WATER SUPPLY IMPROVEMENTS PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

GN PROJECT#: 04-4417
WEC PROJECT#: 13655.00

RECORD DRAWING

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DATE (YYYY MM DD): 2014.10.09

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CANADA

2010.08.06
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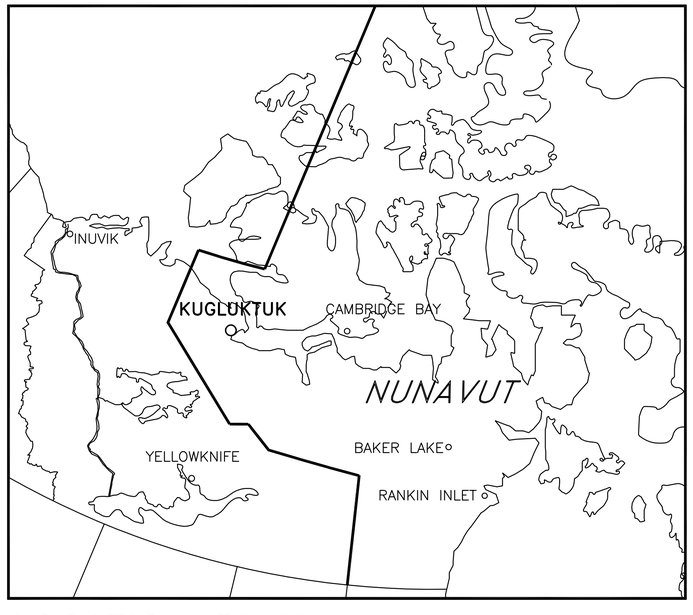
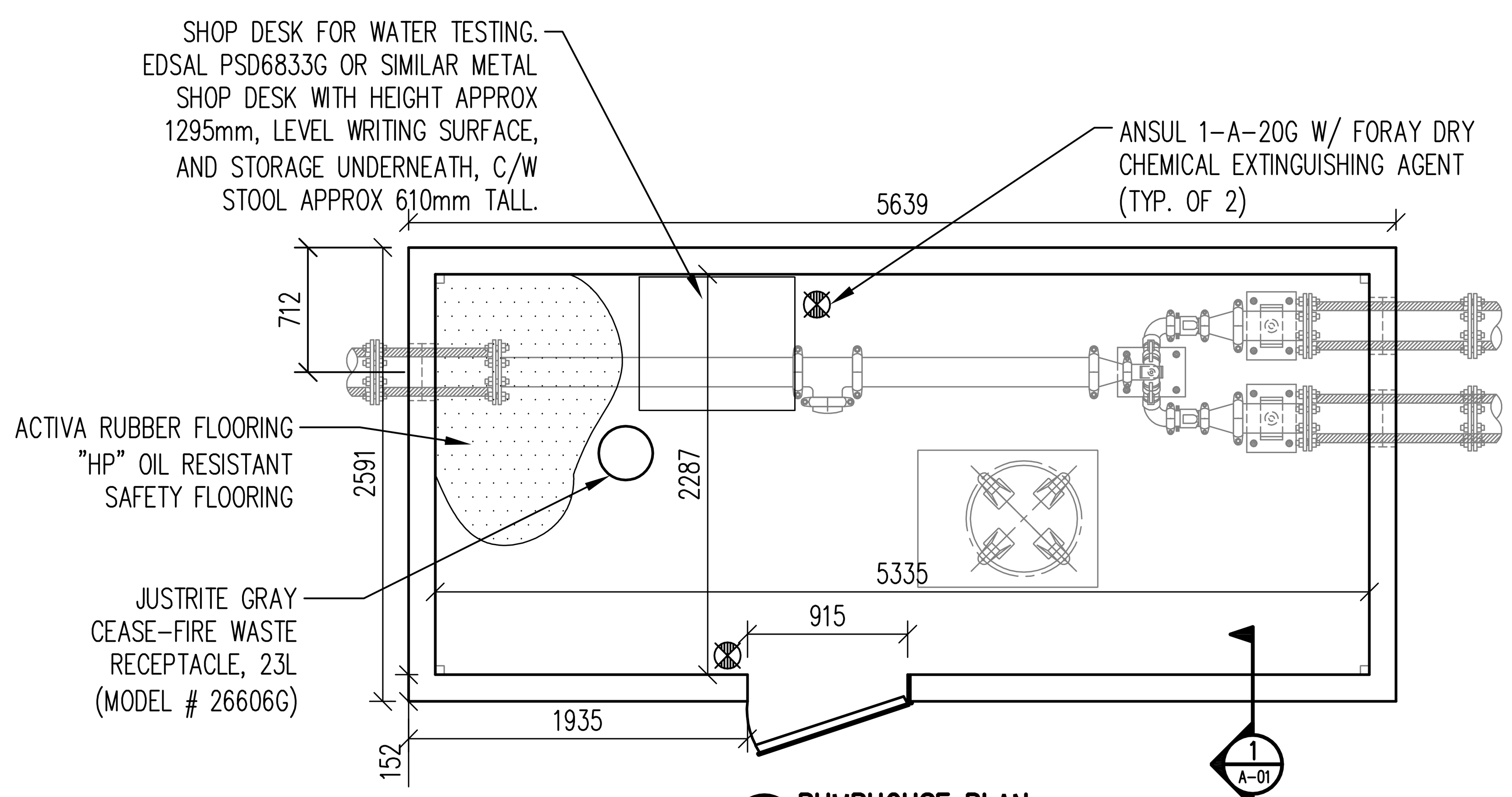


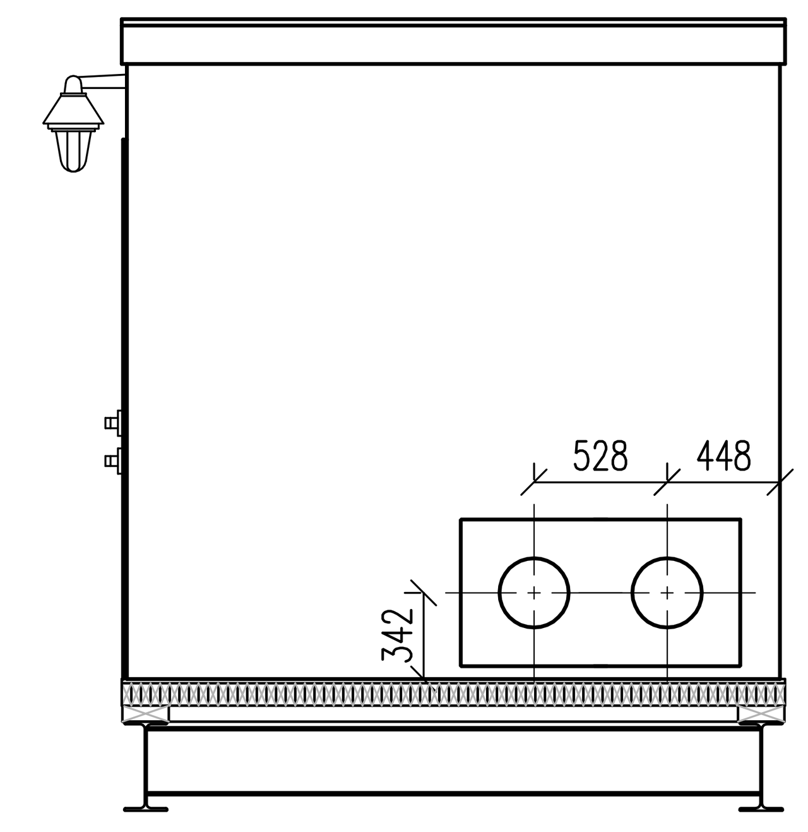
LOCATION PLAN

LIST OF DRAWINGS:

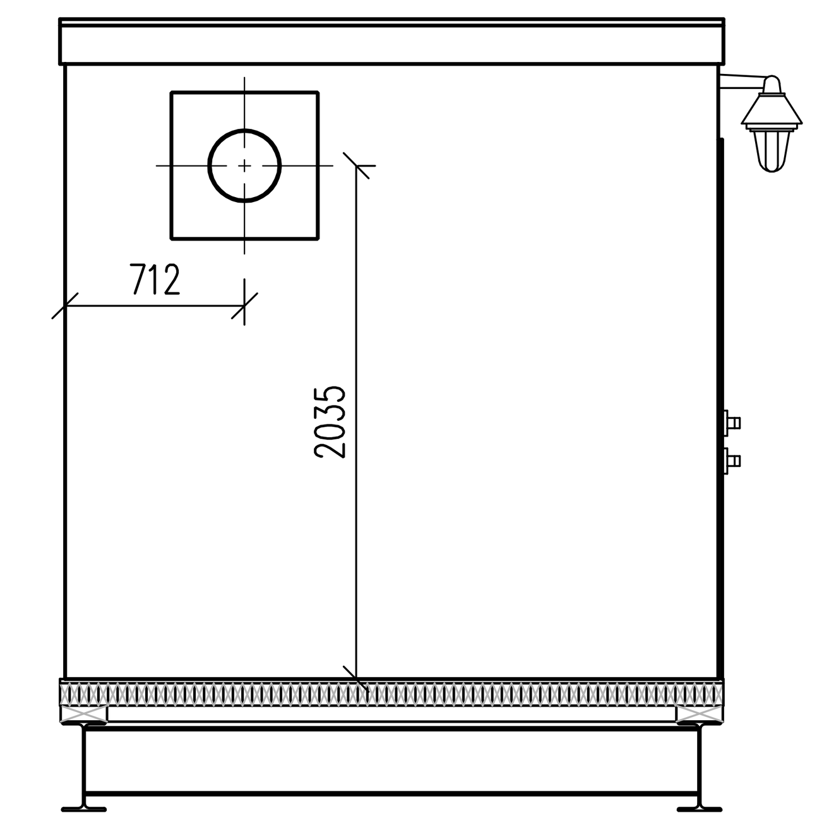
G-00	TITLE PAGE
A-01	PUMPHOUSE PLAN AND ELEVATIONS
C-01	SITE PLAN
C-02	INTAKE PLAN AND PROFILE
C-03	TRENCH CROSS-SECTIONS AND VOLUME TABLE
C-04	INTAKE CONCEPTUAL SKETCH
C-05	INTAKE DETAILS
EP-1	PUMPHOUSE ELECTRICAL SITE PLAN AND SINGLE LINE DIAGRAM
EP-2	PUMPHOUSE ELECTRICAL SCHEMATICS & DETAILS
EP-3	PUMPHOUSE ELECTRICAL CONTROL AND INSTRUMENTATION
EP-4	PUMPHOUSE ELECTRICAL SCHEMATICS
EP-5	PUMPHOUSE ELECTRICAL SCHEDULES & HEAT TRACE SCHEMATICS
M-01	PUMPHOUSE AND ACCESS VAULTS PLANS AND SECTIONS
M-02	INTAKE PIPELINE DETAILS
P-01	PROCESS DRAWING
S-01	ACCESS VAULTS
S-02	PUMPHOUSE SKID
S-03	PIPE SUPPORTS



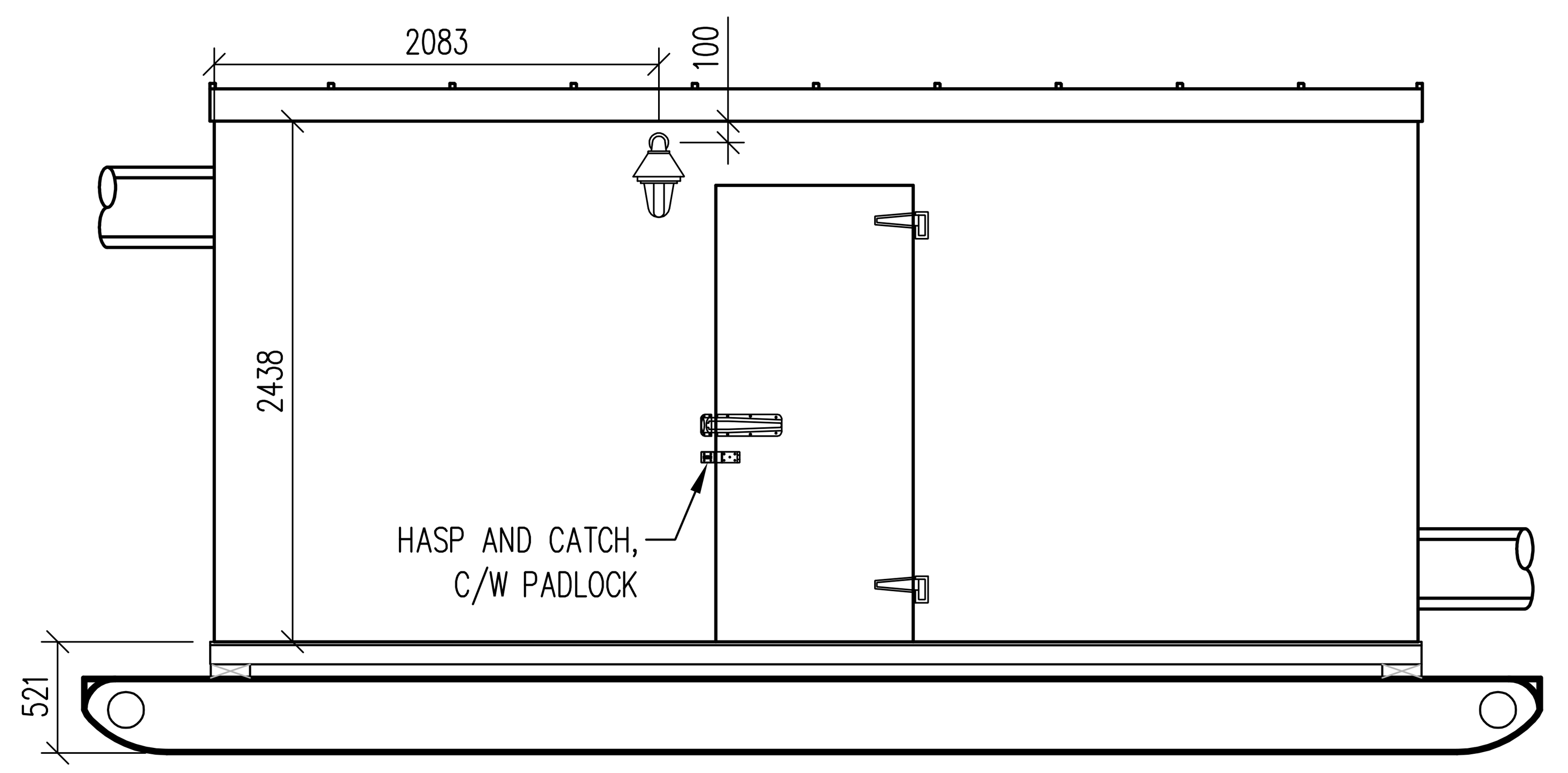
A A-01 PUMPHOUSE PLAN 1:30



B A-01 RIGHT ELEVATION 1:30



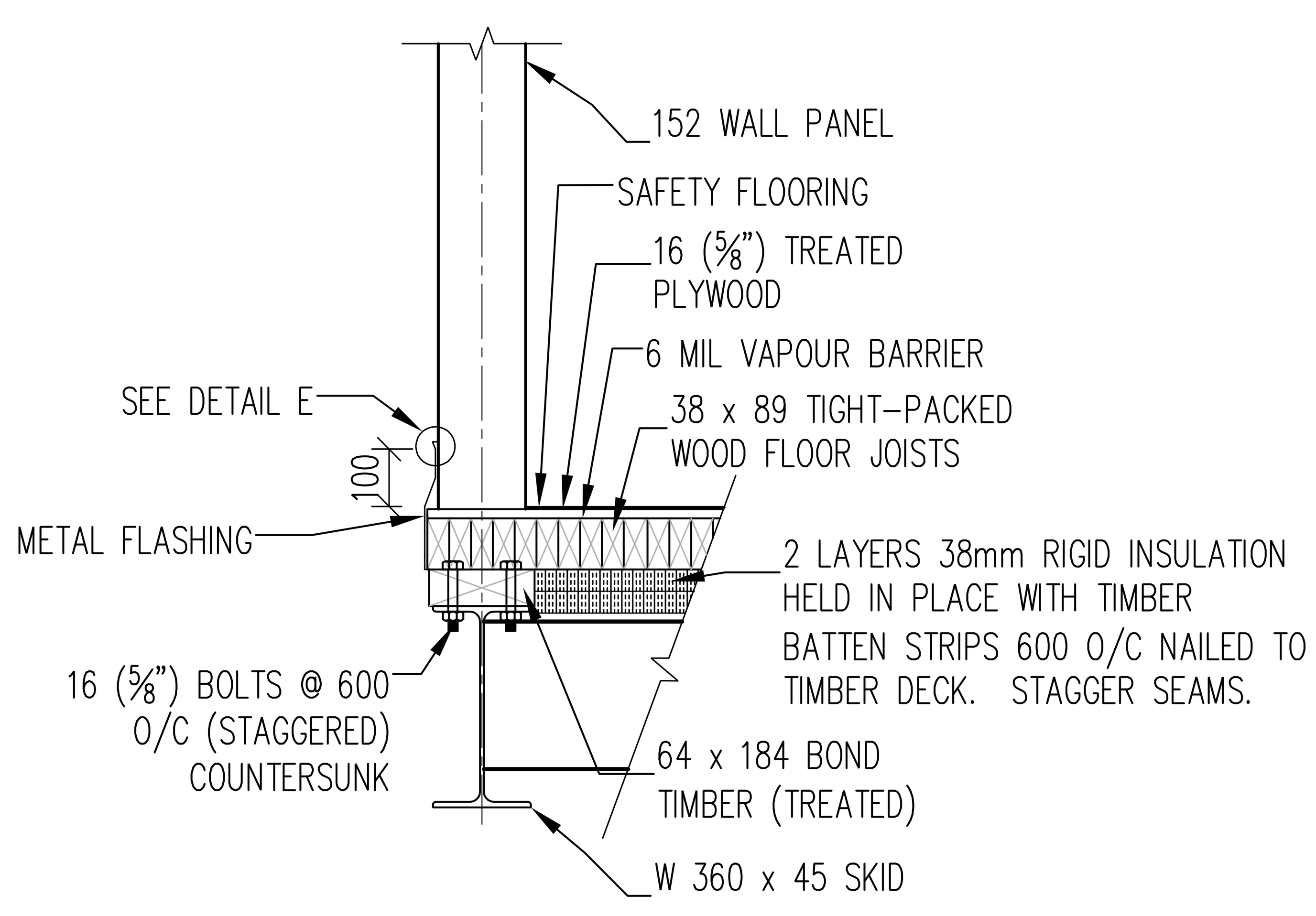
C A-01 LEFT ELEVATION 1:30



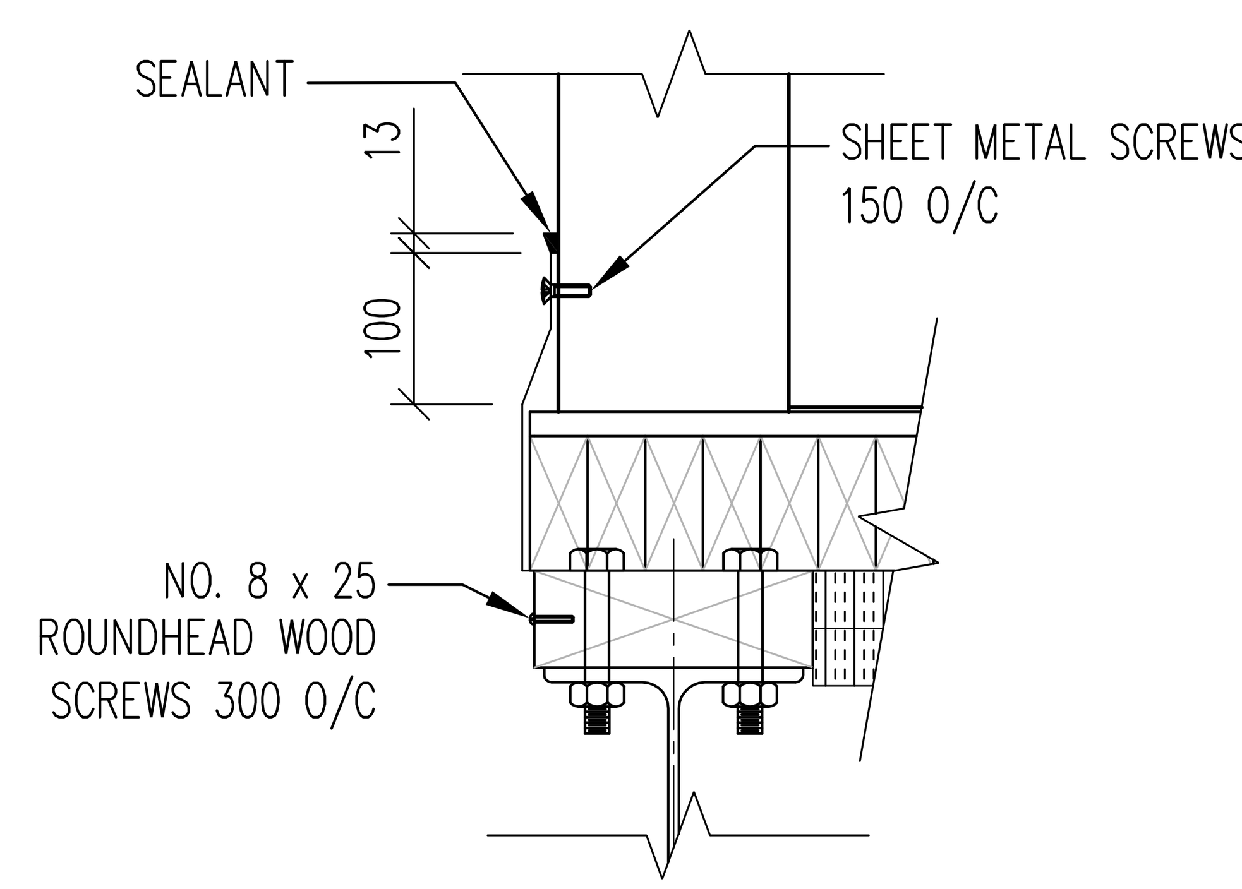
D A-01 FRONT ELEVATION 1:30

BUILDING NOTES:

1. BUILDING TO BE A BALLY MODULAR STRUCTURE WITH THE FOLLOWING SPECIFICATIONS:
2. DESIGNED TO NATIONAL BUILDING CODE OF CANADA USING CLIMACTIC DATA FOR KUGLUKTUK, NU (FORMERLY KNOWN AS COPPERMINE)
3. WALLS AND CEILING 152mm THICK
4. BR-2 BULLET RESISTANCE
5. STANDING SEAM ALUMINUM ROOF
6. ONE (1) DOOR 101.6mm THICK, 914mm X 2134mm, C/W HASP, CATCH, AND PADLOCK.
7. INTERIOR FINISH SMOOTH WHITE, EXTERIOR FINISH POLYESTER OVER GALVANIZED STEEL IN OWNER'S CHOICE OF COLOURS
8. ALL SHOP DRAWINGS TO BE STAMPED BY A P.ENG REGISTERED WITH THE NORTHWEST TERRITORIES AND NUNAVUT ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS (NAPEG).
9. FLOOR (DWG A-01, SECTION 1) AND SKID (SEE DWG S-02) NOT PROVIDED BY BALLY.



1 A-01 DECKING SECTION 1:10



E A-01 FLASHING DETAIL 1:5

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
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DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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LEGEND

1 A-001 SECTION # / SOURCE / REFERENCE DWG.
A E-001 DETAIL # / SOURCE / REFERENCE DWG.

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WILLIAMS ENGINEERING CANADA

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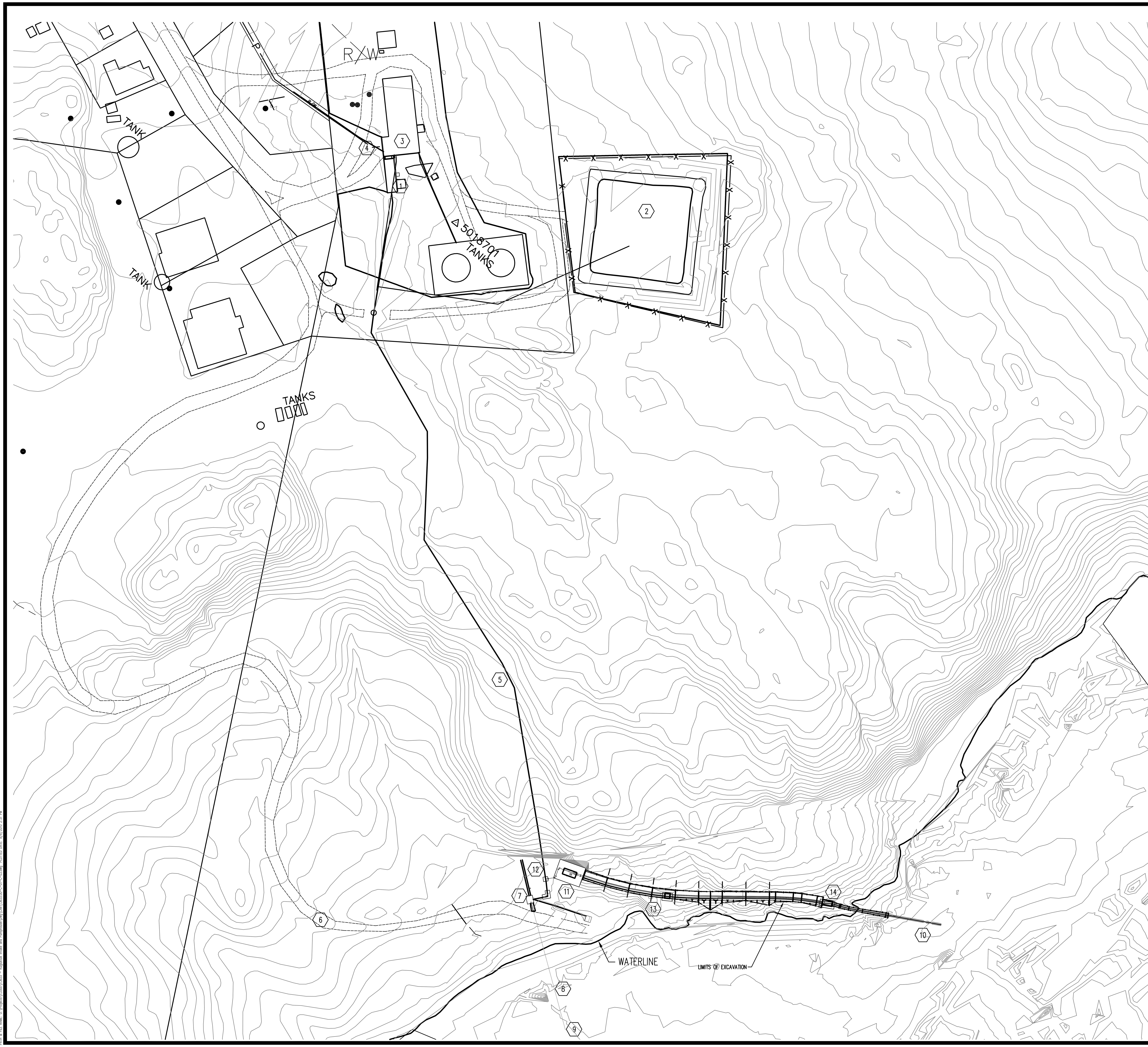
JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE:
PUMPHOUSE PLAN AND ELEVATIONS

DWN. BY: JG	DES. BY: JG	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # 13655.00
DWG # A-01	OF 1	REV # 1



KEYNOTES:

1. EXISTING WATER TREATMENT PLANT
2. EXISTING RAW WATER STORAGE POND
3. EXISTING TREATED WATER STORAGE
4. EXISTING TRUCKFILL STATION
5. EXISTING RAW WATER PIPELINE
6. EXISTING PUMPHOUSE ACCESS ROAD
7. EXISTING PUMPHOUSE
8. EXISTING RAW WATER CASING
9. INTAKE SCREENS TO BE REPLACED WITH BLIND FLANGES AND PIPE ABANDONED IN PLACE
10. PROPOSED NEW RAW WATER INTAKE. SEE DWG C-02 FOR PLAN AND PROFILE.
11. PROPOSED NEW RAW WATER PUMPHOUSE.
12. PROPOSED CONNECTION TO EXISTING 150mm RAW WATER PIPELINE – SEE DWG M-03, DETAIL A.
13. ACCESS VAULT 1
14. ACCESS VAULT 2

REVISIONS

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REFERENCE DRAWINGS

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SECTION # / SOURCE / REFERENCE DWG. (1 / A-001) — DETAIL # / SOURCE / REFERENCE DWG. (A / E-001)

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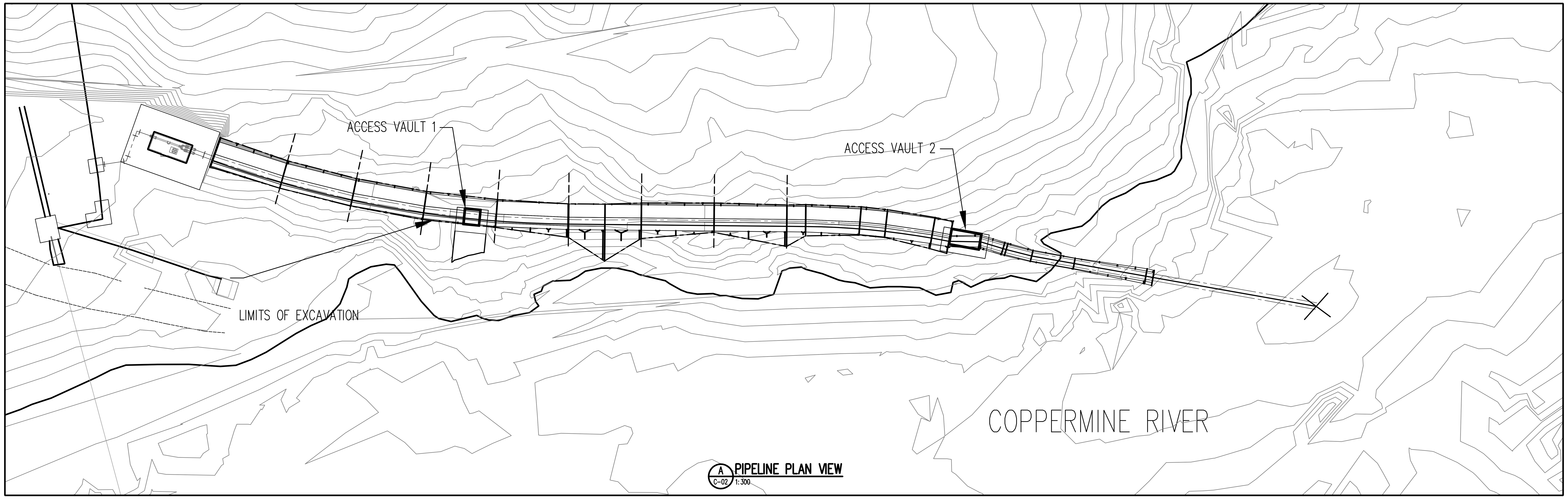
KUGLUKTUK, NU

