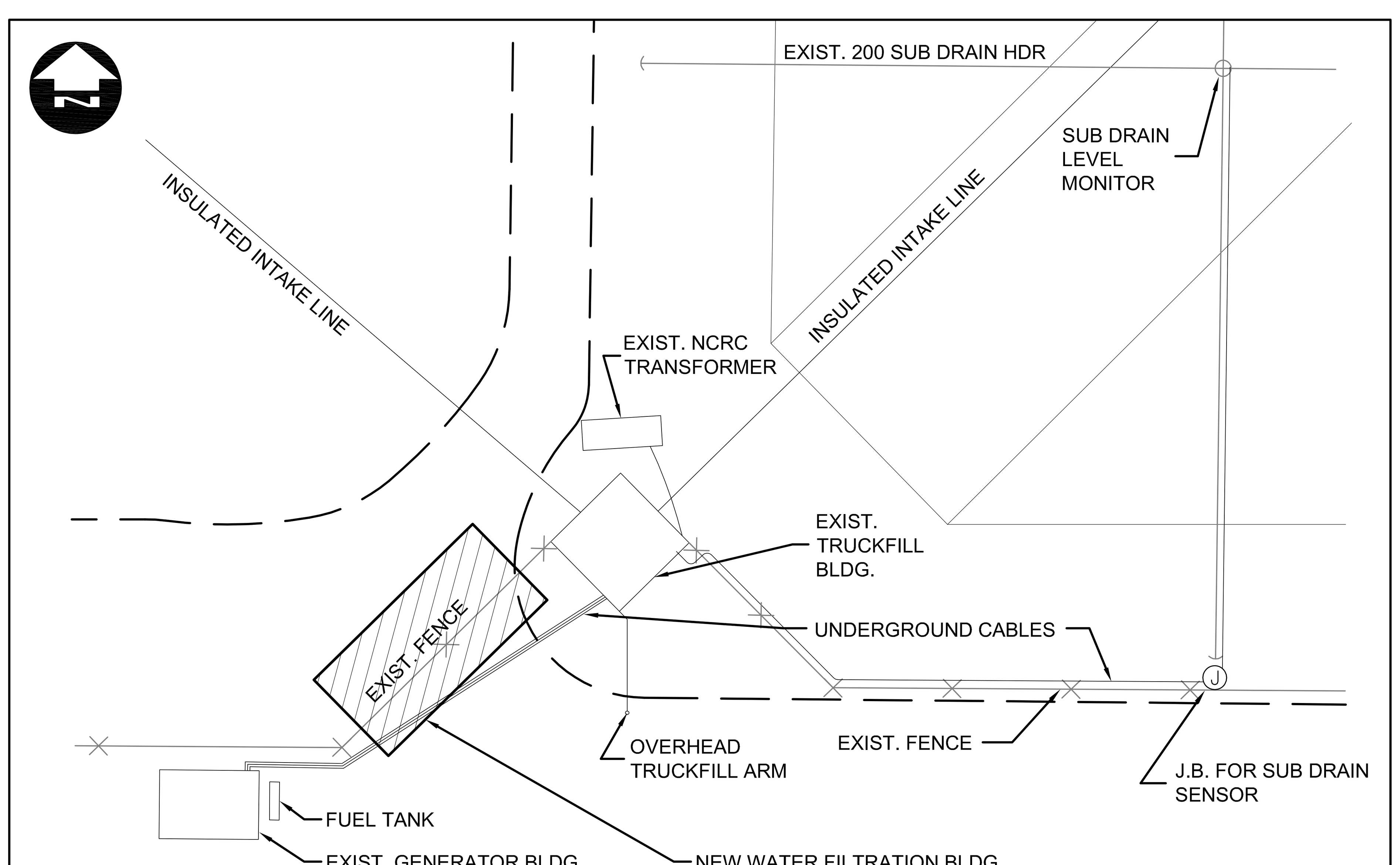

THE GOVERNMENT OF NUNAVUT
PUBLIC WORKS AND SERVICES

ARVIAT WATER SUPPLY FILTRATION UPGRADE

ISSUED FOR TENDER

APRIL, 2008

PROJECT No. 078254

Drawing List

Sheet Number	Sheet Title
000	Cover
101	Siteworks
102	Building Layout
103	Filtration Building Elevations
104	Metal Skid Plan & Details and Pump Skid Detail
201	P & ID Process Legend
202	Process Water Flow Schematic
203	Building Mechanical
204	Filtration System
205	Domestic Plumbing
301	Existing Plans Details and Schematics
302	Diagrams Schematics and Panel Schedule
303	New Filtration Building Electrical
304	Wiring Controls and Schematics
305	Schedules

