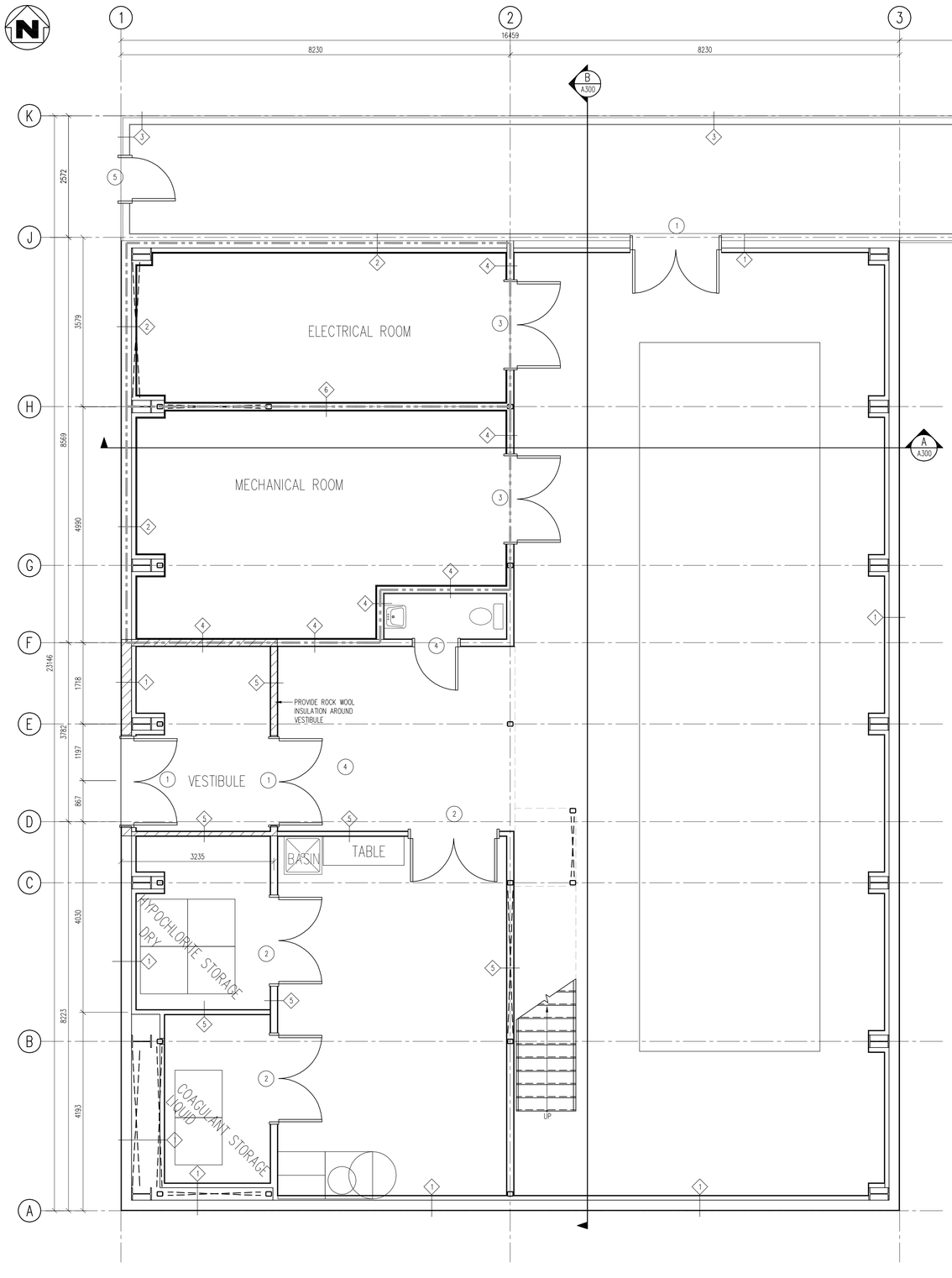
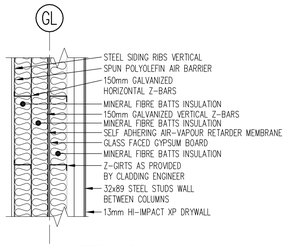
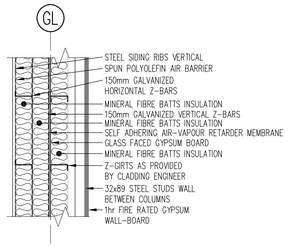


MAIN FLOOR PLAN
1:50



SECTION VIEW

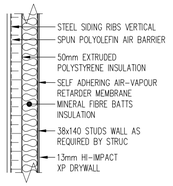
WALL TYPE-1



SECTION VIEW

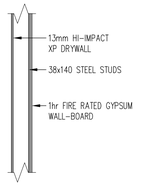
WALL TYPE-2

(FIRE RATED)



SECTION VIEW

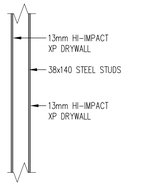
WALL TYPE-3



SECTION VIEW

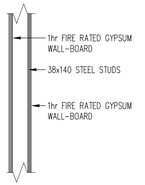
WALL TYPE-4

(FIRE RATED)



SECTION VIEW

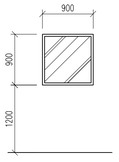
WALL TYPE-5



SECTION VIEW

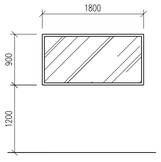
WALL TYPE-6

(FIRE RATED)



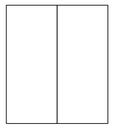
ANODIZED ALUMINUM FRAME
c/w SEALED UNIT GLAZING
c/w SPANDREL PANELS\
c/w EXTERNAL POLYCARBONATE "STORM SASH" FOR ROOK PROTECTION BY MANUFACTURER

WINDOWTYPE A



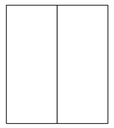
ANODIZED ALUMINUM FRAME
c/w SEALED UNIT GLAZING
c/w SPANDREL PANELS
c/w EXTERNAL POLYCARBONATE "STORM SASH" FOR ROOK PROTECTION BY MANUFACTURER

WINDOWTYPE B



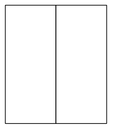
EXTERIOR DOOR
DOUBLE 900X2100
INS STEEL W/
T.B. PSF, CLOSER,
T.B.THRESHOLD,
WEATHER STRIPPING
SWEEP. KEYED LOCK &
DEAD BOLT

DOOR TYPE 1



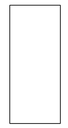
INTERIOR DOOR
DOUBLE 900X2100
INS STEEL W/
PSF, CLOSER,
THRESHOLD,
KEYED LOCK

DOOR TYPE 2



1 HR. F.R.DOOR
DOUBLE 900X2100 STEEL
W/ PSF, CLOSER,
THRESHOLD,
WEATHER STRIPPING
KEYED LOCK

DOOR TYPE 3



INTERIOR DOOR
760X2100 STEEL W/
PSF, CLOSER,
THRESHOLD,
PRIVACY SET

DOOR TYPE 4

EXTERIOR DOOR
900X2100 INS STEEL W/
T.B. PSF, CLOSER,
T.B.THRESHOLD,
WEATHER STRIPPING
SWEEP.
KEYED LOCK &
DEAD BOLT

DOOR TYPE 5

1 HR. F.R.DOOR
DOUBLE 760X2100 STEEL
W/ PSF, CLOSER,
THRESHOLD,
WEATHER STRIPPING
KEYED LOCK

DOOR TYPE 6

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR 100% REVIEW	2014.01.16	JK	TL
B	ISSUED FOR REVISED 100% REVIEW	2014.02.20	JK	TL
0	ISSUED FOR TENDER	2014.03.05	JK	TL

LEGEND:

- 1 — WALL TYPE SEE TYPICAL DETAIL
- 1 — DOOR TYPE SEE TYPICAL DETAIL
- A — WINDOW TYPE SEE TYPICAL DETAIL
- FIRE RATED WALL
- ROCK WOOL INSULATED WALL

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.

PERMIT STAMP:

PERMIT TO PRACTICE
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PERMIT NUMBER
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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:

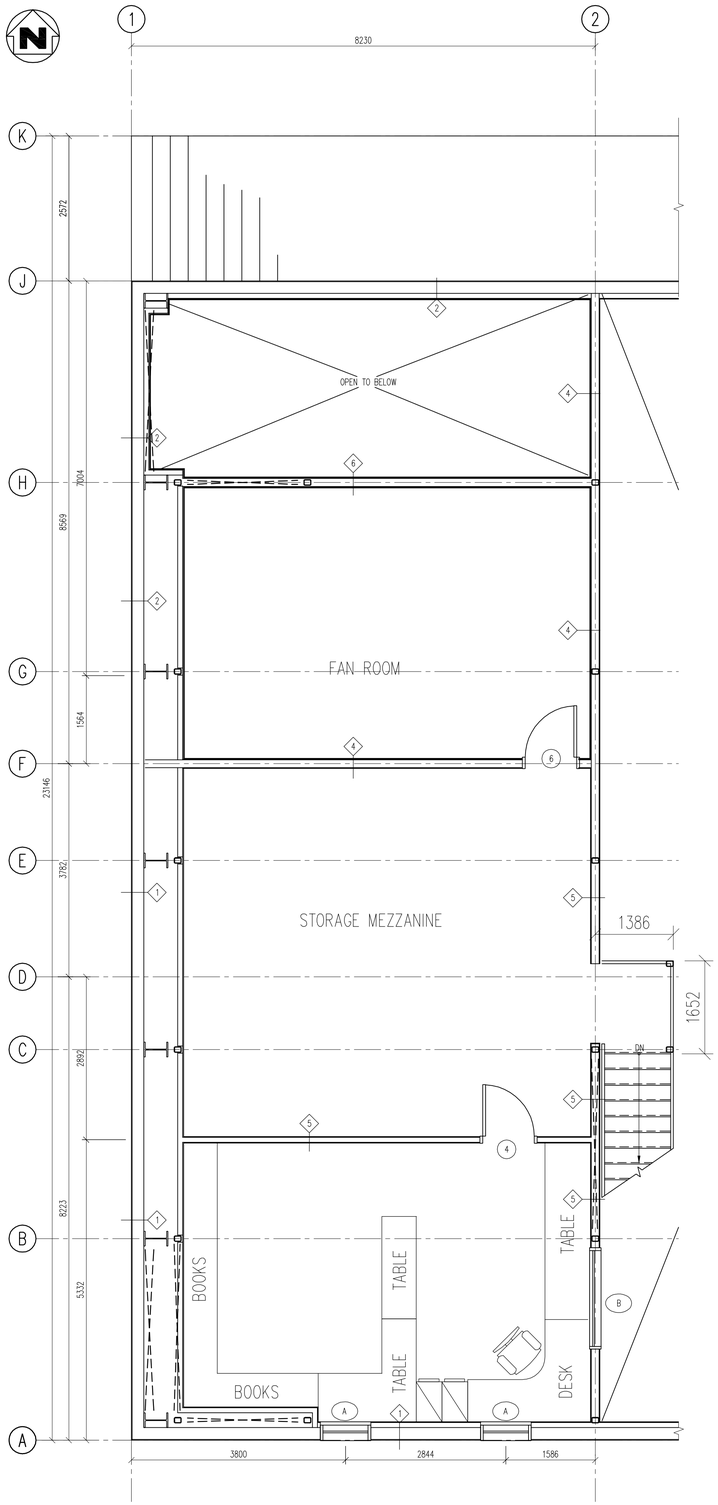
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT

KUGLUKTUK, NU

DWG. TITLE:

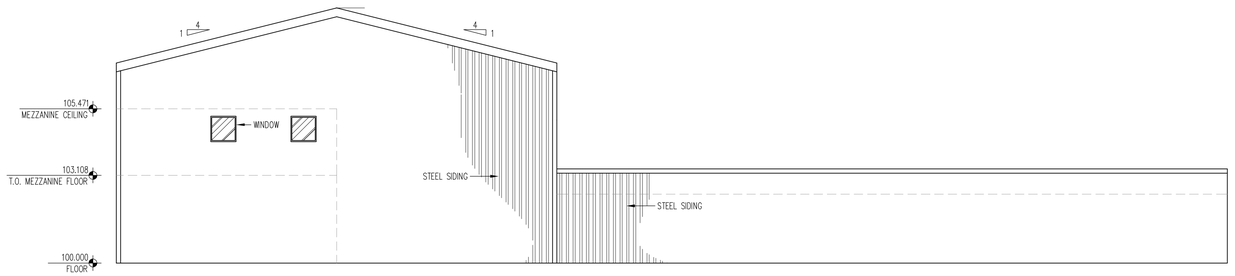
MAIN FLOOR PLAN WALL, DOOR & WINDOW SCHEDULE

DWN. BY: JK	DES. BY: TL	PROJ. MGR.: JH
PEER REVIEW: TL	DATE: (YY-MM-DD) 2014.03.05	SCALE: AS NOTED
CLIENT PROJ. #: 04-4417		WE PROJ. #: 13655.00
DWG. A100	SHT. 3	REV. 0

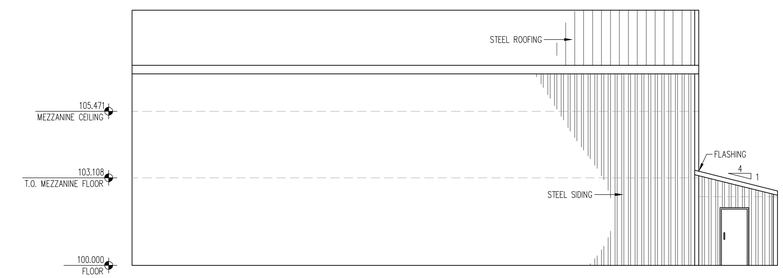


MEZZANINE FLOOR PLAN
1:50

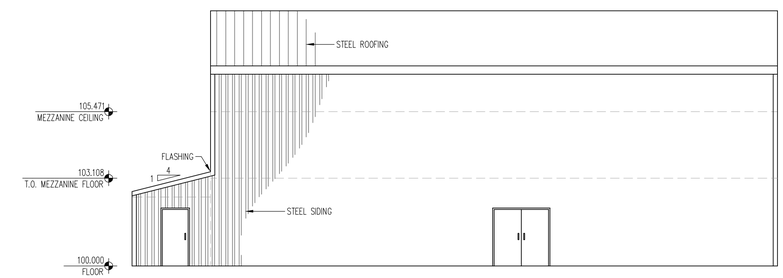
NORTH ELEVATION
1:100



SOUTH ELEVATION
1:100



EAST ELEVATION
1:100



WEST ELEVATION
1:100

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR 100% REVIEW	2014.01.16	JK	TL
B	ISSUED FOR REVISED 100% REVIEW	2014.02.20	JK	TL
0	ISSUED FOR TENDER	2014.03.05	JK	TL

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-007 — SECTION # / SOURCE / REFERENCE DWG.

A / E-007 — DETAIL # / SOURCE / REFERENCE DWG.

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www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

CLIENT:

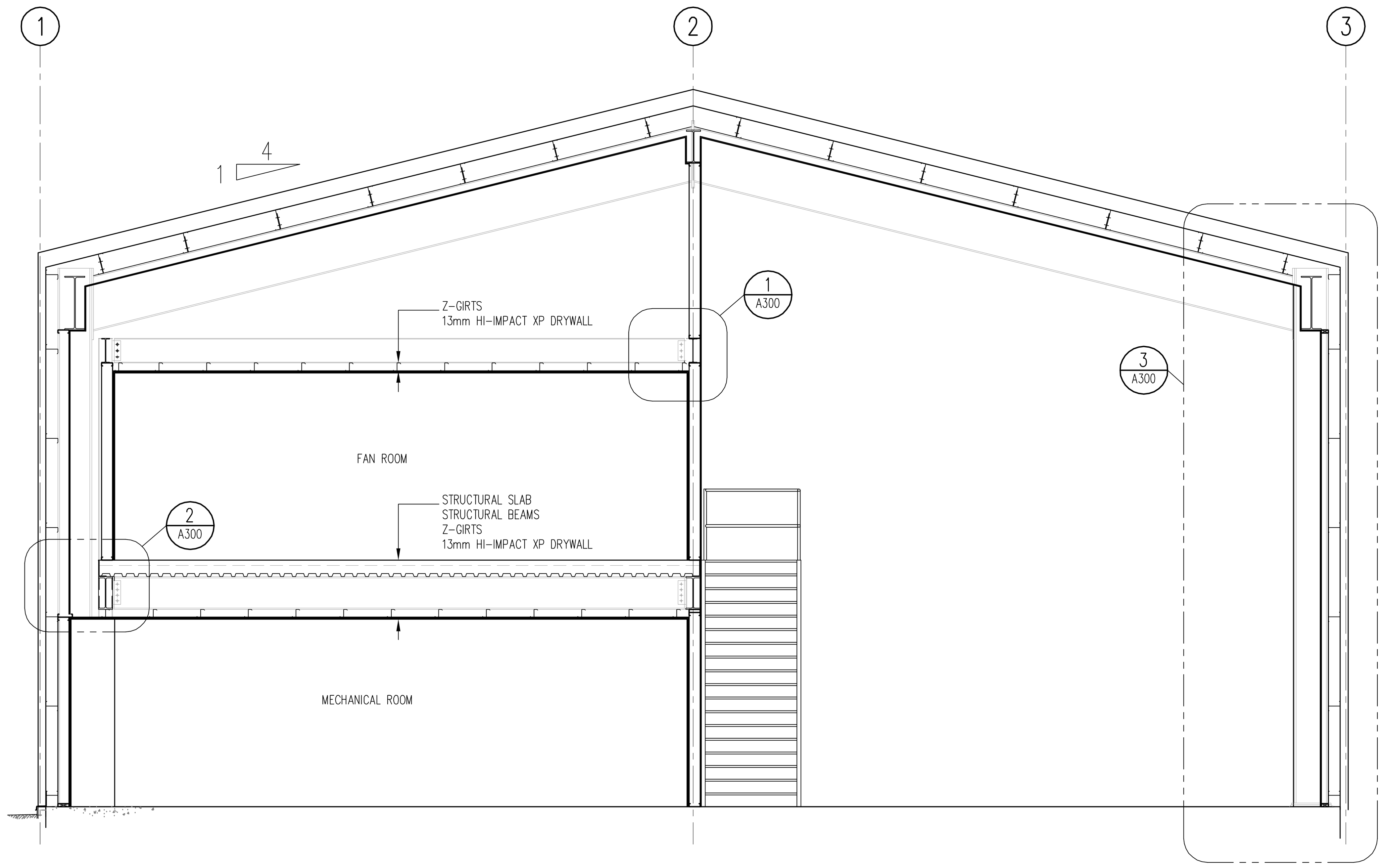
Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

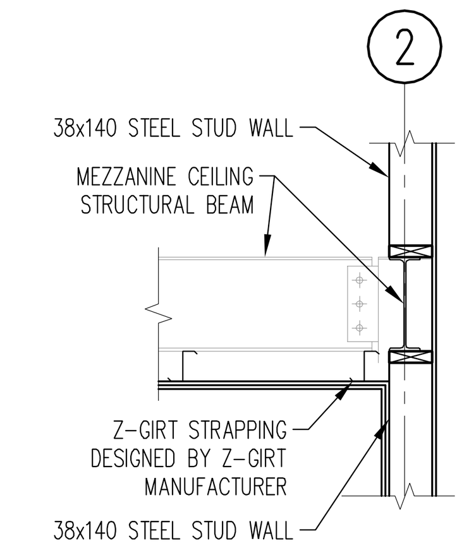
DWG. TITLE:
MEZZANINE PLAN
ELEVATIONS

DWN. BY:	DES. BY:	PROJ. MGR.:
JK	TL	JH
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
TL	2014.03.05	AS NOTED
CLIENT PROJ. #		WE PROJ. #
04-4417		13655.00

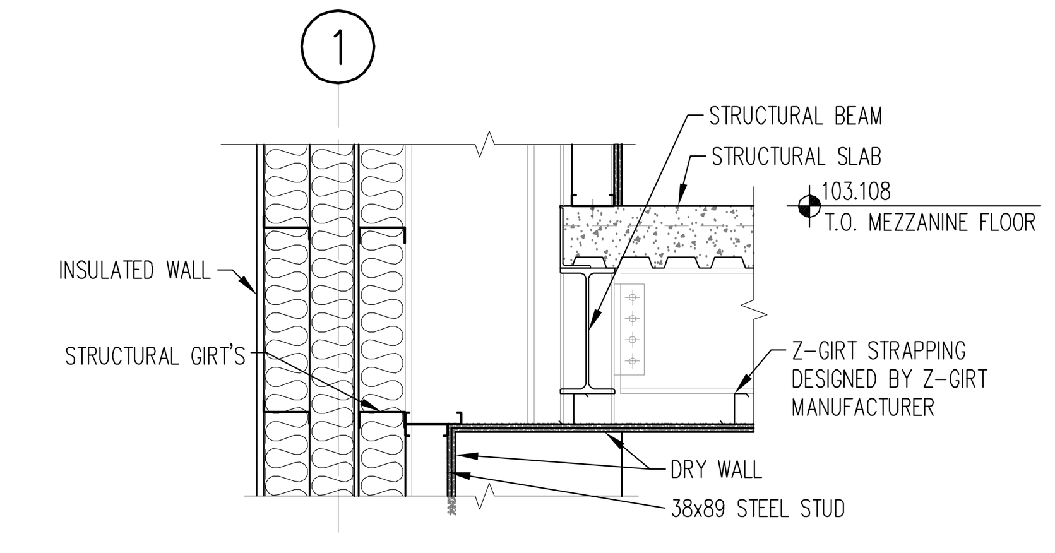
DWG. A200 | SHT. 3 | REV. 0



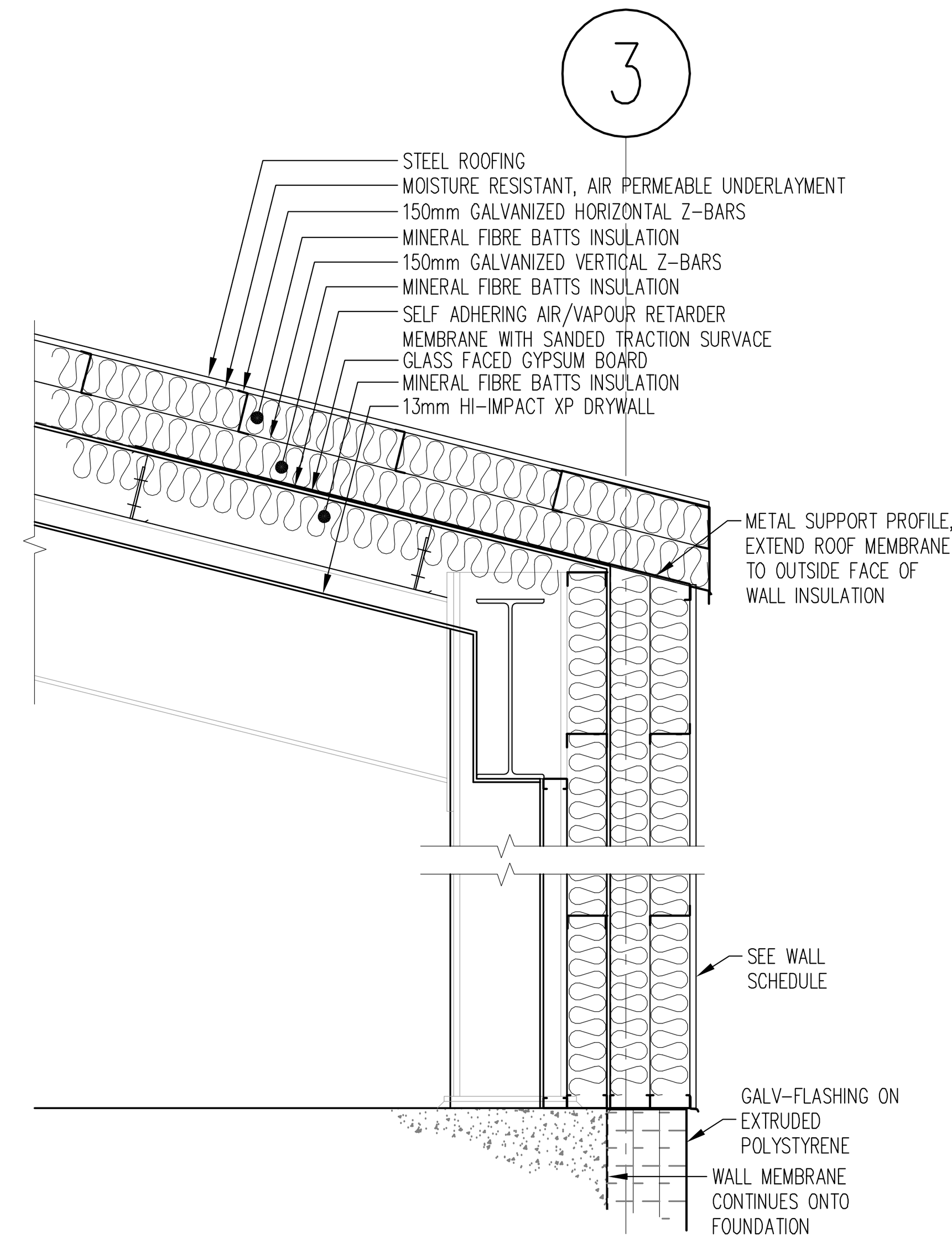
A SECTION
S300 1:50



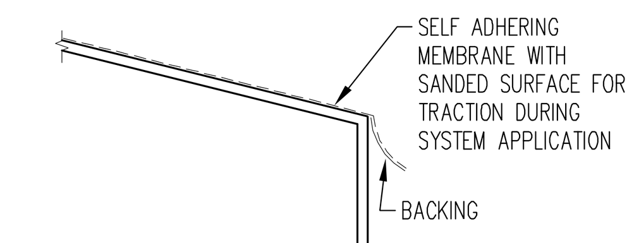
1 DETAIL -
A300 1:25



2 DETAIL -
A300 1:25

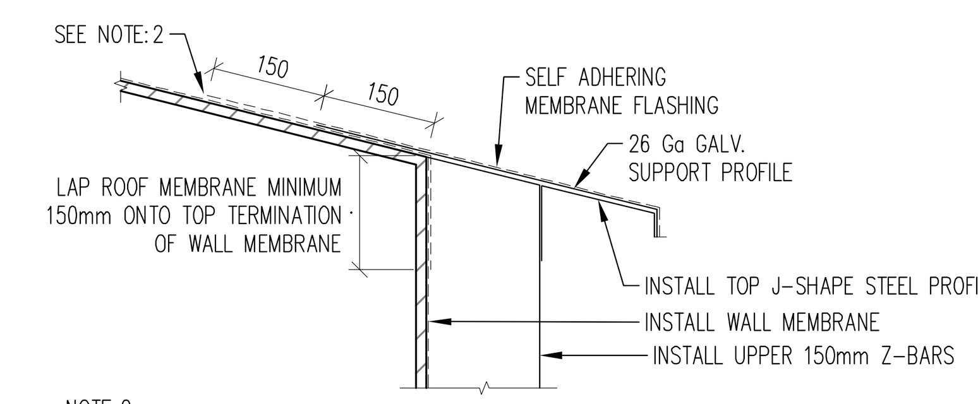


3 DETAIL -
A300 1:25



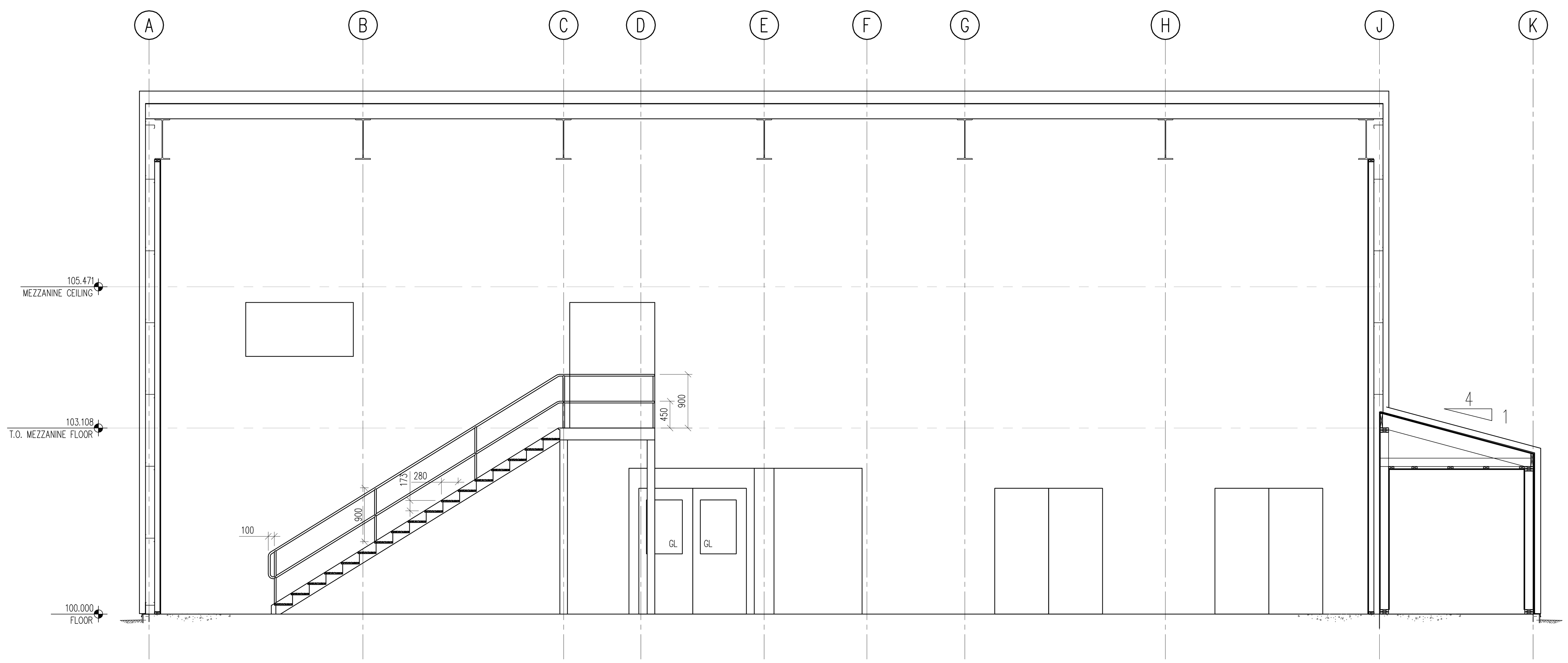
NOTE:1
CONTRACTOR MAY APPLY SELF ADHERING MEMBRANE FOR TEMPORARY MOISTURE PROTECTION.

STEP:1



NOTE:2
SEAL TOP TERMINATION OF MEMBRANE FLASHING TO ROOF MEMBRANE BY ETHER ONE OF TWO ALTERNATE METHODS.
1. TROWEL PLASTIC ROOFING CEMENT AND EMBED A 6mil POLYETHYLENE SEPARATOR SHEET.
2. HEAT AND TROWEL WITH PROPANE TORCH, "BUTTER", FOR A WELDED SEAL.

STEP:2



B SECTION
S300 1:50

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR 100% REVIEW	2014.01.16	JK	TL
B	ISSUED FOR REVISED 100% REVIEW	2014.02.20	JK	TL
0	ISSUED FOR TENDER	2014.03.05	JK	TL

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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PERMIT NUMBER
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Fax: (867) 873-2547
info@williamsengineering.com
www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS
PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
SECTIONS & DETAILS

DWN. BY: JK	DES. BY: TL	PROJ. MGR.: JH
PEER REVIEW: TL	DATE: (YY-MM-DD) 2014.03.05	SCALE: AS NOTED
CLIENT PROJ. #:	04-4417	WE PROJ. #: 13655.00
DWG. #: A300	3	REV: 0

KEYNOTES:

1. EXISTING WATER TREATMENT PLANT
2. EXISTING STORAGE TANKS
3. TRANSMISSION PIPELINE
4. EXISTING HOLDING POND
5. NEW WATER TREATMENT PLANT
6. PIPELINE TO/FROM EXISTING WATER TREATMENT PLANT
7. ACCESS VAULT
8. AUXILIARY INTAKE LOCATION
9. INTAKE PIPELINE
10. INTAKE LOCATION
11. RIVER ACCESS ROAD
12. EXISTING PUMPHOUSE
13. EXISTING ACCESS VAULT 2
14. PUMPHOUSE ACCESS ROAD
15. NEW ACCESS ROAD (105m)
16. OLD PUMPHOUSE
17. RF DRAINAGE POND APPROX LOCATION – FINAL LOCATION TO BE FIELD DETERMINED BY CONTRACTOR AND APPROVED BY ENGINEER TO ENSURE MIN PIPE SLOPE IS MAINTAINED.

UNIVERSAL TRANSVERSE MERCATOR (UTM) COORDINATES ZONE 11, CENTRAL MERIDIAN 117° WEST (NAD83)

STATION	NORTHING	EASTING	ELEVATION
ROCK BOLT	7524100.15	580654.79	7.196

ELEVATIONS ARE ORTHOMETRIC.
NAD83 SUITABLE FOR GRADING ONLY. BUILDING IS TO BE LAID OUT IN GROUND COORDINATES.
ROCK BOLT CONNECTS "OLD PUMPHOUSE" ROCK ANCHORS TO BEDROCK
REFERENCE POINT IS WESTERNMOST OF TWO ROCK BOLTS AT THIS LOCATION.

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.03	JDG	JC

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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WILLIAMS ENGINEERING CANADA

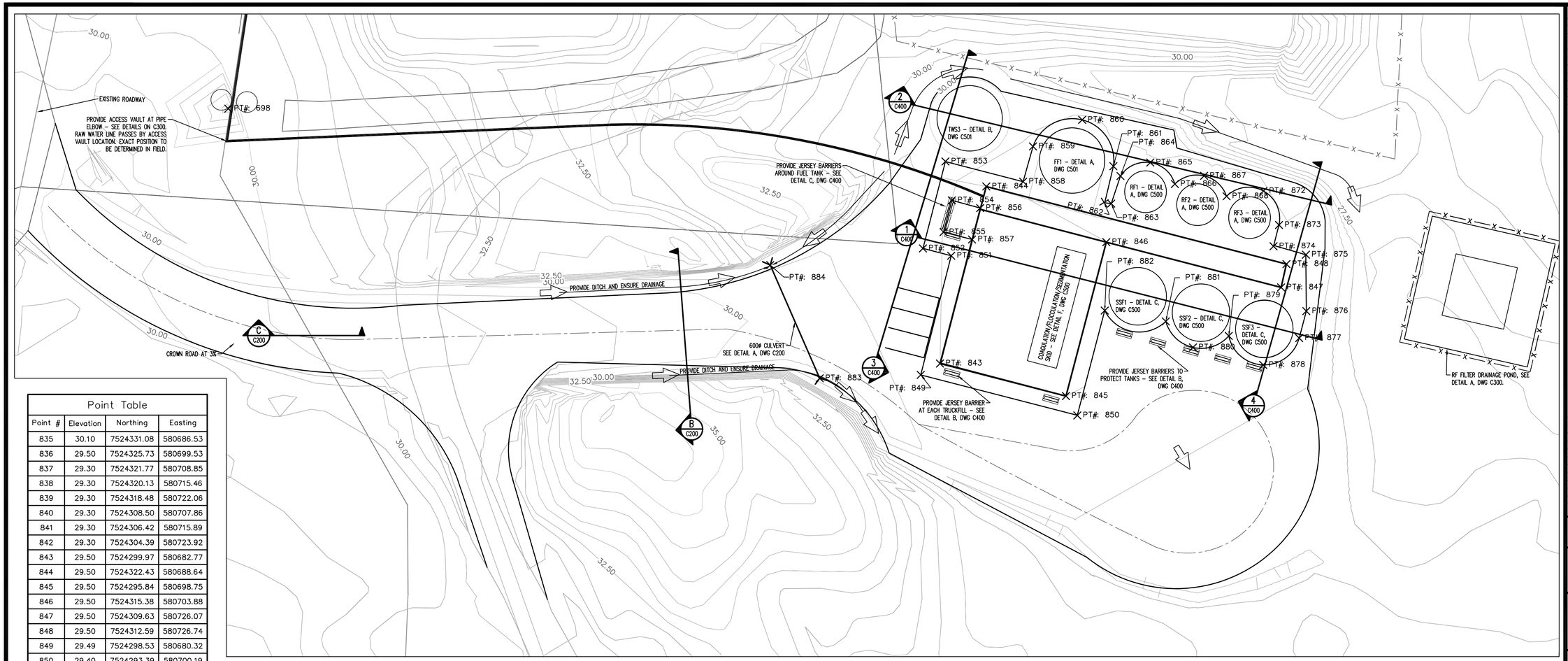
CLIENT:

Nunavut

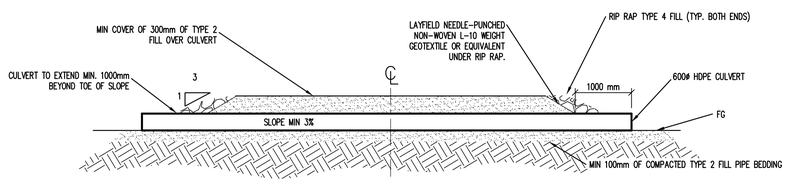
JOB. TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
CIVIL SITE PLAN

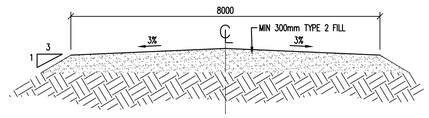
DWN. BY: KR	DES. BY: KR	PROJ. MGR.: WJVR
PEER REVIEW: JDG	DATE: (YY-MM-DD) 2014.03.03	SCALE: 1:1000
CLIENT PROJ. # 04-4417		WE PROJ. #
DWG # C100	OF 6	REV # 0



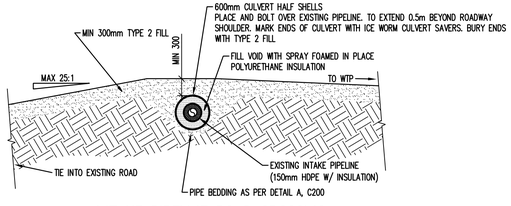
Point Table			
Point #	Elevation	Northing	Easting
835	30.10	7524331.08	580686.53
836	29.50	7524325.73	580699.53
837	29.30	7524321.77	580708.85
838	29.30	7524320.13	580715.46
839	29.30	7524318.48	580722.06
840	29.30	7524308.50	580707.86
841	29.30	7524306.42	580715.89
842	29.30	7524304.39	580723.92
843	29.50	7524299.97	580682.77
844	29.50	7524322.43	580688.64
845	29.50	7524295.84	580698.75
846	29.50	7524315.38	580703.88
847	29.50	7524309.63	580726.07
848	29.50	7524312.59	580726.74
849	29.49	7524298.53	580680.32
850	29.40	7524293.39	580700.19
851	29.40	7524313.65	580684.19
852	29.40	7524314.58	580680.60
853	29.59	7524325.61	580683.46
854	29.50	7524320.67	580684.27
855	29.50	7524316.64	580683.21
856	29.50	7524319.70	580687.86
857	29.50	7524315.71	580686.83
858	29.30	7524323.05	580693.31
859	29.30	7524327.51	580694.57
860	29.30	7524330.89	580700.81
861	29.30	7524325.01	580704.77
862	29.32	7524320.41	580703.58
863	29.10	7524320.26	580704.50
864	29.10	7524323.76	580705.67
865	29.11	7524325.47	580709.45
866	29.10	7524322.75	580712.58
867	29.10	7524323.79	580716.29
868	29.10	7524321.19	580719.14
872	29.10	7524321.86	580723.83
873	29.10	7524317.55	580725.79
874	29.11	7524314.85	580725.10
875	29.31	7524313.78	580729.21
876	29.10	7524306.62	580729.26
877	29.10	7524303.20	580728.36
878	29.10	7524299.80	580723.78
879	29.10	7524303.47	580719.42
880	29.10	7524302.01	580714.87
881	29.10	7524305.31	580711.42
882	29.10	7524306.69	580703.68
883	28.50	7524298.10	580667.49
883	28.50	7524298.10	580667.49
884	29.00	7524312.46	580661.21
884	29.00	7524312.46	580661.21



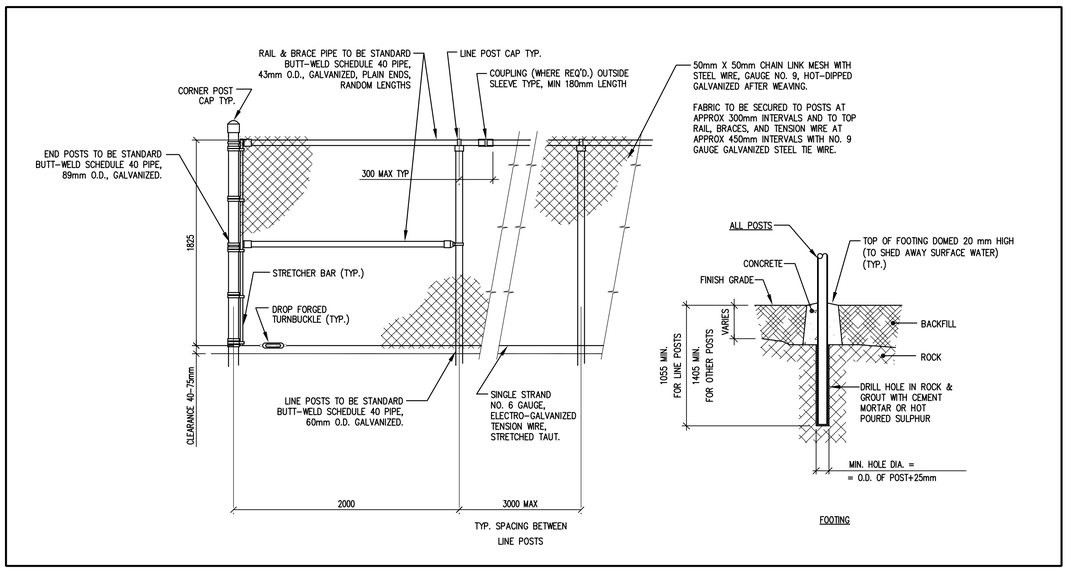
A C200 CULVERT 1:50



B C200 ACCESS ROAD SECTION 1:50



C C200 INTAKE PIPELINE ROAD CROSSING 1:50



D C200 FENCE DETAILS 1:25

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.03	JDG	JC

DRAWING NO.	DESCRIPTOR
C400	C400

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-009 DETAIL # / SOURCE / REFERENCE DWG.

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PERMIT NUMBER P-646
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Fax: (867) 873-2547

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www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

JOB TITLE:

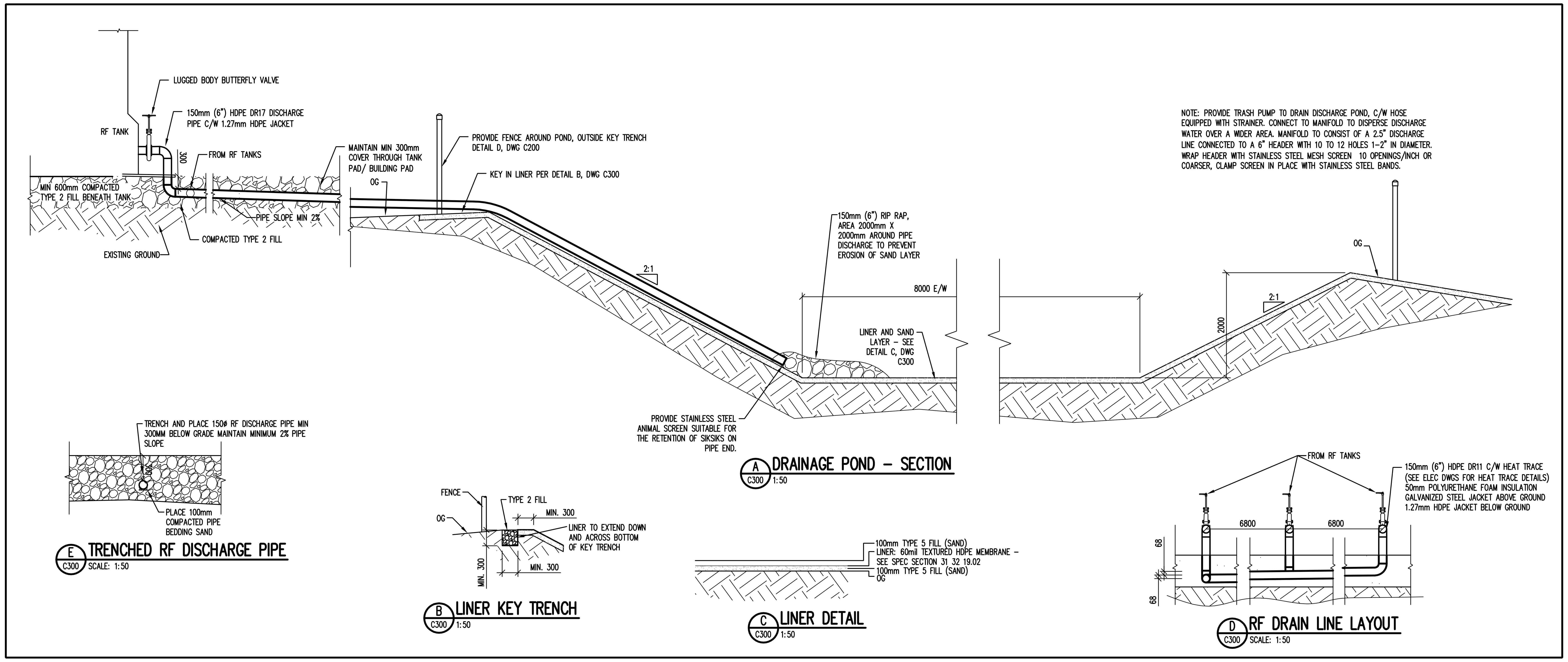
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

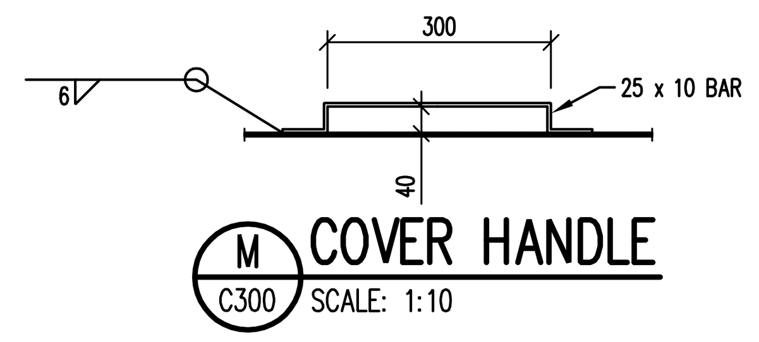
DWG. TITLE:

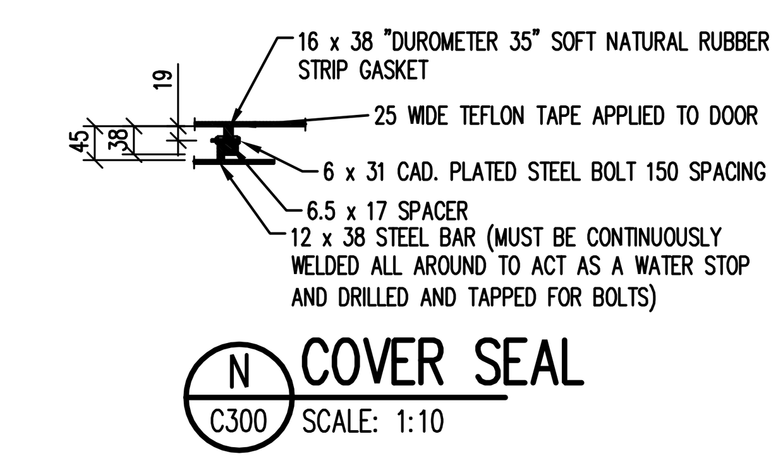
SITE GRADING

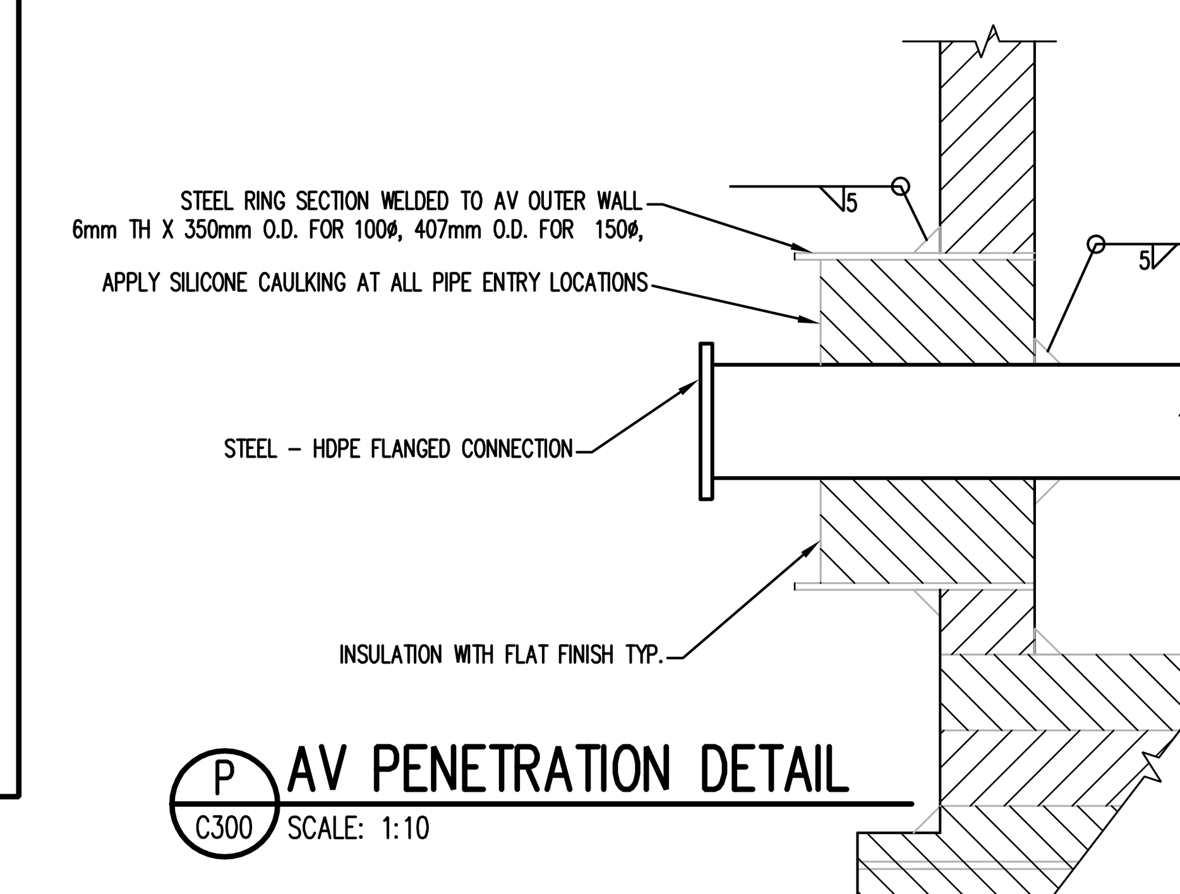
DWN. BY:	DES. BY:	PROJ. MGR.:
KR/JDG	KR	WJVR
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
JDG	2014.03.03	1:150
CLIENT PROJ. #		WE PROJ. #
	04-4417	