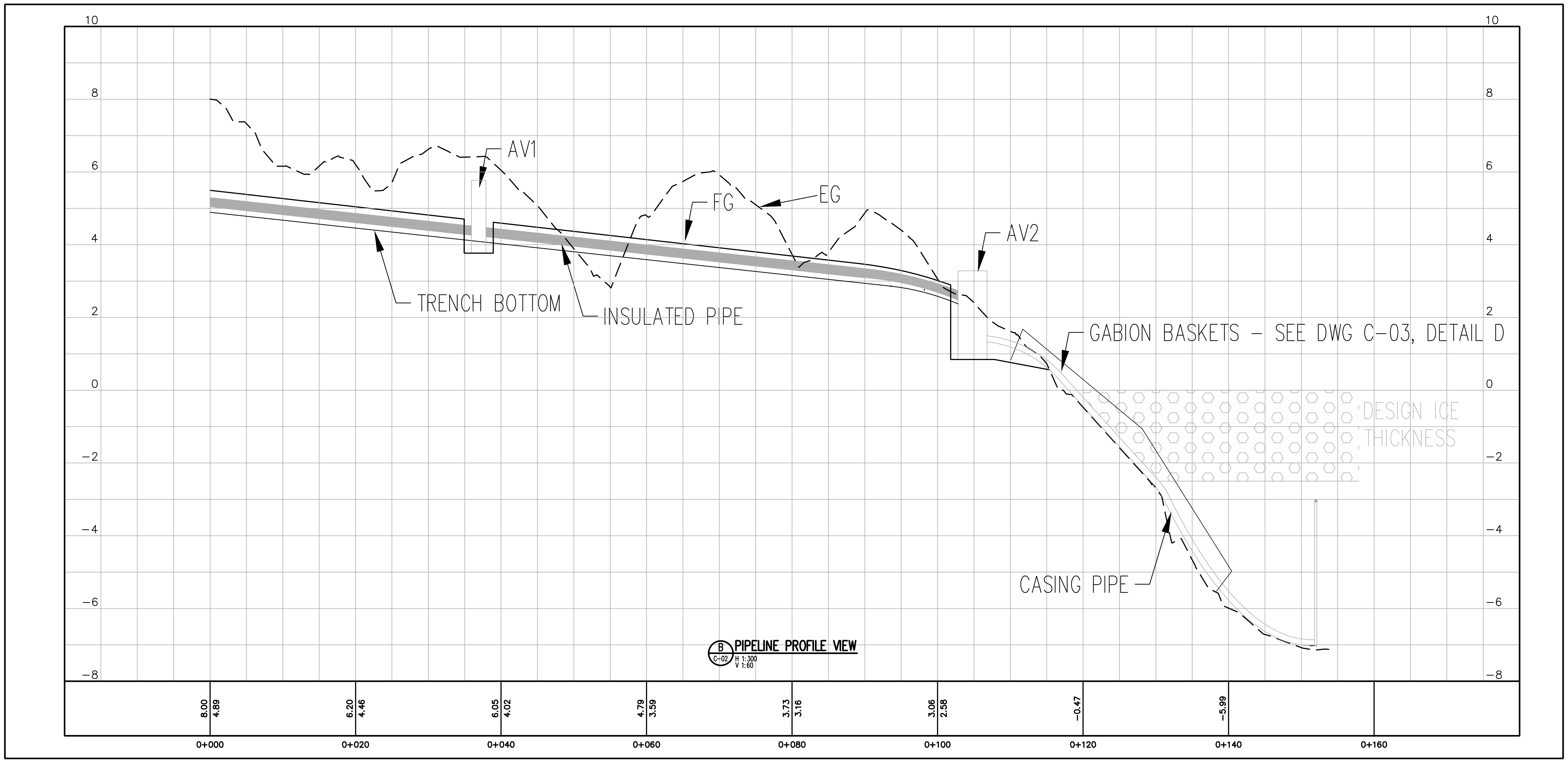
DWG. TITLE:

SITE PLAN

DWN. BY: JH	DES. BY: JH/JG/JC	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: 1:750
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # 13655.00
DWG # C-01	OF 5	REV # 1



A C-02 PIPELINE PLAN VIEW
1:300



B C-02 PIPELINE PROFILE VIEW
H 1:300
V 1:60

REVISIONS

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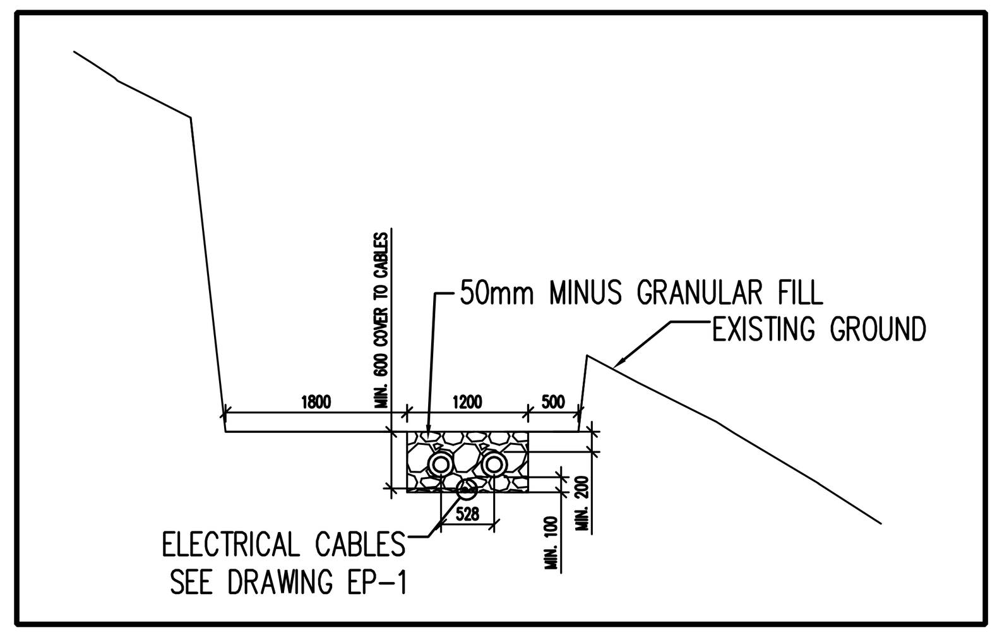
KUGLUKTUK, NU

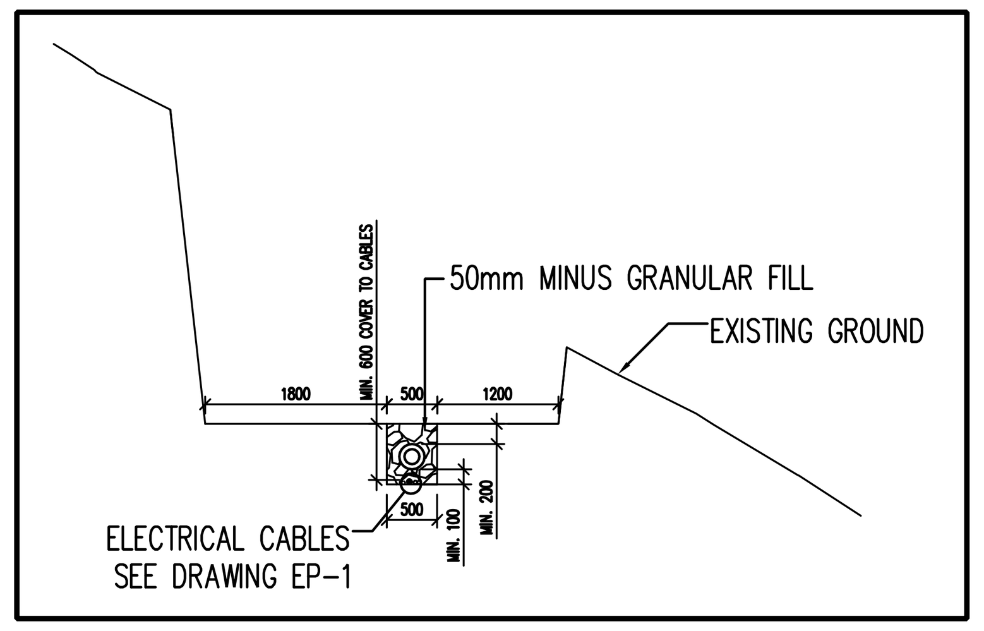
DWG. TITLE:

INTAKE PLAN AND PROFILE

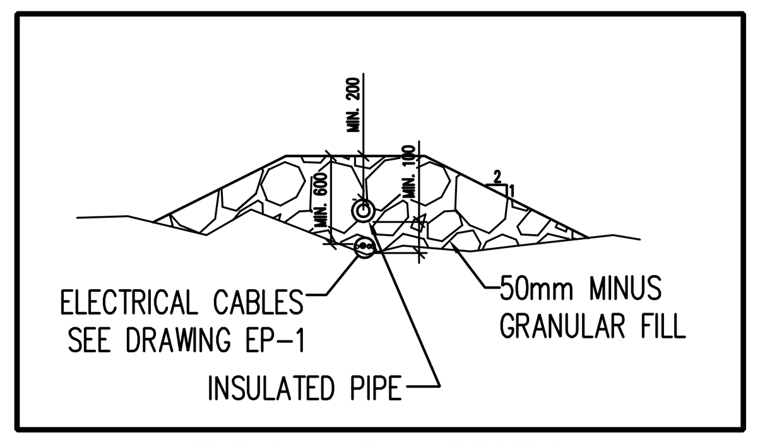
DWN. BY: JG	DES. BY: JH/JG/JC	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # 13655.00
DWG # C-02	OF 5	REV # 1



A TYPICAL CUT SECTION
C3 STA 0+000.0 TO 0+035.0

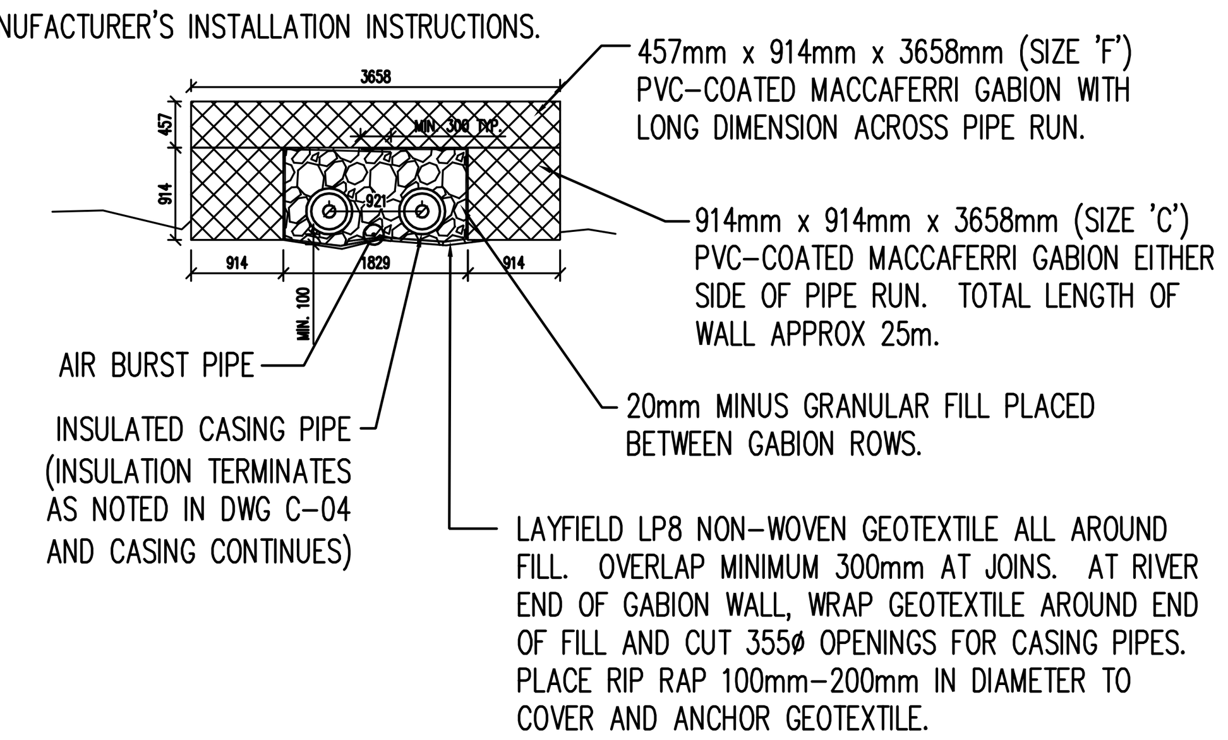


B TYPICAL CUT SECTION
C3 STA 0+037.9 TO 0+102.8



C TYPICAL FILL SECTION
C3 IN LOW AREAS AS NEEDED

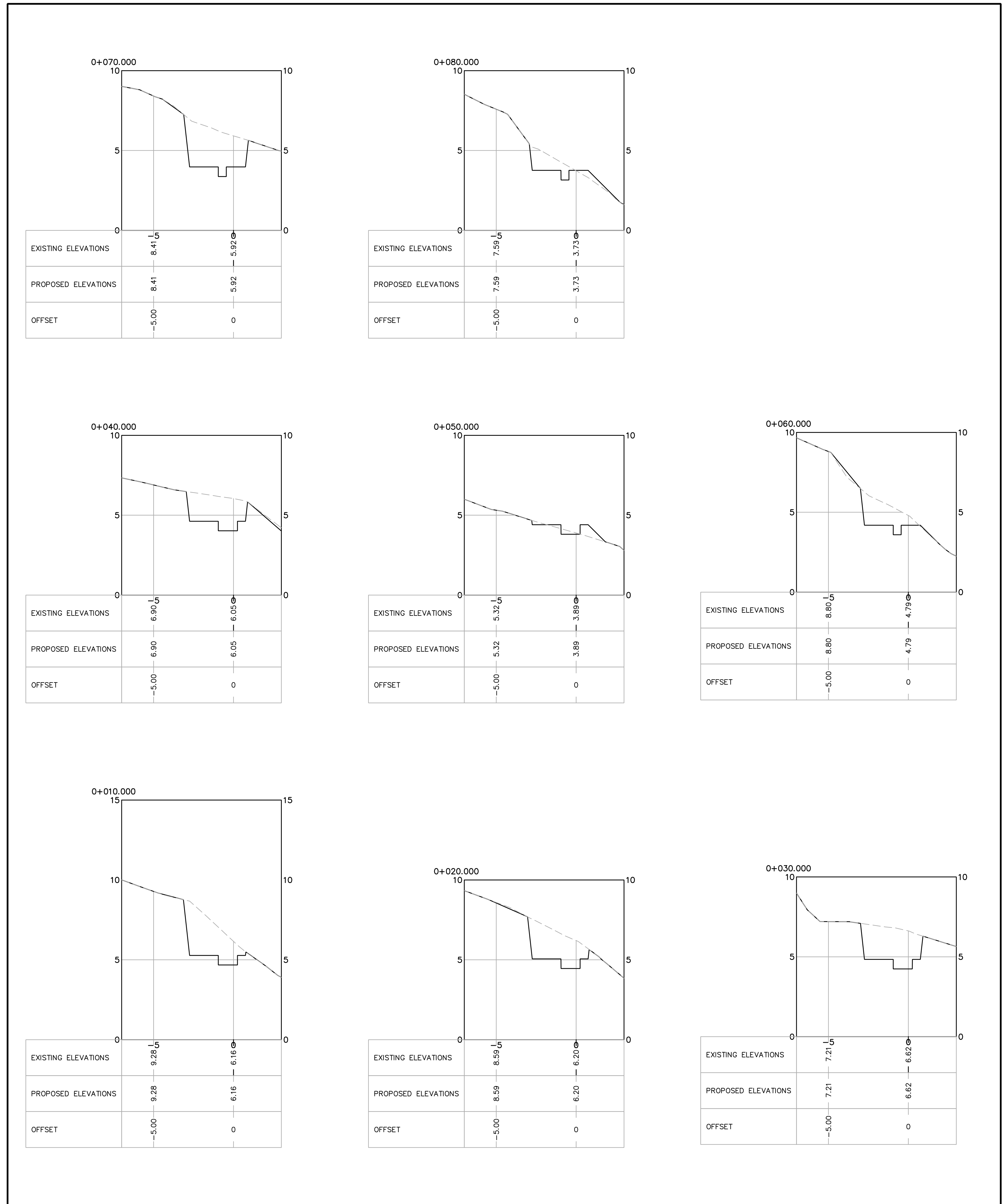
NOTE: ALL GABIONS TO BE FILLED WITH HARD, DURABLE, DENSE, NON-FROST SUSCEPTIBLE ROCK 102mm-203mm IN DIAMETER. FASTEN GABIONS AT ALL ADJOINING EDGES ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.



D TYPICAL UNDERWATER SECTION
C3 STA 0+106.8 TO 0+135.4

Total Volume Table						
Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
0+010.00	0.04	7.72	0.00	0.00	0.00	0.00
0+020.00	0.00	6.85	0.18	72.14	0.18	72.14
0+030.00	0.00	7.92	0.00	73.23	0.18	145.37
0+040.00	0.01	6.47	0.06	71.44	0.24	216.82
0+050.00	0.85	0.34	4.34	33.84	4.58	250.65
0+060.00	0.36	4.40	6.05	23.72	10.63	274.37
0+070.00	0.00	9.10	1.78	67.54	12.40	341.91
0+080.00	0.57	2.51	2.83	58.07	15.24	399.98

F VOLUMES FOR TRENCH SECTIONS SHOWN IN DETAIL E
C-03 NTS



E EXCAVATION SECTIONS
C-03 NTS

REVISIONS

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0	ISSUED FOR TENDER	2010.05.04	JG	JH
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Nunavut

JOB TITLE:

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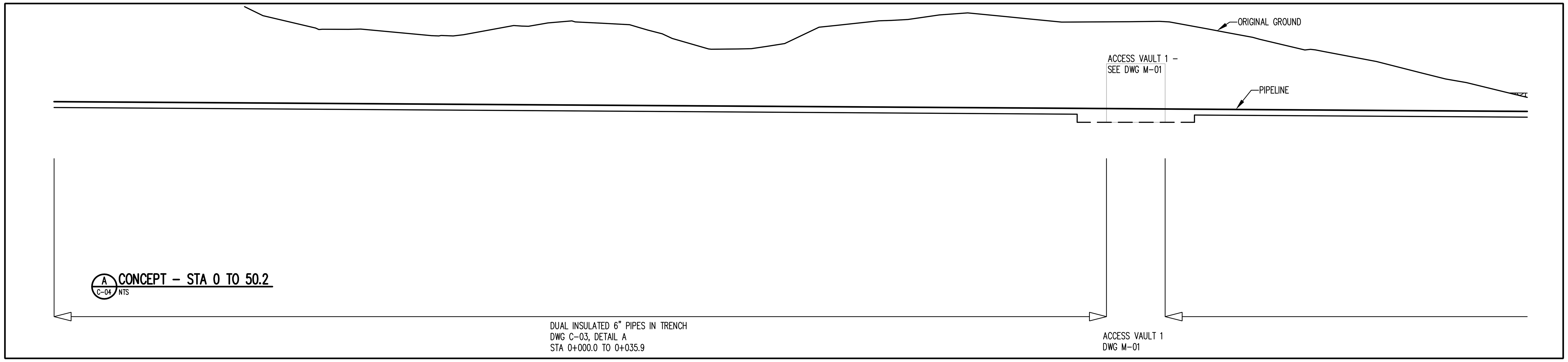
PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

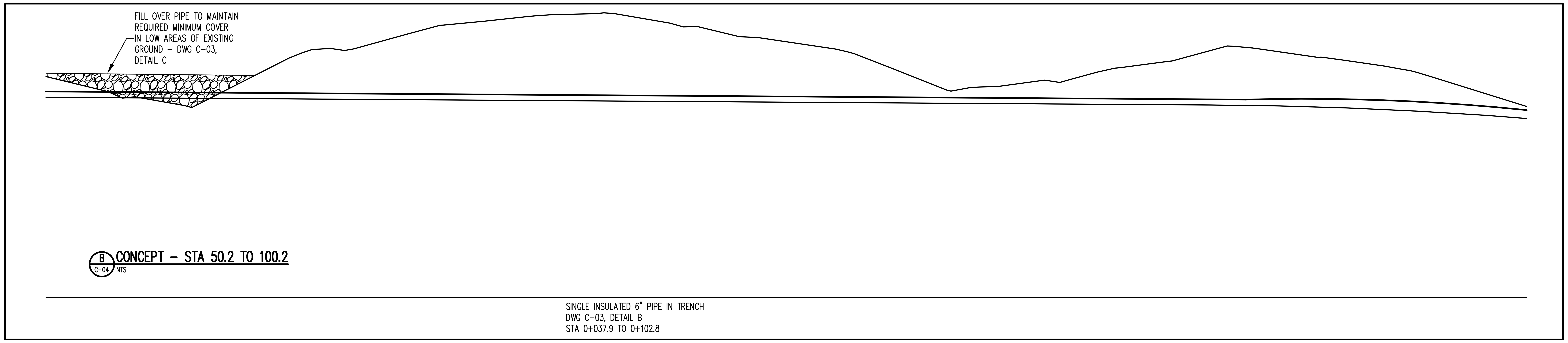
DWG. TITLE:

TRENCH CROSS SECTIONS AND VOLUME TABLE

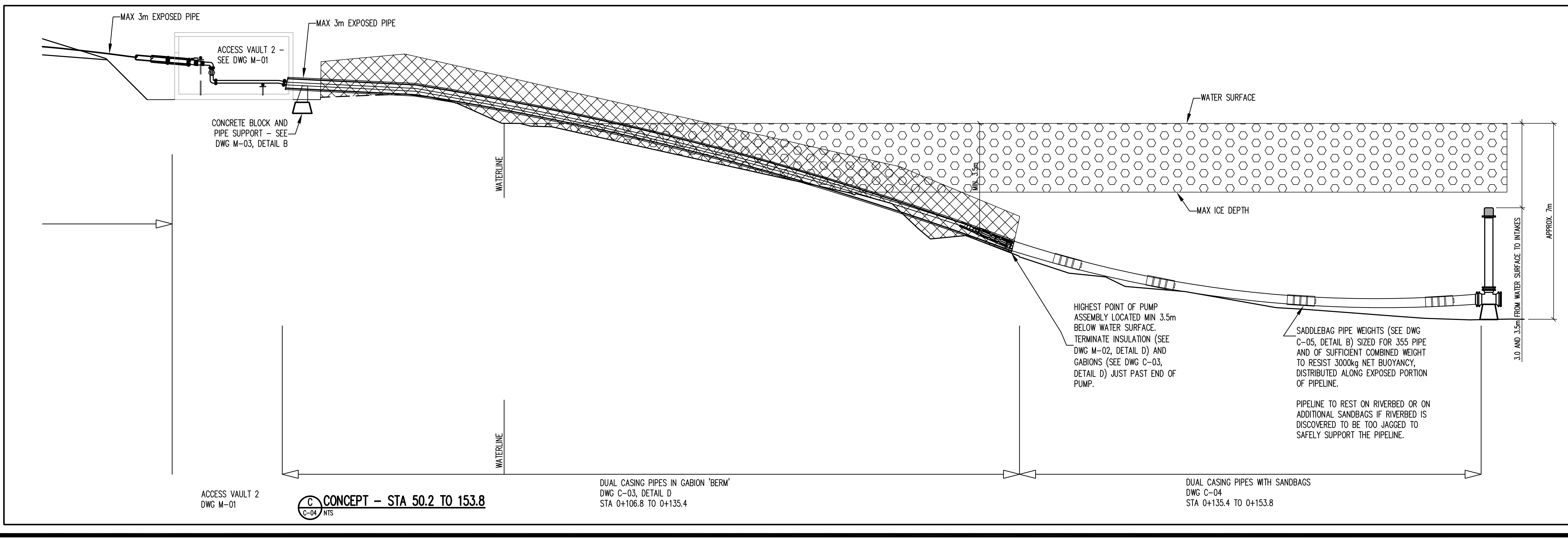
DWN. BY: JG	DES. BY: JH/JG/JC	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # 13655.00
DWG # C-03	OF 5	REV # 1



A C-04 CONCEPT – STA 0 TO 50.2
NTS



B C-04 CONCEPT – STA 50.2 TO 100.2
NTS



C C-04 CONCEPT – STA 50.2 TO 153.8
NTS

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

NOTE: THIS DRAWING IS INTENDED TO SHOW THE GENERAL CONCEPTS OF THE INTAKE DESIGN ONLY. FOR ACCURATE PLAN/PROFILE DATA, REFER TO DRAWING C-02

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KUGLUKTUK, NU

DWG. TITLE:
INTAKE CONCEPTUAL SKETCH

DWN. BY: JG	DES. BY: JH/JG/JC	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: NTS
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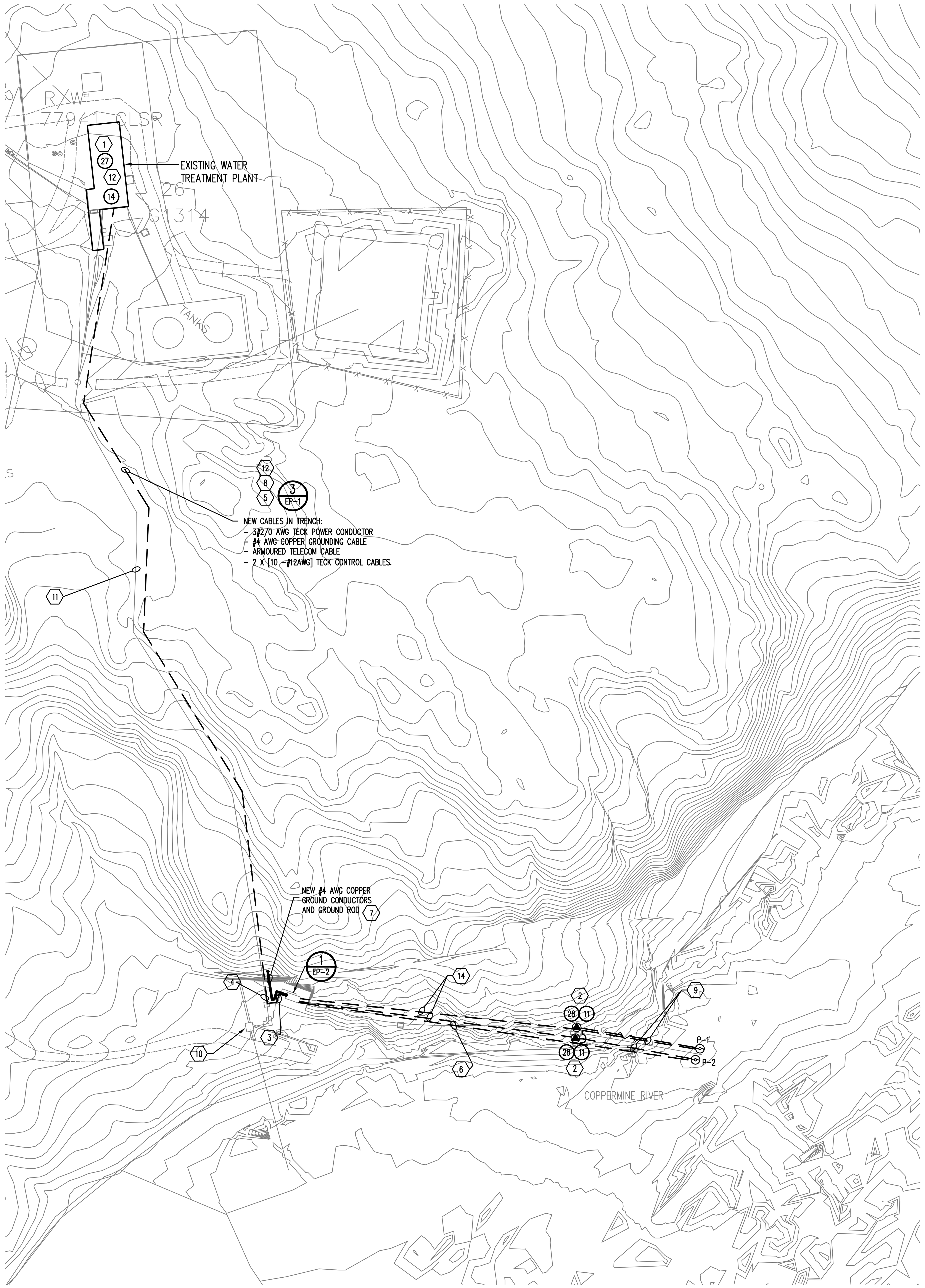
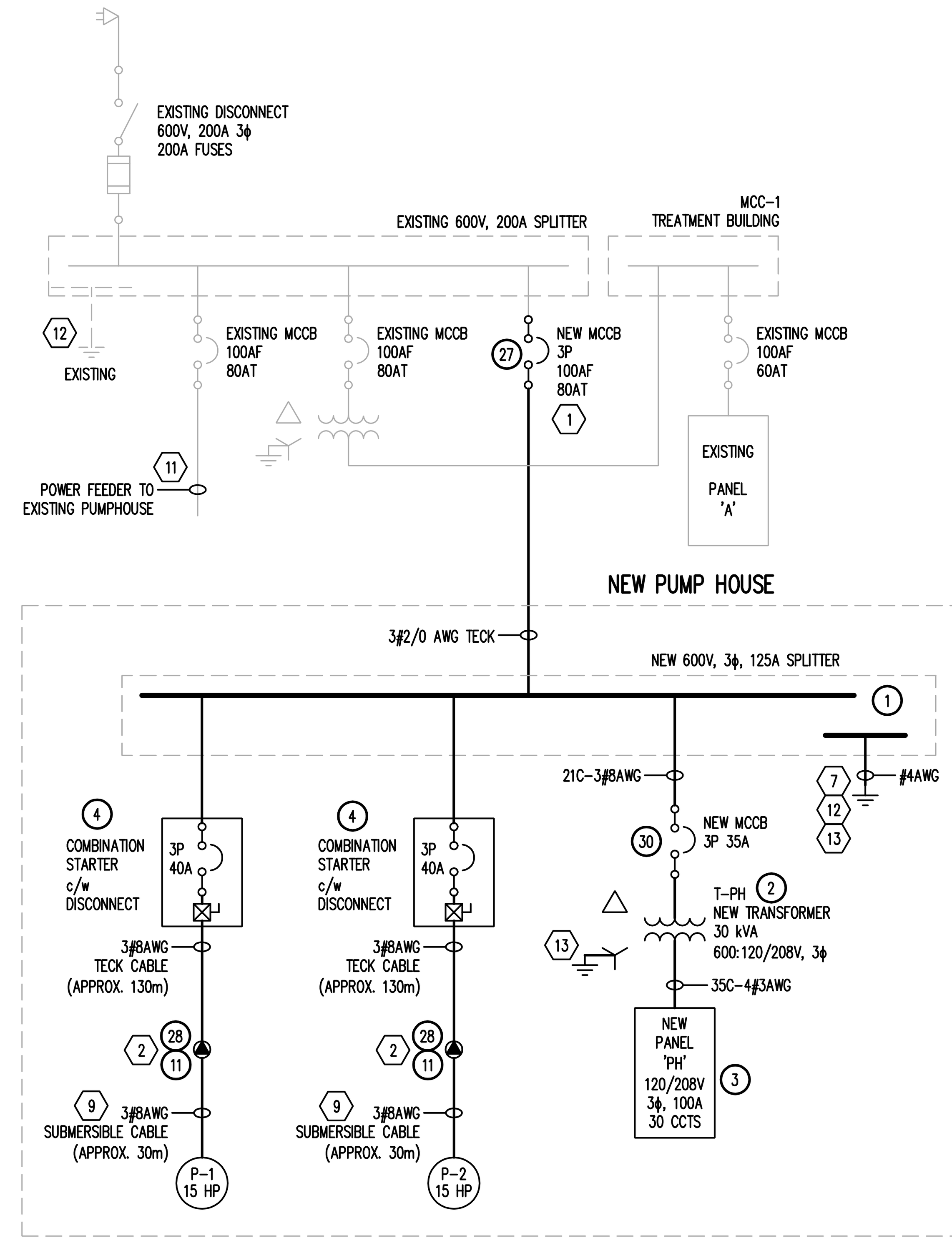
DWG # C-04	OF 5	REV # 1