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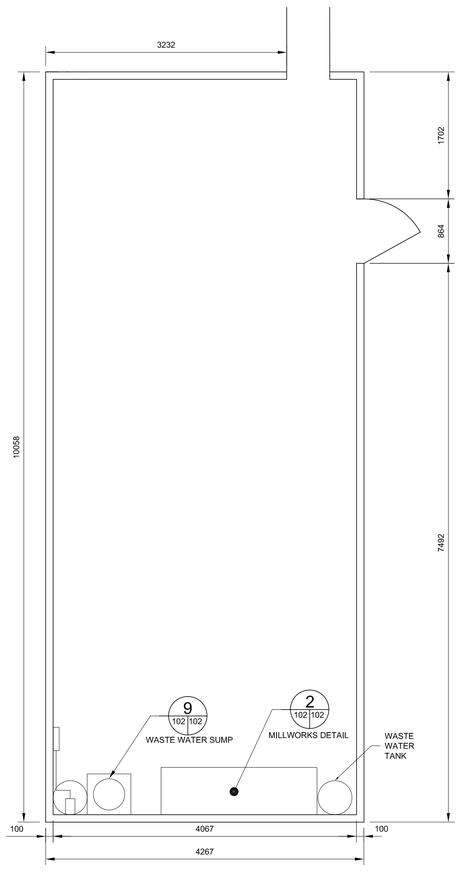
DRAWN: JMS	CHECKED BY: GS
DATE: APRIL 2008	
SCALE: 1:150	

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

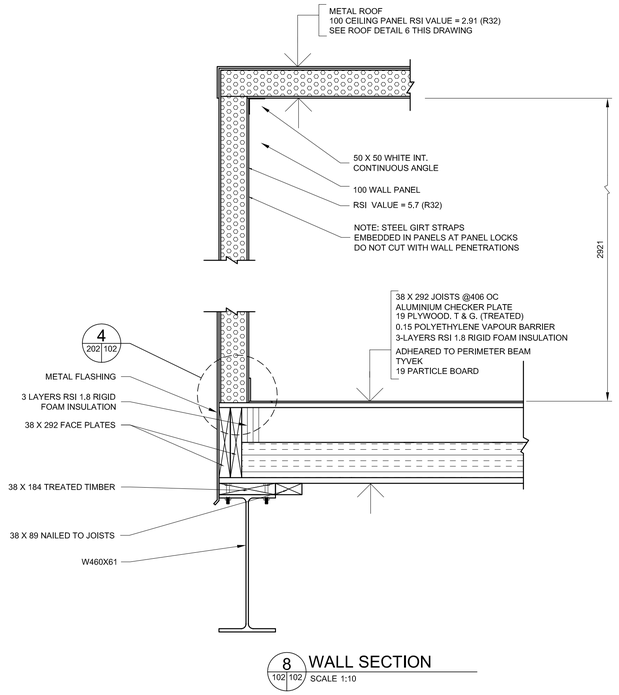
SITEWORKS

PROJECT NO. 07-8254-1000

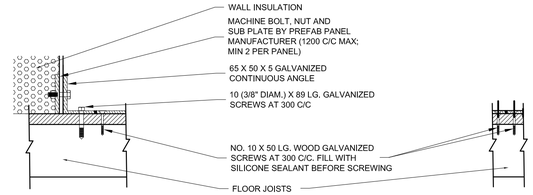
SHEET NO. **101**



1 202 102 INTAKE PUMP HOUSE FLOOR PLAN
SCALE 1:30

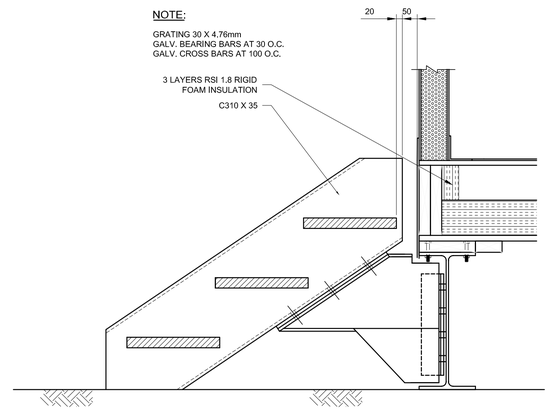


8 102 102 WALL SECTION
SCALE 1:10



6 102 102 TYPICAL WALL ANCHOR DETAIL
SCALE 1:5

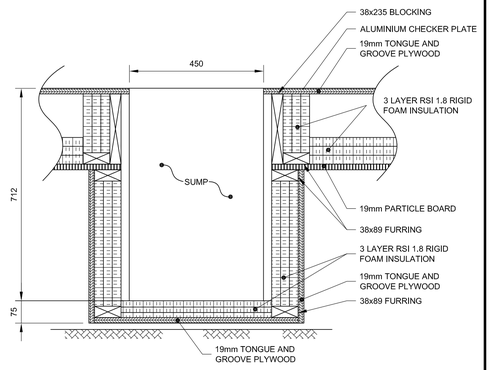
5 202 102 TYPICAL PLATE JOINT DETAIL
SCALE 1:5