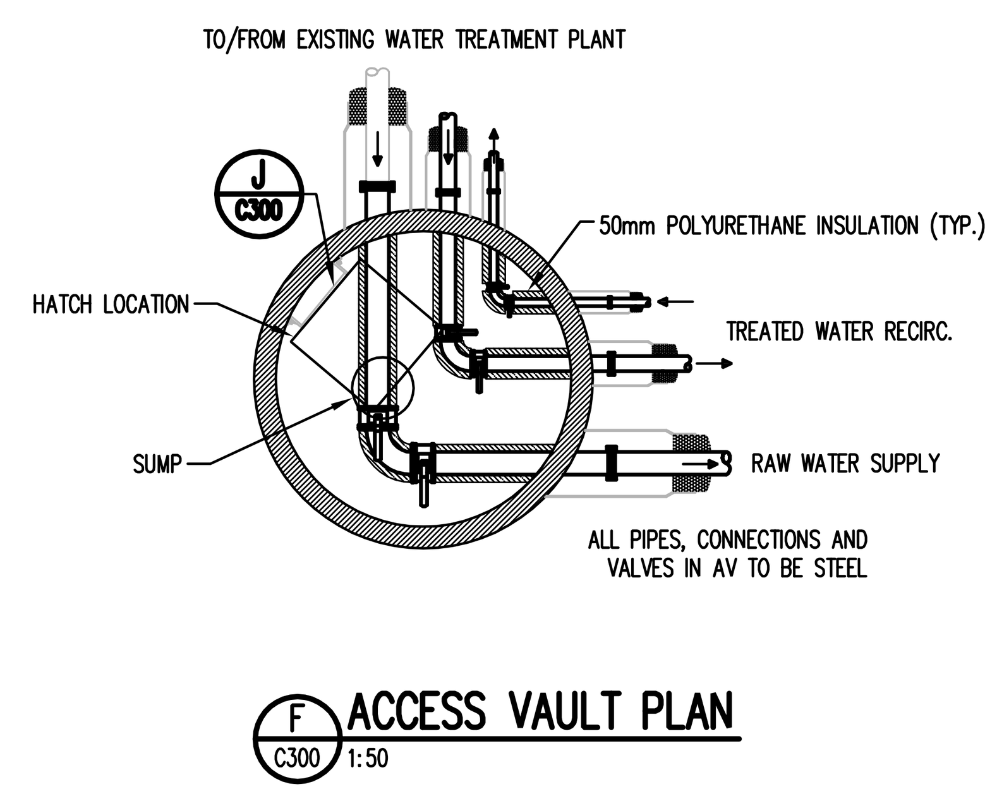
DWG. # C200 | No. 6 | REV 0

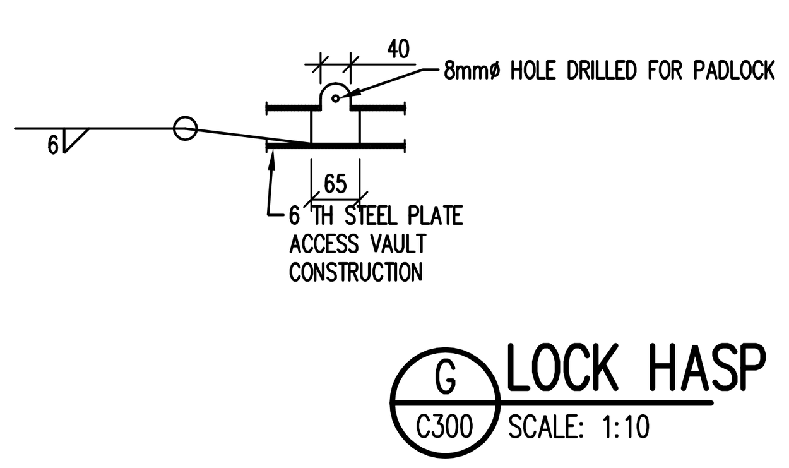


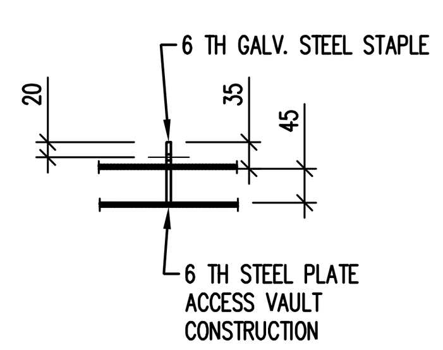


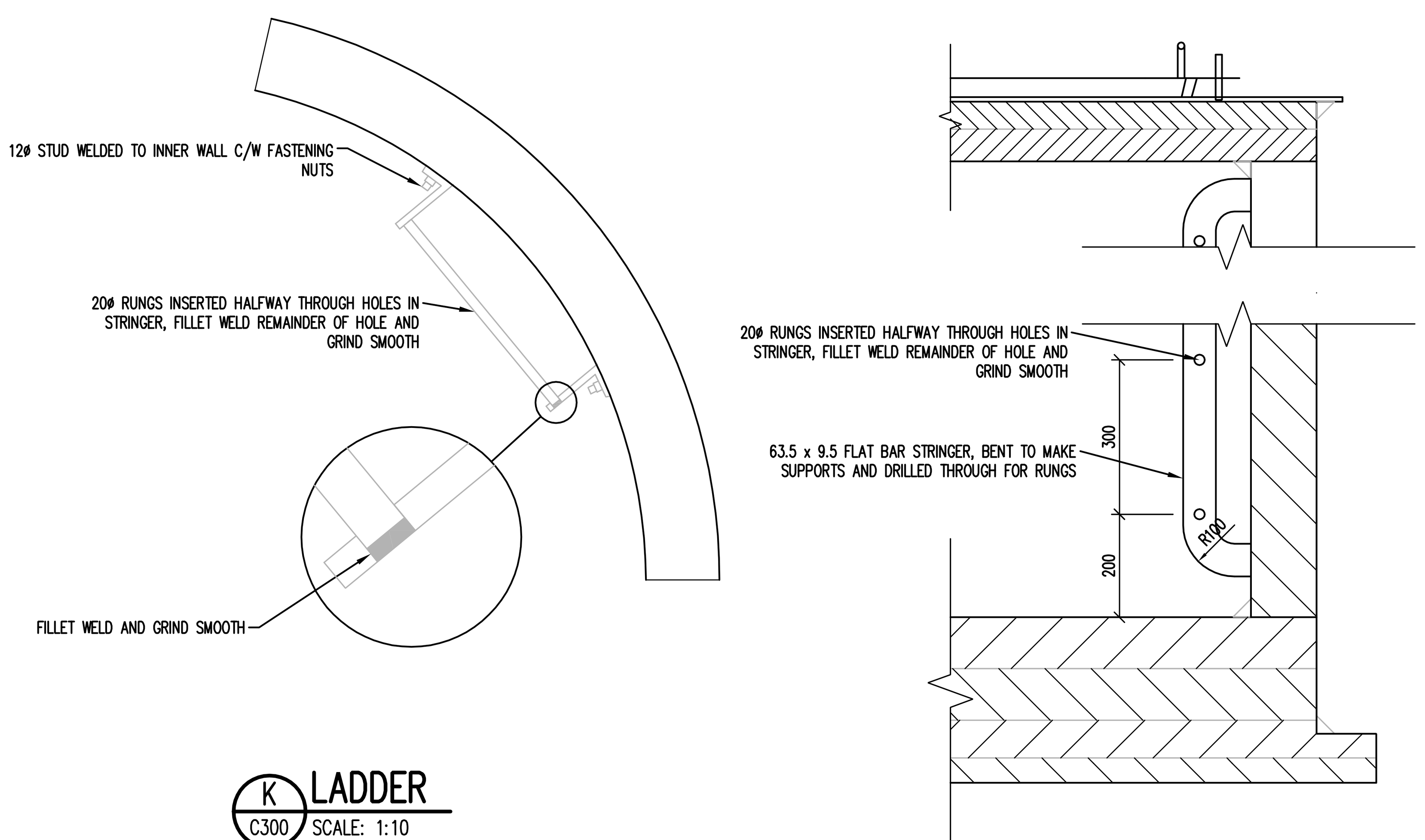


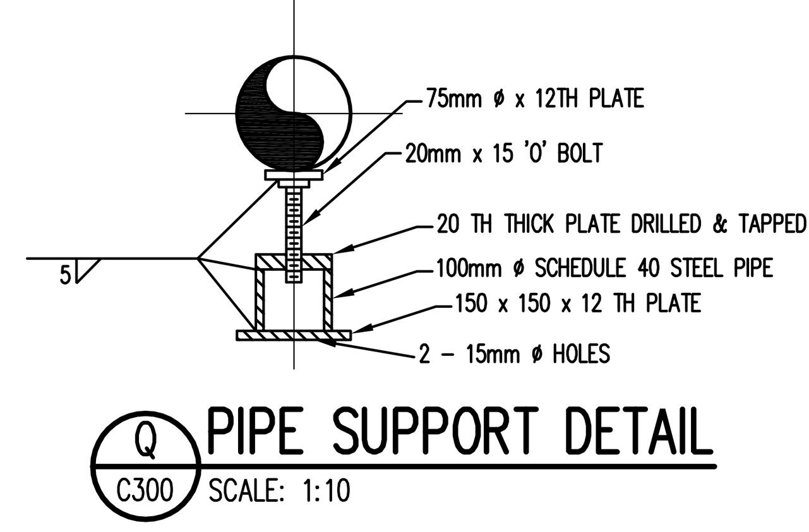


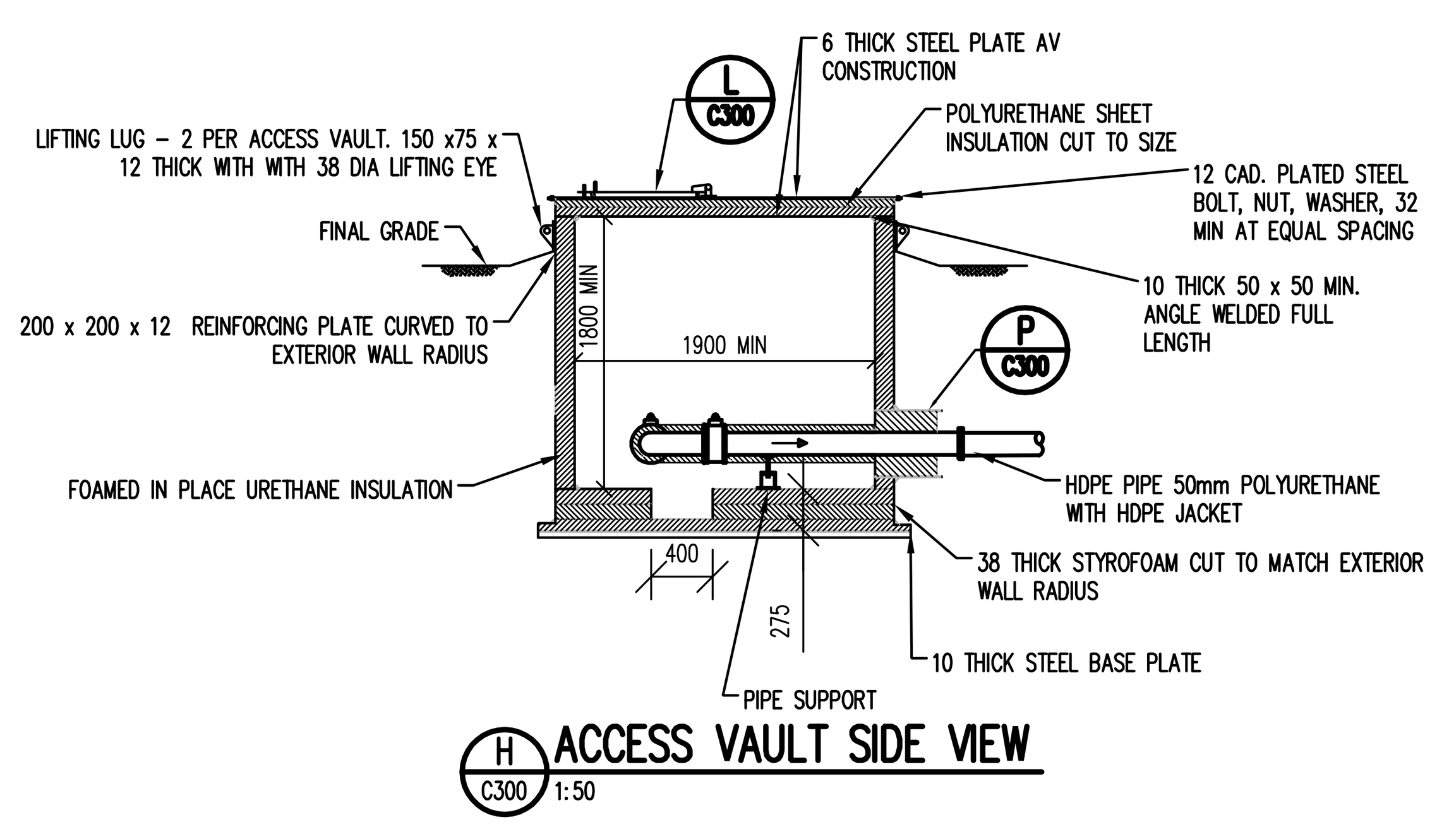


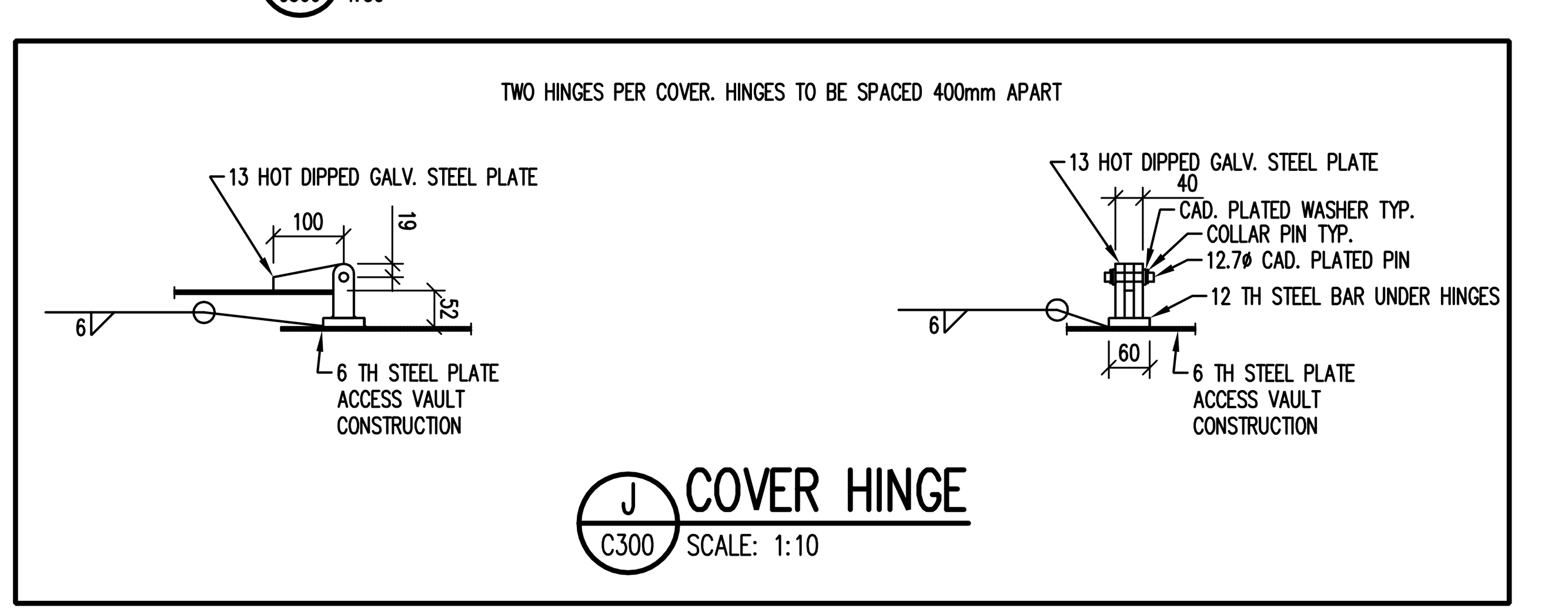


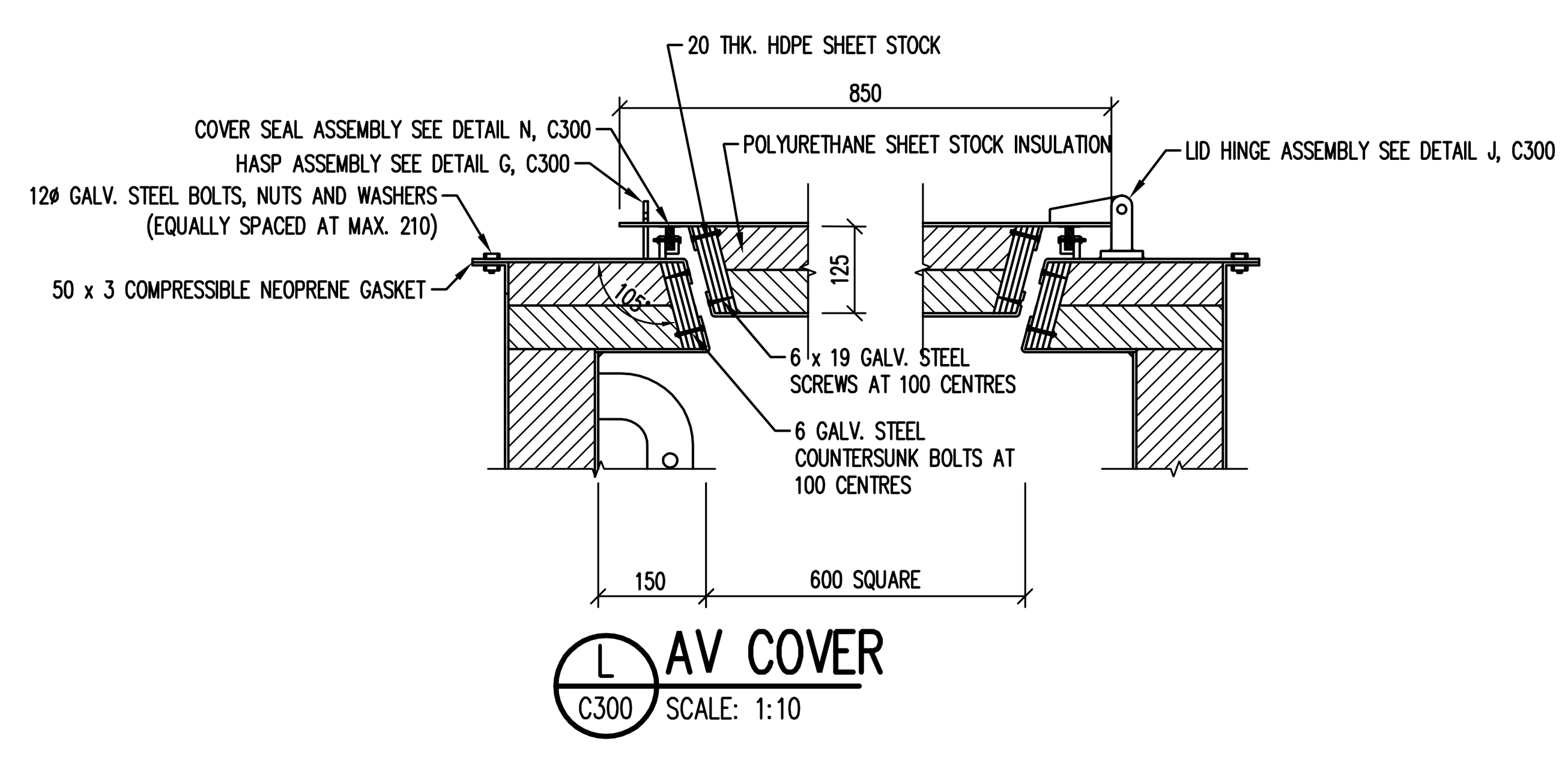












EXTERIOR PIPE SCHEDULE					
NAME	ABOVE/BELOWGROUND	SIZE/MATERIAL	INSULATION	HEAT TRACE	CLADDING
TREATED WATER RECIRC TWS3 TO TWS2/1	ABOVEGROUND	50mm HDPE DR11	50mm POLYURETHANE	YES	GALVANIZED STEEL JACKET
TREATED WATER RECIRC TWS3 TO TWS2/1	BELOWGROUND	50mm HDPE DR11	50mm POLYURETHANE	YES	1.27mm HDPE JACKET
TREATED WATER RECIRC TWS2/1 TO TWS3	ABOVEGROUND	100mm HDPE DR11	50mm POLYURETHANE	YES	GALVANIZED STEEL JACKET
TREATED WATER RECIRC TWS2/1 TO TWS3	BELOWGROUND	100mm HDPE DR11	50mm POLYURETHANE	YES	1.27mm HDPE JACKET
RAW WATER SUPPLY	ABOVEGROUND	150mm HDPE DR11	50mm POLYURETHANE	YES	GALVANIZED STEEL JACKET
RAW WATER SUPPLY	BELOWGROUND	150mm HDPE DR11	50mm POLYURETHANE	YES	1.27mm HDPE JACKET
DRAIN PIPE	ABOVE/BELOWGROUND	150mm HDPE DR11	-	-	-
	ABOVEGROUND		50mm POLYURETHANE	YES	GALVANIZED STEEL JACKET
	BELOWGROUND		50mm POLYURETHANE	YES	1.27mm HDPE JACKET

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.03	JDG	JC

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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LEGEND

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

PERMIT STAMP:
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PERMIT NUMBER
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www.williamsengineering.com
WILLIAMS ENGINEERING CANADA

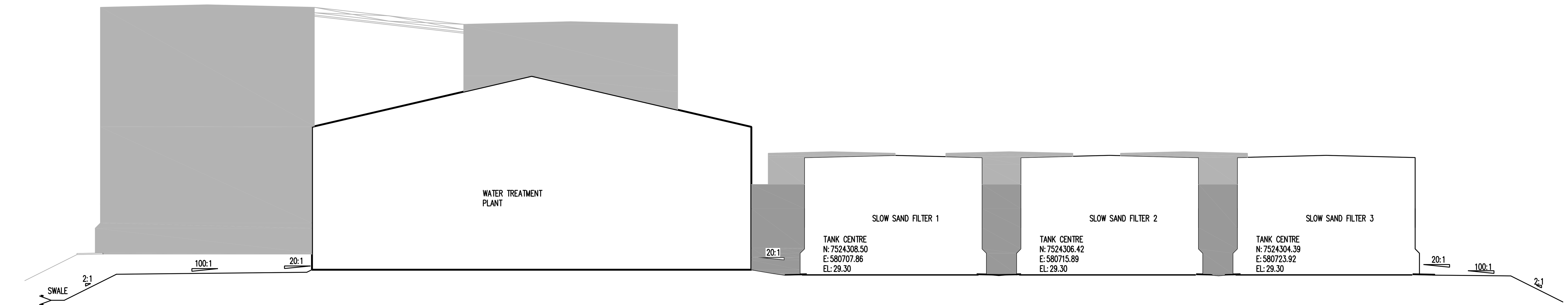
CLIENT:
Nunavut

JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

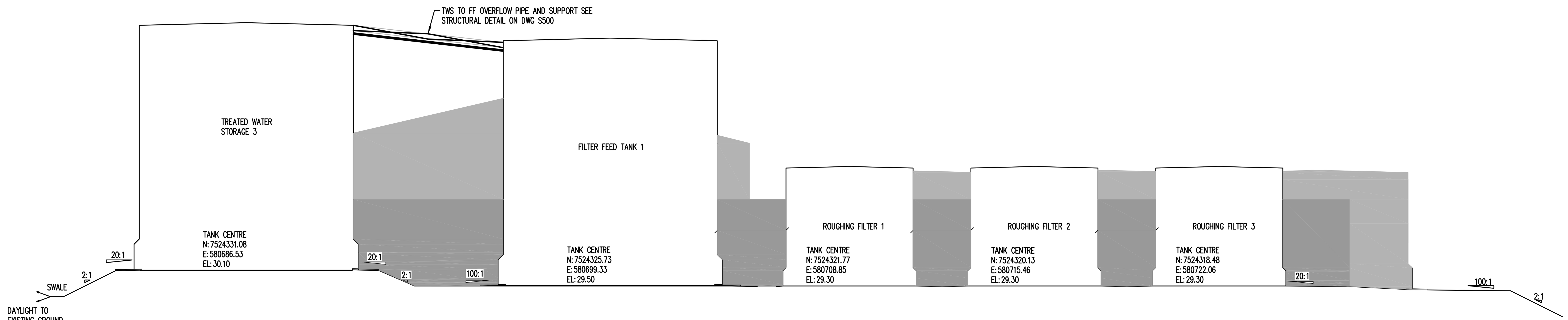
DWG. TITLE: DRAINAGE POND & RF DRAIN DETAILS, ACCESS VAULT DETAILS

DWN. BY: KR	DES. BY: KR	PROJ. MGR.: WJVR
PEER REVIEW: JDG	DATE: (YY-MM-DD) 2014.03.03	SCALE: 1:250
CLIENT PROJ. # 04-4417		WE PROJ. #

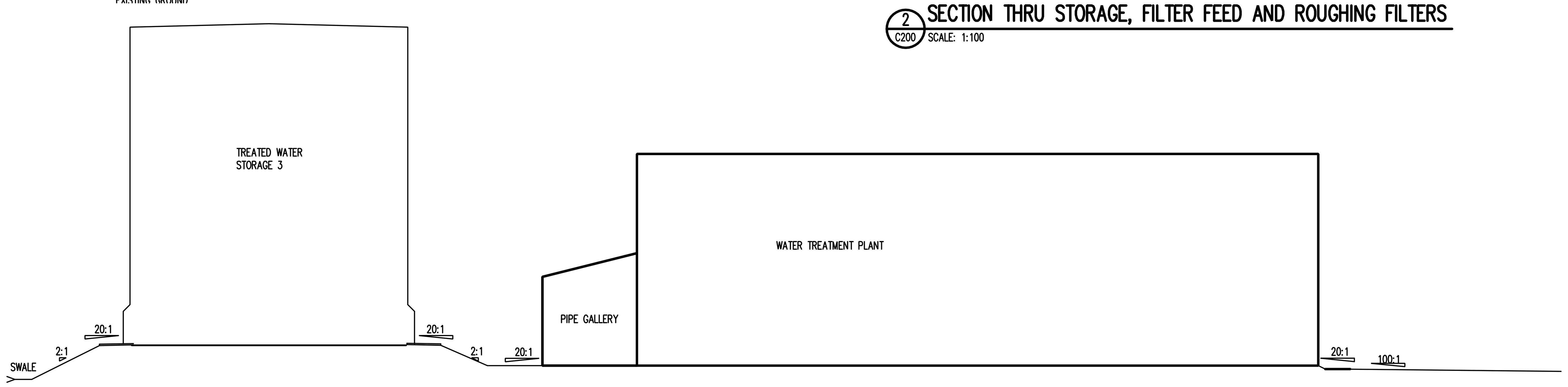
DWG # C300 OF 6 REV # 0



1 / C200 **SECTION THRU WTP AND SLOW SAND FILTERS**
SCALE: 1:100

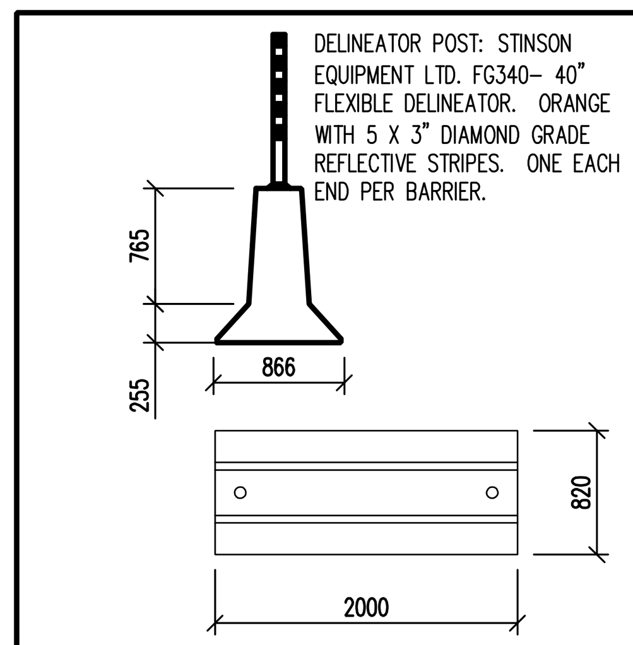


2 / C200 **SECTION THRU STORAGE, FILTER FEED AND ROUGHING FILTERS**
SCALE: 1:100

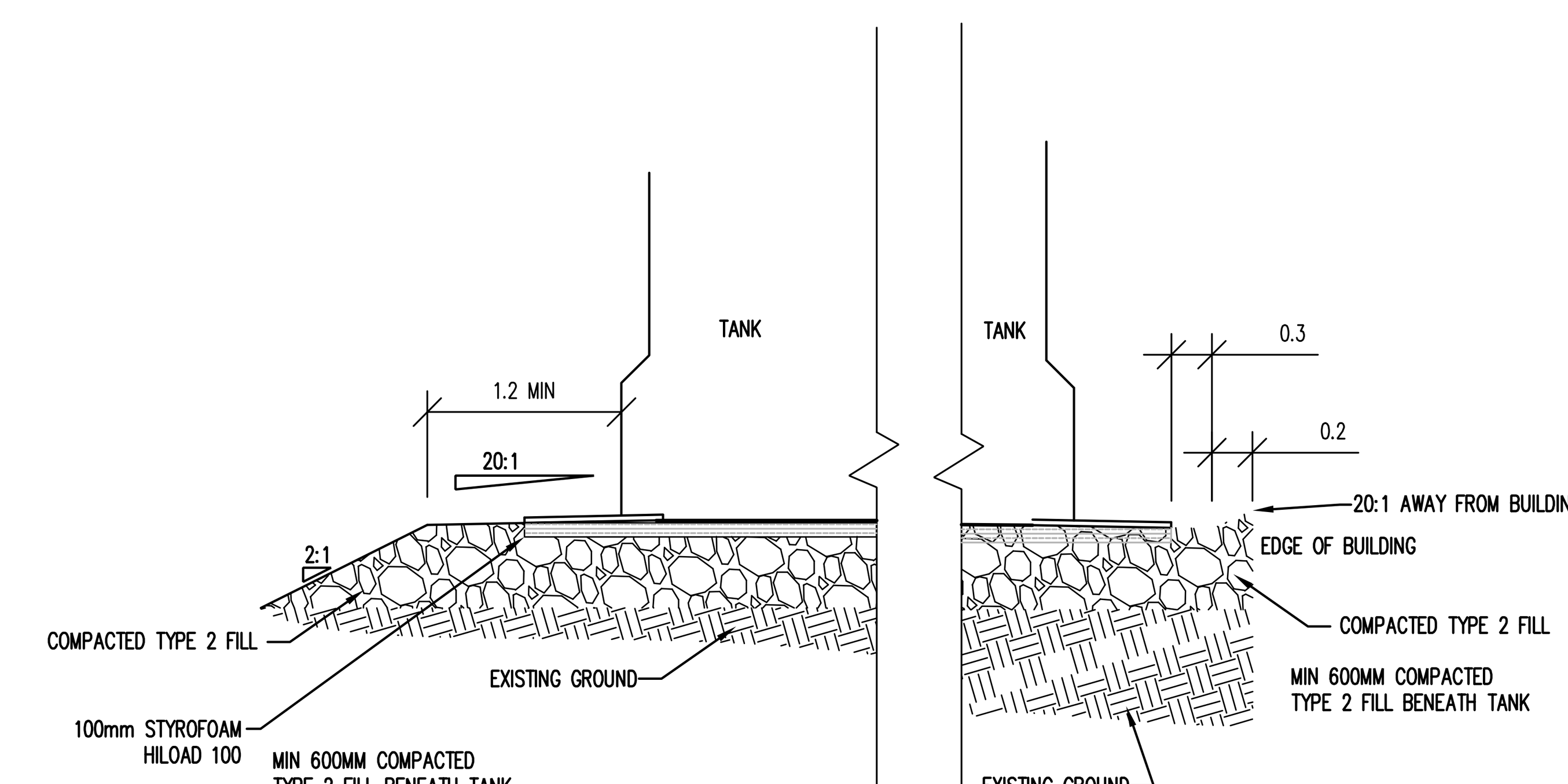


3 / C200 **SECTION THRU STORAGE AND WTP**
SCALE: 1:100

4 / C200 **SECTION THRU SLOW SAND FILTER 3**
SCALE: 1:100



B / C400 **JERSEY BARRIER**
SCALE: 1:50



A / C400 **TANK PAD SECTION (TYP.)**
NTS

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.03	JDG	JC

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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LEGEND

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

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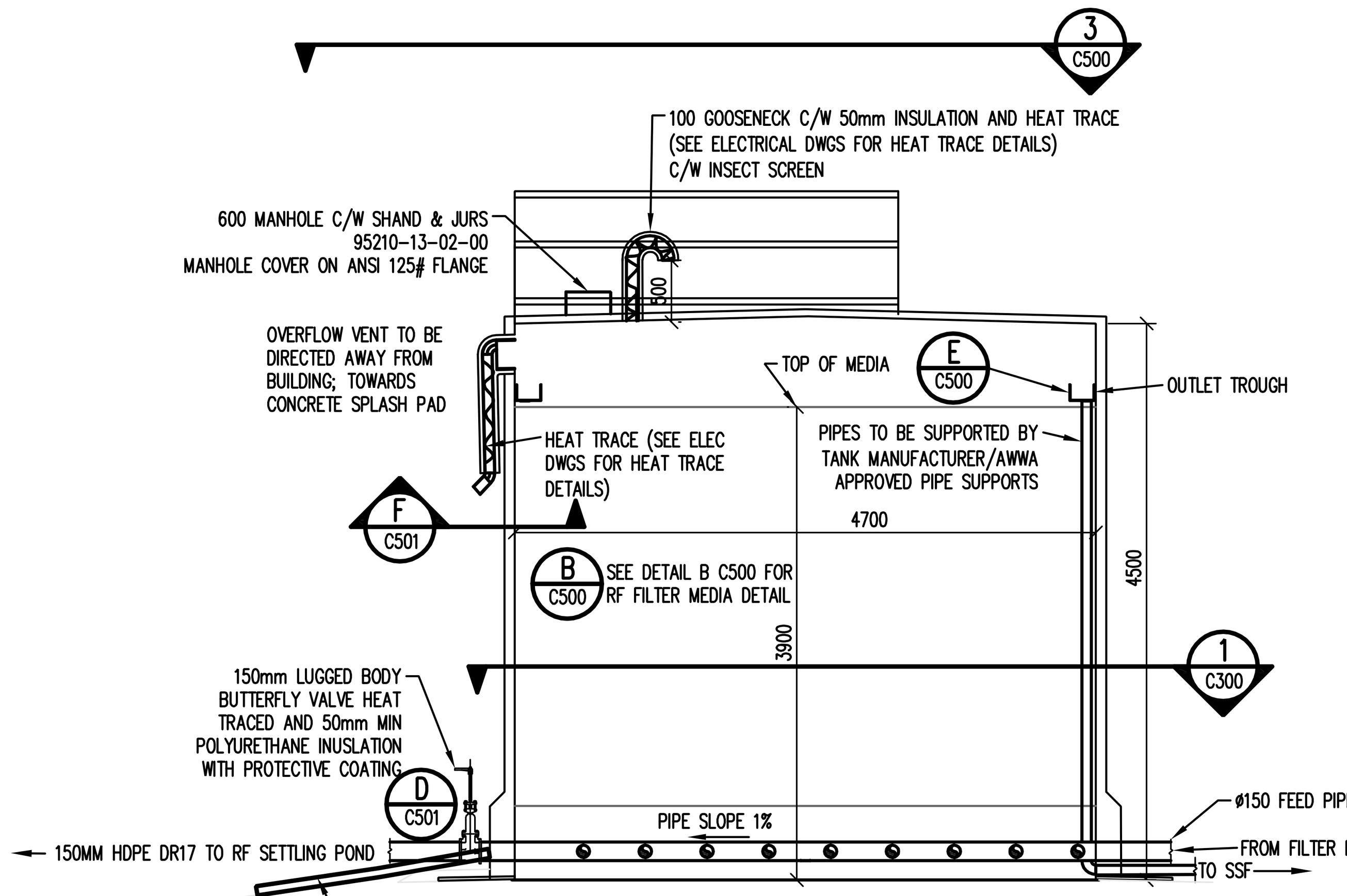
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

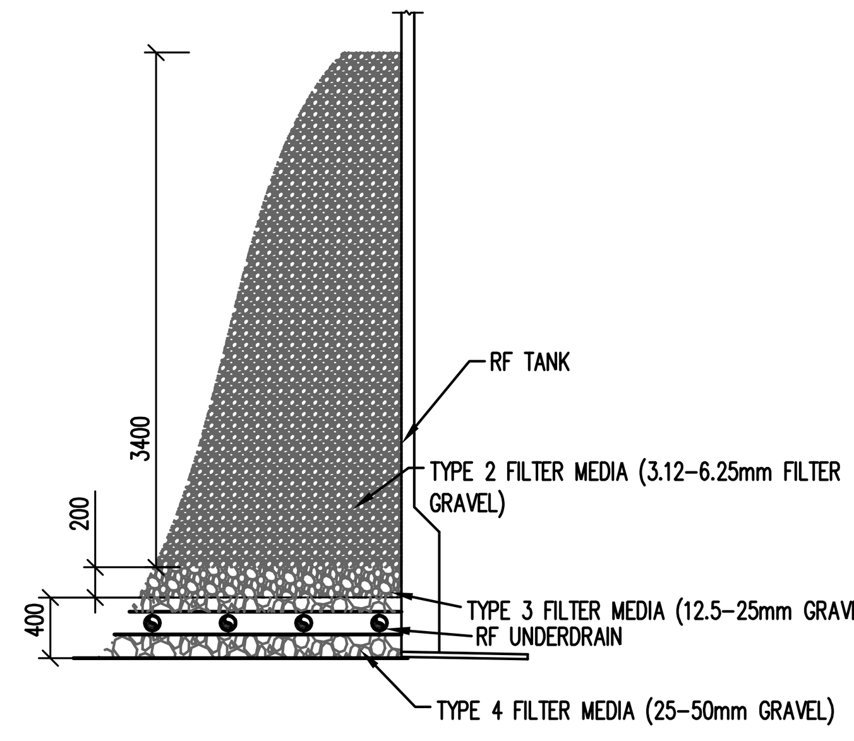
JOB. TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
FILTER TANK ELEVATION VIEWS

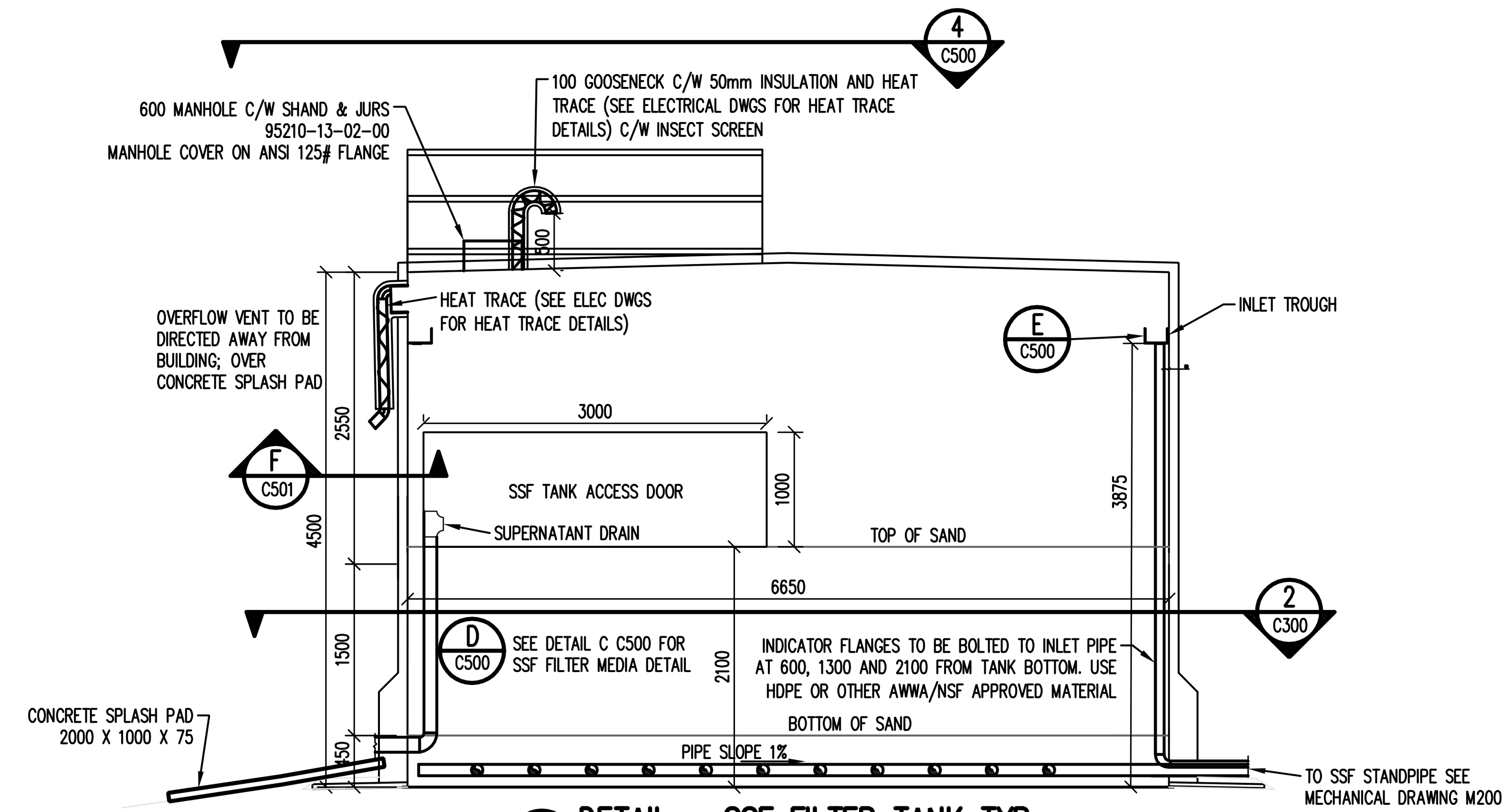
DWN. BY: KR	DES. BY: KR	PROJ. MGR.: WJVR
PEER REVIEW: JDG	DATE: (YY-MM-DD) 2014.03.03	SCALE: 1:1000
CLIENT PROJ. # 04-4417		WE PROJ. #
DWG # C400	OF 6	REV # 0



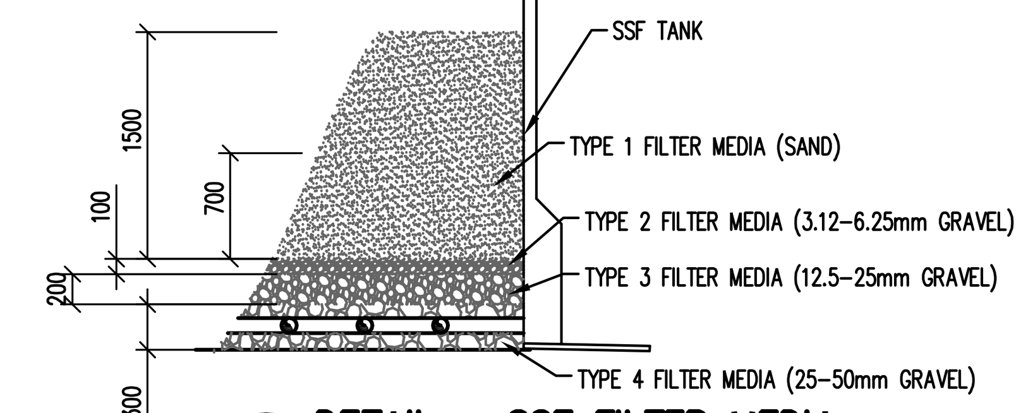
A DETAIL – RF FILTER TANK TYP.
C500 SCALE: 1:50



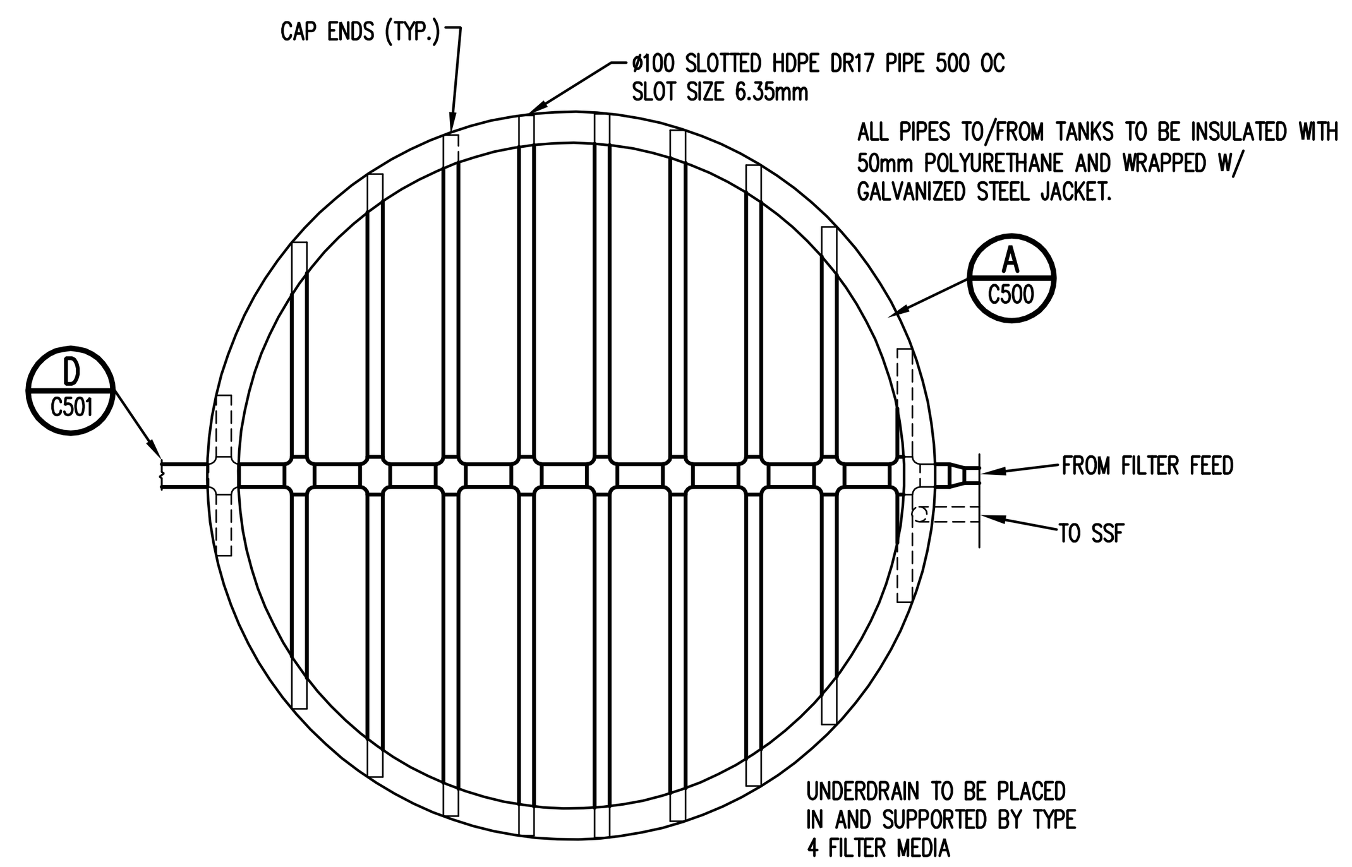
B DETAIL – RF FILTER MEDIA
C500 SCALE: 1:50



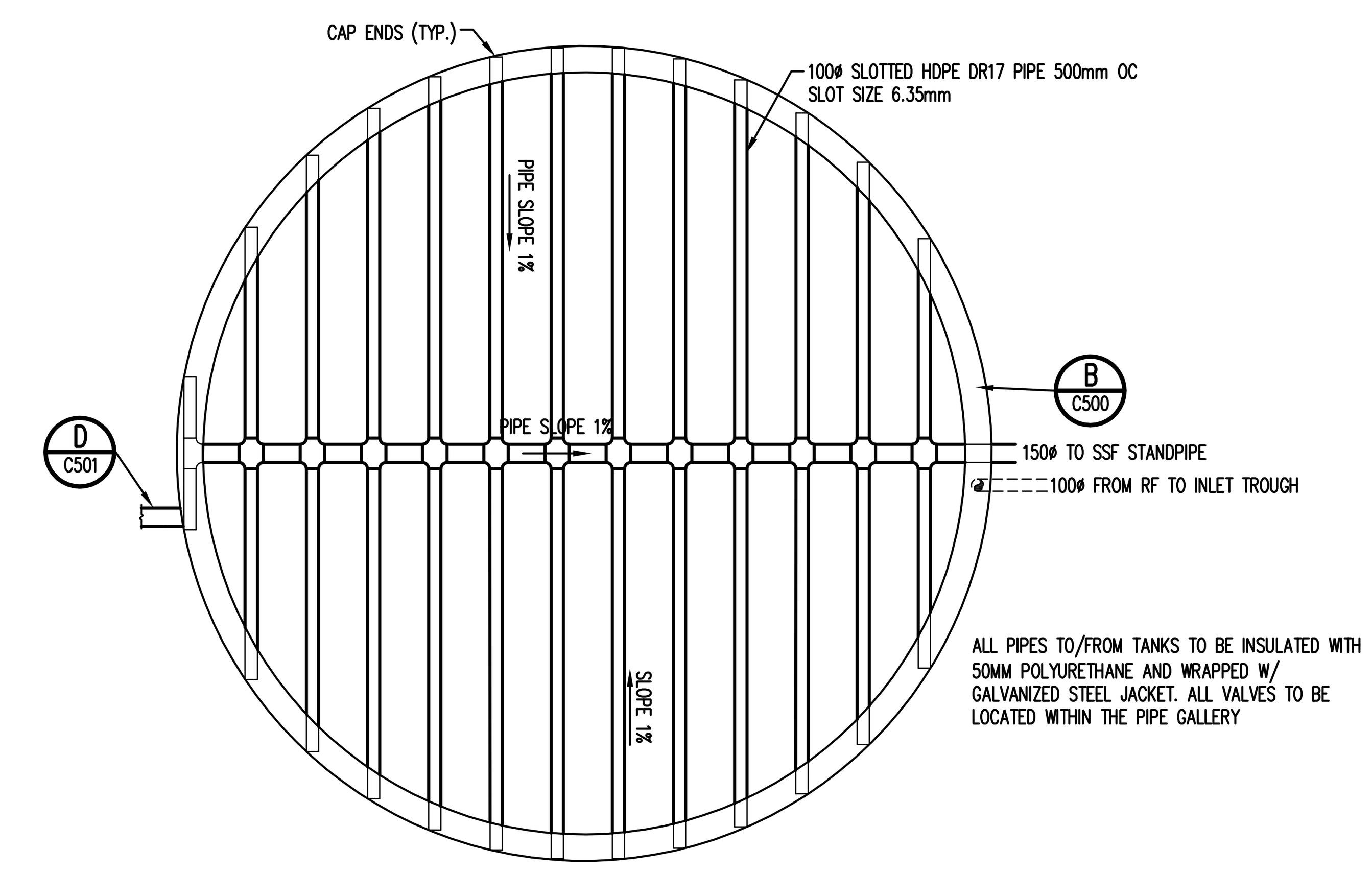
C DETAIL – SSF FILTER TANK TYP.
C500 SCALE: 1:50



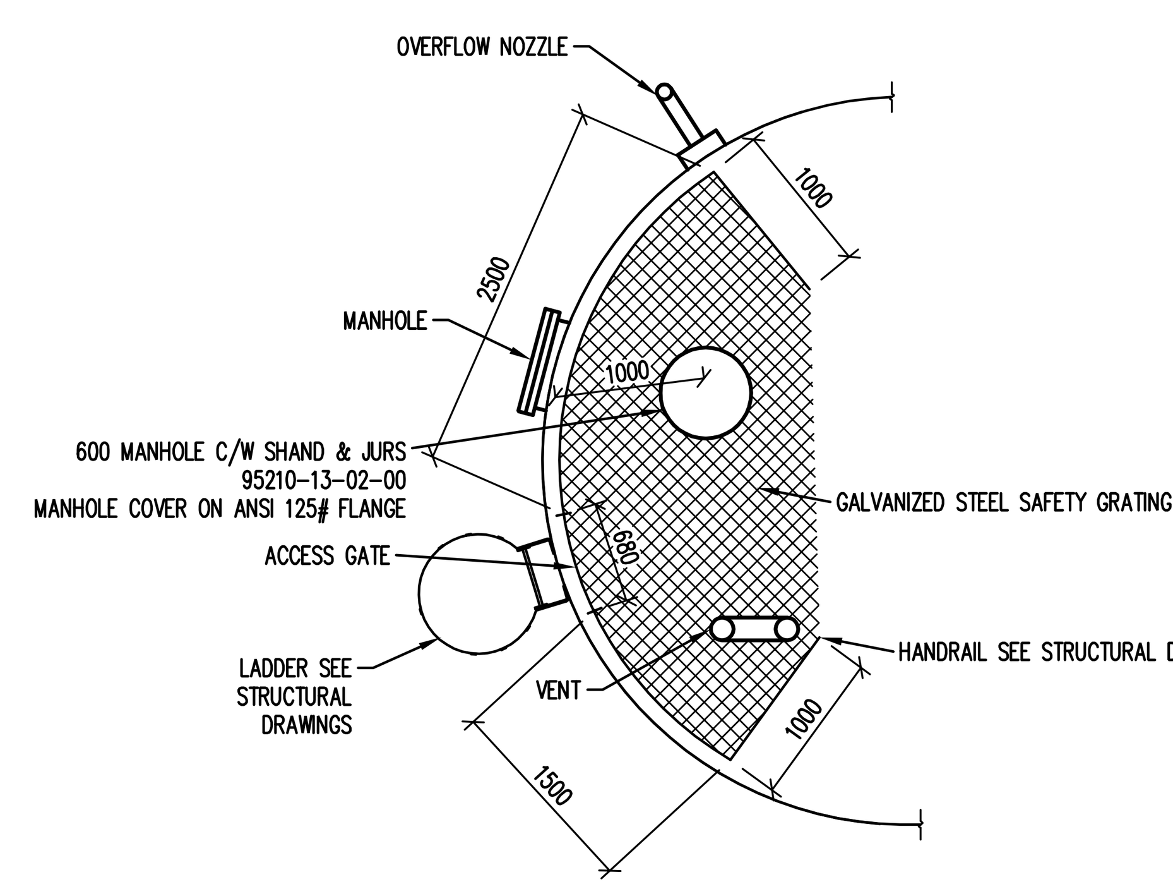
D DETAIL – SSF FILTER MEDIA
C500 SCALE: 1:50