1 EP-1 SITE PLAN
SCALE: 1:1000



2 EP-1 SINGLE LINE DIAGRAM
SCALE: NTS

LOAD CALCULATION

120/208V LOADS	LOAD	LOAD FACTOR	CEC REFERENCE
BASIC LOAD – 14.7 m² @ 25 W/m²	368 W	100%	TABLE 14
HEAT TRACE	6,430 W	100%	62–116 (3),(4)
RADIANT HEATERS	7,200 W	100%	62–116 (3),(4)
COMPRESSOR – 5 HP ASSUMED	5,000 W	100%	TABLE 14
TOTAL FACTORED LOADS – 120/208V	18,998 W		

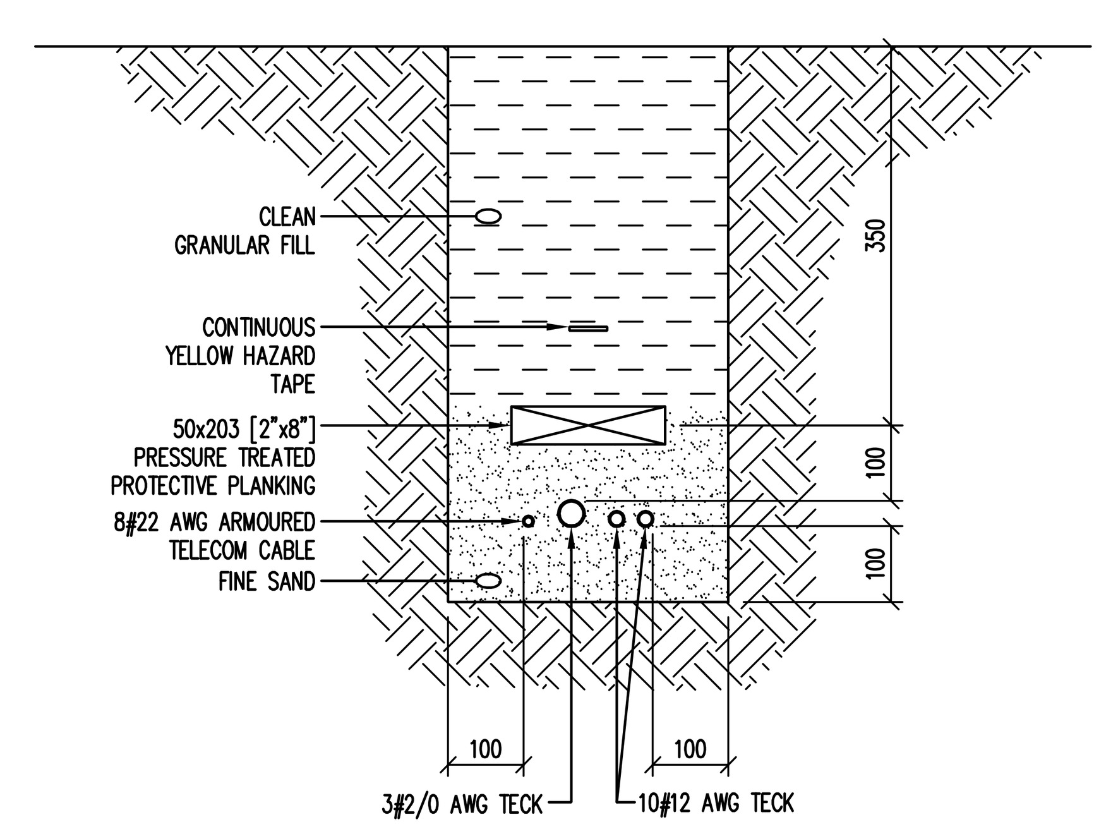
600V LOADS	LOAD	LOAD FACTOR	CEC REFERENCE
PUMPS – 2 @ 15 HP EACH	30,000 W	100%	TABLE 14
TRANSFORMER (120/208V LOADS)	18,998 W	100%	TABLE 14
TOTAL FACTORED LOADS – 600V	48,998 W		

AMPACITY CALCULATION

48,998 W/(√3*600V) = 47.2 A

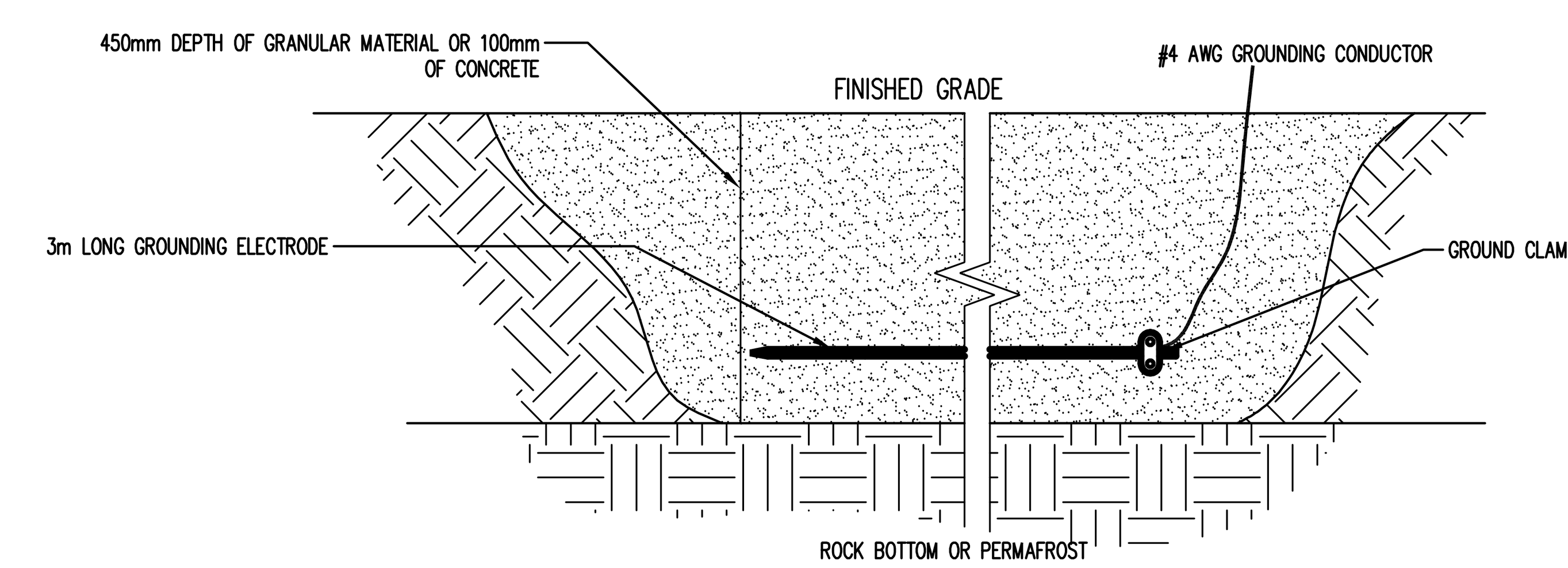
KEYNOTES:

1. PROVIDE NEW MCCB IN MAIN WATER TREATMENT PLANT FOR NEW PUMPHOUSE SERVICE. 3 P RATED @ 600 V, SIZE AS SHOWN.
2. TWISTLOCK CONNECTIONS FOR PUMP FEEDERS CABLING.
3. PROVIDE NEW CABLES ON THE NEW PIPE SUPPORT. REFER TO DRAWING DETAIL /S-02.
4. PROVIDE NEW CABLE SUPPORTS ON THE OTHER SIDE OF EXISTING PIPE SUPPORTS THAT IS SIMILAR WITH EXISTING ONE AND RUN NEW CABLES IN CONDUITS ON NEW CABLE SUPPORTS. MAXIMUM SPACE BETWEEN SUPPORTS IS 3 m WITH MINIMUM CONDUIT SIZE OF 41C.
5. PROVIDE NEW CABLES IN EXISTING TRENCH WITH HAND EXCAVATION DUE TO REMAIN EXISTING FEEDER.
6. HEAT TRACE RUN. SEE DETAIL 7/EP-4 FOR CONTROL AND DETAILS 1, 2, 3, 4, & 5/EP-5 FOR INSTALLATION.
7. PROVIDE NEW GROUNDING SYSTEM AT NEW PUMPHOUSE AS SHOWN ON DETAIL 4. CONNECT INCOMING GROUND CONDUCTOR SPLITTER BOX GROUNDING LUG. RUN #4 AWG BARE COPPER CONDUCTORS TRENCHED AND ALONG WITH NEW CABLES.
8. PROVIDE TWO (2) INCOMING TELEPHONE LINES. ONE LINE TO BE DEDICATED FOR AUTODIALLER. SECOND LINE FOR VOICE HANDSET CONNECTION. CONNECT NEW LINES TO EXISTING BACKBOARD AT WATER TREATMENT PLANT.
9. DO NOT USE SPLICED CABLE. 30 m OF SUBMERSIBLE CABLE c/w PUMP. CABLE TO BE SUPPLIED BY OTHERS AND INSTALLED BY ELECTRICAL. PROVIDE WATERTIGHT PLUGS & RECEPTACLES AT THE VAULT #2, TYPE AS SHOWN ON DRAWING EP-2.
10. EXISTING PUMPHOUSE TO BE DEMOLISHED. REMOVE ALL ELECTRICAL DEVICES INCLUDING CABLES. COORDINATE SCHEDULE WITH OWNER.
11. EXISTING PUMPHOUSE FEEDERS TO REMAIN AS ARE UNTIL DECOMMISSIONING OF EXISTING PUMPHOUSE. NEW CABLES TO BE RUN WITH EXISTING FEEDERS IN EXISTING TRENCH. EXISTING FEEDERS TO BE REMOVED WITH EXISTING PUMPHOUSE. COORDINATE REMOVING FEEDERS WITH OWNER.
12. BOND GROUNDING SYSTEM OF NEW PUMPHOUSE TO EXISTING GROUNDING SYSTEM OF EXISTING WATER TREATMENT PLANT WITH #4 AWG COPPER CABLE.
13. PROVIDE GROUNDING CONNECTION TO TRANSFORMER WITH #4 AWG CABLE FROM NEW GROUNDING SYSTEM AT NEW PUMPHOUSE.
14. TECK CABLE FOR PUMPS P-1 & P-2 BETWEEN PUMPHOUSE AND VAULT #2. RUN IN TRENCH AS PER CEC REQUIREMENT. RUN TECK CABLE IN 41C RIGID STEEL CONDUIT WHERE EXPOSED.



NOTE 1. REFER TO KEYNOTE 5.

3 EP-1 TYPICAL TRENCH DETAIL
N.T.S.



4 EP-1 GROUNDING DETAIL
N.T.S.

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES.
2. CONDUITS SHALL BE RIGID, GALVANIZED STEEL.
3. TO ALL NUMBER OF WIRES SHOWN IN CONDUITS, CONTRACTOR SHALL ADD ONE GROUND WIRE AS PER CEC REQUIREMENTS.
4. MOUNT ALL ELECTRICAL EQUIPMENT SO THAT CONNECTIONS CAN BE EASILY EXPOSED FOR SERVICE.
5. ALL SWITCHES, STARTERS, THERMOSTATS, RELAYS, CONTACTORS, TIMERS, ETC.... SHALL BE IDENTIFIED WITH STAINLESS STEEL LABELS FASTENED TO BOXES.
6. FOR WIRING DIAGRAMS SEE DWG. EP-4.
7. AVAILABLE POWER SUPPLY TO THIS BUILDING SHALL BE 3 PHASE 600 V AND 208 V, 60 Hz.
8. FOR DESCRIPTION OF ITEMS ①, ②, ③, ④, ... REFER TO DWG EP-2.

RECORD DRAWING

DRAWINGS WERE BASED UPON INFORMATION SUBMITTED FROM OTHER PARTIES AND THE ENGINEER DOES NOT WARRANT OR CERTIFY THAT THE INFORMATION FROM THESE OTHER PARTIES IS ACCURATE.

DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

FOR BEST PLOTTING RESULTS, BE SURE TO USE WILLIAMS ENGINEERING CANADA AUTOCAD PLOT CONFIGURATION FILES AVAILABLE FROM: www.williamsengineering.com

LEGEND

1 A-001 SECTION # SOURCE / REFERENCE DWG.
A E-001 DETAIL # SOURCE / REFERENCE DWG.

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PERMIT NUMBER
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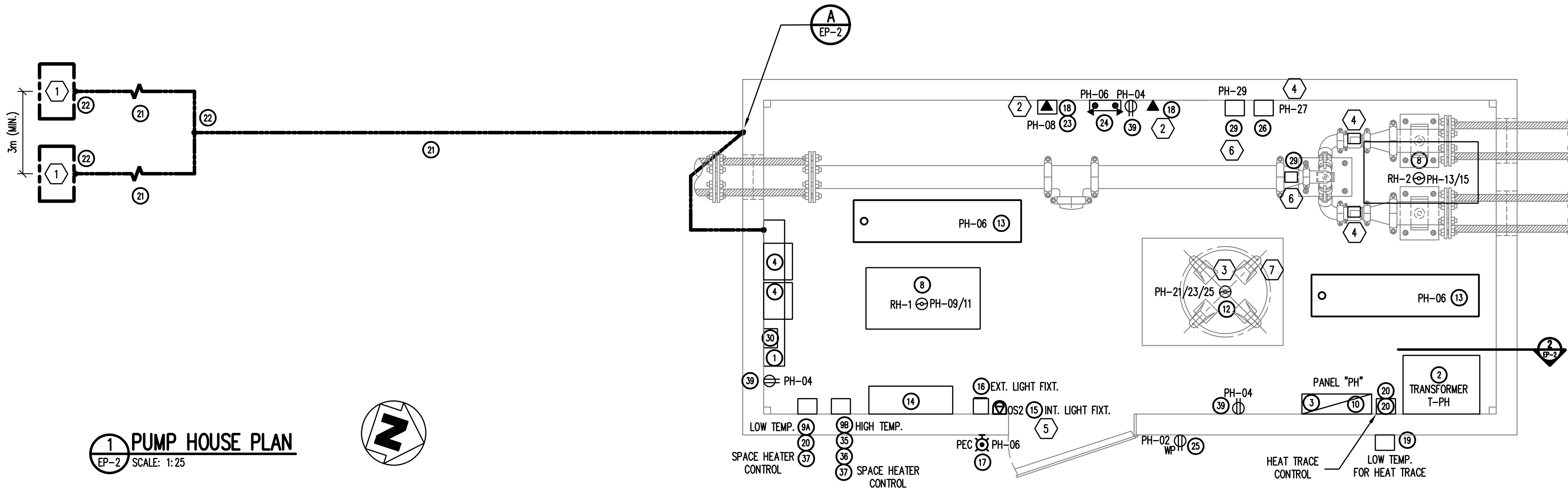
WILLIAMS ENGINEERING
CANADA

CLIENT: Nunavut

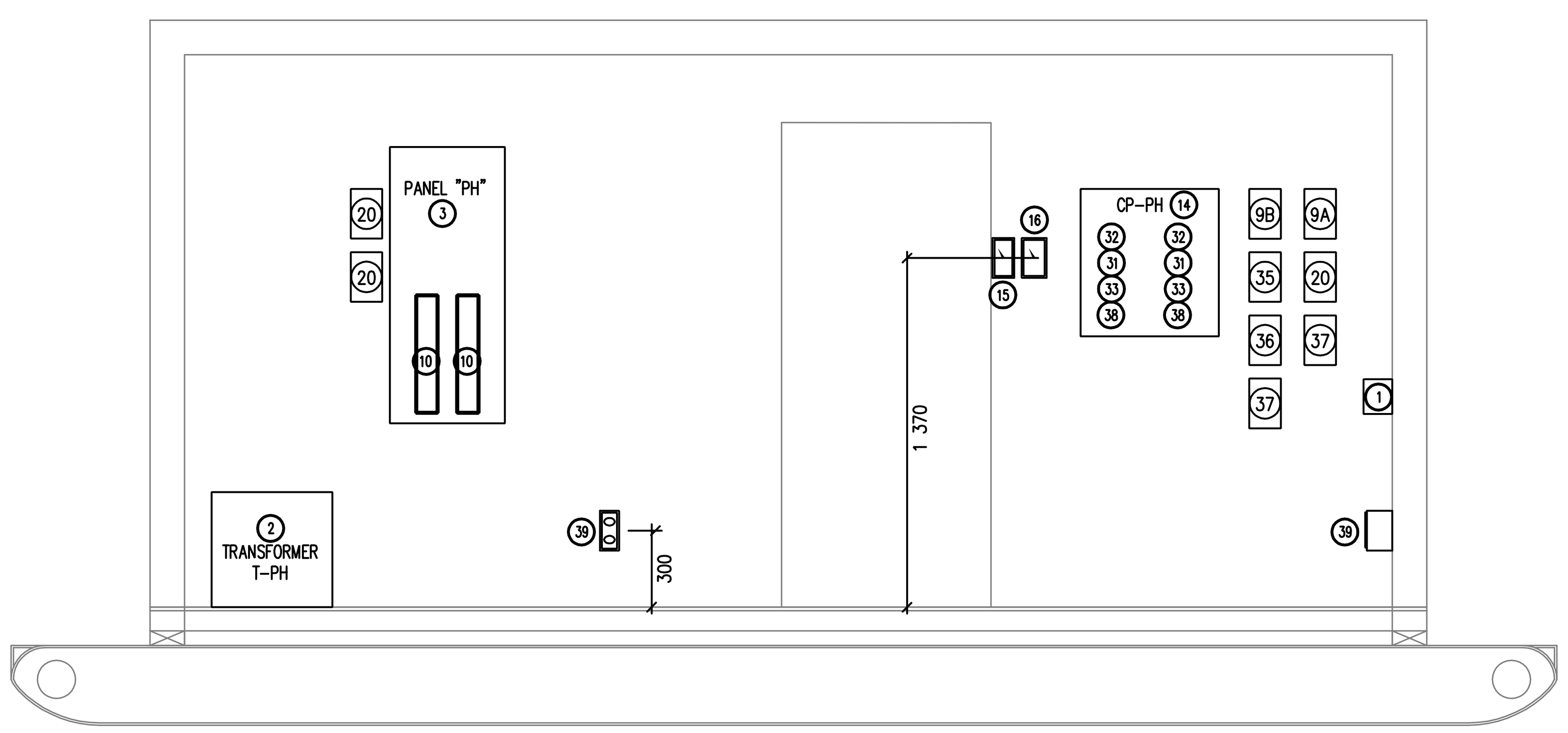
JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE: PUMPHOUSE ELECTRICAL SITE PLAN AND SINGLE LINE DIAGRAM

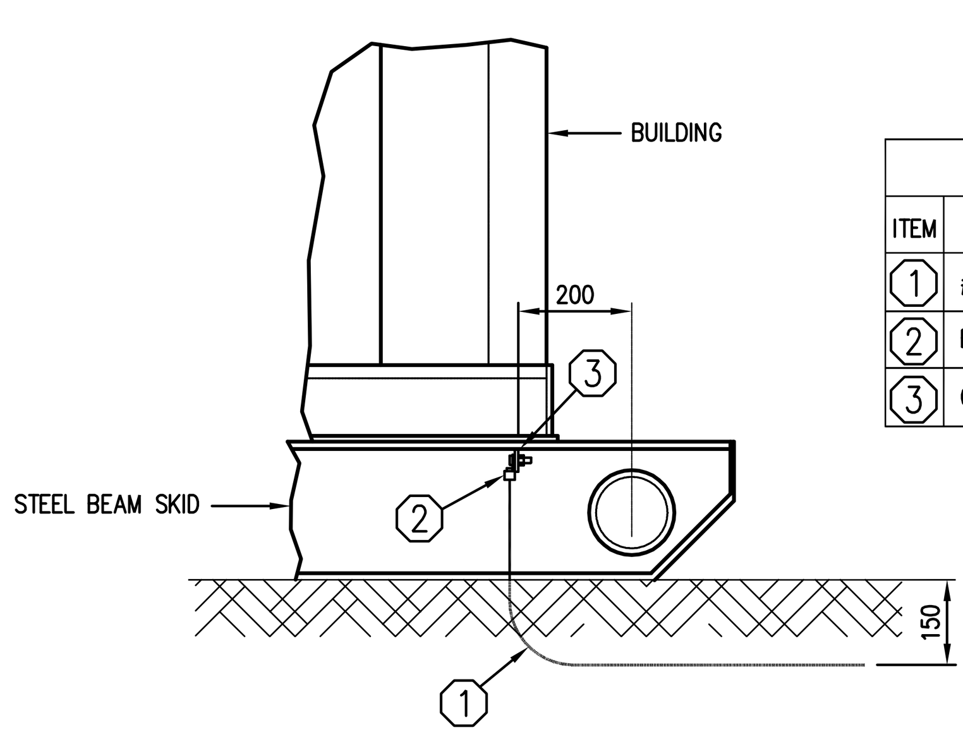
DWN. BY: JL	DES. BY: JL	PROJ. MGR.: JH
PEER REVIEW: JL	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # i13655.00
DWG # EP-1	OF 5	REV # 1



1 PUMP HOUSE PLAN
EP-2 SCALE: 1:25



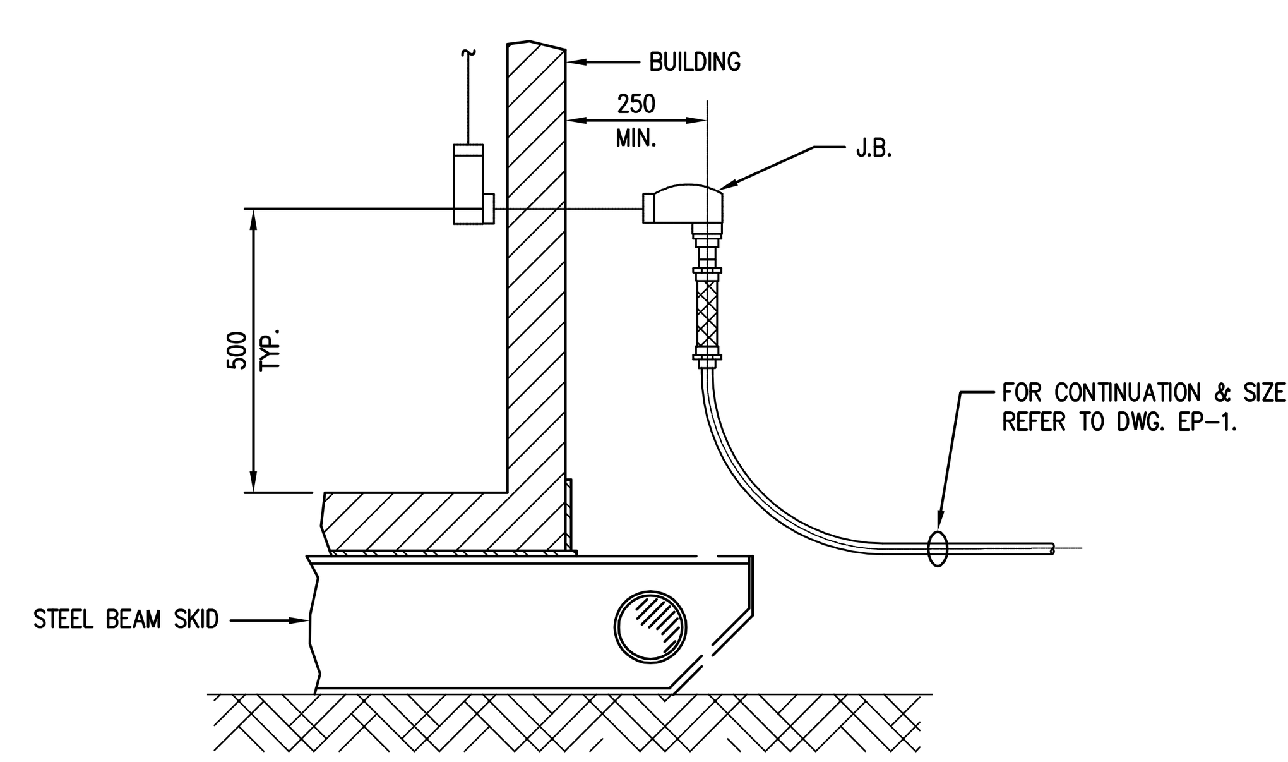
2 WEST WALL ELECTRICAL EQUIPMENT
EP-2 SCALE: 1:25



ITEM	DESCRIPTION
1	#4 STRANDED BARE COPPER GROUND WIRE
2	BURNDY CONNECTOR SCRULUGS TYPE KPA c/w BRASS BOLT & NUTS
3	GROUND LUG PLATE 40 x 40 x 6 TH'K.

(LIST OF MATERIAL)

A STATIC ELECTRICITY GROUNDING CONNECTIONS AT BUILDING
EP-2 SCALE: 1:25



B ELECTRICAL CONDUIT ARRANGEMENT AT ENTRY OF BUILDING
EP-2 SCALE: N.T.S.

KEYNOTES:

1. GROUNDING RODS OF MINIMUM LENGTH 3 m. BURY AS SHOWN ON GROUNDING DETAIL 4/EP-1.
2. PROVIDE TWO (2) INCOMING TELEPHONE LINES. ONE LINE TO BE DEDICATED FOR AUTODIALLER. SECOND LINE FOR VOICE HANDSET CONNECTION. CONNECT NEW LINES TO EXISTING BACKBOARD AT WATER TREATMENT PLANT.
3. AIR COMPRESSOR FOR USE IN SCREEN CLEANING VIA AIR BURST SYSTEM. SUPPLIED BY OTHERS AND WIRING BY ELECTRICAL.
4. PROVIDE POWER TO SWITCHING POWER SUPPLY FOR FLOW METERS. SUPPLIED BY OTHERS AND WIRING BY ELECTRICAL. RUN SENSOR CABLE IN SEPARATE CONDUIT BETWEEN FLOW METER AND FLOW SENSOR.
5. OCCUPANCY SWITCH FOR INTERIOR LIGHTING. SET AT 20 MINUTES.
6. SALINITY METER AND CPVC SENSOR. SUPPLIED BY OTHERS AND WIRING BY ELECTRICAL. PROVIDE CONTROL CIRCUIT AS SHOWN ON DETAIL 1/EP-4. RUN SENSOR CABLE IN SEPARATE CONDUIT BETWEEN METER AND SENSOR.
7. PROVIDE BONDING WIRE TO COPPER PIPE OF COMPRESSOR WITH #4 AWG COPPER CABLE. COORDINATE WITH MECHANICAL.

