HARD COVERS, 8.1/2" X 11" / 216MM X 279MM. WHERE NECESSARY, PROVIDE MULTIPLE BINDERS.

.5 THE MAINTENANCE MANUAL SHALL INCLUDE THE FOLLOWING:

.1 HAVE A TITLE SHEET, OR SHEETS, PRECEDING DATA ON WHICH SHALL BE RECORDED PROJECT NAME, DATE, LIST OF CONTENTS, AND TRADE CONTRACTOR'S NAME.

.2 BE ORGANIZED INTO APPLICABLE SECTIONS OF WORK WITH EACH SECTION SEPARATED BY HARD PAPER DIVIDERS WITH PLASTIC COVERED TABS MARKED BY SECTION.

.3 CONTAIN A LIST OF LOCAL (OR NEAREST) REPRESENTATIVE OF EACH PIECE OF EQUIPMENT INCLUDING ADDRESS AND PHONE NUMBER.

.4 ONE (1) COPY OF EACH FINAL REVIEWED SHOP DRAWING ON WHICH HAVE BEEN RECORDED CHANGES MADE DURING FABRICATION AND INSTALLATION.

.5 MAINTENANCE AND OPERATING INSTRUCTIONS ON ALL BUILDING EQUIPMENT SUPPLIED BY THE MECHANICAL TRADE CONTRACTOR.

.6 BROCHURES AND PARTS LISTS ON ALL EQUIPMENT AS SUPPLIED BY THE EQUIPMENT MANUFACTURER.

.7 LISTS OF SUPPLY SOURCES FOR MAINTENANCE OF ALL EQUIPMENT IN THE PROJECT OF WHICH MORE DETAILED INFORMATION IS NOT INCLUDED ABOVE.

.8 SUBMIT ALL WARRANTEES AND EXTENDED WARRANTEES TOGETHER IN A SEPARATE BINDER.

.9 MATERIAL SAFETY DATA SHEETS (MSDS) FOR ALL CHEMICALS REMAINING AS PART OF THE FINISHED BUILDING (E.G. GLYCOL, PIPE TREATMENT, ETC.).

1.15 CLEANING MECHANICAL EQUIPMENT BEFORE USE

.1 CLEAN INTERIOR AND EXTERIOR OF ALL SYSTEMS INCLUDING STRAINERS.

1.16 AS-BUILT AND RECORD DRAWINGS

.1 MAINTAIN PROJECT "AS-BUILT" DRAWINGS AND ACCURATELY RECORD SIGNIFICANT DEVIATIONS FROM THE CONTRACT DOCUMENTS, CAUSED BY SITE CONDITION OR CONTRACT CHANGE. MARK CHANGES ON WHITE PRINTS IN "RED" AS CONSTRUCTION PROGRESSES. AT THE COMPLETION OF THE PROJECT, AND PRIOR TO FINAL INSPECTION, NEATLY TRANSFER "AS-BUILT" CORRECTIONS AND NOTATIONS TO FINAL WHITE PRINTS, AND SUBMIT TO THE CONSULTANT FOR REVIEW.

.2 AS-BUILT DRAWINGS SHALL SHOW INVERTS AT THE BEGINNING AND END OF MAIN STORM AND SANITARY BRANCHES, AND AT THE EXIT FROM THE BUILDING. THE BURIED SANITARY MAINS SHALL DIMENSIONED OFF COLUMN CENTRE LINES.

.3 RECORD DRAWINGS SHALL BE PREPARED BY THE CONSULTANT BASED ON THE CONTRACTOR'S MARKED UP AS-BUILT DRAWINGS.

.4 AS-BUILT DRAWINGS FOR AN ABOVEGROUND STORAGE TANK SYSTEM SHALL INLCUDE AT A MINIMUM THE OUTLINE OF ALL STORAGE TANKS, THE CENTERLINE OF ALL PIPING OR PIPING GROUPS, THE CENTERLINE OF ALL UNDERGROUND ELECTRICAL POWER AND MONITOR SENSOR CONDUIT, BUILDING FOUNDATION OUTLINES, SECONDARY CONTAINMENT SYSTEMS, AND PROPERTY LINES.

1.17 OWNER SUPPLIED EQUIPMENT

.1 TAKE DELIVERY OF AND INSTALL CERTAIN PIECES OF EQUIPMENT WHICH IS BEING PROVIDED BY THE OWNER OR HIS REPRESENTATIVE.

.2 PROVIDE ALL NECESSARY PIPING AND DUCT CONNECTIONS AS NECESSARY TO LEAVE THE EQUIPMENT READY FOR OPERATION.

1.18 RENOVATIONS

.1 CO-ORDINATE THE REMOVAL OR SHUTDOWN OF EXISTING SERVICES WITH THE OWNER OR THE OWNER'S REPRESENTATIVE. INDICATE INTENT TO REMOVE AND/OR DISCONNECT EXISTING SERVICES OR EQUIPMENT. BEFORE REMOVAL OF EQUIPMENT PROVIDE OWNER WITH FIRST RIGHT OF REFUSAL BEFORE DISCARDING EQUIPMENT.

.2 MAINTAIN SERVICES TO, AND RECONNECT ALL EQUIPMENT, DUCTS AND PIPES THAT REMAIN SHOULD SUCH SERVICES BE DISRUPTED DURING THE RENOVATION WORK.

.3 IT IS ASSUMED THAT ALL PIPE, DUCT AND EQUIPMENT BEING RETAINED IS SAFE AND ADEQUATE. SHOULD THE CONTRACTOR DISCOVER FAULTY OR QUESTIONABLE MATERIAL, EQUIPMENT OR WORKMANSHIP, HE SHALL NOTIFY THE CONSULTANT FOR FURTHER INSTRUCTIONS.

1.19 MANUFACTURER'S EQUIPMENT NAMEPLATES

.1 PROVIDE ON EACH PIECE OF EQUIPMENT A METAL NAMEPLATE, MECHANICALLY FASTENED WITH RAISED OR RECESSED LETTERS.

.2 LOCATE NAMEPLATES SO THAT THEY ARE EASILY READ. DO NOT INSULATE OR PAINT OVER PLATES.

.3 DISCONNECT SWITCHES SHALL NOT OBSCURE MANUFACTURER'S NAMEPLATE DATA.

1.20 SYSTEM NAMEPLATES

.1 PROVIDE LAMINATED PLASTIC PLATES WITH BLACK FACE AND ENGRAVED WITH MINIMUM 1" / 25MM HIGH WHITE LETTERING.

.2 FASTEN NAMEPLATES SECURELY IN A CONSPICUOUS PLACE TO FACILITATE EASY READING AND IDENTIFICATION FROM OPERATING FLOOR.

1.21 PIPE IDENTIFICATION

.1 IDENTIFY MEDIUM IN PIPING WITH (MARKERS OR) STENCILS SHOWING NAME AND SERVICE INCLUDING TEMPERATURE AND PRESSURE AND DIRECTIONAL FLOW ARROWS WHERE RELEVANT.

.1 LOCATE ON LONG STRAIGHT RUNS IN OPEN EXPOSED LOCATIONS AT NOT MORE THAN 50FT / 15 M INTERVALS AND MORE FREQUENTLY IF REQUIRED TO ENSURE THAT AT LEAST ONE IS VISIBLE FROM ANY ONE VIEWPOINT IN OPERATING AREAS AND WALKING AISLES. AT LEAST ONCE IN EACH ROOM THROUGH WHICH PIPING PASSES.

.2 COLOUR BANDS, ARROWS AND WRAP MARK:

.1 PLASTIC COATED CLOTH MATERIAL WITH PROTECTIVE OVER COATING AND WATERPROOF CONTACT ADHESIVE UNDERCOATING, SUITABLE FOR CONTINUOUS OPERATING TEMPERATURE OF 300F / 149C AND INTERMITTENT TEMPERATURE OF 400F / 204C.

.2 USE 2" / 50MM WIDE TAPE SINGLE WRAPPED AROUND PIPE OR PIPE COVERING WITH ENDS OVERLAPPING ONE PIPE DIAMETER BUT NOT LESS THAN 1" / 25MM FOR COLOUR BANDS. TAPE IS TO BE CUT, NOT TORN.

.3 BLOCK CAPITAL LETTERS 2" / 50MM HIGH FOR PIPES 3" / 75MM NOMINAL AND LARGER O.D. INCLUDING INSULATION AND NOT LESS THAN 3/4" / 19MM HIGH FOR SMALLER DIAMETERS TO BE USED.

.4 DIRECTION ARROWS 6" / 150MM LONG BY 2" / 50MM WIDE FOR PIPING OF 3" / 75MM NOMINAL OR LARGER O.D. INCLUDING INSULATION AND 4" LONG BY 3/4" / 19MM WIDE FOR SMALLER DIAMETERS TO BE USED. DOUBLE HEADED ARROWS TO BE USED WHERE DIRECTION OF FLOW IS REVERSIBLE.

.5 WATERPROOF AND HEAT RESISTANT PLASTIC MARKER TAGS TO BE USED FOR PIPES AND TUBING 3/4" / 19MM NOMINAL AND SMALLER O.D.

.6 USE BLACK PIPE MARKER LETTERS AND DIRECTION ARROWS. USE WHITE ON RED BACKGROUND FOR FIRE PROTECTION PIPE MARKERS.

.7 USE WRAP MARK IN LIEU OF COLOUR BAND, ARROWS AND STENCILS.

.8 ACCEPTABLE MATERIALS: SMS COIL-MARK OR EQUIVALENT.

.3 STENCILED IDENTIFICATION: AS AN ALTERNATE TO MANUFACTURED PIPE MARKERS IDENTIFICATION MAY BE STENCILED A FIRST QUALITY ENVIRONMENTALLY FRIENDLY PAINT AND COLOUR BANDS. LETTERS SHALL BE A MINIMUM OF 2" / 50MM HIGH.

PART 2 – PRODUCTS

2.1 FIRE EXTINGUISHER

.1 CONFORM TO THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION, NUNAVUT TERRITORY FIRE MARSHALL, NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND NFPA 10, STANDARD FOR PORTABLE FIRE EXTINGUISHERS.

.2 PROVIDE QUANTITY OF EXTINGUISHERS OF TYPE AND SIZE SHOWN ON THE DRAWINGS.

.3 EXTINGUISHERS TO BE ULC OR CUL LABELED.

.4 EACH EXTINGUISHER (EXCEPT THOSE DESIGNATED AS 'SPARES') TO BE SUPPLIED WITH WALL BRACKET FOR SUPPORT.

.5 ACCEPTABLE MATERIALS: AMEREX, ANSUL, BADGER, CFH, DIAMOND, FLAGG, NATIONAL FIRE EQUIP., PYRENE, STRIKE FIRST, WILSON AND COUSINS.

2.2 FIRE EXTINGUISHER WALL BRACKETS

.1 WALL MOUNT FIRE EXINGUISHERS AS INDICATED ON DRAWING USING WALL MOUNT BRACKET.

2.3 PIPE INSULATION

.1 PIPE INSULATION WILL BE PRE-FORMED GLASS FIBRE HAVING A NOMINAL DENSITY OF 3.5 LB PER FT3 / 88.11 KG/M3.

.2 JACKETING ON PIPE INSULATION WILL BE AS FOLLOWS:

.1 GLASS FIBRE REINFORCED KRAFT FOIL LAMINATE.

.2 MAXIMUM VAPOUR TRANSMISSION RATE OF 0.02 PERMS.

.3 2"/50 MM LONGITUDINAL OVERLAP JOINTS.

.4 FIRE RETARDANT HAVING A MAXIMUM FLAME SPREAD RATING OF 25 AND A MAXIMUM SMOKE DEVELOPED RATING OF 50.

.5 2"/50 MM OVERLAP BUTT JOINTS.

.6 INSULATION COVERS FOR FITTINGS WILL BE PREMOULDED P.V.C.

.7 FLEXIBLE ELASTOMERIC INSULATION SHALL BE USED ON REFRIGERANT PIPING, WITH AN ALUMINUM JACKET WHERE EXPOSED TO EXTERIOR WEATHER CONDITIONS. SIZES: 1.1/2" / 38MM AND UNDER – 1"/25MM THICK, 2"/50MM TO 3"/75MM – 2"/50MM THICK.

2.4 INSULATION COVER

.1 P.V.C.:

.1 P.V.C. INSULATION COVER SHALL ONLY BE USED ON FITTINGS AND VALVE COVERS SHALL BE TYPE II GRADE GU AND TYPE III POLYVINYL CHLORIDE.

.2 IT SHALL HAVE A FLAME SPREAD RATING LESS THAN 25 AND A SMOKE DEVELOPMENT RATING OF 50.

.3 IT SHALL HAVE A MINIMUM THICKNESS OF 0.02 MILS AND A PERMEABILITY OF NOT MORE THAN 1.3 PERMS.

.4 FITTING COVERS SHALL BE ONE PIECE, PREMOULDED. PIPE COVER SHALL BE PRECURLED.

.5 ALL JOINTS SHALL BE SEALED.

2.5 INSULATION DUCTWORK

.1 MINERAL FIBRE: AS SPECIFIED. INCLUDES GLASS FIBRE, ROCK WOOL, SLAG WOOL.

.2 THERMAL CONDUCTIVITY ("K" FACTOR) NOT TO EXCEED SPECIFIED VALUES AT 24°C MEAN TEMPERATURE WHEN TESTED IN ACCORDANCE WITH ASTM C335.

2.6 INSULATION EXTERIOR DUCT

.1 WEATHER PROOF DUCT INSULATION FOR FULL LENGTH OF EXTERIOR DUCTWORK IS TO HAVE (2) 1" LAYERS OF RIGID DUCT INSULATION C/W WATER PROOF REINFORCED ALUMINUM FOIL BITUMEN, SELF-HEALING, UV STABLE MEMBRANE 60MIL W/SELF-ADHERING STICK ADHESIVE BACKING. JOINTS TO BE OVERLAPPED ALL ENCASED IN AN EMBOSSED ALUMINUM JACKET. INSULATION TO BE RATED FOR HIGH TEMPERATURE.

2.7 INSULATION FIRE AND SMOKE RATING

.1 EXCEPT AS NOTED OTHERWISE BELOW FLAME SPREAD AND SMOKE DEVELOPMENT SHALL BE AS FOLLOWS: MAXIMUM FLAME SPREAD RATING: 25, MAXIMUM SMOKE DEVELOPED RATING: 50.

2.8 INSULATION ACCESSORIES

.1 STAINLESS STEEL WIRE, 18 GAUGE, TYPE 304, DEAD SOFT ANNEALED.

.2 GALVANIZED WIRE, 15 GAUGE, ANNEALED.

.3 STAINLESS STEEL MESH, HEXAGONAL MESH, 20 GAUGE, TYPE 204.

.4 GALVANIZED MESH, HEXAGONAL MESH, 15 GAUGE, GALVANIZED ANNEALED.

.5 ALUMINUM STRAPS, WILL BE 1/2" X 0.02" / 12 MM X 0.51 MM.

.6 STAINLESS STEEL STRAPS, WILL BE 1/2" X 0.02" / 12 MM X 0.51 MM, TYPE 304, DEAD SOFT.

.7 LAGGING ADHESIVE, WILL BE PERMASTIK 2001 OR SEALFAST 30.36.

.8 VAPOUR BARRIER MASTIC, WILL BE BENJAMINE FOSTER 8207 OR FLINTKOTE 23004.

2.9 INSULATION PRODUCTS

.1 ACCEPTABLE MATERIALS: FIBREGLASS CANADA, SCHULLER, KNAUF FIBRE GLASS, CERTAINTEED, MANSON, BAKOR, PREMIER REFRACTORIES (CERAMIC FIBRE), JOHNS MANVILLE.

2.10 PIPING

.1 WATER PIPING ABOVE GRADE

.1 PIPE: TYPE L COPPER CONFORMING TO ASTM B88-93A.

.2 FITTINGS: WROUGHT COPPER OR CAST BRASS ON COPPER TUBING.

.3 JOINTS: LEAD-FREE SOLDER. FOR PIPES 2"/50MM AND LARGER SILFOS SHALL BE USED. UNIONS AT FIXTURES.

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REGISTERED PROFESSIONAL ENGINEER J.C.L. YABLECKI LICENSEE 10/26/2021 NT/NU

ISSUED FOR CONSTRUCTION

Canada

Nunavut

DILLON CONSULTING

NO.	ISSUED FOR	DATE	BY
2	ISSUED FOR CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN: SMC	REVIEWED BY: JY
DRAWN: SMC	CHECKED BY: SM
DATE: OCTOBER 2021	
SCALE: 1 : 25	

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

SPECIFICATIONS

PROJECT NO. 20-3940

SHEET NO. M05

.2 WATER PIPING BELOW GRADE 2.1/2"/65MM & LARGER

.1 PIPE: DUCTILE IRON CEMENT LINED, CLASS 2 TO ANSI/AWWA C151/A21.51

.2 FITTINGS: DUCTILE IRON TO ANSI/AWWA C111/A21.10.93

.3 JOINTS: TO ANSI/AWWA C110/A21.11

.3 WATER PIPING BELOW GRADE 1"/25MM TO 2"/50MM

.1 PIPE: TYPE "K" COPPER CONFORMING TO ASTM B88-93A.

.2 FITTINGS: WROUGHT COPPER OR CAST BRASS.

.3 JOINTS: SILFOS SOLDER. UNIONS AT FIXTURES.

.4 SANITARY / STORM DRAINAGE PIPING BELOW GRADE PLASTIC

.1 PIPE: P.V.C. CONFORMING TO CAN/CSA-B.181.2 WITH A SIZE TO DIAMETER RATIO (SDR) OF 35 OR LESS.

.2 FITTINGS: SAME AS PIPE.

.3 JOINTS: SOLVENT WELD OR GASKETTED BELL & SPIGOT.

.5 SANITARY / STORM / VENT PIPING ABOVE GRADE (3"/75MM AND LARGER)

.1 PIPE: CAST IRON CONFORMING TO CAN/CSA-B70-M91.

P.V.C. DWV CONFORMING TO CAN/CSA-B181.2-M90.

.2 FITTINGS: SAME AS PIPE.

.3 JOINTS: MECHANICAL JOINT OR SOLVENT WELD ON P.V.C. DWV.

.6 SANITARY / STORM / VENT PIPING ABOVE GRADE (2.1/2"/65MM AND SMALLER)

.1 PIPE: DWV COPPER CONFORMING TO ASTM/B306. P.V.C. DWV CONFORMING TO CAN/CSA-B181.2-M90 AND NBC SUB-SECTION 3.1.10.

.2 FITTINGS: COPPER - CAST BRASS CONFORMING TO CAN/CSA-B125.93. P.V.C. DWV SAME AS PIPE.

.3 JOINTS: COPPER – 50/50 SOLDERED, SCREWED AT FIXTURES. P.V.C. DWV SOLVENT WELD.

.7 HOT WATER HEATING PIPING

.1 PIPE: 2"/50MM & SMALLER - BW STEEL, SCH. 40, ASTM-A53, GRADE B 2.1/2" / 65MM & LARGER - ERW STEEL, SCH. 40, ASTM-A53, GRADE B

.2 CONSTRUCTION: 2"/50MM & SMALLER - THREADED. 2.1/2" / 65MM & LARGER - WELDED, FLANGED OR VALVES AT EQUIPMENT.

.3 FITTINGS: 2"/50MM & SMALLER - STANDARD MALLEABLE IRON, THREADED. 2.1/2" / 65MM & LARGER - SCH. 40 STEEL BUTT WELDING ASTM-A234, GRADE A, WELD-O-LETS OR EQUAL. FITTINGS FOR CHEMICAL POT FEEDER PIPING TO USE CROSSES IN LIEU OF 90O ELBOWS WITH UNUSED OPENING PLUGGED.

.4 FLANGES: ALL - CLASS 150 STEEL SLIP-ON OR WELD NECK TYPE, RAISED FACE, ASTM-A181.

.5 BOLTS: STUD BOLTS, CARBON STEEL, HEAVY HEX NUTS.