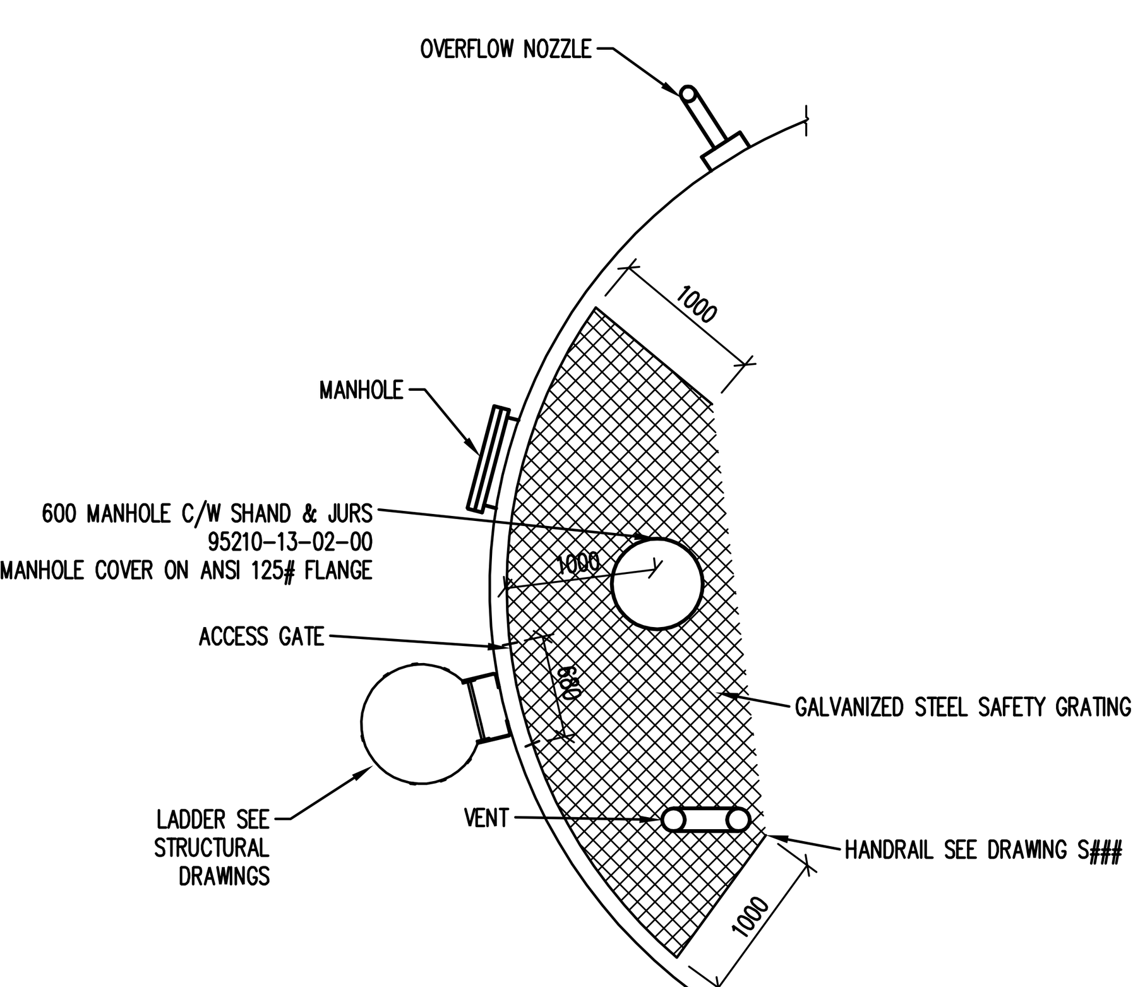
1 SECTION – RF UNDERDRAIN LAYOUT
C500 SCALE: 1:50



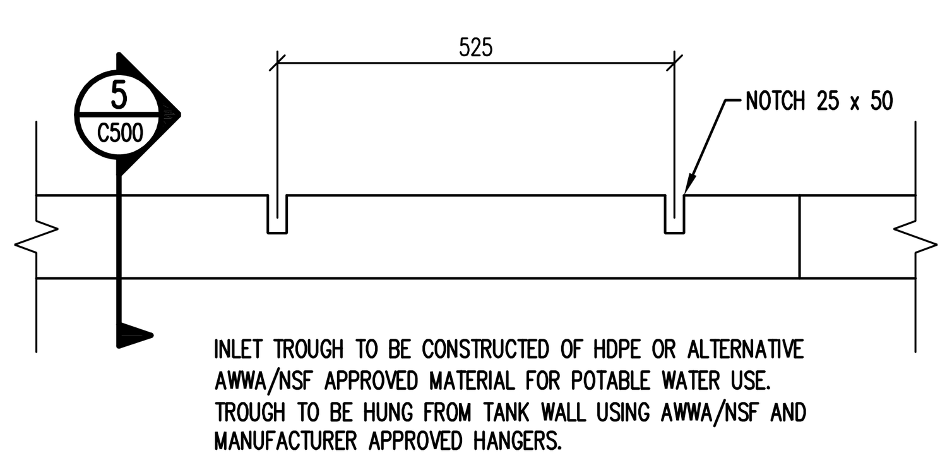
2 SECTION – SSF UNDERDRAIN LAYOUT
C500 SCALE: 1:50



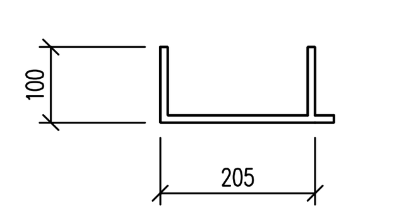
4 SECTION – SSF FILTER TANK ROOF LAYOUT
C500 SCALE: 1:50



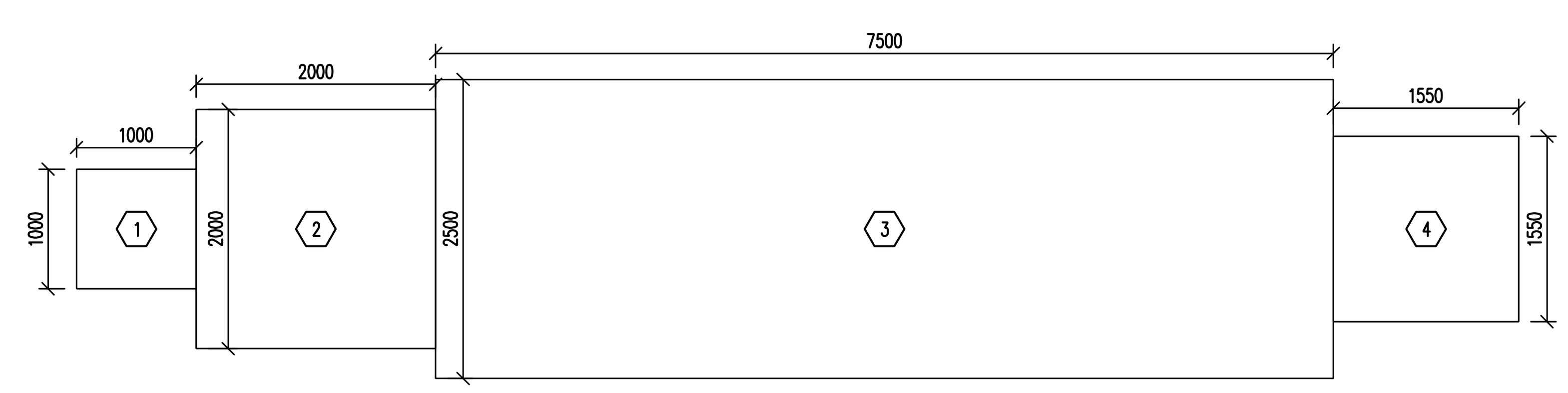
3 SECTION – RF FILTER TANK ROOF LAYOUT
C500 SCALE: 1:50



E DETAIL – INLET/OUTLET TROUGH
C500 SCALE: 1:10



5 SECTION – INLET/OUTLET TROUGH
C500 SCALE: 1:10



KEYNOTES:

1. DESIGN IS BASED ON THE FOLLOWING COMPONENTS PROVIDED BY H20 INNOVATION. CONTRACTOR IS RESPONSIBLE FOR CHANGES RELATED TO SUBSTITUTION OF EQUIPMENT.
2. RAPID MIX TANK: H20 INNOVATION H20-RM2XT, HEIGHT 1.8m, C/W LIGHTNIN EV5Q75 MIXER.
3. FLOCCULATION TANK: H20 INNOVATION H20-FM2XT, HEIGHT 1.8m C/W LIGHTNIN 14 Q1.5 MIXER.
4. PRIMARY CLARIFIER: H20 INNOVATION HRC-TS-2575, HEIGHT 2.5m C/W BRENTWOOD IFR-6024 TUBE SETTLER, DEPTH OF TUBE SETTLER MEDIA 0.61m, VOLUME OF TUBE SETTLER MEDIA $11.4m^3$, 3 COMPARTMENTS.
5. TREATED WATER STORAGE TANK: HDPE TANK, HEIGHT 2.5m.
6. COAGULANT PACKAGE: COAGULANT TYPE 20% POLYALUMINIUM CHLORIDE (PACL), DOSAGE RANGE 10–20 mg/L, C/W TWO PROMINENT DOSING PUMPS.
7. FLOCCULANT PACKAGE: FLOCCULANT TYPE 0.2% HIGH MOLECULAR WEIGHT POLYMER, DOSAGE RANGE 1–3 mg/L, C/W DOSING PUMP.

F CFS SKID
C500 SCALE: 1:50

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.03	JDG	JC

TANKS:
1. TANKS TO BE AWWA D100 OR D103 SUITABLE FOR POTABLE WATER USE
2. CATHODIC PROTECTION IS TO BE PROVIDED FOR ALL TANKS
3. OVERFLOW AND AIR VENTS TO BE HEAT TRACED AND INSULATED
4. ALL TANKS TO HAVE GROUND LEVEL ACCESS HATCH
5. PIPE FROM TANK TO PIPE GALLERY TO BE INSULATED
6. ROOF TO HAVE TIE DOWN POINTS SUITABLE FOR FALL ARREST TIE OFFS
7. BOLTED CONSTRUCTION
8. EPOXY-COATED INTERIOR

INSULATION:
TANK – MEDIUM DENSITY SPRAYED-ON POLYURETHANE
PIPE – POLYURETHANE HALF-SHELLS
1. THERMAL CONDUCTIVITY 0.024 W/M°C MAX.
2. CORE DENSITY: 30 KG/M^3 MIN.
3. SERVICE TEMPERATURE: -50°C – 40°C
4. COMPRESSIVE STRENGTH: 135 kPa MIN.
5. OPEN CELL CONTENT: 5% MAX.
6. TENSILE STRENGTH: 337 kPa MIN.
7. WATER ABSORPTION: 2.5% MAX.
8. ACCEPTABLE MAT'L: BASF WALLTITE CT OR APPR. EQUAL
9. 22 GA. ALUMINUM SHEET METAL CLADDING OVER ALL INSULATION

PROTECTIVE COATING:
FLAME RETARDANT LOW GLOSS ACRYLIC COPOLYMER
1. 55–60% SOLIDS BY VOLUME
2. DRY FILM THICKNESS: 550–700 MICRON (22–28MIL)
3. COLOUR AS PER CLOVERDALE PAINT PALETTE SWATCH # OR APPROVED EQUIVALENT:
FILTER FEED TANK: #8311 GREY
RF TANK: #8330 GREY
SSF TANK: #7606 GREEN
TREATED WATER TANK: #7407 BLUE
5 ACCEPTABLE MAT'L: TOWERTHON ii ELASTOMERIC OR APPROVED EQUIVALENT

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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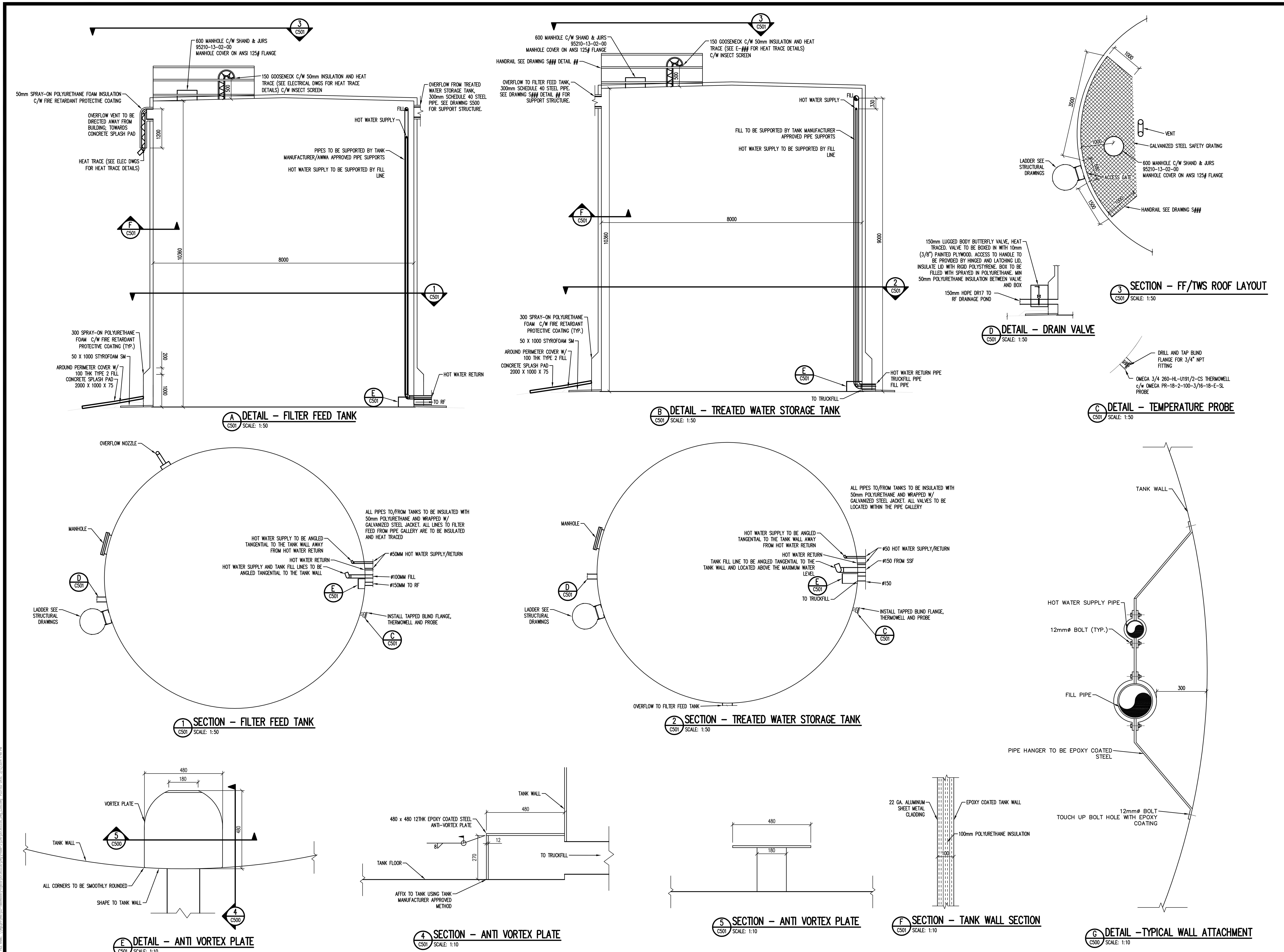
WILLIAMS ENGINEERING CANADA

CLIENT:
Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
FILTER TANK AND CFS SKID DETAILS

DWN. BY: KR/JDG	DES. BY: KR	PROJ. MGR.: WJVR
PEER REVIEW: JDG	DATE: (YY-MM-DD) 2014.03.03	SCALE: AS NOTED
CLIENT PROJ. #		WE PROJ. # 04-4417
DWG # C500	6	REV # 0



REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.03	JDG	JC

TANKS:
1. TANKS TO BE AWWA D100 OR D103 SUITABLE FOR POTABLE WATER USE
2. CATHODIC PROTECTION IS TO BE PROVIDED FOR ALL TANKS
3. OVERFLOW AND AIR VENTS TO BE HEAT TRACED AND INSULATED
4. ALL TANKS TO HAVE GROUND LEVEL ACCESS HATCH
5. PIPE FROM TANK TO PIPE GALLERY TO BE INSULATED
6. ROOF TO HAVE TIE DOWN POINTS SUITABLE FOR FALL ARREST TIE OFFS
7. BOLTED CONSTRUCTION
8. EPOXY-COATED INTERIOR

INSULATION:
TANK - MEDIUM DENSITY SPRAYED-ON POLYURETHANE
PIPE - POLYURETHANE HALF-SHELLS
1. THERMAL CONDUCTIVITY 0.024 W/M°C MAX.
2. CORE DENSITY: 30 KG/M^3 MIN.
3. SERVICE TEMPERATURE: -50°C - 40°C
4. COMPRESSIVE STRENGTH: 135 kPa MIN.
5. OPEN CELL CONTENT: 5% MAX.
6. TENSILE STRENGTH: 337 kPa MIN.
7. WATER ABSORPTION: 2.5% MAX.
8. ACCEPTABLE MAT'L: BASF WALLTITE CT OR APPR. EQUAL
9. 22 GA. ALUMINUM SHEET METAL CLADDING OVER ALL INSULATION

PROTECTIVE COATING:
FLAME RETARDANT LOW GLOSS ACRYLIC COPOLYMER
1. 55-60% SOLIDS BY VOLUME
2. DRY FILM THICKNESS: 550-700 MICRON (22-28MIL)
3. COLOUR AS PER CLOVERDALE PAINT PALETTE SWATCH # OR APPROVED EQUIVALENT:
FILTER FEED TANK: #8311 GREY
RF TANK: #8330 GREY
SSF TANK: #7606 GREEN
TREATED WATER TANK: #7407 BLUE
5 ACCEPTABLE MAT'L: TOWERTHON ii ELASTOMERIC OR APPROVED EQUIVALENT

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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info@williamsengineering.com
www.williamsengineering.com

WILLIAMS ENGINEERING CANADA

CLIENT:
Nunavut

JOB. TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

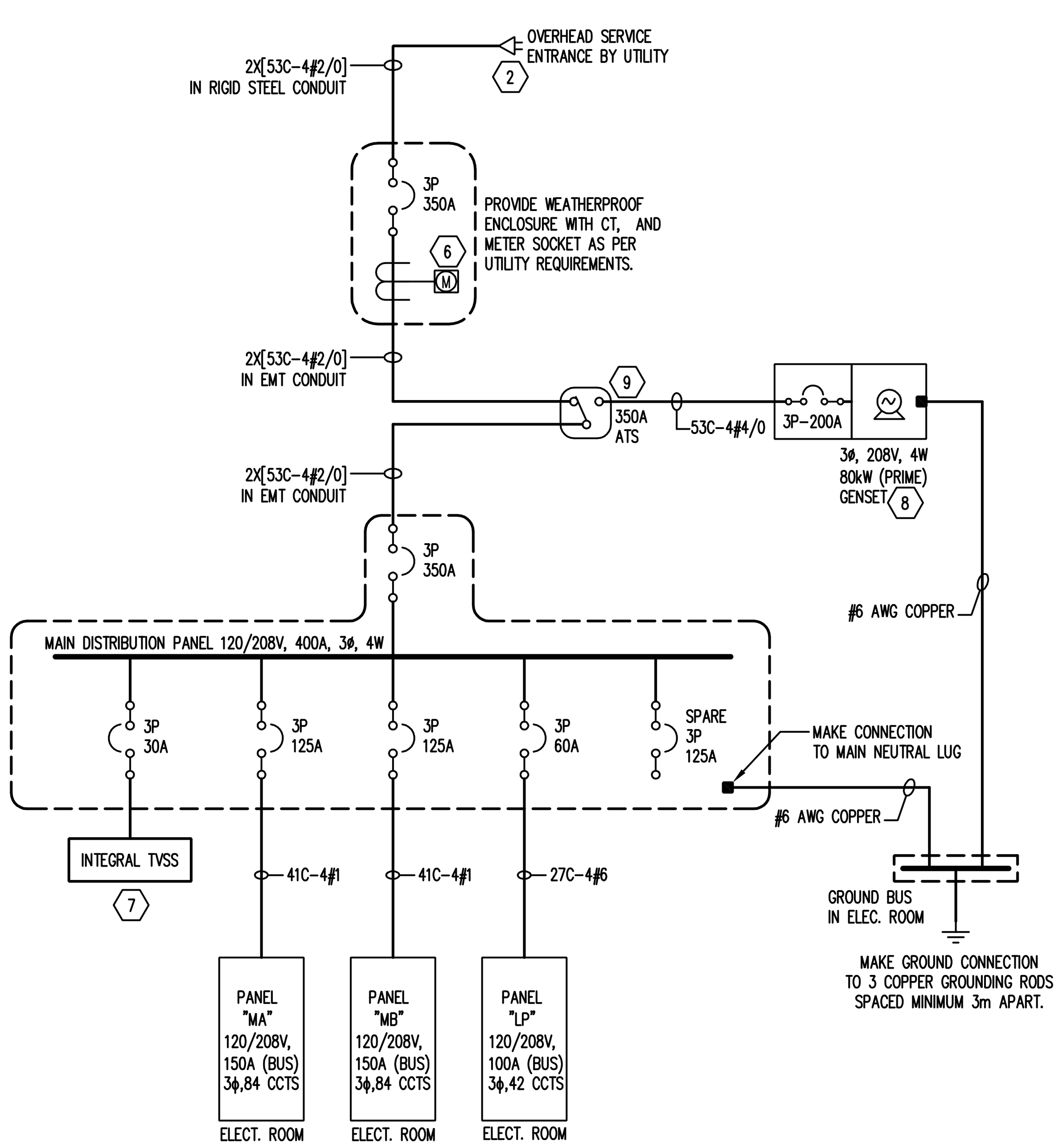
DWG. TITLE:
STORAGE AND FILTER FEED TANK DETAILS

DWN. BY: KR	DES. BY: KR	PROJ. MGR.: WJVR
PEER REVIEW: JDG	DATE: (YY-MM-DD) 2014.03.03	SCALE: AS NOTED
CLIENT PROJ. # 04-4417		WE PROJ. #
DWG # C501	OF 6	REV # 0

SITE PLAN
E100 1:400

ELECTRICAL SYMBOL LEGEND

	LUMINAIRE, FLUORESCENT, STRIP
	LUMINAIRE, FLUORESCENT, SURFACE OR PENDANT MOUNT
	LUMINAIRE, FLUORESCENT, WALL MOUNT
	LUMINAIRE, H.I.D., WALL MOUNT
F01	DESCRIPTOR–LUMINAIRE (FIXTURE TAG); E.G. F01 = LUMINAIRE TYPE F01
$	SWITCH, SINGLE–POLE: 3 = 3 WAY SWITCH 4 = 4 WAY SWITCH a = LUMINAIRE SWITCHED
$	SWITCH, TWO SINGLE POLE IN 2–GANG BOX
	DUPLEX RECEPTACLE DESCRIPTORS: c = MOUNTED ABOVE COUNTER GFCI = GROUND FAULT CIRCUIT INTERRUPTER WP = WATERPROOF
$M	MOTOR STARTER – MANUAL
	SERVICE ENTRANCE WEATHERHEAD
M	UTILITY METER
	CIRCUIT BREAKER
	ELECTRICAL PANEL
	SWITCH, AUTOMATIC TRANSFER
	HARD WIRE CONNECTION
	MOTOR CONNECTION
	120V = LOCAL LINE VOLTAGE SMOKE/CO DETECTOR
	JACK, TELEPHONE/DATA, WALL MOUNT:
	DETECTOR, MOTION
	KEYPAD, SYSTEM
	SWITCH, DOOR POSITION (DPS)
	LIGHT, EXIT, CEILING MOUNT
	LIGHT, EXIT, WALL MOUNT
	LIGHT, EXIT, WALL MOUNT; ARROWS INDICATE DIRECTION OF EGRESS
	LIGHT, EMERGENCY & BATTERY PACK, 2 LAMP HEADS
	LIGHT, EMERGENCY, 2 HEAD REMOTE



SINGLE LINE DIAGRAM
E100 NTS

LOAD CALCULATION

1. BUILDING AREA = 605m²
   BASIC LOAD (CEC TABLE 14): 25W/m²
   25W/m² X 605m² = 15,125 WATTS ......(i)
2. MECHANICAL LOAD = 60,000 WATTS ......(ii)
3. ADDITIONAL FUTURE LOADS (ASSUMED 25%) = 18,781 WATTS ......(iii)
4. TOTAL LOADING (i + ii + iii) = 93,906 WATTS
5. TOTAL AMPERES FOR 100% DEMAND LOAD:
   93,906/(208 X 1.73) = 260.9 AMPS
6. TOTAL LOAD FOR SERVICE BY APPLYING CORRECTION FACTOR 0.8:
   260.9/0.8 = 326.2 AMPS
7. RECOMMENDED BREAKER SIZE IS 350A AND CABLE SIZE 2X[53C-4#2/0].

GENERATOR TESTING PROCEDURE NOTES

1. DO FIELD TESTING IN COMPLIANCE WITH CAN/CSA 282 AND PROVIDE TEST REPORT. TEST TO INCLUDE BUT NOT LIMITED TO THE FOLLOWING;
   .1 100% LOAD TEST FOR 24 HOURS.
   .2 110% LOAD TEST FOR 1 HOUR.
   .3 RECORD VOLTAGE, CURRENT, FREQUENCY, OIL TEMPERATURE AND PRESSURE AND BATTERY VOLTAGE EVERY HOUR.
   .4 AFTER COMPLETION OF TEST, DEMONSTRATE OIL OVER–TEMPERATURE PROTECTION, LOW OIL PRESSURE PROTECTION, OVER–SPEED, AND OVER–CRANK PROTECTION.
2. PROVIDE FUEL REQUIRED FOR TESTING. ENGINEER IS TO WITNESS TEST.
3. SUBMIT TEST REPORT TO ENGINEER WITHIN 72 HOURS OF COMPLETION OF TEST.
4. MAKE ALL ADJUSTMENTS TO SYSTEMS AS REQUIRED, AND AS REQUESTED BY ENGINEER.
5. INSTRUCT OPERATING PERSONNEL ON COMPLETE OPERATION, TESTING, AND MAINTENANCE OF THE EMERGENCY GENERATOR SET.
6. ALL TESTING TO BE COMPLETED WITH CONTRACTOR, MANUFACTURER'S FACTORY TRAINED REPRESENTATIVE AND ENGINEER PRESENT. MAKE ALL ALLOWANCES.
7. COMPLETE LOG/RECORD BOOK SHALL BE PROVIDED TO BE KEPT IN THE ENGINE GENERATOR ROOM IN ACCORDING WITH MANUFACTURES' RECOMMENDATIONS, AND SHALL INCLUDE THE FOLLOWING:
   .1 THE DATE OF WHICH WORK WAS DONE
   .2 THE NAME OF THE PERSON WHO PERFORMED THE WORK
   .3 ABNORMALITIES / CORRECTIONS ENTRY
   .4 PARTS REPLACEMENT ENTRY
   .5 SAFETY DEACTIVATION SWITCHES ENTRY DURING MAINTENANCE RESTORED TO FULL OPERATING CONDITIONS.

WIRING METHOD

1. ALL WIRING AND CONDUIT SHALL BE CONCEALED EXCEPT IN SERVICE ROOMS.
2. ALL FIXTURES RECESSED IN FIRE RATED WALLS OR CEILINGS SHALL ALSO BE FIRE RATED.
3. ALL TELEPHONE WIRING TO BE FT–4 RATED. GROUP CABLES WHERE POSSIBLE (NO MORE THAN 6) FOR PENETRATIONS THROUGH FIRE RATED WALLS/CEILING AND FIRE SEAL.
4. EMERGENCY LIGHTING D.C. WIRING IS TO BE #10 AWG.
5. ELECTRICAL DEVICES SHOULD NOT BE INSTALLED BACK TO BACK AND BE SEPARATED BY 300mm MINIMUM.
6. ALL PENETRATIONS THROUGH FIRE WALLS ARE TO BE FIRE–SEALED.

CIRCUITING GUIDELINES

1. LIGHTING CIRCUITS TO BE LOADED TO 1440 WATTS MAXIMUM, IF CIRCUIT BREAKER SIZE AS 15A IS MENTIONED.
2. EXIT SIGNS AND EMERGENCY LIGHTING TO BE ON THE SAME SINGLE DEDICATED CIRCUIT. PROVIDE VOLTAGE SENSING RELAYS TO MONITOR CIRCUITS IN AREA BEING SERVED. CONTRACTOR TO PROVIDE DC EMERGENCY POWER TO ALL EXIT SIGNS.
3. ALLOW MINIMUM OF 10% SPACES IN EACH ELECTRICAL DISTRIBUTION PANEL.

GENERAL NOTES:

1. ALL INSTALLATIONS TO MEET THE REQUIREMENT OF THE CANADIAN ELECTRICAL CODE, C22.1–12 AND THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION.
2. COORDINATE WITH OWNER TO ENSURE THAT GROUNDING AND BONDING SYSTEM WIRING IS PROVIDED AS REQUIRED BY CANADIAN ELECTRICAL CODE, C22.1–12.
3. PERFORM COMPLETE INSTALLATION AND EQUIPMENT IN STRICT ACCORDANCE TO THE MOST REQUIREMENTS OF THE FOLLOWING:
   A) CSA C22.1–12–22ND EDITION OF CANADIAN ELECTRICAL CODE 2012.
   B) GOVERNMENT OF NUNAVUT'S GOOD BUILDING PRACTICES GUIDELINE 2005.
   C) GN – DEPARTMENT OF COMMUNITY & GOVERNMENT SERVICES – PROTECTION SERVICES DIVISION

KEYNOTES:

1. APPROXIMATE LOCATION OF THE EXISTING POWER POLE. NEW POWER POLES WILL BE REQUIRED MAXIMUM OF 30 METERS APART. PRIOR TO CONSTRUCTION, CONTRACTOR TO COORDINATE WITH POWER UTILITY FOR NEW SERVICE CONNECTION REQUIREMENTS.
2. NEW OVERHEAD 120/208V, 3ø, SERVICE. RUN IN RIGID STEEL CONDUIT. PRIOR TO CONSTRUCTION, CONTRACTOR TO COORDINATE WITH POWER UTILITY FOR NEW SERVICE CONNECTION REQUIREMENTS.
3. NEW OVERHEAD TELEPHONE SERVICE, TO BE TERMINATED TO TTB IN ELECTRICAL ROOM. PRIOR TO CONSTRUCTION, CONTRACTOR TO COORDINATE WITH NORTHWEST, FOR TELEPHONE NEW SERVICE CONNECTION REQUIREMENTS
4. PROVIDE 1200mm WIDE X 1200mm HIGH TELEPHONE TERMINATION BOARD (TTB) FOR TELEPHONE KEY SWITCH, PATCH PANEL, AND TERMINATION POINT FOR TELEPHONE. PAINTED 2 COATS FIRE RETARDANT PAINT, LIGHT GRAY. TERMINATE 53mm CONDUIT FROM OVERHEAD SERVICE HERE.
5. PROVIDE NEW INTELLIGENT PARKING LOT CONTROLLER (IPLC) 125V, 15A WEATHER PROOF RECEPTACLES, COORDINATE WITH THE OWNER FOR THE PROGRAM PROFILE REQUIREMENTS.
6. PROVIDE NEW 120/208V, 3ø, 400A UTILITY METER. COORDINATE WITH UTILITY.
7. PROVIDE A SURFACE MOUNT, 120/208V, 50kA PER PHASE SPD (SURGE PROTECTION DEVICE EATON MODEL# SPD50208Y2K) c/w NEMA 1 ENCLOSURE. TO BE CONNECTED WITH BREAKER. COORDINATE WITH SUPPLIER FOR THE CONNECTION REQUIREMENTS.
8. PROVIDE NEW GENERATOR SIZED AS INDICATED WITH AUTO TRANSFER SWITCH (ATS), BATTERIES, CHARGER AND NECESSARIES REQUIREMENTS. TO BE TESTED AS PER MANUFACTURE REQUIREMENT AND AS INDICATED IN GENERATOR TESTING PROCEDURE NOTES.
9. PROVIDE NEW 3ø, 120/208V, AUTOMATIC TRANSFER SWITCH SIZED AS INDICATED.

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

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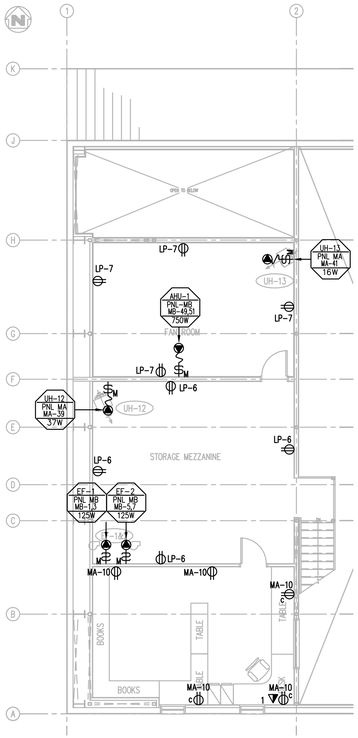
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

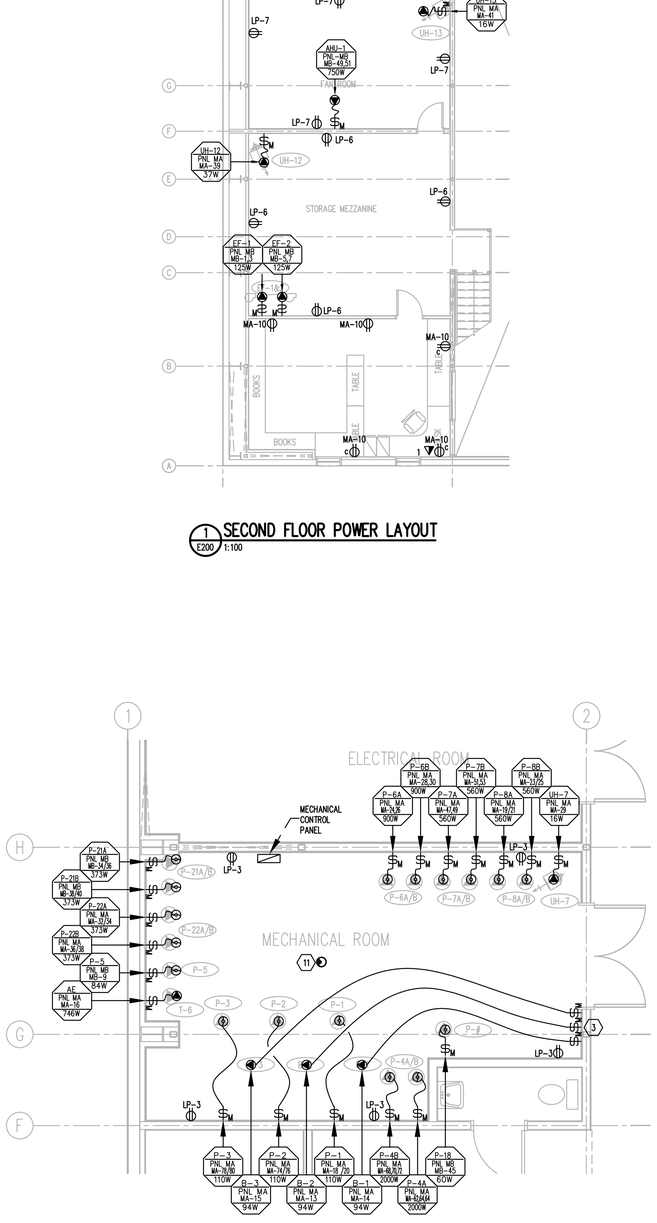
JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE: SITE PLAN

DWN. BY: HR	DES. BY: HR	PROJ. MGR.: JH
PEER REVIEW: JAB	DATE: (YY-MM-DD)	SCALE: AS SHOWN
CLIENT PROJ. #: 04-4417		WE PROJ. #: 013655.02
DWG #: E100	OF 1	REV #: C



1 SECOND FLOOR POWER LAYOUT
E200 1:100



2 MECHANICAL ROOM EQUIPMENT CONNECTIONS
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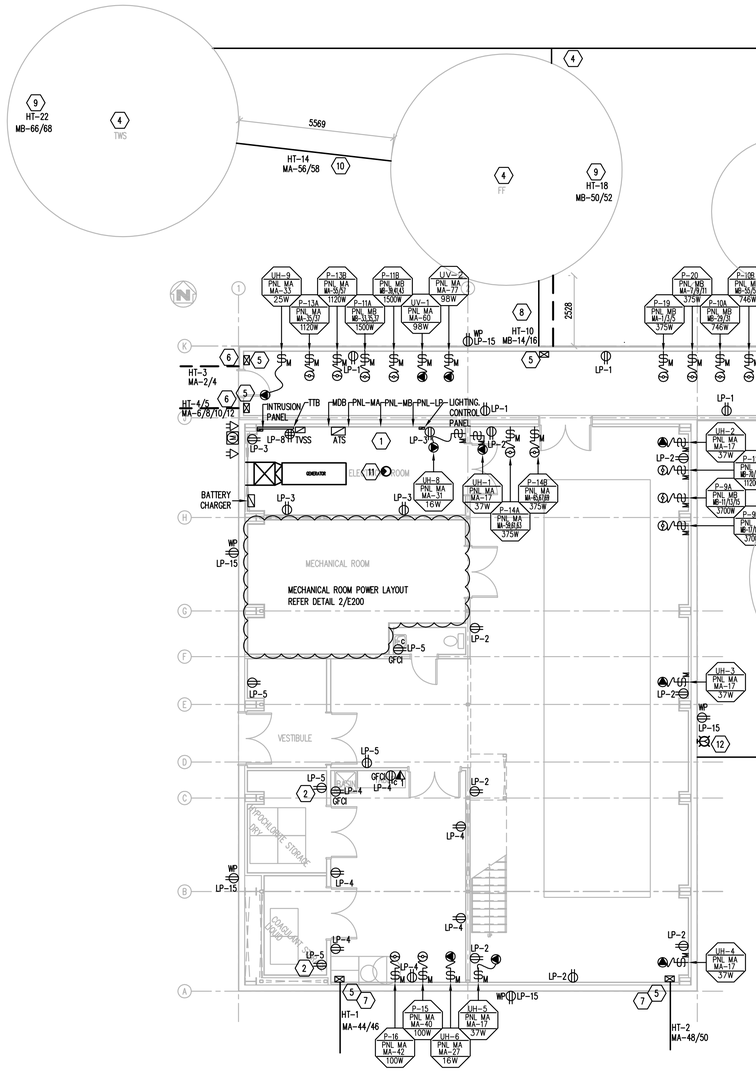
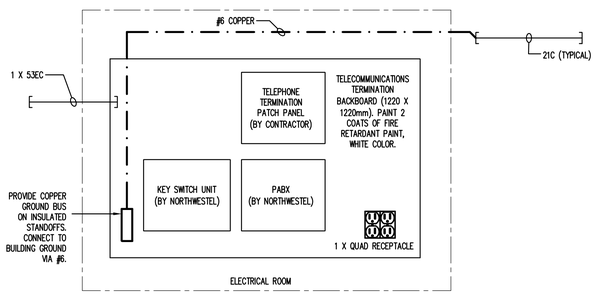


3 MAIN FLOOR POWER LAYOUT
E200 1:100



4 TELECOMMUNICATIONS RISER DIAGRAM
E300 NTS

KEYNOTES:

1. PROVIDE NEW SURFACE MOUNT, 120/208V, 3Φ PANELS. CONTRACTOR TO ENSURE MINIMUM OF ONE METER CLEARANCE IN FRONT OF PANEL AS PER C.E.C REQUIREMENTS.
2. WIRING METHOD AND ELECTRICAL FIXTURES FOR CHEMICAL AREA SHALL BE FOLLOWED AS PER REQUIREMENT OF CEC.
3. PROVIDE DISCONNECT SWITCHES FOR BOILERS NEXT TO THE DOOR AND COLORED RED WITH PERMANENT LABELS.
4. PROVIDE NEW HEAT TRACE (HT-15-22) ON THE GOOSENECK AND OVERFLOW VENTS, TO BE FED WITH #12AWG IN 16C PVC CONDUIT RUN THROUGH THE TANK INSULATION FROM HEAT TRACE POWER CONNECTION.
5. HEAT TRACE SINGLE ENTRY POWER CONNECTION BOX TYPE TYCO THERMAL JBS-100A.
6. PROVIDE HEAT TRACE (HT-3,4 AND 5) FOR SUPPLY AND RECIRC PIPES, TO BE CONNECTED TO THE SINGLE ENTRY CONNECTION BOXES LOCATED IN THE ENTRANCE TO THE CORRIDOR.
7. PROVIDE HEAT TRACE (HT-1 AND 2) FOR TRUCK FILL PIPES, TO BE CONNECTED TO THE SINGLE ENTRY CONNECTION BOXES LOCATED IN HYPOCHLORITE STORAGE ROOM.
8. LENGTH OF THE PIPES BETWEEN BUILDING AND TANKS IS APPROXIMATE 2.5m. THE HEAT TRACE LENGTH PER PIPE IS DOUBLED TO 5m. CONTRACTOR TO CONFIRM THE LENGTH OF THE PIPES AT SITE.
9. FOR EXACT LOCATION OF HEAT TRACE, REFER CIVIL DETAIL NUMBER A/C500, B/C500, A/C501 & B/C501.
10. LENGTH BETWEEN THE TANKS IS 5.6m.THE HEAT TRACE LENGTH PER PUMP IS DOUBLED 11.2m. CONTRACTOR TO CONFIRM THE LENGTH OF THE PIPE AT SITE.
11. PROVIDE 120V LOCAL COMBINATION SMOKE/CO DETECTOR WITH BATTERY BACKUP. ENSURE NO MEANS OF DISCONNECTION BETWEEN DETECTOR AND BRANCH CIRCUIT BREAKER. AVOID PLACING DETECTOR ON SAME BRANCH CIRCUIT AS FLUORESCENT LIGHTING.
12. MECHANICAL EQUIPMENT STROBE LIGHTS FOR SEWAGE TANK. COORDINATE WITH MECHANICAL.

ELECTRICAL SYMBOL LEGEND

	DUPLEX RECEPTACLE DESCRIPTORS: c = MOUNTED ABOVE COUNTER GFCI = GROUND FAULT CIRCUIT INTERRUPTER WP = WATERPROOF
S_M	MOTOR STARTER – MANUAL
	SERVICE ENTRANCE WEATHERHEAD
M	UTILITY METER
	CIRCUIT BREAKER
	ELECTRICAL PANEL
	SWITCH, AUTOMATIC TRANSFER
	HARD WIRE CONNECTION
	MOTOR CONNECTION
	120V = LOCAL LINE VOLTAGE SMOKE/CO DETECTOR
	JACK, TELEPHONE/DATA, WALL MOUNT:

GENERAL NOTES:

1. CONTRACTOR TO ENSURE MAXIMUM OF 4–RECEPTACLES PER 15 AMP CIRCUIT FOR GENERAL PURPOSE AND MAXIMUM OF 3–RECEPTACLES PER 15 AMP CIRCUIT FOR COMPUTER PURPOSE.
2. PROVIDE MOTOR PROTECTION AS REQUIRED BY CANADIAN ELECTRICAL CODE (CEC 2012).
3. ALL THE COMMUNICATION WIRING MUST BE COMPLETED BY THE CONTRACTOR IN CONFORMANCE WITH GOVERNMENT OF NUNAVUT: DEPARTMENT OF COMMUNITY & GOVERNMENT SERVICES (CGS–IPS) STRUCTURED CABLING GUIDELINES VERSION 1.5 2012.

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
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DRAWING NO. | DESCRIPTOR

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WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

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WATER SUPPLY IMPROVEMENTS PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

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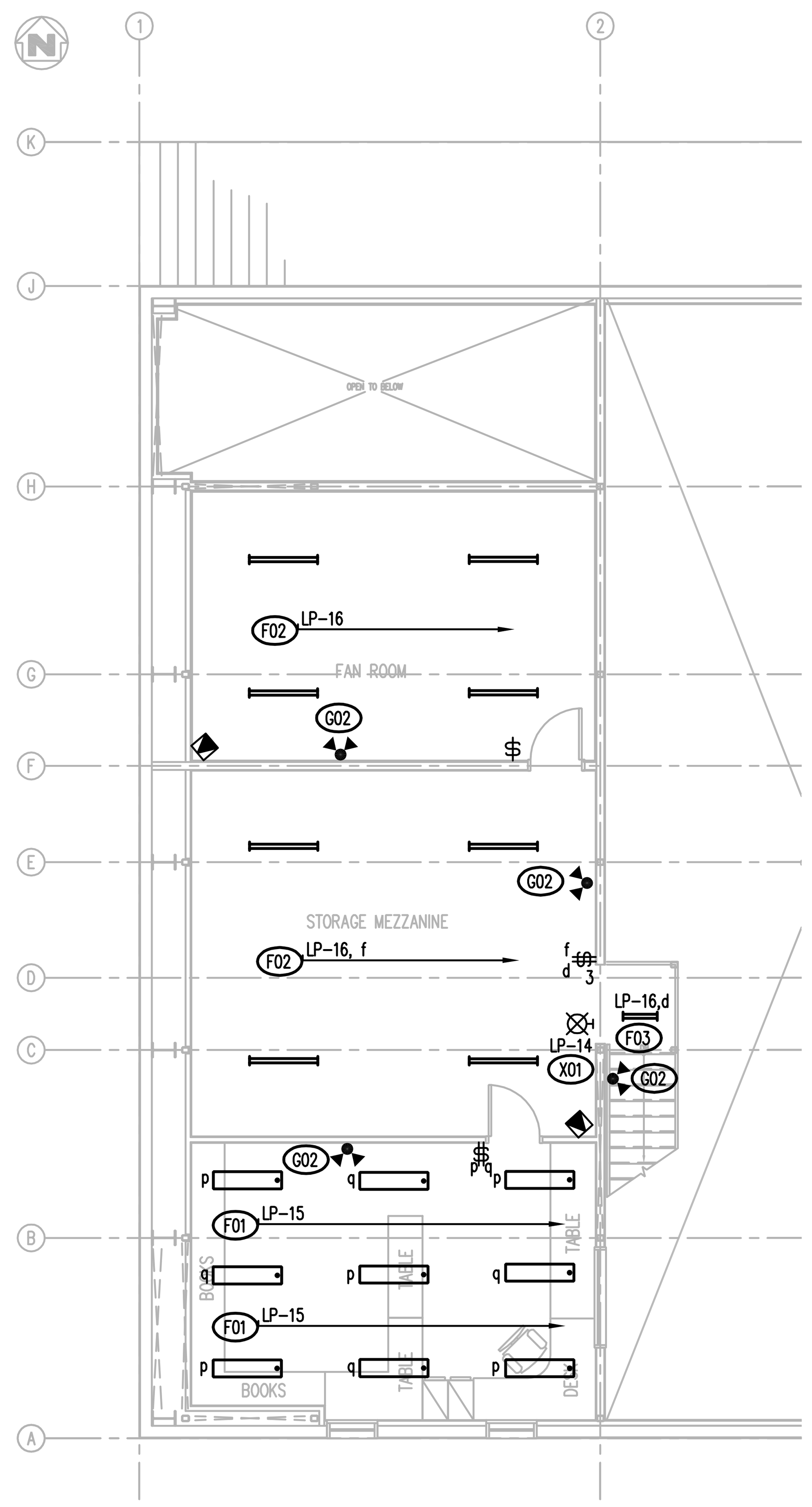
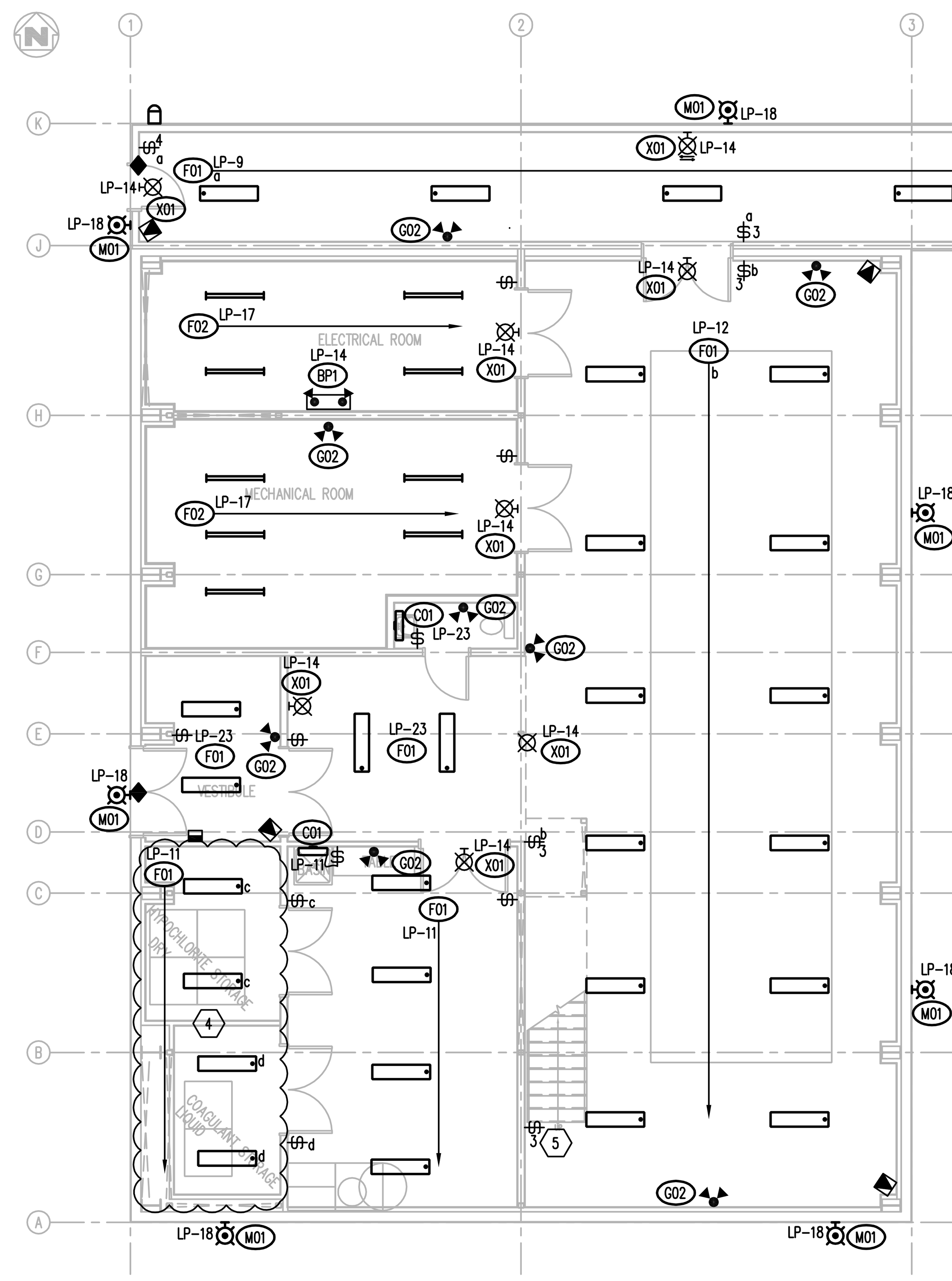


1 SECOND FLOOR LIGHTING LAYOUT
E300 1:100



3 MAIN FLOOR LIGHTING LAYOUT
E300 1:100

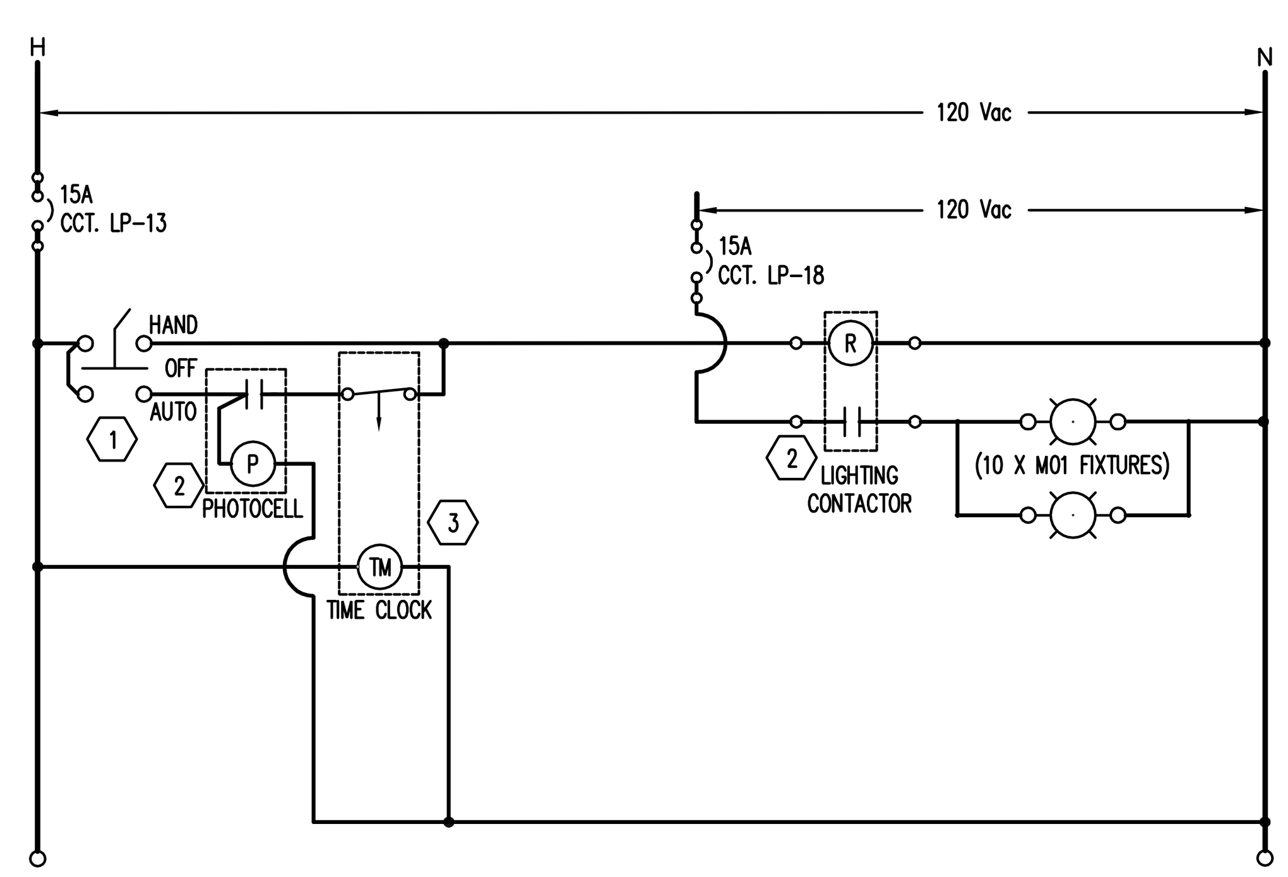
LUMINAIRE SCHEDULE						
TYPE	MANUFACTURER	CATALOG NO.	DESCRIPTION	LAMPS	BALLAST	MOUNTING
F01	METALUX	VT2-232DR-120V-ER81-WL-U	1' X 4' SURFACE WRAP VAPOUR TIGHT FLUORESCENT, RAPID START	2 X 32 W T8	ELECTRONIC	SURFACE MOUNT
F02	METALUX	SNF-232-120V-ER81	4' STRIP FLUORESCENT, C/W WIREGUARD (ELEC./MECH. ROOM)	2 X 32 W T8	ELECTRONIC	SURFACE MOUNT
F03	METALUX	SNF-232-120V-ER81	2' STRIP FLUORESCENT, NARROW STRIPLITE.	2 X 32 W T8	ELECTRONIC	SURFACE MOUNT
C01	PROGRESS LIGHTING	P3110-30 (CHANNEL GLASS)	24" 4-LAMP WALL MOUNT VANITY FIXTUYRE, WHITE	4 X 27 W CFL MEDIUM BASE	N/A	WALL MOUNT
M01	LUMARK	CFWP-GL-175-120V	BOROSILICATE GLASS DOOR COMPACT FLUORESCENT WALL MOUNT EXTERIOR LIGHT	2 X 70 W CFL	N/A	WALL MOUNT
BP1	LUMACELL	RG24S350-2MT18W-AT	EMERGENCY LIGHTING BATTERY PACK; CAPABLE OF DELIVERING 432 WATTS OF DC POWER FOR 1/2 HOUR, C/W 2 INTEGRAL LIGHTING HEADS AND INTERNALLY WIRED VOLTAGE SENSING RELAYS	2 X 9W MINI TUNGSTEN	N/A	UNIVERSAL MOUNT 120VAC / 24VDC
G02	LUMACELL	MT224V9W	EMERGENCY LIGHTING DOUBLE LAMP REMOTE HEAD	2 X 9W MINI TUNGSTEN	N/A	UNIVERSAL MOUNT 24VDC
X01	LUMACELL	LA SERIES	EMERGENCY EXIT PICTOGRAM SIGNAGE, SINGLE FACE (TO USE OF THE RUNNING MAN ON EXIT SIGNAGE)	LED	N/A	UNIVERSAL MOUNT 120VAC / 24VDC

KEYNOTES:

1. EXTERIOR LIGHTING CONTROLLER C/W HAND/OFF/AUTO SWITCH.
2. PHOTOCELL TO TURN LIGHTS ON AT SUNSET, TURN LIGHTS OFF AT SUNRISE.
3. TIMECLOCK TO TURN LIGHTS ON AND OFF. COORDINATE AT SITE WITH OWNER REQUIREMENTS.
4. CHEMICAL AREA ELECTRICAL FIXTURES AND WIRING METHOD SHALL BE AS PER REQUIREMENT OF CEC.
5. PROVIDE A 3 WAY SWITCH FOR STAIR LIGHT

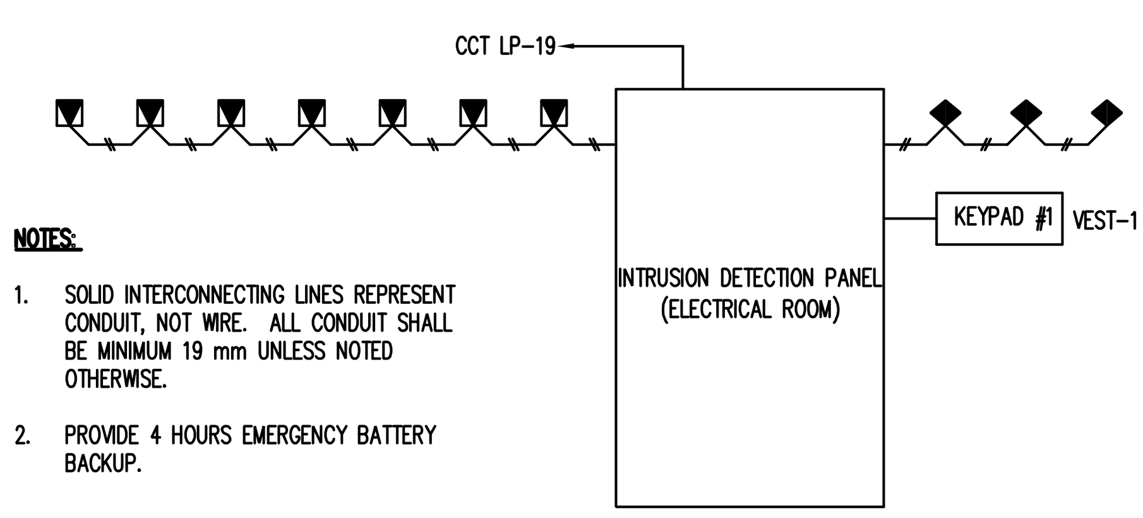
GENERAL NOTES:

1. CONTRACTOR TO ENSURE MAXIMUM "15 AMP" CIRCUIT LOADING FOR LIGHTING IS 1200 WATTS.
2. ALL THE AVERAGE MAINTAINED HORIZONTAL AND VERTICAL ILLUMINANCE LEVELS AT A SPECIFIED HEIGHT OR LOCATION SHALL CONFORM TO THE 10th EDITION OF "LIGHTING HANDBOOK" ILLUMINATING ENGINEERING SOCIETY (IES) AND NATIONAL ENERGY CODE FOR BUILDS 2011 (NECB).
3. LUMINAIRE ALIGNMENT
   a) ALIGN LUMINARIES MOUNTED IN CONTINUOUS ROWS TO FORM STRAIGHT UNINTERRUPTED LINE.
   b) ALIGN LUMINARIES MOUNTED INDIVIDUALLY



2 EXTERIOR LIGHTING CONTROL SCHEMATIC
E300 1:100

BATTERY PACK RELAY SCHEDULE	
BATTERY PACK	CIRCUITS MONITORED BY RELAYS
BP1	LP-9, LP-11, LP-12, LP-15, LP-16, LP-17



NOTES:

1. SOLID INTERCONNECTING LINES REPRESENT CONDUIT, NOT WIRE. ALL CONDUIT SHALL BE MINIMUM 19 mm UNLESS NOTED OTHERWISE.
2. PROVIDE 4 HOURS EMERGENCY BATTERY BACKUP.