LIST OF PUMPHOUSE BLDG. ELECTRICAL & GROUNDING EQUIPMENT

NO.	QTY.	DESCRIPTION
1	1	600V, 125A, 3ϕ SPLITTER, BEL FT3103, SBT200 SPLITTER BLOCKS & TGR200 GROUNDING KIT.
2	1	30 kVA, 600V-120/208V THREE PHASE TRANSFORMER, REX POWER MAGNETICS TYPE BC30JM/EP ENCAPSULATED, FLOOR MOUNT.
3	1	DISTRIBUTION PANELBOARD "PH", CUTLER-HAMMER TYPE POW-R-LINE, 120/208V, 100 AMP BUS, 3 ø c/w TVSS, EEMAC 4 ENCLOSURE, AND DOOR. SURFACE MOUNT. CAT #. P1aL4C1-30.
4	2	DISCONNECT COMBO STARTER c/w GROUND FAULT SENSOR, NON-REVERSING, 3-POLE FOR 600 V LINE VOLTAGE AND 120V COIL. ALLEN BRADLEY TYPE 512-CDCD-EC2D.
5	-	NOT USED.
6	-	NOT USED.
7	AS REQ'D	HEAT TRACE TYPE TYCO THERMAL 8BTV2-CT.
8	2	3.6 KW RADIANT HEATER. CHROMALOX TYPE RBC-33680, 208V, 1ϕ, 17.3 A.
9	2	THERMOSTAT FOR BUILDING HEATING CONTROL, HONEYWELL TYPE T87 ROUND NON-PROGRAMMABLE THERMOSTAT.
10	AS REQ'D	DISTRIBUTION BREAKERS, 10,000 A.I.C., BOLT-ON TYPE, AMP. RATING AND No. OF POLES AS PER DISTRIBUTION PANEL SCHEDULE, CUTLER-HAMMER TYPE BAB FOR ITEM 3.
11	2	3 POLE, 4 WIRE, 600 VOLTS AC, 30 AMP WATERTIGHT LOCKING PLUG AND CONNECTOR. COOPER CAT. # L1730PW & L1730CW.
12	1	5 HP, 208 V, 3 ø, 60 HZ COMPRESSOR INCLUDING COMPRESSOR CONTROL PACKAGE. REFER TO CIVIL SPECIFICATION.
13	2	METALUX VAPORTITE FLUORESCENT FIXTURE VT2-232DR-120V-EB81-WL-U, 2-T8 LAMPS, 120V.
14	2	CONTROLS ENCLOSURE, SINGLE DOOR NEMA 4, HAMMOND MANUFACTURING TYPE 1418N4J8.
15	1	PASSIVE INFRARED WALL SWITCH OCCUPANCY SENSOR LEVITON TYPE ODS15-IDG .
16	1	AUTO/OFF TOGGLE SWITCH, DOUBLE POLE INDUSTRIAL GRADE. HUBBELL TYPE HBL1202.
17	1	HIGH PRESSURE SODIUM EXTERIOR LIGHTING FIXTURE GREY, WALL PACKETTE, 70 W, 120 V c/w BALLAST, PHOTOELECTRIC CONTROL, POLYCARBONATE COVER AND PROTECTION GRILLE, HOLOPHANE CAT. # W4070HP12SGB.
18	2	TELEPHONE OUTLET, WALL MOUNT.
19	1	AMBIENT SENSING THERMOSTAT FOR HEAT TRACING CABLE, DIGITRACE TYPE AMC-1A.
20	3	CONTROL RELAY FOR BUILDING HEATER, ELECTRICALLY HELD AC., c/w 4 CONTACTS N.O. TYPE, 35 A CONTACT RATING. ALLEN-BRADLEY CAT.# 700-PH401-A1. c/w EEMAC ENCLOSURE CAT.# 700-N31S.
21	1	#4 STRANDED BARE COPPER GROUND WIRE.
22	3	MECHANICAL GROUND CLAMP, BURNDY TYPE GP644C.
23	1	AUTODIALLER, NEMA 4 ENCLOSURE, LOW TEMPERATURE SENSOR, SENSAPHONE MODEL 1400.
24	1	EMERGENCY BATTERY PACK, LUMACELL RGNX-36-M6W-CW1.
25	1	HEAVY DUTY WEATHER RESISTANT RECEPTACLE, HUBBELL TYPE HBL5262BKWR. RECEPTACLE COVER HUBBELL TYPE HBL5206WO.
26	1	SWITCHING POWER SUPPLY TO CONVERT 120VAC TO 12-24VDC.
27	1	600 V, 3 POLE, 100 A c/w ENCLOSURE. EATON CAT. # FDB3100.
28	2	3 POLE, 4 WIRE, 600 VOLTS AC, 30 AMP WATERTIGHT LOCKING RECEPTACLES. COOPER CAT. # L1730RW.
29	1	120V SALINITY METER WITH RELAY ACTUATION, WALCHEM TYPE CAT. #WEC-1NDN.
30	1	600V, 3 POLE, 35 A c/w ENCLOSURE. EATON CAT. # FDB3035.
31	AS REQ'D	MOMENTARY CONTACT PUSHBUTTONS, PANEL MOUNT, EATON CAT. # E22E2A, E22E2B, E22E3A, E22E3B.
32	2	TWO-POSITION SELECTOR SWITCH, PANEL MOUNT. EATON CAT. # E22V51A.
33	AS REQ'D	LED INDICATING LIGHT, PANEL MOUNT, EATON CAT. # EM22H2X43, EM22H2X44, EM22H9X96
34	10	GENERAL PURPOSE RELAY. 120 VAC COIL, 7 A CONTACT RATING, 4 POLE 4 FORM C. ALLEN BRADLEY CAT. #700-HC24A1.
35	1	AUTOMATIC RESET TIMER FOR BUILDING HEATER, INTERVAL USE TYPE 500 SERIES, 120 VAC. RANGE 0 TO 5 HRS., 5 MIN. PARAGON ELECTRIC CO. MODEL# 501-142-00 c/w MOISTURE AND DUST RESISTANT CASE MODEL 500 AND EDP.# 41150 ENCLOSURE TIMER SET AT 1 HR.
36	1	STANDARD DUTY STATION MOMENTARY CONTACT START/STOP PUSH BUTTON c/w PILOT LIGHT FOR BUILDING HEATER CONTROL. ALLEN BRADLEY CAT. # 800S-25AP.
37	2	CONTROL RELAY FOR REMOTE HEATER, ELECTRICALLY HELD AC., c/w 4 CONTACTS N.O. TYPE, 10 A CONTACT RATING. ALLEN-BRADLEY CAT.# 700-P401-A1 c/w EEMAC ENCLOSURE CAT.# 700-N31S.
38	2	PANEL MOUNT RESETTABLE AC HOUR METER. ENM COUNTING INSTRUMENTS CAT. # T34BN62D.
39	3	FS BOX WITH SPECIFICATION GRADE, 125 V., 15 A., DUPLEX RECEPTACLE, BROWN, SIDE WIRED, HUBBELL CAT. # 5262 AND FS TYPE COVER.
40	3	HEAT TRACE SINGLE ENTRY POWER CONNECTION BOX TYPE TYCO THERMAL JBS-100A.
41	4	HEAT TRACE END SEAL KIT TYPE TYCO THERMAL E-100-A.
42	4	HEAT TRACE SPLICE CONNECTION TYPE TYCO THERMAL T-100.
43	1	HEAT TRACE MULTIPLE ENTRY POWER CONNECTION BOX TYPE TYCO THERMAL JBM-100.

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
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1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES.
2. CONDUITS SHALL BE RIGID, GALVANIZED STEEL.
3. TO ALL NUMBER OF WIRES SHOWN IN CONDUITS, CONTRACTOR SHALL ADD ONE GROUND WIRE AS PER CEC REQUIREMENTS.
4. MOUNT ALL ELECTRICAL EQUIPMENT SO THAT CONNECTIONS CAN BE EASILY EXPOSED FOR SERVICE.
5. ALL SWITCHES, STARTERS, THERMOSTATS, RELAYS, CONTACTORS, TIMERS, ETC.... SHALL BE IDENTIFIED WITH STAINLESS STEEL LABELS FASTENED TO BOXES.
6. FOR WIRING DIAGRAMS SEE DWG. EP-4.
7. AVAILABLE POWER SUPPLY TO THIS BUILDING SHALL BE 3 PHASE 600 V AND 208 V, 60 Hz.

RECORD DRAWING
DRAWINGS WERE BASED UPON INFORMATION SUBMITTED FROM OTHER PARTIES AND THE ENGINEER DOES NOT WARRANT OR CERTIFY THAT THE INFORMATION FROM THESE OTHER PARTIES IS ACCURATE.
DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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LEGEND
SECTION # / SOURCE / REFERENCE DWG. (1 / A-001)
DETAIL # / SOURCE / REFERENCE DWG. (A / E-001)

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www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE KUGLUKTUK, NU

DWG. TITLE: PUMPHOUSE ELECTRICAL SCHEMATICS & DETAILS

DWN. BY: JL/JPC	DES. BY: JL/JPC	PROJ. MGR.: JH
PEER REVIEW: JL	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # i13655.00
DWG # EP-2	OF 5	REV # 1

CONTROLS DESCRIPTION

1) LOCAL PUMP CONTROL (MANUAL)
- PUSH BUTTON CONTROL AT STARTER (START, STOP).
- SELECTOR SWITCH FOR LOCAL OR REMOTE (PUMPHOUSE OR WTP CONTROL PANELS).

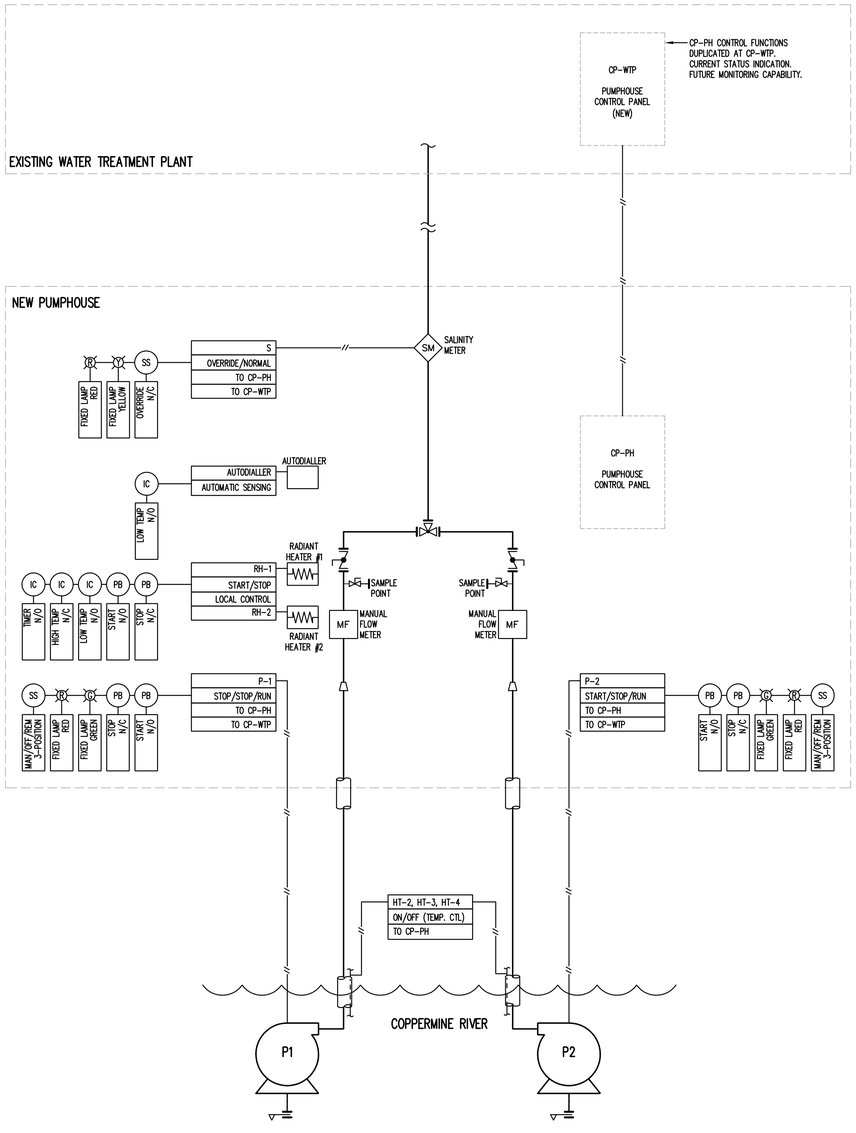
2) PUMPHOUSE CONTROL PANEL (CP-PH)
- PUSH BUTTON CONTROL FOR P1 & P2 (START, STOP).
- INDICATOR LIGHTS FOR P1 & P2 (RUNNING, STOPPED).
- TIMING CONTROL FOR PUMPS: MANUALLY SWITCHING BETWEEN PUMPS AFTER X HOURS OF OPERATION.
- SALINITY METER OVERRIDE.
- SALINITY METER STATUS INDICATOR LIGHTS (CUT-OUT, OVERRIDE).
- AUTODIALLER FOR CALL-OUT (BLDG. LOW/HIGH TEMP).
- BUILDING SPACE HEAT TIMER & CONTROL RELAY,

3) WATER TREATMENT PLANT CONTROL PANEL (CP-WTP)
- PUSH BUTTON CONTROL FOR P1 & P2 (START, STOP).
- INDICATOR LIGHTS FOR P1 & P2 (RUNNING, STOPPED).
- SALINITY METER STATUS INDICATOR LIGHTS (CUT-OUT, OVERRIDE).

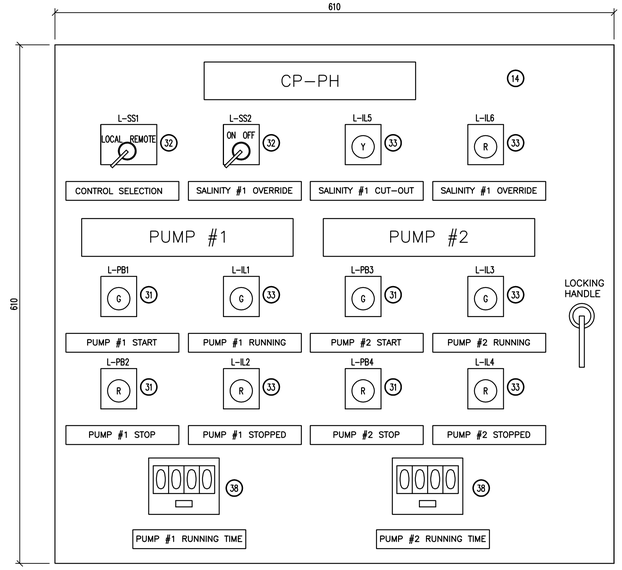
4) SALINITY METER OPERATION
- CONTINUOUS "ONLINE" MONITORING OF SALINITY AT INTAKE PIPES IN PUMPHOUSE
- SALINITY LEVEL EXCEEDING PRESET WILL STOP PUMPS.

5) BUILDING HEAT OPERATION
- TWO HEATING "SETPOINTS" – LOW TEMP LIMIT & HIGH TEMP LIMIT.
- LOW TEMPERATURE SETPOINT (X°C) AUTOMATICALLY STARTS HEATER.
- "START" PUSHBUTTON ALLOWS OPERATOR TO START HEATER UPON ENTERING PUMPHOUSE.
- "STOP" PUSHBUTTON ALLOWS OPERATOR TO STOP HEATER WHEN LEAVING PUMPHOUSE. TIMER WILL STOP HEATER AFTER PRESET TIME (1 HOUR) IF STOP BUTTON IS NOT PRESSED.
- HIGH TEMPERATURE SETPOINT WILL STOP HEATER WHEN BUILDING REACHES THE HIGH TEMPERATURE SETPOINT, REGARDLESS OF START METHOD.

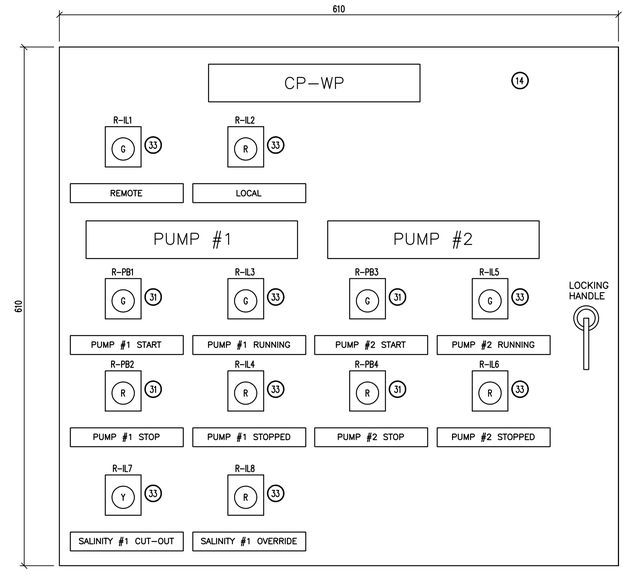
6) HEAT TRACE OPERATION
- HEAT TRACE REQUIRES MANUAL CONNECTION.
- WHEN HEAT TRACE IS CONNECTED, LOW AMBIENT AIR TEMPERATURE ACTIVATES THE CIRCUIT.



1 EP-3 **PUMPHOUSE PROCESS & INSTRUMENTATION**
SCALE: N.T.S.



2 EP-3 **CONTROL PANEL FRONT LAYOUT AT PUMPHOUSE**
SCALE: N.T.S.



3 EP-3 **CONTROL PANEL FRONT LAYOUT AT WATER TREATMENT PLANT**
SCALE: N.T.S.

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
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1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

LIST OF ABBREVIATIONS:
IC = INPUT CONTACT
OC = OUTPUT CONTACT
PB = PUSHBUTTON
N/O = NORMALLY OPEN
N/C = NORMALLY CLOSED
SS = SELECTOR SWITCH

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES.
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4. MOUNT ALL ELECTRICAL EQUIPMENT SO THAT CONNECTIONS CAN BE EASILY EXPOSED FOR SERVICE.
5. ALL SWITCHES, STARTERS, THERMOSTATS, RELAYS, CONTACTORS, TIMERS, ETC.... SHALL BE IDENTIFIED WITH STAINLESS STEEL OR LAMACOIDS LABELS FASTENED TO BOXES.
6. FOR WIRING DIAGRAMS SEE DWG. EP-4.
7. AVAILABLE POWER SUPPLY TO THIS BUILDING SHALL BE 3 PHASE 600 V AND 208 V, 60 Hz.
8. FOR DESCRIPTION OF ITEMS (13), (31), (32), (33), & (38) REFER TO DWG EP-2.

RECORD DRAWING
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DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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1 / A-001 SECTION # / SOURCE / REFERENCE DWG.
A / E-001 DETAIL # / SOURCE / REFERENCE DWG.

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WILLIAMS ENGINEERING CANADA

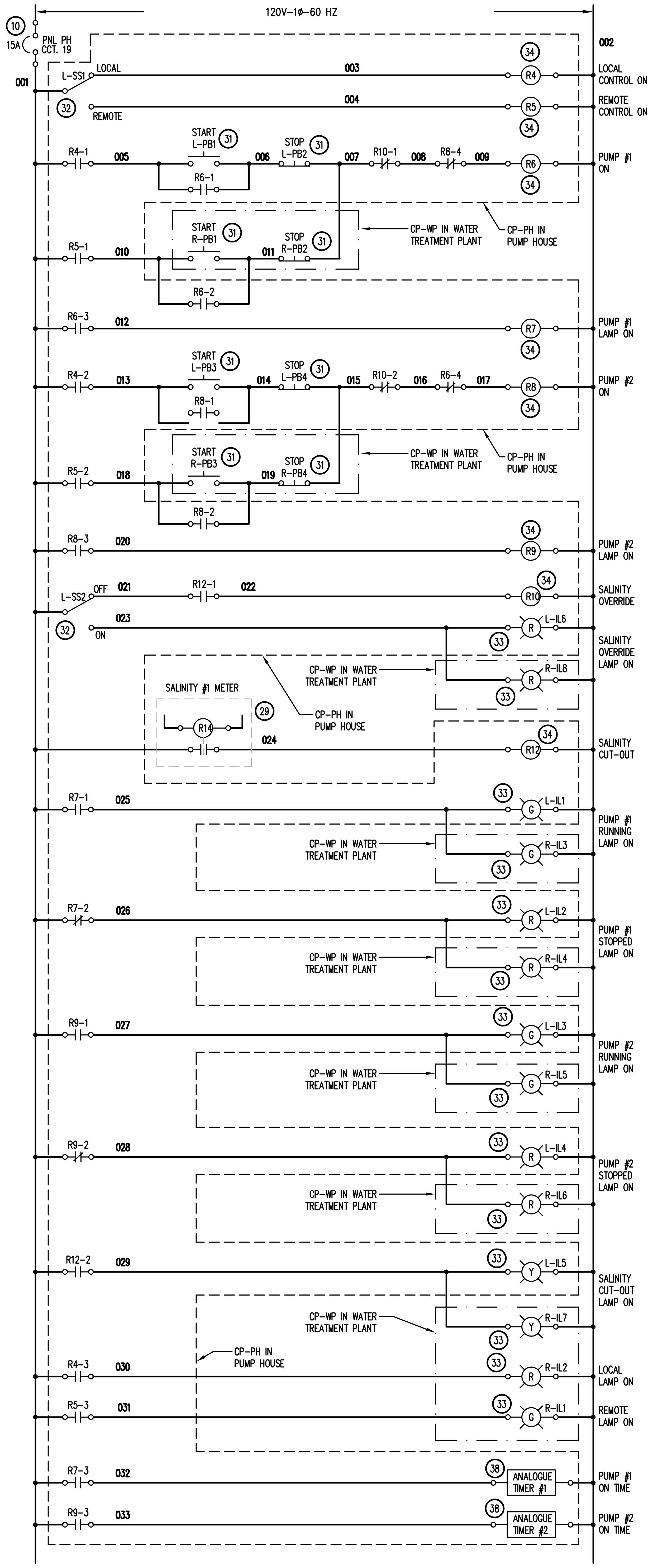
CLIENT: Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

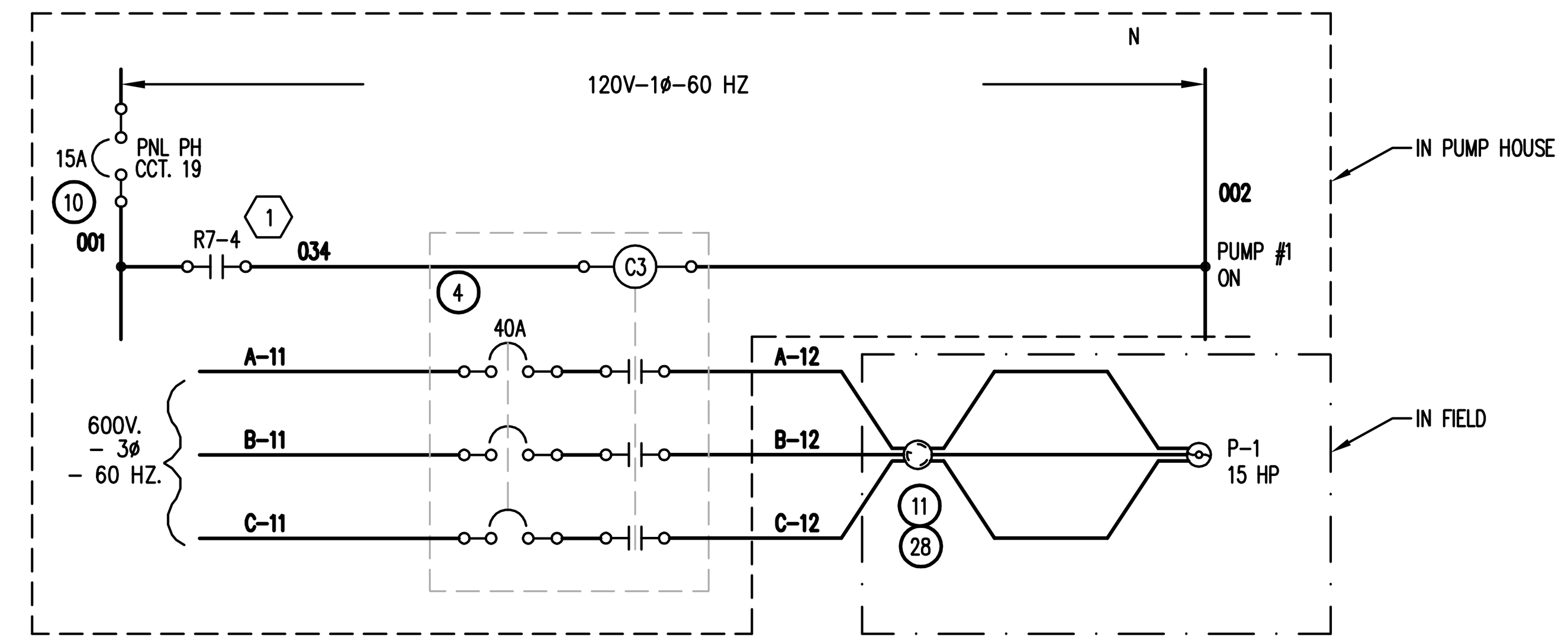
DWG. TITLE:
PUMPHOUSE ELECTRICAL CONTROL AND INSTRUMENTATION

DWN. BY:	DES. BY:	PROJ. MGR.:
JL	JL	JH
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
JL	2010.08.06	AS NOTED
CLIENT PROJ. #	GN PROJECT #04-4417	WEC PROJ. # 13655.00

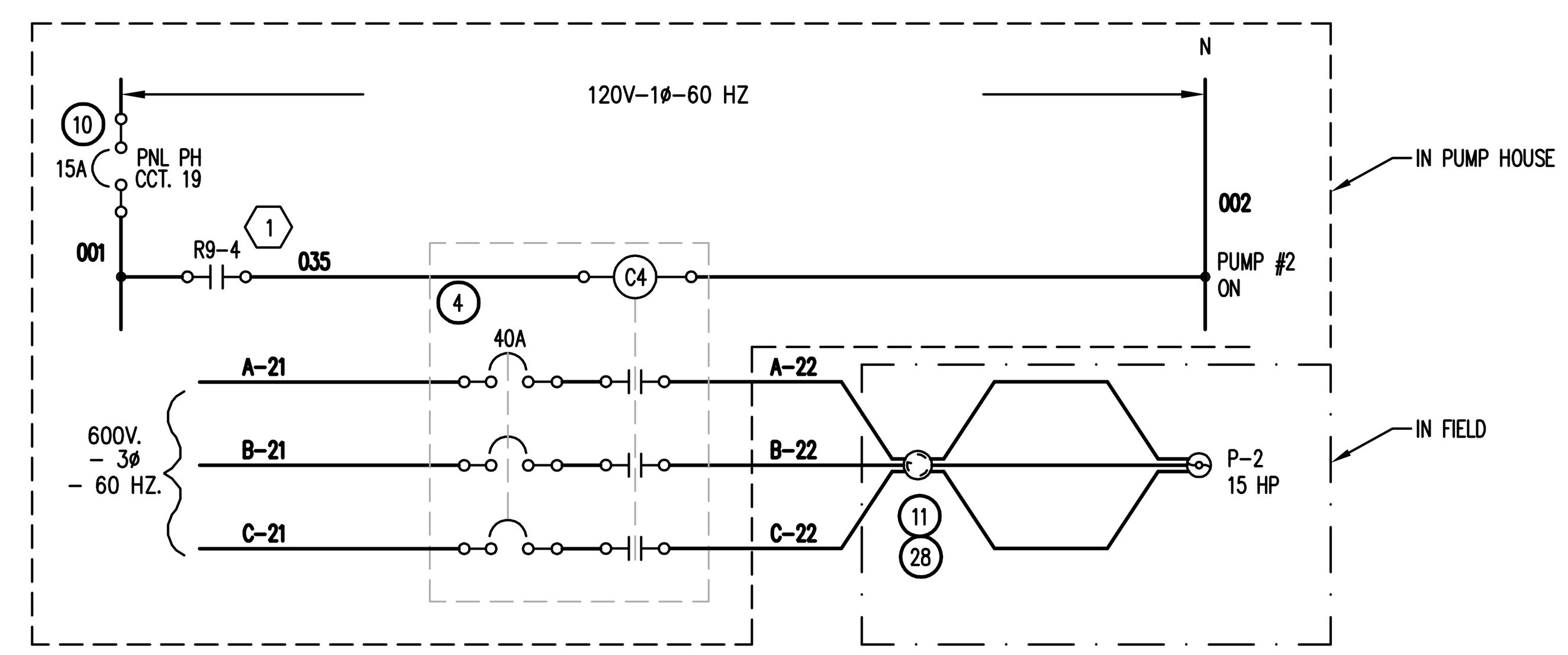
DWG. EP-3 SHT. 5 REV. 1



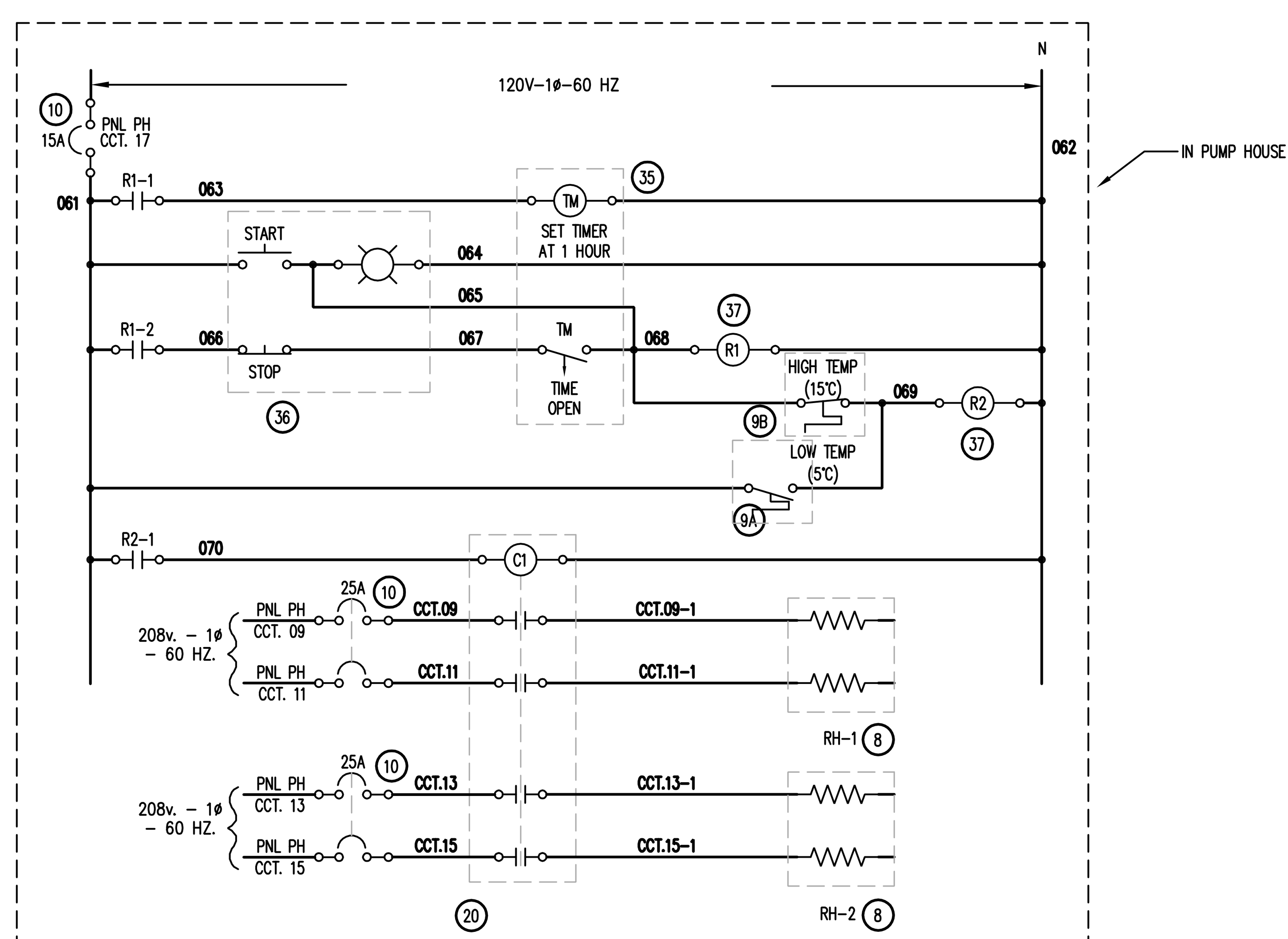
1 PUMP #1 & #2 CONTROL SCHEMATIC
EP–4 SCALE: N.T.S.



2 PUMP #1 OPERATING SCHEMATIC
EP–4 SCALE: N.T.S.



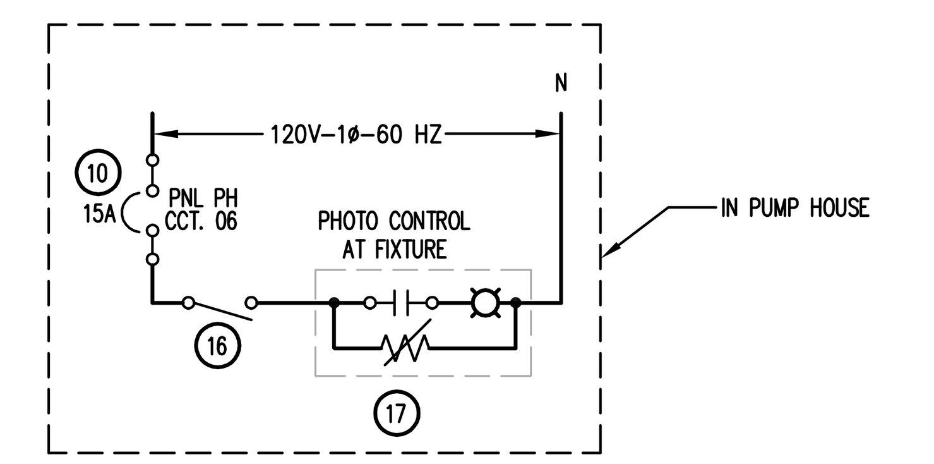
3 PUMP #2 OPERATING SCHEMATIC
EP–4 SCALE: N.T.S.