.6 UNIONS: 2.1/2" / 65MM & SMALLER - CLASS 150 MALLEABLE IRON, BRASS TO IRON SEATS.

.7 GASKETS: ALL -3/32" / 2MM THICK CRANITE OR APPROVED EQUAL.

.8 FUEL OIL PIPING

.1 PIPE: STEEL, ASTM A53, SCHEDULE 40, CONTINUOUS WELD OR ERW. COPPER, TYPE L, SOFT COPPER, IN LONG LENGTHS FOR FINAL CONNECTION TO BURNER.

.2 JOINTING MATERIAL: STEEL FITTINGS: SOCKET WELD, COPPER FITTINGS: SILFOS.

.3 FITTINGS: STEEL: BUTT-WELDING TO ANSI/ASME-B16.9. UNIONS: MALLEABLE IRON, BRASS TO IRON, GROUND SEAT, SCREWED, TO ASTM A47M. COPPER: COPPER FITTINGS.

.4 FILL AND VENT MATERIALS AS PER CSA B139, CEPA SOR/2008-197, NFCC. STEEL TO ASTM A53/A53M, SCHEDULE 40, CONTINUOUS WELD OR ELECTRIC RESISTANCE WELDED.

2.11 PIPE HANGERS

.1 EQUIVALENT TO FOLLOWING:

.1 CAST IRON PIPING: MYATT FIG. 124 OR BIBBY STEEL SUPPORT HANGER 6600 SERIES.

.2 PVC: MYATT FIG. 124, OR BIBBY STEEL SUPPORT HANGER 6600 SERIES.

.3 COPPER PIPE: MYATT FIG. 151CT OR MYATT FIG. 124L WITH TAPED OR PLASTIC HANGERS, INSIDE I INSULATION.

.4 HOT WATER PIPING – MYATT 124L INSIDE INSULATION, MYATT 124 OUTSIDE INSULATION.

.5 WALL MOUNTED PIPES B MYATT FIG. 321 WELDED STEEL BRACKET.

.6 PIPE ROLL - HANGERS MYATT FIG. 258/261.

.7 RISER CLAMPS: COPPER PIPE – MYATT FIG. 150CT, STEEL/PVC MYATT FIG. 182/183.

2.12 DI-ELECTRIC UNIONS

.1 ALL CONNECTIONS BETWEEN STEEL AND COPPER OR BRASS FOR PIPE 2"/50MM AND SMALLER SHALL BE MADE OF DI-ELECTRIC UNIONS, EXCEPT ON ALL CLOSED SYSTEMS. ON PIPE 2.1/2" / 65MM AND LARGER USE FLANGED CONNECTIONS WITH NON-METALLIC GASKET AND PLASTIC SLEEVES FOR BOLTS.

.2 ACCEPTABLE MATERIALS: WATTS 3000 SERIES OR EQUIVALENT

2.13 VALVES

.1 ALL VALVES, SHALL BE OF ONE MANUFACTURER AND SHALL HAVE THE MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON THE OUTSIDE OF THE BODY.

.2 THE METALS USED IN THE BODIES, BONNETS, YOKES, AND DISCS OF ALL THE BRONZE VALVES SHALL CONFORM TO ASTM-B62. IN IRON BODY VALVES, THE CAST IRON SHALL CONFORM TO ASTM-A126, CLASS B. ON DOMESTIC WATER SYSTEMS THE VALVE IS TO MEET LEAD FREE REQUIREMENTS.

.3 COMPOSITION DISC ON ALL VALVES SHALL BE SUITABLE FOR THE SERVICE AND SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

.4 USE GLOBE VALVES FOR BY-PASSES THAT ARE THE SAME SIZE AS CONTROL VALVES AND PRESSURE REDUCING STATIONS.

.5 FOR SHUT OFF AND CONTROL USE BALL VALVES FOR PIPE 2"/50MM AND SMALLER. FOR PIPE LARGER THAN 2"/50MM USE BUTTERFLY VALVES.

2.14 CIRCUIT BALANCING VALVES (C.B.V's)

.1 SHALL BE CALIBRATED BRONZE BALANCE VALVE WITH PROVISIONS FOR CONNECTING A PORTABLE DIFFERENTIAL PRESSURE METER AS SHOWN ON THE PLANS. METER CONNECTIONS TO HAVE BUILT-IN CHECK VALVES. AN INTEGRAL POINTER SHALL REGISTER DEGREE OF VALVE OPENING. EACH BALANCE VALVE TO BE CONSTRUCTED WITH INTERNAL SEALS TO PREVENT LEAKAGE AROUND ROTATING ELEMENT, AND BE SUITABLE FOR SHUT-OFF TO PERMIT EQUIPMENT SERVICING. EACH VALVE SHALL BE CONSTRUCTED FOR 300 LBS/136 KG WORKING PRESSURE AT 250F/121C AND BE SUPPLIED WITH PREFORMED POLYURETHANE INSULATION SUITABLE FOR USE ON HEATING AND COOLING SYSTEMS.

.2 ACCEPTABLE MATERIALS: BELL & GOSSETT, ARMSTRONG, TACO, TOUR & ANDERSON.

2.15 SAFETY AND RELIEF VALVES

.1 SAFETY VALVES OF THE CORRECT RATING FOR EQUIPMENT TO BE PROTECTED.

.2 ACCEPTABLE MATERIALS: CONSOLIDATED FIG. 1541 OR FIG. 1511.

2.16 FUEL OIL VALVES

.1 GATE VALVES: 2"/50 MM AND UNDER, SOCKET WELD.

.1 RISING STEM: TO MSS-SP-80, CLASS 125, 125 PSI / 860 KPA , BRONZE BODY, SOLID WEDGE DISC.

.2 ACCEPTABLE MATERIALS: KITZ 24, CRANE, JENKINS.

.2 GLOBE VALVES: 2"/50 MM AND UNDER, SOCKET WELD.

.1 TO MSS-SP-80, CLASS 125, 125 PSI / 860 KPA, BRONZE BODY, THREADED OVER BONNET, RENEWABLE COMPOSITION DISC SUITABLE FOR OIL SERVICE.

.2 LOCKSHIELD HANDLES: AS INDICATED.

.3 ACCEPTABLE MATERIALS: KITZ 03, CRANE, JENKINS.

.3 BALL VALVES: 2"/50 MM AND UNDER, SOCKET WELD.

.1 BRONZE BODY, SCREWED ENDS, TEF SEAL, HARD CHROME BALL, 600 PSI / 4137 KPA, WOG.

.4 SWING CHECK VALVE: 2"/50 MM AND UNDER, SOCKET WELD.

.1 TO MSS-SP-80, CLASS 125, 125 PSI / 860 KPA, BRONZE BODY, BRONZE SWING DISC, THREADED CAP, REGRINDABLE SEAT.

.2 ACCEPTABLE MATERIALS: KITZ 22, CRANE, JENKINS.

2.17 DRAINS

.1 DAHL #21.616 WITH CAP AND CHAIN ON RADIATION.

.2 ON ALL MAINS AND RISERS DAHL #50.430 BALL VALVE WITH CUP AND CHAIN.

2.18 STRAINERS

.1 "Y" PATTERN, FULL SIZE OF PIPE, 2"/50MM AND SMALLER, THREADED; 2.1/2" / 65MM AND LARGER, FLANGED. STRAINERS SHALL HAVE MONEL PERFORATED SCREENS AND EQUAL TO THE FOLLOWING SARCO CAT. NOS.: UP TO 2"/50MM - TYPE SB, CLASS 125, 2.1/2" / 65MM AND UP - TYPE D, CLASS 125.

.2 ACCEPTABLE MATERIALS: SARCO, CRANE, DUNHAM-BUSH, BRAUKMANN, WATTS, VICTAULIC (WHERE GROOVED PIPING IS USED).

2.19 PLUMBING SPECIALTIES

.1 FLOOR DRAINS (FD'S)

.1 STRAINERS SHALL BE NICKEL BRONZE IN FINISHED AREAS.

.2 DRAINS SHALL HAVE A CAST IRON COLLAR.

.3 ACCEPTABLE MATERIALS:

.1 UNFINISHED AREAS: EQUIVALENT TO ZURN ZXN211-A

.2 FUNNEL: EQUIVALENT TO ZURN ZN211-BF C/W TYPE "F" FUNNEL.

.2 CLEANOUTS (CO'S)

.1 FLOOR CLEANOUTS SHALL HAVE AN ADJUSTABLE TOP AND SEAL PLUG.

.2 CLEANOUTS FOR FINISHED AREAS SHALL HAVE NICKEL BRONZE TOPS.

.3 ACCEPTABLE MATERIALS:

.1 FLOOR: EQUIVALENT TO ZURN Z1602.

.3 REDUCED PRESSURE BACKFLOW PREVENTERS (RPBFP'S)

.1 REDUCED PRESSURE TYPE SUITABLE FOR PRESSURES UP TO 175PSI/1200 KPA AND TEMPERATURES UP TO 110F/45C.

.2 PIPE SIZES UP TO 2"/50MM, EQUIVALENT TO WATTS 009 C/W 1"/25MM AIR GAP FITTING.

.3 PIPE SIZES 2"/50MM AND UP, EQUIVALENT TO WATTS 909 C/W 1"/25MM AIR GAP FITTING.

.4 WATER HAMMER ARRESTORS (WHA'S)

.1 PROVIDE WHERE INDICATE ON DRAWINGS ON HOT AND COLD WATER PIPING.

.2 ARRESTORS SHALL BE SIZED IN ACCORDANCE WITH P.O.I. STANDARD WH201 WHERE NOT INDICATED ON THE DRAWINGS.

.3 ACCEPTABLE MATERIALS: ZURN Z-1700.

.5 HOSE BIBBS (HB'S)

.1 HOSE BIBS TO HAVE INTEGRAL BACK FLOW PREVENTER, BE SELF-DRAINING AND C/W REMOVABLE KEY HANDLE OPERATOR.

.2 ACCEPTABLE MATERIALS:

.1 OUTSIDE WALL EXPOSED; ZURN Z1310

.2 OUTSIDE WALL, ENCASED: ZURN ZN-1320

.3 INSIDE: CRANE C-5046

2.20 THERMOMETERS

.1 ADJUSTABLE TYPE, 9"/225MM METAL CASE, CALIBRATED IN DEGREES F AND DEGREES C WITH RANGE TO SUIT THE NORMAL OPERATING TEMPERATURE OF THE FLUID.

.2 ACCEPTABLE MATERIALS: WINTERS INDUSTRIAL 91T ALUMINUM CASE, ADJUSTABLE ANGLE.

2.21 PRESSURE GAUGES

.1 GLYCERIN FILLED AND MIN. 4"/100MM DIAMETER.

.2 ACCURACY OF +/-1.5% AND CALIBRATED IN PSI AND KPA WITH RANGE TO SUIT THE NORMAL OPERATING PRESSURE OF THE FLUID.

.3 ALL GAUGES TO BE COMPLETE WITH A GAUGE COCK AND SNUBBER.

.4 ACCEPTABLE MATERIALS: WINTERS LF SERIES.

2.22 AIR VENTS

.1 FLOAT TYPE AUTOMATIC AIR ELIMINATORS AT ALL HIGH POINT IN THE PIPING SYSTEM.

.2 RATED FOR 150PSI/690KPA OPERATING PRESSURE.

.3 ON ALL RADIATION UNITS PROVIDE MANUAL TYPE AIR VENTS. ON FIN TYPE RADIATION PROVIDE EXTENSION CABLE SO THAT AIR VENT MAY BE OPERATED WITHOUT MOVING CABINET COVER.

.4 ACCEPTABLE MATERIALS: MAID-O-MIST SERIES 72 SCREWDRIVER OPERATED. MAID-O-MIST SERIES 75 FOR AUTOMATIC

2.23 FUEL OIL FILTER

.1 REPLACEABLE CARTRIDGE TYPE AS RECOMMENDED BY OIL BURNER MANUFACTURER.

.2 FURNISH A SPARE FILTER FOR EACH BURNER.

2.24 PRE-CHARGED EXPANSION TANKS

.1 PRE-CHARGED EXPANSION TANK OF THE SIZE AND CAPACITY INDICATED IN DRAWINGS. TANK TO BE SUITABLE FOR 100PSI/690 KPA.

.2 TANK TO BE PRE-CHARGED AS REQUIRED TO SUIT SYSTEM REQUIREMENTS. DIAPHRAGM TYPE TO BE USED FOR ACCEPTANCE VOLUME LESS THAN 35USGAL / 132L, BLADDER TYPE TO BE USED FOR ACCEPTANCE VOLUMES OVER 35USGAL / 132L. TANKS TO BE SUITABLE FOR USE WITH PROPYLENE GLYCOL WHERE REQUIRED.

.3 DRAINS TO DISCHARGE TO A FLOOR DRAIN EXCEPT PROPYLENE GLYCOL SYSTEMS BACK TO GLYCOL FILL SYSTEM.

.4 TANK TO BE COMPLETE WITH SUITABLE SUPPORTS.

.5 TANK TO BE COMPLETE WITH AUTOMATIC FILL.

.6 PROVIDE A LOCKSHIELD ISOLATION VALVE FOR EACH EXPANSION TANK.

.7 ACCEPTABLE MATERIALS: TACO CX SERIES (DIAPHRAGM) AND CA SERIES (BLADDER).

2.25 AUTOMATIC WATER FEEDER

.1 1"/25MM OR 3/4" / 19MM AUTOMATIC WATER FEEDER COMPLETE WITH CHECK VALVES, STRAINER, RELIEF VALVE, AND REDUCED PRESSURE BACKFLOW PREVENTER.

.2 STANDARD OF ACCEPTANCE: WATTS N256.

2.25 GLYCOL MAKE-UP PACKAGE

.1 PROVIDE A PROPYLENE GLYCOL MAKE-UP SYSTEM FOR THE HEATING SYSTEM.

.2 SYSTEM SHALL CONSIST OF A SELF-PRIMING DIAPHRAGM. PUMP SHALL BE BRONZE WITH STAINLESS STEEL SHAFT, WITH FLEXIBLE HOSE FOR SUCTION AND DISCHARGE, INLET STRAINER, RELIEF VALVE. HAVE A 48 GALLON/181L, POLYPROPYLENE MIXING TANK COMPLETE WITH COVER, STAND AND DRAIN VALVE.

.3 UNIT SHALL BE COMPLETE WITH ADJUSTABLE PRESSURE SWITCH, PRESSURE GAUGE, CHECK VALVE, STARTERS ALL PREWIRED FOR A SINGLE POINT POWER CONNECTION

.4 ACCEPTABLE MATERIALS: AXIOM SF-100.

2.26 PLUMBING FIXTURES AND TRIM

.1 PLUMBING FIXTURES SHALL BE THE PRODUCT OF ONE MANUFACTURER. ALL FIXTURES ARE TO BE WHITE.

.2 ACCEPTABLE MATERIALS: KOHLER, ZURN, CRANE, AMERICAN STANDARD.

.3 TRIM SHALL HEAVY DUTY PATTERN FOR INSTITUTIONAL USE AND BE OF ONE MANUFACTURER.

.4 ACCEPTABLE MATERIALS: ZURN, CRANE, AMERICAN STANDARD, MOEN, WALTEC, BRASSCRAFT, OS&B, DELTA/CAMBRIDGE BRASS, CHICAGO FAUCET, KOHLER, SLOAN, SYMMONS, MCGUIRE, AND EQUAL IN QUALITY TO THE SPECIFIED PRODUCT.

.5 MATERIALS: VITREOUS CHINA TO C.S.A. B45.1-94. STAINLESS STEEL FIXTURES TO C.S.A. B45.494 CLASS II, TYPE 302 IN ACCORDANCE WITH C.S.A. G110.61978 UNLESS OTHERWISE STATED.

.6 CARRIERS TO BE PROVIDED FOR ALL WALL MOUNTED FIXTURES.

2.27 HOT WATER/GLYCOL UNIT HEATER

.1 UNIT HEATERS SHALL BE OF 16 GAUGE STEEL WITH ALL CORNERS ROUNDED, HAVE A GLOSS ENAMEL FINISH AND THREADED CONNECTIONS FOR HANGER ROD.

.2 COILS SHALL BE CONSTRUCTED FROM SEAMLESS COPPER TUBING MECHANICAL BONDED ALUMINUM FINS EVENLY SPACED. COILS SHALL BE OF THE FLAT PLATE TYPE. COILS SHALL BE TESTED TO A MINIMUM OF 175PSI / 1200 KPA.

.3 FANS SHALL BE OF THE STANDARD PROPELLER TYPE MACHINED AND BALANCED TO ELIMINATE VIBRATION.

.4 MOTORS SHALL BE TOTALLY ENCLOSED OF STANDARD PATTERN FOR THE DUTY. MOTORS SHALL BE MOUNTED OUT OF THE HEATER AIR STREAM. EACH UNIT SHALL BE EQUIPPED WITH A MULTIPLE LOUVERED TYPE ADJUSTABLE DIFFUSER.

.5 CONTROL SHALL BE PROVIDED AS INDICATED ON THE CONTROL DIAGRAMS AND CONTROL SEQUENCE.

.6 ACCEPTABLE MATERIALS: TRANE, SIGMA, ROSEMEX, DUNHAM-BUSH, CONSULTANTED AIR.

2.28 BREECHING

.1 SUPPLY AND INSTALL BREECHING FROM THE BOILERS TO THE STACK. BREECHING SHALL BE MADE OF 10 GAUGE, ALL WELDED, BLACK IRON PLATE, COMPLETE WITH ALL NECESSARY TAPS FOR DRAUGHT GAUGES, TEMPERATURE INDICATORS, ETC. AND ALL NECESSARY CLEANOUT OPENINGS.

.2 ALL BREECHING CONNECTIONS TO BE MADE AT 45 DEGREES

2.29 CHIMNEYS

.1 PRE-INSULATED, DOUBLE WALLED, METAL CHIMNEY OF THE SIZE INDICATED ON THE DRAWINGS.

.2 CHIMNEY TO BE 5 FT./1.5M HIGH MEASURED ABOVE ROOF LINE.

.3 CHIMNEY TO HAVE A STAINLESS STEEL INNER CASING, (ALUMINUMIZED STEEL / TYPE 316 STAINLESS STEEL) O UTER CASING AND TO BE COMPLETE WITH ALL NECESSARY SUPPORTS, GUY WIRES, DRAINS, CLEAN OUTS, ETC..

.4 ACCEPTABLE MATERIALS: SELKIRK.

2.30 DUCTWORK

.1 GENERAL:

.1 ALL DUCTWORK AND HANGERS SHALL BE CONSTRUCTED TO ASHRAE AND SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS.

.2 RECTANGULAR DUCTWORK:

.1 RECTANGULAR DUCT SHALL BE GALVANIZED STEEL UNLESS ROUTED IN THE WETWELL OR IN THE PUMP ROOM IN WHICH CASE STAINLESS STEEL DUCTWORK SHALL BE USED.

.2 HANGER RODS MUST BE ATTACHED TO THE SHELF ANGLE WITHIN 2"/50MM OF THE DUCT ON BOTH SIDES.

.3 FOR DUCTS 20"/500MM AND SMALLER, 1"/25MM WIDE STRAP HANGERS EXTENDING DOWN TWO SIDES OF THE DUCT AND A MINIMUM OF 6"/150MM UNDER THE BOTTOM OF THE DUCT MAY BE USED.

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REGISTERED PROFESSIONAL ENGINEER
J.C.L. YABLECKI
LICENSEE
10/26/2021
NT/NU

ISSUED FOR CONSTRUCTION

Canada

Nunavut

DILLON CONSULTING

NO.	ISSUED FOR	DATE	BY
2	ISSUED FOR CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN: SMC	REVIEWED BY: JY
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DATE: OCTOBER 2021	
SCALE: 1 : 25	

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

SPECIFICATIONS

PROJECT NO. 20-3940

SHEET NO. M06

.4 STRAP HANGERS MUST BE ATTACHED TO THE DUCT A MAXIMUM OF 2"/50MM FROM THE CORNER AND AT MAXIMUM OF 48"/1200MM CENTRES. HANGERS SHALL BE THE SAME MATERIAL AS THE DUCT

.5 LONGITUDINAL JOINTS SHALL BE PITTSBURG LOCKED OR BUTTON PUNCH SNAP LOCK AND SHALL MEET SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS.