4 SECURITY RISER DIAGRAM
E300 NTS

ELECTRICAL SYMBOL LEGEND	
	LUMINAIRE, FLUORESCENT, STRIP
	LUMINAIRE, FLUORESCENT, SURFACE OR PENDANT MOUNT
	LUMINAIRE, FLUORESCENT, WALL MOUNT
	LUMINAIRE, H.I.D., WALL MOUNT
F01	DESCRIPTOR-LUMINAIRE (FIXTURE TAG); E.G. F01 = LUMINAIRE TYPE F01
$	SWITCH, SINGLE-POLE: 3 = 3 WAY SWITCH 4 = 4 WAY SWITCH a = LUMINAIRE SWITCHED
$$	SWITCH, TWO SINGLE POLE IN 2-GANG BOX
	DETECTOR, MOTION
	KEYPAD, SYSTEM
	SWITCH, DOOR POSITION (DPS)
	LIGHT, EXIT, CEILING MOUNT
	LIGHT, EXIT, WALL MOUNT
	LIGHT, EXIT, WALL MOUNT; ARROWS INDICATE DIRECTION OF EGRESS
	LIGHT, EMERGENCY & BATTERY PACK, 2 LAMP HEADS
	LIGHT, EMERGENCY, 2 HEAD REMOTE

DRAWING NO.	DESCRIPTOR

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CLIENT:

Nunavut

JOB. TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
SITE PLAN

DWN. BY: HR	DES. BY: HR	PROJ. MGR.: JH
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DWG #: E300	OF 1	REV #: C

PANEL SCHEDULE

PANEL MA	LOCATION	VOLTAGE	PHASE	WIRE	BUS	MAIN BKR.	INT. CAP. (SYM RMS)	CIRCUITS	MOUNTING	FEEDER
	ELECTRICAL ROOM	120/208V	3	4	150A		10KA	84	SURFACE	35-4#2

NOTES: [*] = PROVIDE BREAKER LOCK ON CIRCUIT [GFCI] = GROUND FAULT CIRCUIT BREAKER

LOADS L1	L2	L3	DESCRIPTION	POLE	AMP	CCT. NO.	CCT. NO.	AMP	POLE	DESCRIPTION	LOADS L1	L2	L3
125			P-19, PIPE GALLERY	3		1	2	30		HT-3, PIPE GALLERY	2500		
	125					3	4		2			2500	
		125			15	5	6	30		HT-4, PIPE GALLERY			2500
125			P-20, PIPE GALLERY	3		7	8		2		2500		
	125					9	10	30		HT-5, PIPE GALLERY		2500	
		125			15	11	12		2				2500
94			B-2, MECHANICAL ROOM	1	15	13	14	15	1	B-1, MECHANICAL ROOM	94		
	94		B-3, MECHANICAL ROOM	1	15	15	16	15	1	AE, MECHANICAL ROOM		746	
		185	UH-1 TO UH-5, SKID AREA	1	15	17	18	15		P-1, MECHANICAL ROOM			55
280			P-8A, MECHANICAL ROOM	2		19	20		2		55		
	280				15	21	22	15	1	SPARE		X	
		280	P-8B, MECHANICAL ROOM	2		23	24	25		P-6A, MECHANICAL ROOM			450
280					15	25	26		2		450		
	16		UH-6, MIXING ROOM	1	15	27	28	25		P-6B, MECHANICAL ROOM		450	
		16	UH-7, MECHANICAL ROOM	1	15	29	30		2				450
16			UH-8, ELECTRICAL ROOM	1	15	31	32	15		P-22A, MECHANICAL ROOM	186		
	75		UH-9 TO UH-11, PIPE GALLERY	1	15	33	34		2			186	
		560	P-13A, PIPE GALLERY	2		35	36	15		P-22B, MECHANICAL ROOM			186
560					25	37	38		2		186		
	37		UH-12, STORAGE MEZZANINE	1	15	39	40	15	1	P-15, MIXING AREA		100	
		16	UH-13, FAN ROOM	1	15	41	42	15	1	P-16, MIXING AREA			100
98			UV-2, MECHANICAL ROOM	1	50	43	44	15		HT-1, MIXING AREA	83		
	500		MECHANICAL CONTROL PANEL	1	15	45	46		2			83	
		280	P-7A, MECHANICAL ROOM	2		47	48	15		HT-2, SKID AREA			83
280					15	49	50		2		83		
	280		P-7B, MECHANICAL ROOM	2		51	52	15		SPARE		x	
		280			15	53	54		2				x
560			P-13B, PIPE GALLERY	2		55	56	15		HT-14, TWS & FF TANK	185		
	560				25	57	58		2			185	
		125	P-14A, SKID AREA	3		59	60	15	1	UV-1, MECHANICAL ROOM			98
125						61	62	25		P-4A, MECHANICAL ROOM	667		
	125				15	63	64					667	
		125	P-14B, SKID AREA	3		65	66		3				667
125						67	68	25		P-4B, MECHANICAL ROOM	667		
	125				15	69	70					667	
						71	72		3				667
						73	74	15		P-2, MECHANICAL ROOM	55		
			SPARE	1	15	75	76		2			55	
			SPARE	1	15	77	78	15		P-3, MECHANICAL ROOM			55
			SPARE	1	15	79	80		2		55		
			SPARE	1	15	81	82						
			SPARE	1	15	83	84						
2668	2342	2117	TOTAL PEAK LOAD 30,844W AT 208V, IMPLIES 85.7A								7766	8140	7811

PANEL MB	LOCATION	VOLTAGE	PHASE	WIRE	BUS	MAIN BKR.	INT. CAP. (SYM RMS)	CIRCUITS	MOUNTING	FEEDER
	ELECTRICAL ROOM	120/208V	3	4	150		10kVA	84	SURFACE	41C-4#1

NOTES: [*] = PROVIDE BREAKER LOCK ON CIRCUIT [GFCI] = GROUND FAULT CIRCUIT BREAKER

LOADS L1	L2	L3	DESCRIPTION	POLE	AMP	CCT. NO.	CCT. NO.	AMP	POLE	DESCRIPTION	LOADS L1	L2	L3
62			EF-1, STORAGE MEZZANINE	2		1	2	15		HT-7, TANK RF-3	165		
	62				15	3	4		2			165	
		62	EF-2, STORAGE MEZZANINE	2		5	6	15		HT-8, TANK RF-2			165
62					15	7	8		2		165		
	84		P-5, MECHANICAL ROOM	1	15	9	10	15		HT-9, TANK RF-1		165	
		1233	P-9A, SKID AREA	3		11	12		2				165
1233						13	14	15		HT-10, TANK FF	165		
	1233				40	15	16		2			165	
		1233	P-9B, SKID AREA	3		17	18	15		HT-11, TANK SSF-1			165
1233						19	20		2		165		
	1233				40	21	22	15		HT-12, TANK SSF-2		165	
						23	24		2				165
						25	26	15		HT-13, TANK SSF-3	165		
						27	28		2			165	
		373	P-10A, PIPE GALLERY	2		29	30	15		HT-15, TANK RF-3			50
373					20	31	32		2		50		
	500		P-11A, PIPE GALLERY	3		33	34	15		P-21A, MECHANICAL ROOM		186	
		500				35	36		2				186
500					15	37	38	15		P-21B, MECHANICAL ROOM	186		
	500		P-11B, PIPE GALLERY	3		39	40		2			186	
		500				41	42	15		HT-16, TANK RF-2			50
500					15	43	44		2		50		
	60		P-18, MECHANICAL ROOM	1	15	45	46	15		HT-17, TANK RF-1		50	
				1	15	47	48		2				50
373			AHU-1, FAN ROOM	2		49	50	15		HT-18, TANK FF	50		
	373				15	51	52		2			50	
			SPARE			53	54	15		HT-19, TANK SSF-1			50
373			P-10B, PIPE GALLERY	2		55	56		2		50		
	373				20	57	58	15		HT-20, TANK SSF-2		50	
						59	60		2				50
						61	62	15		HT-21, TANK SSF-3	50		
						63	64		2			50	
						65	66	15		HT-22, TANK TWS			50
						67	68		2		50		
						69	70	110		P-12, SKID AREA		3734	
						71	72						3734
						73	74		3		3734		
						75	76						
			SPARE	2		77	78	15	1	SPARE			
					15	79	80	15	1	SPARE			
			SPARE	2		81	82	15	1	SPARE			
					15	83	84	15	1	SPARE			
4709	4418	3901	TOTAL PEAK LOAD 28,082W AT 208V., IMPLIES 78.0A								5045	5129	4880

MECHANICAL EQUIPMENT SCHEDULE

EQUIPMENT NO.	DESCRIPTION	LOCATION	W / HP / A	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.					
B-1/2/3	OIL FIRED BOILERS	MECHANICAL ROOM	3 x 94W (282W)	120V/1ø				X					MA-13,14,15	1P-15A	16C-2#12	NOTE 1
UH-1/2/3/4/5	HORIZONTAL UNIT HEATERS	SKID AREA	5 X 37W (185W)	120V/1ø				X					MA-17	1P-15A	16C-2#12	NOTE 1
UH-6	HORIZONTAL UNIT HEATER	MIXING ROOM	16W	120V/1ø				X					MA-27	1P-15A	16C-2#12	NOTE 1
UH-7	HORIZONTAL UNIT HEATER	MECHANICAL ROOM	16W	120V/1ø				X					MA-29	1P-15A	16C-2#12	NOTE 1
UH-8	HORIZONTAL UNIT HEATER	ELECTRICAL ROOM	16W	120V/1ø				X					MA-31	1P-15A	16C-2#12	NOTE 1
UH-9/10/11	HORIZONTAL UNIT HEATERS	PIPE GALLEY	3 X 25W (75W)	120V/1ø				X					MA-33	1P-15A	16C-2#12	NOTE 1
UH-12	HORIZONTAL UNIT HEATER	STORAGE MEZZANINE	37W	120V/1ø				X					MA-39	1P-15A	16C-2#12	NOTE 1
UH-13	HORIZONTAL UNIT HEATER	FAN ROOM	16W	120V/1ø				X					MA-41	1P-15A	16C-2#12	NOTE 1
AHU-1	AIR HANDLING UNIT	FAN ROOM	746W (1HP)	208V/1ø				X					MB-49,51	2P-15A	16C-3#12	NOTE 1
EF-1	EXHAUST FAN-1	STORAGE MEZZANINE	125W	208V/1ø				X					MB-1,3	2P-15A	16C-3#12	NOTE 1
EF-2	EXHAUST FAN-2	STORAGE MEZZANINE	125W	208V/1ø				X					MB-5,7	2P-15A	16C-3#12	NOTE 1
P-1/2/3	BOILER PUMPS	MECHANICAL ROOM	3 x 110W (330W)	208V/1ø				X					MA-18,20,74,76,78,80	2P-15A	16C-3#12	NOTE 1
P-4A/4B	HEAT LOOP PUMPS	MECHANICAL ROOM	2 x 2000W (4000W)	208V/3ø			X						MA-62,64,66,68,70,72	3P-25A	16C-3#12	NOTE 1
P-5	GLYCOL MAKEPUP PUMP	MECHANICAL ROOM	84W (0.7A)	120V/1ø				X					MB-9	1P-15A	16C-2#12	NOTE 1
P-6A/6B	HX LOOP PUMPS	MECHANICAL ROOM	2 X 900W (1800W)	208V/1ø				X					MA-24,26,28,30	2P-25	16C-3#12	NOTE 1
P-7A/7B	FF HEAT EX PUMPS	MECHANICAL ROOM	2 X 560W (1120W)	208V/1ø				X					MA-47,49,51,53	2P-15A	16C-3#12	NOTE 1
P-8A/7B	TWS HEAT EX PUMPS	MECHANICAL ROOM	2 X 560W (1120W)	208V/1ø				X					MA-19,21,23,25	2P-15A	16C-3#12	NOTE 1
P-9A/9B	SKID TO FF PUMPS	SKID AREA	2 X 3700W (7400W)	208V/3ø				X					MB-11,13,15,17,19,21	3P-40A	16C-3#12	NOTE 1
P-10A/10B	SSF TO FF RETURN PUMPS	PIPE GALLERY	2 X 746W (1492W)	208V/1ø				X					MB-29,31,55,57	2P-20A	16C-3#12	NOTE 1
P-11A/11B	SSF TO TWS PUMPS	PIPE GALLERY	2 X 1500W (3000W)	208V/3ø				X					MB-33,35,37,39,41,43	3P-15A	16C-3#12	NOTE 1
P-12	TWS TO SSF BACK WASH	SKID AREA	15 HP (11200W)	208V/3ø			X						MB-70,72,74	3P-110A	27C-3#6	NOTE 1
P-13A/13B	STORAGE RECIRC PUMPS	PIPE GALLERY	2 X 1120W (2240W)	208V/1ø				X					MA-35,37,55,57	2P-25A	16C-3#12	NOTE 1
P-14A/14B	TRUCK FILL PUMPS	SKID AREA	2 X 373W (746W)	208V/3ø				X					MA-59,61,63,65,67,69	3P-15A	16C-3#12	NOTE 1
P-15/16	CL INJECTION PUMP	MIXING ROOM	FRAC	120V/1ø				X					MA-40,42	1P-15A	16C-2#12	NOTE 1
P-17	NOT USED															
P-18	DCW TO HWT PUMP	MECHANICAL ROOM	60W	120V/1ø				X					MB-45	1P-15A	16C-2#12	NOTE 1
P-19/20	RF PUMPS	PIPE GALLERY	2 X 373W (746W)	208V/3ø				X					MA-1,3,5,7,9,11	3P-15A	16C-3#12	NOTE 1
P-21A/21B	FUEL PUMPS	MECHANICAL ROOM	2 X 373W (746W)	208V/1ø				X					MB-34,36,38,40	2P-15A	16C-3#12	NOTE 1
P-22A/22B	FUEL PUMPS	MECHANICAL ROOM	2 X 373W (746W)	208V/1ø				X					MA-32,34,36,38	2P-15A	16C-3#12	NOTE 1
UV-1/2	ULTRA VIOLET LIGHT	PIPE GALLERY	98W	120V/1ø				X					MA-60,77	1P-15A	16C-2#12	NOTE 1
AE	MIOX AE SYSTEM	MECHANICAL ROOM	746W	120V/1ø				X					MA-16	1P-15A	16C-2#12	NOTE 1
HT-1/2	ELECTRIC HEAT TRACE	TRUCKFILL ARMS	2 X 165W (330W)	208V/1ø				X					MA-44,46,48,50	2P-15A	16C-3#12	NOTE 1,2
HT-3	ELECTRIC HEAT TRACE	SUPPLY PIPE, (GALLERY)	5000W	208V/1ø				X					MA-2,4	2P-30A	16C-3#10	NOTE 1,2
HT-4/5	ELECTRIC HEAT TRACE	RECIRC PIPE, (GALLERY)	2 x 5000W (10000W)	208V/1ø				X					MA-6,8,10,12	2P-30A	16C-3#10	NOTE 1,2
HT-6	NOT USED															
HT-7/8/9/10/11/12/13	ELECTRIC HEAT TRACE	TANK PIPES	7 x 330W (2310W)	208V/1ø				X					MB-2,4,6,8,10,12,14,16,18,20 MB-22,24,26,28	2P-15A	16C-3#12	NOTE 1,2
HT-14	ELECTRIC HEAT TRACE	TANK PIPES (TWS & FF)	370W	208V/1ø				X					MA-56,58	2P-15A	16C-3#12	NOTE 1,2
HT-15/16/17/18/19/20/21/22	ELECTRIC HEAT TRACE	TANK PIPES	8 x 100W (800W)	208V/1ø				X					MB-30,32,42,44,46,48,50,52 MB-54,56,58,60,62,64,66,68	2P-15A	16C-3#12	NOTE 1,2

NOTES:
1. PROVIDE DISCONNECTION SWITCH, PROTECTION AND CONTROL WIRING AS PER CEC; CONTROLS BY MECHANICAL
2. FEED POWER THROUGH GFI BREAKER

PANEL SCHEDULE

PANEL LP	LOCATION	VOLTAGE	PHASE	WIRE	BUS	MAIN BKR.	INT. CAP. (SYM RMS)	CIRCUITS	MOUNTING	FEEDER
	ELECTRICAL ROOM	120/208V	3	4	100A		10KA	42	SURFACE	27C-4#6

NOTES: [*] = PROVIDE BREAKER LOCK ON CIRCUIT [GFCI] = GROUND FAULT CIRCUIT BREAKER

LOADS L1	L2	L3	DESCRIPTION	POLE	AMP	CCT. NO.	CCT. NO.	AMP	POLE	DESCRIPTION	LOADS L1	L2	L3
1000			RECEPTACLES-PIPE GALLEY	1	15	1	2	15	1	RECEPTACLES-SKID AREA	1000		
	1000		RECEPTACLES-MECHANICAL / ELECTRICAL ROOM	1	15	3	4	15	1	RECEPTACLES-MIXING AREA		875	
		625	RECEPTACLES-VESTIBLE, WASHROOM & CHEMICAL ROOM	1	15	5	6	15	1	RECEPTACLES-STORAGE MEZZANINE			500
500			RECEPTACLES-FAN ROOM MEZZANINE	1	15	7	8	15	1	RECEPTACLE-TTB	500		
	560		LIGHTS-PIPE GALLEY	1	15	9	10	15	1	RECEPTACLES-OFFICE MEZZANINE		625	
		630	LIGHTS-MIXING AREA	1	15	11	12	15	1	LIGHTS-SKID AREA			840
500			EXTERIOR LIGHTING CONTROLS	1	15	13	14	15	1	BP1-ELECTRICAL ROOM [*]	500		
	630		LIGHTS-MEZZANINE OFFICE	1	15	15	16	15	1	LIGHTS-FAN ROOM & STORE MEZZANINE		630	
		630	LIGHTS-MECHANICAL / ELECTRICAL ROOM	1	15	17	18	15	1	LIGHTS-OUTSIDE			700
500			INTRUSION DETECTION PANEL	1	15	19	20	15	1	PARKING RECEPTACLE (IPLC)	650		
	875		RECEPTACLE-OUTSIDE [GFCI]	1	15	21	22	15	1	PARKING RECEPTACLE (IPLC)		650	
		350	LIGHTS-WASHROOM	1	15	23	24	15	1	PARKING RECEPTACLE (IPLC)			650
						25	26						
						27	28						
						29	30						
						31	32						
						33	34						
						35	36						
						37	38						
			SPARE	1	15	39	40	15	1	SPARE			
			SPARE	1	15	41	42	15	1	SPARE			
2500	3040	2235	TOTAL PEAK LOAD 15,895W AT 208V, IMPLIES 44.2A								2650	2780	2690

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR TENDER	2014.03.07	HR	JAB

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.

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

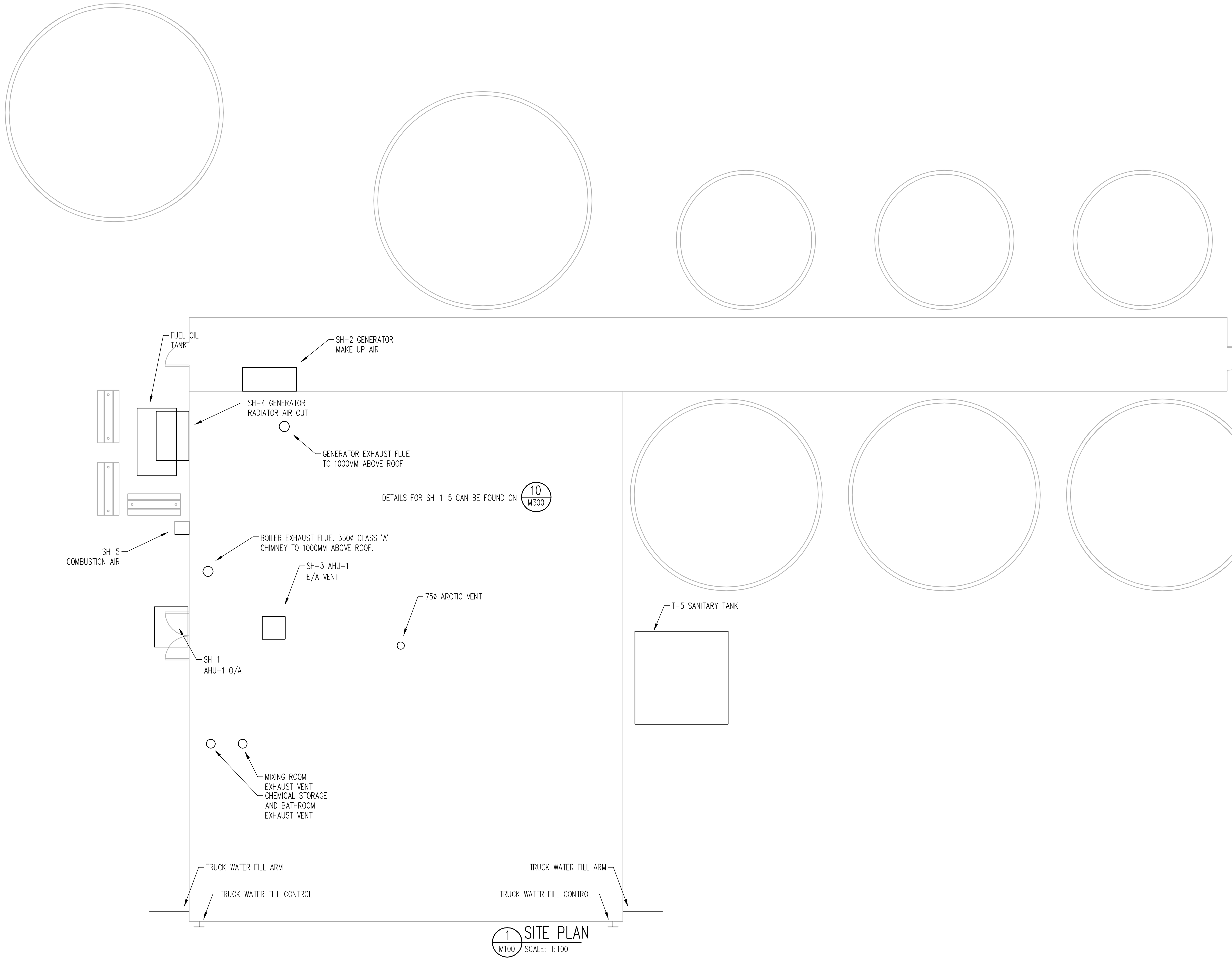
CLIENT:

Nunavut

JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE: SITE PLAN

DWN. BY: HR	DES. BY: HR	PROJ. MGR.: JH
PEER REVIEW: JAB	DATE: (YY-MM-DD)	SCALE: AS SHOWN
CLIENT PROJ. # 04-4417		WE PROJ. # 013655.02
DWG # E400	OF 1	REV # C



1 M100 SITE PLAN
SCALE: 1:100

SYMBOL LEGEND

SANITARY SEWER	FUSIBLE LINK VALVE
SANITARY SEWER UNDERGROUND	NEEDLE VALVE
DOMESTIC COLD WATER	PLUG VALVE
DOMESTIC HOT WATER	PRESSURE RELIEF VALVE
PLUMBING VENT	RELIEF VALVE
HYDRONIC HOT WATER SUPPLY LINE	PRESSURE GAUGE
HYDRONIC HOT WATER RETURN LINE	ELECTRONIC ACTUATOR
TOP TAKE OFF	AUTOMATIC FLOW CONTROL VAVLE
BOTTOM TAKE OFF	THERMOSTAT/HUMIDISTAT/WITH LOCKABLE COVER
ELBOW RISING	SUPPLY AIR DUCT (UP & DOWN)
ELBOW DROPPING	RETURN/EXHAUST AIR DUCT (UP & DOWN)
CAP OR PLUG	FLEXIBLE DUCT CONNECTION
CLEAN OUT	BALANCING DAMPER
FLOOR DRAIN	FIRE, SMOKE AND FIRE SMOKE DAMPER
PUMP	ACOUSTIC DUCT INSULATION
FIXTURE TRAP	THERMAL DUCT INSULATION
UNION/FLANGE	TURNING VANES
HB WALL HYDRANT / HOSE BIBB	DUCT END CAP
NFHB NON-FREEZE WALL HYDRANT	RETURN OR EXHAUST INLET (WALL TYPE)
WC-1 PLUMBING FIXTURE TYPE	SUPPLY AIR OUTLET (WALL TYPE)
PRESSURE GAUGE/ PRESSURE TAP	SUPPLY DIFFUSER
THERMOMETER/ THERMOMETER WELL	RETURN OR EXHAUST INLET (CEILING TYPE)
AUOTMATIC AIR VENT	DOOR UNDERCUT
BACKFLOW PREVENTION VALVE	UH-1 EQUIPMENT TAG
MANUAL BALANCING VALVE	FIRE EXTINGUISHER
BALL VALVE	
BUTTERFLY VALVE	
CHECK VALVE	
GATE VALVE	
GLOBE VALVE	
LOCK SHIELD VALVE	
PRESSURE REDUCING VALVE	
STRAINER	
3-WAY VALVE	

HVAC EQUIPMENT

TAG	QTY	ITEM	LOCATION	MAKE	MODEL	DATA	ELEC INFO	DESCRIPTION
B-1/2/3	3	OIL FIRED BOILERS	MECHANICAL ROOM	WEIL MCLAIN	480	100.8kW [344 MBH] OUTPUT	115/1/60, 93.9W	BOILERS TO FIRE IN STAGES, PRIME, SECONDARY, & TERTIARY TO ALTERNATE EVERY 6 MONTHS.
HX-1	1	PLATE TYPE HEAT EXCHANGER	MECHANICAL ROOM	ARMSTRONG	S-X13-350-17	184kW CAPACITY	N/A	GLYCOL TO WATER HX, SS PLATES, ALL CONNECTIONS 50MMø
HX-2/3	2	PLATE TYPE HEAT EXCHANGER	MECHANICAL ROOM	ARMSTRONG	S-X13-350-8	75kW CAPACITY	N/A	WATER TO WATER HX, SS PLATES, ALL CONNECTIONS 50MMø
RC-1	1	REHEAT COIL	OFFICE			5kW	N/A	INLINE WITH S/A TO OFFICE, CONTROLLED VIA ROOM THERMOSTAT
UH-1-5	5	HORIZONTAL UNIT HEATER	SKID AREA	TRANE	S-60	12.8kW [43.6MBH]	120/1/60, 37W	
UH-6	1	HORIZONTAL UNIT HEATER	MIXING ROOM	TRANE	S-A08	2kW [6.8mbh]	120/1/60, 16W	
UH-7	1	HORIZONTAL UNIT HEATER	MECH ROOM	TRANE	S-24	7kW [24MBH]	120/1/60, 16W	
UH-8	1	HORIZONTAL UNIT HEATER	ELECTRICAL ROOM	TRANE	S-24	7kW [24MBH]	120/1/60, 16W	
UH-9-11	3	HORIZONTAL UNIT HEATER	PIPE GALLERY	TRANE	S-36	7.7kW [26.1MBH]	120/1/60, 25W	
UH-12	1	HORIZONTAL UNIT HEATER	STORAGE ROOM	TRANE	S-48	10.2kW [34.8MBH]	120/1/60, 37W	
UH-13	1	HORIZONTAL UNIT HEATER	FAN ROOM	TRANE	S-18	3.8kW [13.1MBH]	120/1/60, 16W	
AHU-1	1	AIR HANDLING UNIT	MECHANICAL ROOM	TRANE	CLIMATE CHANGER	S/A: 740L/S, 30% O/A MIN	208/1/60, 1HP	SAT = 15C, OAT = -45C, 333KG
EF-1	1	EXHAUST FAN	STORAGE ROOM	GREENHECK	SQ 60	90LPS [190CFM]	208/1/60, 1/6HP	FROM CHEMICAL STORAGE & WASHROOM
EF-2	1	EXHAUST FAN	STORAGE ROOM	GREENHECK	SQ 75	190LPS [400CFM]	208/1/60, 1/6HP	MIXING ROOM EXHAUST, TO OPERATE WHEN ROOM LIGHTS ARE ON
EXT-1	1	HYDRONIC EXPANSION TANK	MECHANICAL ROOM	AMTROL	SX-110V	[32 USGal] VOLUME	N/A	FOR HYDRONIC SYSTEM
EXT-2	1	HYDRONIC EXPANSION TANK	MECHANICAL ROOM	AMTROL	EX-15	8L [2 USGal] VOLUME	N/A	FOR HEAT EXCHANGER LOOP
EXT-3	1	DOMESTIC WATER EXPANSION TANK	MECHANICAL ROOM	AMTROL	WX-104	40L [10 USGal] VOLUME	N/A	TO MAINTAIN DOMESTIC WATER SYSTEM PRESSURE

PUMPS

TAG	QTY	ITEM	LOCATION	MAKE	MODEL	DATA	ELEC INFO	DESCRIPTION
P-1/2/3	3	BOILER PUMP	MECHANICAL ROOM	GRUNDFOS	UPS 32-40/4		115(230)/1/60, 110W	PUMP TO OPERATE ONLY WHEN BOILER IN OPERATION
P-4A/B	2	HEAT LOOP PUMP	MECHANICAL ROOM	GRUNDFROS	UPS 80-160/2	8.5LPS @ 95kPA [135GPM @ 32FTWC]	230/3/60, 2kW	VFD TO MAINTAIN 95kPa
P-5	1	GLYCOL MAKE UP PUMP	MECHANICAL ROOM	AXIOM	SF-100		115/1/60, 0.7A	FOR T-6, GLYCOL MAKE UP TANK
P-6A/B	2	HEAT EXCHANGER LOOP PUMP	MECHANICAL ROOM	GRUNDFOS	MAGNA 60-120F		230/1/60, 900W	VFD TO OPERATE ON CONSTANT PRESSURE
P-7A/B	2	FILTER FEED TANK HEAT EXCHANGER PUMP	MECHANICAL ROOM	MONARCH	ACE-75		115(230)/1/60, 560W	
P-8A/B	2	TREATED WATER HEAT EXCHANGER PUMP	MECHANICAL ROOM	MONARCH	ACE-75		115(230)/1/60, 560W	
P-9A/B	2	SKID TO FF PUMP	SKID AREA	GRUNDFOS	CRN-32-1-1		3PH, 3.7kW	
P-10A/B	2	SSF TO FF RETURN PUMPS	PIPE GALLERY	GRUNDFOS	UPS 32-160		115(230)/1/60, 746W	
P-11A/B	2	SSF TO TWS PUMPS	PIPE GALLERY	GRUNDFOS	UPS 40-240		208-230/3/60,, 1500W	
P-12	1	TWS TO SSF BACKWASH PUMP	PIPE GALLERY	GRUNDFOS	CRNE 90-1-1		3PH, 11.2kW	
P-13A/B	2	STORAGE RECIRC PUMPS	PIPE GALLERY	MONARCH	ACE-150		115(230)/1/60, 1120W	
P-14A/B	2	TRUCK FILL PUMPS	SKID AREA	ARMSTRONG	4380 - 4x4x6		230/3/60, 373W	
P-15/16	2	OXIDANT INJECTION PUMPS	MIXING ROOM	PROMINENT	MIKRO DELTA			
P-17		NOT USED						
P-18	1	DOMESTIC WATER PUMP	MECHANICAL ROOM	GRUNDFOS	UP 15-18 BUC 7	0.4 LPS	115/1/60, 60W	PUMP TO TURN OFF AT SANITARY TANK HIGH LEVEL
P-19/20	2	RF PUMPS	PIPE GALLERY	ARMSTRONG	4380 - 3x3x6		230/3/60, 373W	
P-21A/B	2	DUPLEX TRANSFER PUMPS	MECHANICAL ROOM	ARMSTRONG	SFOP3A	1200LPH	230/1/50, 0.37kW	TO GENERATOR BELLY TANK
P-22A/B	2	DUPLEX TRANSFER PUMPS	MECHANICAL ROOM	ARMSTRONG	SFOP3A	1200LPH	230/1/50, 0.37kW	TO BOILER DAYTANK

TANKS

TAG	QTY	ITEM	LOCATION	MAKE	MODEL	DATA	ELEC INFO	DESCRIPTION
FF	1	FILTER FEED TANK	OUTSIDE					
TWS 3	1	TREATED WATER STORAGE	OUTSIDE					
RF-1/2/3	3	ROUGHENING FILTER TANK	OUTSIDE					
SSF-1/2/3	3	SLOW SAND FILTER TANK	OUTSIDE					
T-1	1	FUEL OIL TANK	OUTSIDE	WESTEEL		4500L CAPACITY	N/A	DOUBLE WALLED TANK
T-2	1	SURGE TANK	EXISTING WTP FACILITY					
T-3	1	HYPOCHLORITE INJECTION TANK	PIPE GALLERY					
T-4	1	DOMESTIC HOT WATER TANK	MECHANICAL ROOM	WEIL MCLAIN	AQUA PLUS 35	110L [35USGal] CAPACITY	N/A	INDIRECT HEATED HOT WATER TANK
T-5	1	SANITARY TANK	OUTSIDE	FIBERGLASS NORTH		5000L CAPACITY		C/W HYDRONIC HEAT TRACE, 100MM INSULATION
T-6	1	GLYCOL MAKE UP TANK	MECHANICAL ROOM	AXIOM	SF-100	208L CAPACITY	115/1/60, 0.7A	C/W P-5
T-7	1	DAY TANK	MECHANICAL ROOM	ROTH	DWT 400L	400L CAPACITY	N/A	

PLUMBING FIXTURES

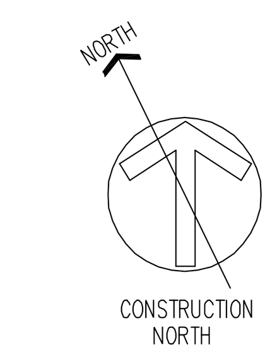
TAG	QTY	ITEM	LOCATION	MAKE	MODEL	DATA	ELEC INFO	DESCRIPTION
WC-1	1	TOILET	WASHROOM	AMERICAN STANDARD	2833128	4.8LPF	N/A	CADET 3 FLOWISE ELONGATED
LAV-1	1	LAVATORY SINK	WASHROOM	AMERICAN STANDARD	491019	N/A	N/A	FAUCET HOLES AT 100MM
FAU-1	3	FAUCET	VARIOUS	AMERICAN STANDARD	7502.1700	6 LPM	N/A	FOR LAV-1, SK-1, & SK-2
SK-1/2	2	UTILITY SINK	VARIOUS	KINDRED	QSLA2225/8/3	N/A	N/A	
EW-1	1	EYE-WASH STATION	MIXING ROOM	HAWS	7620	4 LPM	N/A	ATTACHED TO FAU-1 IN OFFICE
EW-2	1	EYE-WASH STATION	SKID AREA	HAWS	7260BT-7270BT	4 LPM	N/A	PLASTIC BOWL, WALL MOUNTED

PROCESS EQUIPMENT

TAG	QTY	ITEM	LOCATION	MAKE	MODEL	DATA	ELEC INFO	DESCRIPTION
UV	2	ULTRAVIOLET LIGHT	PIPE GALLERY	NEOTECH	D322		120/1/60/, 98W	UV LAMP WALL MOUNTED, C/W CU-4-X UV CONTROLLER & UVLTK-3 LIGHT TRAP

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.04	TAG	



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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PERMIT NUMBER
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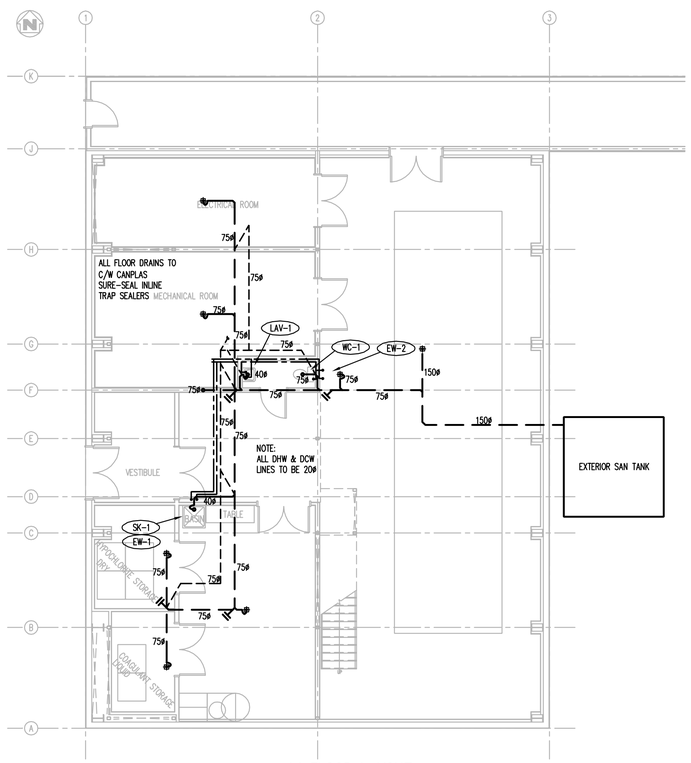
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

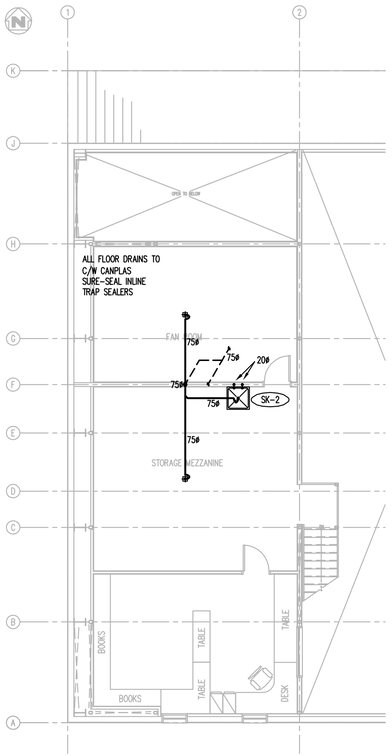
JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE: MECHANICAL SITEPLAN

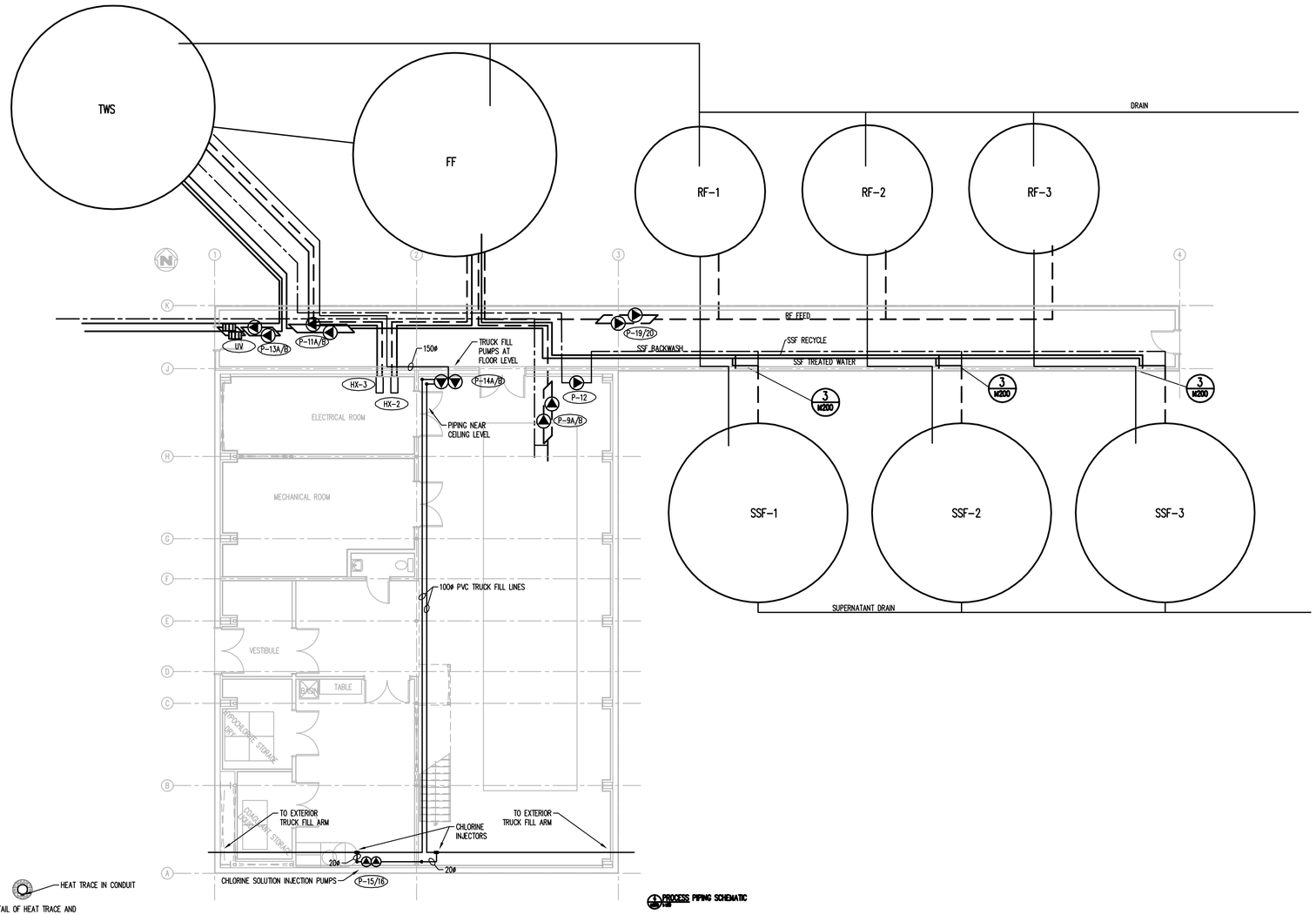
DWN. BY: TAG	DES. BY: TAG	PROJ. MGR.: JH
PEER REVIEW: BFG	DATE: (YY-MM-DD) 2012.02.03	SCALE: AS SHOWN
CLIENT PROJ. # 04-4417		WE PROJ. # 0013655.00
DWG # M100	OF 8	REV # 0



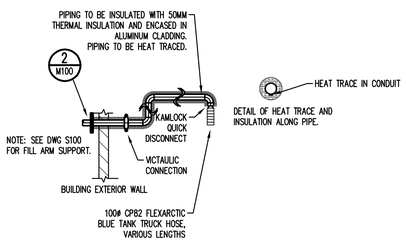
1 MAIN FLOOR LAYOUT
M200 SCALE: 1:100



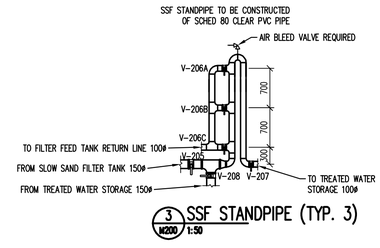
2 SECOND FLOOR LAYOUT
M200 SCALE: 1:100



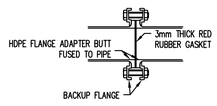
4 PROCESS PIPING SCHEMATIC
M100



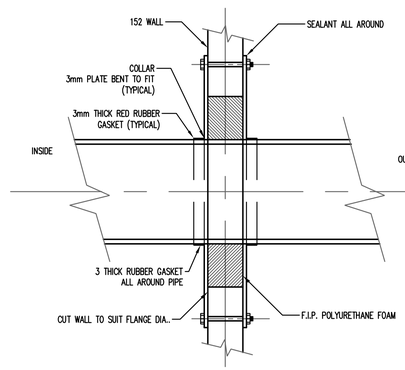
6 FILL ARM DETAIL
M100 SCALE: NTS



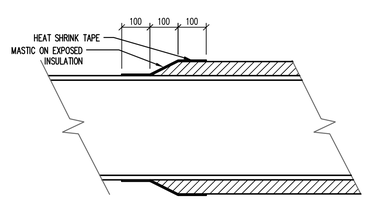
3 SSF STANDPIPE (TYP. 3)
M200 1:50



B DETAIL – TYPICAL HDPE FLANGED CONNECTION
M200 1:10



C DETAIL – PIPE WALL PENETRATION
M200 NTS



D DETAIL – INSULATION TERMINATION (TYP.)
M200 NTS

REVISIONS

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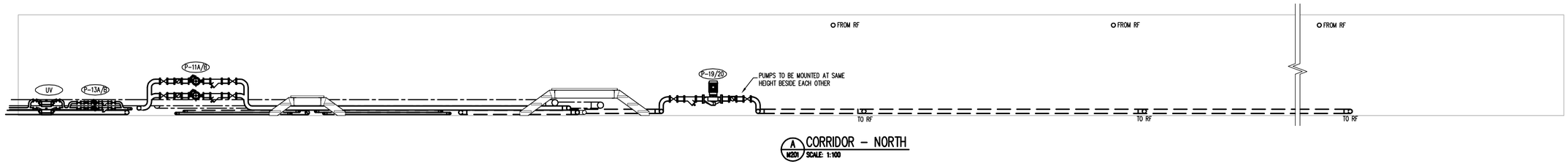
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

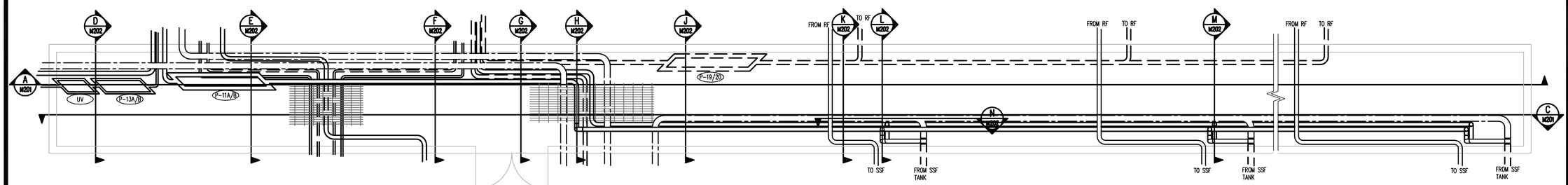
JOB TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
MECHANICAL PLUMBING & PIPING

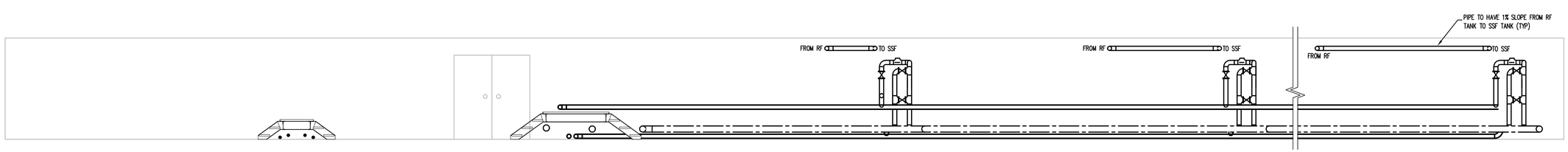
DWN. BY: TAG	DES. BY: TAG	PROJ. MGR.: JH	
PEER REVIEW: BFG	DATE: (YY-MM-DD) 2012.12.14	SCALE: AS SHOWN	
CLIENT PROJ. #: 04-4417	WE PROJ. #: 0013655.00		
DWG. NO.: M200	SHT. NO.: 8	REV.: 0	



A M201 CORRIDOR – NORTH
SCALE: 1:100



B M201 CORRIDOR – PLAN
SCALE: 1:100



C M201 CORRIDOR – SOUTH (MIRRORED FOR CLARITY)
SCALE: 1:100

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WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

JOB TITLE:

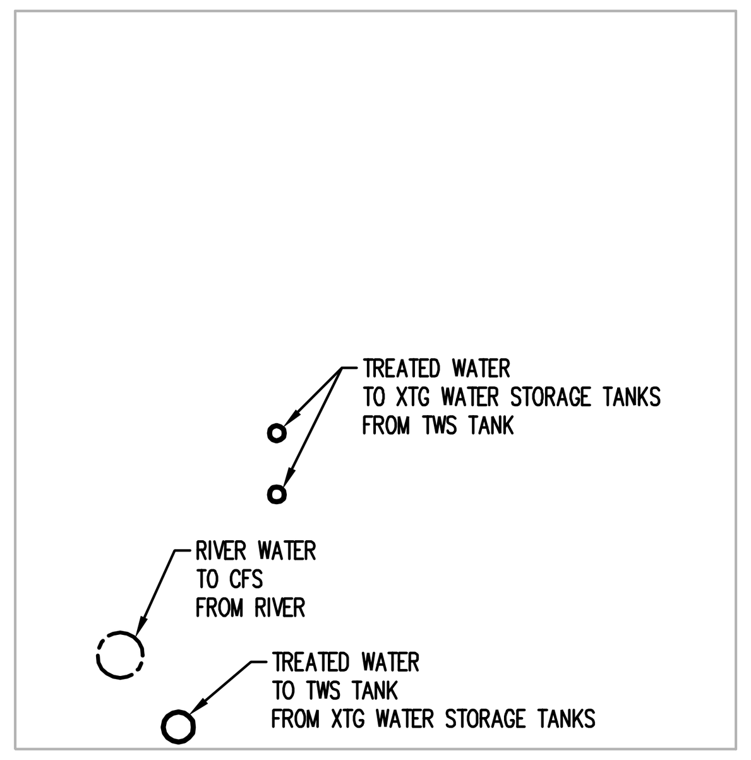
WATER SUPPLY IMPROVEMENTS PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:

MECHANICAL
PROCESS PIPING

DWN. BY:	DES. BY:	PROJ. MGR.:
TAG	TAG	JH
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
BFG	2012.12.14	AS SHOWN
CLIENT PROJ. #		WE PROJ. #
04-4417		0013655.00

M201 | 8 | 0



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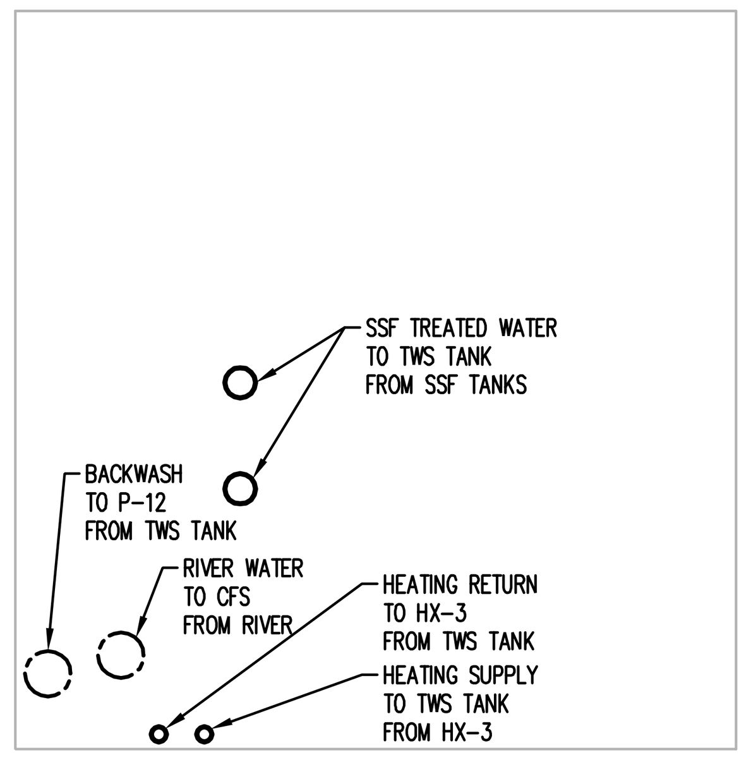

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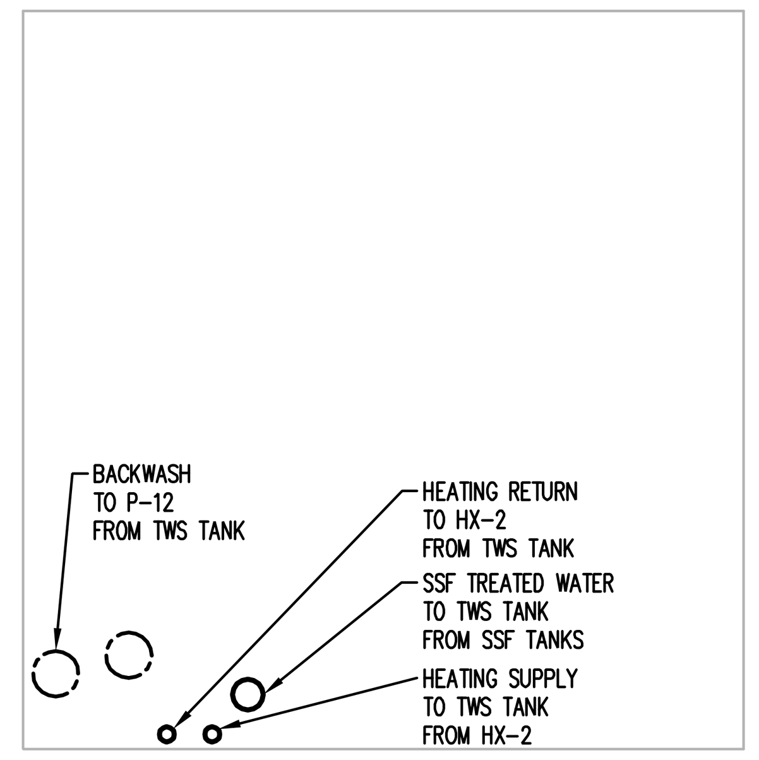

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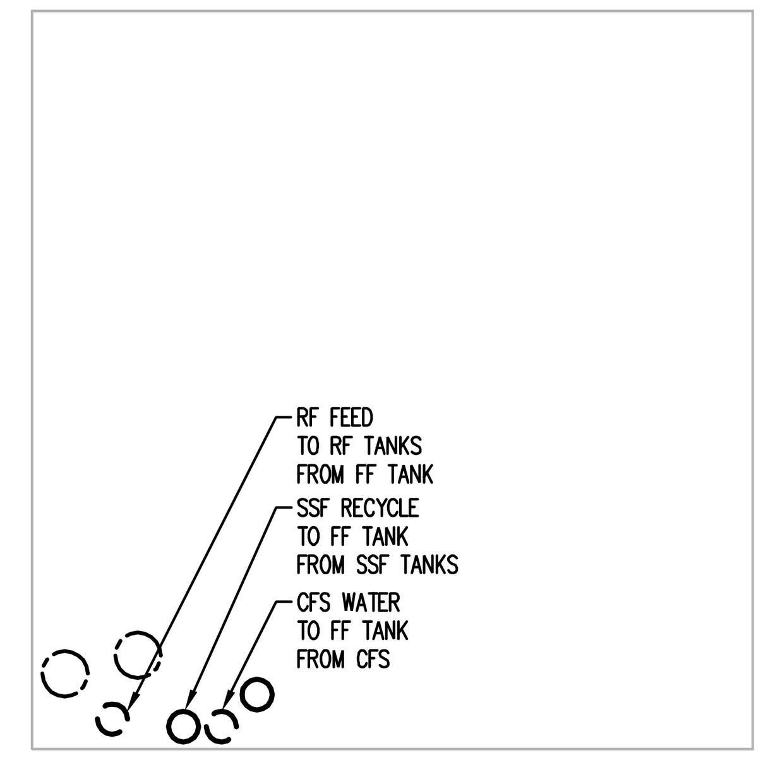

G CORRIDOR
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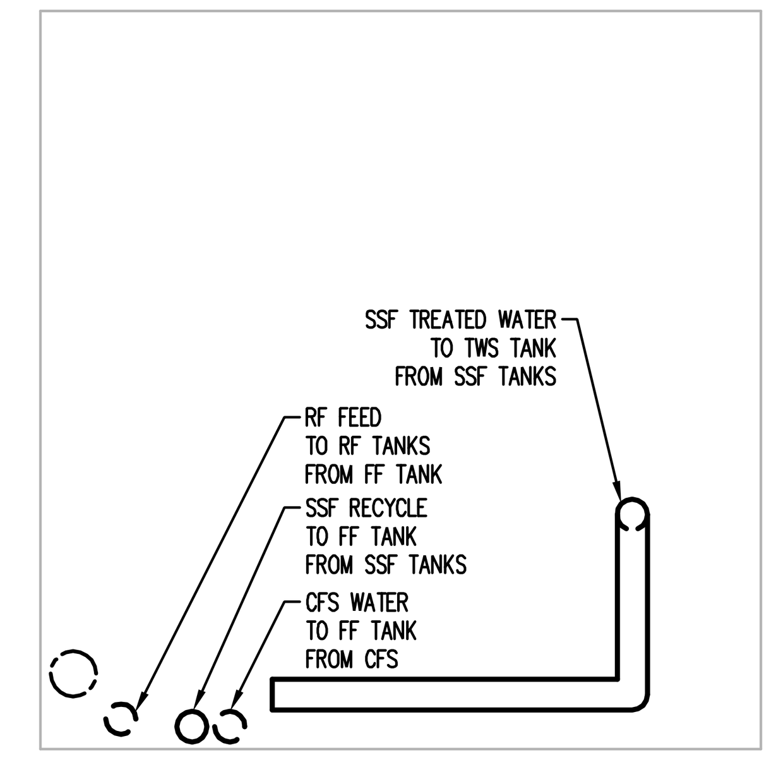

H CORRIDOR
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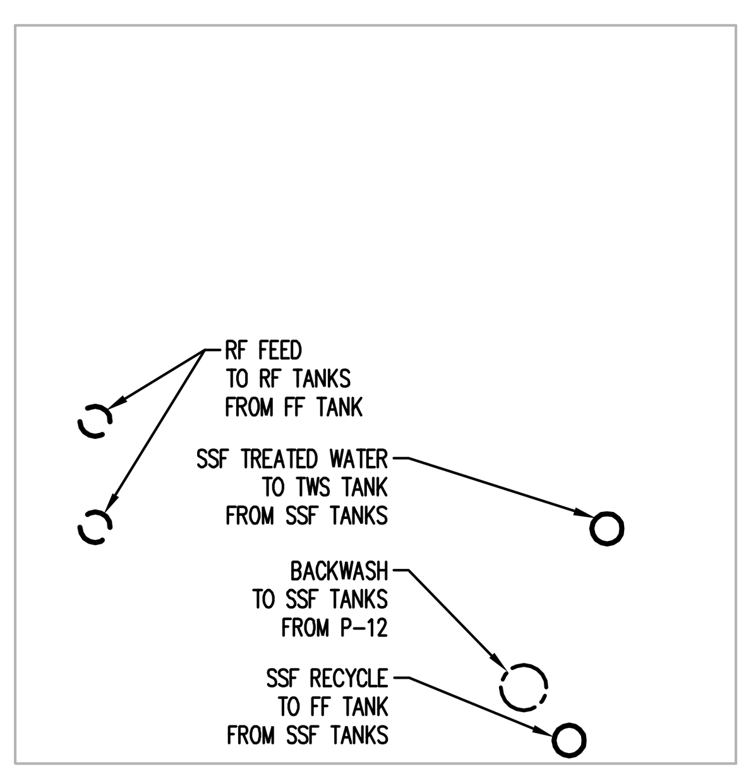

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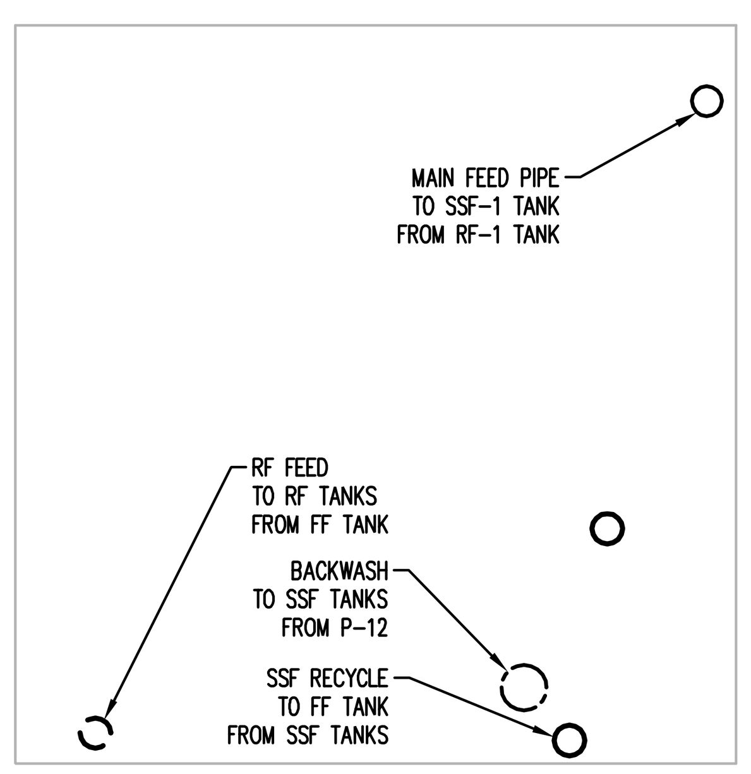

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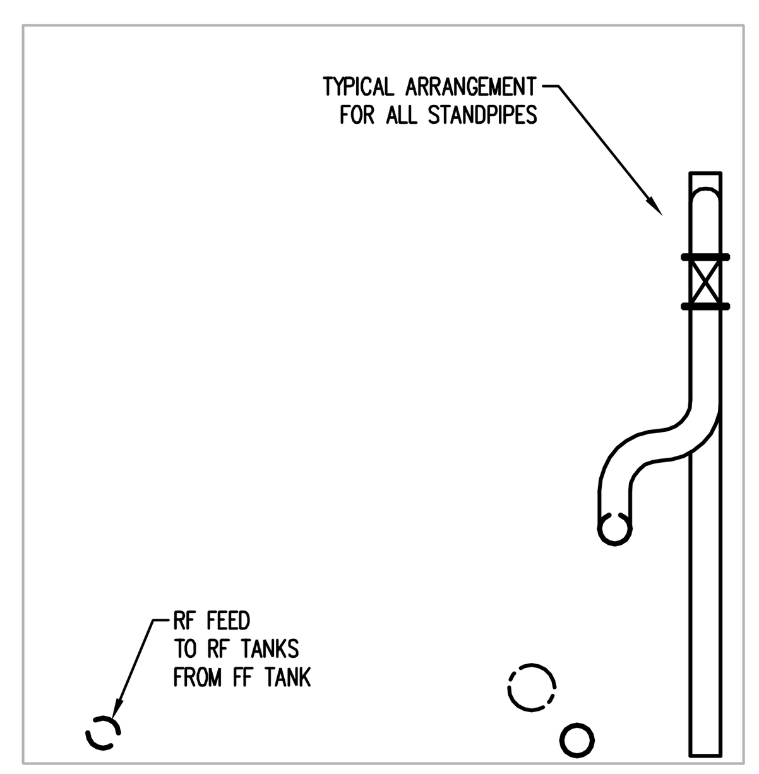

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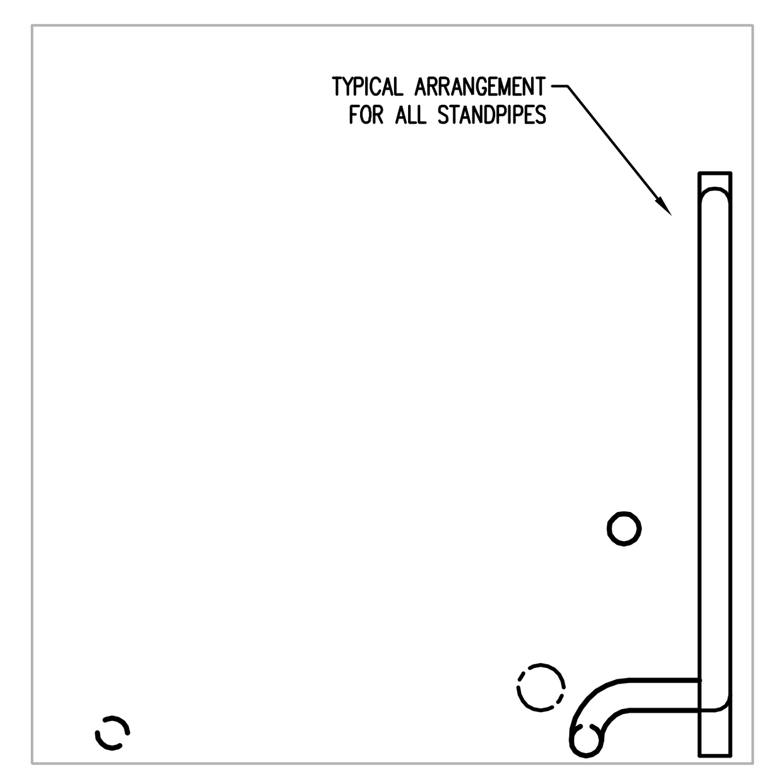

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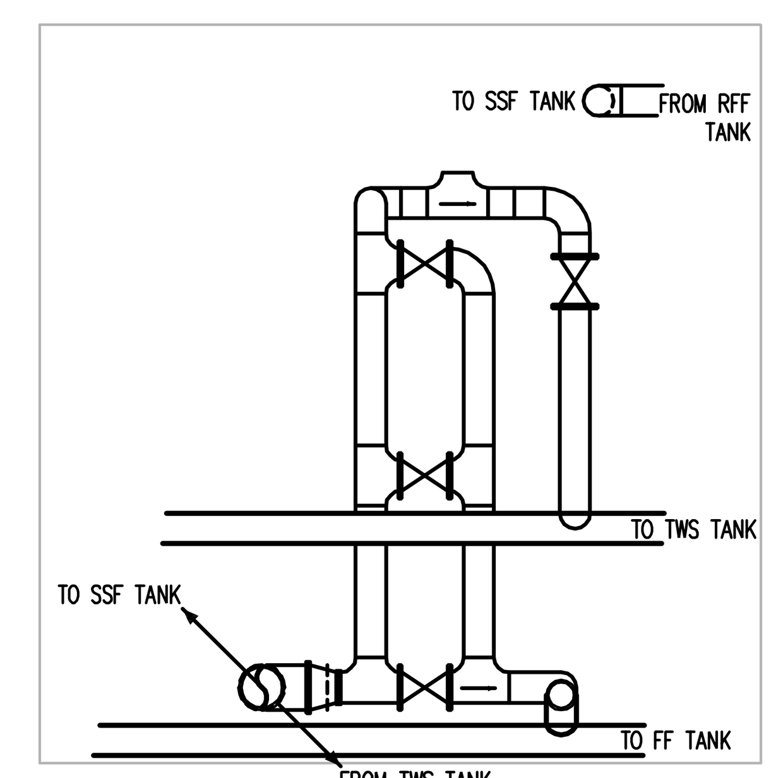

N STANDPIPE
M202 SCALE: 1:50

REVISIONS

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WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

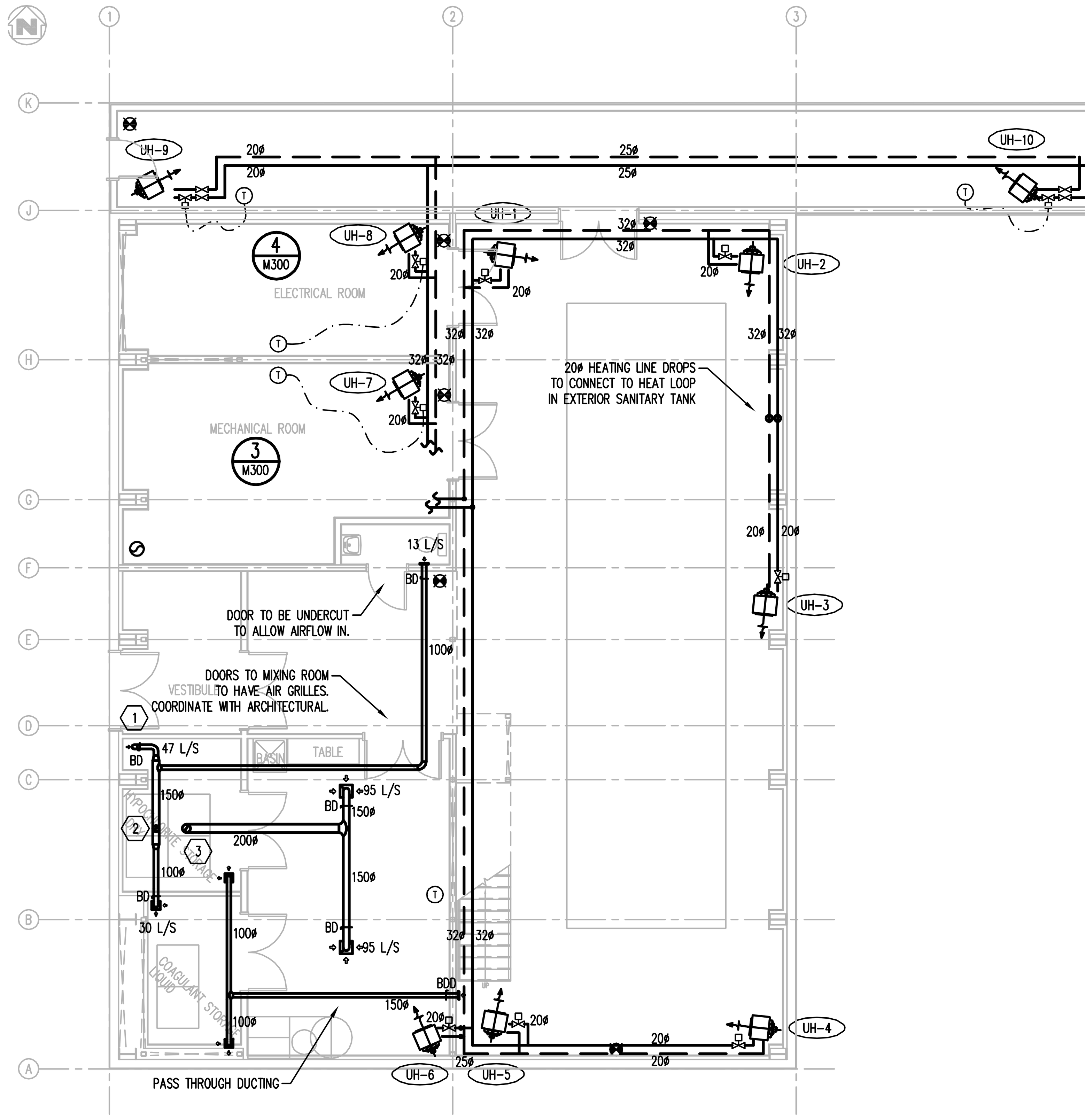
JOB. TITLE:

WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE:

MECHANICAL PROCESS PIPING

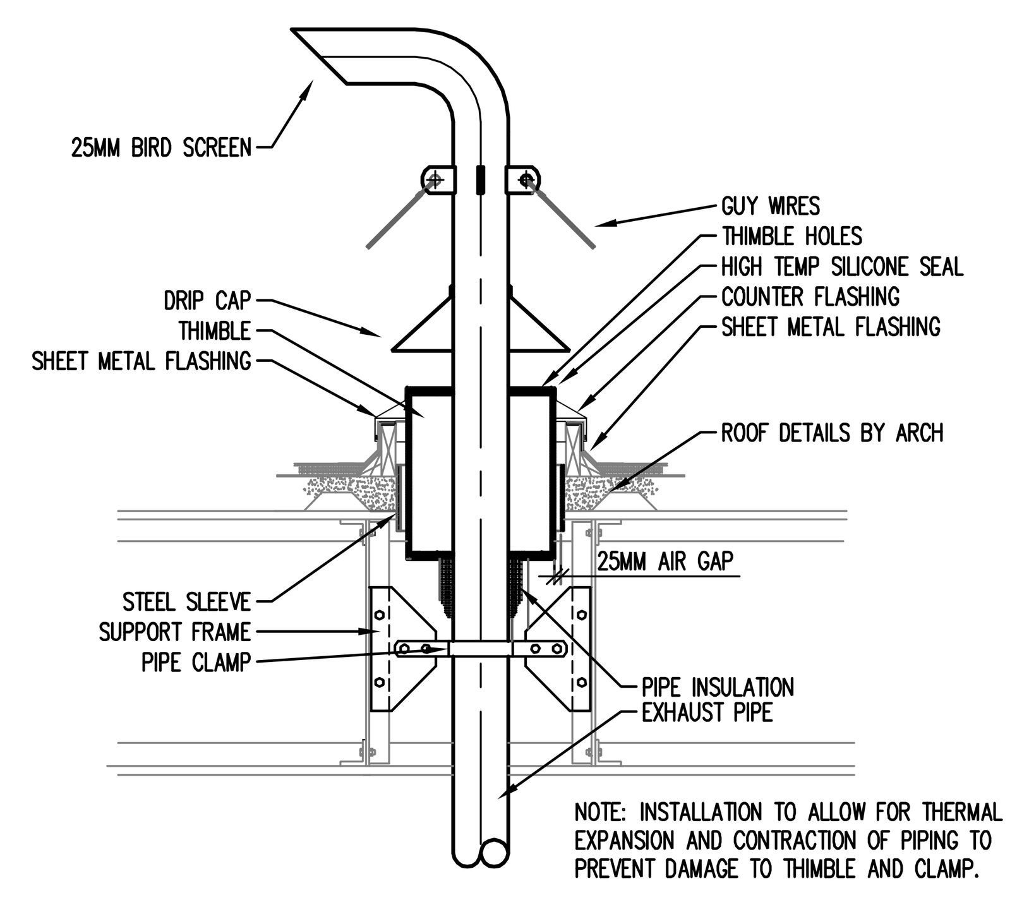
DWN. BY: TAG	DES. BY: TAG	PROJ. MGR.: JH
PEER REVIEW: BFG	DATE: (YY-MM-DD) 2012.12.14	SCALE: AS SHOWN
CLIENT PROJ. # 04-4417		WE PROJ. # 0013655.00
DWG # M202	OF 8	REV # 0



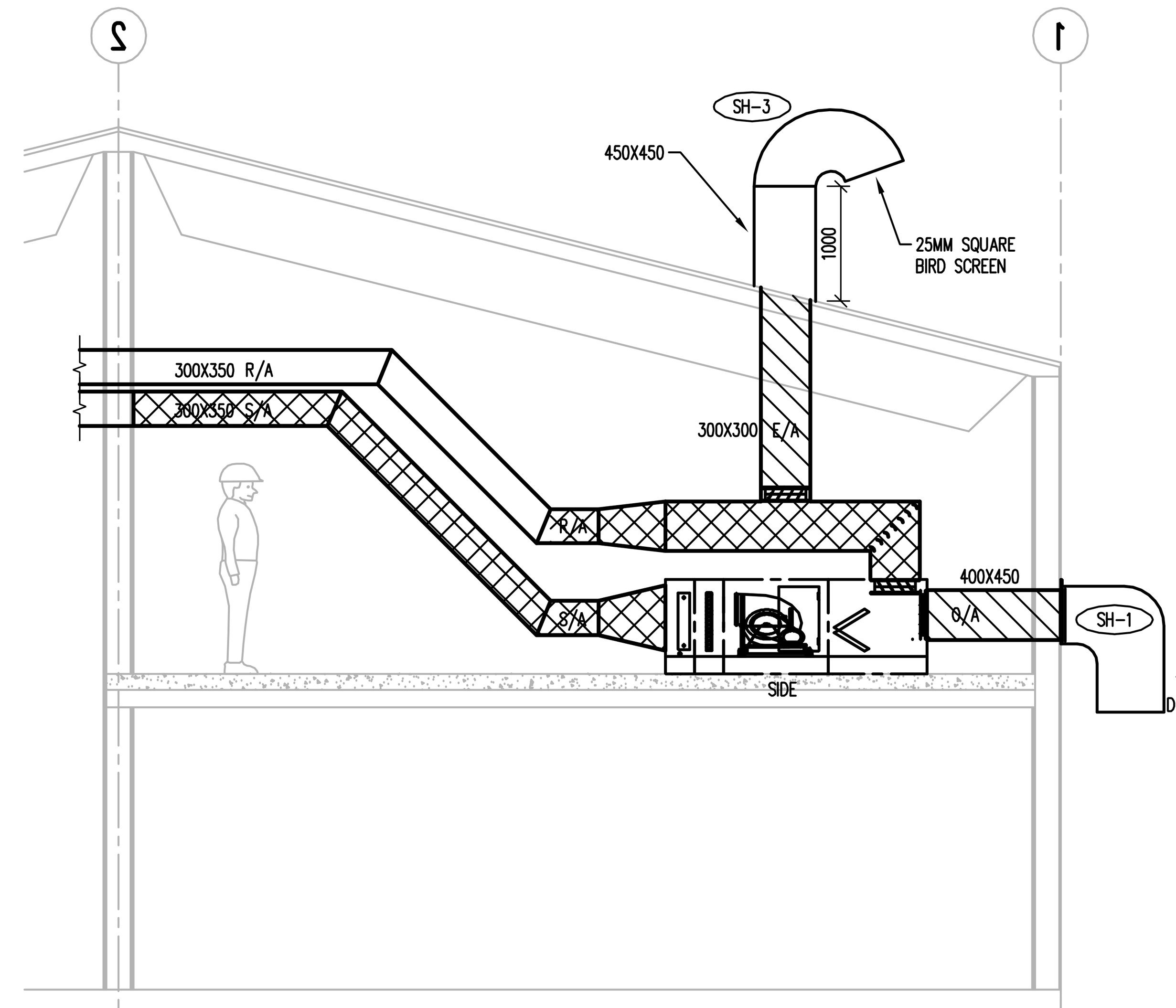
1 MAIN FLOOR LAYOUT
M300 SCALE: 1:100

KEYNOTES:

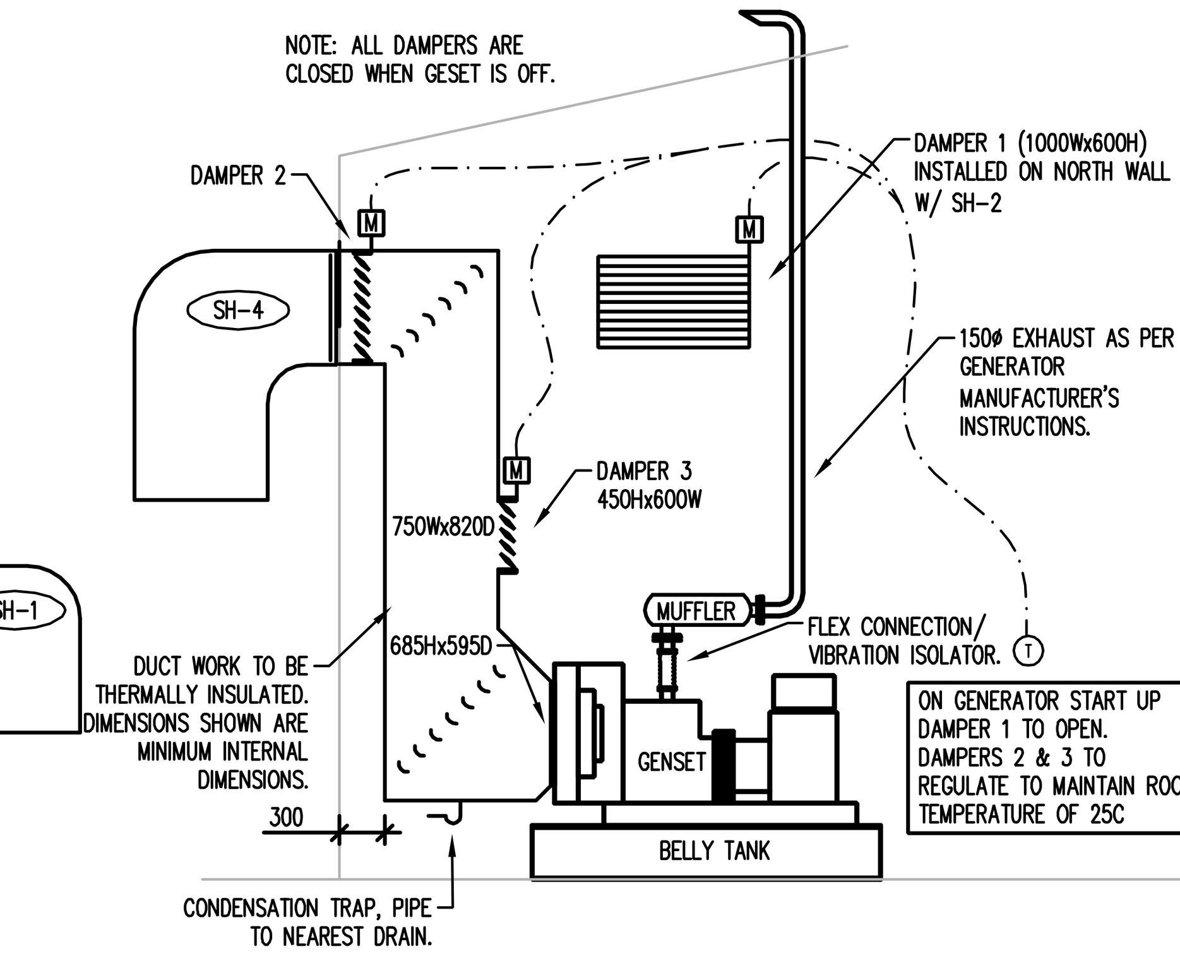
1. EXHAUST OPENING TO BE WITHIN 150 OF FLOOR.
2. CHEMICAL STORAGE/WASHROOM EXHAUST AIR DUCT TO CONNECT WITH EXHAUST FAN IN CEILING SPACE. 24HR CONTINUAL OPERATION.
3. MIXING AREA EXHAUST AIR DUCT TO CONNECT WITH EXHAUST FAN IN CEILING SPACE ABOVE CHEMICAL STORAGE. UNIT TO BE CONNECTED TO LIGHT SWITCH TO OPERATE WHEN ROOM OCCUPIED.
4. EXHAUST AIR DUCTS FROM EF-1 AND EF-2 UP THROUGH CEILING TO BE 200x200 THERMALLY INSULATED DUCTING. DUCTS TO TERMINATE INTO 300x300 GOOSE NECK SNOW HOOD SIMILAR TO SH-3.



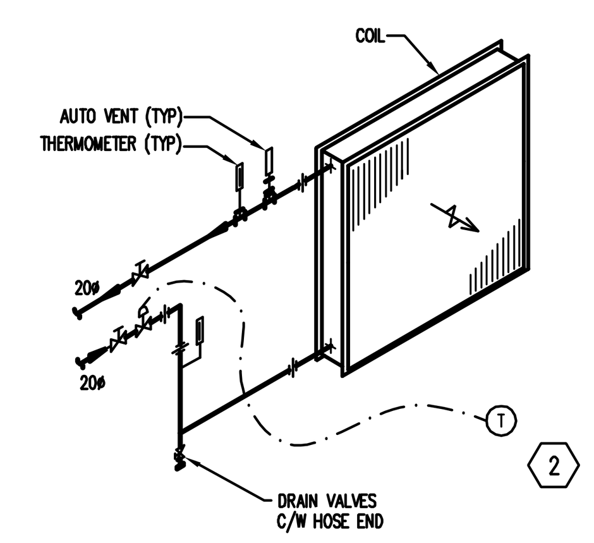
11 VERTICAL GENERATOR EXHAUST DETAIL
M300 SCALE: NTS



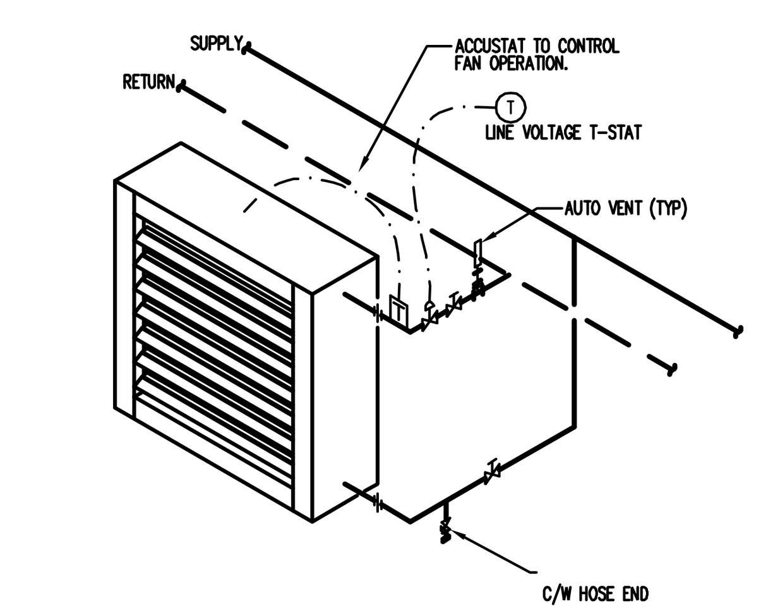
A AHU ARRANGEMENT
M300 SCALE: 1:50



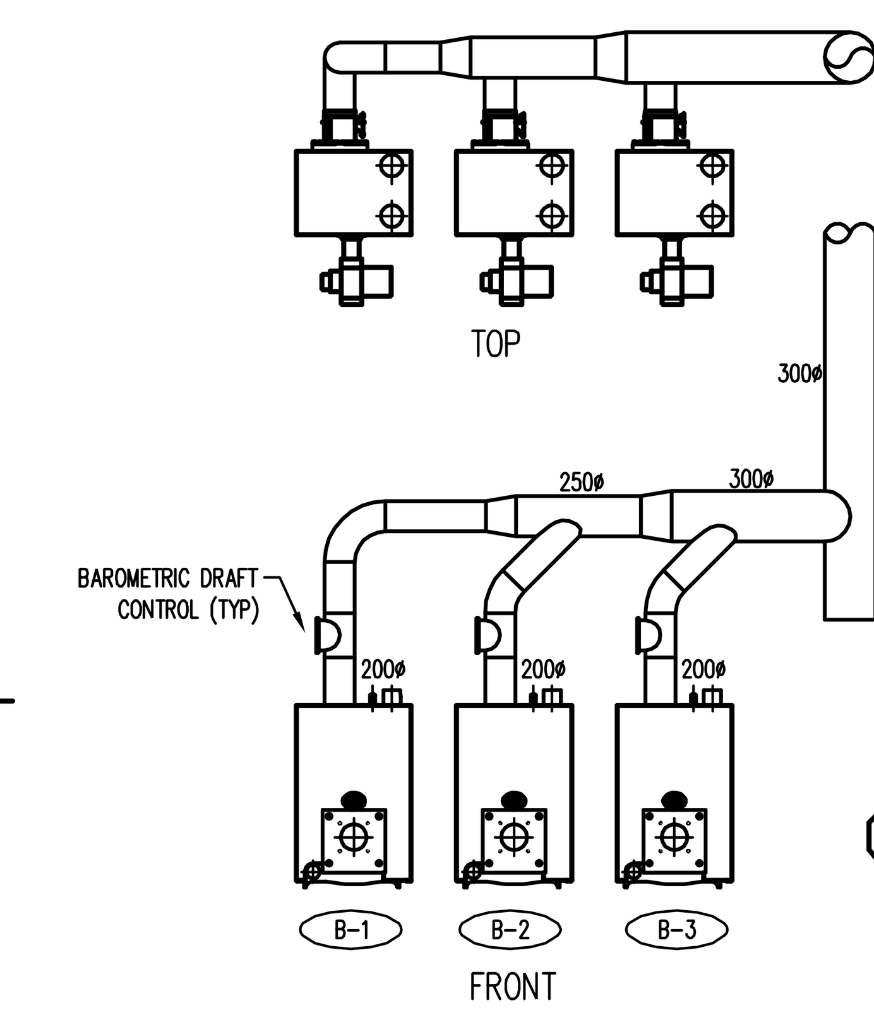
B GENSET ARRANGEMENT
M300 SCALE: 1:50



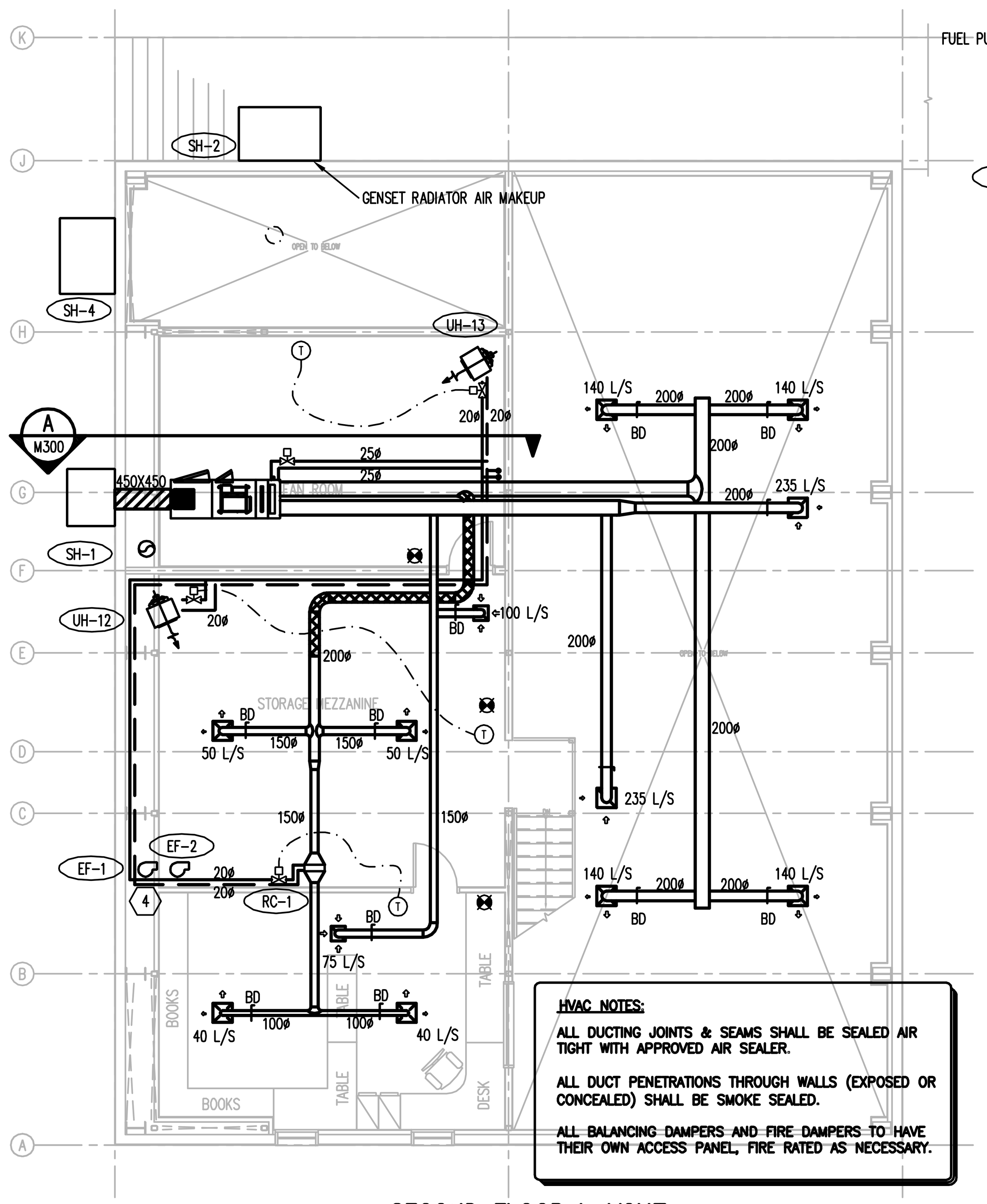
5 DETAIL - HEAT COIL
M300 NTS



6 DETAIL - UNIT HEATER (HORIZONTAL)
M300 NTS



7 BOILER FLUE
M300 SCALE: 1:50



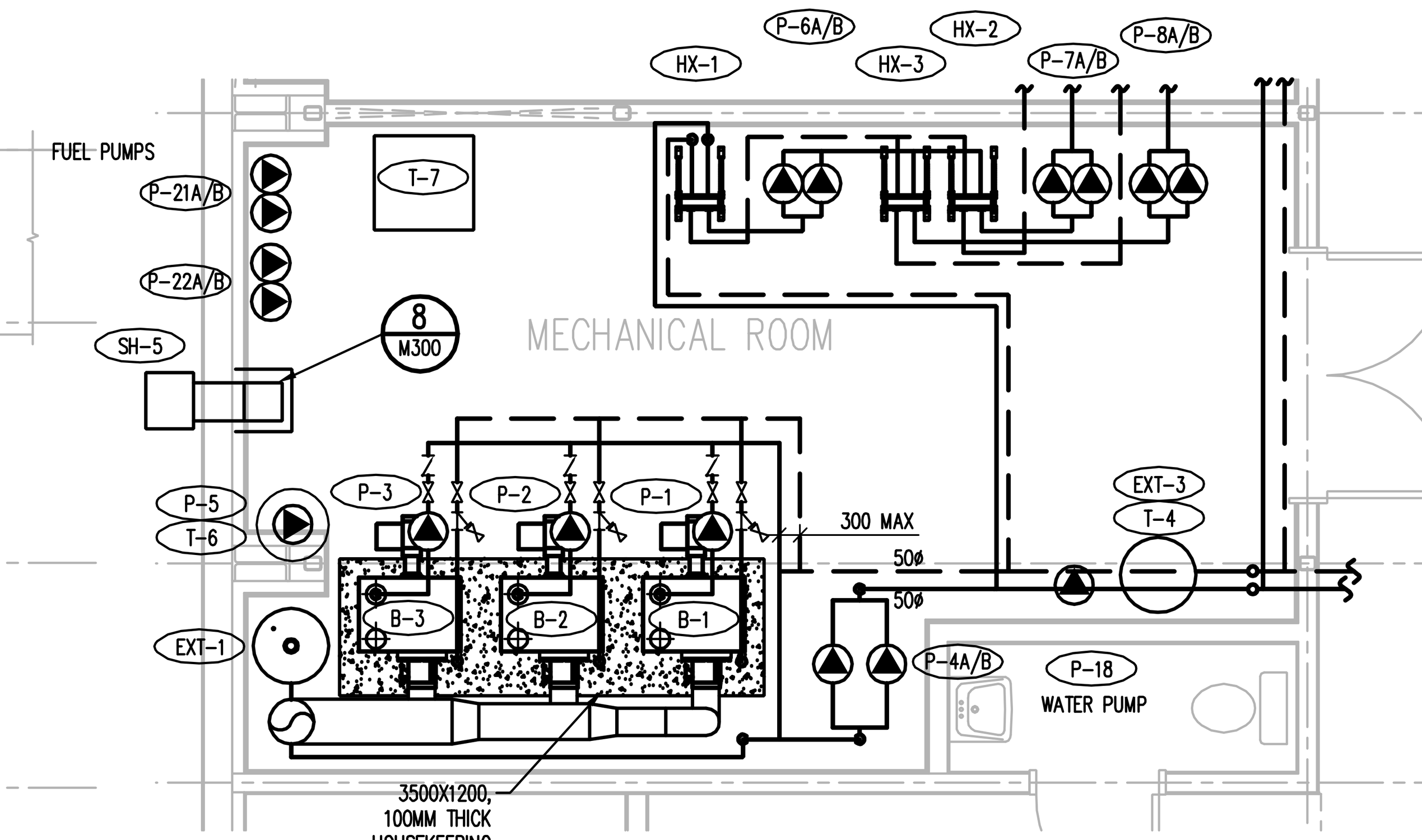
HVAC NOTES:

ALL DUCTING JOINTS & SEAMS SHALL BE SEALED AIR TIGHT WITH APPROVED AIR SEALER.

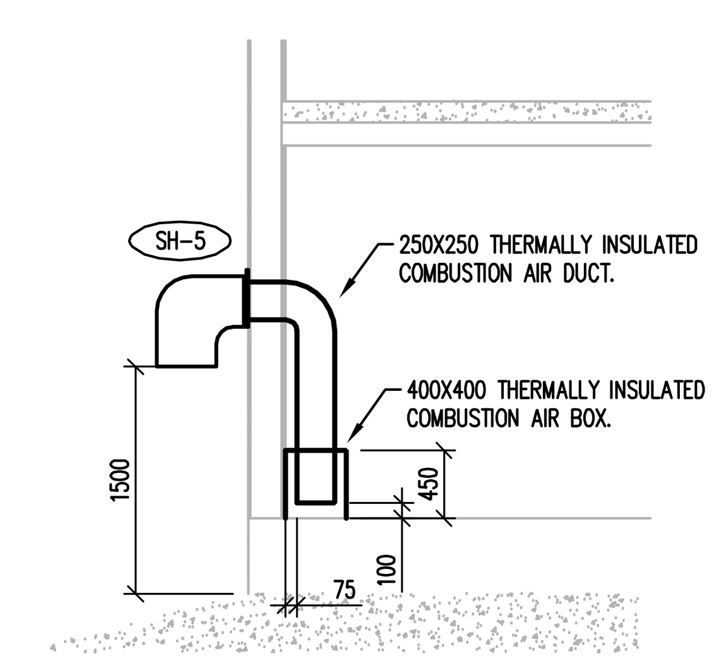
ALL DUCT PENETRATIONS THROUGH WALLS (EXPOSED OR CONCEALED) SHALL BE SMOKE SEALED.

ALL BALANCING DAMPERS AND FIRE DAMPERS TO HAVE THEIR OWN ACCESS PANEL, FIRE RATED AS NECESSARY.

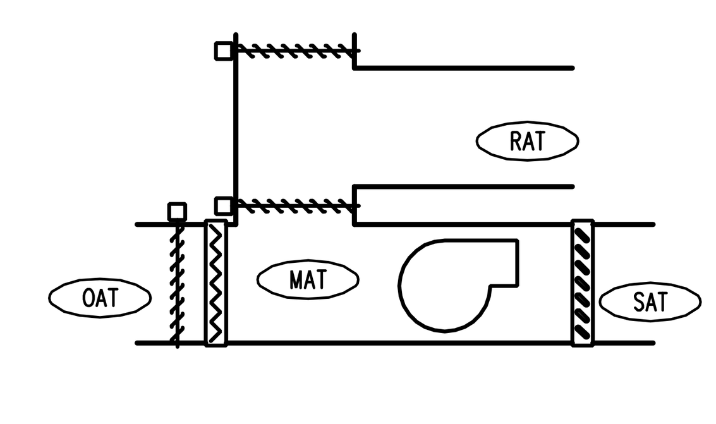
2 SECOND FLOOR LAYOUT
M300 SCALE: 1:100



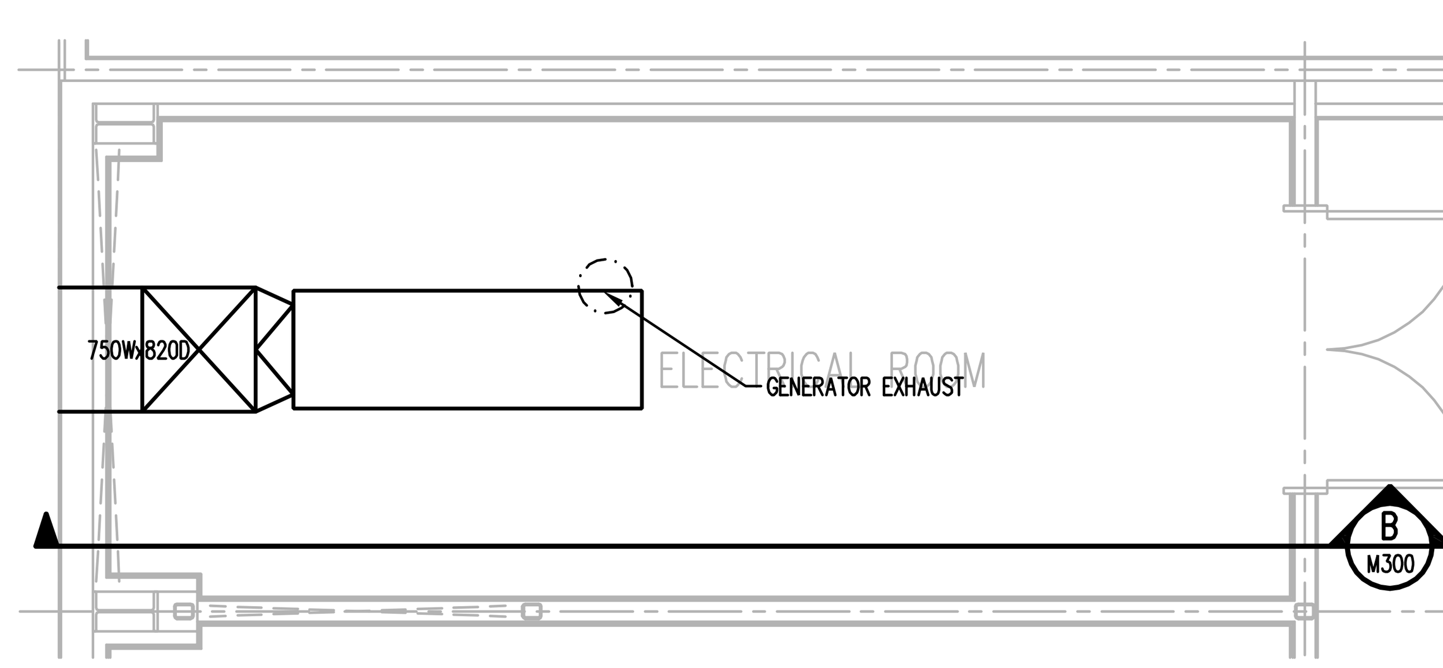
3 MECHANICAL ROOM LAYOUT
M300 SCALE: 1:50



8 COMBUSTION AIR DETAIL
M300 SCALE: 1:50



9 AHU SCHEMATIC
M300 SCALE: 1:100



4 ELECTRICAL ROOM LAYOUT
M300 SCALE: 1:50

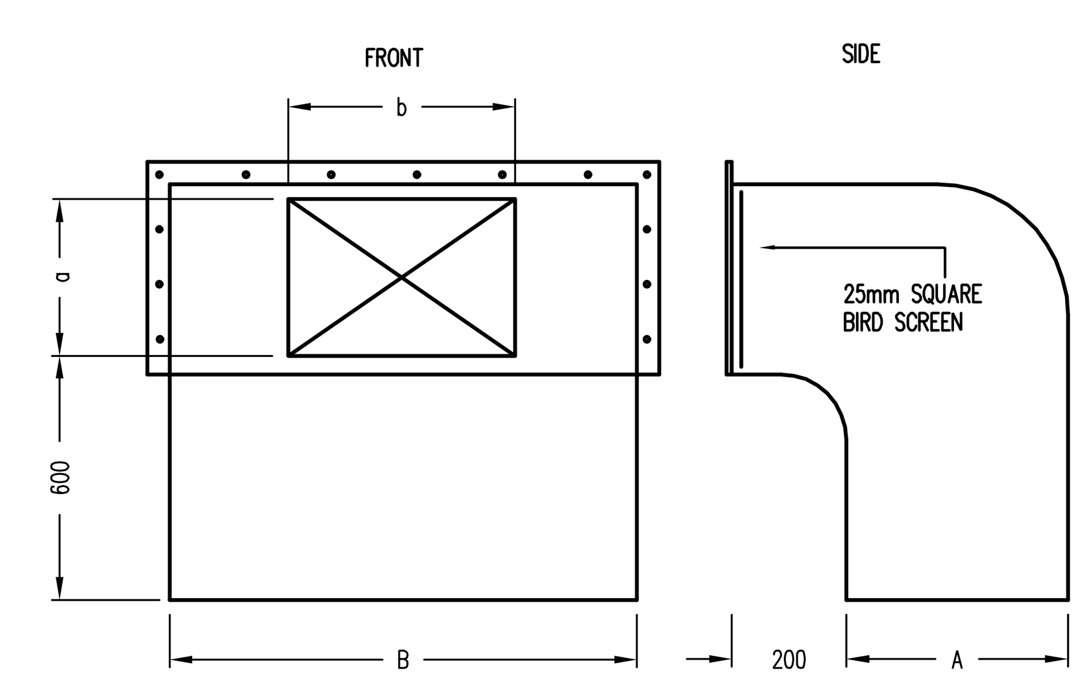
VENTILATION SCHEDULE [L/S]			
ROOM	S/A	E/A	R/A
VESTIBULE	0	0	0
SKID AREA	560	0	470
WASHROOM	0	13	0
MIXING ROOM	A	A	0
CHLORINE STORAGE	B	47	0
COAGULANT STORAGE	B	30	0
MECHANICAL ROOM	0	0	0
ELECTRICAL ROOM	0	0	0
PIPE GALLERY	0	0	0
OFFICE	80	0	75
DRY STORAGE	100	0	100
FAN ROOM	0	0	0

A – E/A @ 190 TO ACTIVATE WHEN ROOM LIGHT TURNED ON. S/A PROVIDED BY DOORS WITH AIR GRILLS & UNDERCUT

B – S/A PROVIDED BY DUCTING FROM SKID AREA

	a	b	A	B
SH-1	450	450	500	800
SH-2	600	1000	900	1050
SH-3	300	300	450	450
SH-4	720	850	900	1050
SH-5	250	250	300	400

NOTE: SH-3 IS A VERTICAL MOUNTED SNOW HOOD ON THE ROOF. HOOD TO FACE DOWN SLOPE OF ROOF.
SH-5 TO DROP 400MM NOT 600MM.