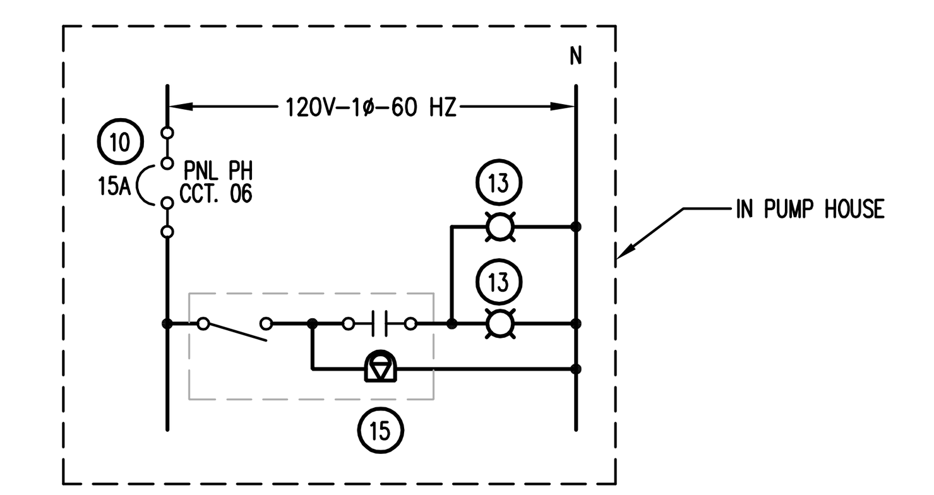
4 SPACE HEATER CONTROL SCHEMATIC
EP–4 SCALE: N.T.S.

KEYNOTES:

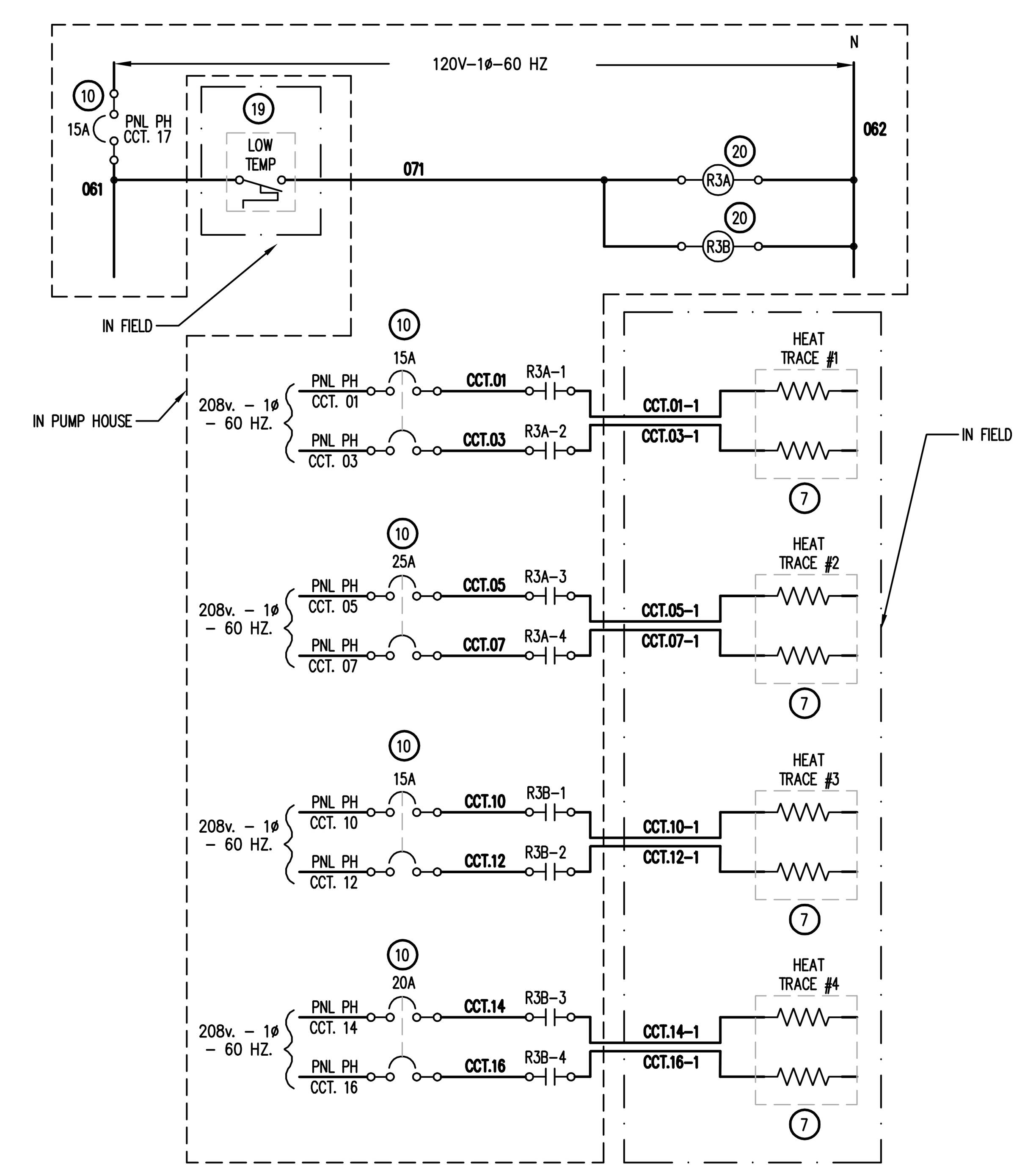
1 SEE DETAIL 1/EP–4.



5 EXTERIOR LIGHTING CONTROL SCHEMATIC
EP–4 SCALE: N.T.S.



6 INTERIOR LIGHTING CONTROL SCHEMATIC
EP–4 SCALE: N.T.S.



7 HEAT TRACE CONTROL SCHEMATIC
EP–4 SCALE: N.T.S.

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
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1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

1. ALL SWITCHES, STARTERS, THERMOSTATS, RELAYS, CONTACTORS, TIMERS, ETC.... SHALL BE IDENTIFIED WITH STAINLESS STEEL LABELS FASTENED TO BOXES.
2. AVAILABLE POWER SUPPLY TO THIS BUILDING SHALL BE 3 PHASE 600 V AND 208 V, 60 Hz.
3. FOR DESCRIPTION OF ITEMS ⑦, ⑧, ⑩, ㉚, ... REFER TO DWG EP–2.

RECORD DRAWING

DRAWINGS WERE BASED UPON INFORMATION SUBMITTED FROM OTHER PARTIES AND THE ENGINEER DOES NOT WARRANT OR CERTIFY THAT THE INFORMATION FROM THESE OTHER PARTIES IS ACCURATE.

DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTION

REFERENCE DRAWINGS

FOR BEST PLOTTING RESULTS, BE SURE TO USE WILLIAMS ENGINEERING CANADA AUTOCAD PLOT CONFIGURATION FILES AVAILABLE FROM: www.williamsengineering.com

LEGEND

SECTION # / SOURCE / REFERENCE DWG. (1, A–001)
DETAIL # / SOURCE / REFERENCE DWG. (A, E–001)

PERMIT STAMP:

PERMIT TO PRACTICE
WILLIAMS ENGINEERING CANADA INC.
PERMIT NUMBER
P 646
NWT/NU Association of Professional Engineers and Geoscientists

ENGINEER'S SEAL:

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WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

JOB. TITLE:

WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE:

PUMPHOUSE ELECTRICAL SCHEMATICS

DWN. BY: JL	DES. BY: JL	PROJ. MGR.: JH
PEER REVIEW: JL	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04–4417		WEC PROJ. # i13655.00
DWG # EP–4	OF 5	REV # 1

MECHANICAL EQUIPMENT SCHEDULE

EQUIP. No.	DESCRIPTION	LOCATION	HP/W	VOLT/ PHASE	STARTER AND ACCESSORIES							REMOTE CONTROL	MCC KEY or CCT. No.	FUSE/ BREAKER SIZE	FEEDER	REMARKS
					SIZE	MAN.	MAG.	ON/OFF	P.L.	H.O.A.	V.F.D.					
P-1	INTAKE PUMP	INTAKE LOCATION	7.5 HP	600V / 3ø				X	X			X	SPLITTER	3P-40A	16C-3#10	NOTE 2, 3, 4.
P-2	INTAKE PUMP	INTAKE LOCATION	7.5 HP	600V / 3ø				X	X			X	SPLITTER	3P-40A	16C-3#10	NOTE 2, 3, 4.
C-1	COMPRESSOR	PUMP HOUSE	5.0 HP	208V / 3ø									PH-21/23/25	3P-40A	16C-3#10	NOTE 1, 2, 5.
RH-1	RADIANT HEATER #1	PUMP HOUSE	3.6 kW	208V / 1ø			X					X	PH-09/11	2P-25A	16C-2#10	NOTE 1, 2.
RH-2	RADIANT HEATER #2	PUMP HOUSE	3.6 kW	208V / 1ø			X					X	PH-13/15	2P-25A	16C-2#10	NOTE 1, 2.
HT-1	HEAT TRACE #1	PIPE IN FIELD	0.27 KW (1.9 A)**	208V / 1ø								X	PH-01/03	2P-15A	16C-2#10	NOTE 2, 6, 7.
HT-2	HEAT TRACE #2	PIPE IN FIELD	2.61 KW (11.4 A)**	208V / 1ø								X	PH-05/07	2P-25A	16C-2#10	NOTE 2, 6, 7.
HT-3	HEAT TRACE #3	PIPE IN FIELD	0.94 KW (4.1 A)**	208V / 1ø								X	PH-10/12	2P-15A	16C-2#10	NOTE 2, 6, 7.
HT-4	HEAT TRACE #4	PIPE IN FIELD	2.61 KW (11.4 A)**	208V / 1ø								X	PH-14/16	2P-25A	21C-2#6	NOTE 2, 6, 7.

NOTES:
1. PROVIDE DISCONNECT SWITCH AS REQUIRED BY CEC, CONTROLS BY DIV. 15.
2. PROVIDE GROUNDING & BONDING AS CEC REQUIREMENT.
3. PROVIDE TWIST-LOCK RECEPTACLES. COORDINATE RECEPTACLE TYPE WITH MECHANICAL.
4. STARTER c/w GROUND FAULT SENSOR.
5. COMPRESSOR c/w THERMAL RELAY MOTOR PROTECTION WITH RESET BUTTON IN A NEMA 1 ENCLOSURE.
6. SYMBOL "**" IS CIRCUIT OPERATING CURRENT.
7. FEED POWER THROUGH GFI BREAKERS.

PANEL SCHEDULE

PANEL PH — LOCATION: PUMPHOUSE; VOLTAGE: 120/208; PHASE: 3; WIRE: 4; BUS: 100A; MAIN BKR.: –; INT. CAP. (SYM RMS): 10KA; CIRCUITS: 30; MOUNTING: SURFACE; FEEDER: 35C-4#3

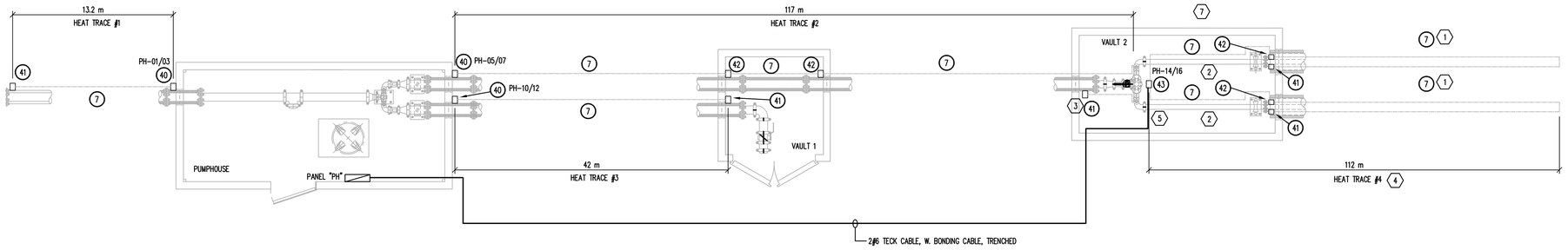
NOTES: * PROVIDE BREAKER LOCK ON
** GFI BREAKER

	LOADS L1	LOADS L2	LOADS L3	DESCRIPTION	POLE	AMP	CCT. NO.	#	CCT. NO.	AMP	POLE	DESCRIPTION	LOADS L1	LOADS L2	LOADS L3
**	0.14			HEAT TRACE #1 [GFI BREAKER]	2	15	1		2	15	1	EXTERIOR RECEPTACLE	0.5		
		0.14					3		4	15	1	INTERIOR RECEPTACLES		0.6	
**			1.3	HEAT TRACE #2 [GFI BREAKER]	2	25	5		6	15	1	INTERIOR & EXTERIOR LIGHTING / EMERGENCY LIGHTS			0.4
1.3							7		8	15	1	AUTO-DIALLER	0.5		
	1.8			RADIANT HEATER RH-1	2	25	9		10	15	2	HEAT TRACE #3 [GFI BREAKER]		0.5	**
		1.8					11		12						0.5
1.8				RADIANT HEATER RH-2	2	25	13		14	25	2	HEAT TRACE #4 [GFI BREAKER]	1.1		**
	1.8						15		16					1.1	
		0.1		SPACE HEATER & HEAT TRACE CONTROL	1	15	17		18	15	1	SPARE			
0.1				PUMP #1 & PUMP #2 CONTROL	1	15	19		20	15	1	SPARE			
	1.5			COMPRESSOR C-1	3	40	21		22	15	1	SPARE			
		1.5					23		24						
1.5							25		26						
	0.5			SWITCHING POWER SUPPLY FOR FLOW METER	1	15	27		28						
		0.5		SALINITY METER	1	15	29		30						
4.84	5.74	5.2											2.1	2.2	0.9

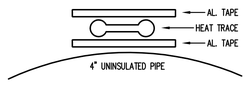
TOTAL PEAK LOAD (WATTS) W
AT (VOLTS) V., IMPLIES (AMPS) A
CEC DEMAND FACTOR OF 0.9 APPLIED
RESULTS IN A MIM. SERVICE AMPACITY
OF (AMPS) A.

KEYNOTES:

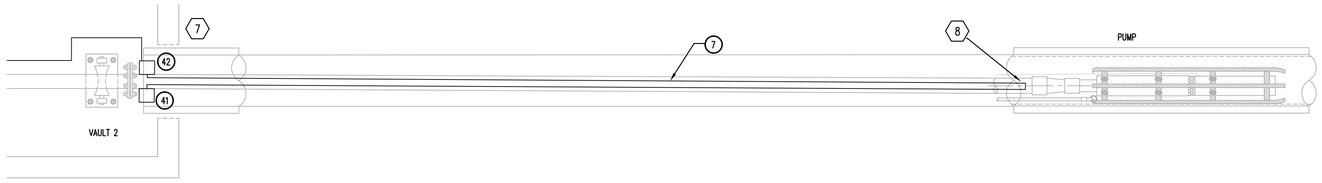
1. HEAT TRACE RUNS DOWN FROM VAULT 2 TO TO PUMPS ALONG UNINSULATED 4" HDPE INNER PIPE AND THEN BACK UP AGAIN, TERMINATING ON THE INNER PIPE JUST INSIDE VAULT 2. SEE DETAIL 4, THIS DRAWING. HEATER MUST BE SANDWICHED WITH ALUMINUM TAPE FOR THE FULL RUN AND STRAPPED TO THE PIPE AT REGULAR INTERVALS. SEE DETAIL 2, THIS DRAWING.
2. 4" SCHEDULE 40 STEEL PIPING SECTION TO BE INSULATED WITH SPRAY FOAM INSULATION. MOUNT HEAT TRACE TO PIPING BEFORE INSULATING.
3. HEAT TRACE #2 ENTERS VAULT #2, WRAPS AROUND AND DOUBLES BACK ON EACH LEG OF THE TECH-TAYLOR VALVE, THEN TERMINATES WITH AN END SEAL (41) BACK AT ITS ENTRY POINT JUST INSIDE VAULT 2. SEE DETAILS 4,5 THIS DRAWING. DISTRIBUTE DOUBLE RUNS ON SINGLE PIPE EVENLY (180° APART). CONSULT MANUFACTURER AS TO RECOMMENDED VALVE WRAPPING PATTERN.
4. THE LENGTH SPECIFIED FOR HEAT TRACE #4 IS TOTAL FOR BOTH PIPES, DOUBLED BACK.
5. MULTIPLE ENTRY JUNCTION BOX (43) MOUNTS TO PIPE STAND SUPPORTING TECK-TAYLOR VALVE. MOUNT AT MAXIMUM HEIGHT POSSIBLE ON STAND. FREE AIR RUN OF HEAT TRACE FROM JUNCTION BOX TO PIPING ELBOW.
6. PROVIDE HEAT TRACE NUMBER AND ASSOCIATED FEED CIRCUIT NUMBER ON LAMICOID LABEL MOUNTED NEXT TO POWER ENTRY JUNCTION BOX FOR EACH HEAT TRACE CABLE.
7. REFER TO DETAILS 4,5, THIS DRAWING, FOR EXACT LOCATIONS OF HEAT TRACING COMPONENTS IN VAULT 2.
8. RUN HEAT TRACE TO POINT AS CLOSE AS POSSIBLE TO PIPE CONNECTION WITH PUMP.



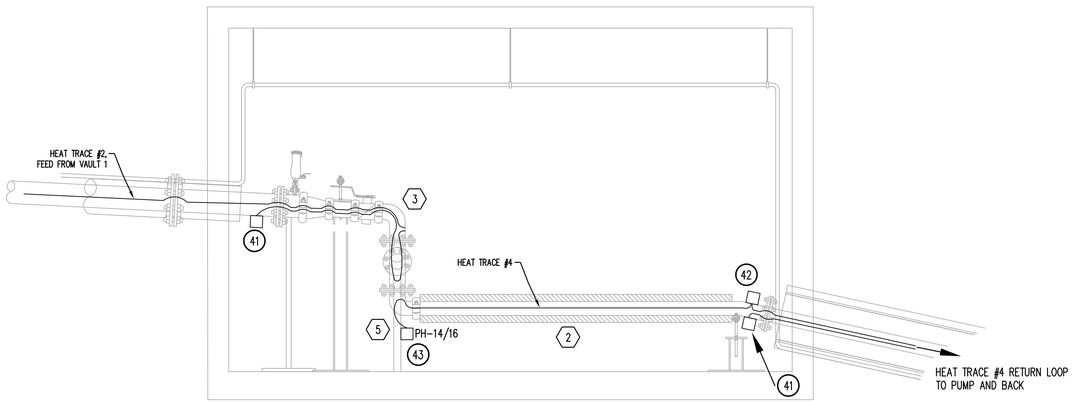
1 EP-5 HEAT TRACING SYSTEM SCHEMATIC
SCALE: N.T.S.



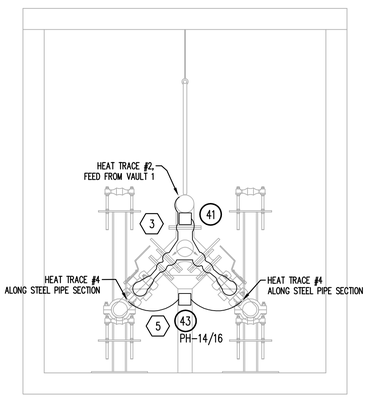
2 EP-5 HEATER SANDWICHING
SCALE: N.T.S.



3 EP-5 HEAT TRACE PUMP RUN
SCALE: N.T.S.



4 EP-5 ACCESS VAULT 2 – HEAT TRACING, SIDE PROFILE
1:20



5 EP-5 DETAIL – ACCESS VAULT 2 – VALVE HEAT TRACING, FRONT PROFILE
1:20

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JC	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JC	JH
2	RECORD DRAWING	2014.10.09	AC	

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETRES.
2. CONDUITS SHALL BE RIGID, GALVANIZED STEEL.
3. TO ALL NUMBER OF WIRES SHOWN IN CONDUITS, CONTRACTOR SHALL ADD ONE GROUND WIRE AS PER CEC REQUIREMENTS.
4. MOUNT ALL ELECTRICAL EQUIPMENT SO THAT CONNECTIONS CAN BE EASILY EXPOSED FOR SERVICE.
5. ALL SWITCHES, STARTERS, THERMOSTATS, RELAYS, CONTACTORS, TIMERS, ETC.... SHALL BE IDENTIFIED WITH STAINLESS STEEL LABELS FASTENED TO BOXES.
6. FOR WIRING DIAGRAMS SEE DWG. EP–4.
7. AVAILABLE POWER SUPPLY TO THIS BUILDING SHALL BE 3 PHASE 600 V AND 208 V, 60 Hz.
8. FOR DESCRIPTION OF ITEMS①,②,③,④, ... REFER TO DWG EP–2.
9. PROVIDE HEAT TRACE NUMBER AND ASSOCIATED FEED CIRCUIT NUMBER ON LAMICOID LABEL MOUNTED NEXT TO POWER ENTRY JUNCTION BOX FOR EACH HEAT TRACE CABLE.

RECORD DRAWING
DRAWINGS WERE BASED UPON INFORMATION SUBMITTED FROM OTHER PARTIES AND THE ENGINEER DOES NOT WARRANT OR CERTIFY THAT THE INFORMATION FROM THESE OTHER PARTIES IS ACCURATE.
DATE (YYYY MM DD): 2014.10.09

DRAWING NO. | DESCRIPTION

REFERENCE DRAWINGS

FOR BEST PLOTTING RESULTS, BE SURE TO USE WILLIAMS ENGINEERING CANADA AUTOCAD PLOT CONFIGURATION FILES AVAILABLE FROM: www.williamsengineering.com

LEGEND

1 / A-001 SECTION # / SOURCE / REFERENCE DWG.
A / E-001 DETAIL # / SOURCE / REFERENCE DWG.

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WILLIAMS ENGINEERING CANADA

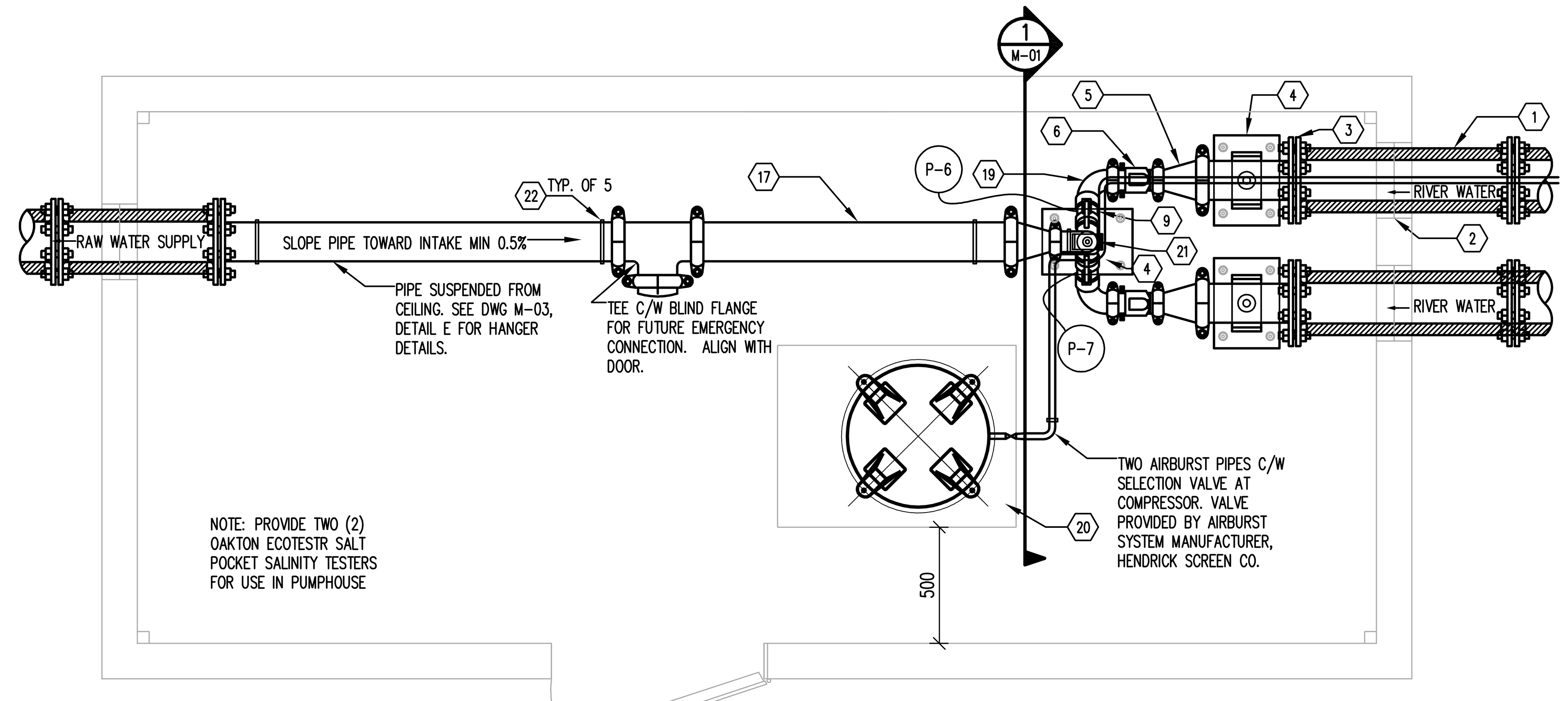
CLIENT: Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

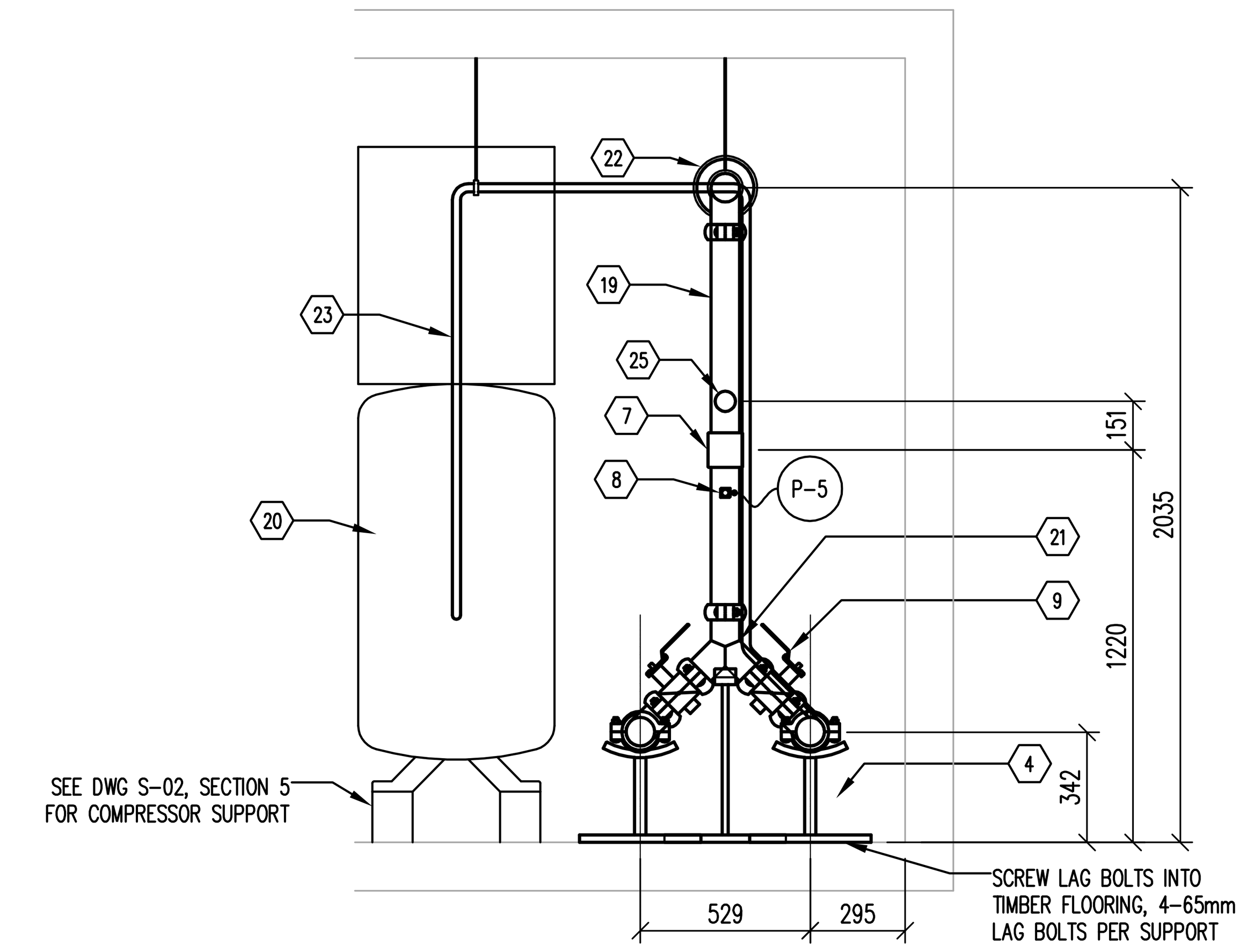
DWG. TITLE:
PUMPHOUSE ELECTRICAL SCHEDULES & HEAT TRACE SCHEMATICS

DWN. BY:	DES. BY:	PROJ. MGR.:
JL/JPC	JL/JPC	JH
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
JL	2010.08.06	AS NOTED
CLIENT PROJ. #	GN PROJECT #04-4417	WEC PROJ. #
		113655.00