.6 DUCTS 18"/450MM WIDE AND LARGER SHALL BE CROSS BROKEN OR BEADED.

.7 ON DUCTS WHICH WILL BE UNDER NEGATIVE PRESSURE DUCTS WILL BE CROSS BROKEN FOR INWARD DEFLECTION.

3. ROUND DUCT:

.1 ROUND DUCTWORK SHALL BE GALVANIZED STEEL OF THE FOLLOWING U.S. STANDARD GAUGES UNLESS ROUTED IN THE WETWELL OR IN THE PUMP ROOM IN WHICH CASE STAINLESS STEEL DUCTWORK SHALL BE USED.

.1 DUCT DIAMETER: 3"/75MM - 8"/200MM, SPIRAL DUCT GAUGE 28, PLAIN DUCT GA. 24.

.2 DUCT DIAMETER: 9"/225MM - 14"/350MM, SPIRAL DUCT GAUGE 26, PLAIN DUCT GA. 24.

.3 DUCT DIAMETER: 15"/375MM - 26"/650MM, SPIRAL DUCT GAUGE 24, PLAIN DUCT GA. 22.

.2 ON CONCEALED DUCTS UP TO 16"/400MM DIAMETER LONGITUDINAL JOINTS ARE PERMITTED, IN ACCORDANCE WITH SMACNA TYPE RL4 OR SMACNA TYPE RL5.

.3 CONCEALED ROUND DUCTS OVER 16"/400MM DIAMETER AND ALL EXPOSED ROUND DUCTS SHALL BE FACTORY FABRICATED CONDUIT CONSISTING OF HELICALLY WOULD GALVANIZED IRON STRIPS WITH SPIRAL LOCK SEAMS. FITTINGS FOR THESE CONDUITS SHALL BE FABRICATED OF 20 GAUGE GALVANIZED SHEET STEEL WITH BUTT WELDED SEAMS OF STANDARD DIMENSIONS.

.4 ALL LONGITUDINAL JOINTS ARE TO BE SEALED WITH DUCT SEALER OR ALUMINUM TAPE.

.5 TRANSVERSE JOINTS BEADED CRIMP JOINTS WITH AT LEAST 1"/25MM LAP TO ACCOMMODATE SCREWS AT 15"/375MM CENTRES OR A MINIMUM OF 3 PER JOINT.

.6 LONG RADIUS ELBOWS SHALL BE USED WHERE SPACE PERMITS. WHERE 90DEG. TAKE-OFFS ARE NECESSARY, CONICAL T'S SHALL BE USED.

.4 MECHANICAL JOINT DUCTWORK:

.1 IN LIEU OF THE CONSTRUCTION SPECIFIED FOR GALVANIZED RECTANGULAR DUCTWORK, TRANSVERSE JOINTS MAY BE MADE USING A MECHANICAL JOINT SYSTEM.

.2 INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.

.3 ALL GASKETS SHALL HAVE ADHESIVE ON BOTH SIDES.

.4 ACCEPTABLE MATERIALS: DUCTMATE 25R FOR UP TO 30"/750MM, DUCTMATE 35R FOR 31"/775MM AND LARGER.

2.31 FLEXIBLE DUCTWORK

.1 UL LISTED FOR CLASS 1 AIR DUCT MATERIAL, UL181.

.2 IN ACCORDANCE WITH NFPA STANDARD 90A.

.3 CONSTRUCTED OF CORROSION RESISTANT, COATED SPRING WIRE BONDED TO A WOVEN FIBRE GLASS IMPREGNATED FABRIC OR 22 MIL P.V.C. CLOTH.

.4 CAPABLE OF OPERATING PRESSURES OF 10"/2.49 KPA POSITIVE AND 2"W.G./0.5 KPA NEGATIVE.

.5 CAPABLE OF OPERATING TEMPERATURES OF FROM 18OC TO 93OC.

.6 ACCEPTABLE PRODUCTS: DYN-AIR, THERMAFLEX M-KE OR ATLAS TYPE LD, INSULATED, FOR BOTH INSULATED AND NON-INSULATED DUCT SYSTEMS.

2.32 DUCT SEALERS AND TAPES

.1 DUCT SEALERS WILL CONSIST OF WOVEN FABRIC MATERIAL COATED WITH A SEALANT WHICH WILL BE:

.1 WATER RESISTANT; COMPATIBLE WITH DUCT MATERIALS; SUITABLE FOR THE SERVICE INVOLVED; MEET ULC S102 ; FLAME SPREAD RATINGS OF 25 AND MAXIMUM SMOKE DEVELOPED RATING OF 50; NONTOXIC.

.2 STANDARD OF ACCEPTANCE: BAKOR DUCK-SEAL.

2.33 FLEXIBLE CONNECTIONS

.1 FLEXIBLE CONNECTIONS SHALL BE AS FOLLOWS:

.1 HEAVY GLASS FABRIC DOUBLE COATED WITH NEOPRENE; NON-COMBUSTIBLE; WEATHERPROOF AND AIR TIGHT; RESISTANT TO ACIDS, GREASE, ALKALINE, OIL AND GASOLINE; ACCEPTABLE FOR TEMPERATURES OF UP TO 200°F/93°C.

.2 THE FLEXIBLE CONNECTIONS WILL BE PRE-ASSEMBLED OF 24 GAUGE GALVANIZED METAL CLINCHED BY MEANS OF A DOUBLE LOCK SEAM TO EACH SIDE OF THE FABRIC.

.3 ACCEPTABLE MATERIALS: DURO DYNE, NEOPRENE.

2.34 BALANCING DAMPERS

.1 SINGLE BLADE DAMPERS:

.1 OF SAME MATERIAL AS DUCT, BUT ONE SHEET METAL THICKNESS HEAVIER. V-GROOVE STIFFENED.

.2 SIZE AND CONFIGURATION TO RECOMMENDATIONS OF SMACNA.

.3 LOCKING QUADRANT WITH SHAFT EXTENSION TO ACCOMMODATE INSULATION THICKNESS.

.4 INSIDE AND OUTSIDE NYLON OR BRONZE END BEARINGS.

.5 CHANNEL FRAME OF SAME MATERIAL AS ADJACENT DUCT, COMPLETE WITH ANGLE STOP.

.2 MULTI-BLADE DAMPERS:

.1 FACTORY MANUFACTURED OF MATERIAL COMPATIBLE WITH DUCT.

.2 OPPOSED BLADE: CONFIGURATION, METAL THICKNESS AND CONSTRUCTION TO RECOMMENDATIONS OF SMACNA.

.3 MAXIMUM BLADE HEIGHT: 4"/100MM.

.4 BEARINGS: PIN IN BRONZE BUSHINGS OR SELF-LUBRICATING NYLON.

.5 LINKAGE: SHAFT EXTENSION WITH LOCKING QUADRANT.

.6 CHANNEL FRAME OF SAME MATERIAL AS ADJACENT DUCT, COMPLETE WITH ANGLE STOP.

2.35 CONTROL DAMPERS

.1 MINIMUM 12 GAUGE EXTRUDED ALUMINUM FRAMES AND AIR FOIL BLADES. FRAMES SHALL BE 4"/100MM DEEP. BLADES SHALL BE 16 GAUGE AND SHALL NOT EXCEED 6"/150MM WIDE OR 4FT/1200MM LONG. MODULAR MAXIMUM SIZE IS 4FT X 4FT./1200MM X 1200MM MULTIPLE SECTIONS SHALL HAVE STIFFENING MULLIONS AND JACK SHAFTS.

.2 DAMPERS TO BE EXTREME COLD RATED.

.2 EXTRUDED SYNTHETIC RUBBER BLADE AND FRAME SEALS.

.3 ALUMINUM AND CORROSION RESISTANT ZINC PLATED STEEL LINKAGE LOCATED OUT OF THE AIR STREAM.

.4 CELCON INNER BEARING IN A POLYCARBONATE OUTER BEARING COMPLETE WITH A 2"/50MM SHAFT.

.5 LEAKAGE SHALL NOT EXCEED 0.6% OF RATED AIR FLOW AT 10"W.G./2.49 KPA ACROSS DAMPER.

.6 PRESSURE DROP SHALL NOT EXCEED 0.036"W.G./90PA AT 1000 FPM / 5.0M/S FACE VELOCITY FOR A 24" X 24" / 600MM X 600MM DAMPER.

.7 ACCEPTABLE MATERIALS: TAMCO SERIES 1000, RUSKIN.

2.36 EXHAUST FANS

.1 GENERAL:

.1 STATICALLY AND DYNAMICALLY BALANCED. CONSTRUCTED IN CONFORMITY WITH AMCA 99.

.2 SOUND RATINGS: COMPLY WITH AMCA 301, TESTED TO AMCA 300. UNIT SHALL BEAR AMCA CERTIFIED SOUND RATING SEAL.

.3 PERFORMANCE RATINGS: BASED ON TESTS PERFORMED IN ACCORDANCE WITH ANSI/AMCA 210, AND ANSI/ASHRAE 51, UNIT TO BEAR AMCA CERTIFIED RATING SEAL.

.4 FANS SHALL BE UL AND CUL LISTED PER UL 705 SAFETY STANDARD.

.2 WALL EXHAUSTERS:

.1 HOUSINGS: SPUN ALUMINUM COMPLETE WITH RESILIENT MOUNTED MOTOR AND FAN.

.2 BELT DRIVE UNITS TO HAVE ADJUSTABLE MOTOR SHEAVE.

.3 FAN TO BE COMPLETE WITH A 1/2" / 13MM BIRD SCREEN, DISCONNECT T SWITCH, AND THERMAL OVERLOAD ON MOTOR, AND CURB WITH CURB GASKETTING ON ROOF FANS

.4 PROVIDE WITH RUBBER OR NEOPRENE GROMMETS FOR WIRING PASSAGES, INTEGRAL ATTACHMENT COLLAR, OR ANGLE RING MOUNTED TO MATING FLANGED WALL SLEEVE WITH FULL GASKETTING ON WALL EXHAUSTERS

.5 PROVIDE MOTORIZED GASKETTED ALUMINUM DAMPERS WHERE INLET TO FAN IS 0.08 SQ M OR LARGER AND WHERE SHOWN ON DRAWINGS. GRAVITY OR SPRING OPERATED BACKDRAFT DAMPERS TO BE USED OTHERWISE.

.6 ACCEPTABLE MATERIALS: COOK, GREENHECK, PENN, TWIN CITY.

PART 3 - EXECUTION

3.1 FIRE EXTINGUISHERS

.1 FIRE EXTINGUISHERS SHALL NOT HAVE A GROSS WEIGHT OVER 40 IB. /18.14 KG AND THE TOP OF THE EXTINGUISHER IS TO NE MORE THAN 5FT / 1500MM ABOVE THE FINISHED FLOOR.

.2 THE EXTINGUISHER OPERATING INSTRUCTIONS LABEL SHALL BE LOCATED ON THE FRONT AND BE CLEARLY VISIBLE.

.3 EXTINGUISHER CABINETS SHALL NOT BE LOCKED.

.4 UNLESS NOTED ON PLANS EXTINGUISHERS SHALL BE TYPE ABC AND BE MIN. 10IB./4.54KG CAPACITY AND BE LOCATED ON BUILDING EXIT ROUTES AND TRAVEL DISTANCE TO EXTINGUISHERS IS NOT TO EXCEED 75FT/25 METERS.

3.2 PIPE INSULATION

.1 1"/25 MM INSULATION WILL BE REQUIRED ON:

.1 DOMESTIC RECIRCULATION PIPE.

.2 DOMESTIC COLD WATER PIPE COMPLETE WITH VAPOUR BARRIER.

.3 ALL ABOVE GROUND STORM DRAINAGE PIPE AND ROOF DRAIN BODY.

.2 2"/50MM INSULATION WILL BE REQUIRED ON:

.1 ALL HOT WATER HEATING SUPPLY AND RETURN PIPING, FITTINGS AND VALVES.

.2 ALL GLYCOL HOT WATER HEATING SUPPLY AND RETURN PIPING, FITTINGS AND VALVES

.3 PVC JACKET SHALL BE INSTALLED ON ALL EXPOSED WATER PIPING INSULATION 10FT OR LOWER

.4 INSULATION WILL NOT BE APPLIED UNTIL ALL THE REQUIRED TESTS HAVE BEEN COMPLETED.

.5 PIPE SURFACES MUST BE CLEAN AND DRY PRIOR TO APPLICATION OF INSULATION.

.6 PIPE INSULATION MUST BE KEPT CLEAN AND DRY.

.7 UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, INSULATION WILL BE CARRIED THROUGH WALLS AND FLOORS IN 16 GAUGE GALVANIZED IRON PIPE SLEEVES. PIPE SLEEVES WILL BE 1"/25MM LARGER IN DIAMETER THAN THE INSULATED PIPE AND THE RESULTING VOID WILL BE PACKED WITH FIBREGLASS INSULATION. CAULK VOID BETWEEN SLEEVE AND INSULATION TO MAKE AIR TIGHT AND/OR MAINTAIN FIRE SEPARATION.

.8 BOTH LONGITUDINAL AND BUTT JOINTS MAY BE MADE WITH FACTORY APPLIED PRESSURE SENSITIVE VAPOUR PROOF ADHESIVE.

.9 BOTH LONGITUDINAL AND BUTT JOINTS WILL BE MADE USING A VAPOUR PROOF MASTIC EXTENDING AT LEAST 1"/25MM ON EITHER SIDE OF THE JOINT.

.10 FITTINGS SHALL HAVE REMOVABLE INSULATION WITH P.V.C. COVER IN EXPOSED AREAS. VALVE BODIES SHALL HAVE REMOVABLE P.V.C. COVERS. IN LIEU OF REMOVABLE INSULATION AND P.V.C. COVERS REMOVABLE PRE-FABRICATED INSULATION PADS MAY BE USED.

.11 ON PIPING WITH INSULATION AND VAPOUR BARRIER, INSTALL CALCIUM SILICATE INSULATED HANGER SHIELDS AT EACH HANGER TO MAINTAIN THE INTEGRITY OF THE VAPOUR BARRIER.

.12 GOUGE OUT INSULATION FOR PROPER FIT WHERE THERE IS INTERFERENCE BETWEEN WELD BEAD AND INSULATION. INSULATION SHALL BE BEVELED AWAY FROM STUDS AND NUTS TO PERMIT THEIR REMOVAL WITHOUT DAMAGE TO INSULATION, AND SHALL BE CLOSELY AND NEATLY TRIMMED AROUND EXTENDING PARTS OF PIPE SADDLES, SUPPORTS, HANGERS, AND CLAMP GUIDES AND SEALED WITH INSULATING CEMENT.

3.3 PIPE INSTALLATION

.1 INSTALL STRAIGHT, PARALLEL AND CLOSE TO WALLS AND CEILINGS, WITH SPECIFIED PITCH. USE STANDARD FITTINGS FOR DIRECTION CHANGES.

.2 INSTALL GROUPS OF PIPING PARALLEL TO EACH OTHER; SPACED TO PERMIT APPLICATION OF INSULATION, IDENTIFICATION, AND SERVICE ACCESS.

.3 ALL PIPING SHALL BE RUN CONCEALED IN PIPE SPACES, CHASES AND CEILING SPACES WHERE POSSIBLE. PIPING THAT IS RUN EXPOSED IN FINISHED AREAS SHALL BE LOCATED IN CORNERS, AND BOXED IN. WHERE NOT BOXED IN, PIPING TO BE CHROME PLATED.

.4 RIGHT ANGLE CONNECTIONS IN DRAIN PIPES SHALL BE MADE WITH Y-BRANCHES AND 1/8 BENDS. THE USE OF 90° TEES & ELBOWS IS NOT PERMITTED.

.5 EACH FIXTURE SHALL BE PROVIDED WITH BACK VENT CONNECTIONS AND AN INDIVIDUAL TRAP.

.6 REAM ENDS OF PIPES AND TUBES BEFORE BEING MADE UP.

.7 LAY COPPER TUBING SO THAT IT IS NOT IN CONTACT WITH DISSIMILAR METAL AND WILL NOT BE KINKED OR COLLAPSED.

.8 USE NON-CORROSIVE LUBRICANT OR TEFLON TAPE APPLIED TO MALE THREAD.

.9 CLEAN ALL EXCESS FLUX AND SOLDER FROM JOINTS.

.10 GROOVED PIPE ENDS: CUT SQUARE, SEATING SURFACE CLEAN AND FREE FROM INDENT AND SCORE MARKS.

.11 INSTALL DI-ELECTRIC COUPLINGS WHEREVER PIPING OF DISSIMILAR METALS ARE JOINED.

.12 ALL PIPES PASSING UNDER OR THROUGH WALLS OR UNDERGROUND SHALL BE PROTECTED FROM BREAKAGE. ALL PIPES BELOW GRADE SHALL BE CAREFULLY SUPPORTED AND EVERY PRECAUTION TAKEN AGAINST DAMAGE TO PIPE OR JOINTS.

.13 AN EASILY ACCESSIBLE CLEANOUT SHALL BE PROVIDED TO EACH ALTERNATE CHANGE OF DIRECTION IN MAIN SOIL OR WASTE PIPE, AND AT THE BASE OF EACH STACK. ALL CLEANOUTS SHALL BE OF THE SAME NOMINAL SIZE AS THE PIPES UP TO 4"/100MM, AND NOT LESS THAN 4"/100MM FOR LARGER PIPES.

.14 ALL DRAINAGE SERVING BOILER ROOMS SHALL BE CAST IRON BELL & SPIGOT OR MECHANICAL JOINT.

.15 EACH MAIN, ALL BRANCH MAINS AND RUNOUTS TO A FUTURE FIXTURE GROUP OR EQUIPMENT SHALL BE VALVED TO PERMIT REMOVAL FOR MAINTENANCE WITHOUT INTERFERING WITH REMAINDER OF SYSTEM.

.16 PIPE ALL RELIEF VALVES TO THE NEAREST FUNNEL FLOOR DRAIN. IN OTHER THAN MECHANICAL ROOMS, PIPE RELIEF VALVES TO FLOOR DRAINS OR SERVICE SINK.

.17 KEEP PIPING FREE FROM SCALE AND DIRT. PROTECT OPEN PIPES DURING CONSTRUCTION, TO PREVENT FOREIGN BODIES ENTERING OR LODGING, USING TEMPORARY PLUGS, TAPE OR OTHER APPROVED MATERIALS FOR PROTECTION.

.18 WHERE PIPE SIZES DIFFER FROM EQUIPMENT CONNECTION SIZES, INSTALL REDUCING FITTINGS CLOSE TO EQUIPMENT. REDUCING BUSHINGS ARE NOT PERMITTED.

.19 THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PIPING AND MAKE ALL CONNECTIONS TO ALL SPECIAL EQUIPMENT SUCH AS HEATING EQUIPMENT, VENTILATION EQUIPMENT, ETC. ALL AIR HANDLING UNITS SHALL BE PROVIDED WITH DRAINS AND PIPED INDIRECTLY TO THE SEWER OR ROOF. AN INDIRECT DRAIN SHALL BE PROVIDED AT ALL FRESH AIR INTAKE AND EXHAUST OPENINGS. TRAPS OR DRAINS SHALL HAVE UNEQUAL LEGS TO COMPENSATE FOR THE FAN STATIC PRESSURE.

.20 GRADE FORCED WATER PIPING 1"/25MM PER 60FT/18M SO THAT WHEN THE SYSTEM IS FILLED, THE AIR IN THE MAINS AND RISERS SHALL BE CARRIED TO VENTING HIGH POINTS AND SEDIMENT FAUCETS AT DRAIN LOW POINTS.