10 SNOWHOOD DETAIL
M300 SCALE: NTS (1:20)

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.04	TAG	

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

ENGINEER'S SEAL:

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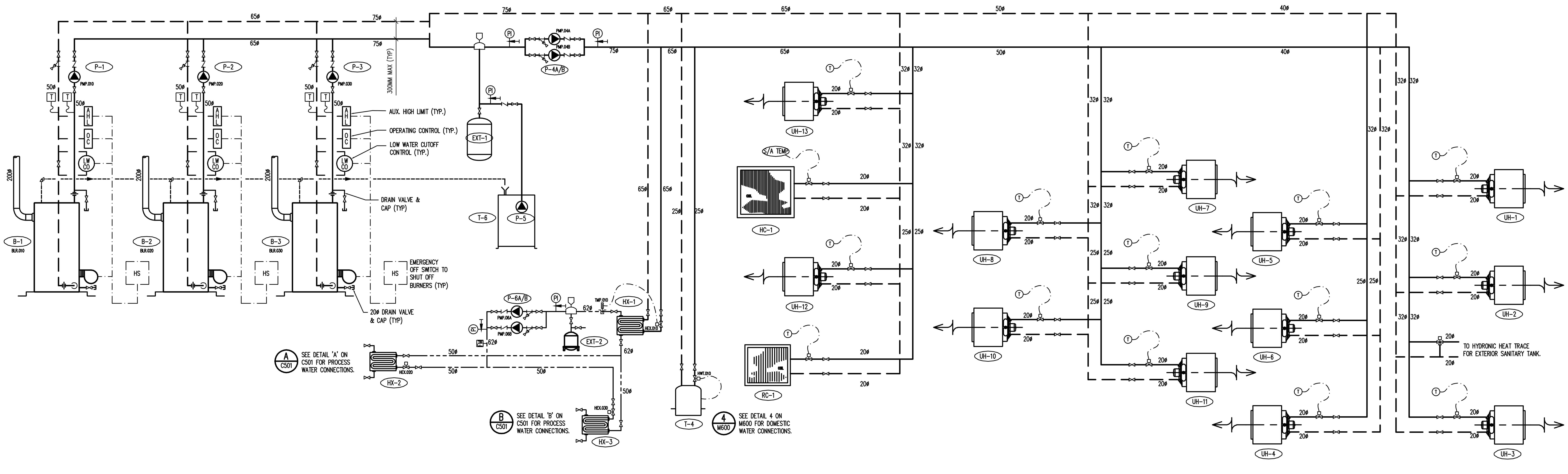
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

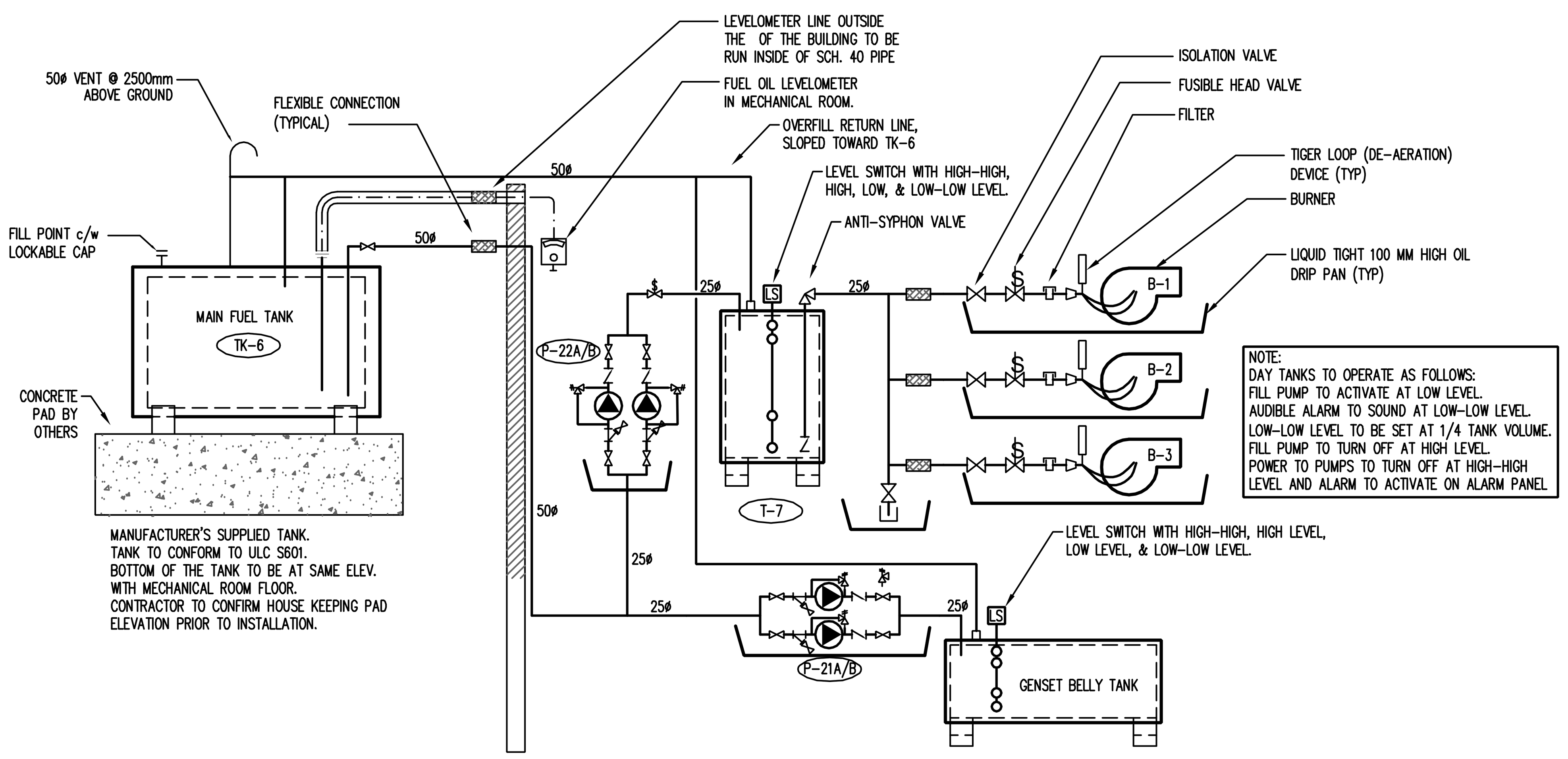
JOB TITLE: WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE: MECHANICAL HVAC LAYOUT & DETAILS

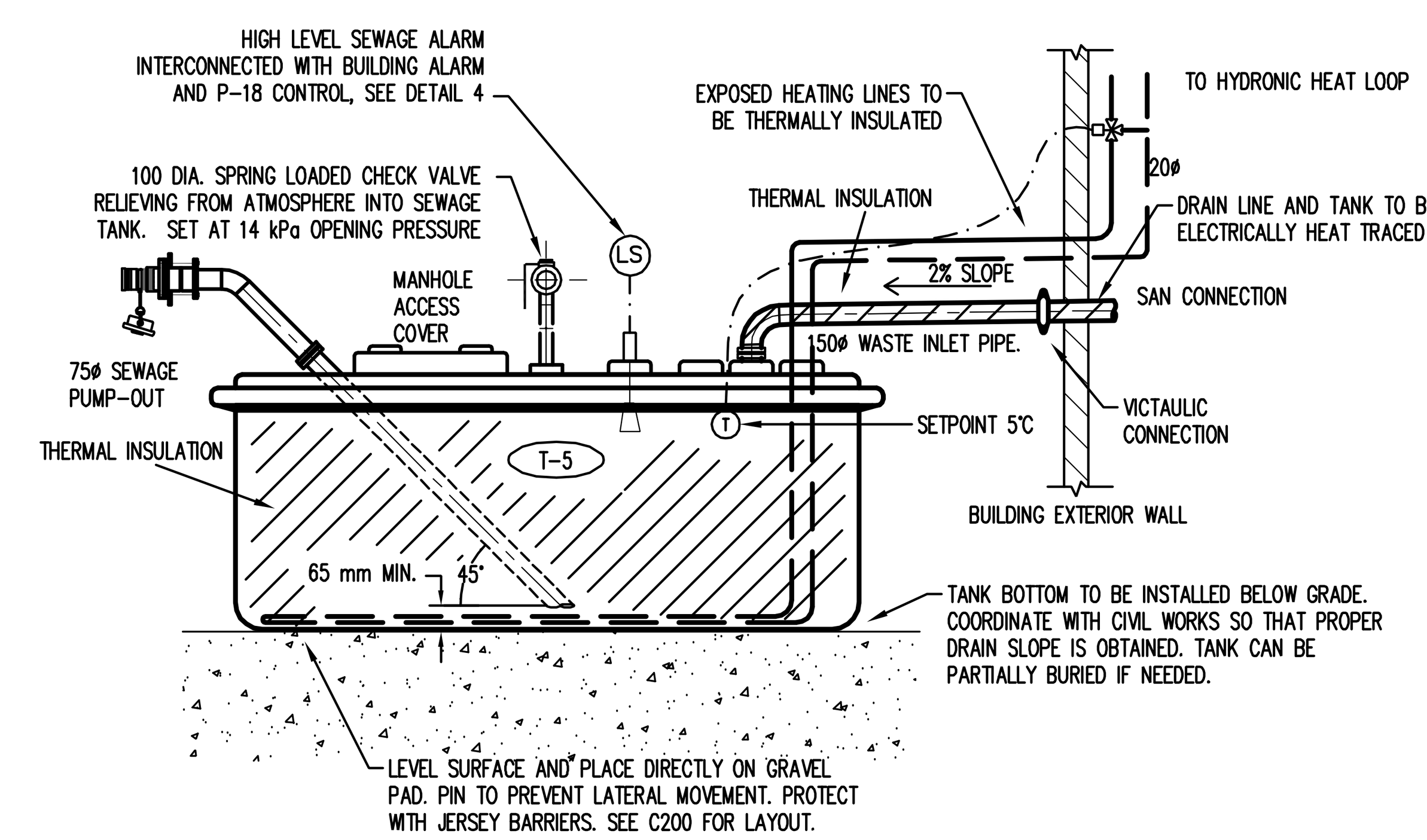
DWN. BY: TAG	DES. BY: TAG	PROJ. MGR.: JH
PEER REVIEW: EC/BFG	DATE: (YY-MM-DD) 2012.12.10	SCALE: AS SHOWN
CLIENT PROJ. #:	04-4417	WE PROJ. #: 0013655.00
DWG #: M300	OF: 8	REV #: 0



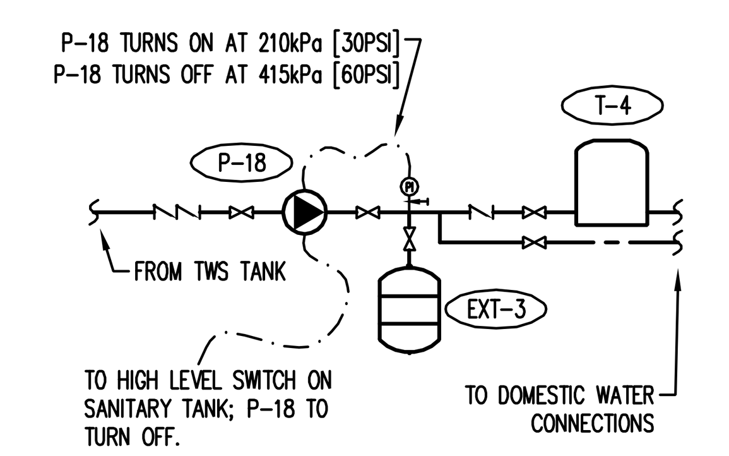
1 HEATING SCHEMATIC
M600 NTS



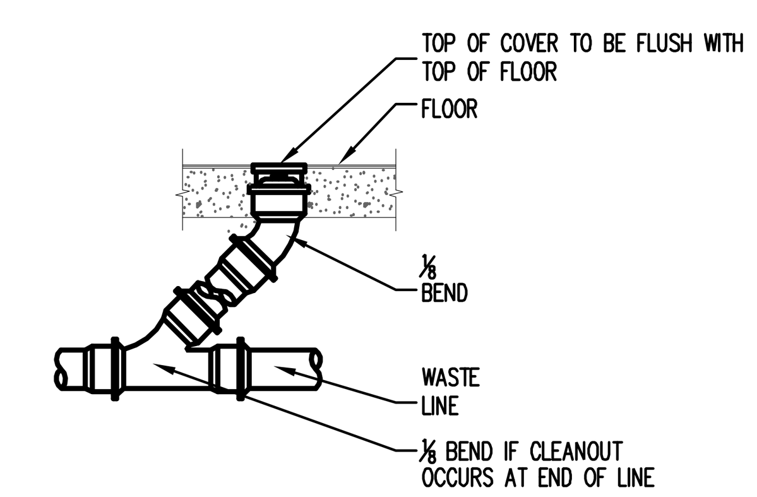
2 FUEL SYSTEM SCHEMATIC
M600 SCALE: NTS



3 SANITARY TANK DETAIL
M600 SCALE NTS



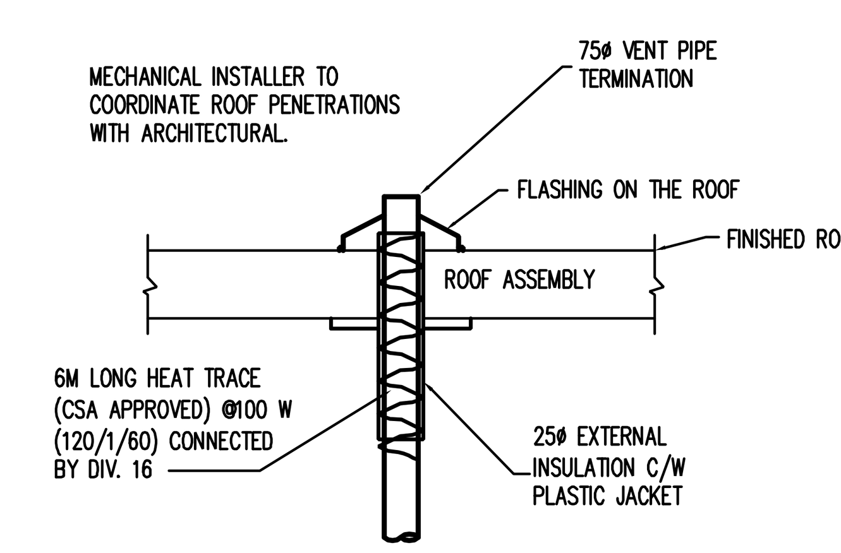
4 DOMESTIC WATER SCHEMATIC
M600 SCALE: NTS



5 FLOOR CLEAN OUT DETAIL
M600 SCALE: NTS

GENERAL NOTES:

1. HEATING SYSTEM TO OPERATE AT 150F WHEN OAT > 0C, AT 160F WHEN 0C > OAT > -20C, AND AT 170F WHEN OAT < -20C. HEATING SYSTEM TO TURN OFF WHEN OAT > 15C.
2. BOILERS ARE TO FIRE IN STAGES BASED ON GLYCOL SUPPLY AND RETURN TEMPERATURE DIFFERENCE OF 8C.
3. BOILER ARE TO ROTATE PRIMARY TO SECONDARY, SECONDARY TO TERTIARY, TERTIARY TO PRIMARY, EVERY SIX (6) MONTHS.



10 ARCTIC VENT DETAIL
M100 SCALE: NTS

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.04	TAG	

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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DETAIL # / SOURCE / REFERENCE DWG.

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WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

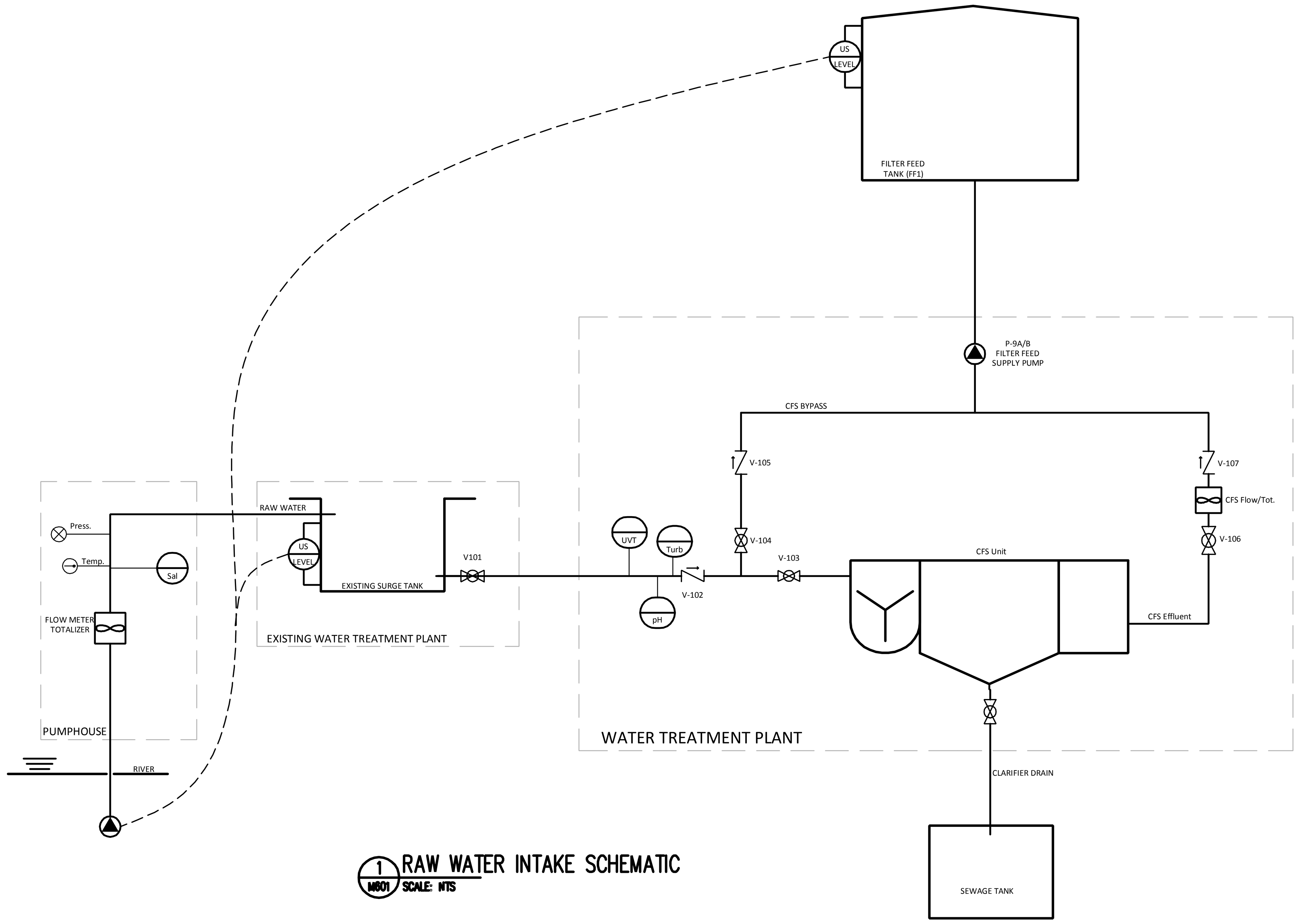
JOB TITLE:

WATER SUPPLY IMPROVEMENTS PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

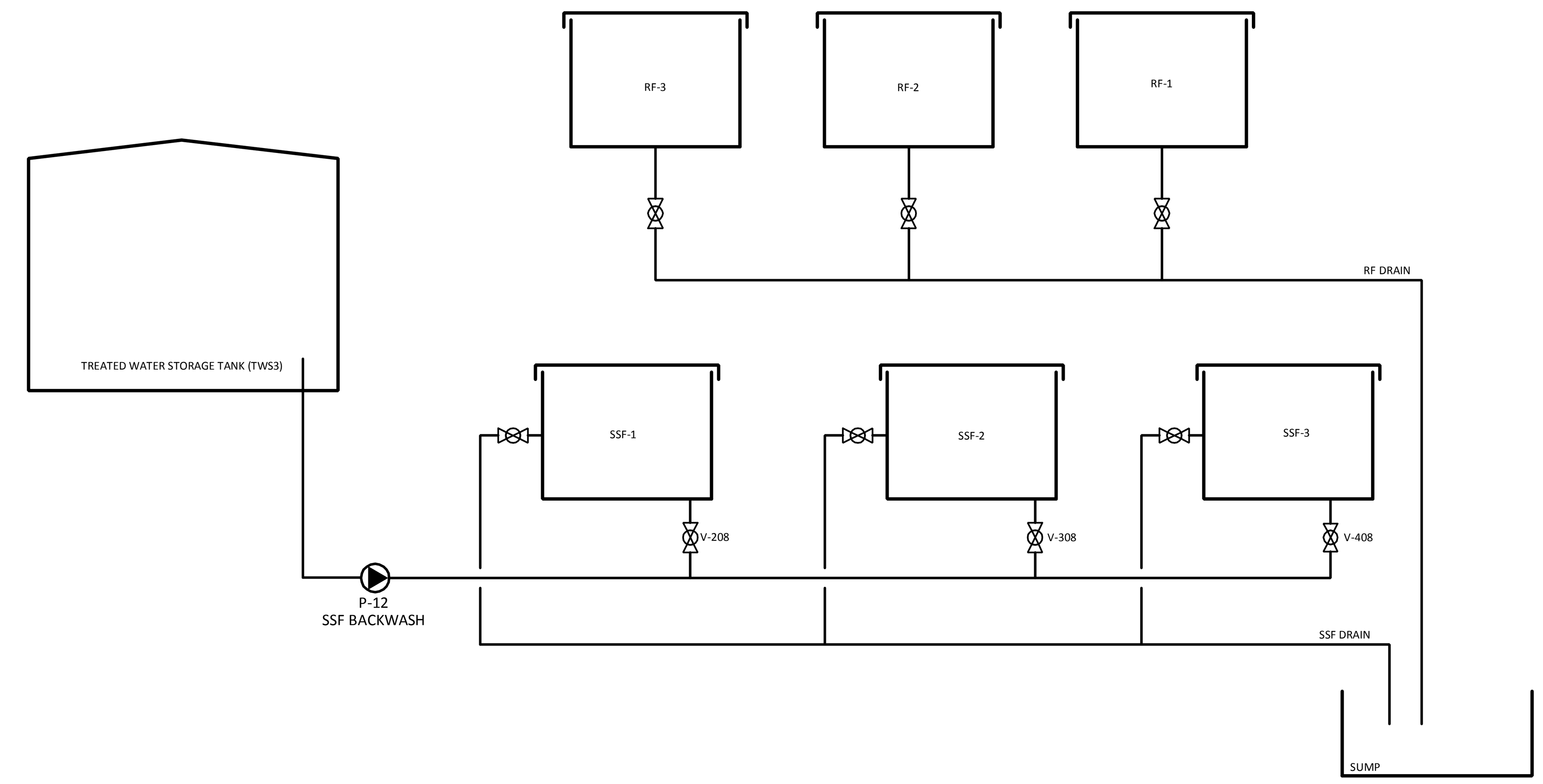
DWG. TITLE:

MECHANICAL SCHEMATICS & DETAILS

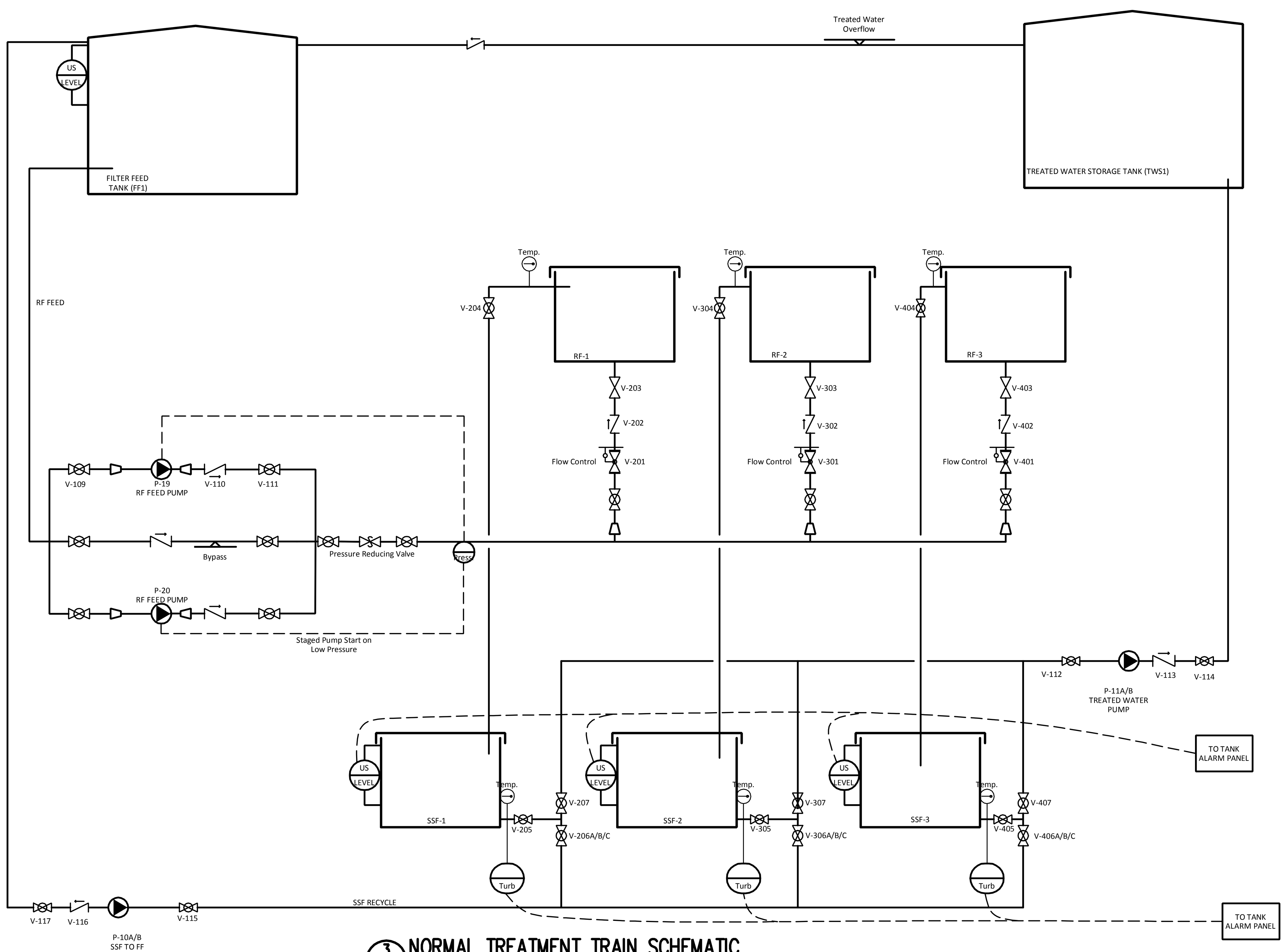
DWN. BY: TAG	DES. BY: TAG	PROJ. MGR.: JH
PEER REVIEW: BFC	DATE: (YY-MM-DD) 2011.11.25	SCALE: AS SHOWN
CLIENT PROJ. #: 04-4417		WE PROJ. #: 0013655.00
DWG #: M600	SEQ: 8	REV: 0



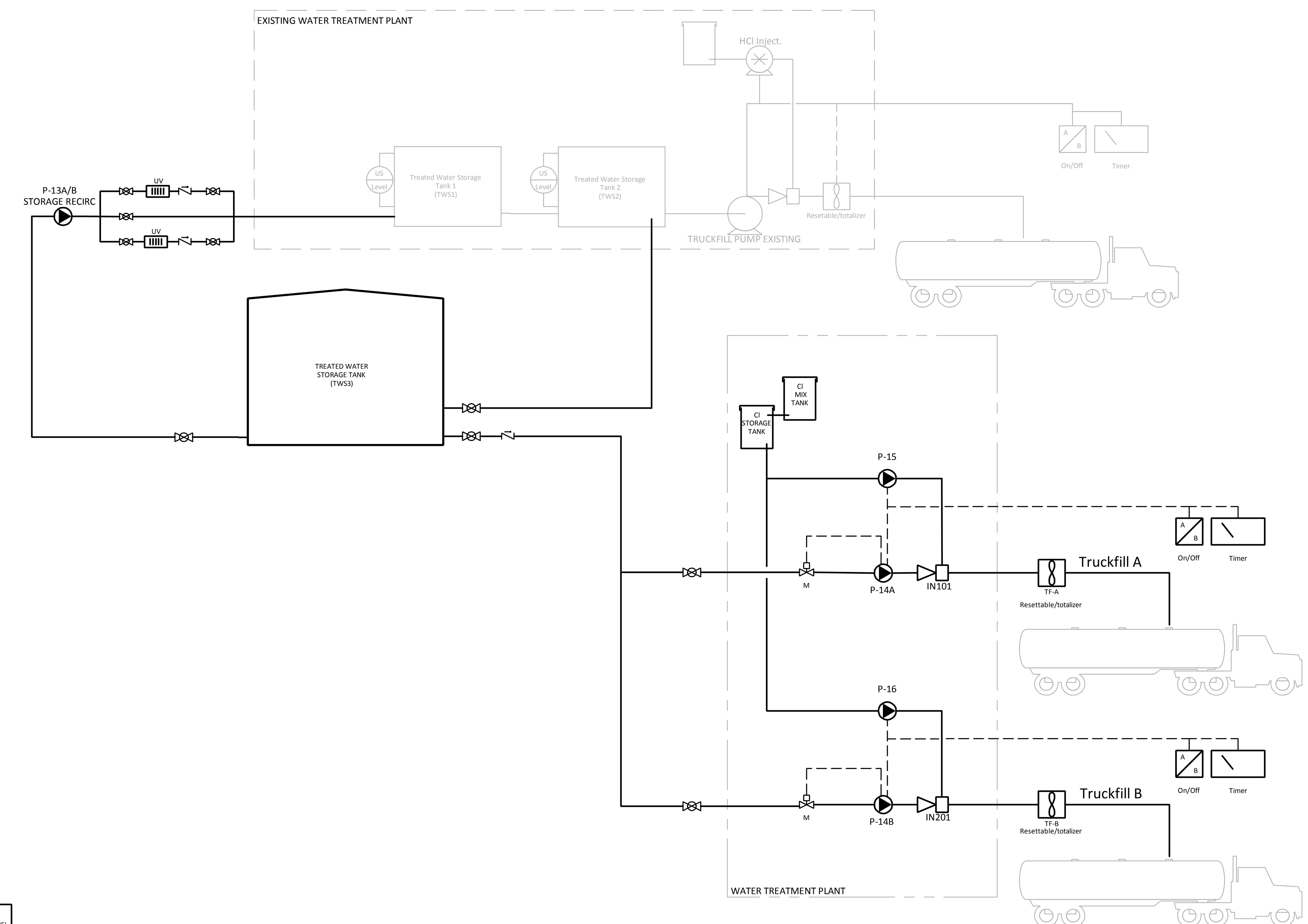
1 M601 RAW WATER INTAKE SCHEMATIC
SCALE: NTS



2 M601 FILTER CLEANING SCHEMATIC
SCALE: NTS



3 M601 NORMAL TREATMENT TRAIN SCHEMATIC
SCALE: NTS



4 M601 WATER RECIRCULATION AND TRUCKFILL SCHEMATIC
SCALE: NTS

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.04	TAG	

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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

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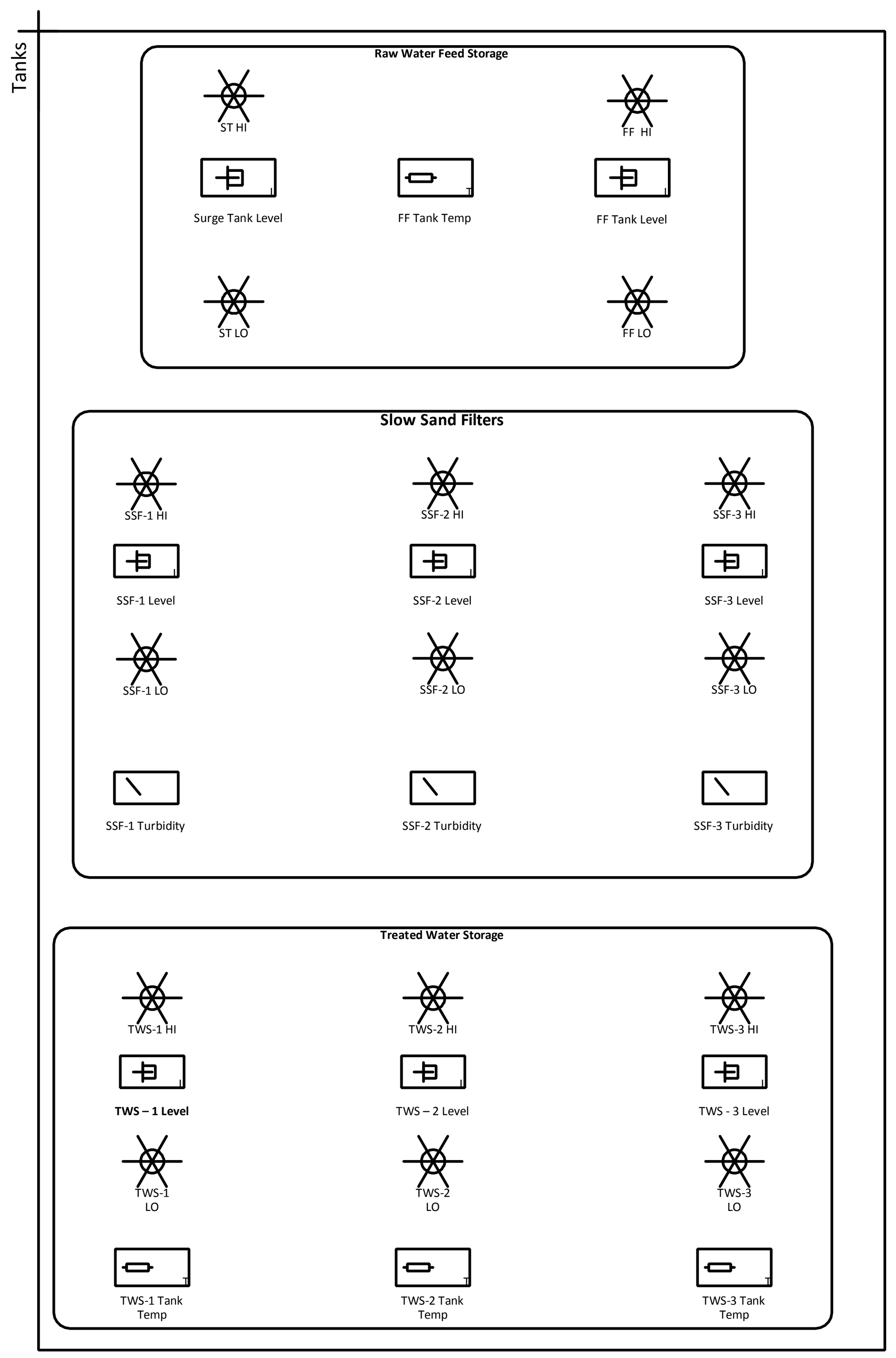
WILLIAMS ENGINEERING CANADA

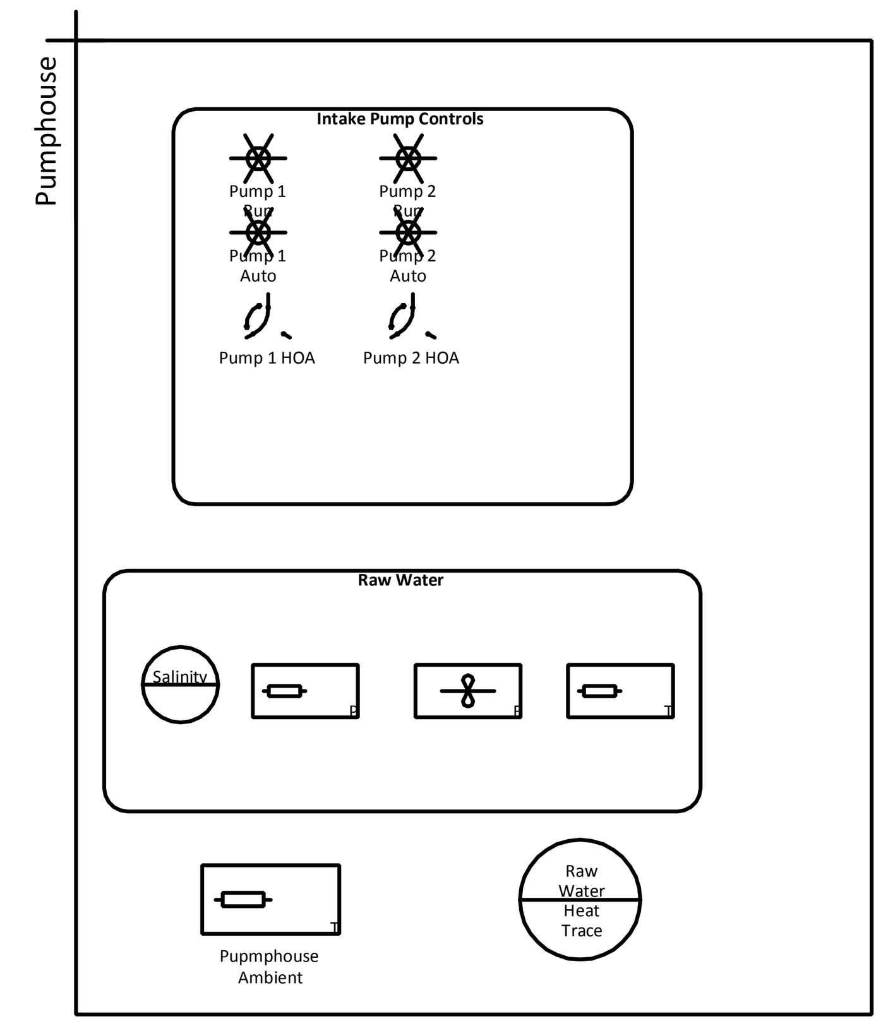
CLIENT: Nunavut

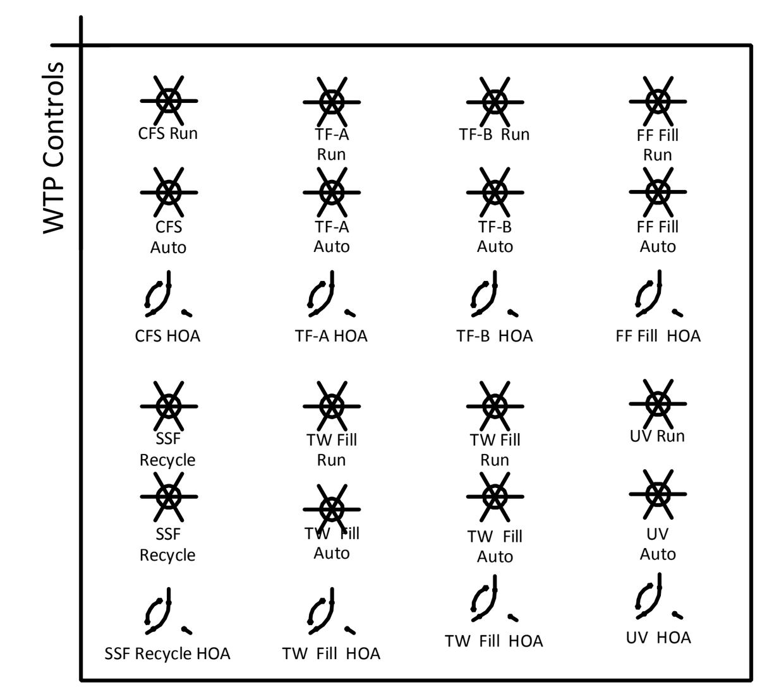
JOB. TITLE:
WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT
KUGLUKTUK, NU

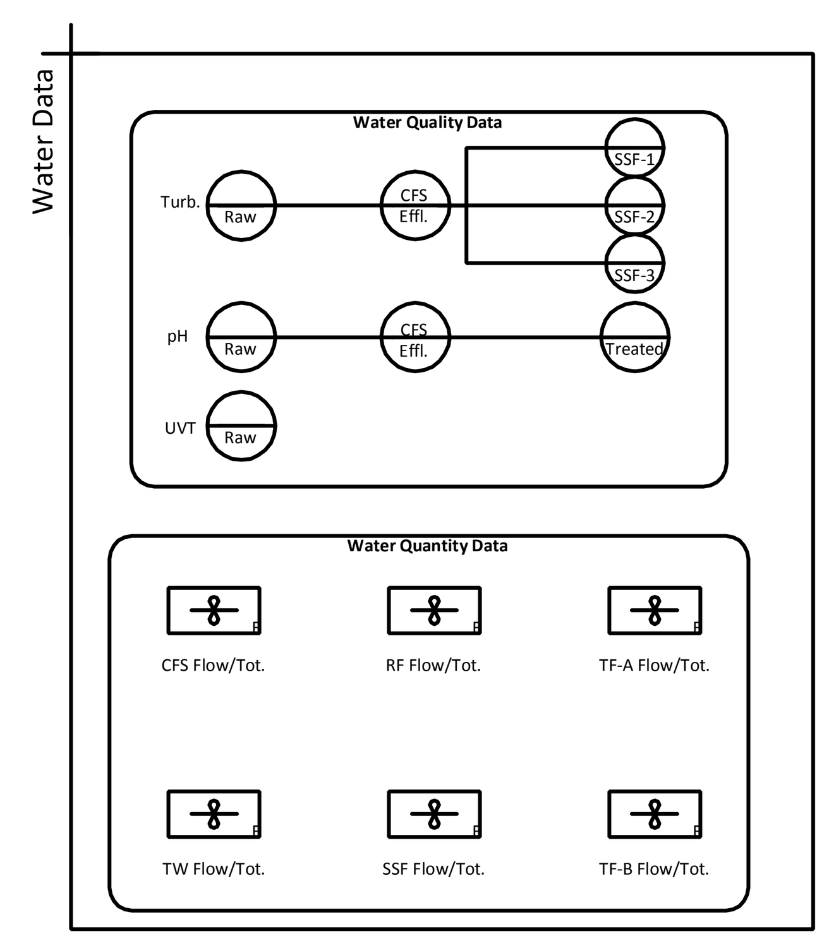
DWG. TITLE:
MECHANICAL SCHEMATICS & DETAILS

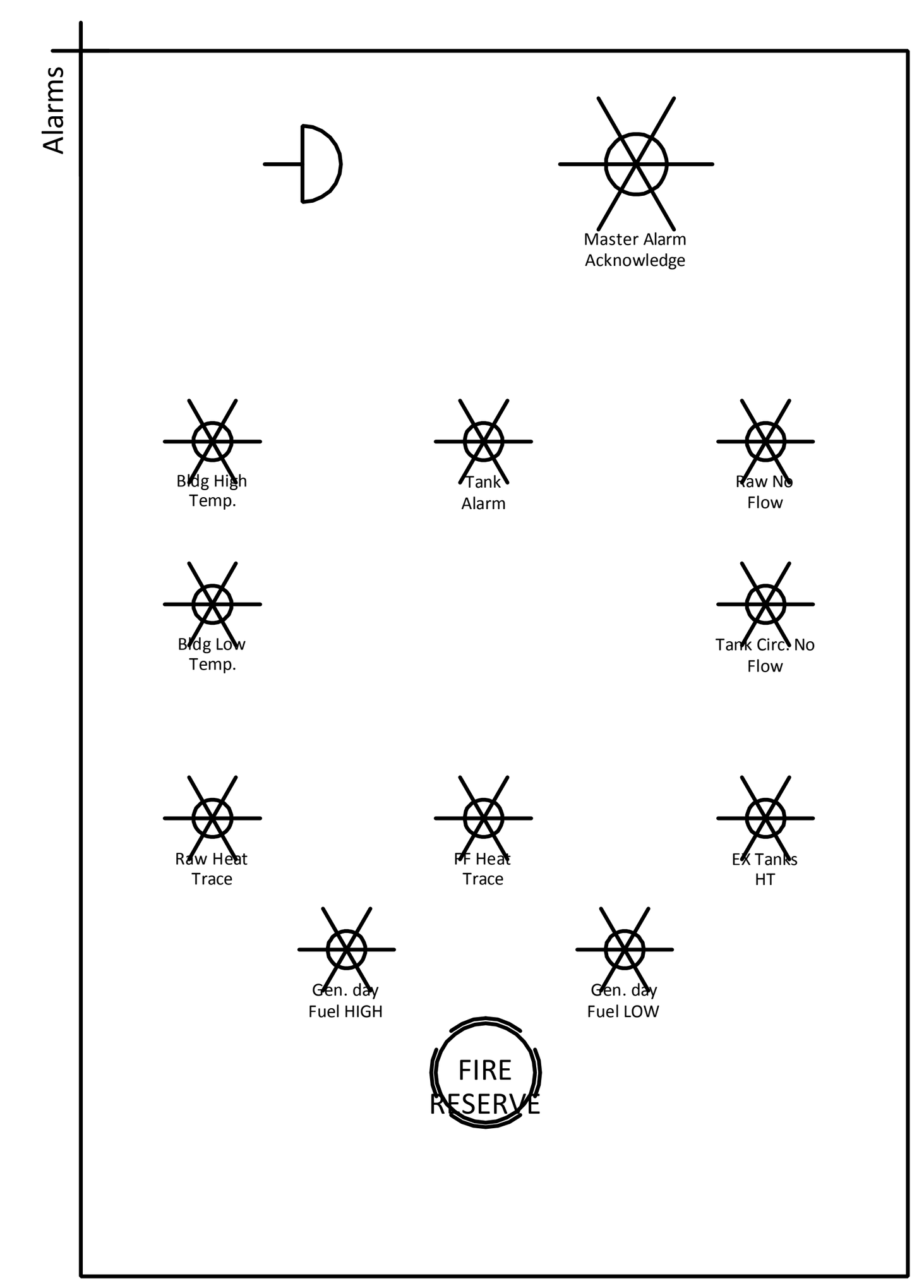
DWN. BY: JC	DES. BY: JC	PROJ. MGR.: JH
PEER REVIEW:	DATE: (YY-MM-DD) 2012.12.14	SCALE: AS SHOWN
CLIENT PROJ. # 04-4417		WE PROJ. # 0013655.00
DWG # M601	OF 8	REV # 0











REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
0	ISSUED FOR TENDER	2014.03.04	TAG	

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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

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WILLIAMS ENGINEERING CANADA

CLIENT:

Nunavut

JOB TITLE:

WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE:

INSTRUMENTATION

DWN. BY: JC	DES. BY: JC	PROJ. MGR.: JH
PEER REVIEW	DATE: (YY-MM-DD) 2012.12.14	SCALE: AS SHOWN
CLIENT PROJ. # 04-4417		WE PROJ. # 0013655.00
DWG # M602	8	REV 0

1. GENERAL REQUIREMENTS

IN THE FOLLOWING SECTIONS, "ENGINEER" REFERS TO THE STRUCTURAL DESIGN ENGINEER OF RECORD FOR THIS WORK.

1.1 EXECUTION:

PERFORM WORK IN ACCORDANCE WITH NATIONAL BUILDING CODE OF CANADA 2010; AND LOCAL CODES, BY-LAWS, ORDINANCES, AND SAFETY REGULATIONS. THE COMPLETE WORK UNDER THESE TRADES SHALL BE GOVERNED BY THE DICTATES OF GOOD PRACTICE IN ALL DETAILS OF MATERIALS AND METHODS, EVEN IF NOT MINUTELY SPECIFIED. PROPERLY COORDINATE THE WORK WITH THE REQUIREMENTS OF OTHER UNITS OF WORK SPECIFIED IN OTHER SECTIONS. THE DRAWINGS DESCRIBE THE COMPLETED PROJECT, AND DO NOT INDICATE COMPONENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY IN-AND-ABOUT THE JOB SITE DURING CONSTRUCTION, AND THE DESIGN AND ERECTION OF ALL TEMPORARY STRUCTURES, FORMWORK, FALSEWORK, SHORING, ETC., REQUIRED TO COMPLETE THE PROJECT. MAINTAIN THE WORK, INCLUDING ROOF AND BUILDING SYSTEMS, AT LEAST ON A DAILY BASIS, FREE FROM ACCUMULATIONS OF WASTE MATERIAL AND DEBRIS. IN PREPARATION FOR FINAL ACCEPTANCE OF THE PROJECT ON AN INTERIM, OR FINAL CERTIFICATE OF COMPLETION, PERFORM FINAL CLEANING.