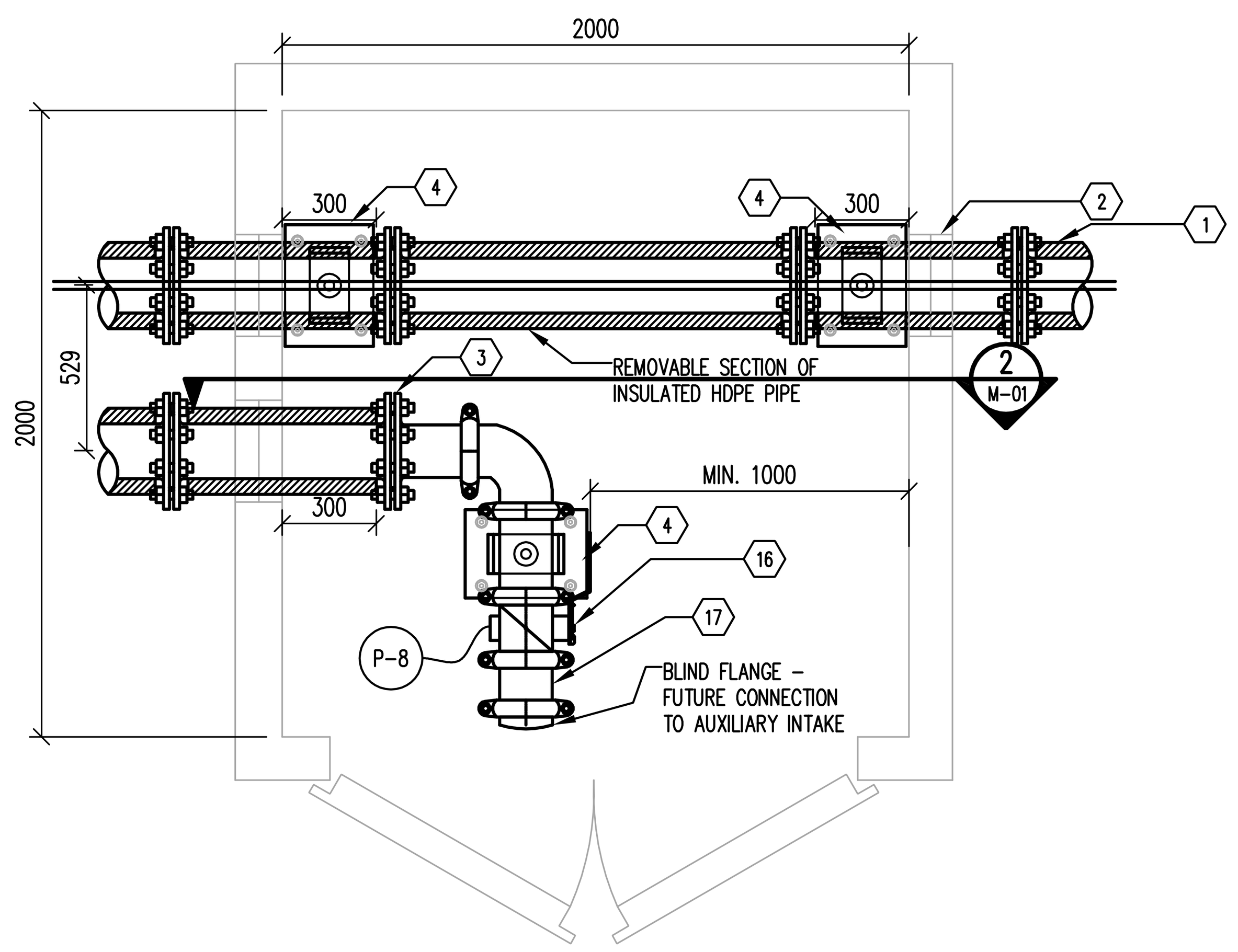
DWG EP-5 No. 5 REV 1



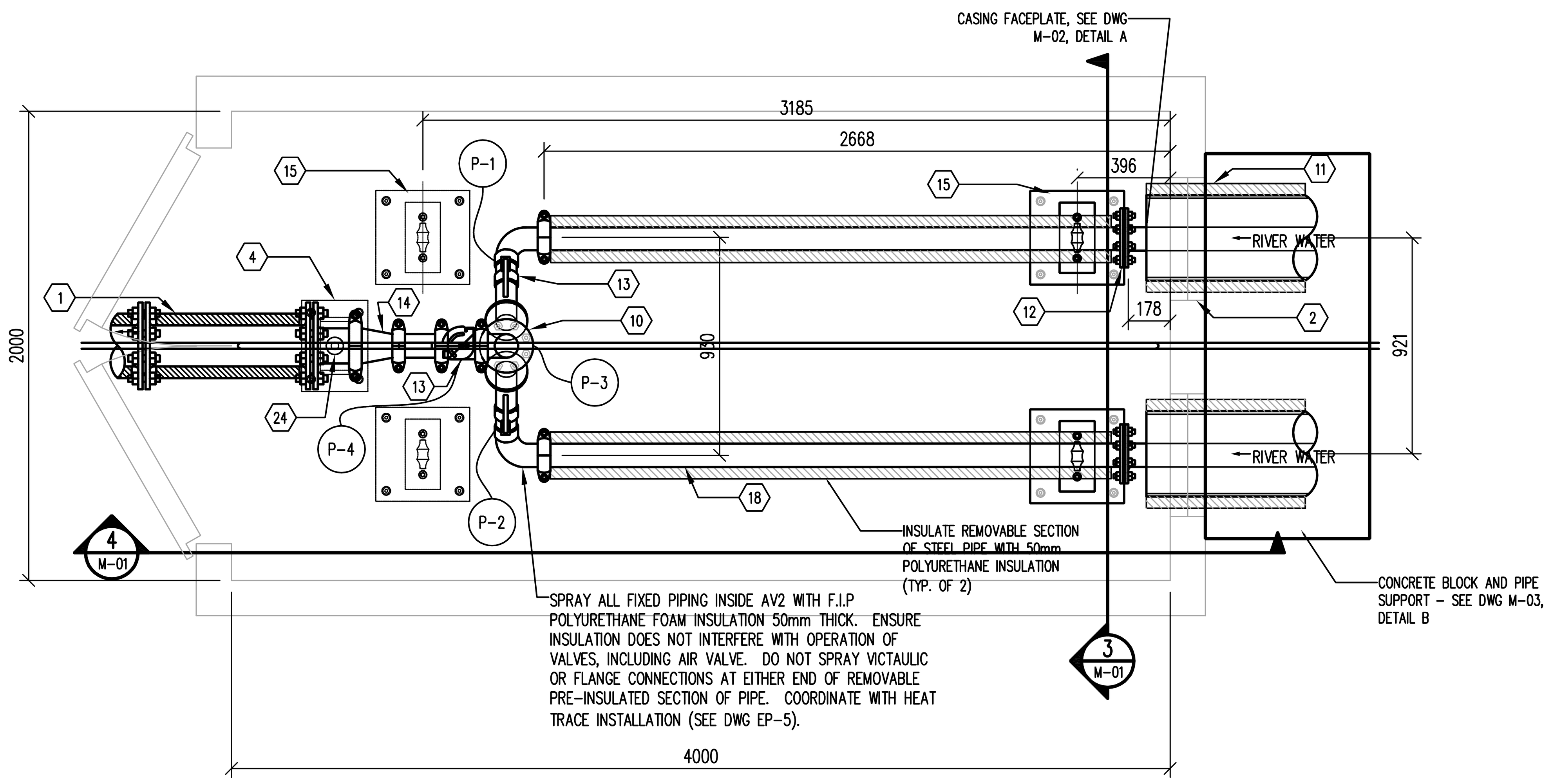
A PUMPHOUSE PLAN
M-01 1:20



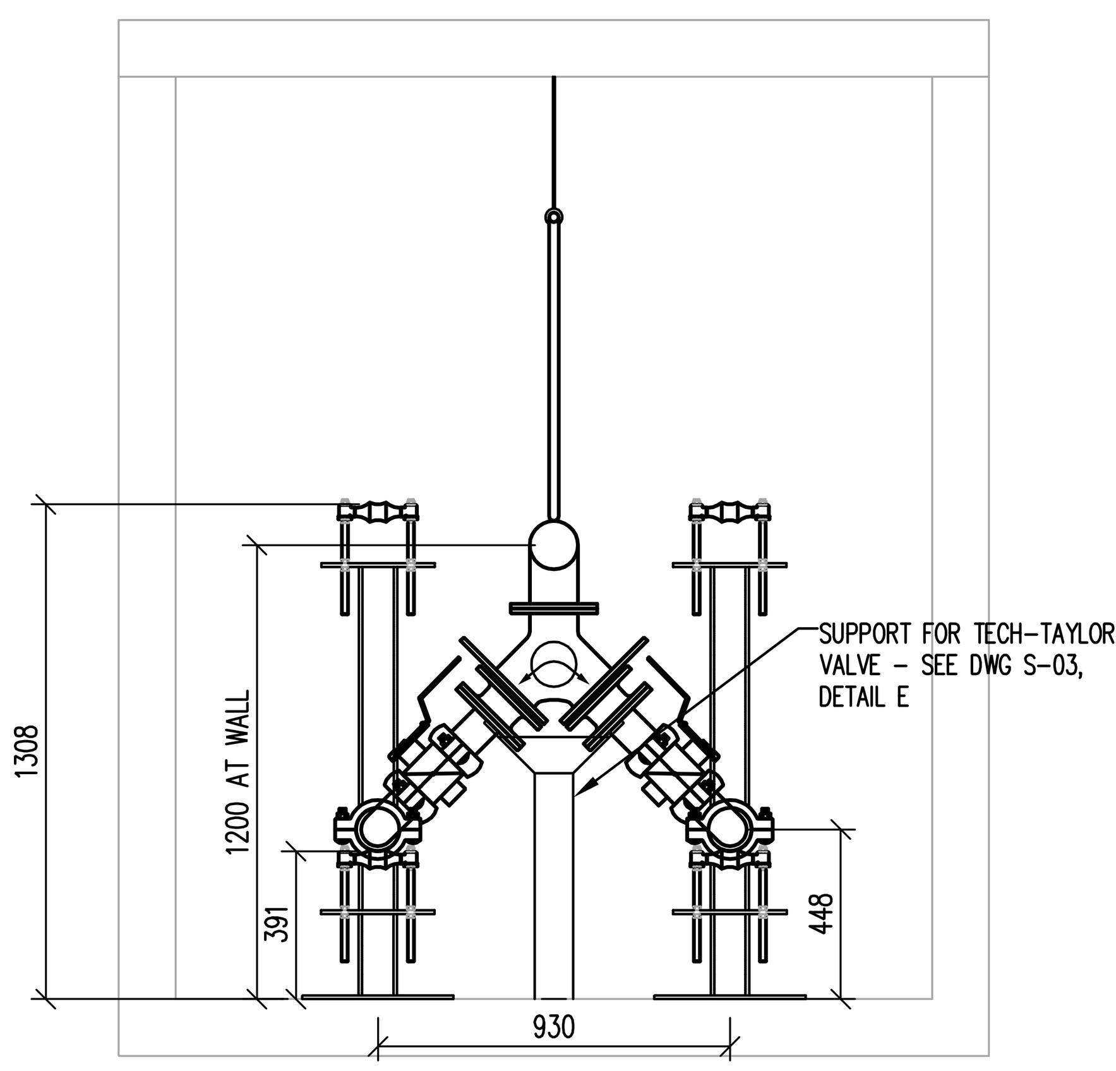
1 PUMPHOUSE SECTION
M-01 1:20



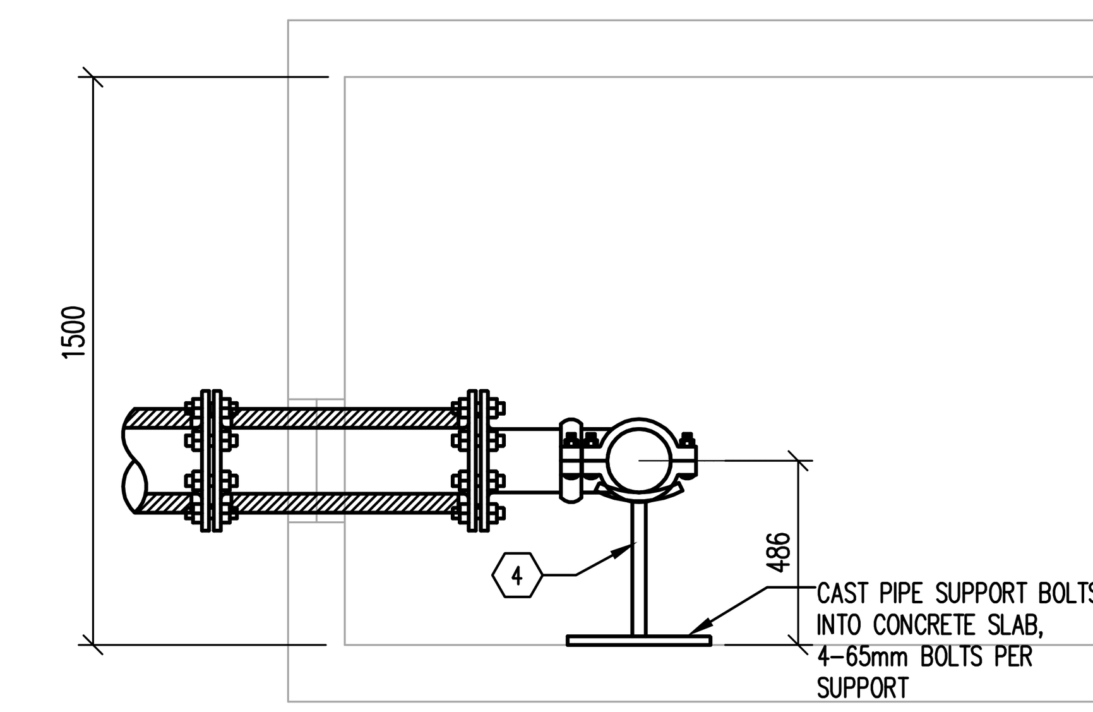
B ACCESS VAULT 1 PLAN
M-01 1:20



C ACCESS VAULT 2 PLAN
M-01 1:20



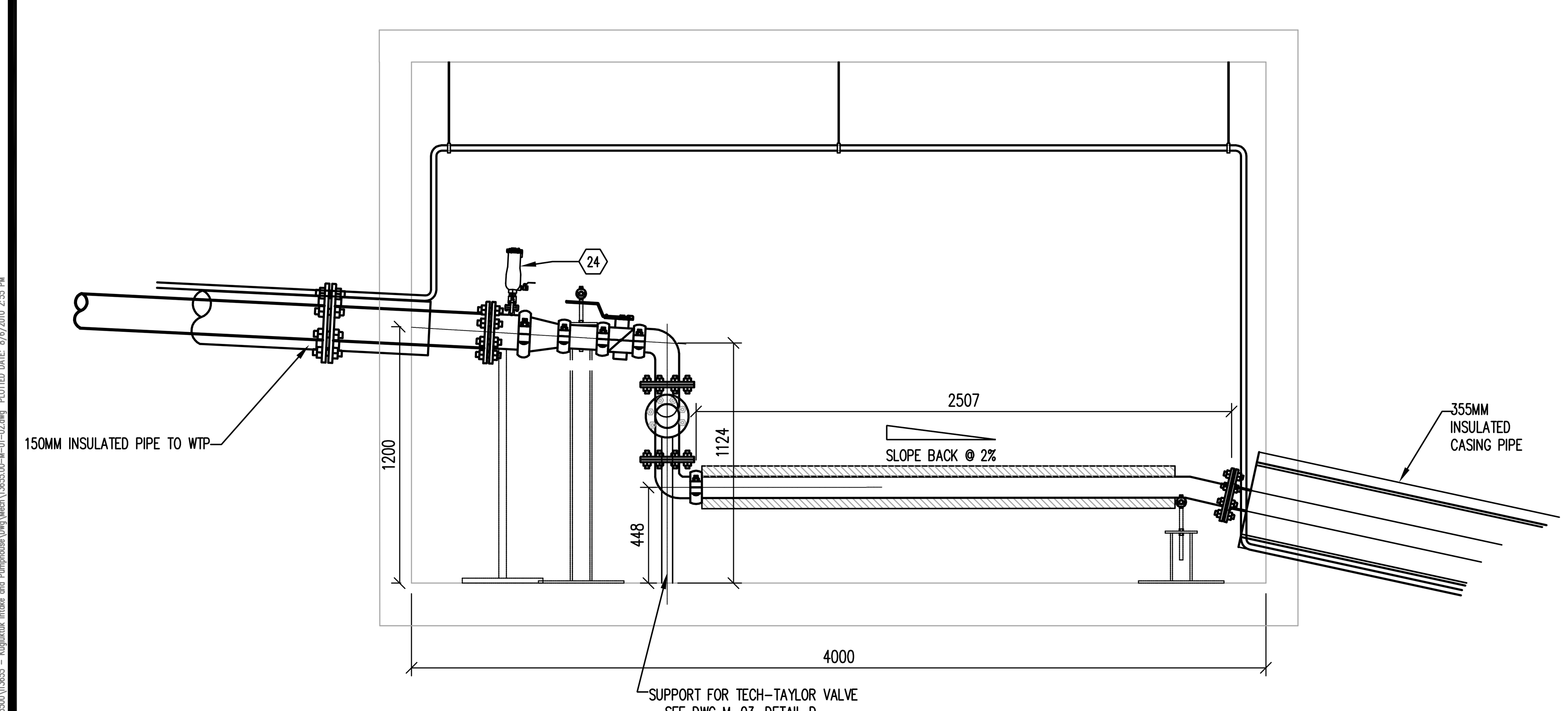
3 ACCESS VAULT 2 SECTION
M-01 1:20



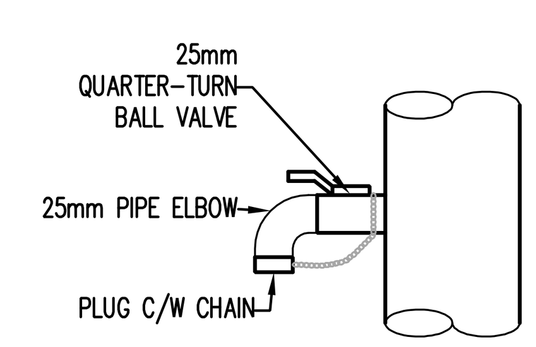
2 ACCESS VAULT 1 SECTION
M-01 1:20

KEYNOTES:

1	150mm ø HDPE DR9 PE3408 PIPE WITH 50mm RIGID POLYURETHANE INSULATION
2	WALL PENETRATION – SEE DWG M-02, DETAIL F
3	150mm (6") ø HDPE TO STEEL PIPE FLANGE ADAPTOR
4	PIPE SUPPORT
5	150x75mm (6"x3") REDUCER
6	MANUAL FLOW METER: GF SIGNET 515 ROTOR-X PADDLEWHEEL FLOW SENSOR C/W GF SIGNET 8550 PROCESSPRO FLOW TRANSMITTER CONFIGURED TO SHOW FLOW RATE IN L/min AND TOTAL FLOW IN m^3. PROVIDE MIN 10W SWITCHING POWER SUPPLY TO CONVERT 120VAC TO 12-24VDC TO SUPPLY BOTH FLOW METERS.
7	SALINITY METER: WALCHEM WEC410-1NDN, PUMP CUTOFF SETPOINT 1mS/cm (1000µS/cm)
8	SAMPLE POINT – 25mm QUARTER-TURN GLOBE VALVE, SEE DWG M-01, DETAIL D
9	75mm (3") ø BUTTERFLY VALVE SHUT OFF
10	TECH-TAYLOR VALVE
11	100mm HDPE DR9 PE3408 CARRIER PIPE FROM RIVER ENCLOSED IN 355mm DR41 CASING PIPE WITH 50mm RIGID POLYURETHANE INSULATION
12	100mm (4") ø HDPE TO STEEL PIPE FLANGE ADAPTOR
13	100mm (4") ø BUTTERFLY VALVE
14	6"x4" (150x100mm) REDUCER
15	PIPE ROLLER SUPPORT STAND – SEE DWG S-03, DETAIL D
16	150mm (6") ø BUTTERFLY VALVE
17	150mm (6") SCHEDULE 40 STEEL PIPE
18	100mm (4") SCHEDULE 40 STEEL PIPE
19	75mm (3") SCHEDULE 40 STEEL PIPE
20	COMPRESSOR FOR AIRBURST SYSTEM: INGERSOLL RAND 2475N5 FULLY PACKAGED AIR COMPRESSOR W/ MANUAL CONTROL AS SOLD BY HENDRICK SCREEN COMPANY. REQUIRES CUSTOM ORDER W/ FEET ROTATED 45° FROM STANDARD MODEL TO LINE UP WITH SKID SUPPORTS, AND 208/3/60, 5 HP COMPRESSOR WITH THERMAL RELAY MOTOR PROTECTION.
21	75mm (3") WYE FITTING
22	PIPE HANGER – SEE DWG M-03, DETAIL E
23	25mm (1") PEX PIPE WITH MINIMUM MAINTAINED PRESSURE RATING 200 PSIG. SUPPORT AS SHOWN ON DRAWINGS.
24	25mm (1") VAL-MATIC #801A WASTEWATER SINGLE-BODY COMBINATION VALVE. PIPE OUTLET TO LOCATION AWAY FROM ELECTRICAL AND MECHANICAL EQUIPMENT.
25	MECHANICAL PRESSURE GAUGE: ASHCROFT 3005 LIQUID-FILLED GAUGE, RANGE 0-1725kPa (0-250 PSI) WITH CONNECTION ON BACK. INDICATION TO BE PRIMARY METRIC (Pa PREFERRED); SECONDARY PSI OR FT OF H_2O. INCLUDE PLUG C/W CHAIN. HANG PLUG FROM GAUGE TO BE USED IN CASE OF GAUGE REMOVAL.



4 ACCESS VAULT 2 SECTION
M-01 1:20

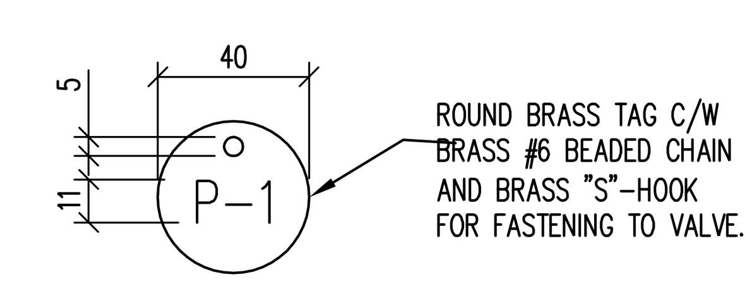


D SAMPLE POINT
M-01 1:5

VALVE CHART

NO = NORMALLY OPEN
NC = NORMALLY CLOSED

TAG NUMBER	DESCRIPTION	PURPOSE	POSITION
P-1	BUTTERFLY VALVE	ISOLATE PIPELINE A	NO
P-2	BUTTERFLY VALVE	ISOLATE PIPELINE B	NO
P-3	TECH-TAYLOR VALVE	AUTOMATICALLY OPENS THE PIPELINE WHOSE PUMP IS OPERATING	–
P-4	BUTTERFLY VALVE	ISOLATE MAIN PIPELINE AT AV2	NO
P-5	1/4-TURN BALL VALVE	OBTAINING RAW WATER SAMPLES	NC
P-6	BUTTERFLY VALVE	ISOLATE MAIN PIPELINE	NO
P-7	BUTTERFLY VALVE	ISOLATE AUXILIARY PIPELINE	NO
P-8	BUTTERFLY VALVE	ISOLATE AUXILIARY PIPELINE AT AV1	NC



E VALVE TAG
M-01 1:2

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

RECORD DRAWING

DRAWINGS WERE BASED UPON INFORMATION SUBMITTED FROM OTHER PARTIES AND THE ENGINEER DOES NOT WARRANT OR CERTIFY THAT THE INFORMATION FROM THESE OTHER PARTIES IS ACCURATE.

DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

FOR BEST PLOTTING RESULTS, BE SURE TO USE WILLIAMS ENGINEERING CANADA AUTOCAD PLOT CONFIGURATION FILES AVAILABLE FROM: www.williamsengineering.com

LEGEND

SECTION # SOURCE / REFERENCE DWG. DETAIL # SOURCE / REFERENCE DWG.

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www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

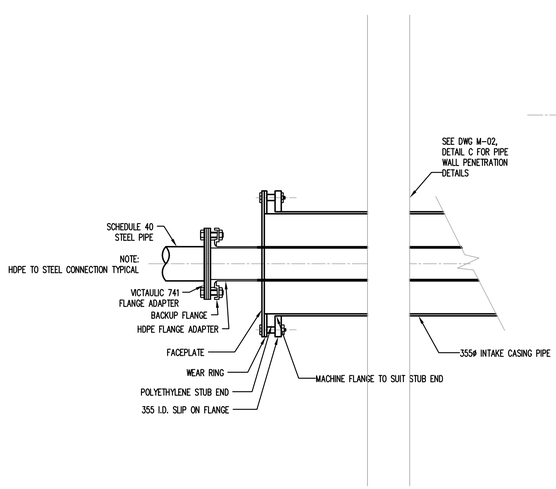
CLIENT:

Nunavut

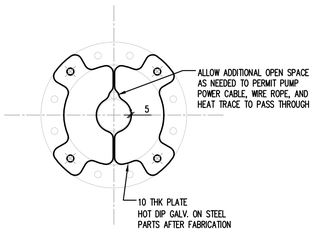
JOB. TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE:
PUMPHOUSE AND ACCESS VAULTS PLANS AND SECTIONS

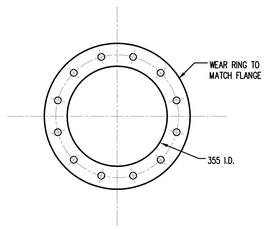
DWN. BY: CB/JG	DES. BY: JH/JG/JC	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. #: GN PROJECT #04-4417		WEC PROJ. #: 13655.00
DWG #: M-01	OF: 2	REV #: 1



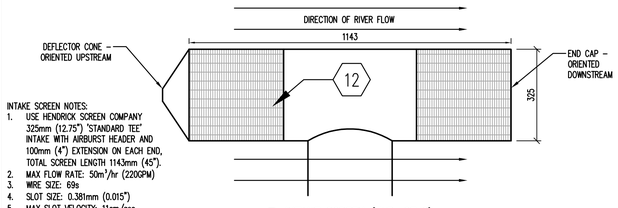
A M-02 1:10 **DETAIL – HDPE TO STEEL TRANSITION AND CASING FACEPLATE**



FACEPLATE

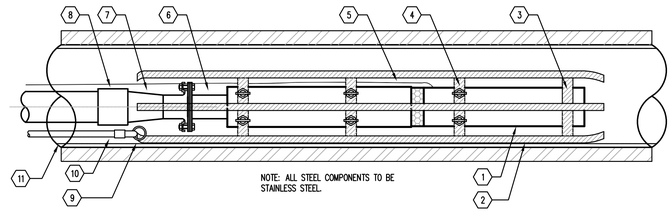


WEAR RING

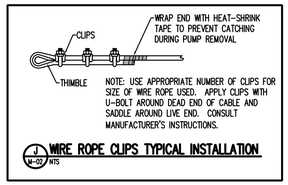


INTAKE SCREEN NOTES:
1. USE HENDRICK SCREEN COMPANY 325mm (12.75") "STANDARD TEE" INTAKE WITH AIRBURST HEADER AND 100mm (4") EXTENSION ON EACH END, TOTAL SCREEN LENGTH 1143mm (45").
2. MAX FLOW RATE: 50m³/hr (220GPM)
3. WIRE SIZE: 69s
4. SLOT SIZE: 0.381mm (0.015")
5. MAX SLOT VELOCITY: 11cm/sec (0.36ft/sec)

C M-02 NTS **INTAKE SCREEN (TYP. OF 2)**



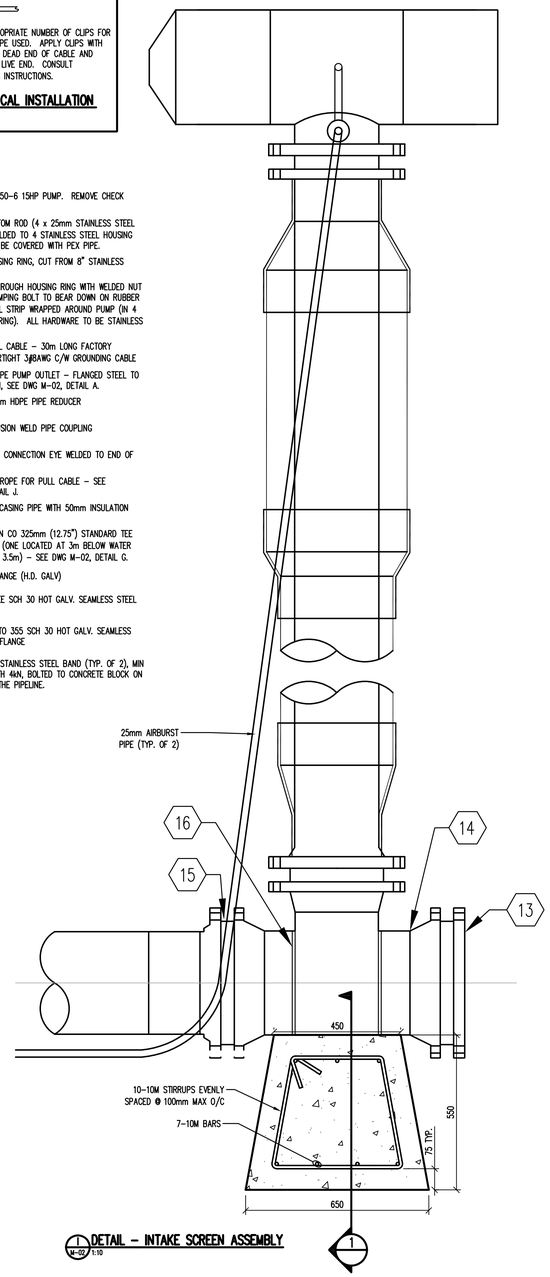
H M-02 1:10 **DETAIL – PUMP ASSEMBLY WITH FABRICATED PUMP SLED**



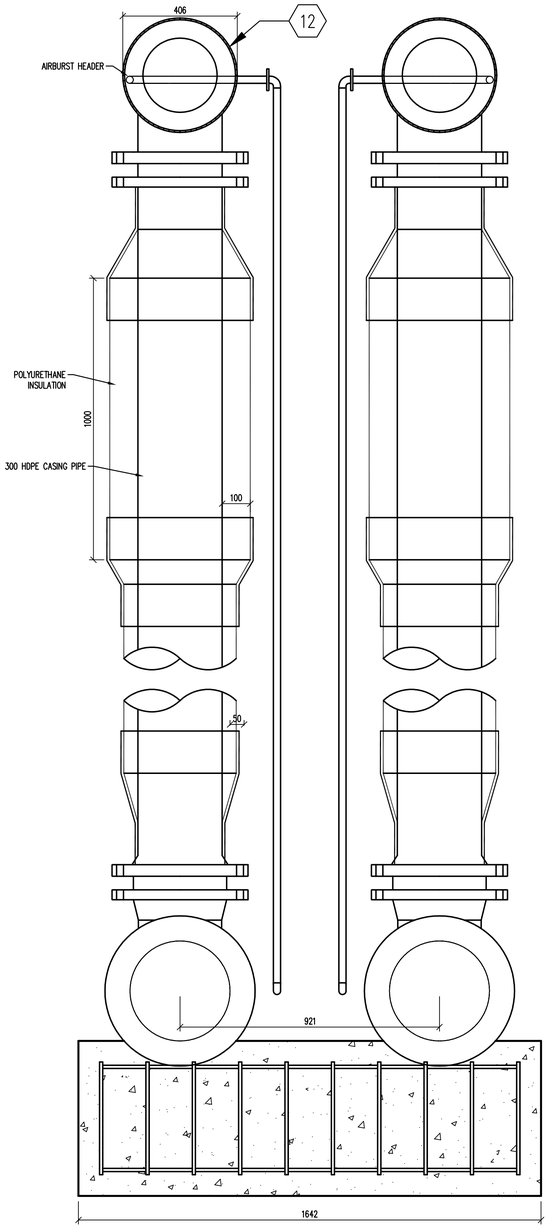
J M-02 NTS **WIRE ROPE CLIPS TYPICAL INSTALLATION**

KEYNOTES:

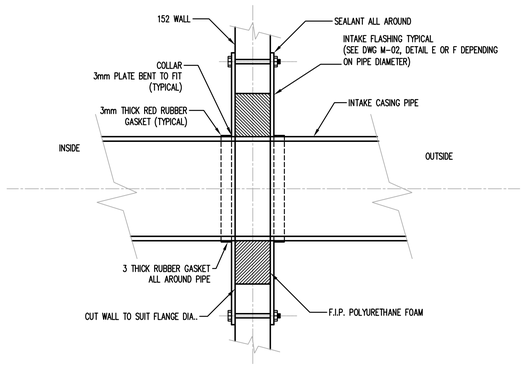
1. GRUNDFOS 150S150-6 15HP PUMP. REMOVE CHECK VALVE.
2. PUMP SLED BOTTOM ROD (4 x 25mm STAINLESS STEEL RODS TOTAL) WELDED TO 4 STAINLESS STEEL HOUSING RINGS. RODS TO BE COVERED WITH PEX PIPE.
3. PUMP SLED HOUSING RING, CUT FROM 8" STAINLESS STEEL PIPE.
4. DRILLED HOLE THROUGH HOUSING RING WITH WELDED NUT TO PROVIDE CLAMPING BOLT TO BEAR DOWN ON RUBBER GASKET MATERIAL STRIP WRAPPED AROUND PUMP (IN 4 LOCATIONS PER RING). ALL HARDWARE TO BE STAINLESS STEEL.
5. PUMP ELECTRICAL CABLE – 30m LONG FACTORY INSTALLED WATERTIGHT 3ØBAWG C/W GROUNDING CABLE
6. 75ømm STEEL PIPE PUMP OUTLET – FLANGED STEEL TO HDPE TRANSITION, SEE DWG M-02, DETAIL A.
7. 75ømm x 100ømm HDPE PIPE REDUCER
8. HDPE SOCKET FUSION WELD PIPE COUPLING
9. STAINLESS STEEL CONNECTION EYE WELDED TO END OF PUMP SLED
10. 8.3mm S3 WIRE ROPE FOR PULL CABLE – SEE CONNECTION DETAIL J.
11. 355ømm (14"ø) CASING PIPE WITH 50mm INSULATION
12. HENDRICK SCREEN CO 325mm (12.75") STANDARD TEE INTAKE SCREENS (ONE LOCATED AT 3m BELOW WATER LEVEL OTHER AT 3.5m) – SEE DWG M-02, DETAIL G.
13. 150 LB BLIND FLANGE (H.D. GALV)
14. 355x300 RED. TEE SCH 30 HOT GALV. SEAMLESS STEEL
15. 355 HDPE PIPE TO 355 SCH 30 HOT GALV. SEAMLESS STEEL ADAPTOR FLANGE
16. 10mm x 0.7mm STAINLESS STEEL BAND (TYP. OF 2), MIN TENSILE STRENGTH 4kN, BOLTED TO CONCRETE BLOCK ON BOTH SIDES OF THE PIPELINE.