.21 PROVIDE AIR VENTS, MANUAL OR AS INDICATED AT ALL HIGH POINTS IN THE PIPING SYSTEM. AIR VENTS TO BE INSTALLED AT AN ACCESSIBLE PLACE WITH THE AID OF NECESSARY PIPING IN ORDER TO FACILITATE MAINTENANCE. PIPE THE DISCHARGE FROM ALL AUTOMATIC VENTS TO THE NEAREST WASTE.

.22 UNIONS SHALL BE PROVIDED WHERE INDICATED OR AT THE FOLLOWING LOCATION IF NOT INDICATED; IN BY-PASSES AROUND EQUIPMENT, HEATER, TANK, PUMPS OR OTHER EQUIPMENT REQUIRING DISCONNECTION FOR REPAIRS OR REPLACEMENTS. LOCATE BETWEEN SHUT-OFF AND EQUIPMENT. DO NOT CONCEAL UNIONS IN WALLS, PARTITIONS, OR CEILINGS.

3.4 PIPE HANGERS

.1 FURNISH AND INSTALL ALL HANGERS REQUIRED FOR THE PROPER SUPPORT OF PIPING IN THIS DIVISION.

.2 SPACE HANGERS FOR HORIZONTAL STEEL AND COPPER PIPING AS FOLLOWS:

.1 NOMINAL PIPE SIZE UP TO 1.1/4"/32MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 7'-0"/2.1M STEEL, 6'-0"/1.8M COPPER.

.2 NOMINAL PIPE SIZE: 1.1/2"/38MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 9'-0"/2.7M STEEL, 8'-0"/2.4M COPPER.

.3 NOMINAL PIPE SIZE 2"/50MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 10'-0"/3.0M STEEL, 9'-0"/2.7M COPPER.

.4 NOMINAL PIPE SIZE: 2.1/2"/65MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 12'-0" 3.3M STEEL, 10'-0"/3.0M COPPER.

.5 NOMINAL PIPE SIZE: 3"/75MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 12'-0"/3.3M STEEL, 10'-0"/3.0M COPPER.

.3 SPACE HANGERS FOR HORIZONTAL ABS, PVC, CPVC AND PEX PIPING AS FOLLOWS:

.1 NOMINAL PIPE SIZE: UP TO 2.1/2" / 65MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 4FT/1.2M ABS AND PVC.

.2 NOMINAL PIPE SIZE: 3"/75MM TO 4"/100MM HANGER ROD 1/2" / 12MM AT MAX. SPACING 4FT/1.2M ABS AND PVC.

.3 NOMINAL PIPE SIZE: 6"/150MM TO 4"/100MM HANGER ROD 7/8" / 22MM AT MAX. SPACING 4FT/1.2M ABS AND PVC.

.4 NOMINAL PIPE SIZE: UP 2"/50MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 3FT/1.0M CPVC AND PEX PIPING.

.4 SPACE HANGERS FOR HORIZONTAL NATURAL/PROPANE GAS AND FUEL PIPING AS FOLLOWS:

.1 NOMINAL PIPE SIZE: UP TO 3/4" / 19MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 6FT/1.8M STEEL.

.2 NOMINAL PIPE SIZE: 1"/25MM TO 1.1/4" / 32MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 8FT/2.4M STEEL.

.3 NOMINAL PIPE SIZE: 1.1/2" / 38MM TO 2.1/2" / 65MM HANGER ROD 1/2" / 12MM AT MAX. SPACING 15FT/4.6M STEEL.

.4 NOMINAL PIPE SIZE: 3"/75MM TO 4"/100MM HANGER ROD 1/2" / 12MM AT MAX. SPACING 10FT/3.0M STEEL.

.5 NOMINAL PIPE SIZE: UP TO 1.1/4" / 32MM AT MAX. SPACING 4FT/1.2M STEEL ON ROOF.

.6 NOMINAL PIPE SIZE: 1.1/2" / 38MM TO 2.1/2" / 65MM SPACING 10FT/3.0M STEEL ON ROOF.

.7 NOMINAL PIPE SIZE: 3"/75MM TO 4"/100MM SPACING 15FT/4.6M STEEL ON ROOF.

.5 BEAM CLAMPS SHALL BE USED WHEN HANGING FROM ANY STRUCTURAL STEEL MEMBERS. NO DRILLING OR WELDING OF THESE MEMBERS SHALL BE PERMITTED UNLESS APPROVED BY THE STRUCTURAL CONSULTANT.

.6 ALL PIPING SHALL BE SECURELY HUNG FROM THE BUILDING STRUCTURE USING APPROVED HANGERS.

.7 HANG ALL PIPING TO AND FROM ANY CIRCULATING PUMPS 2HP/1.5KW AND LARGER WITHIN MECHANICAL ROOM WITH SPRING HANGERS.

.8 SUPPORTING BOLTS SHALL BE MAXIMUM SIZE USEABLE WITH THE SPECIFIED HANGER, WITH ADJUSTABLE AND LOCKING STOP UNITS.

.9 HANGER PIPE AND STRUCTURAL ATTACHMENTS SHALL BE OFFSET IN SUCH A MANNER THAT THE ROD IS VERTICAL WHERE THE PIPING IS HOT.

.10 HANGERS FOR HEATING PIPING 4"/100MM AND SMALLER SHALL BE LINE SIZE LONG CLEVIS TYPE MYATT 124L OR EQUAL. PROVIDE OVERSIZED HANGERS AND SADDLES ON PIPING OVER 4"/100MM WITH CALCIUM SILICATE OR BUCKAROOS BETWEEN THE PIPE AND THE SADDLE.

.11 HANGERS SUPPORTING PUMPS TO USE A NUT AND A LOCK-NUT AT THE BOLTED CONNECTIONS TO EQUIPMENT AND STRUCTURE.

3.5 VALVE INSTALLATION

.1 PROVIDE SHUT-OFF VALVES WHERE INDICATED OR SPECIFIED IN THE FOLLOWING LOCATIONS IF NOT INDICATED OR SPECIFIED, IN RISERS AND MAIN BRANCHES AT POINT OF TAKE-OFF FROM THE SUPPLY OR RETURN MAIN, INDIVIDUAL EQUIPMENT UNITS AT INLETS AND OUTLETS TO PERMIT UNIT REMOVAL FOR REPAIRS WITHOUT INTERFERING WITH REMAINDER OF SYSTEM.

.2 DO NOT LOCATE VALVE STEMS BELOW HORIZONTAL PLANE.

3.6 BALANCING VALVES

.1 INSTALL WHERE INDICATED ON DRAWINGS AND PROVIDE CIRCUIT BALANCING VALVES ON RETURNS FROM FORCE FLOW HEATERS, UNIT HEATERS, HEATING COILS AND WALL MOUNTED RADIATORS AND DOMESTIC HOT WATER RECIRCULATION LINES. ALSO PROVIDE CIRCUIT BALANCING VALVES ON MAIN AND BRANCH SUPPLIES/RETURNS WHERE REQUIRED FOR EASY BALANCING OF THE SYSTEM. BALANCING VALVES USED ON HOT WATER SERVICE SHALL BE FITTED WITH DISCS SUITABLE FOR HOT WATER SERVICE.

.2 LOCATE TO PROVIDE ACCESS FOR BALANCING PERSONNEL.

.3 IDENTIFY LOCATION AND FUNCTION OF SYSTEM FLOW DIAGRAMS.

.4 SUBMIT TAB WATER BALANCING REPORT TO THE CONSULTANT FOR REVIEW.

3.7 SAFETY AND RELIEF VALVES

.1 LOCATE AS INDICATED AND SO THAT THEY CAN BE TAKEN APART WITHOUT BREAKING PIPING CONNECTIONS.

3.8 DRAINS

.1 PROVIDE DRAIN VALVES WITH HOSE ENDS AT THE LOW POINTS OF ALL PIPING, AND AT THE BOTTOM OF EACH DOWN FEED HEATING RISER.

.2 ALL SMALL DRAINS FROM EACH PIECE OF EQUIPMENT SHALL BE BROUGHT OVER TO A HOPPER DRAIN AND SHALL TERMINATE 2"/50 MM ABOVE THE FUNNEL. THESE SHALL INCLUDE SMALL SURFACE DRAINS FROM PUMPS, STRAINERS, BOILERS, HEATING SYSTEM MAIN DRAIN OUTLETS, ETC., AND SHALL BE RUN IN GALVANIZED STEEL PIPING TO NEAREST FLOOR DRAIN OR HOPPER. NO DRIP DRAIN OR OVER-FLOW LINE SHALL BE LEFT SO THAT LIQUID OR VAPOUR WILL SPILL ON EQUIPMENT OR FLOORS.

.3 ON ALL MAINS AND RISERS PROVIDE A BALL VALVE BETWEEN MAINS AND SEDIMENT FAUCETS.

3.9 STRAINERS

.1 INSTALL MAIN STRAINERS ON THE INLET OF ALL PUMPS AND CIRCULATORS, REDUCING VALVES, ETC., AND WHEREVER ELSE INDICATED ON DRAWINGS.

3.10 PLUMBING SPECIALTIES

.1 FLOOR DRAINS SHALL BE INDIVIDUALLY VENTED AND INDIVIDUALLY TRAP PRIMED.

.3 EVERY CLEANOUT SHALL BE EASILY ACCESSIBLE AND IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO SEE THAT ACCESS PANELS ARE PROVIDED FOR THIS PURPOSE. PROVIDE CLEANOUTS IN TRAP ARMS OR IN VERTICAL WASTE LINES. PROVIDE CLEANOUTS IN VERTICAL WASTE LINES BELOW DOUBLE WASTE FITTINGS. ALL TRAPS TO HAVE CLEANABLE DIPS. ENSURE CLEANOUTS MEET THE REQUIREMENTS OF THE CANADIAN PLUMBING CODE.

.4 WATER HAMMER ARRESTORS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. WHERE NOT INDICATED, THEY SHALL BE LOCATED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

.5 INSTALL WALL HYDRANTS 20"/500 MM ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED

3.11 BACKFLOW PREVENTERS

.1 INSTALL ON ALL POTABLE WATER CONNECTIONS TO HYDRONIC SYSTEMS AND TO MAKE-UP CONNECTIONS TO ANY EQUIPMENT, TANKS, ETC. DRAINS TO DISCHARGE TO FUNNEL FLOOR DRAIN. REDUCED PRESSURE TYPE SUITABLE FOR PRESSURES UP TO 175PSI/1200 KPA AND TEMPERATURES UP TO 110°F/43°C.

REGISTERED PROFESSIONAL ENGINEER — J.C.L. YABLECKI — LICENSEE — 10/26/2021 — NT/NU

ISSUED FOR CONSTRUCTION

Canada — Nunavut

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
2	ISSUED FOR CONSTRUCTION	10/26/2021	ASW
1	TENDER	07/16/2021	ASW

DESIGN: SMC | REVIEWED BY: JY
DRAWN: SMC | CHECKED BY: SM
DATE: OCTOBER 2021
SCALE: 1 : 25

GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

SPECIFICATIONS

PROJECT NO. 20-3940

SHEET NO. M07

PLOT DATE: 2021-10-25 4:28:11 PM
FILE NAME: U:\dms7483\03940\01-WP\M-CON.vt

3.12 THERMOMETERS

.1 THERMOMETERS TO BE INSTALLED FOR EASY READING WHERE INDICATED ON THE DRAWINGS AND AS INDICATED BELOW.

.2 FOR PLUMBING SYSTEMS, INSTALL THERMOMETERS ON THE OUTLET OF ALL DHW TANKS AND ON THE INLET AND OUTLET OF PRIMARY TEMPERING VALVES. ALSO INSTALL THERMOMETERS ON DOMESTIC HOT WATER RETURN (RECIRCULATION PIPING).

3.13 GAUGES

.1 PRESSURE GAUGES TO BE INSTALLED FOR EASY READING WHERE INDICATED ON THE DRAWINGS AND AS INDICATED BELOW.

.2 FOR PLUMBING SYSTEMS, PROVIDE FOR EACH PUMP OVER 2 HP/1.5KW, ON THE WATER SERVICE INSIDE THE BUILDING, AND ON THE OUTLETS OF PRESSURE REDUCING VALVE ASSEMBLIES.

3.14 AIR VENTS

.1 AT EVERY HIGH POINT IN PIPING MAINS, THE CONTRACTOR SHALL SUPPLY AND INSTALL AUTOMATIC AIR ELIMINATORS IN ORDER TO AVOID AIR POCKETS IN THE SYSTEM. AIR VENTS, TO BE INSTALLED IN AN ACCESSIBLE PLACE, WITH THE AID OF NECESSARY PIPING IN ORDER TO FACILITATE MAINTENANCE.

.2 SUPPLY AND INSTALL A MINI BALL VALVE ON PIPE BETWEEN MAIN AND AIR VENT FOR SHUT-OFF AND SERVICING OF VENT.

.3 PROVIDE MANUAL TYPE AIR VENTS ON ALL UP-FEED RADIATION. EXTENSION SHALL BE PROVIDED TO ENABLE OPERATION OF THE VENT WITHOUT REMOVING THE ENCLOSURE.

3.15 PRE-CHARGED EXPANSION TANKS

.1 ALL EXPANSION TANKS TO BE SUPPORTED WITH SUITABLE HANGERS OR PIPE STANDS AS REQUIRED ACCORDING TO THE SIZE OF THE TANK.

.2 PRE-CHARGE TANK WITH SUITABLE PRESSURE TO MEET SYSTEM REQUIREMENTS.

.3 DRAINS TO DISCHARGE TO FUNNEL FLOOR DRAIN.

3.16 AUTOMATIC WATER FEEDER

.1 INSTALL COMPLETE WITH A 3 VALVE BY-PASS.

.2 PIPE RELIEF VALVE TO FUNNEL FLOOR DRAIN.

3.17 GLYCOL MAKE-UP

.1 INSTALL GLYCOL MIXING TANK IN A LOCATION THAT PERMITS ADEQUATE MIXING OF GLYCOL WATER MIXTURE.

.2 ENSURE COLD WATER SUPPLY PIPING FOR THE MIXING TANKS IS PROTECTED WITH A BACKFLOW PREVENTER AS SPECIFIED.

3.18 ACCESS DOORS

.1 ENSURE THAT EQUIPMENT IS CLEARLY WITHIN VIEW AND ACCESSIBLE FOR OPERATING, INSPECTING, ADJUSTING, SERVICING WITHOUT THE NEED FOR SPECIAL TOOLS. SPECIFICALLY THIS SHALL INCLUDE BUT IS NOT LIMITED TO VALVES, WATER HAMMER ARRESTERS, PLUMBING CLEANOUTS, TRAP PRIMERS, DRAIN POINTS, AUTOMATIC AND MANUAL AIR VENTS, CONTROLLERS AND CONTROLLED DEVICES.

3.19 UNIT HEATERS

.1 ALL UNIT HEATERS TO BE INSTALLED AS PER THE MANUFACTURERS INSTRUCTIONS AND AS DETAILED ON DRAWINGS.

3.20 TESTING

.1 NOTICE OF TESTS: GIVE WRITTEN NOTICE FOR A MINIMUM OF FOUR WORKING DAYS PRIOR TO DATE WHEN TESTS WILL BE MADE.

.2 PRIOR TESTS: DO NOT CONCEAL OR INSULATE WORK PRIOR TO THE REQUIRED TESTING. INSULATE AND CONCEAL WORK ONLY AFTER TESTING AND APPROVAL BY THE MECHANICAL DESIGN CONSULTANT. CONDUCT TESTS IN THE PRESENCE OF THE MECHANICAL DESIGN CONSULTANT OR PERSON AUTHORIZED BY THE MECHANICAL DESIGN CONSULTANT.

.3 ACCEPTANCE TESTS: CONDUCT IN PRESENCE OF THE OWNER’S REPRESENTATIVE OR REPRESENTATIVE OF AGENCIES HAVING JURISDICTION.

.4 COSTS: BEAR ALL COSTS IN CONNECTION WITH ALL TESTS.

.5 FILL WITH WATER AND HYDRAULICALLY TEST AT 1.1/2 TIMES SYSTEM OPERATING PRESSURE OR AT 125PSI/862 KPA WHICHEVER IS GREATEST. UNLESS OTHERWISE NOTED MAINTAIN TEST PRESSURES WITHOUT LOSS FOR A FOUR (4) HOUR PERIOD.

.6 TEST BACKFLOW PREVENTERS IN ACCORDANCE WITH THE LOCAL WATER UTILITY.

.7 SANITARY AND VENT PIPING SHALL BE TESTED BY SEALING OUTLETS AND FILLING THE SYSTEM WITH WATER TO PROVIDE 10FT/3.0M OF HEAD ABOVE THE HIGHEST POINT. THE WATER LEVEL SHALL REMAIN CONSTANT FOR A MINIMUM OF TWO (2) HOURS.

3.21 FLUSHING AND CHLORINATING

.1 COMPLETE AFTER ALL TESTING HAS BEEN COMPLETED AND CERTIFIED AS ACCEPTABLE BY THE CONSULTANT.

.2 FLUSH ALL WATER MAINS AND COLD WATER SERVICE PIPES BOTH EXTERIOR AND INTERIOR PRIOR TO CHLORINATION THROUGH ALL AVAILABLE OUTLETS. FLUSHING SHALL BE DONE AFTER THE HYDROSTATIC TESTS HAVE BEEN COMPLETED. THE MINIMUM FLUSHING VELOCITY SHALL BE 1 METRE PER SECOND (3 FEET PER SECOND) IN THE MAINS.

.3 THE DISINFECTING OF WATER MAINS SHALL BE IN ACCORDANCE WITH ANSI/AWWA-C65192 STANDARD FOR DISINFECTING WATER MAINS. WATER MAINS SHALL BE CHLORINATED SO THAT A FREE AVAILABLE CHLORINE RESIDUAL OF 25 PPM REMAINS AFTER 24 HOUR RETENTION ON THE PIPE. THIS MAY BE EXPECTED WITH AN INITIAL APPLICATION OF 50 PPM CHLORINE UNDER ORDINARY CONDITIONS. THE RATE OF CHLORINE APPLICATION SHALL BE PROPORTIONAL TO THE WATER ENTERING THE PIPE: CHLORINE APPLICATION SHALL BE CLOSE TO THE POINT OF FILLING, AND AT THE SAME TIME TESTS SHALL BE TAKEN FOR CHLORINE RESIDUAL CLOSE TO THE EXTREME END OF THE LINE UNDER DISINFECTION. EVERY PRECAUTION SHALL BE TAKEN TO PREVENT THE DISINFECTING SOLUTION FROM ENTERING WATER MAINS ALREADY IN USE.

.4 FLUSH AND DRAIN SYSTEMS UNTIL FREE OF DIRT, SLUDGE, OIL, GREASE AND OTHER FOREIGN MATERIAL. CLEAN STRAINERS.

3.22 FLEXIBLE DUCT INSULATION

.1 FLEXIBLE DUCT INSULATION 1”/25MM THICK SHALL BE INSTALLED ON ALL CONCEALED CONDITIONED S/A DUCTS.

.2 FLEXIBLE DUCT INSULATION 2”/50MM THICK SHALL BE INSTALLED ON ALL S/A AND R/A DUCTS THAT ARE CONCEALED AND EXPOSED TO OUTSIDE AMBIENT TEMPERATURES SUCH AS IN ATTICS.

.3 INSULATE ALL CONCEALED EXHAUST AIR DUCTS PENETRATING EXTERIOR, FROM EXTERIOR WALL/ROOF TO MINIMUM 10FT/3M FROM EXTERIOR WALL OR ROOF PENETRATION.

.4 CUT INSULATION SLIGHTLY LONGER THAN THE CIRCUMFERENCE OF THE DUCT TO ENSURE FULL THICKNESS AT CORNERS.

.5 TIGHTLY STRETCH EDGES WITH STAPLES AND COVER WITH A 3”/75MM WIDE STRIP OF PRESSURE SENSITIVE ALUMINUM FOIL TAPE.