1.2 STANDARDS:

.1 NATIONAL BUILDING CODE OF CANADA: NBC 2010
.2 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION: CSA A23.1-09
.3 METHODS OF TEST AND STANDARD PRACTICES FOR CONCRETE: CSA A23.2-09
.4 DESIGN OF CONCRETE STRUCTURES: CSA A23.3-04 (R2010)
.5 ACI BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY: ACI 318-08
.6 CONCRETE FORMWORK: CSA S269.3-M92 (R2008)
.7 CARBON STEEL BARS FOR CONCRETE REINFORCEMENT: CSA G30.18-09
.8 STANDARD SPECIFICATION FOR STEEL WELDED WIRE REINFORCEMENT, PLAIN, FOR CONCRETE: ASTM A185/A185M-07
.9 STANDARD SPECIFICATION FOR STEEL WELDED WIRE REINFORCEMENT, DEFORMED, FOR CONCRETE: ASTM A497/A497M-07
.10 STANDARD SPECIFICATION FOR EPOXY-COATED STEEL REINFORCING BARS: ASTM A775/A775M-07
.11 DESIGN OF STEEL STRUCTURES: CSA S16-09
.12 NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS: CSA S136-07
.13 GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL/STRUCTURAL QUALITY STEEL: CSA G40.20-04/G40.21-04 (R2009)
.14 STANDARD SPECIFICATION FOR STRUCTURAL BOLTS, STEEL, HEAT TREATED, 120/105 KSI MINIMUM TENSILE STRENGTH: ASTM A325-10/A325M-09
.15 WELDED STEEL CONSTRUCTION (METAL ARC WELDING): W59-03 (R2008)
.16 STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED OR ZINC-IRON ALLOY-COATED BY THE HOT-DIP PROCESS: A653-09/A653M-09
.17 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT: ASTM D698-07
.18 ENGINEERING DESIGN IN WOOD: CSA 086-01 (R2006)
.19 CONSTRUCTION OF PRESERVED WOOD FOUNDATIONS: CSA S406-92 (R2008)
.20 WOOD PRESERVATION: CSA 080 SERIES-08
.21 DOUGLAS FIR PLYWOOD: CSA 0121-08
.22 STANDARDS ON OSB AND WAFERBOARD: CSA 0437 SERIES-93 (R2006)

1.3 LIVE LOADS (SERVICE):

.1 GROUND SNOW LOAD (Ss) - 2.6 KPA
.2 RAIN LOAD (Sr) - 0.1 KPA
.3 IMPORTANCE FACTOR FOR SNOW LOAD - ULS: 1.25, SLS: 0.9
.4 BASIC ROOF FACTOR FOR SNOW LOAD (Cb) - 0.8
.5 WIND EXPOSURE FACTOR FOR SNOW LOAD (Cw) - 1.0
.6 ROOF DESIGN SNOW LOAD (DRIFT CONDITIONS ON DRAWINGS) - 2.725 KPA
.7 WIND (1/50 HOURLY PRESSURE) - 0.46 KPA
.8 IMPORTANCE FACTOR FOR WIND LOAD - ULS: 1.25, SLS: 0.75
.9 EXPOSURE FACTOR FOR WIND LOAD (Ce) - 0.9
.10 WIND UPLIFT (SERVICE) - 1.52 KPA
.11 CORRIDORS, LOBBIES, AND AISLES - 4.8 KPA
.12 WASHROOM - 2.4 KPA
.13 OFFICE AREAS - 4.8 KPA
.14 MECHANICAL AND EQUIPMENT ROOMS - 3.6 KPA OR EQUIPMENT LOADS (WORST CASE)
.15 STORAGE AREAS: 4.8 KPA OR EQUIPMENT LOADS (WORST CASE)
    HYPOCHLORITE STORAGE - 20 KPA
    COAGULANT STORAGE - 20 KPA
.16 SKID PROCESS AREA - 25 KPA

1.4 DEAD LOADS (SERVICE):

.1 ROOF (UNLESS NOTED OTHERWISE):
    DEAD LOAD - 1.50 KPA
    SUPERIMPOSED DEAD LOAD - 1.0 KPA
.2 MEZZANINE (UNLESS NOTED OTHERWISE):
    DEAD LOAD - 3.43 KPA
    SUPERIMPOSED DEAD LOAD - 1.0 KPA
.3 FLOOR (UNLESS NOTED OTHERWISE):
    DEAD LOAD - 7.20 KPA
    SUPERIMPOSED DEAD LOAD - 0.5 KPA
    PARTITIONS: 1.00 KPA

NOTE: SUPERIMPOSED DEAD LOADS ARE NON-STRUCTURAL DEAD LOADS DUE TO MECHANICAL, ELECTRICAL, TOPPINGS, AND MISCELLANEOUS LOADINGS.

1.5 SEISMIC DATA:

Sa (0.2)	0.095
Sa (0.5)	0.057
Sa (1.0)	0.026
Sa (2.0)	0.008
PGA	0.036

1.6 GEOTECHNICAL INFORMATION:

.1 THE FOLLOWING INVESTIGATION REPORTS HAVE BEEN USED BY THE ENGINEER IN DESIGN AND PREPARATION OF THE DRAWINGS:
GEOTECHNICAL EVALUATION FOR WATER TREATMENT PLANT, KUGLUKTUK, NT - (Y14101445.001) BY EBA ENGINEERING, DATED AUGUST 2012.

.2 ALLOWABLE NET STATIC SOIL BEARING PRESSURE FOR FOOTINGS FOUNDED IN UNDISTURBED NATIVE MATERIAL (SERVICE):

STRIP FOOTINGS	130 KPA
SPREAD FOOTINGS	130 KPA

.3 SITE INVESTIGATION IS RECOMMENDED PRIOR TO CONSTRUCTION TO CONFIRM ALLOWABLE NET STATIC BEARING PRESSURE ASSUMED FOR DESIGN

1.7 ALL SHOP DRAWINGS:

SUBMIT ONE SET OF REPRODUCIBLE DRAWINGS WITH THREE SETS OF PRINTS. SHOP DRAWINGS NOT STAMPED, SIGNED, AND DATED AS REVIEWED BY THE CONTRACTOR WILL BE RETURNED WITHOUT BEING REVIEWED BY THE ENGINEER, AND SHALL BE CONSIDERED REJECTED. SHOP DRAWINGS FOR WORK DESIGNED BY FABRICATOR SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED IN THE NORTHWEST TERRITORIES & NUNAVUT..

2. EXCAVATING AND BACKFILLING

2.1 SITE CONDITIONS:

SHOULD BE GRANITIC BEDROCK BLASTED FLAT, HOLLOWS FILLED WITH COMPACTED SHARP GRANULAR MATERIAL OF SAME ROCK TYPE.

2.2 UTILITY LINES:

CONTACT ALL REQUIRED UTILITY COMPANIES PRIOR TO COMMENCING WORK, AND BECOME INFORMED OF EXACT LOCATION OF UTILITIES. PROTECT UTILITIES DURING CONSTRUCTION, AND ASSUME LIABILITY FOR DAMAGE TO UTILITIES.

2.3 PERMITS:

OBTAIN AND PAY FOR ANY NECESSARY PERMITS REQUIRED TO COMPLETE THE WORK.

2.4 INSPECTION AND TESTING:

.1 OWNER WILL PAY COSTS FOR PRE-APPROVED INSPECTION AND TESTING.
.2 EXCAVATED SURFACES: WHEN UNDISTURBED EXCAVATED SURFACE IS BEING PREPARED, MAKE A SERIES OF THREE TESTS OF SURFACE FOR EACH 500 SQ.M. AREA.
.3 SIEVE ANALYSIS: PROPOSED FILL MATERIALS MAY BE TESTED TO CONFIRM SUITABILITY FOR INTENDED USE, AND CONFORMITY WITH SPECIFICATIONS.
.4 FILLS UNDER SLABS ON GRADE: MAKE THREE TESTS FOR EVERY TWO LIFTS OF COMPACTED FILL FOR EACH 500 SQ.M. AREA.
.5 BACKFILLING AND COMPACTION DENSITIES NOT CONFORMING TO THE SPECIFICATIONS AND DRAWINGS, AS REPRESENTED BY TEST RESULTS, WILL BE REJECTED DURING THE PROGRESS OF THE WORK WHEN THE DEFECT IS DISCOVERED. REMOVE DEFECTIVE MATERIALS, REPLACE AND RE-TEST AT THE CONTRACTOR'S EXPENSE.

2.5 PROTECTION:

.1 PROTECT BOTTOMS OF EXCAVATIONS FROM SOFTENING OR FREEZING. SHOULD SOFTENING OCCUR, REMOVE SOFTENED SOIL AND REPLACE WITH TYPE 1 FILL COMPACTED TO 98% MAXIMUM DRY DENSITY. (PER. ASTM D698-07e1 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12400 ft lbf/ft^3 (600 kN m/m^3))

.2 PROTECT BOTTOMS OF EXCAVATIONS FROM PRECIPITATION, FREEZING TEMPERATURES, AND EXCESSIVE DRYNESS.

.3 CONSTRUCT BANKS IN ACCORDANCE WITH LOCAL BYLAWS AND LOCAL SOIL CONDITIONS. PROTECT EXCAVATIONS BY SHORING, BRACING, OR BY OTHER METHODS, AS REQUIRED TO PREVENT CAVE-INS OR LOOSE DIRT FROM FALLING INTO THE EXCAVATION. ALL LOOSE MATERIAL, DISTURBED OR SLOUGHED MATERIAL IS TO BE CLEARED FROM THE EXCAVATION.

.4 PROVIDE ADEQUATE PROTECTION AROUND BENCH MARKERS, LAY-OUT MARKERS, SURVEY MARKERS, AND GEODETIC DOCUMENTS.

.5 PROVIDE PROTECTION TO ENSURE NO DAMAGE TO EXISTING FACILITIES AND EQUIPMENT SITUATED ON THE SITE.

.6 MAINTAIN ADEQUATE BARRIERS AND CONSTRUCTION SIGNS TO PREVENT INJURY TO THE PUBLIC.

.7 DO NOT STOCKPILE EXCAVATED MATERIAL TO INTERFERE WITH SITE OPERATIONS OR DRAINAGE.

2.6 MATERIALS:

.1 ALL MATERIALS TO BE SUBJECT TO THE ENGINEER'S APPROVAL. GRADING OF GRANULAR MATERIALS TO SHOW NO MARKED FLUCTUATIONS BETWEEN OPPOSITE ENDS OF EXTREME LIMITS.

.2 TYPE 1 FILL: CONTAINS CLEAN CRUSHED 20 MM GRAVEL COMPOSED OF SOUND, HARD PARTICLES FREE FROM FROZEN MATERIAL, FLAKY PARTICLES, SOFT SHALE, ORGANIC MATTER OR FOREIGN MATTER. TO ALSO BE FREE OF COAL, CLAY, ANY COATINGS OF CLAY, SILT OR OTHER DELETERIOUS MATERIALS. OF THE MATERIAL RETAINED, 60% MINIMUM SHOULD HAVE AT LEAST TWO FRESHLY CRUSHED FACES. TYPE 1 FILL TO MEET THE FOLLOWING REQUIREMENTS:

SIEVE SIZE (MM)	PERCENT PASSING BY WEIGHT
20.0	100
12.5	60 - 95
5.0	40 - 65
1.25	20 - 40
0.315	10 - 25
0.08	2 - 8

TYPE 1 FILL SHOULD BE COMPACTED IN LIFTS NOT EXCEEDING 150 MM TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. (PER. ASTM D698-07e1 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12400 ft lbf/ft^3 (600 kN m/m^3))

.3 TYPE 2 FILL: CONTAINS PIT RUN GRAVEL COMPOSED OF SOUND, HARD PARTICLES FREE FROM FROZEN MATERIAL, FLAKY PARTICLES, SOFT SHALE, ORGANIC MATTER OR FOREIGN MATTER. TO ALSO BE FREE FROM ANY COATING AND ANY GRAVEL CONTAINING CLAY, LOAM OR OTHER DELETERIOUS MATERIALS. THERE SHOULD BE NO OVERSIZE MATERIALS. THE MATERIAL PASSING THE 0.08 MM SIEVE SHOULD NOT EXCEED 2/3 OF THE MATERIAL PASSING THE 0.4 MM SIEVE. TYPE 2 FILL TO MEET THE FOLLOWING REQUIREMENTS:

SIEVE SIZE (MM)	PERCENT PASSING BY WEIGHT
75.0	100
5.0	25 - 50
0.08	3 - 8

TYPE 2 FILL SHOULD BE COMPACTED IN LIFTS NOT EXCEEDING 150 MM TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. (PER. ASTM D698-07e1 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12400 ft lbf/ft^3 (600 kN m/m^3))

.4 TYPE 3 FILL: CONTAINS CLEAN, WASHED, COARSE SAND FREE FROM FROZEN MATERIAL, CLAY, SHALE, AND ORGANIC MATTER. IT IS TO MEET THE FOLLOWING REQUIREMENTS:

SIEVE SIZE (MM)	PERCENT PASSING BY WEIGHT
10.0	100
5.0	95 - 100
2.5	80 - 100
1.25	50 - 85
0.63	30 - 65
0.315	10 - 30
0.160	2 - 10

.5 TYPE 4 FILL: EXCAVATED EARTH FREE FROM FROZEN MATERIAL, ROOTS, ROCKS LARGER THAN 75 MM IN SIZE, AND BUILDING DEBRIS AND ORGANIC MATERIAL. FILL UNDER LANDSCAPED AREAS TO BE FREE FROM ALKALI, SALT, PETROLEUM PRODUCTS, AND OTHER MATERIALS DETRIMENTAL TO PLANT GROWTH. USE SUBSOIL EXCAVATED FROM SITE ONLY IF APPROVED BY ENGINEER.

LANDSCAPE FILL SHOULD BE PLACED IN COMPACTED LIFTS NOT EXCEEDING 300 MM AND COMPACTED TO NO LESS THAN 90% OF THE MAXIMUM DENSITY.

.6 TYPE 5 FILL: IMPORTED EARTH FREE FROM FROZEN MATERIAL, ROOTS, ROCKS LARGER THAN 75 MM IN SIZE, IF APPROVED BY THE ENGINEER.

.7 TYPE 6 FILL:
WASHED COARSE GRAVEL: CONTAINS ONLY WASHED CRUSHED STONE - SUITABLE FOR DRAINAGE LAYERS. CAN BE COMPACTED.

SIEVE SIZE (MM)	PERCENT PASSING BY WEIGHT
50	100
25	95-100
37.5	5

.9 STOCKPILE FILL MATERIALS IN AREAS DESIGNATED BY THE ENGINEER. STOCKPILE GRANULAR MATERIALS IN A MANNER TO PREVENT SEGREGATION.

2.7 EXCAVATING:

.1 STRIP ALL TOPSOIL OR ORGANIC MATERIAL FROM THE CONFINES OF THE BUILDING.
.2 STOCKPILE AND REMOVE ALL TOPSOIL WHICH IS UNSUITABLE FOR RE-GRADING.
.3 EXCAVATE TO ELEVATIONS AND DIMENSIONS INDICATED FOR INSTALLATION, CONSTRUCTION, AND INSPECTION OF WORK SPECIFIED.
.4 EXCAVATE TO WELL DEFINED LINES TO MINIMIZE QUANTITY OF FILL MATERIAL REQUIRED.
.5 REMOVE FROM THE SITE, AND DISPOSE OF SURPLUS OR UNSUITABLE MATERIAL NOT REQUIRED FOR BACKFILL OR GRADING.
.6 EARTH BOTTOMS OF EXCAVATIONS TO BE DRY, UNDISTURBED SOIL, LEVEL, FREE FROM LOOSE OR ORGANIC MATTER.
.7 ALL LOOSE MATERIAL, DISTURBED OR SLOUGHED MATERIAL IS TO BE CLEARED FROM THE EXCAVATION.
.8 EXCAVATION MUST NOT INTERFERE WITH NORMAL 45° SPLAY OF BEARING FROM BOTTOM OF ANY FOOTING.
.9 WHEN COMPLETE, THE ENGINEER SHALL INSPECT EXCAVATIONS TO VERIFY SOIL BEARING CAPACITY, DEPTHS, AND DIMENSIONS.
.10 CORRECT UNAUTHORIZED EXCAVATION OR OVER-EXCAVATION AT NO EXTRA COST AS FOLLOWS:
    .1 FILL UNDER BUILDING FOOTPRINT WITH TYPE 6 FILL COMPACTED TO 100% DENSITY.
    .2 FILL UNDER OTHER AREAS WITH TYPE 1 FILL COMPACTED TO 98%.

2.8 BACKFILLING AND COMPACTION:

.1 DO NOT COMMENCE BACKFILLING UNTIL AREAS OF WORK TO BE BACKFILLED HAVE BEEN INSPECTED BY THE ENGINEER.
.2 AREAS TO BE BACKFILLED SHALL BE FREE FROM DEBRIS, SNOW, ICE, WATER, OR FROZEN GROUND.
.3 COMPACTION DENSITIES ARE PERCENTAGES OF STANDARD PROCTOR MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT OBTAINABLE FROM ASTM D698-07. (PER. ASTM D698-07e1 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12400 ft lbf/ft^3 (600 kN m/m^3))
.4 PLACE AND COMPACT FILL MATERIALS IN CONTINUOUS HORIZONTAL LAYERS NOT EXCEEDING 200 MM LOOSE DEPTH OR 150 MM COMPACTED DEPTH.
.5 IF, DURING PROGRESS OF WORK, TESTS INDICATE FILLS DO NOT MEET SPECIFIED REQUIREMENTS, REMOVE DEFECTIVE FILLS, REPLACE, AND RETEST AT NO EXTRA COST.
.6 WHERE TEMPORARY UNBALANCED EARTH PRESSURES ARE LIABLE TO DEVELOP ON WALLS OR OTHER STRUCTURES, USE EXTREME CAUTION DURING BACKFILL OPERATIONS.
.7 MAXIMUM UNBALANCED EARTH ELEVATIONS AGAINST FOUNDATIONS TO BE 300 MM UNLESS OTHERWISE APPROVED IN WRITING.
.8 SHORE AS REQUIRED, SHORING TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
.9 GRADE-SUPPORTED SLABS: PRIOR TO PLACING FILL, SCARIFY AND RECOMPACT TOP 200 MM OF EXISTING SUBGRADE TO 98% DENSITY. REMOVE "SOFT" MATERIAL, AND FILL WITH TYPE 1 FILL OR OTHER FILL MATERIALS (IF APPROVED), COMPACTED TO 100% DENSITY (PER. ASTM D698-07e1 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12400 ft lbf/ft^3 (600 kN m/m^3)). USE TYPE 2 FILL OR TYPE 4 FILL (IF APPROVED) SUBBASE TO BASE COURSE LEVELS, COMPACT TO 100% DENSITY(PER. ASTM D698-07e1 STANDARD TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12400 ft lbf/ft^3 (600 kN m/m^3)). 13 MM LAYER OF TYPE 3 FILL TO UNDERSIDE OF VAPOUR BARRIER.

2.10 DEWATERING:

.1 KEEP EXCAVATIONS DRY AT ALL STAGES OF CONSTRUCTION.
.2 CONTROL THE GRADING ADJACENT TO THE EXCAVATION TO PREVENT WATER RUNNING INTO EXCAVATED AREAS. IF TRENCHES ARE USED, ENSURE THAT TRENCH EXCAVATION DOES NOT INTERFERE WITH OR WEAKEN FOOTING BEARING SURFACES.
.3 PROVIDE SUITABLE EQUIPMENT, INCLUDING PUMPS, PIPING, TEMPORARY DRAINS, GRADING, TRENCHES, AND SUMPS TO KEEP EXCAVATIONS FREE FROM WATER UNTIL CONCRETE IS PLACED, CURED, AND STRUCTURAL ADEQUACY IS ASSURED.

CAST-IN-PLACE CONCRETE

3.1 FORMWORK MATERIALS:

FORMWORK TO CSA A23.1-09; FORM OIL TO BE NON-STAINING AND NON-VOLATILE TYPE; VOID FORM TO BE BIODEGRADABLE CARDBOARD FORM CAPABLE OF SUPPORTING WET CONCRETE, POLYSTYRENE IS NOT ACCEPTABLE AS A VOID FORM.

3.2 ERECTION OF CONCRETE FORMWORK:

DETERMINE THE REQUIREMENTS OF THE OTHER TRADES, INFORM ALL CONCERNED TRADES, AND ASSUME RESPONSIBILITY FOR LOCATION, INSTALLATION AND QUALITY OF ALL ITEMS WHICH AFFECT THE WORK OF THIS SECTION. CHECK LOCATIONS AND SIZES OF SLEEVES, OPENINGS, ETC., SHOWN ON STRUCTURAL DRAWINGS WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. OBTAIN ENGINEER'S PERMISSION BEFORE FORMING OPENINGS, NOT INDICATED ON THE DRAWINGS, IN CONCRETE BEAMS OR COLUMNS.

3.3 CONCRETE: SUPPLY "CONTROLLED CONCRETE" AS DEFINED BY CSA A23.1-09 IN ACCORDANCE WITH THE FOLLOWING:

CONCRETE SLAB MIX DESIGN WILL BE PROVIDED BY ENGINEER ONCE TRIAL MIXES ARE COMPLETE.
LOCAL COARSE AND FINE GRANULAR MATERIAL IS SPECIFIED IN THIS MIX.

3.4 CONCRETE ACCESSORIES:

.1 VAPOUR BARRIER: 0.15 MM THICK POLYETHYLENE SHEET TO CGSB 51.34-M86. LAP VAPOUR BARRIER A MINIMUM OF 300 MM.
.2 COMPRESSIBLE MATERIAL: PRE-FORMED FLEXIBLE JOINT FILLER CONSISTING OF ASPHALT, VEGETABLE FIBRE, AND MINERAL FILLERS SECURELY BONDED TOGETHER AND UNIFORMLY IMPREGNATED WITH A BITUMINOUS BINDER.
.3 LIQUID MEMBRANE CURING COMPOUND: CHLORINATED RUBBER TYPE COMPOUND TO CSA A23.1-09.
.4 BITUMINOUS DAMP-PROOFING: WATERPROOF EMULSION COMPOSED OF ASPHALT DISPERSED IN A MINERAL COLLOID EMULSIFIER TO CGSB 37-GP-9MA.
.5 NON-SHRINK GROUT: TO BE "SIKAGROUT 212" AS MANUFACTURED BY THE SIKA CORPORATION.
.6 BONDING AGENT: TO BE "SIKADUR 32 HI-MOD" EPOXY BONDING AGENT AS MANUFACTURED BY THE SIKA CORPORATION.

3.5 REINFORCING:

PROVIDE SHOP DRAWINGS INCLUDING PLACING DRAWINGS FOR ALL REINFORCEMENT. REINFORCING STEEL TO CSA G30.18-09; NEW BILLET STEEL, GRADE 400R DEFORMED BARS FOR 10M AND LARGER. WELDABLE REINFORCING STEEL TO CSA G30.18-09, NEW BILLET STEEL, GRADE 400R DEFORMED BARS. WELDED WIRE MESH TO ASTM A185/A185M-07 (PROVIDE IN FLAT SHEETS ONLY). DEFORMED WELDED WIRE MESH TO ASTM A497/A497M-07 (PROVIDE IN FLAT SHEETS ONLY). CHAIRS, BOLSTERS, BAR SUPPORTS, AND SPACERS TO BE ADEQUATE FOR STRENGTH AND SUPPORT OF REINFORCING, AND MUST NOT CAUSE STAINING OF EXPOSED CONCRETE. ALL SUPPORTS USED TO SUPPORT EPOXY COATED REINFORCING SHALL BE PLASTIC COATED. EPOXY COATINGS TO ASTM A775/A775M-07.

3.6 FABRICATION OF CONCRETE REINFORCEMENT:

HOOKS, BENDS, LAPS AND SIMILAR DETAILS TO ACI 318-08. USE SPLICES ONLY WHERE SHOWN ON THE DRAWINGS, OR AS APPROVED BY THE ENGINEER. FOR SPLICES NOT SHOWN ON THE DRAWINGS, USE CLASS "B" SPLICES FOR REINFORCEMENT BARS. ALL HORIZONTAL BARS IN WALLS SHALL BE CONSIDERED AS TOP REINFORCEMENT.

3.7 PLACING REINFORCING STEEL:

PLACE TO TOLERANCES IN ACCORDANCE WITH CSA A23.1-09. REINFORCING IS TO BE PLACED ON PURPOSE-MADE SUPPORTS. A REINFORCEMENT TECHNICIAN IS TO BE ON SITE DURING THE PLACEMENT OF CONCRETE FLOOR SLABS, AND IS TO RECHAIR AND/OR ADJUST SUPPORTS FOR REINFORCEMENT AS REQUIRED DURING THE PLACEMENT OF CONCRETE. WELDING OF REINFORCEMENT IS NOT PERMITTED, UNLESS OTHERWISE NOTED.

3.8 CLEAR COVER TO REINFORCEMENT:

PROVIDE MINIMUM CONCRETE COVER (DISTANCE FROM CONCRETE FACE TO NEAREST SURFACE OF BAR)

PLACEMENT CONDITION:	EXPOSED*	NOT EXPOSED
CAST AGAINST & PERMANENTLY EXPOSED TO EARTH	75mm	N/A
BEAMS, GIRDERS, COLUMNS AND PILES:		
PRINCIPAL REINFORCEMENT, No. 35 & SMALLER	50mm	40mm
TIES, STIRRUPS AND SPIRALS	40mm	30mm
SLABS, WALLS, JOINT SHELLS, AND FOLDED PLATES:		
No.20 AND SMALLER, 16mm WIRE	30mm	20mm
SLABS, ON GRADE (TOP SURFACE)	N/A	40
FOR BARS OF DIAMETER > THAN LISTED ABOVE:	60mm OR 1.5db	1.0db
MINIMUM RATIO OF COVER TO MAX. AGGREGATE SIZE	1.5	1.0

*EXPOSED EARTH, WEATHER, OR WATER
NOTE: THE COVER FOR A BUNDLE OF BARS SHALL BE THE SAME AS THAT OF A SINGLE BAR WITH AN EQUIVALENT AREA

3.9 VAPOUR RETARDERS UNDER SLABS:

- VAPOUR PERMEANCE OF LESS THEN 0.2 PERMS (0.3 US PERMS) WHEN TESTED TO ASTM E 96.
- 10MIL (0.25mm) POLYETHYLENE SHEETS WILL MEET THIS REQUIREMENT.
- SUB-GRADE SHOULD BE ADEQUATELY COMPACTED. USE A CLEAN FINE-GRADED (PREFERABLY CRUSHED) GRANULAR MATERIAL WITH APPROXIMATELY 10 TO 30 PERCENT PASSING THE No. 100 (150mm) SIEVE AND FREE OF CLAY OR ORGANIC MATERIAL. IDEALLY INSTALL A 150mm TO 200mm LAYER OF COARSE GRAVEL AS A CAPILLARY BREAK, TOPPED WITH 50mm FINE-GRAINED COMPACTABLE FILL TO PREVENT DAMAGE TO THE VAPOUR RETARDER.
- OVERLAP SHEETS OF VAPOUR RETARDER BY A MINIMUM OF 150mm & TAPE ALL SUCH JOINTS.
- TAPE AND SEAL VAPOUR RETARDER SHEETS AROUND OPENINGS, DUCTS AND PIPES.

3.10 PLACING CONCRETE:

CONCRETE MUST BE PLACED WITHIN 60 MINUTES OF BEING MIXED AT THE PLANT. CLEAN PREVIOUSLY PLACED CONCRETE TO ENSURE BOND. MIX AND BRUSH ON BONDING AGENT, WHERE SPECIFIED, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PLACE CONCRETE AS A CONTINUOUS OPERATION, STOPPING ONLY AT CONSTRUCTION JOINTS INDICATED ON THE DRAWINGS, OR AS FOLLOWS: AT CENTRE OF SPAN OF SUSPENDED SLABS AND BEAMS; IN WALLS AND COLUMNS IMMEDIATELY ABOVE OR BELOW FLOOR CONSTRUCTION; AT CENTRE OF STEEL BEAM THAT SUPPORTS CONCRETE SLAB. USE WINTER CONCRETING METHODS IN ACCORDANCE WITH CSA A23.1-09 WHEN THE MEAN DAILY TEMPERATURE FALLS BELOW 5°C. USE HOT WEATHER CONCRETE METHODS IN ACCORDANCE WITH CSA A23.1-09 WHEN THE AIR TEMPERATURE IS AT OR ABOVE 25°C DURING THE PLACING OF THE CONCRETE. IF PLACING CONCRETE DURING COLD WEATHER FOLLOW APPROVED COLD WEATHER CONCRETE PROCEDURES, WHICH WILL BE SUPPLIED TO CONTRACTOR BY ENGINEER AS REQUIRED.

3.11 FINISHING FORMED SURFACES AND FLATWORK:

.1 USE OF CALCIUM CHLORIDE IS NOT PERMITTED.
.2 ROUGH FINISH CONCRETE SURFACES NOT EXPOSED TO VIEW: CUT OFF FORM TIES A MINIMUM OF 10 MM BELOW CONCRETE SURFACE. PATCH TIE HOLES AND DEFECTS.
.3 GROUT CLEANED FINISH, EXTERIOR SURFACES, AND VERTICAL INTERIOR SURFACES EXPOSED TO VIEW: PLACE CONCRETE AGAINST PLYWOOD, STEEL, OR TEMPERED HARDBOARD. PATCH TIE HOLES AND DEFECTS. REMOVE FINS. RUB DOWN WITH CEMENT SAND SLURRY.
.4 UNLESS OTHERWISE NOTED, STEEL TROWEL CONCRETE SLABS TO A SMOOTH AND EVEN SURFACE. FOLLOW WITH A SECOND STEEL TROWELLING TO PRODUCE A SMOOTH BURNISHED SURFACE TO WITHIN 6 MM TOLERANCE WHEN MEASURED IN ANY DIRECTION USING A 3000 MM STRAIGHT EDGE. PROVIDE SAWN CONTROL JOINTS AT 4500 MM ON CENTRE (MAXIMUM). SAW CUT DEPTH SHALL BE 1/4 OF SLAB THICKNESS. SAWING SHALL BE DONE AS SOON AS THE CONCRETE HAS SUFFICIENTLY HARDENED TO PREVENT RAVELLING OF THE EDGES, BUT IN NO CASE LATER THAN 24 HOURS AFTER THE CONCRETE SLAB HAS BEEN PLACED.
.5 LIGHT BROOM FINISH ALL EXTERIOR CONCRETE SLABS. APPLY HARDENERS AND SEALERS TO LOCATIONS WHERE INDICATED.

3.12 TWO BASIC CURING METHODS:

1. PREVENTING LOSS OF MOISTURE, OR
2. KEEPING EXPOSED SURFACES CONTINUOUSLY WET:
   PONDING OR CONTINUOUS SPRINKLING;
   ABSORPTIVE MAT OR FABRIC KEPT CONTINUOUSLY WET;
   CURING COMPOUNDS SHALL BE MANUFACTURED TO COMPLY WITH ASTM C-309 TYPE 1 - STANDARD SPECIFICATION FOR LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE AASHTO M-148, TYPE 1 AND CGSB 90-GP-1A TYPE 1 (NO LONGER IN PRINT). [CURING COMPOUNDS SHALL NOT BE USED ON CONCRETE SURFACES TO RECEIVE TOPPING OR OTHER TYPE OF BONDED FINISH UNLESS APPROVED BY THE ENGINEER.]
   POLYETHYLENE SHEET IS NOT AN ACCEPTABLE CURING METHOD FOR SLABS WHICH ARE TO BE EXPOSED.

CURING TEMPERATURE RANGE: BETWEEN +10 AND +20 C.

TYPE GU (10): HYDRATED MIN. 7 DAYS
TYPE MS OR MH (20): HYDRATED MIN. 14 DAYS
TYPE HE (30): HYDRATED MIN. 3 DAYS UNTIL ATTAINING 70% OF SPECIFIED 28-DAY COMPRESSIVE STRENGTH

3.13 TESTING CONCRETE:

CONCRETE MUST BE TESTED BY AN APPROVED TESTING LABORATORY AT THE EXPENSE OF THE CONTRACTOR. NOTIFY THE ENGINEER 24 HOURS IN ADVANCE OF A POUR FOR REVIEW BEFORE PLACING CONCRETE. TESTING FIRM WILL TAKE THREE TEST CYLINDERS FROM EACH 50 CU.M OF CONCRETE, OR FRACTION THEREOF, OF EACH TYPE OF CONCRETE PLACED IN ANY ONE DAY. TESTING FIRM WILL MAKE AT LEAST ONE SLUMP TEST AND ONE ENTRAINED AIR TEST FOR EACH SET OF TEST CYLINDERS TAKEN. TESTING FIRM WILL TAKE ONE ADDITIONAL TEST CYLINDER WHEN THE TEMPERATURE IS LIKELY TO FALL BELOW 0°C WITHIN 48 HOURS AFTER PLACING, AND NO PROVISIONS HAVE BEEN MADE TO HEAT THE CONCRETE TO GREATER THAN 10°C. TEST CYLINDER TO BE CURED ON JOBSITE UNDER SAME CONDITIONS AS CONCRETE IT REPRESENTS, AND TESTED IN 7 DAYS. RESULTS OF FIELD TESTS WILL BE REPORTED IMMEDIATELY TO THE CONTRACTOR BY THE FIELD REPRESENTATIVE OF THE TESTING FIRM. THESE RESULTS DO NOT IMPLY APPROVAL OR DISAPPROVAL OF THE WORK, BUT ARE FOR THE CONTRACTOR'S INFORMATION. A QUALIFIED PROFESSIONAL ENGINEER SHALL CERTIFY ALL TEST RESULTS OBTAINED AS PER THESE SPECIFICATIONS, AND THE CERTIFIED RESULTS SHALL BE SUBMITTED TO THE DIRECTOR NO LATER THAN 90 DAYS AFTER TESTING. CONCRETE THAT DOES NOT MEET THE SPECIFIED REQUIREMENTS SHALL BE REJECTED. PROVIDE AT LEAST ONE ASTM CUBE TEST ON GROUT USED UNDER BASE PLATES OR MACHINERY.

4.0 TIMBER - ROUGH CARPENTRY

4.1 MATERIALS:

.1 SAWN LUMBER: TO NLGA STANDARD GRADING RULES FOR CANADIAN LUMBER
    FLOOR JOISTS & STUDS: MIN. S-P-F #1/#2 OR AS SPECIFIED
    BEAM & STRINGER, HEAVY TIMBER: MIN. S-P-F # 1 OR AS SPECIFIED
.2 PLYWOOD: IF D. FIR IS SPECIFIED: TO CSA 0121-08. IF CANADIAN SOFTWOOD PLY IS SPECIFIED: TO CSA 0151-04
.3 ORIENTED STRAND BOARD: TO CSA 0437 SERIES-93 (R2006), GRADE O-2 (NOTE: USED FOR FORM WORK ONLY)
.4 PLYWOOD WEB AND PARALLEL LAMINATED VENEER LUMBER FLANGES: AS MANUFACTURED BY TRUSJOIST CANADA LTD., OR APPROVED ALTERNATE
.5 PARALLEL LAMINATED VENEER LUMBER BEAMS: LUMBER AS MANUFACTURED BY TRUSJOIST CANADA LTD., OR APPROVED ALTERNATE
.6 ROUGH SAWN LUMBER: SPRUCE, PINE, FIR (S-P-F) OR AS SPECIFIED
.7 GLUED END-JOINTED OR FINGER-JOINTED LUMBER: NOT ACCEPTABLE
.8 WIRE NAILS, SPIKES AND STAPLES: TO CSA B111-1974 (R-2003)

5.0 STRUCTURAL STEEL

5.1 MATERIALS:

.1 STRUCTURAL STEEL: TO CSA G40.20-04/G40.21-04 (R2009) GRADE 350W
    STRUCTURAL SHAPES: GRADE 350 W
    HOLLOW STRUCTURAL SECTIONS: GRADE 350W; CLASS "C"
    MISCELLANEOUS PLATES, BARS AND RODS: GRADE 300W
.2 ANCHOR BOLTS: TO CSA G40.20-04/G40.21-04 (R2009), GRADE 300
.3 BOLTS AND NUTS: TO ASTM A325-10 OR A325M-10, PROVIDE A MINIMUM OF 2-M20 BOLTS UNLESS OTHERWISE NOTED
.4 WELDING MATERIALS: STEEL TO CSA W59-03 (R2008)
.5 PRIMER: STEEL SHALL BE PAINTED WITH SHOP PRIMER MEETING THE REQUIREMENTS OF CFSB 1-GP-40D: "SPECIFICATION FOR PRIMER: STRUCTURAL STEEL,OIL ALKYD TYPE"

5.2 DESIGN:

CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN OF CONNECTIONS TO RESIST THE FORCES SHOWN ON THE DRAWINGS. WHERE FORCES ARE NOT SHOWN, CONNECTIONS ARE TO BE DESIGNED FOR NOT LESS THAN 50% OF THE SHEAR RESISTANCE OF THE MEMBER. MINIMUM CONNECTION TO BE 2-M16-A325M BOLTS. DESIGN BRACING, BRIDGING AND CONNECTORS TO SAFELY SUPPORT LOADS AS INDICATED, EQUIPMENT LOADS, WET SERVICE CONDITIONS, SNOW AND SNOW ACCUMULATION AND LOADS DURING ERECTION. PROVIDE 10 MM THICK BEARING STIFFENERS EACH SIDE OF BEAM WEB OR TO ONE SIDE OF CHANNEL WEB (CENTERED OVER SUPPORT) WHERE BEAM OR CHANNEL PASSES OVER SUPPORT.

5.3 SHOP DRAWINGS:

SUBMIT SHOP DRAWINGS FOR STRUCTURAL STEEL, AND METAL DECKING. SHOP DRAWINGS FOR WORK DESIGNED BY FABRICATOR SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED IN THE NORTHWEST TERRITORIES

ABBREVIATIONS:

U.N.O.	- UNLESS NOTED OTHERWISE
T.O.	- TOP OFF
C/W	- COMES WITH
O/C	- ON CENTER
E/S	- EACH SIDE
E/W	- EACH WAY
E/F	- EACH FACE
THK.	- THICK
PL	- PLATE
R/W	- REINFORCED WITH
DP	- DEEP
BUL	- BOTTOM UPPER LAYER
BLL	- BOTTOM LOWER LAYER
TUL	- TOP UPPER LAYER
TLL	- TOP LOWER LAYER
/W	- WITH
GL	- GRID LINE
BOT.	- BOTTOM
C.I.A.	- CAST IN PLACE
CONT.	- CONTINUOUS
DWG.	- DRAWING
ELEV.	- ELEVATION
E.S.	- EACH SIDE
E.WAY	- EACH WAY
GALV.	- GALVANIZED
H.1.E.	- HOOK ONE END
H.2.E.	- HOOK TWO ENDS
MAX.	- MAXIMUM
MIN.	- MINIMUM
N.S.	- NEAR SIDE
N.T.S.	- NOT TO SCLE
OPP.	- OPPOSITE
OWSJ	-OPEN WEB STEEL JOIST
TYP.	- TYPICAL
T&B	- TOP AND BOTTOM
CL	- CENTRE LINE
LLH	- LONG LEG HORIZONTAL (STEEL ANGLE)
LLV	- LONG LEG VERTICAL (STEEL ANGLE)

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR 100% REVIEW	2014.01.15	JK	TL
B	ISSUED FOR REVISED 100% REVIEW	2014.02.20	JK	TL
0	ISSUED FOR TENDER	2014.03.05	JK	TL

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

LEGEND

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

PERMIT STAMP:

PERMIT TO PRACTICE
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PERMIT NUMBER
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WILLIAMS ENGINEERING
CANADA

CLIENT:

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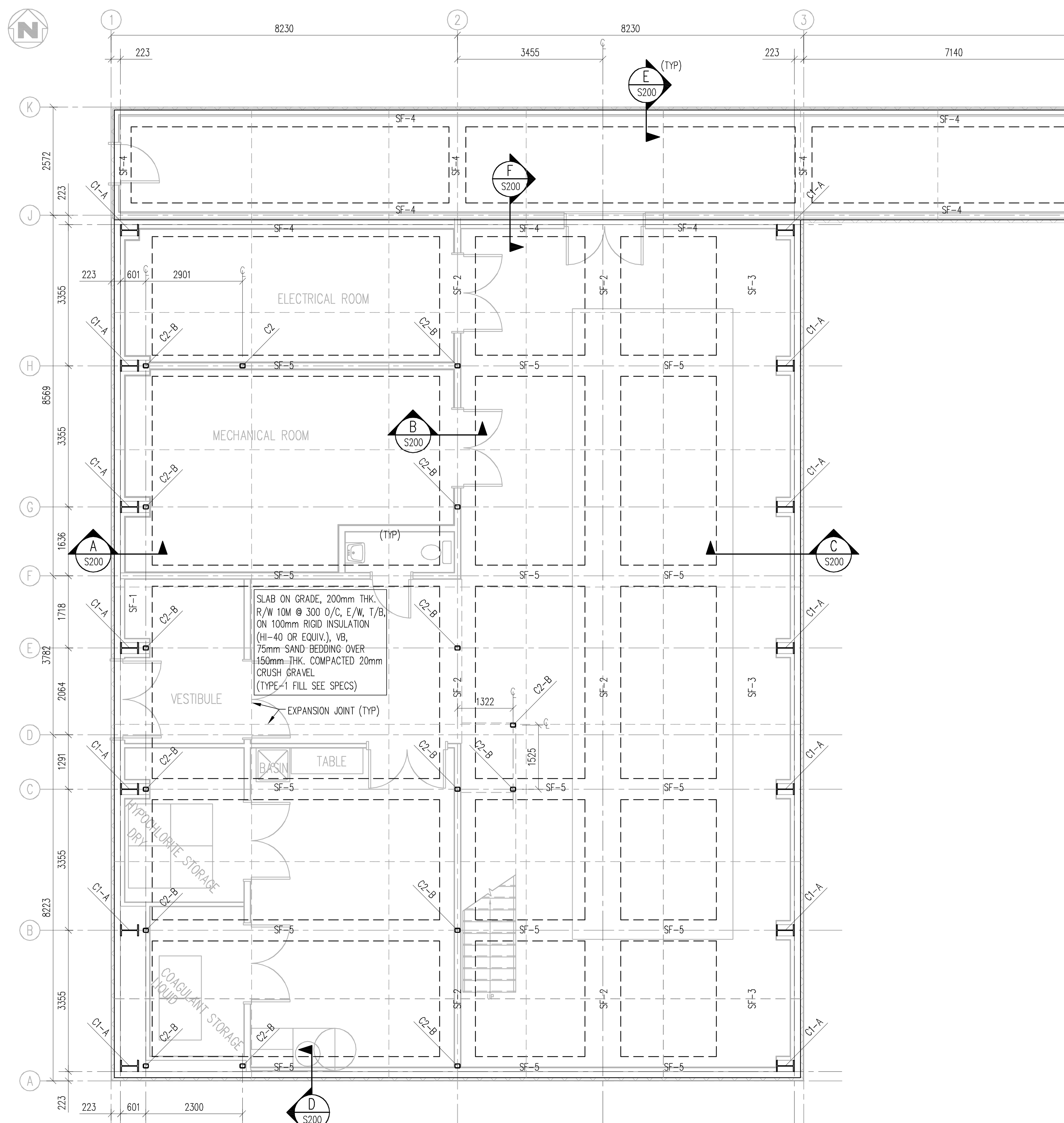
Nunavut

JOB. TITLE:
WATER SUPPLY IMPROVEMENTS
PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
GENERAL
STRUCTURAL

DWN. BY: PC	DES. BY: TL	PROJ. MGR.: JH
PEER REVIEW:	DATE: (YY-MM-DD) 2014.03.05	SCALE: AS SHOWN
CLIENT PROJ. # 04-4417		WE PROJ. #
DWG # S100	OF 5	REV # 0



FOUNDATION LAYOUT

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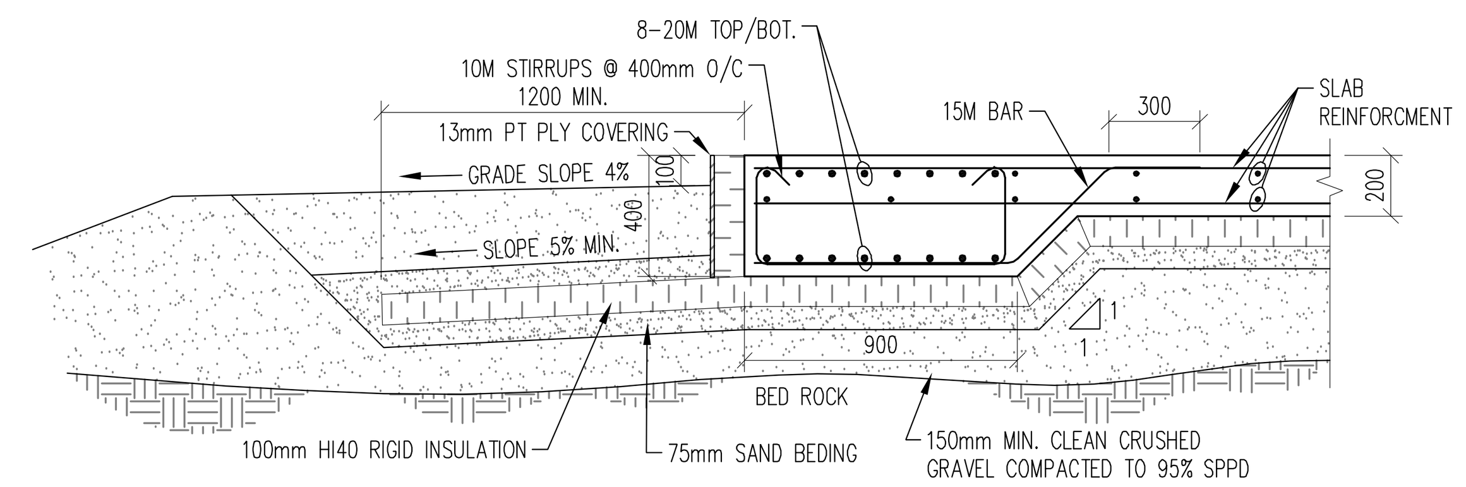

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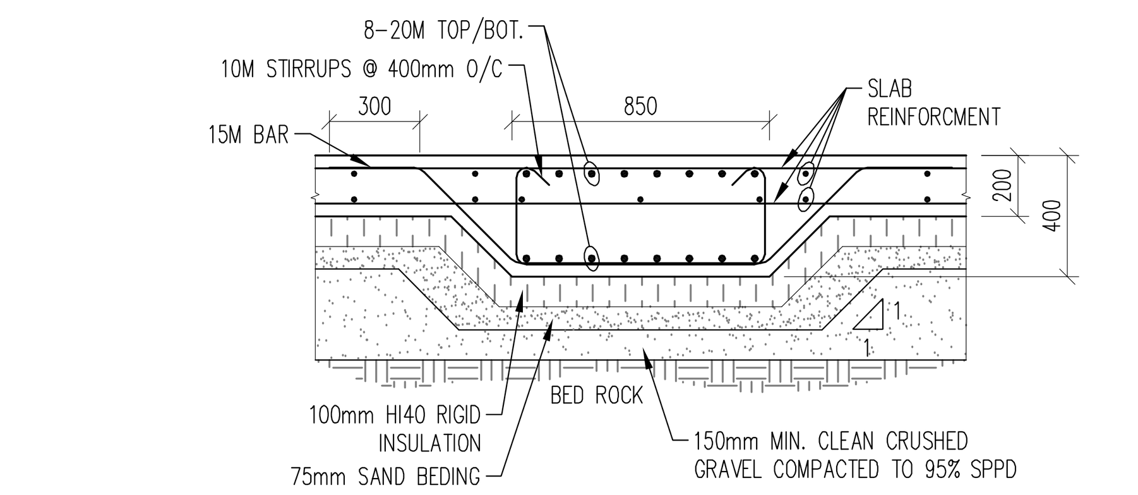

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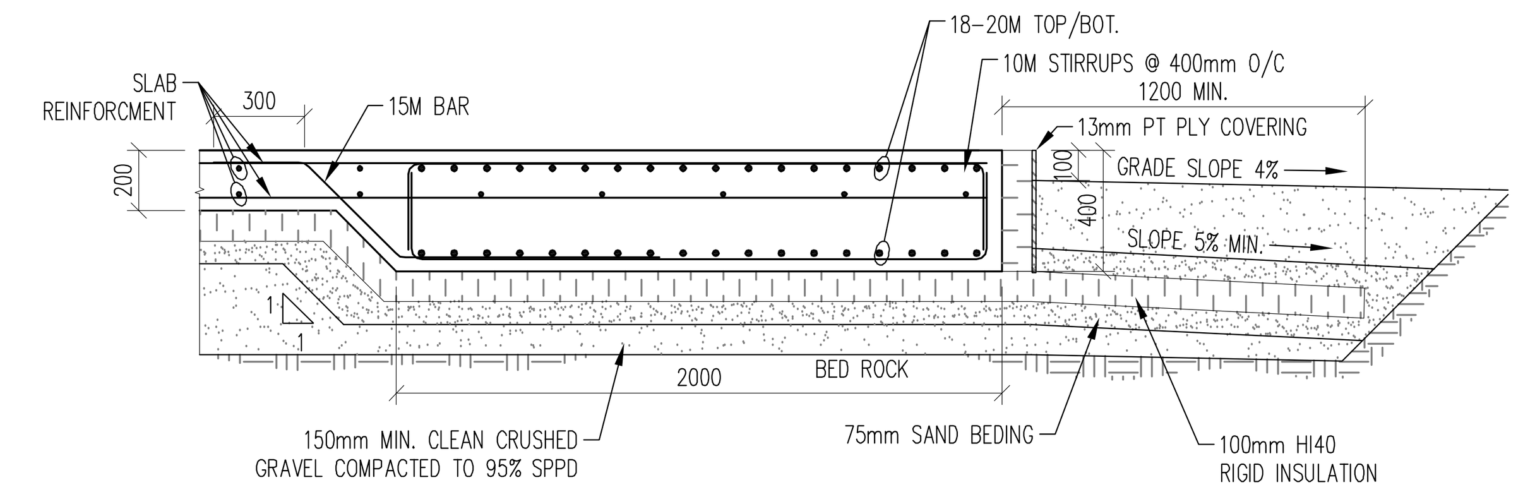

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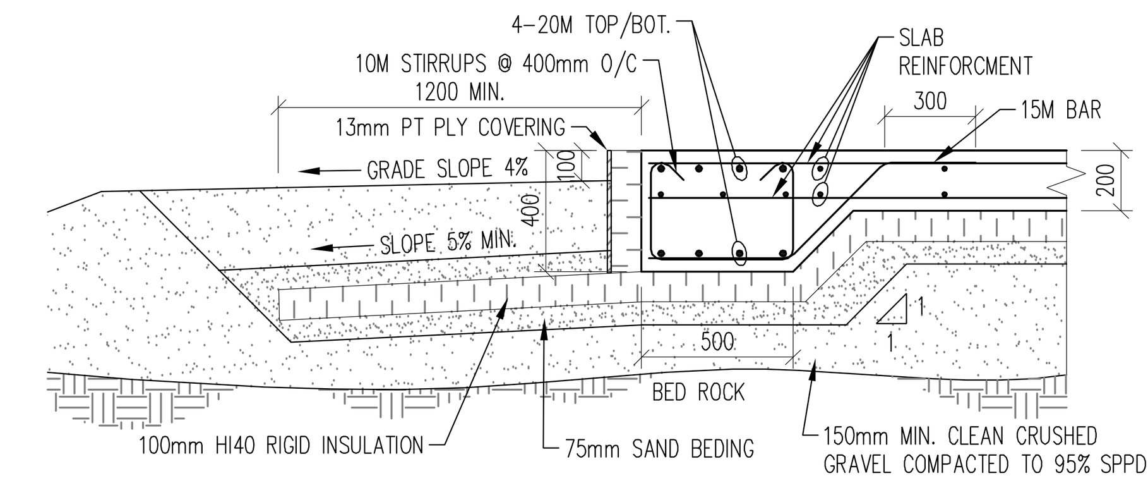

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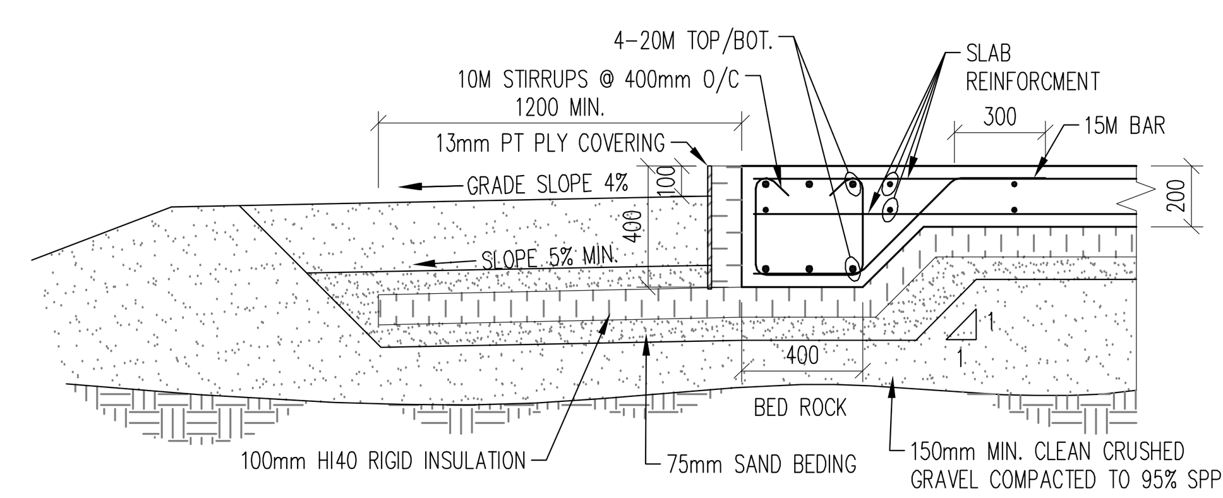

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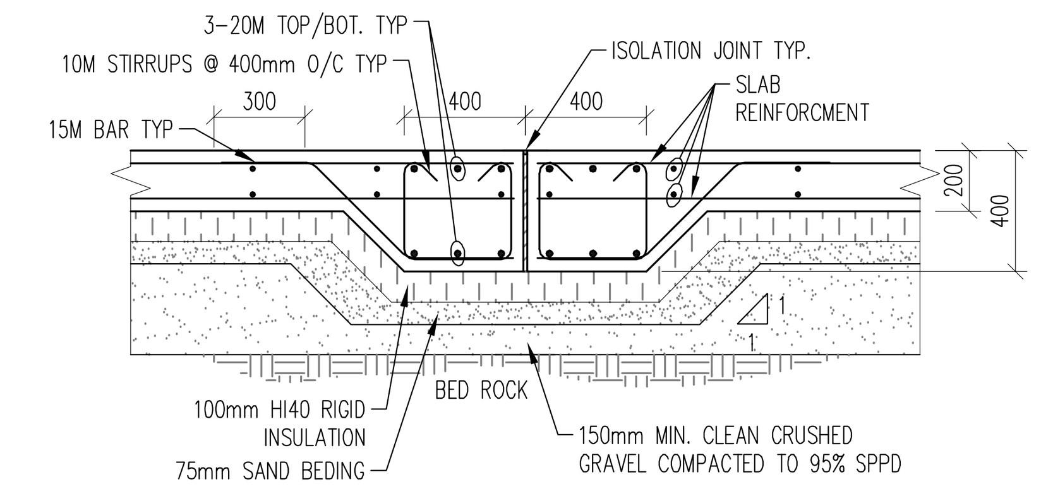


F S200 SECTION 1:25

STRIP FOOTING SCHEDULE

TYPE	FOOTING SIZE	FOOTING REINFORCING		EL. U/S FOOTING	DETAIL
		LONG.	TRANSVERSE		
SF-1	900x400	8-20M TOP/BOT.	10M STIRRUPS @ 400mm O/C	99.600	A/S200
SF-2	850x400	8-20M TOP/BOT.	10M STIRRUPS @ 400mm O/C	99.600	B/S200
SF-3	2000x400	18-20M TOP/BOT.	10M STIRRUPS @ 400mm O/C	99.600	C/S200
SF-4	400x400	3-20M TOP/BOT.	10M STIRRUPS @ 400mm O/C	99.600	E/S200, F/S200
SF-5	500x400	4-20M TOP/BOT.	10M STIRRUPS @ 400mm O/C	99.600	D/S200

COLUMN SCHEDULE

TYPE	SIZE	BASE PLATE TYPE
C1	W410x132	A
C2	HSS127x102x9.5	B

NOTE: SEE PLAN FOR LOCATION. COLUMNS TO BE CAPPED WITH 6mm THK. PLATE TO SUIT, WELDED ALL AROUND. FOR BASE PLATE SEE DRAWING S200

BASE PLATE → C1-A
COLUMN TYPE →

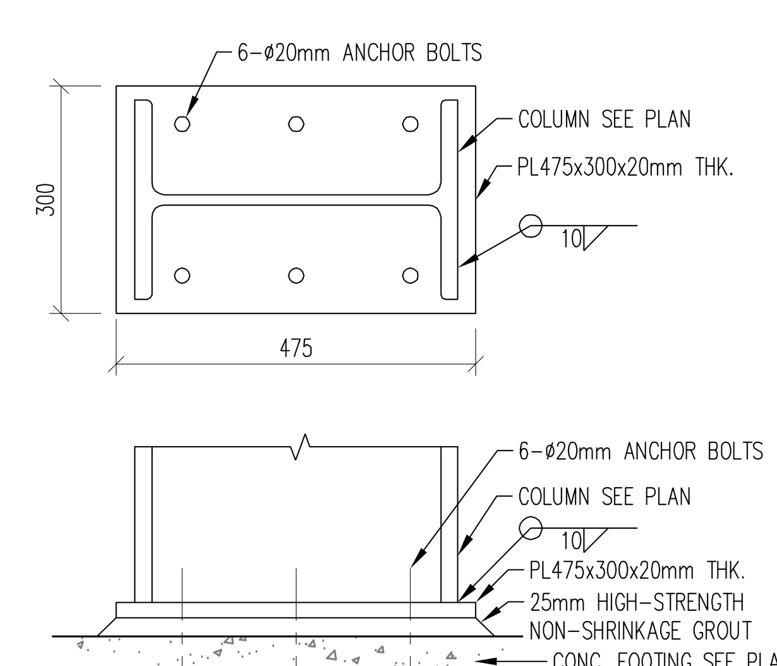
LAP SPLICE SCHEDULE

BAR SIZE	FULL TENSION SPLICE		FULL TENSION SPLICE FOR TOP BARS (NOTE 1)	
	REGULAR BARS	EPOXY COATED BARS	REGULAR BARS	EPOXY COATED BARS
10M	400	600	500	650
15M	550	850	750	950
20M	700	1000	900	1150
25M	1100	1650	1400	1850
30M	1300	1950	1700	2200
35M	1550	2300	2000	2600

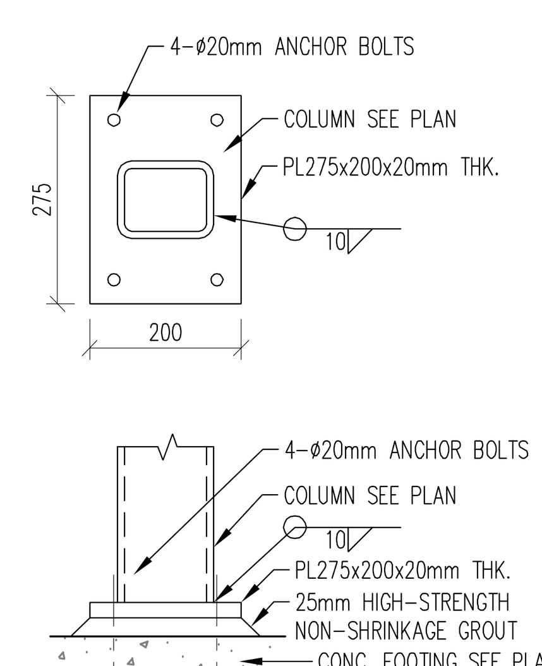
NOTES:
1. TOP BAR ARE DEFINED AS HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 300mm OF CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.
2. THIS SCHEDULE IS FOR CLASS 'B' SPLICE U.N.O.
3. APPLIES TO REINFORCING SPLICES NOT OTHERWISE DETAILED.
4. FOR STANDARD EMBEDMENT DEPTH INTO CONCRETE, DIVIDE BASIC TENSION LAP SPLICE NUMBER BY 1.30.
5. LAP SPLICE BASED ON f'c = 30 MPa.