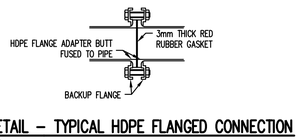
1 M-02 1:10 **DETAIL – INTAKE SCREEN ASSEMBLY**



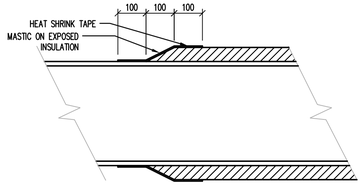
1 M-02 1:10 **INTAKE SCREEN END VIEW**



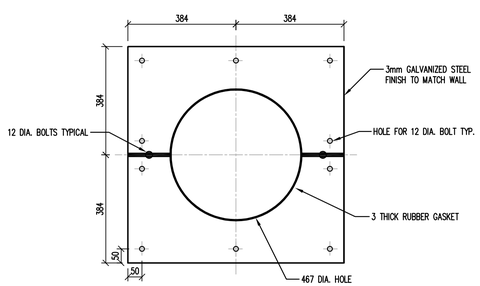
C M-02 NTS **DETAIL – PIPE WALL PENETRATION**



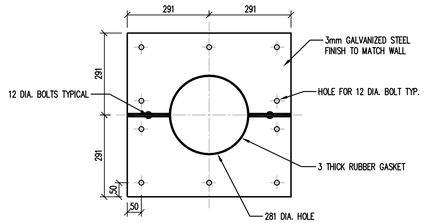
B M-02 1:10 **DETAIL – TYPICAL HDPE FLANGED CONNECTION**



D M-02 NTS **DETAIL – INSULATION TERMINATION (TYP.)**



E M-02 1:10 **PIPE WALL FLASHING FOR INSULATED 355 DIAM CASING PIPE**



F M-02 1:10 **PIPE WALL FLASHING FOR INSULATED 150 DIAM PIPE**

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

RECORD DRAWING

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DATE (YYYY MM DD): 2014.10.09

DRAWING NO. | DESCRIPTOR

REFERENCE DRAWINGS

FOR BEST PLOTTING RESULTS, BE SURE TO USE WILLIAMS ENGINEERING CANADA AUTOCAD PLOT CONFIGURATION FILES AVAILABLE FROM: www.williamsengineering.com

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A / E-001 DETAIL # / SOURCE / REFERENCE DWG.

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PERMIT NUMBER P 646
NWT/NU Association of Professional Engineers and Geoscientists

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info@williamsengineering.com
www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

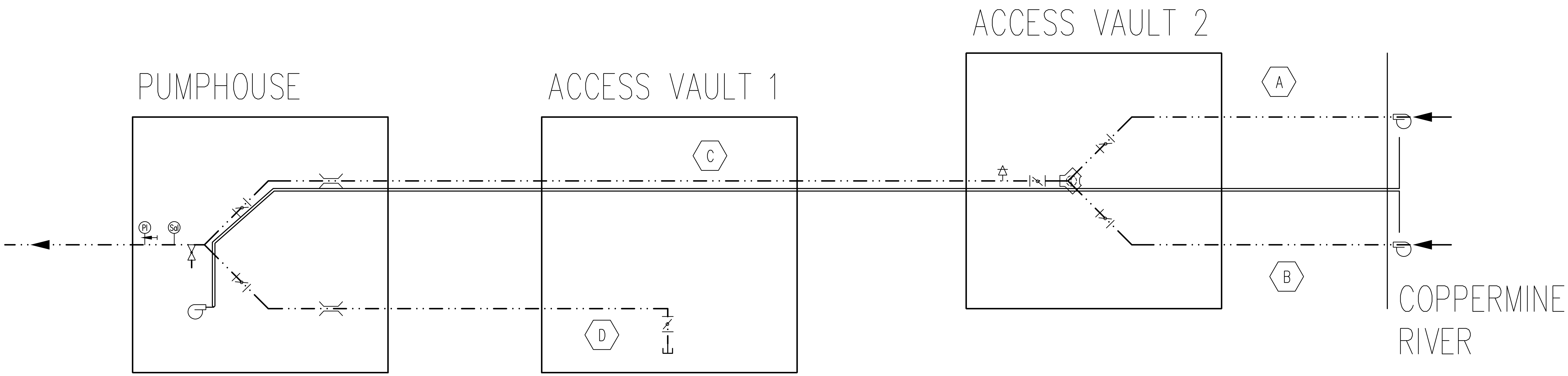
CLIENT: Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE:
INTAKE PIPELINE DETAILS

DWN. BY:	DES. BY:	PROJ. MGR.:
CB/JG	JH/JG/JC	JH
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
JH	2010.08.06	AS NOTED
CLIENT PROJ. #	GN PROJECT #04-4417	WEC PROJ. # 13655.00

DWG # M-02 | SHEET # 2 | REV # 1



LEGEND:

- PRESSURE GAUGE (PI)
- SALINITY METER (Sal)
- QUARTER-TURN BALL VALVE
- FLOW METER
- BLIND FLANGE
- COMBINATION AIR VALVE
- BUTTERFLY VALVE
- TECH-TAYLOR VALVE
- PUMP
- RAW WATER
- COMPRESSED AIR

KEYNOTES:

- (A) 100mm PUMP DISCHARGE LINE IN INSULATED 355mm CASING PIPE
- (B) 100mm PUMP DISCHARGE LINE IN INSULATED 355mm CASING PIPE
- (C) 150mm INSULATED PIPE – MAIN LINE
- (D) 150mm INSULATED PIPE – AUXILIARY LINE

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

RECORD DRAWING
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DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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A / E-001 — DETAIL # / SOURCE / REFERENCE DWG.

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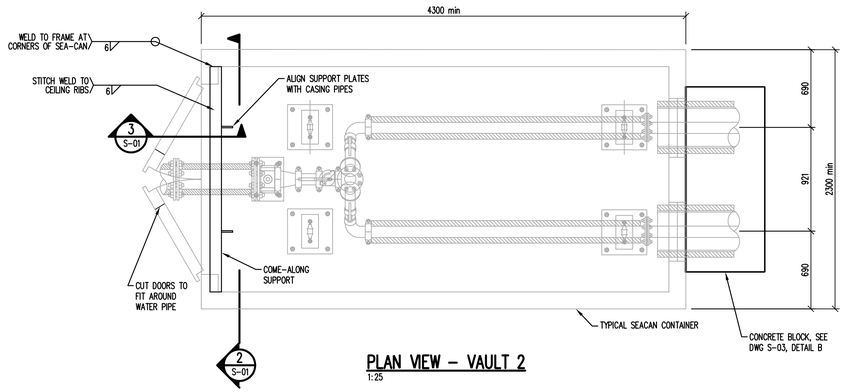
WILLIAMS ENGINEERING CANADA

CLIENT:
Nunavut

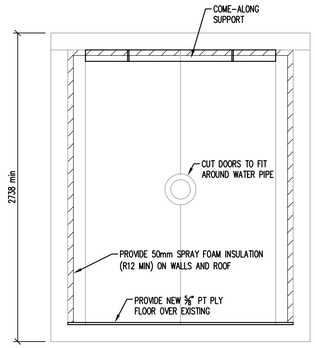
JOB. TITLE: **WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE**
KUGLUKTUK, NU

DWG. TITLE: **PROCESS DIAGRAM**

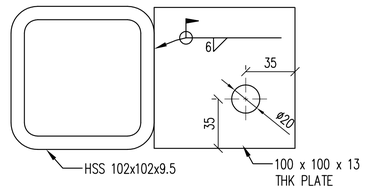
DWN. BY: JG	DES. BY: JG	PROJ. MGR.: JH
PEER REVIEW: JH	DATE: (YY-MM-DD) 2010.08.06	SCALE: NTS
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # 13655.00
DWG # P-01	OF 1	REV # 1



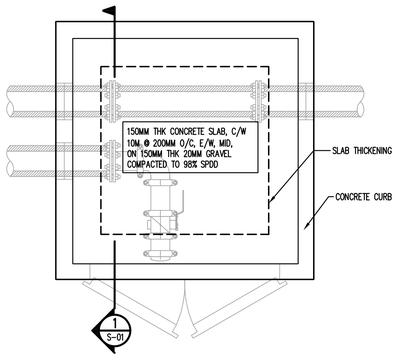
PLAN VIEW – VAULT 2
1:25



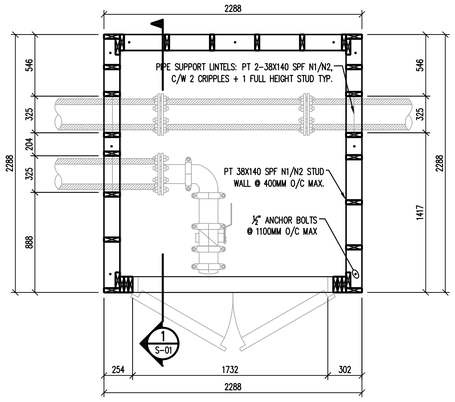
2 S-01 ACCESS VAULT 2 SECTION
1:25



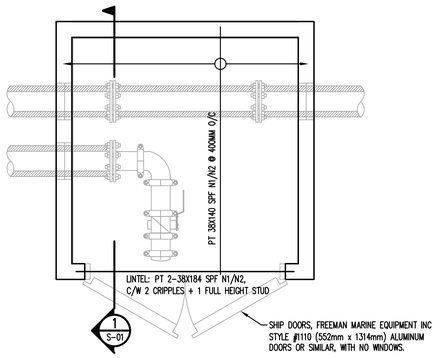
3 S-01 COME-ALONG SUPPORT
SCALE:



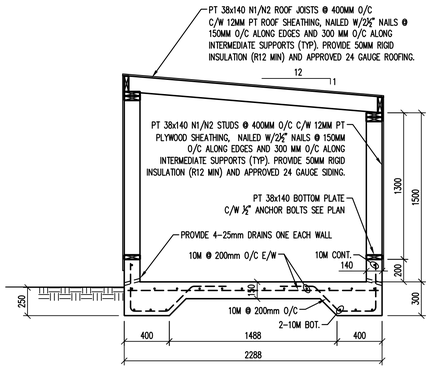
FOUNDATION PLAN – ACCESS VAULT 1
1:25



WALL FRAMING PLAN – ACCESS VAULT 1
1:25



ROOF FRAMING PLAN – ACCESS VAULT 1
1:25



1 S-01 ACCESS VAULT 1 SECTION
1:25

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

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DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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A / E-001 — DETAIL # / SOURCE / REFERENCE DWG.

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WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

JOB TITLE:

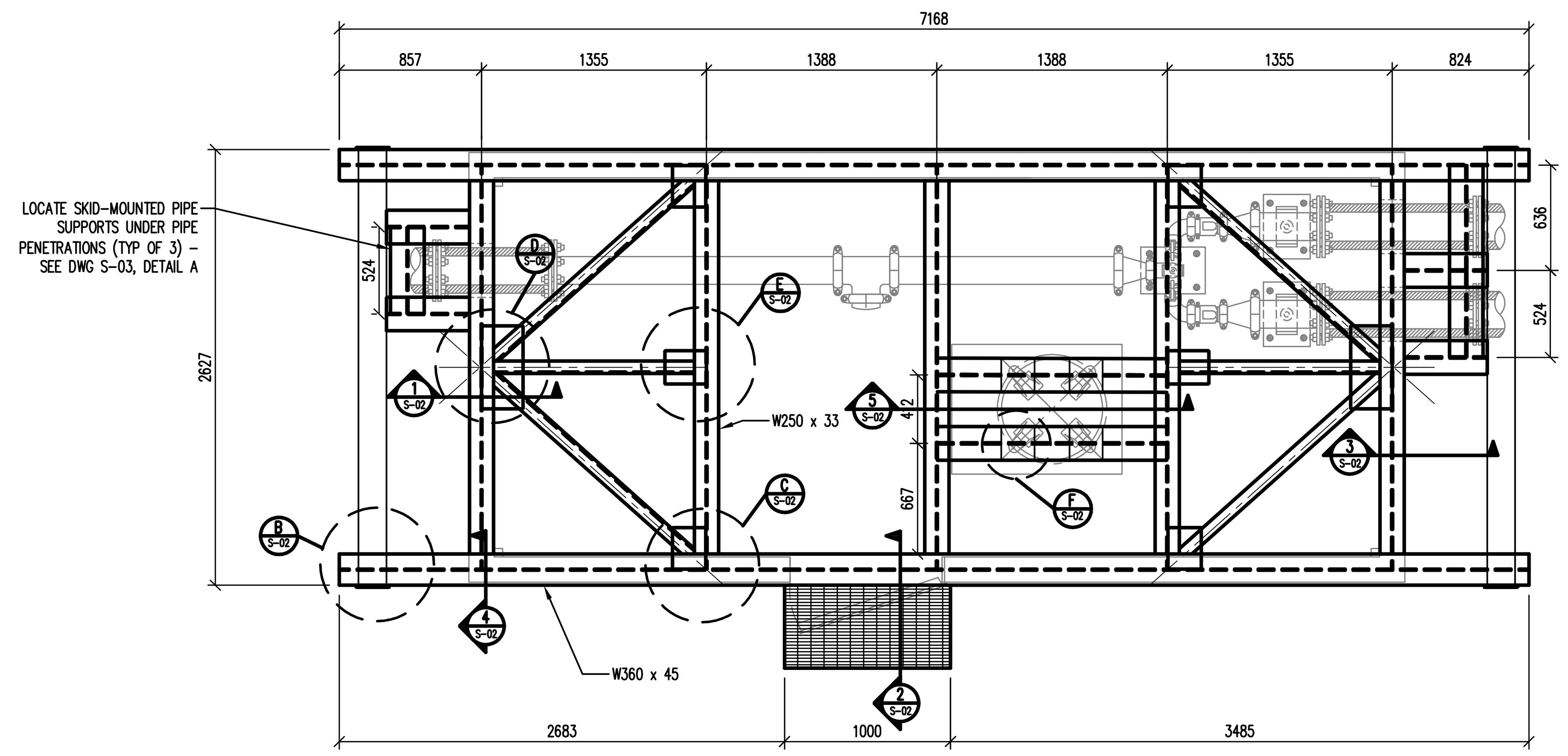
WATER SUPPLY IMPROVEMENTS PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE:

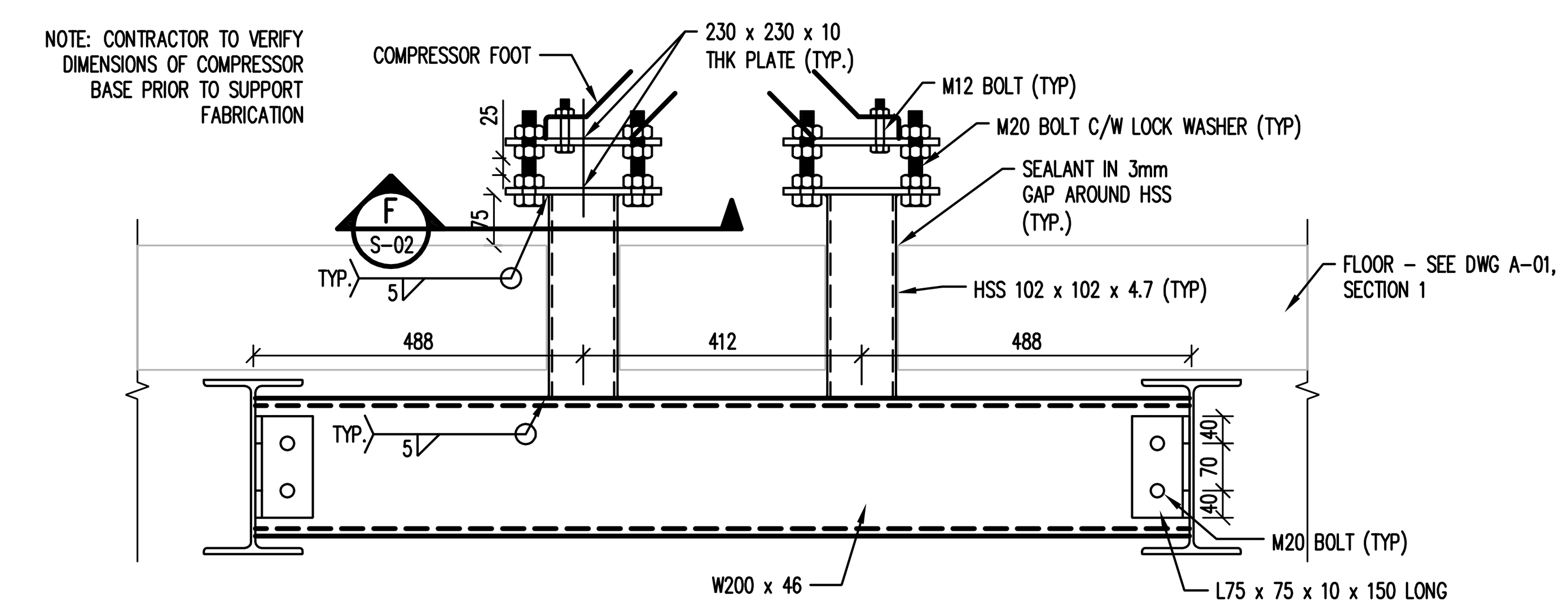
ACCESS VAULTS 1 AND 2

DWN. BY:	DES. BY:	PROJ. MGR.:
JK	EP	JH
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
AL	2010.08.06	AS SHOWN
CLIENT PROJ. #	GN PROJECT #04-4417	WEC PROJ. #
		13655.00

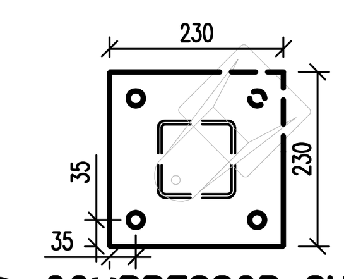
DWG S-01 No. 3 REV 1



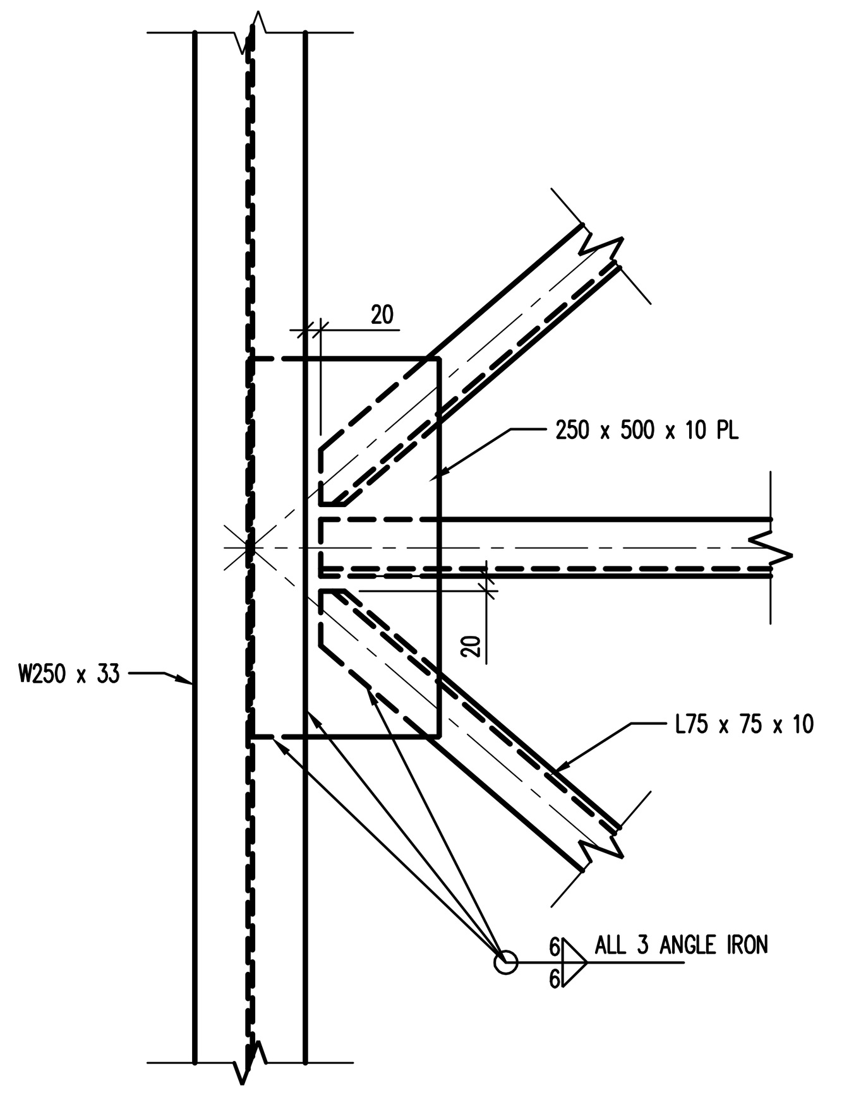
A S-02 SKID PLAN 1:30



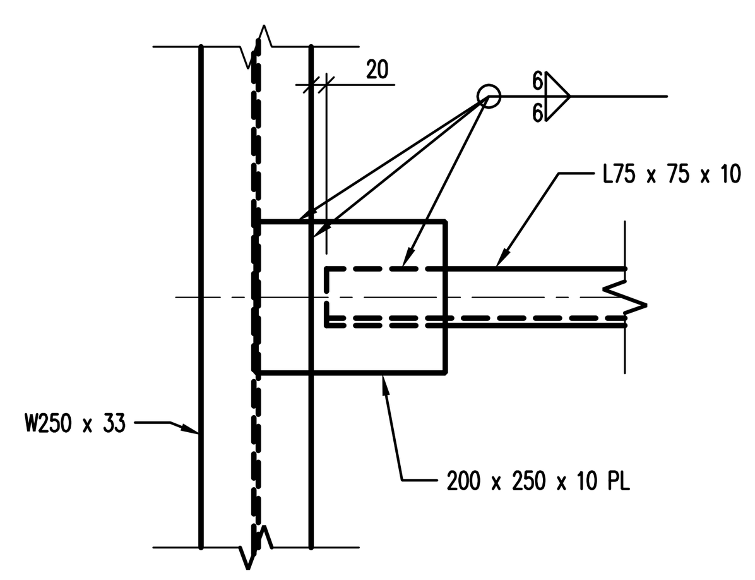
5 S-02 COMPRESSOR SUPPORT SECTION 1:10



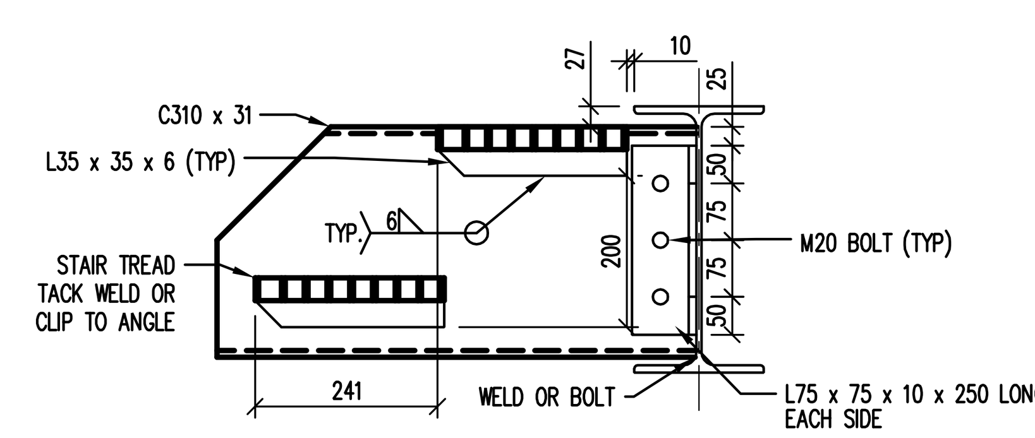
F S-02 COMPRESSOR SUPPORT 1:10



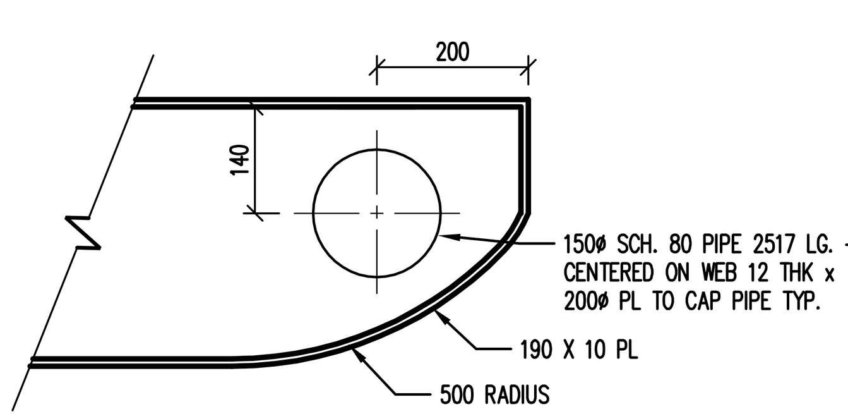
D S-02 CONNECTION DETAIL 1:10



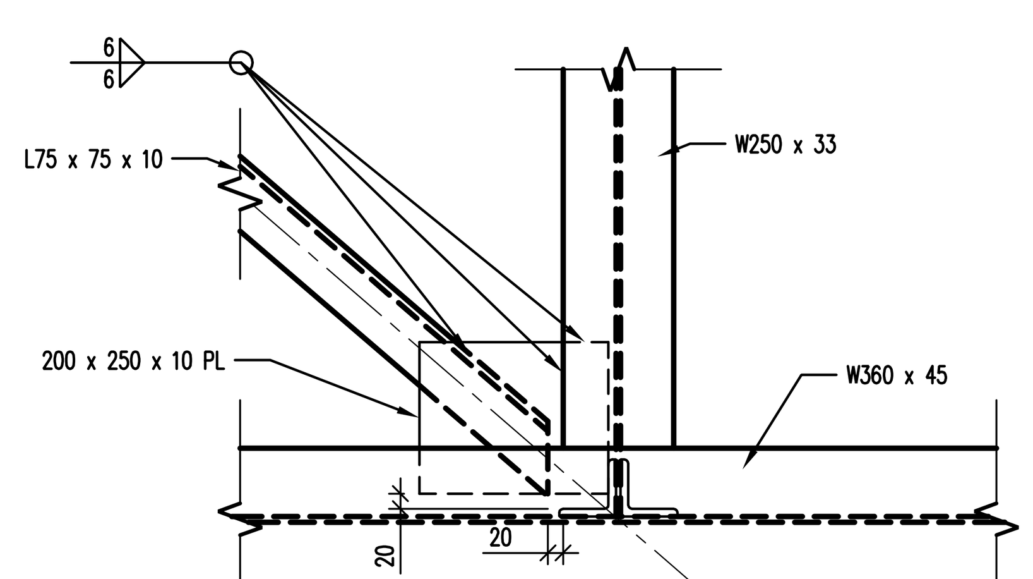
E S-02 CONNECTION DETAIL 1:10 (TYP)



2 S-02 SECTION 1:10



B S-02 SKID END (TYP. OF 4) 1:10



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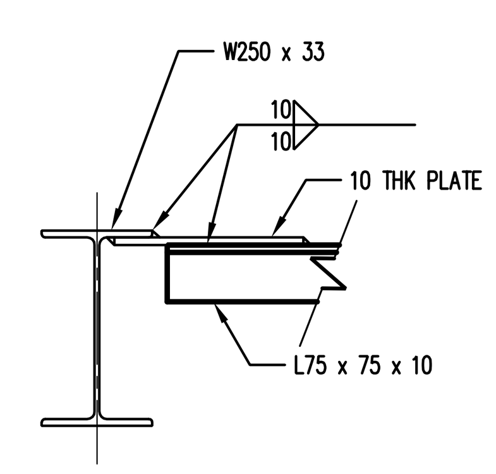
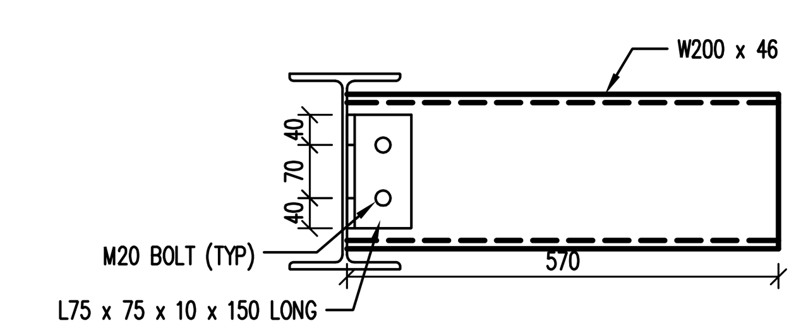
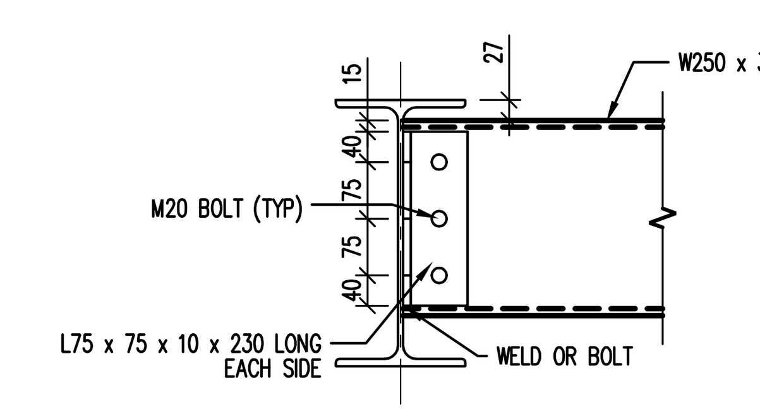