.6 ON DUCTS 18”/450MM AND WIDER THE INSULATION WILL BE SECURED TO THE BOTTOM OF THE DUCTS BY MEANS OF WELDED PINS AND SPEED CLIPS. CUT PINS FLUSH AFTER THE CLIP HAS BEEN APPLIED.

.7 SEAL ALL JOINTS AND PENETRATIONS OF THE VAPOUR BARRIER, INCLUDING LOCATIONS WHERE IT IS PENETRATED BY SECURING PINS, WITH 3”/75MM PRESSURE SENSITIVE ALUMINUM FOIL TAPE.

3.23 RIGID DUCT INSULATION

.1 RIGID DUCT INSULATION WITH CANVAS COVERING AND LAGGING WILL BE USED ON EXPOSED DUCTS.

.2 INSULATION WILL BE APPLIED WITH EDGES TIGHTLY BUTTED AND SEALED WITH A 3"/75MM WIDE STRIP OF THE VAPOR BARRIER MATERIAL, APPLIED WITH COMPATIBLE ADHESIVE.

.3 THE INSULATION WILL BE APPLIED ON STICK CLIPS OR PINS WELDED TO THE DUCT & SECURED WITH SPEED WASHERS. MAXIMUM SPACING OF PINS WILL BE 1 PIN PER SQUARE FOOT.

.4 PENETRATIONS OF THE VAPOR BARRIER WILL BE PATCHED WITH A STRIP OF VAPOR BARRIER MATERIAL.

.5 DUCT INSULATION AND VAPOR BARRIER, WHERE APPLICABLE, SHALL BE CONTINUOUS THROUGH WALLS AND FLOOR OPENINGS EXCEPT AT FIRE DAMPERS.

.6 WHERE MORE THAN ONE THICKNESS OF INSULATION IS REQUIRED STAGGER BOTH LONGITUDINAL AND HORIZONTAL JOINTS.

.7 INSULATION TO BE 2"/75MM THICK FOR TEMPERATURES BELOW 50°F/10°C (SUCH AS O/A PLENUMS & DUCTWORK) AND 1"/25MM THICK FOR TEMPERATURES ABOVE 50°F/10°C.

.8 ALL CANVAS INSULATION JACKETS TO BE COMPLETE WITH TWO COATS OF LAGGING ADHESIVE.

3.24 DUCTWORK

.1 DUCTWORK AT ALL OTHER LOCATIONS WHERE MOISTURE MAY COLLECT, SHALL BE WELDED OR MADE SUITABLY WATER TIGHT. AT THESE PLACES DUCTWORK SHALL BE SLOPED TOWARDS A LOW POINT WHERE A 1.1/4"/32MM DRAIN WITH A DEEP SEAL TRAP SHALL BE PROVIDED, DISCHARGING THROUGH A COPPER PIPE TO A FUNNEL FLOOR DRAIN.

.2 AT EACH MAIN BRANCH TAKE-OFF AND IN SUCH OTHER LOCATIONS WHERE REQUIRED TO PROPERLY BALANCE THE AIR DISTRIBUTION SYSTEM, FURNISH AND INSTALL VOLUME DAMPERS WHICH SHALL BE PROVIDED WITH DAMPER REGULATORS. WHERE REGULATORS ARE MOUNTED ON INSULATED DUCTS THE REGULATOR SHALL BE MOUNTED ON TOP OF THE INSULATION.

.3 A BALANCING DAMPER SHALL BE INSTALLED IN ALL BRANCHES OFF THE MAIN TRUNK DUCT. ADDITIONAL DAMPERS SHALL BE INSTALLED IN ANY SHORT BRANCHES LEADING TO SUPPLY OR RETURN OUTLETS. IN ALL CASES, SUFFICIENT DAMPERS SHALL BE INSTALLED IN THE BRANCHES SO THAT THE DAMPERS AT THE DIFFUSERS ARE USED FOR "FINE TUNING" ONLY.

.4 DUCTWORK SHALL BE FREE FROM PULSATION OR OBJECTIONABLE NOISES. SHOULD THESE DEFECTS APPEAR, THEY SHALL BE CORRECTED BY REPLACING OR REINFORCING THE WORK AS DIRECTED BY THE CONSULTANT AT THE SITE AND WITHOUT CHARGE.

.5 THE DIMENSIONS OF ANY DUCT MUST BE AS INDICATED ON THE DRAWINGS, EXCEPT WHEREVER ANY CONSTRUCTION IMPEDIMENT OR REQUIREMENT RENDERS SUCH DIMENSIONS IMPOSSIBLE, IN WHICH CASE IT MUST BE ALTERED TO GIVE AN EFFECTIVE CROSS SECTIONAL AREA EQUAL TO THAT WHICH COULD HAVE BEEN OBTAINED FROM THE ORIGINAL AT NO COST TO THE OWNER. WHERE CONFLICTS OCCUR WITH OTHER TRADES, THE ARCHITECT RESERVES THE RIGHT TO MAKE CHANGES IN SITE AND LOCATIONS WITHOUT EXTRA COST.

.6 INSTALL DUCTWORK IN ACCORDANCE TO CEILING HEIGHT SCHEDULES INDICATED ON GENERAL CONSTRUCTION DRAWINGS; CONSULT WITH OTHER TRADES AND IN CONJUNCTION WITH THEM, ESTABLISH NECESSARY SPACE REQUIREMENTS FOR EACH TRADE, SO AS TO MAINTAIN REQUIRED HEADROOM.

.7 INSTALL DUCT ELBOWS HAVING A THROAT RADIUS 1.1/2 TIMES THE DIAMETER OR FABRICATED WITH SQUARE THROATS AND BACKS, FITTED WITH DUCT TURNS. DUCT TURNS SHALL BE FABRICATED WITH BLADES OF APPROVED CONSTRUCTION.

.8 ALL VERTICAL DUCTS IN SHAFTS SHALL BE RIGIDLY SUPPORTED WITH STEEL ANGLES SUPPLIED AND INSTALLED BY THIS CONTRACTOR. IN NO CASE SHALL ANGLES BE LESS THAN 1.1/2”X1.1/2”X1/4” / 38MM X 38MM X 6MM.

.9 ALL DUCT JOINTS SHALL BE COATED WITH DUCT SEALER APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS BEFORE ASSEMBLING.

.10 WHERE DUCTS SHOWN PASSING THROUGH FIRE SEPARATIONS AND AT THE FLOOR, THERE SHALL BE PROVIDED A CONTINUOUS 1.1/2”X1.1/2”X1/4” / 38MM X 38MM X 6MM. GALVANIZED ANGLE IRON FRAME WHICH SHALL BE BOLTED TO THE CONSTRUCTION AND MADE AIR TIGHT TO THE SAME BY APPLYING CAULKING COMPOUND. SHEET METAL AT THESE LOCATIONS SHALL BE BOLTED TO THE ANGLE IRON.

.11 ALL DUCTWORK SHALL BE SECURELY HUNG FROM THE BUILDING STRUCTURE USING APPROVED HANGERS.

.12 ROUND DUCTWORK:

.1 WHERE SPACE PERMITS ROUND DUCTS OF EQUAL AIR CARRYING CAPACITY MAY BE USED IN PLACE OF RECTANGULAR DUCTS.

.2 LONG RADIUS ELBOWS SHALL BE USED WHERE SPACE PERMITS. WHERE SPACE IS LIMITED USE MAXIMUM RADIUS POSSIBLE.

.3 90 DEGREE BRANCH TAKE-OFFS SHALL BE MADE WITH CONICAL TEE’S.

.4 WHERE SPACE PERMITS BRANCH 45 DEGREE CONICAL BRANCH TAKE-OFFS SHALL BE USED.

.5 BALANCING DAMPERS SHALL BE PROVIDED IN ALL TAKE-OFFS FROM MAINS OR BRANCH MAINS.

3.25 FLEXIBLE DUCTS

.1 INSULATED FLEXIBLE DUCTS MAY BE USED FOR A MINIMUM DISTANCE 36”/900MM AND A MAXIMUM DISTANCE OF 5FT/1.5M BETWEEN THE VENTILATION DIFFUSER SOLID ELBOW CONNECTION AND THE SUPPLY DUCT.

.2 FLEXIBLE DUCT WILL BE SUPPORTED AT 4FT/1.2M INTERVALS MAXIMUM. AT LEAST ONE SUPPORT IS REQUIRED ON ALL FLEXIBLE DUCT.

3.26 DUCT SEALERS AND TAPES

.1 SURFACES WILL BE CLEANED AND TREATED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

.2 SEALER WILL BE SPREAD ON ONE SIDE OF THE TAPE. THE TAPE WILL BE WRAPPED AROUND THE AREA TO BE SEALED (ACTIVATED SIDE TO THE METAL) AND OVERLAPPED 2”/50MM. THE EXPOSED SIDE OF THE TAPE WILL THEN BE COVERED WITH SEALER.

3.27 FLEXIBLE CONNECTIONS

.1 WHERE SHOWN ON THE DRAWINGS AND ON THE INLET AND OUTLET CONNECTIONS OF EACH FAN AND OUTLET OF EACH UNIT, THERE SHALL BE INSTALLED A FLEXIBLE CONNECTION. FLEXIBLE CONNECTIONS SHALL PROVIDE A MINIMUM 3"/75MM OF FABRIC BETWEEN THE METAL ENDS WHETHER THE EQUIPMENT IS ON OR OFF AND A GROUND STRAP.

.2 FLEXIBLE DUCTWORK SHALL NOT HAVE MORE THAN A 15° CHANGE IN DIRECTION. FOR CHANGES IN DIRECTION MORE THAN 15° USE RIGID DUCTWORK FOR THE CHANGE.

3.28 BALANCING DAMPERS

.1 INSTALL BALANCING DAMPERS IN ACCORDANCE WITH RECOMMENDATIONS OF SMACNA AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

.2 INSTALL BALANCING DAMPERS WHERE INDICATED ON THE DRAWINGS. IN ADDITION TO LOCATIONS INDICATED, BALANCING DAMPERS ARE TO BE INSTALLED AT ALL TEE'S IN MAIN DUCTS, BRANCH TAKE-OFFS FROM MAIN DUCTS AND IN ALL BRANCH DUCTS TO GRILLES, DIFFUSERS AND TERMINAL DEVICES.

.3 RUNOUTS TO REGISTERS AND DIFFUSERS: INSTALL SINGLE BLADE DAMPERS LOCATED AS CLOSE AS POSSIBLE TO MAIN DUCTS.

.4 ALL DAMPERS ARE TO BE VIBRATION FREE AND SUPPORTED AT BOTH ENDS.

3.29 CONTROL DAMPERS

.1 CONTROL DAMPERS SHALL BE AS CALLED FOR IN CONTROL SECTION. ALL CONTROL DAMPERS NOT PART OF MANUFACTURED MIXING BOXES SHALL BE SUPPLIED BY THE CONTROL SUPPLIER AND INSTALLED BY THIS SECTION.

.2 OPPOSED BLADE BALANCING DAMPERS WITH LOCKING QUADRANT SHALL BE PROVIDED WHERE SHOWN.

.3 ALL EXHAUST AIR SYSTEMS, INCLUDING ROOF AND WALL EXHAUSTERS, SHALL BE COMPLETE WITH AUTOMATIC BACKDRAFT DAMPERS SUPPLIED AND INSTALLED BY THE CONTRACTOR OR MOTORIZED DAMPERS.

.4 INSTALL DAMPERS AT FRESH AIR INTAKES AND EXHAUST LOUVERS, GOOSENECKS, HOODS, ETC..

3.30 FANS

.1 ALL UNITS WILL BE PROVIDED WITH SUITABLY SIZED SPRING TYPE VIBRATION ISOLATORS TO LIMIT THE VIBRATION TRANSMISSION TO THE STRUCTURE TO 5%.

.2 UNITS SUSPENDED FROM THE STRUCTURE WILL BE PROVIDED WITH SUITABLY SIZED HANGER RODS AND CHANNEL IRON WILL BE PROVIDED TO DISTRIBUTE THE WEIGHT OF THE UNITS OVER AN APPROPRIATE NUMBER OF JOISTS. HANGERS TO USE A NUT AND A LOCK-NUT AT THE BOLTED CONNECTIONS TO EQUIPMENT AND STRUCTURE.

.3 FANS WILL BE MOUNTED IN SUCH A MANNER SO THAT MAXIMUM SPACE IS AVAILABLE FOR ACCESS TO ALL PARTS REQUIRING PERIODIC MAINTENANCE. CO-ORDINATE WITH ALL OTHER TRADE CONTRACTORS TO ENSURE THAT MAXIMUM ACCESS IS MAINTAINED.

3.31 LOUVRES

.1 FRESH AIR INTAKE AND EXHAUST LOUVRES SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.

.2 ALL LOUVRES AND SCREENS SHALL BE ATTACHED TO DUCTWORK IN A MANNER TO GIVE A WEATHER-TIGHT JOINT.

.3 BLANK OFF ANY UNUSED PORTIONS OF LOUVRES WITH A "SANDWICH PANEL" CONSISTING OF 2”/50MM THICK RIGID INSULATION BETWEEN 20 GAUGE GALVANIZED STEEL SHEETS.

3.32 BALANCING

.1 THE CONTRACTOR SHALL BALANCE SYSTEMS

.1 BALANCE DOMESTIC HOT WATER RECIRCULATION TO EQUAL FLOW TO THROUGH RECIRCULATION LOOPS

.2 BALANCE HVAC HYDRONIC SYSTEMS TO OBTAIN REQUIRED FLOWS TO MEET HEATING AND OR COOLING LOADS.

.3 BALANCE SUPPLY AIR, RETURN AIR AND EXHAUST SYSTEMS TO OBTAIN AIR QUANTITIES AS SHOWN ON THE DRAWINGS.

.4 SUBMIT A COPY OF THE BALANCING REPORT TO THE OFFICE OF THE OWNER AND TO THE CONSULTANT.

3.33 DIESEL FUEL TANKS

.1 CONTRACTOR IS RESPONSIBLE FOR GETTING ALL REQUIRED APPROVALS/CERTIFICATIONS/REGISTRATIONS ASSOCIATED WITH THE INSTALLATION OF THE DIESEL FUEL TANKS.

.2 THE INSTALLATIONS MUST COMPLY WITH CSA B-139 AND THE GOVERNMENT OF NUNAVUT - BEST BUILDING PRACTICE 3RD EDITION, JANUARY 2020.

.4 FUEL TANK INSTALLATIONS MUST COMPLY WITH ALL REQUIRED ENVIRONMENT CANADA REGULATIONS AS WELL AS THE REQUIREMENTS OUTLINED IN THE ENVIRONMENTAL CODE OF PRACTICE FOR ABOVEGROUND AND UNDERGROUND STORAGE TANK SYSTEMS CONTAINING PETROLEUM AND ALLIED PETROLIUM PRODUCTS PART 3: DESIGN AND INSTALLATION OF ABOVE GROUND STORAGE TANK SYSTEMS.

.3 AT TIME OF SUBSTANTIAL COMPLETION, PROVIDE FULL FUEL TANKS.

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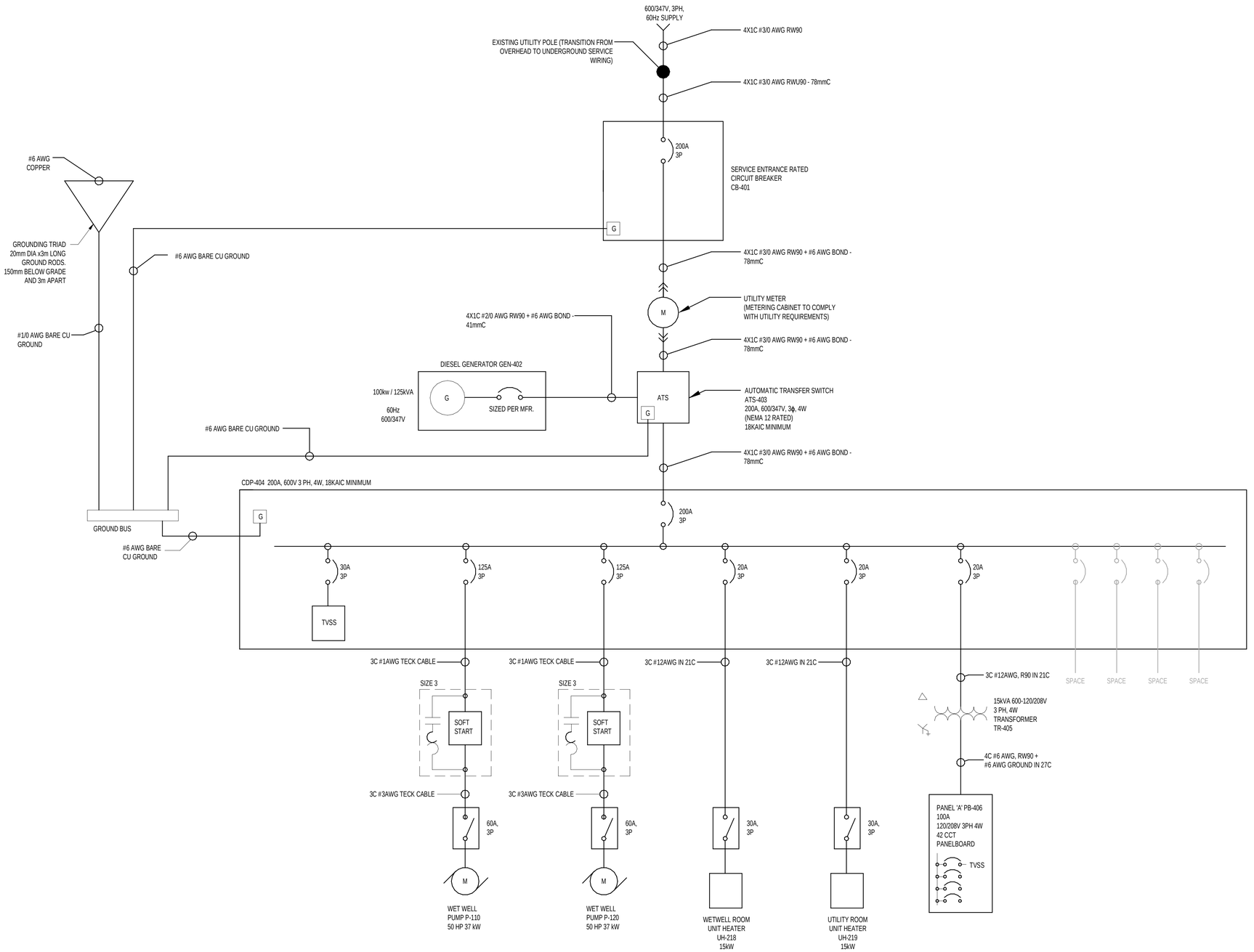
GOVERNMENT OF NUNAVUT
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

SPECIFICATIONS

PROJECT NO. 20-3940

SHEET NO. M08



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GOVERNMENT OF NUNAVUT
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JOHNSTON COVE LIFT STATION