STANDARD END HOOKS (FOR GRADE 400 REBAR)

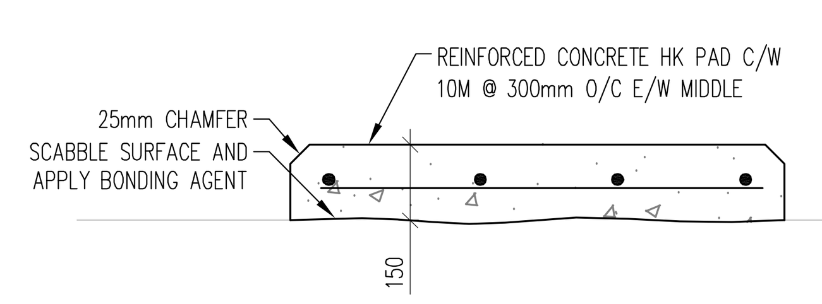
BAR SIZE	90° HOOK LENGTH (SEE BELOW)	180° HOOK LENGTH (SEE BELOW)
10M	180	140
15M	260	180
20M	310	220
25M	400	280
30M	510	400
35M	610	480
45M	790	680
55M	1030	900



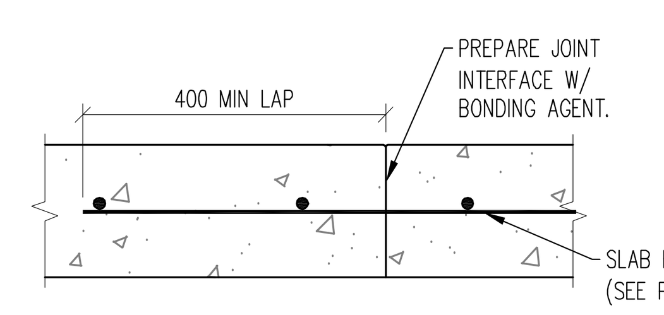
1 S200 TYPICAL BASE PLATE TYPE-A 1:10



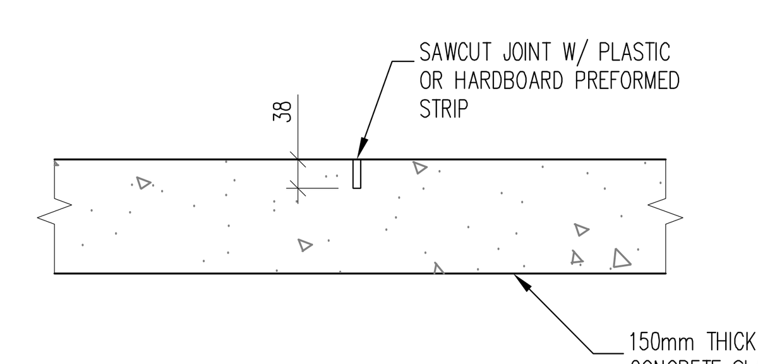
2 S200 TYPICAL BASE PLATE TYPE-B 1:10



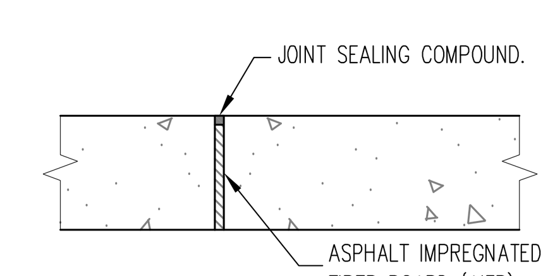
TYPICAL HOUSEKEEPING PAD DETAIL
NTS



TYPICAL CONSTRUCTION JOINT
NTS



TYPICAL CONTROL JOINT
1:25



TYPICAL ISOLATION JOINT
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REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR 100% REVIEW	2014.01.15	JK	TL
B	ISSUED FOR REVISED 100% REVIEW	2014.02.20	JK	TL
0	ISSUED FOR TENDER	2014.03.05	JK	TL

DRAWING NO.	DESCRIPTOR

REFERENCE DRAWINGS

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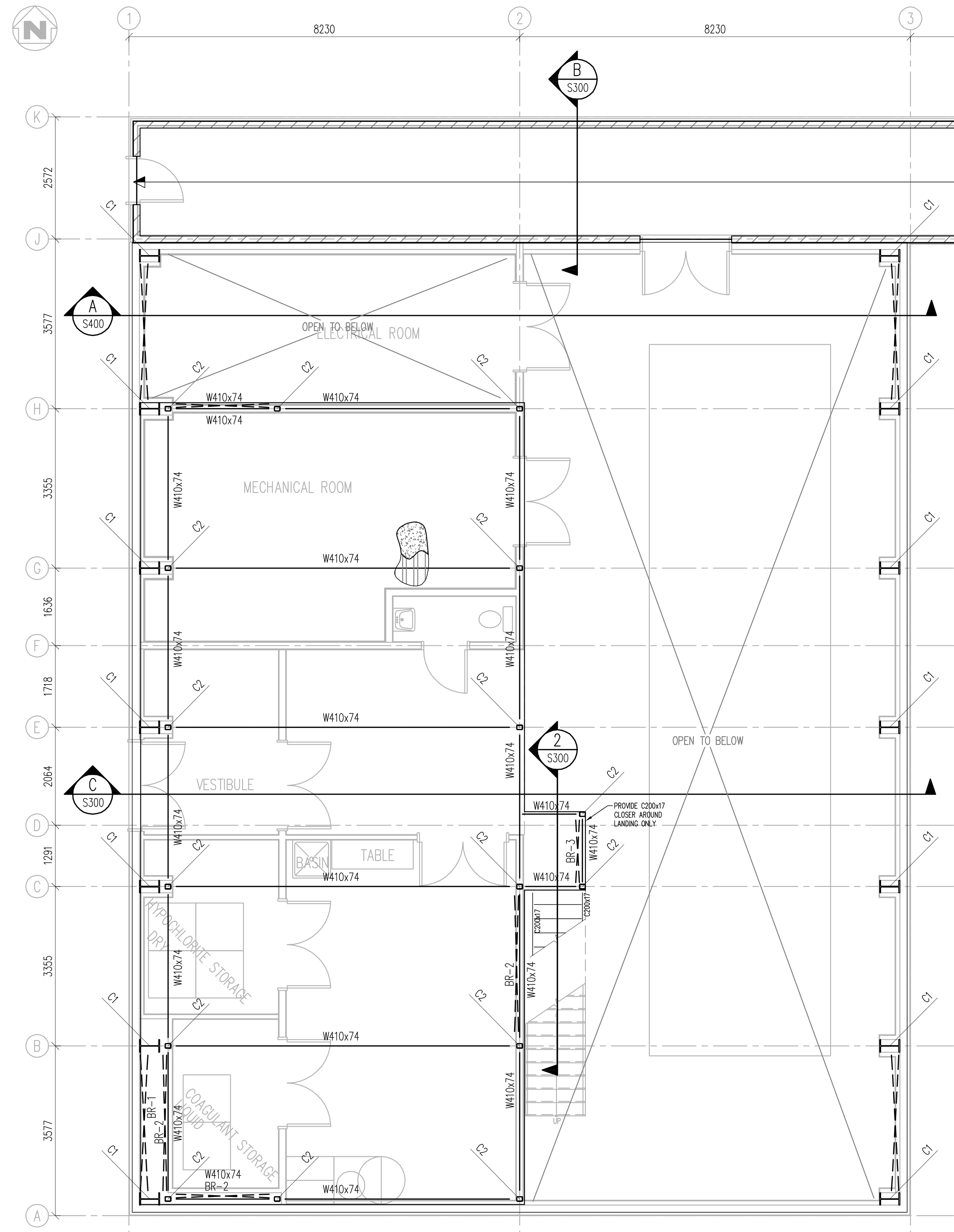
WILLIAMS ENGINEERING CANADA

CLIENT: Nunavut

JOB. TITLE: WATER SUPPLY IMPROVEMENTS PHASE 2 WATER TREATMENT PLANT KUGLUKTUK, NU

DWG. TITLE: STRUCTURAL FOUNDATION PLAN

DWN. BY: JK	DES. BY: TL/WVR	PROJ. MGR.: JC
PEER REVIEW: PC	DATE: (YY-MM-DD) 2014.03.05	SCALE: AS NOTED
CLIENT PROJ. # 04-4417		WE PROJ. # 13655.00
DWG # S200	OF 5	REV # 0



MEZZANINE FLOOR & LEAN-TO ROOF FRAMING PLAN
1:75

LEGEND:

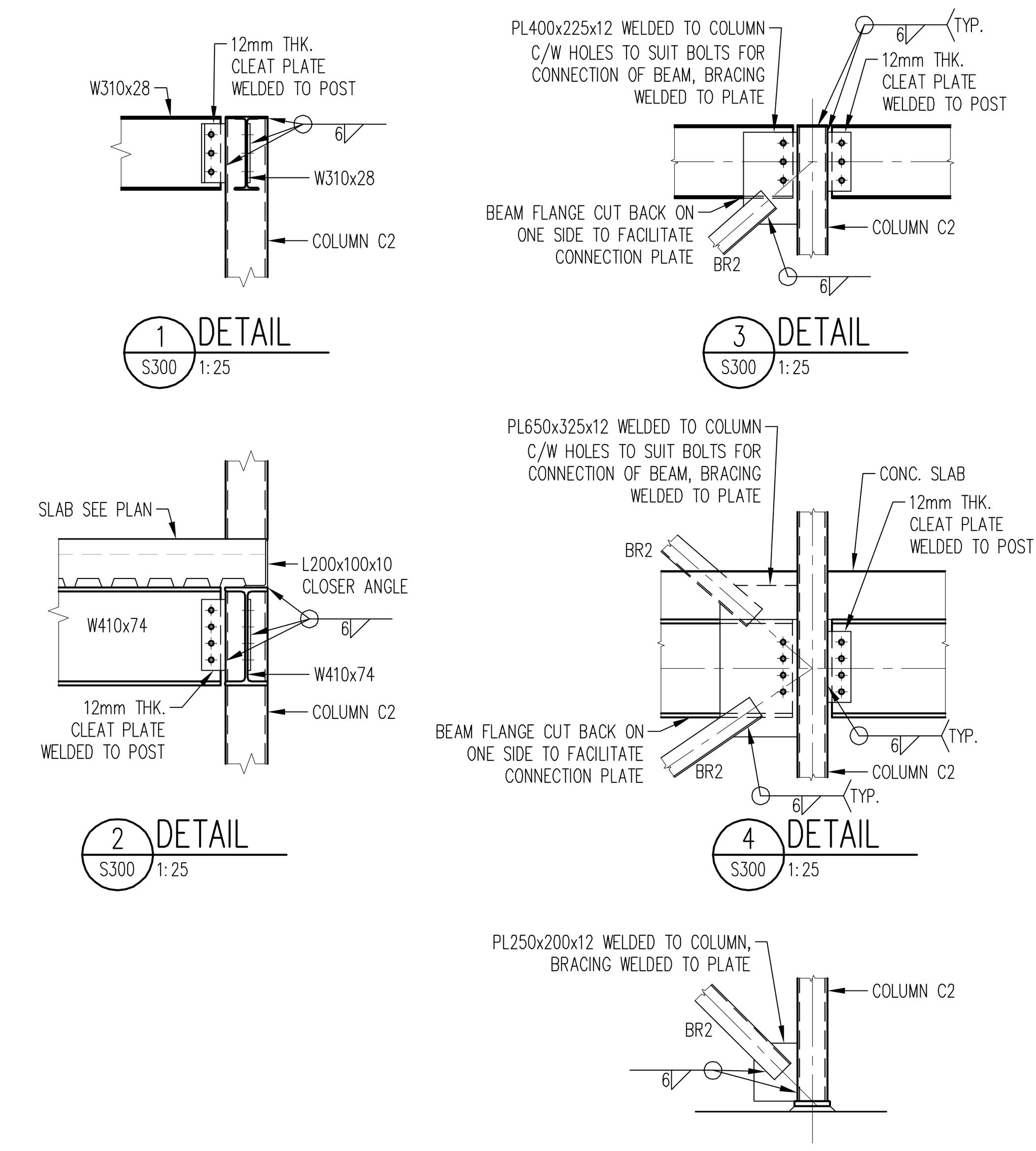
COMPOSITE DECK: (f'c = 30 Mpa)
141mm DEEP SLAB REINFORCED WITH
15M @ 400mm O/C E/W MID. OVER
20 GAUGE (T = 0.91mm) Vic West HB 308 ZG75
GALVANEEAL OR EQUIVALENT COMPOSITE STEEL
DECK

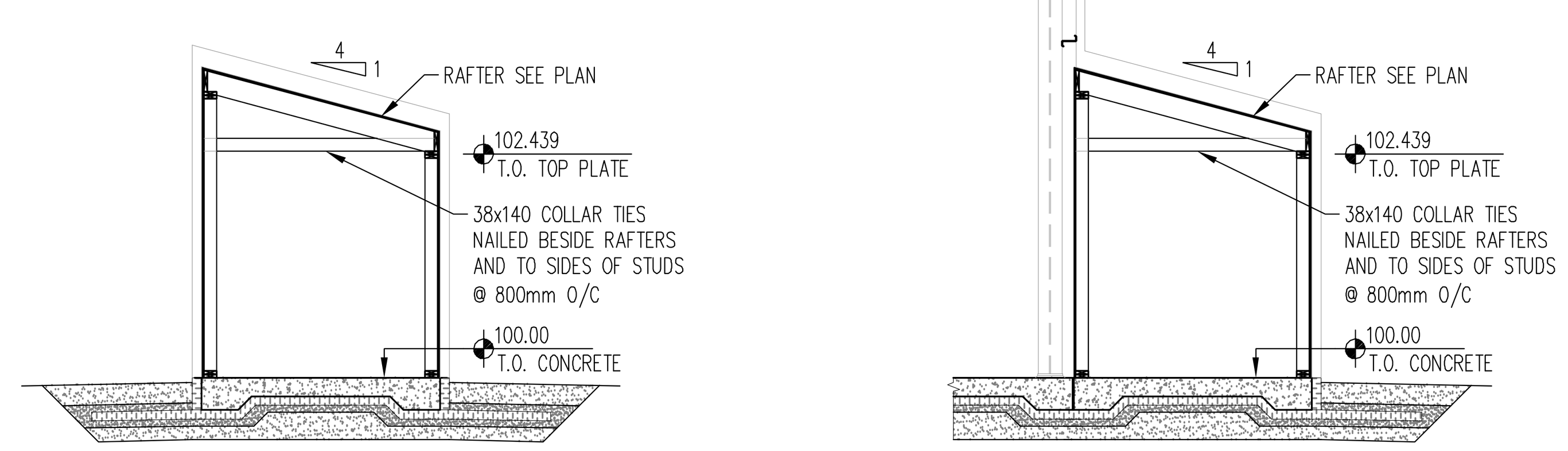
LEAN-TO ROOF DECK:
ROOF DECK HAS BEEN DESIGNED AS A DIAPHRAGM.
PLYWOOD TO BE NAILED DIRECTLY ON JOISTS.
13mm THK PLYWOOD DECKING, C/W 3.33mm MIN.
DIA x 64mm LONG COMMON NAILS @ 150mm O.C
ALONG DIAPHRAGM BOUNDARIES AND PANEL EDGES,
AND AT 300mm O/C ALONG INTERMEDIATE FRAMING
MEMBERS.

WOOD STUD WALL
38x140 STUD @ 400mm O/C MAX,
PROVIDE 12.5mm THK PLYWOOD,
FASTENED 100mm O/C AT SUPPORTED PANEL
EDGES AND @ 300mm O/C ALONG INTERMEDIATE
FRAMING MEMBERS. PROVIDE BLOCKING AT ALL
PANEL EDGES

BRACING SCHEDULE

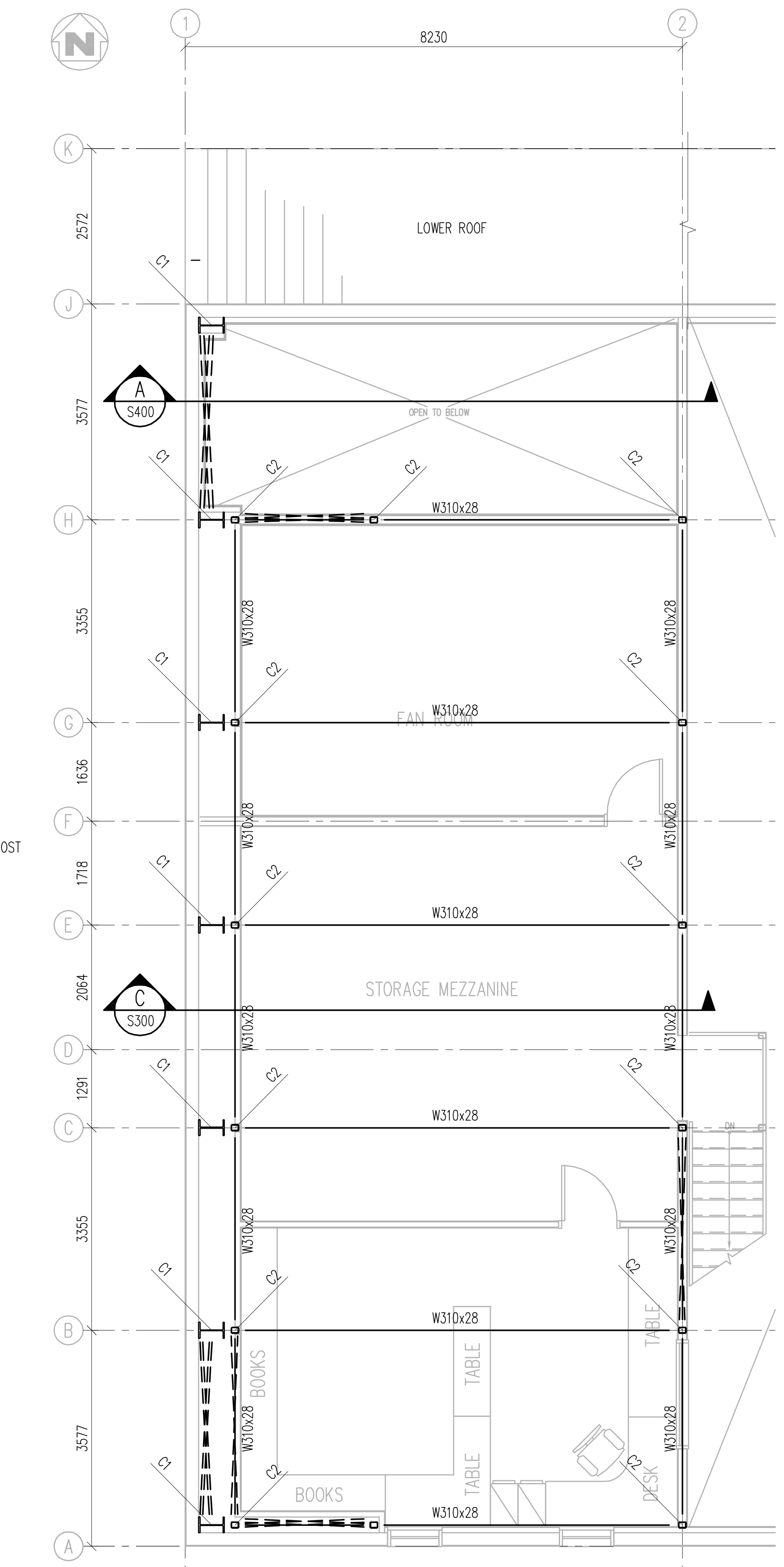
TYPE	MEMBER SIZE	LOCATION
BR1	HSS 76x51x8	PORTAL FRAME VERTICAL
BR2	L100x100x6	MEZZANINE VERTICAL
BR3	L70x70x6	PORTAL FRAME ROOF



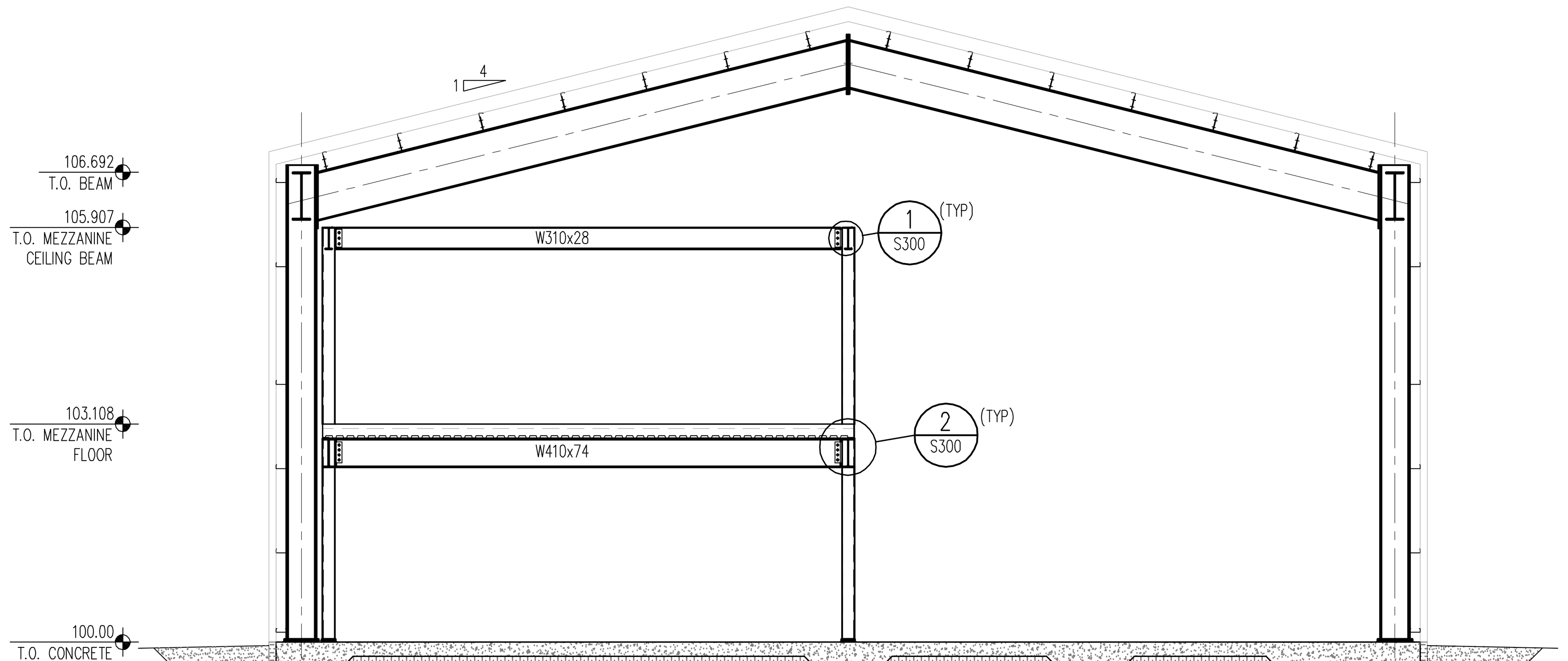


A SECTION S300 1:75

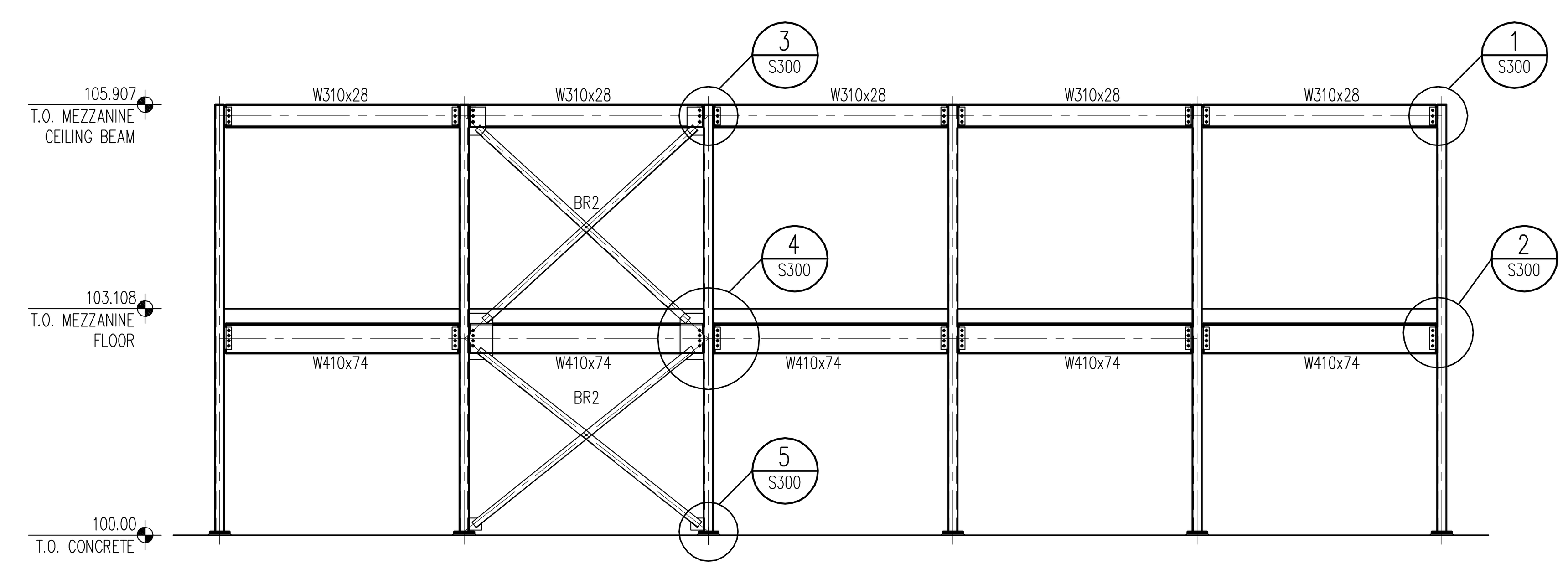
B SECTION S300 1:75



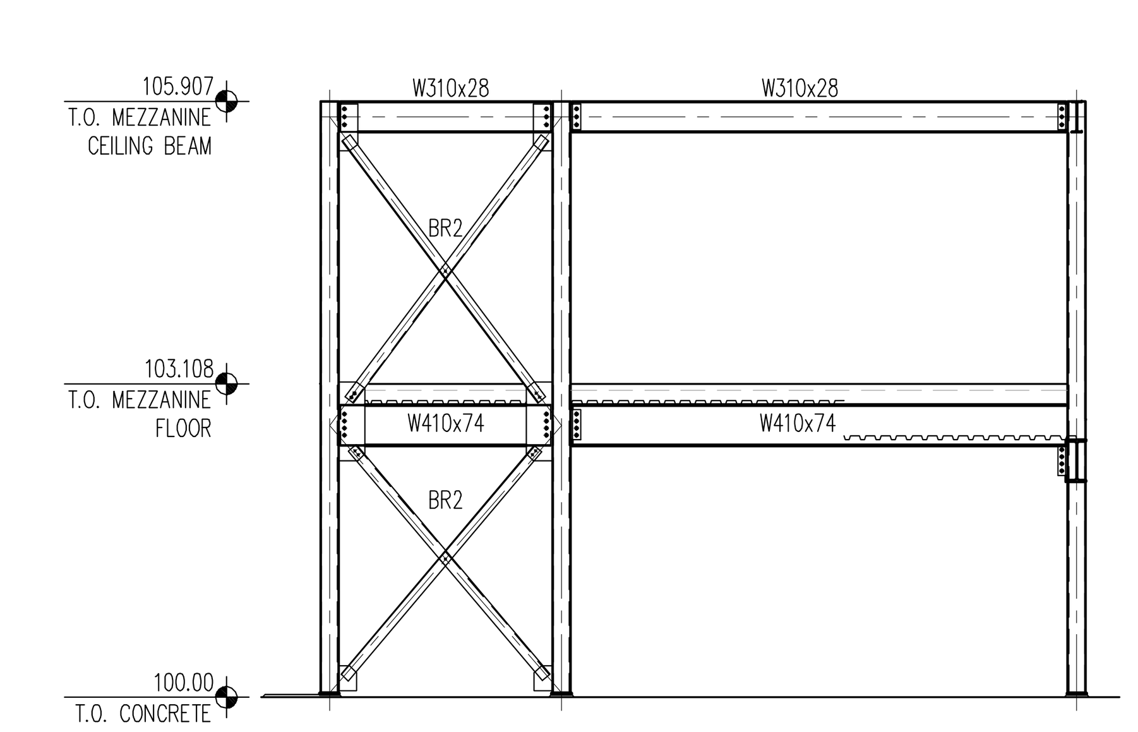
MEZZANINE ROOF FRAMING PLAN
1:75



C SECTION S300 1:75



MEZZANINE BRACING FRAME: GRIDLINE 1 AND 2
1:75



MEZZANINE BRACING FRAME: GRIDLINE A AND H
1:75

REVISIONS

NO.	DESCRIPTION	YYYY.MM.DD	BY	APP.
A	ISSUED FOR 100% REVIEW	2014.01.15	JK	TL
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DRAWING NO.	DESCRIPTOR

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WILLIAMS ENGINEERING CANADA

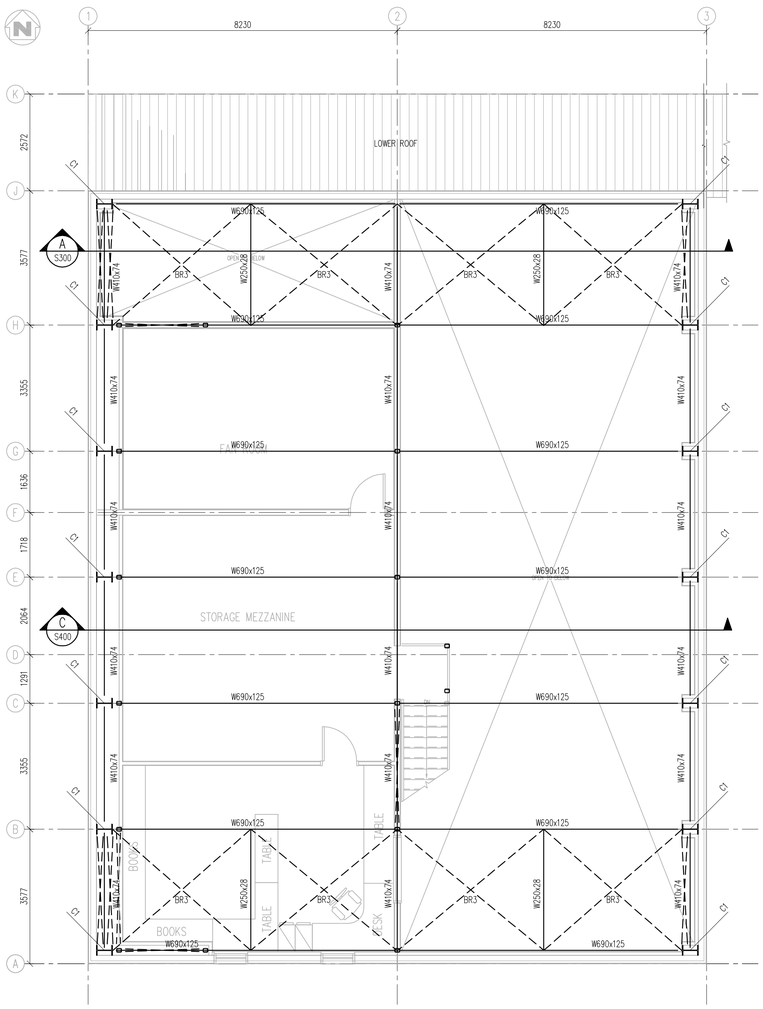
CLIENT:

Nunavut

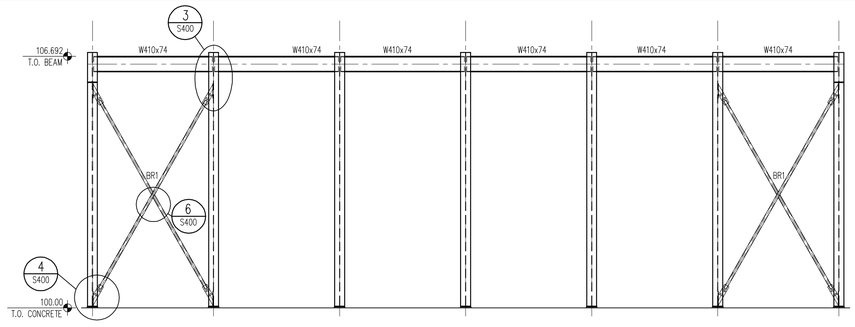
JOB. TITLE:
WATER SUPPLY IMPROVEMENTS
PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
STRUCTURAL
MEZZANINE LAYOUT

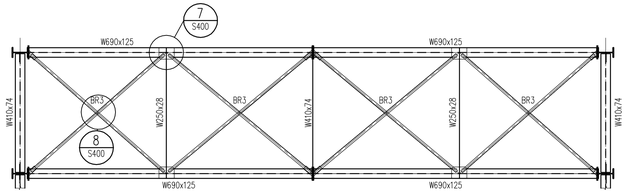
DWN. BY: JK	DES. BY: TL/WVR	PROJ. MGR.: JC
PEER REVIEW: PC	DATE: (YY-MM-DD) 2014.03.05	SCALE: AS NOTED
CLIENT PROJ. # 04-4417		WE PROJ. # 13655.00
DWG # S300	OF 5	REV # 0



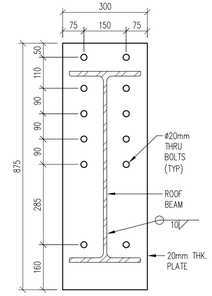
ROOF FRAME PLAN
1:75



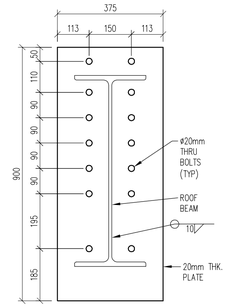
PORTAL SIDE FRAME: GRIDLINE 1 AND 3
1:75



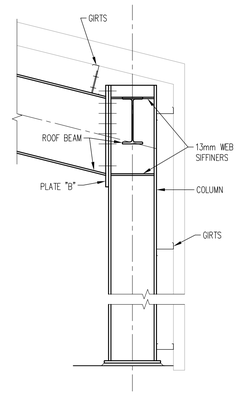
PORTAL FRAME ROOF BRACING
1:75



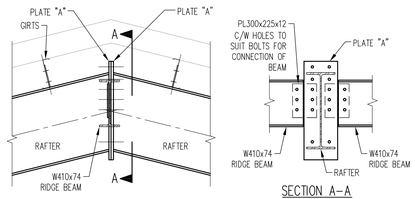
TYPICAL RAFTER CONNECTION PLATE "A"
1:10



TYPICAL RAFTER CONNECTION PLATE "B"
1:10

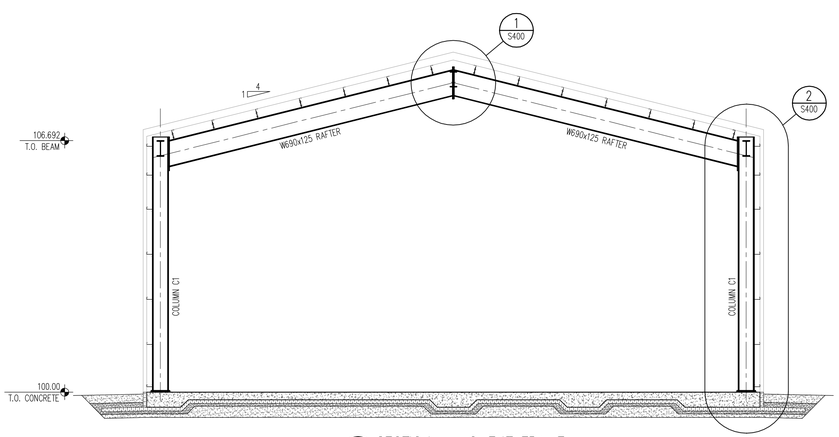


2 S400 DETAIL – PORTAL FRAME EAVE
1:25

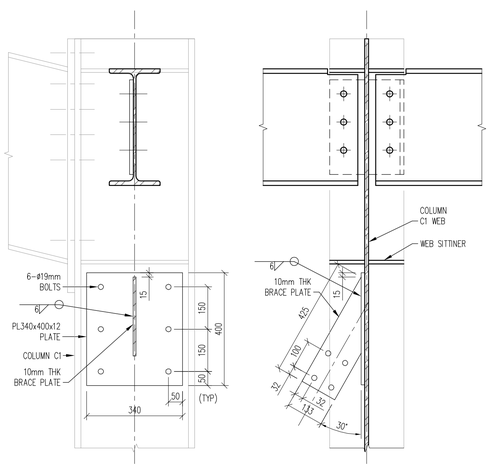


SECTION A–A

1 S400 DETAIL – PORTAL FRAME APEX
1:25

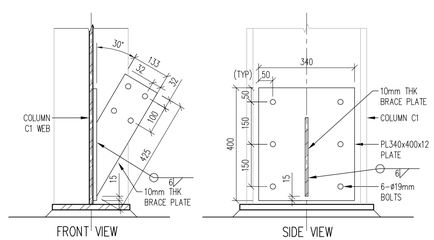


A S400 SECTION – MOMENT FRAME
1:75



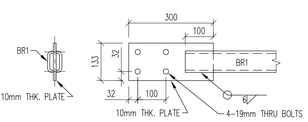
SIDE VIEW FRONT VIEW

3 S400 DETAIL –
1:10



FRONT VIEW SIDE VIEW

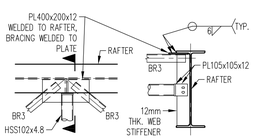
4 S400 DETAIL –
1:10



END VIEW SIDE VIEW

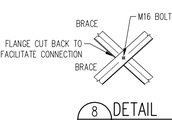
5 S400 DETAIL –
1:10

6 S400 DETAIL
1:25



PLAN VIEW SECTION VIEW

7 S400 DETAIL
1:25



8 S400 DETAIL
1:25

REVISIONS

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DRAWING NO. DESCRIPTOR

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WILLIAMS ENGINEERING CANADA

CLIENT:

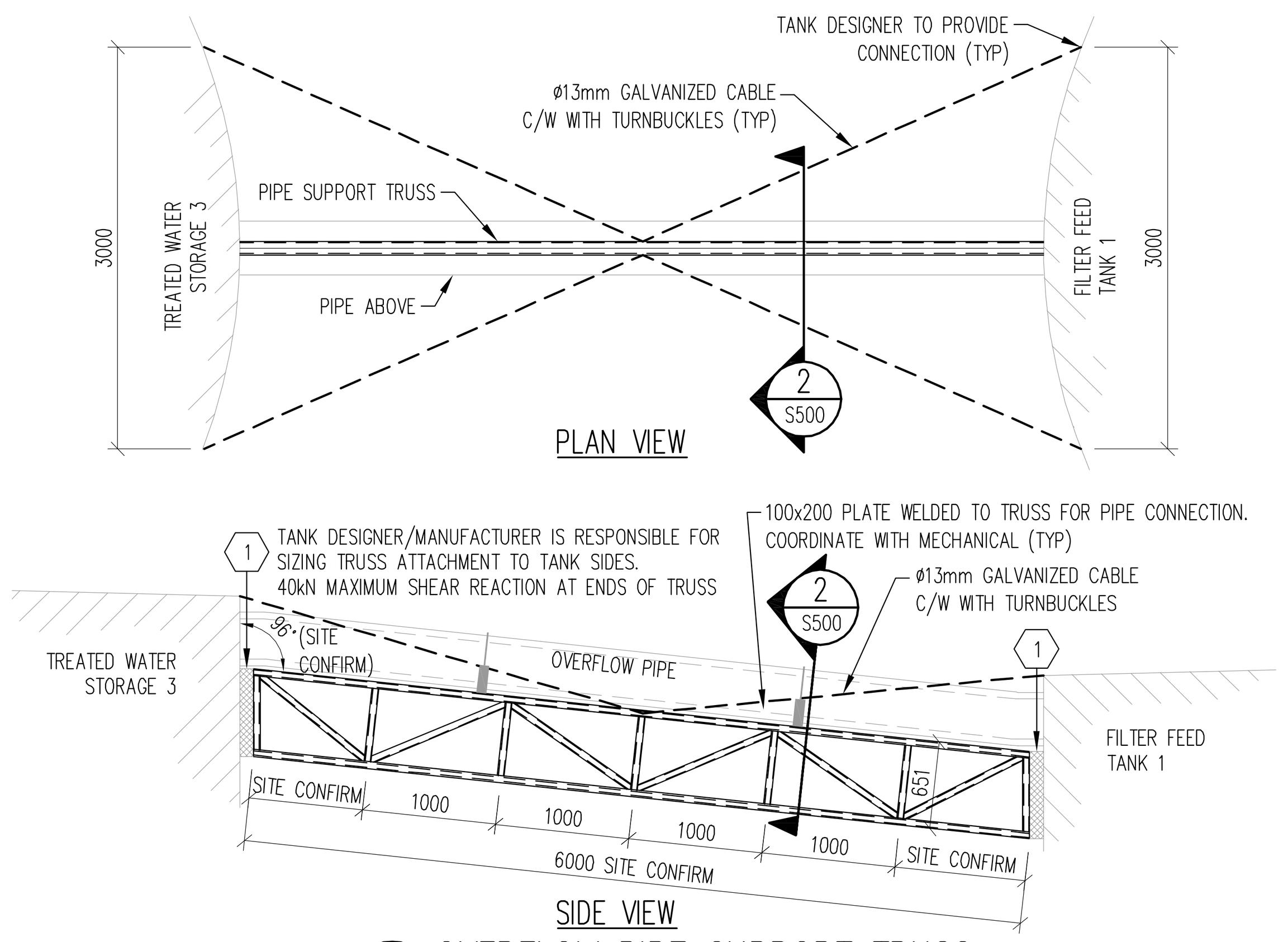
Nunavut

JOB TITLE:
WATER SUPPLY IMPROVEMENTS
PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

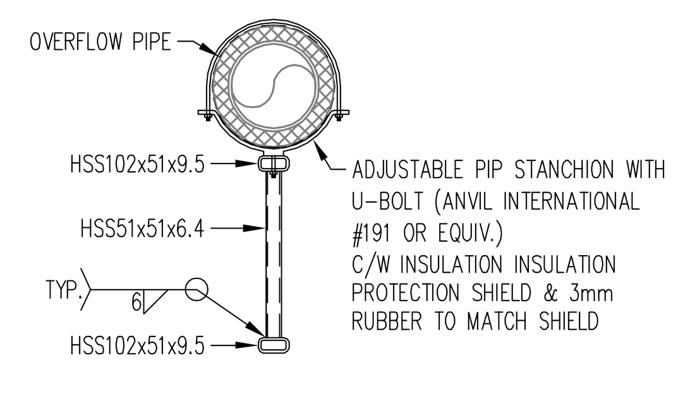
DWG. TITLE:
STRUCTURAL
PORTAL FRAME LAYOUT

DWN. BY:	DES. BY:	PROJ. MGR.:
JK	TL/WVR	JC
PEER REVIEW:	DATE: (YY-MM-DD)	SCALE:
PC	2014.03.05	AS NOTED
CLIENT PROJ. #	WE PROJ. #	
04–4417	13655.00	

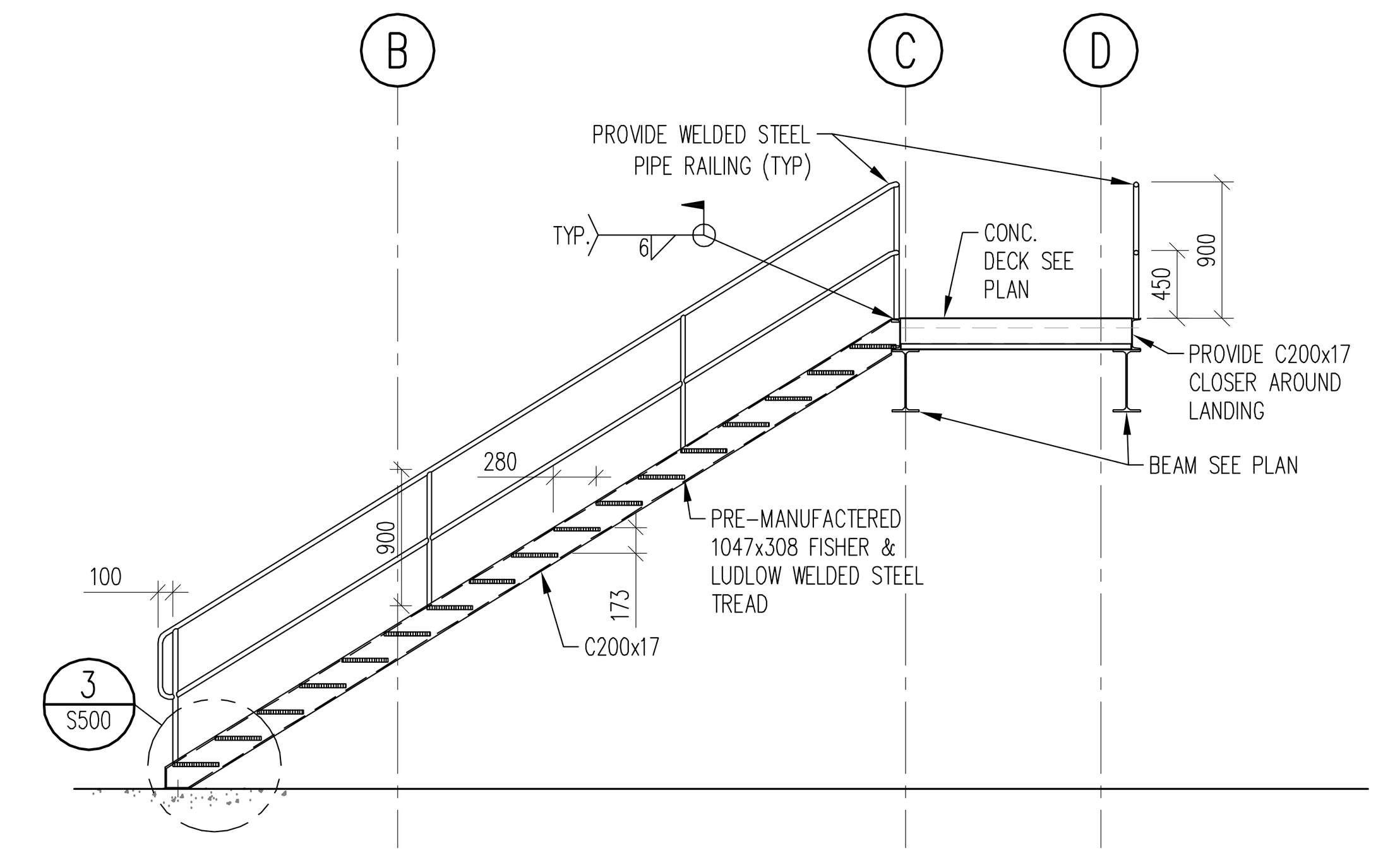
DWG. # S400 SHT. # 5 REV. # 0



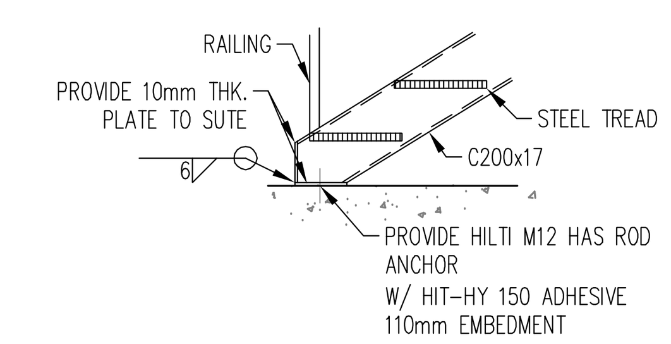
1 S500 OVERFLOW PIPE SUPPORT TRUSS 1:50



2 S500 DETAIL - 1:25



A S500 STAIR SECTION 1:50



3 S500 DETAIL 1:25

REVISIONS

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A C-001 DETAIL # SOURCE / REFERENCE DWG.

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WILLIAMS ENGINEERING CANADA

CLIENT:

JOB. TITLE:
WATER SUPPLY IMPROVEMENTS
PHASE 2
WATER TREATMENT PLANT
KUGLUKTUK, NU

DWG. TITLE:
STRUCTURAL
MISCELLANIES
SECTIONS & DETAILS

DWN. BY: JK	DES. BY: TL/WVR	PROJ. MGR.: JC
PEER REVIEW: PC	DATE: (YY-MM-DD) 2014.03.05	SCALE: AS NOTED
CLIENT PROJ. # 04-4417		WE PROJ. # 13655.00
DWG # S500	OF 5	REV # 0