1 S-02 SECTION 1:10



3 S-02 PIPE SUPPORT SECTION 1:10



4 S-02 SECTION 1:10

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

RECORD DRAWING

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DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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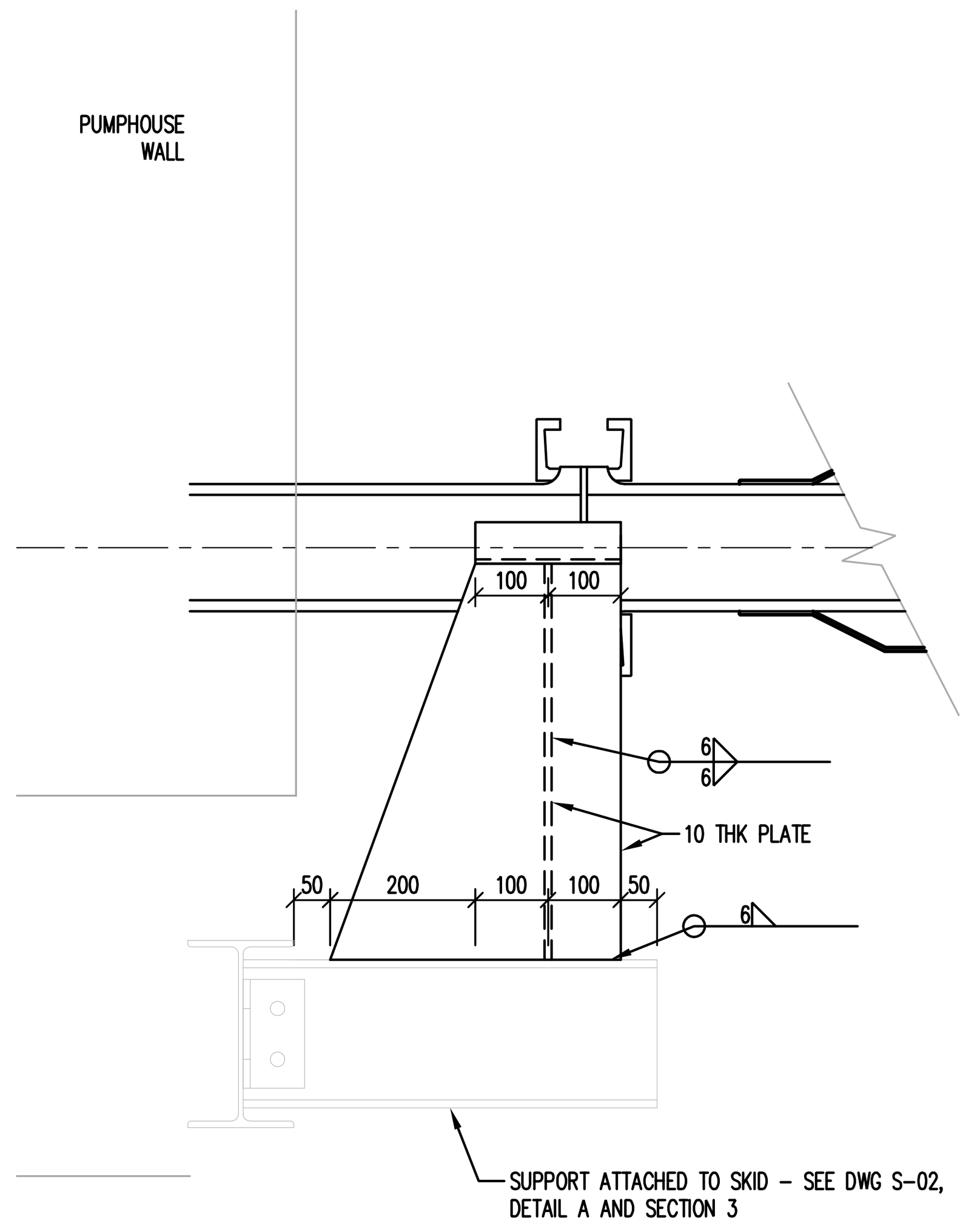
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

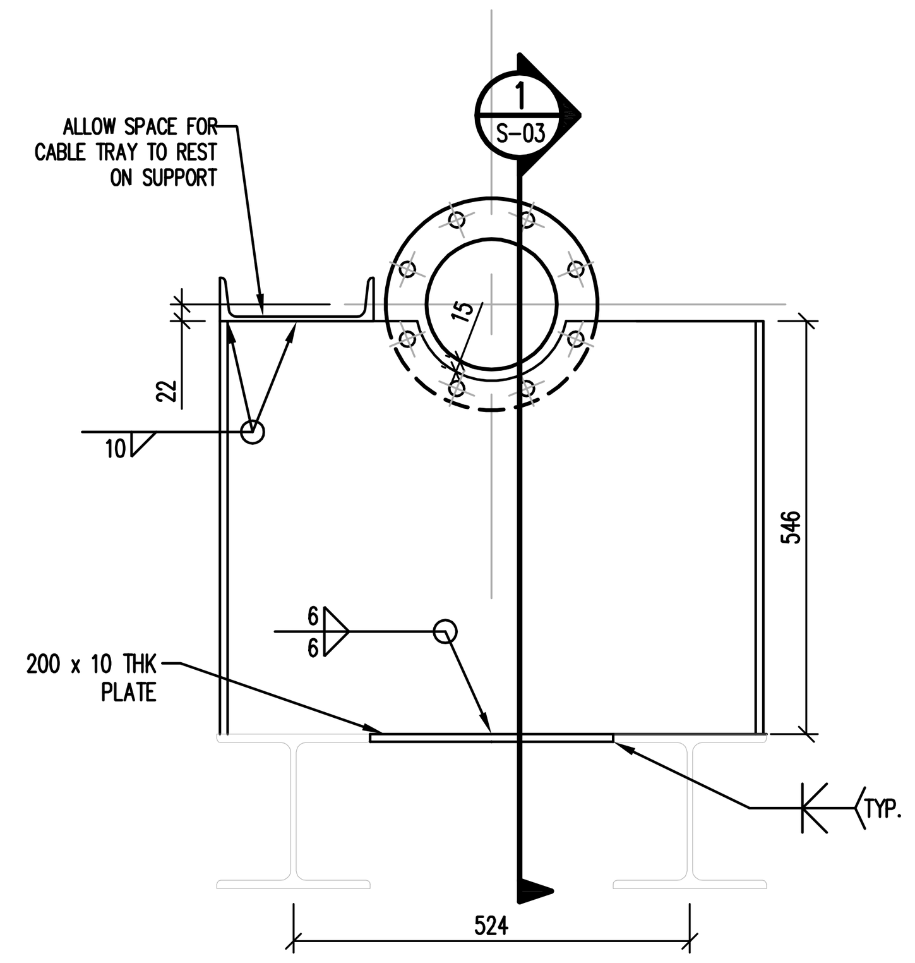
JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 1 NEW INTAKE AND PUMPHOUSE KUGLUKTUK, NU

DWG. TITLE: PUMPHOUSE SKID DETAILS

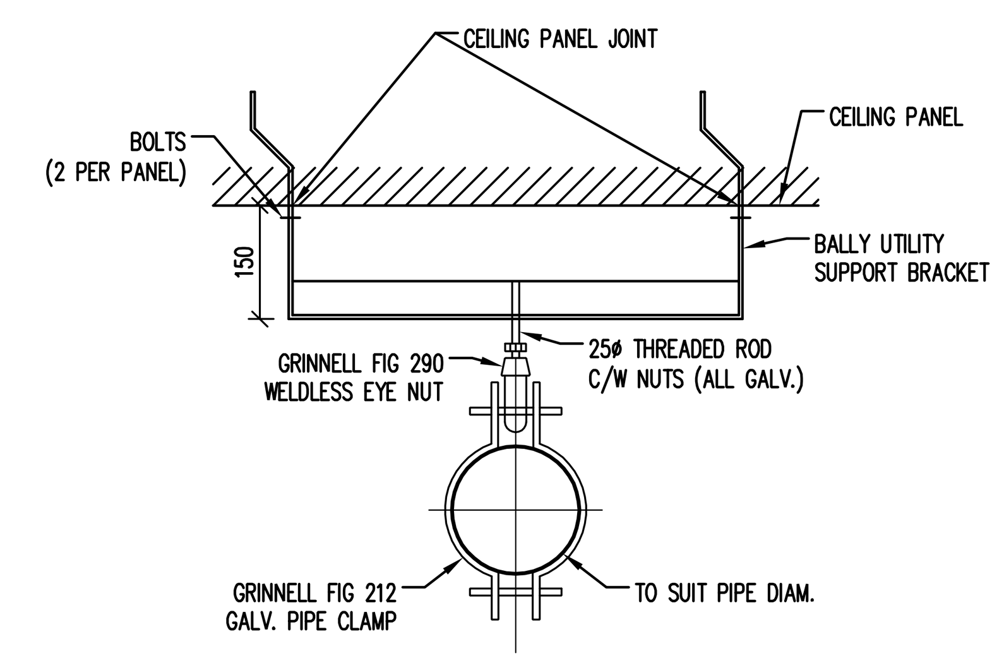
DWN. BY: JG	DES. BY: JC/JG	PROJ. MGR.: JH
PEER REVIEW: EP	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. #	GN PROJECT #04-4417	WEC PROJ. # 13655.00
DWG # S-02	OF 3	REV # 1



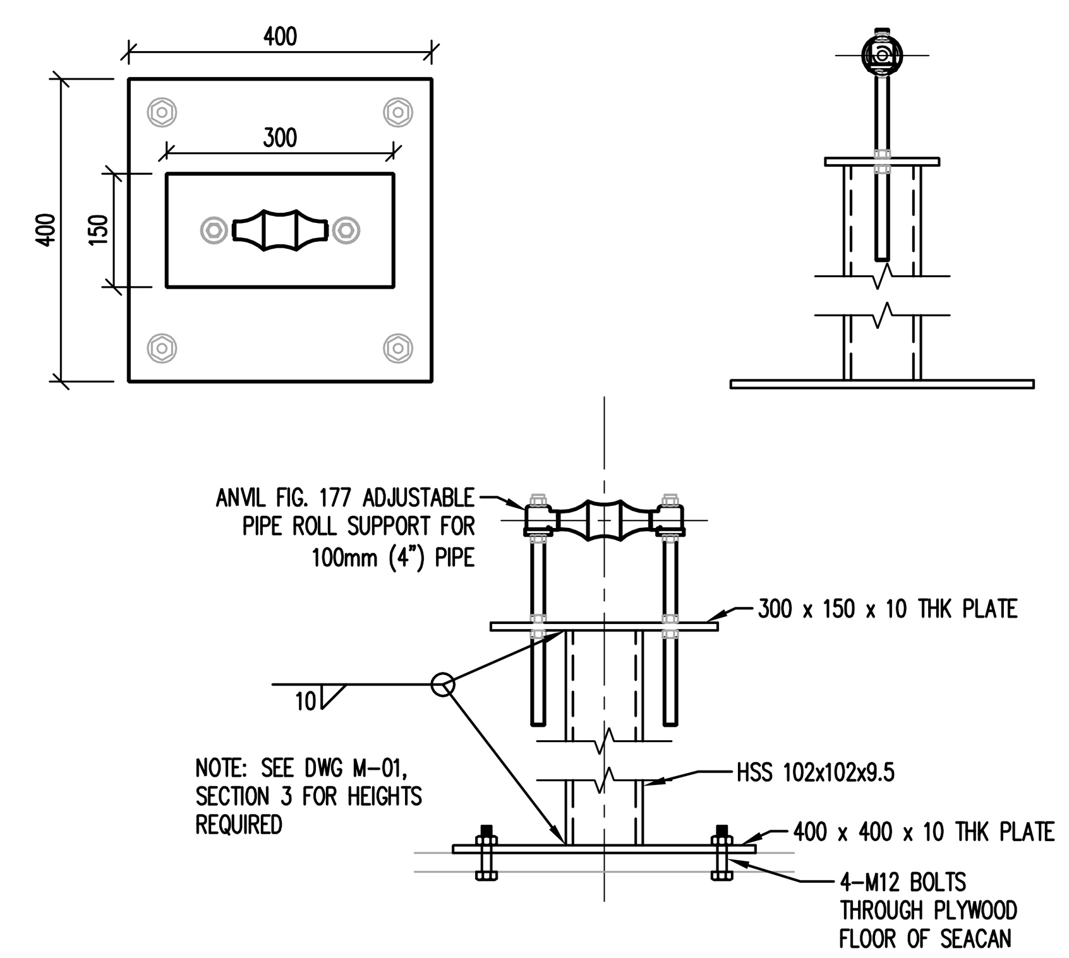
1 PIPE SUPPORT SECTION
S-03 1:10



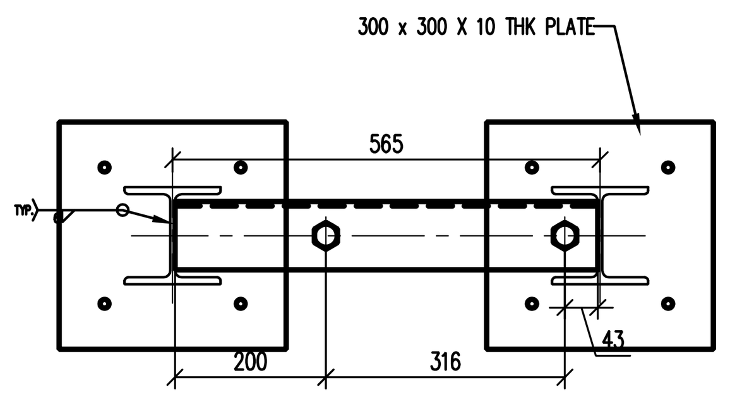
A PIPE SUPPORT ON SKID
S-03 1:10



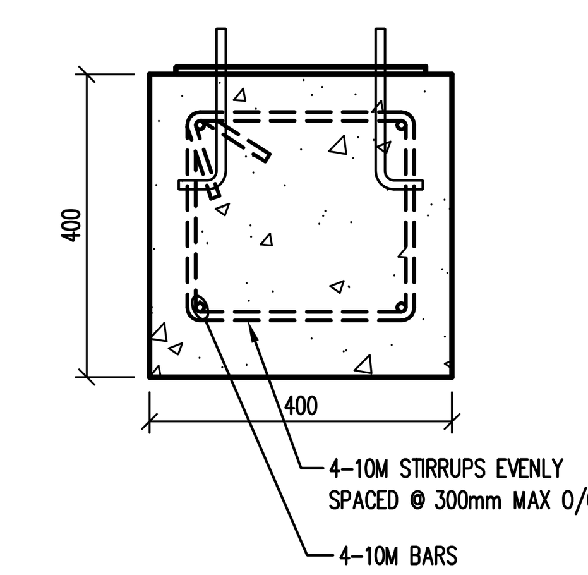
C PIPE HANGER
S-03 1:10



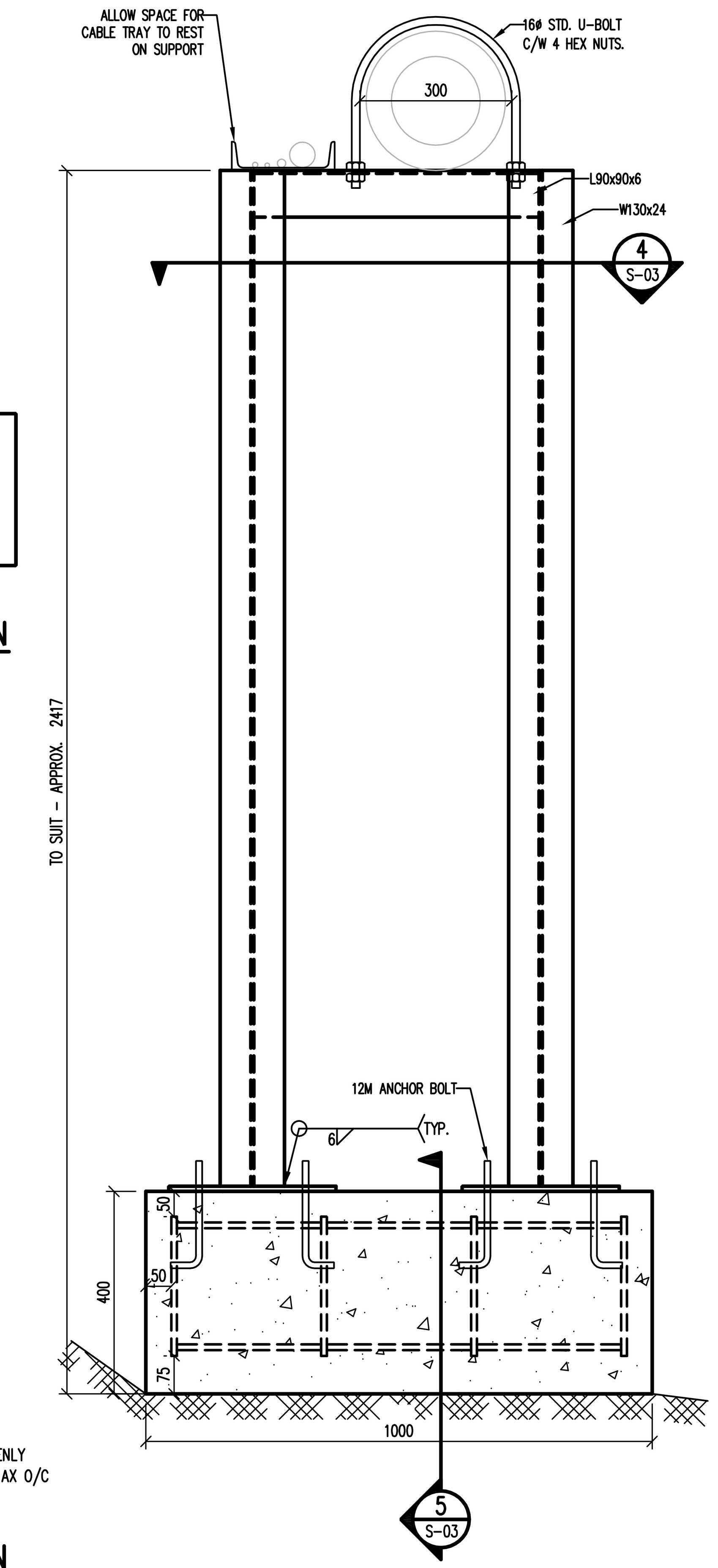
D ROLLER PIPE SUPPORT
S-03 1:10



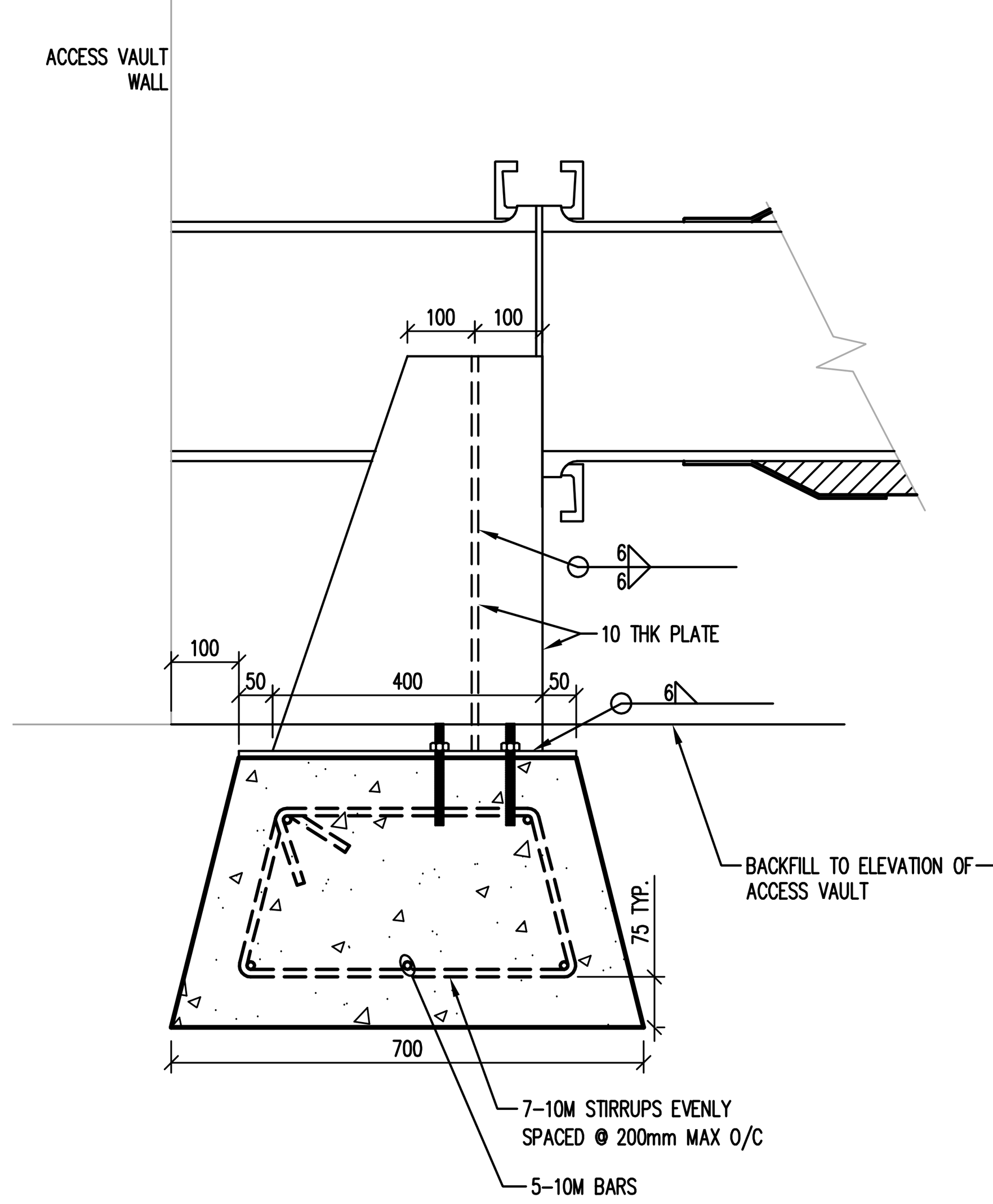
4 PIPE SUPPORT SECTION
S-03 1:10



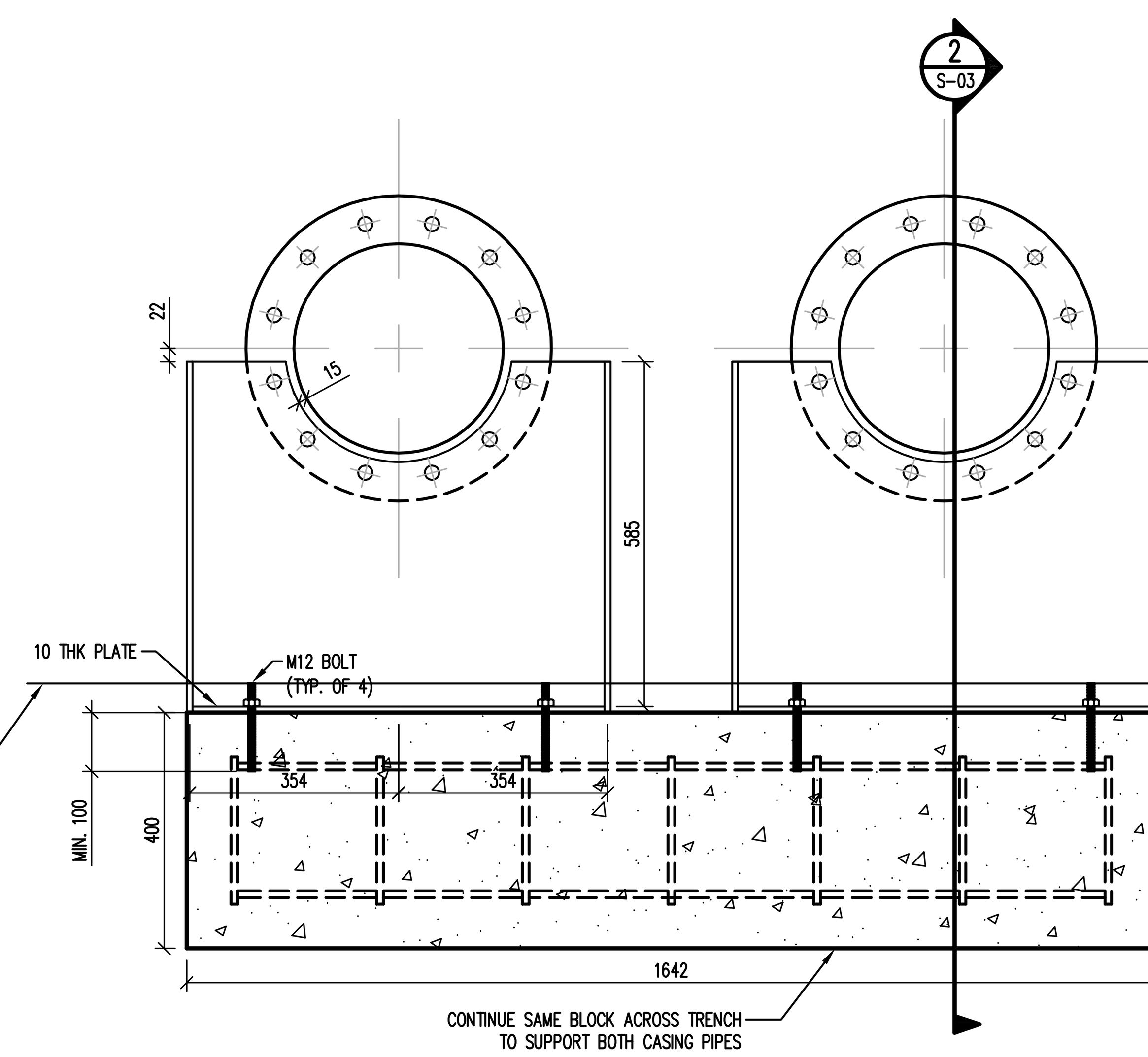
5 CONCRETE SECTION
S-03 1:10



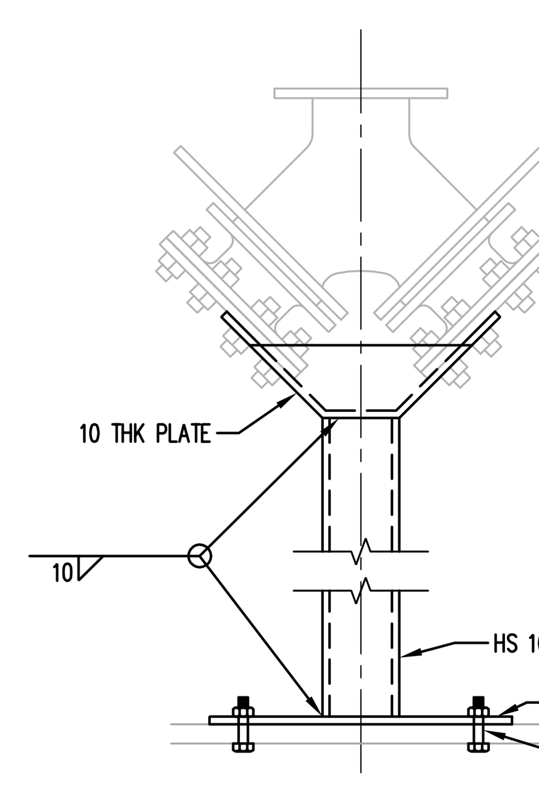
F FREESTANDING PIPE SUPPORT
S-03 1:10



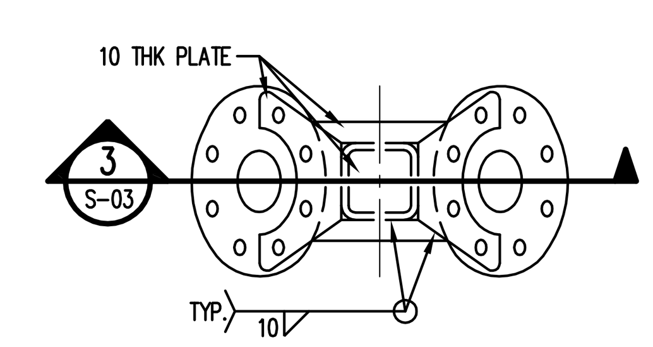
2 PIPE SUPPORT SECTION
S-03 1:10



B PIPE SUPPORT EAST OF AV2
S-03 1:10



3 VALVE SUPPORT SECTION
S-03 1:10



E TECH TAYLOR VALVE SUPPORT
S-03 1:10

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2010.05.04	JG	JH
1	ISSUED FOR CONSTRUCTION	2010.08.06	JG	JH
2	RECORD DRAWING	2014.10.09	AC	

RECORD DRAWING

DRAWINGS WERE BASED UPON INFORMATION SUBMITTED FROM OTHER PARTIES AND THE ENGINEER DOES NOT WARRANT OR CERTIFY THAT THE INFORMATION FROM THESE OTHER PARTIES IS ACCURATE.

DATE (YYYY MM DD): 2014.10.09

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

FOR BEST PLOTTING RESULTS, BE SURE TO USE WILLIAMS ENGINEERING CANADA AUTOCAD PLOT CONFIGURATION FILES AVAILABLE FROM: www.williamsengineering.com

LEGEND

SECTION # / SOURCE / REFERENCE DWG. (1, A-001)
DETAIL # / SOURCE / REFERENCE DWG. (A, E-001)

PERMIT STAMP:

PERMIT TO PRACTICE
WILLIAMS ENGINEERING CANADA INC.
PERMIT NUMBER
P 646
NWT/NU Association of Professional Engineers and Geoscientists

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WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS
PHASE 1
NEW INTAKE AND PUMPHOUSE
KUGLUKTUK, NU

DWG. TITLE:

PIPE SUPPORTS

DWN. BY: JG	DES. BY: JG	PROJ. MGR.: JH
PEER REVIEW: EP	DATE: (YY-MM-DD) 2010.08.06	SCALE: AS NOTED
CLIENT PROJ. # GN PROJECT #04-4417		WEC PROJ. # 13655.00
DWG # S-03	OF 3	REV # 1