ONE LINE DIAGRAM

PROJECT NO. 20-3940

SHEET NO. E01

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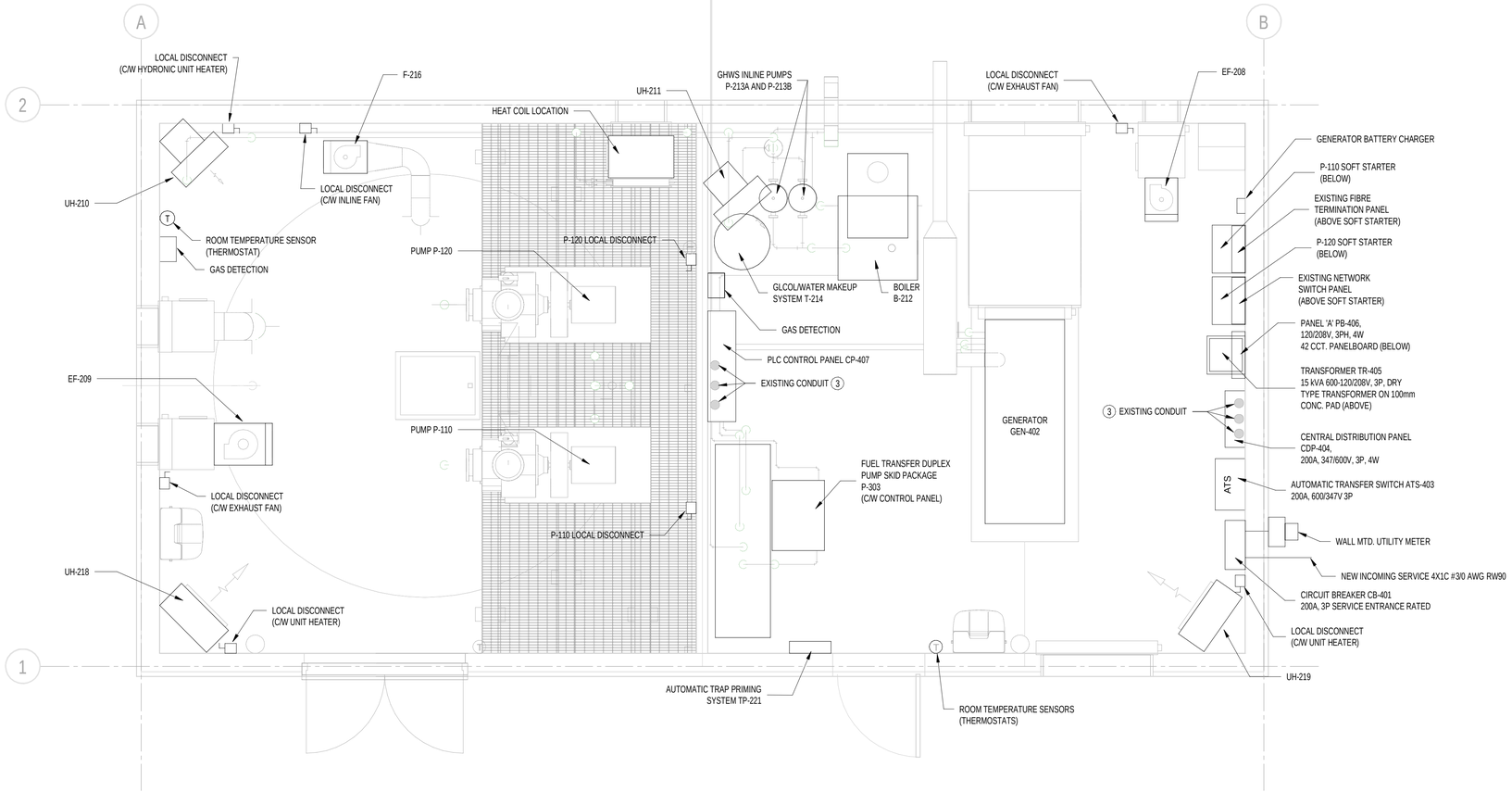

POWER PLAN
SCALE: 1 : 30

DEMOLITION NOTES:

1. EXISTING EQUIPMENT TO BE REUSED AND RELOCATED:
   - FIBRE TERMINATION PANEL
   - NETWORK SWITCH PANEL

2. ALL REMAINING EXISTING ELECTRICAL EQUIPMENT TO BE REMOVED AND DEMOLISHED INCLUDING EXISTING ELECTRICAL SERVICE, POWER PANELS, CONTROL PANELS, MOTOR STARTERS, LIGHTING, RECEPTACLES, CONDUITS, ETC.

3. EXISTING CONDUITS FROM WET WELL TO BE CAPPED AND SEALED.

ELECTRICAL NOTES:

4. CONDUIT ROUTING FOR EQUIPMENT IS NOT SHOWN ON THE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR ROUTING ALL CONDUITS WHICH SHALL INCLUDE CONDUITS SHOWN ON SINGLE LINE POWER DIAGRAMS, INTERCONNECTION DIAGRAMS, AND HOME RUNS SHOWN ON PLAN DRAWINGS. REFER TO SPECIFICATIONS FOR MATERIALS, INSTALLATION, AND OTHER REQUIREMENTS.

5. CONTRACTOR TO FIELD VERIFY ROUTING. COORDINATE AND ADJUST ROUTING AS REQUIRED TO AVOID CONFLICTS WITH OTHER PIPING AND EQUIPMENT.

6. THE EQUIPMENT PROVIDES A GENERAL ARRANGEMENT OF THE NEW ELECTRICAL EQUIPMENT LOCATED WITHIN THE STATION. THE CONTRACTOR IS RESPONSIBLE FOR FINALIZING THE ARRANGEMENT OF ALL ELECTRICAL EQUIPMENT TO ENSURE ALL EQUIPMENT FITS WITHIN THE ROOM WHILE MAINTAINING APPROPRIATE OPERATING ROOM AND SPACING, AS PER THE CANADIAN ELECTRICAL CODE (CEC).

7. ALL ELECTRICAL EQUIPMENT AND FIXTURES LOCATED WITHIN THE WETWELL ACCESS ROOM OF THE STATION SHALL HAVE A RATING SUITED FOR INSTALLATION IN A ZONE 1 CATEGORY 2 AREA.

8. PROVIDE RECEPTACLES, PLUGS, JUNCTION BOXES AND PULL BOXES AS REQUIRED TO COMPLETE CONNECTIONS.

9. PROVIDE SEPARATE NEUTRALS & BOND WIRES FOR ALL CIRCUITS. SHARED NEUTRALS & BOND WIRES SHALL NOT BE ACCEPTABLE.

10. PROVIDE FIRE STOPPING AND GAS SEALING FOR ALL PENETRATIONS THROUGH PUMP ROOM SEPARATION WALL.

PANEL 'A' PB-406 100A, MAINS 120/208V, 3PH, 4W 42CCT'S

DESCRIPTION	100A				DESCRIPTION
CONTROL PANEL ALARM LIGHT	1	15A	15A	2	UTILITY ROOM EXHAUST FAN EF-208
RECEPTACLES	3	15A	15A	4	WETWELL ROOM EXHAUST FAN EF-209
RECEPTACLES	5	15A	15A	6	UTILITY ROOM GAS DETECTION CONTROLLER
CONTROL PANEL	7	15A	15A	8	WETWELL ROOM GAS DEETCTION CONTROLLER
UTILITY ROOM MOTORIZED/MODULATING DAMPERS	9	15A	15A	10	UTILITY ROOM HYDRONIC UNIT HEATER UH-211
DUPLEX FUEL TRANSFER PUMP PACKAGE	11	15A	20A	12	WETWELL ROOM HYDRONIC UNIT HEATER UH-210
UTILITY ROOM LIGHTING	13	15A	15A	14	BOILER CIRCULATION PUMP P-213A
WETWELL ROOM LIGHTING	15	15A	15A	16	BOILER CIRCULATION PUMP P-213B
OUTDOOR LIGHTING	17	15A	15A	18	BOILER B-212
UTILITY ROOM HVAC CONTROLS	19	15A	15A	20	AUTOMATIC GLYCOL FILL PACKAGE
AUTOMATIC TRAP PRIMING SYSTEM TP-221	21	15A	15A	22	WETWELL INLINE FAN F-216
WATER CIRCULATION PUMP	23	15A	15A	24	WETWELL ROOM HVAC CONTROLS
SPARE	25	15A	15A	26	OUTDOOR RECEPTACLES
SPARE	27	15A	15A	28	GENERATOR BATTERY CHARGER
SPARE	29	15A	15A	30	GENERATOR BLOCK HEATER
SPARE	31	15A	15A	32	GENERATOR CONTROL PANEL
SPARE	33	15A		34	SPACE
SPARE	35	15A		36	SPACE
TVSS	37			38	SPACE
	39	30A		40	SPACE
	41			42	SPACE

120/208V PANELBOARD LAYOUT
SCALE: NOT TO SCALE

ELECTRICAL LEGEND

- DISCONNECT SWITCH
- (T) THERMOSTAT

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SCALE As indicated

GOVERNMENT OF NUNAVUT
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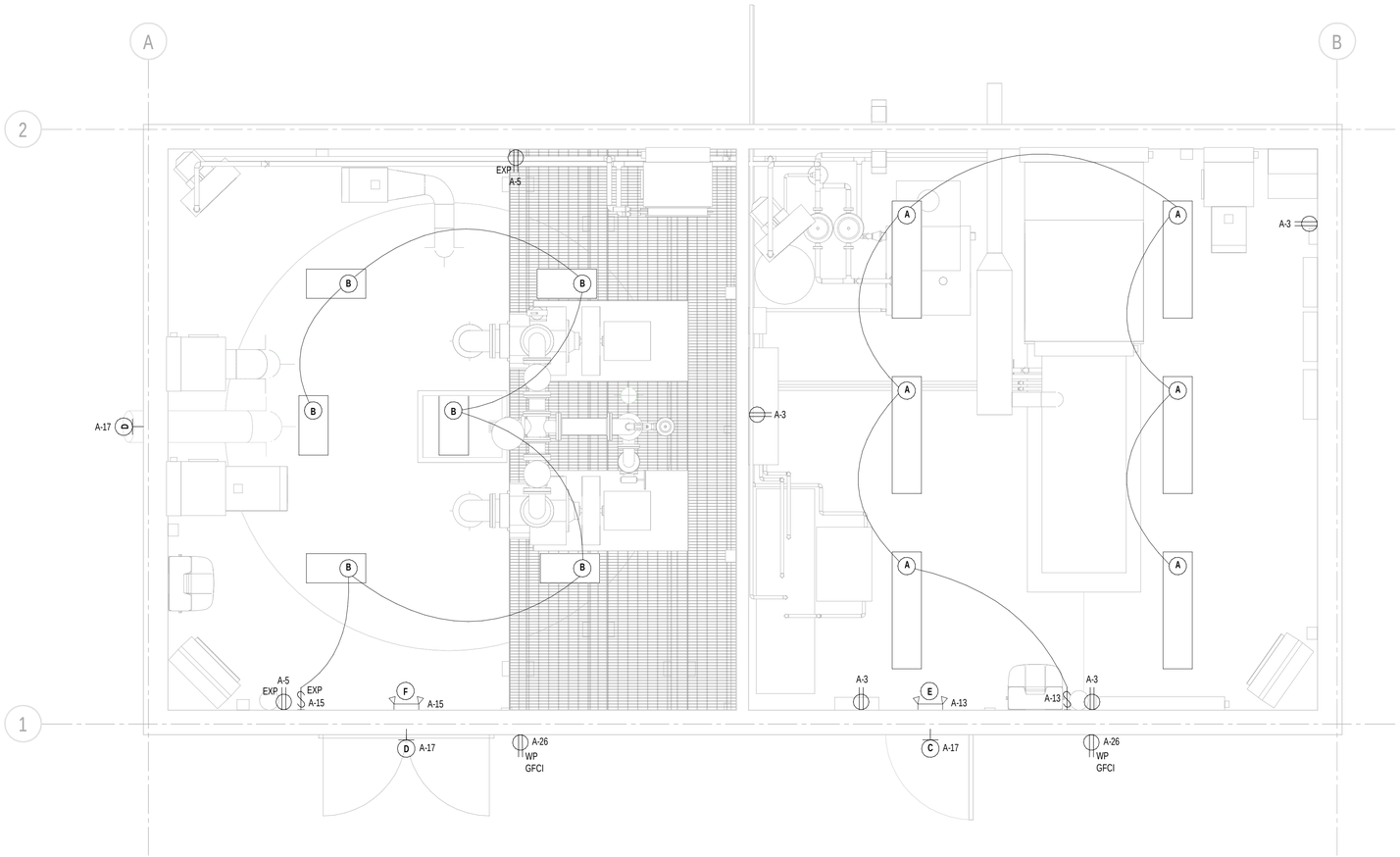
JOHNSTON COVE LIFT STATION

POWER PLAN

PROJECT NO. 20-3940

SHEET NO. E02



LIGHTING PLAN

SCALE: 1 : 30

LIGHTING FIXUTRE SCHEDULE

SYMBOL	TYPE	QTY	DESCRIPTION
	A	6	CEILING MOUNT LUMINAIRE TYPE: SIGNIFY DAY-BRITE CAT. No. V3W443L850FRI-UNV-DIM-LFA OR VISCOR VISIONEERING CAT. No. LSVA48-LED850K042LUNV OR AIMLITE CAT. No. VWP4-LA1A-4/50K OR APPROVED EQUAL
	B	6	CEILING MOUNT LUMINAIRE (ZONE 1 CAT 2 RATED) TYPE: HOLOPHANE CAT. No. HXPL-L24-2-4L-50K OR APPROVED EQUAL
	C	1	OUTDOOR WALL MOUNTED 120V LUMINAIRE, DARK BRONZE COMPLETE WITH INTEGRAL PHOTOCELL CONTROL TYPE: LITHONIA LIGHTING CAT. No. DSXW1 LED 10C 530 50K T2M MVOLT PE DDBXD OR SIGNIFY GARDCO CAT. No. 121-16L-530-NW-G4-2-UNV-PCB-BZ OR EATON GALLEON LED (MCGRAW EDITION) OR HUBBELL OUTDOOR LIGHT LNC2 SERIES OR APPROVED EQUAL
	D	2	WALL MOUNTED, OUTDOOR, ENCLOSED AND GASKETED LED LUMINAIRE (ZONE 2 RATED) TYPE: AZZ CAT No. SAF 07-S-04-G-G-W OR APPROVED EQUAL
	E	1	EMERGENCY LIGHTING UNIT C/W BATTERY, CHARGER UNIT, TWO LED LIGHTING HEADS WITH PROVISIONS FOR REMOTE WIRING OF EXIT PICTOGRAM AND REMOTE HEADS. WET LISTED CORROSIVE ENVIRONMENT TYPE: LUMACELL LNC SERIES OR AIMLITE CRPN SERIES OR APPROVED EQUAL
	F	1	EMERGENCY LIGHTING UNIT C/W BATTERY, CHARGER UNIT, TWO LED LIGHTING HEADS WITH PROVISIONS FOR REMOTE WIRING OF EXIT PICTOGRAM AND REMOTE HEADS. WET LISTED CORROSIVE ENVIRONMENT. (ZONE 1 CAT 2 RATED) TYPE: AIMLITE CRPHZ SERIES OR APPROVED EQUAL

ELECTRICAL NOTES

1. EMERGENCY LIGHTING FIXTURES SHALL BE WIRED TO THE NORMAL LIGHTING CIRCUIT OF THE ROOM IT SERVES.
2. ALL ELECTRICAL EQUIPMENT AND FIXTURES LOCATED WITHIN THE WETWELL ACCESS ROOM OF THE STATION SHALL HAVE RATING SUITED FOR INSTALLATION IN A CLASS 1, ZONE 1, CATEGORY 2 LOCATION.
3. ALL LED-TYPE. FIXTURES SHOULD HAVE A MINIMUM CRI OF 85, 4100K-5000K COLOR TEMPERATURE.

ELECTRICAL LEGEND

DUPLEX U-GROUND RECEPTACLE, CSA 5-15R CONFIGURATION, SURFACE MOUNTED 457mm (18") A.F.F., UNLESS INDICATED OTHERWISE.

HOME RUN TO DESIGNATED EQUIPMENT AND DEVICES. BRANCH CIRCUIT CONDUIT WITH 2 NO. 12 AWG BRANCH CIRCUIT CONDUCTORS AND 1 NO. 12 AWG BOND CONDUCTOR IN CONDUIT UNLESS OTHERWISE NOTED.

DEFINITIONS:

WP - WEATHERPROOF DEVICE
GFCI - GROUND FAULT CIRCUIT INTERRUPTER
EXP - EXPLOSION PROOF

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JOHNSTON COVE LIFT STATION

LIGHTING PLAN

PROJECT NO. 20-3940

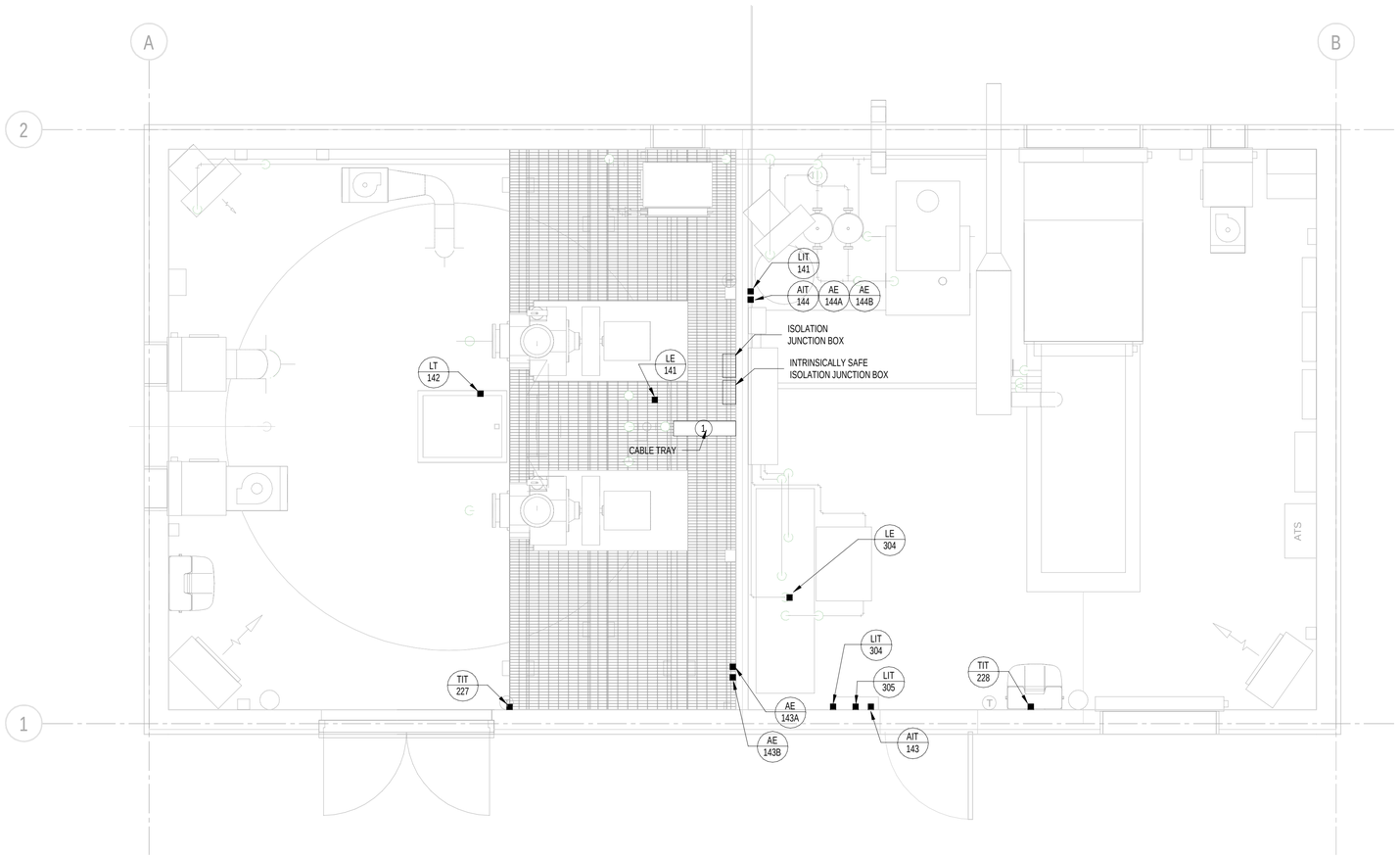
SHEET NO. E03

PLOT DATE: 2021-10-25 5:12:16 PM
FILE NAME: U:\dms7\163\3940\04-SW\PW-COM.rvt

NOTES:

1. INSTALL 150mm ALUMINUM CABLE TRAY WITH STRUT SUPPORTS FOR INSTRUMENTATION CONDUITS.

2. INSTALL LE-305 IN EXTERIOR FUEL TANK. EXTERIOR FUEL TANK LOCATION SHOWN ON SITE PLAN.



INSTRUMENTATION PLAN

SCALE: 1 : 30

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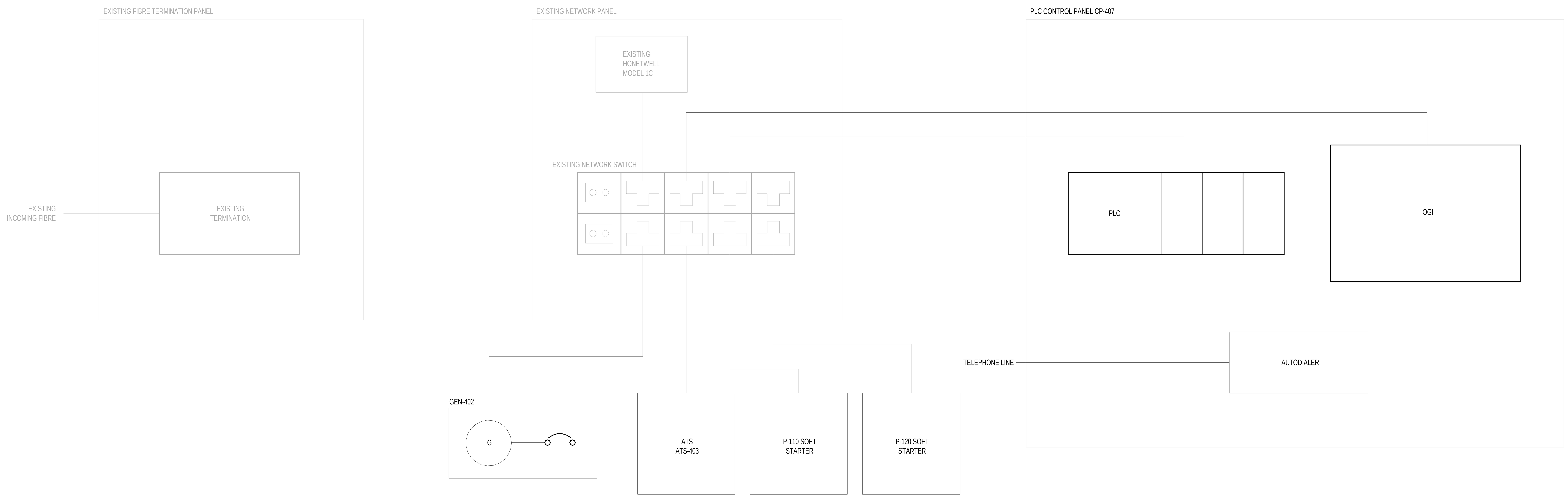
JOHNSTON COVE LIFT STATION

INSTRUMENTATION PLAN

PROJECT NO.: 20-3940

SHEET NO.: E04



ETHERET CONNECTION DIAGRAM

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JOHNSTON COVE LIFT STATION

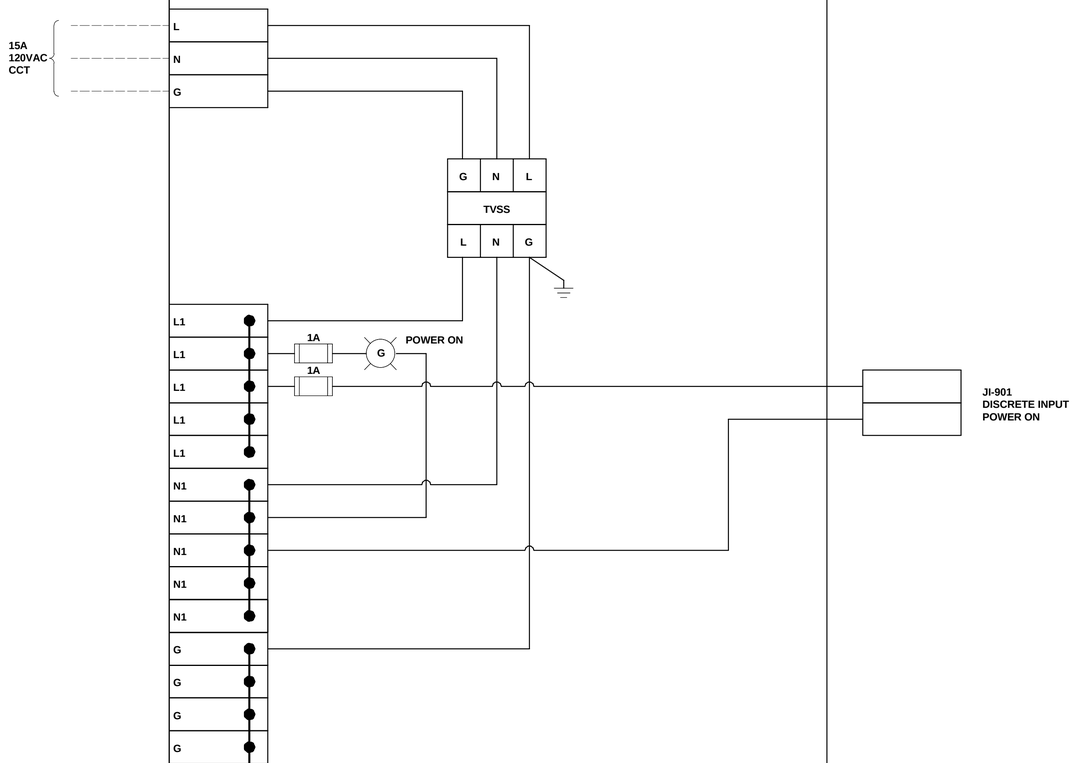
ETHERNET CONNECTION DIAGRAM

PROJECT NO. 20-3940

SHEET NO. E05

INSTRUMENT LOOP DIAGRAM

FIELD	CONTROL PANEL	PLC



LOOP DIAGRAM 01 - 120VAC CONTROL PANEL POWER

SCALE: NOT TO SCALE

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LOOP DIAGRAM 01

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SHEET NO. IL001

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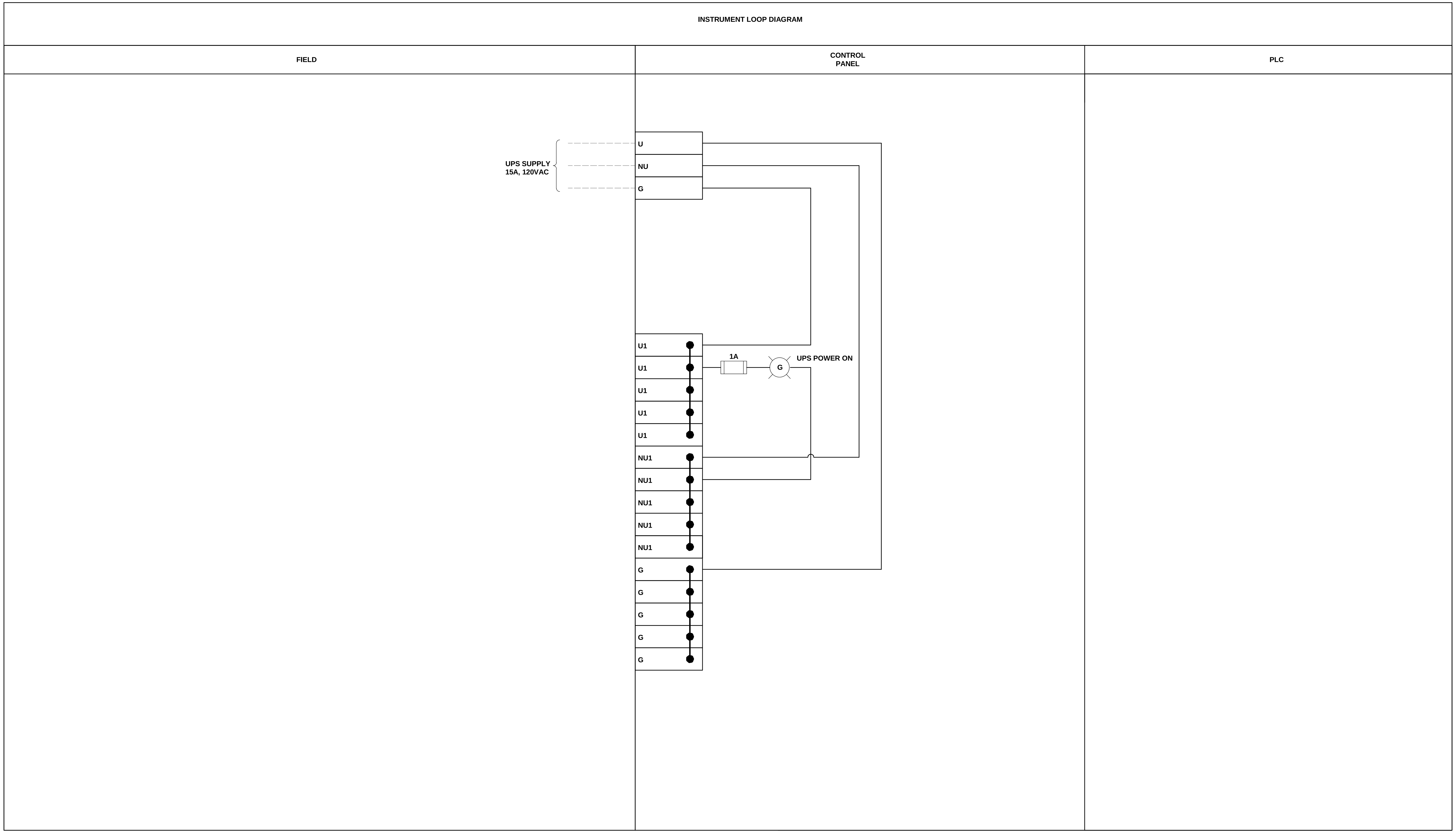

LOOP DIAGRAM 02 - UPS POWER CONTROL PANEL

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JOHNSTON COVE LIFT STATION

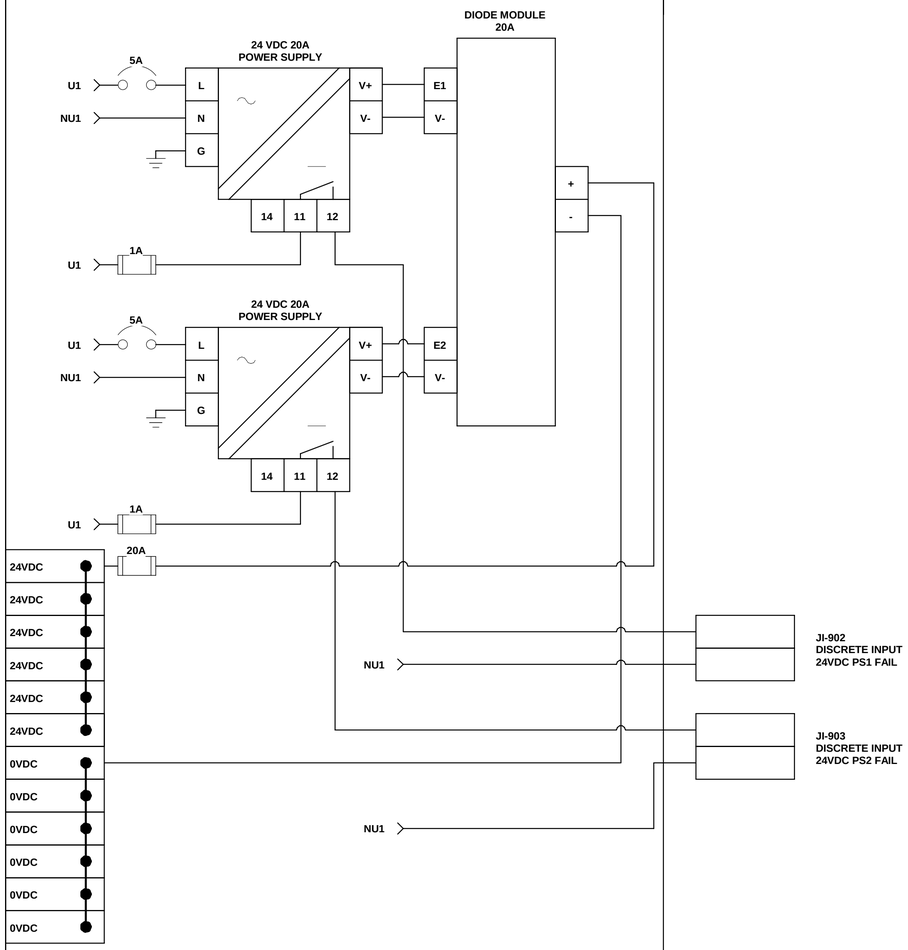
LOOP DIAGRAM 02

PROJECT NO. 20-3940

SHEET NO. IL002

INSTRUMENT LOOP DIAGRAM

FIELD	CONTROL PANEL	PLC



LOOP DIAGRAM 03 - 24VDC CONTROL PANEL POWER

SCALE: NOT TO SCALE

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JOHNSTON COVE LIFT STATION

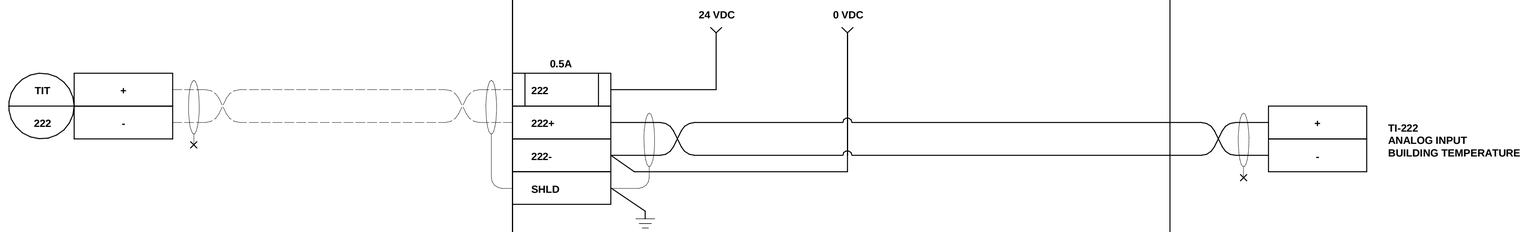
LOOP DIAGRAM 03

PROJECT NO. 20-3940

SHEET NO. IL003

INSTRUMENT LOOP DIAGRAM

FIELD	CONTROL PANEL	PLC



LOOP DIAGRAM 04 - TIT-222 (TYPICAL)

SCALE: NOT TO SCALE

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GOVERNMENT OF NUNAVUT
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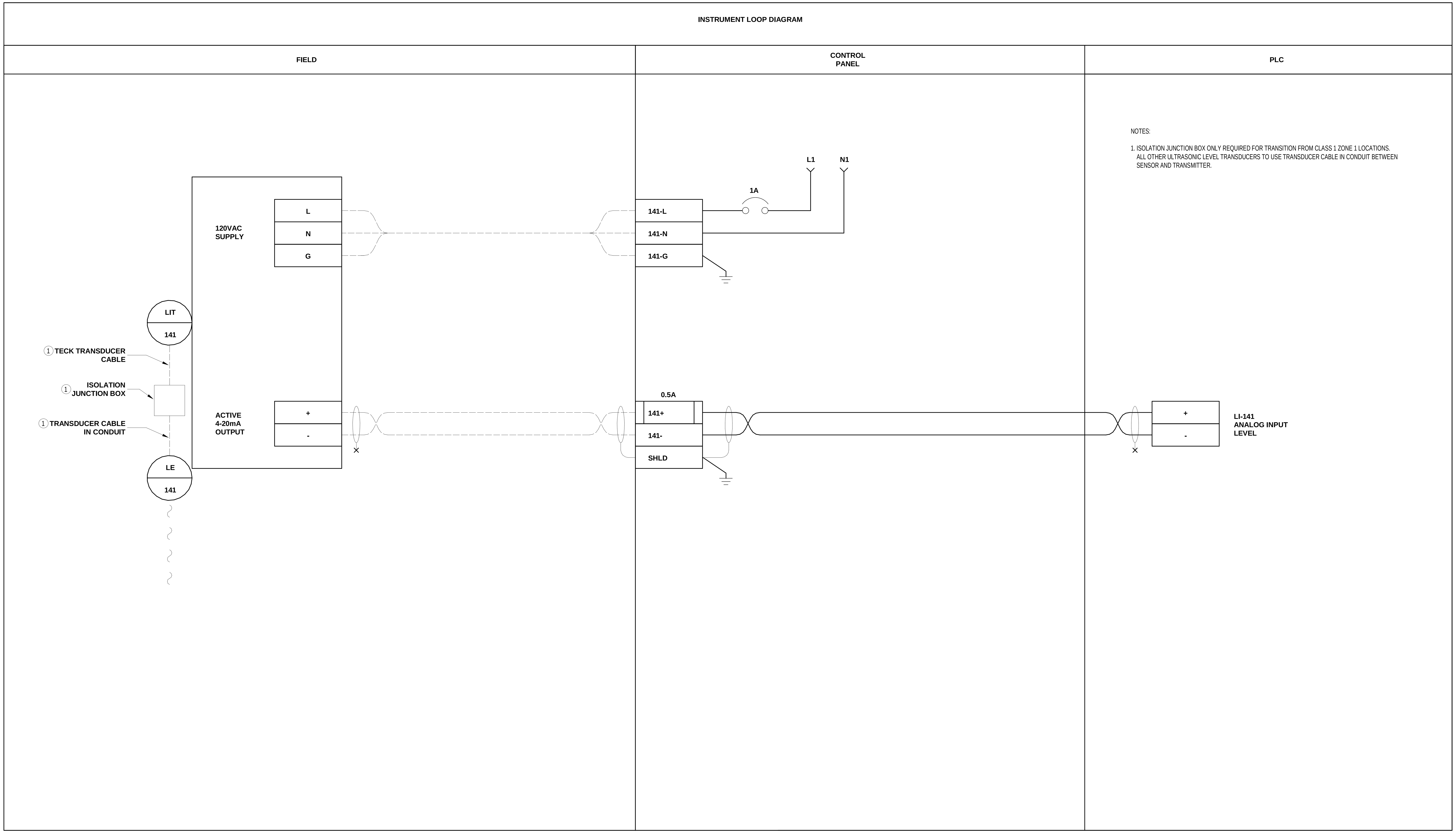
JOHNSTON COVE LIFT STATION
LOOP DIAGRAM 04

PROJECT NO. 20-3940

SHEET NO. IL004



LOOP DIAGRAM 05 - LIT-141 (TYPICAL)

SCALE: NOT TO SCALE

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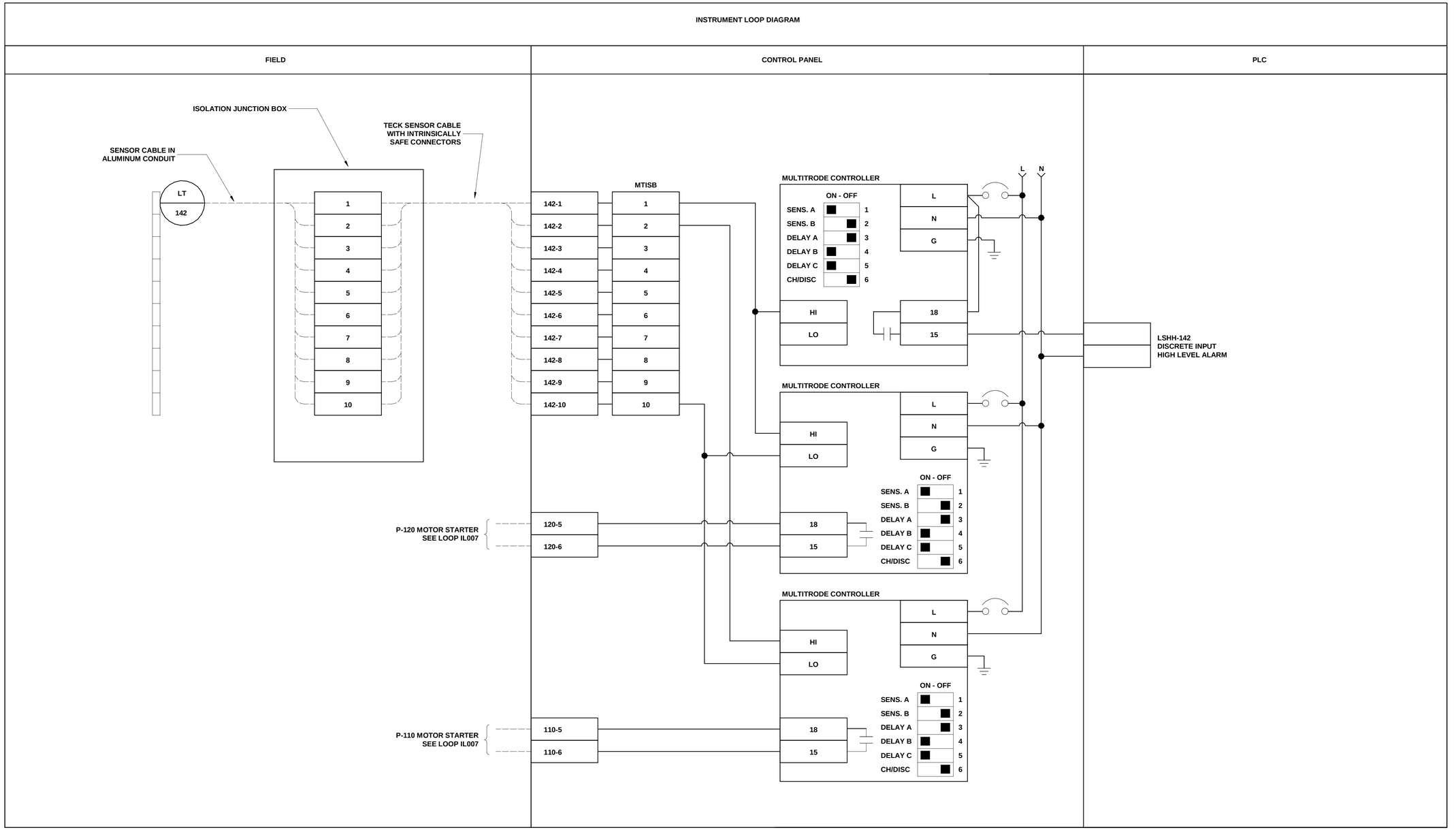
JOHNSTON COVE LIFT STATION

LOOP DIAGRAM 05

PROJECT NO. 20-3940

SHEET NO. IL005

INSTRUMENT LOOP DIAGRAM



LOOP DIAGRAM 06 - LT-142 (TYPICAL)

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DATE: OCTOBER 2021	
SCALE: 1 : 1	

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RANKIN INLET UTILIDOR REPLACEMENT
JOHNSTON COVE LIFT STATION
LOOP DIAGRAM 06

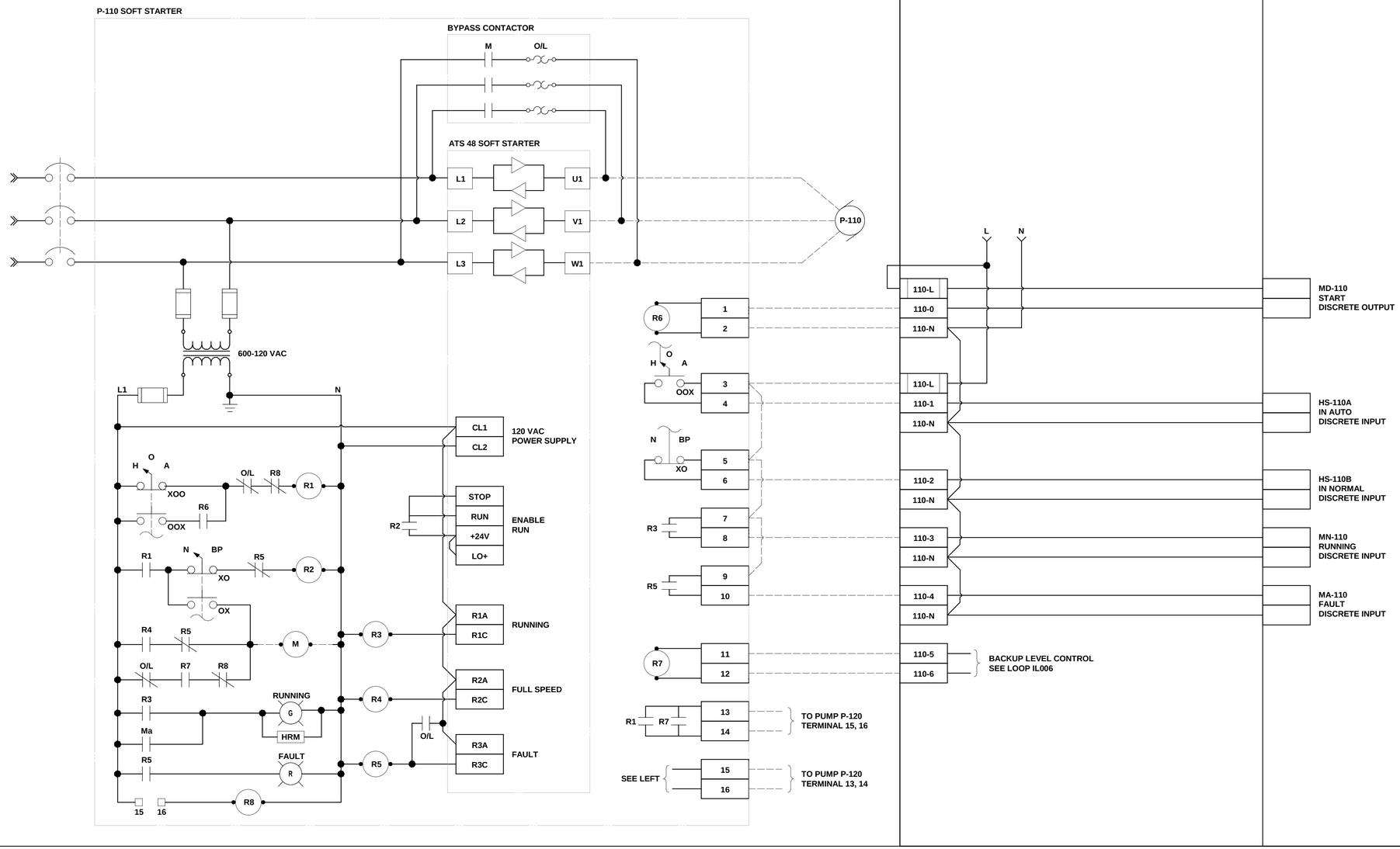
PROJECT NO. 20-3940

SHEET NO. IL006

PLOT DATE: 2021-10-25 5:25:07 PM
FILE NAME: U:\dms\7781\203940-04-WPM\V.CON.rvt

INSTRUMENT LOOP DIAGRAM

FIELD | CONTROL PANEL | PLC



LOOP DIAGRAM 07 - PUMP P-110 (TYPICAL SOFT STARTER)

SCALE: NOT TO SCALE

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JOHNSTON COVE LIFT STATION

LOOP DIAGRAM 07

PROJECT NO. 20-3940

SHEET NO. IL007

PLOT DATE: 2021-10-25 5:25:07 PM
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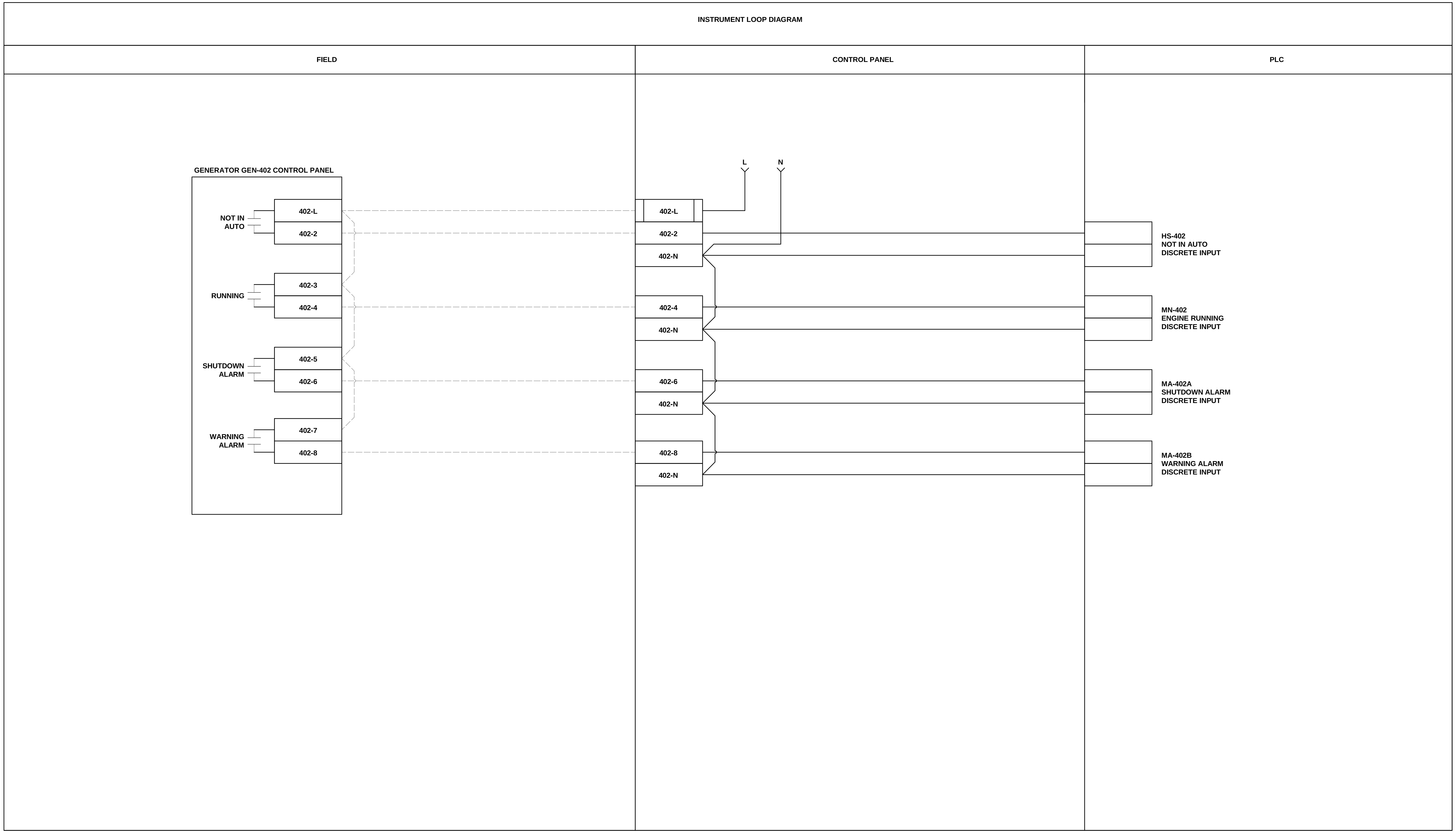

LOOP DIAGRAM 08 - GENERATOR CONTROL GEN-402

SCALE: NOT TO SCALE

PLOT DATE: 2021-10-25 5:25:07 PM
FILE NAME: U:\dms77451\203940-04-WPMV-CON.rvt

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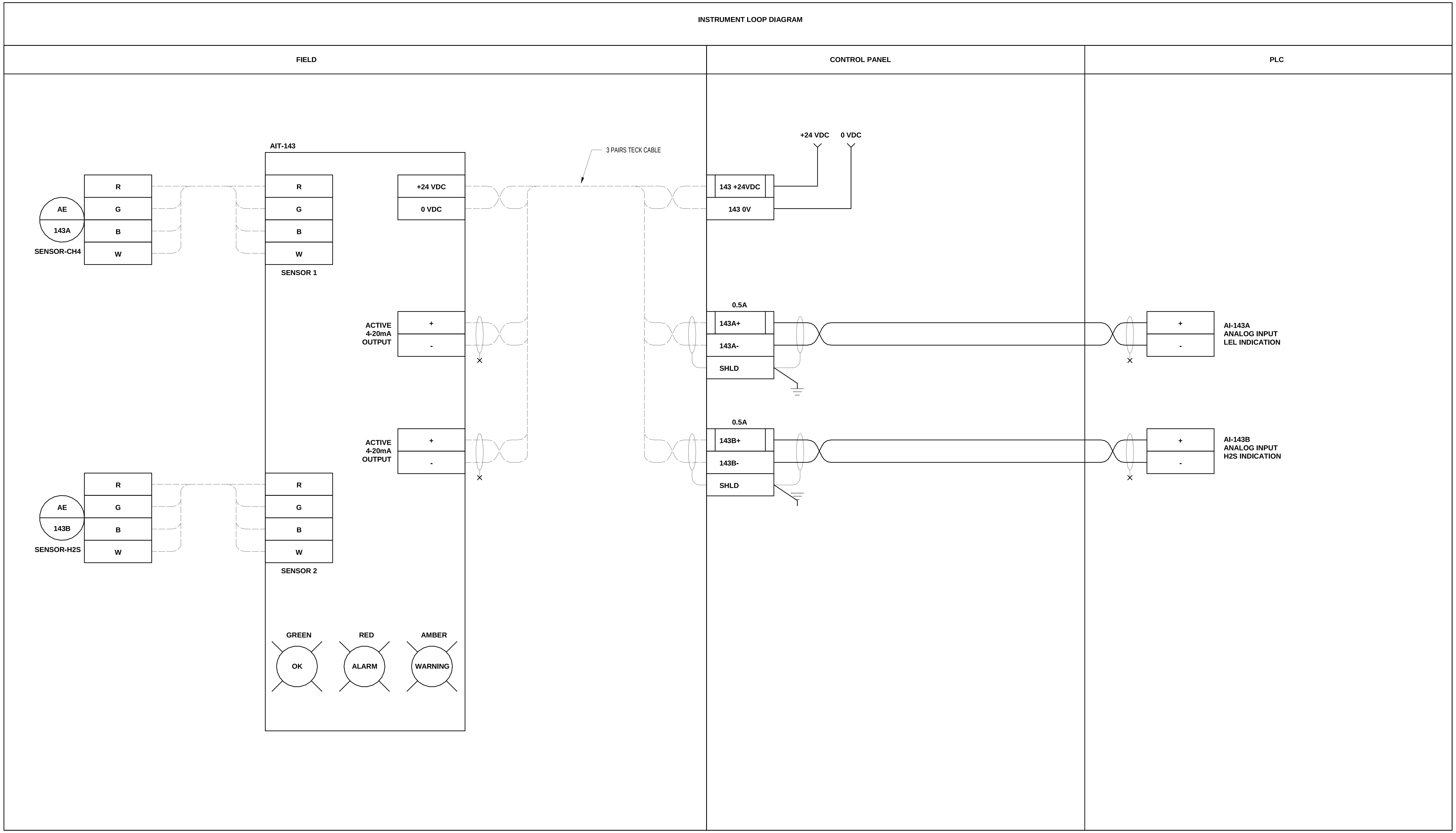
RANKIN INLET UTILIDOR REPLACEMENT

JOHNSTON COVE LIFT STATION

LOOP DIAGRAM 08

PROJECT NO. 20-3940

SHEET NO. IL008



LOOP DIAGRAM 09 -GAS DETECTOR AIT-143

SCALE: NOT TO SCALE

PLOT DATE: 2021-10-25 5:25:08 PM
FILE NAME: U:\dms77451\203940-04-WPMV-CON.rvt

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SCALE: 1 : 1

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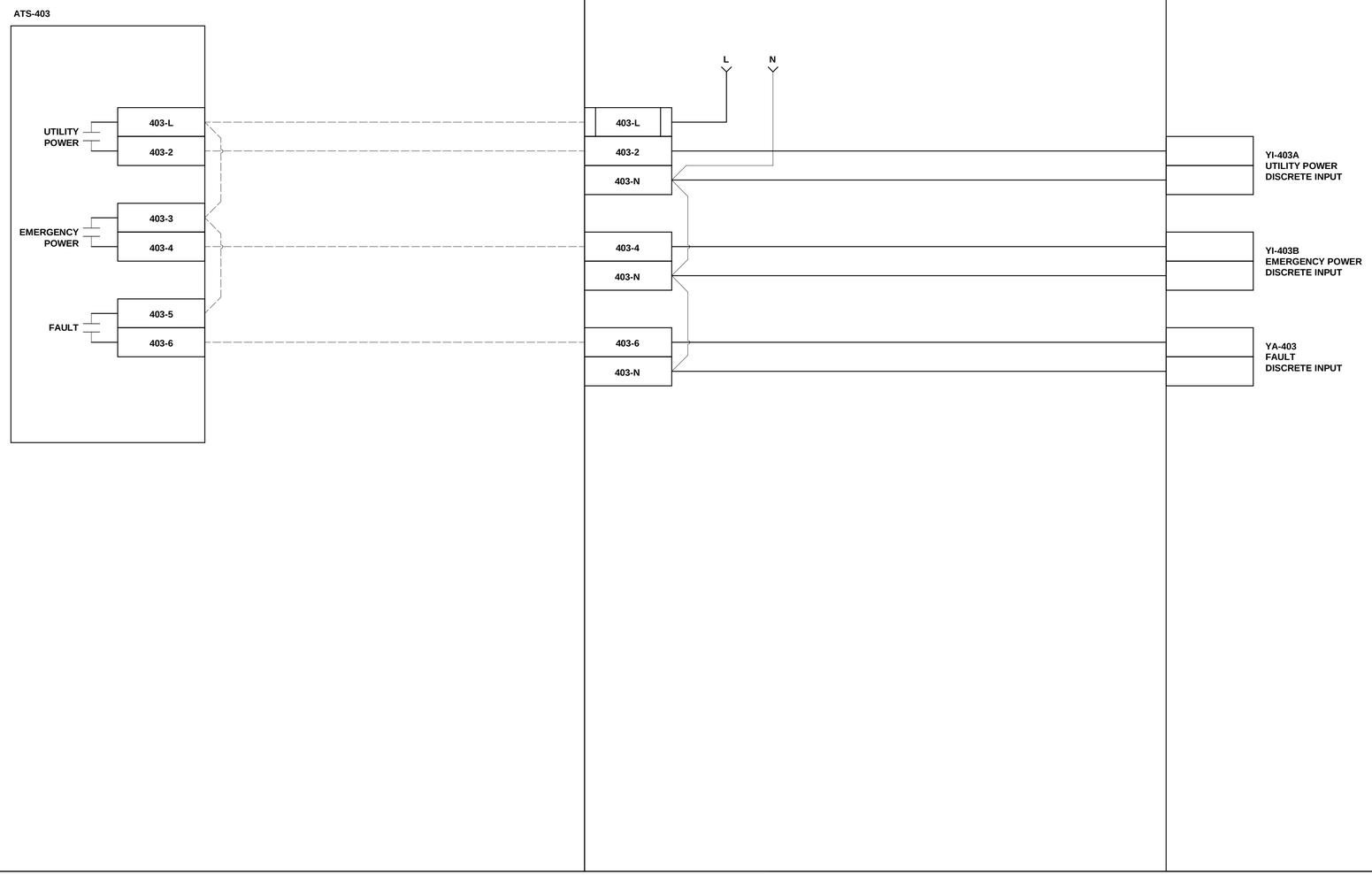
JOHNSTON COVE LIFT STATION

LOOP DIAGRAM 09

PROJECT NO. 20-3940

SHEET NO. IL009

INSTRUMENT LOOP DIAGRAM



LOOP DIAGRAM 10 - AUTOMATIC TRANSFER SWITCH ATS-403

SCALE: NOT TO SCALE

PLOT DATE: 2021-10-25 5:25:08 PM
FILE NAME: U:\dms7\451203940\04-WP\MV-CON.vt

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SCALE: 1 : 1	

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LOOP DIAGRAM 10

PROJECT NO. 20-3940

SHEET NO. IL010