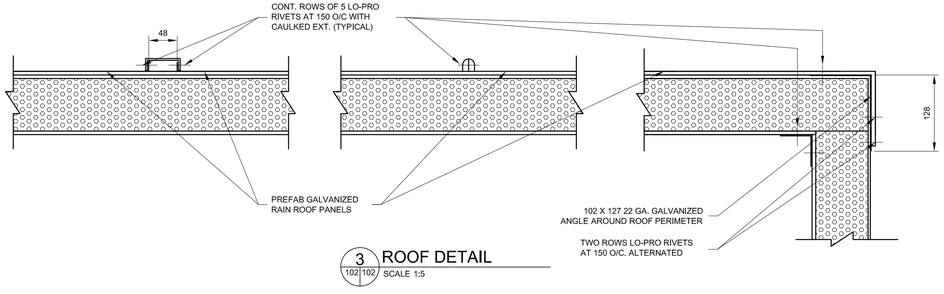
4 102 102 STAIR DETAIL
SCALE 1:10

NOTES:

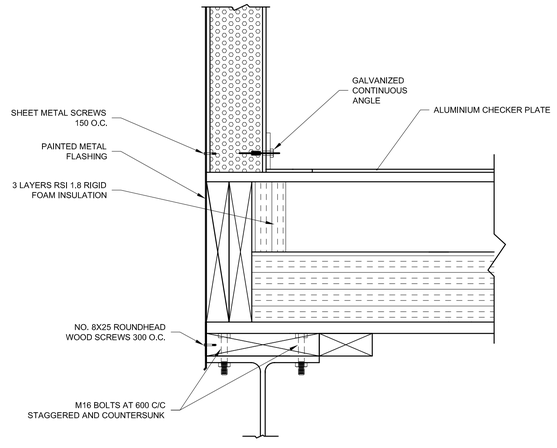
HOUSE KEEPING PAD SIZES TO BE COORDINATED WITH EQUIPMENT INSTALLER.



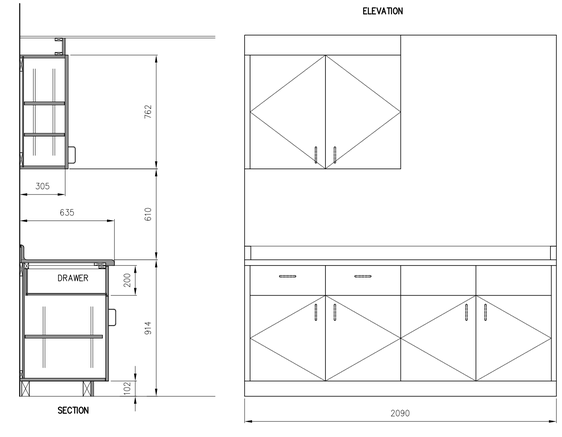
9 102 102 WASTE WATER SUMP DETAIL
SCALE 1:10



3 102 102 ROOF DETAIL
SCALE 1:5



7 102 102 WALL DETAIL
SCALE 1:5



MILLWORK NOTES:

CABINET BOXES, DOOR, AND DRAWER FRONTS OF 19MM PLYWOOD COVERED WITH PLASTIC LAMINATE ON ALL EXPOSED SURFACES AND EDGES

CABINET BACKS OF 12MM PLYWOOD COVERED WITH PLASTIC LAMINATE ON EXPOSED SURFACES

DRAWERS TO SLIDE ON METAL TRACKS WITH NYLON WHEELS

DOORS TO HAVE CONCEALED HINGES WITH 110 DEGREE OPENING

PULLS OF BRUSHED STAINLESS STEEL 10MM DIAM BY 100 LONG D HANDLES

SHELVES SUPPORTED BY RECESSED ADJUSTABLE BRACKETS

COUNTER TOP OF POST FORMED PLASTIC LAMINATE WITH INTEGRAL MOULDED BACKSPLASH

COVER BASE TO MATCH BASE OF ROOM

PROVIDE VALENCE AT TOP AND INFILL PIECES AT EDGES SCRIBED TO ADJACENT SURFACES

2 102 102 MILLWORKS DETAIL
SCALE 1:20

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G. STRONG
N.W.T.

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DRAWN	CHECKED BY
NTB	GS
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WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

PROJECT NO. **07-8254-1000**

BUILDING LAYOUT

SHEET NO. **102**

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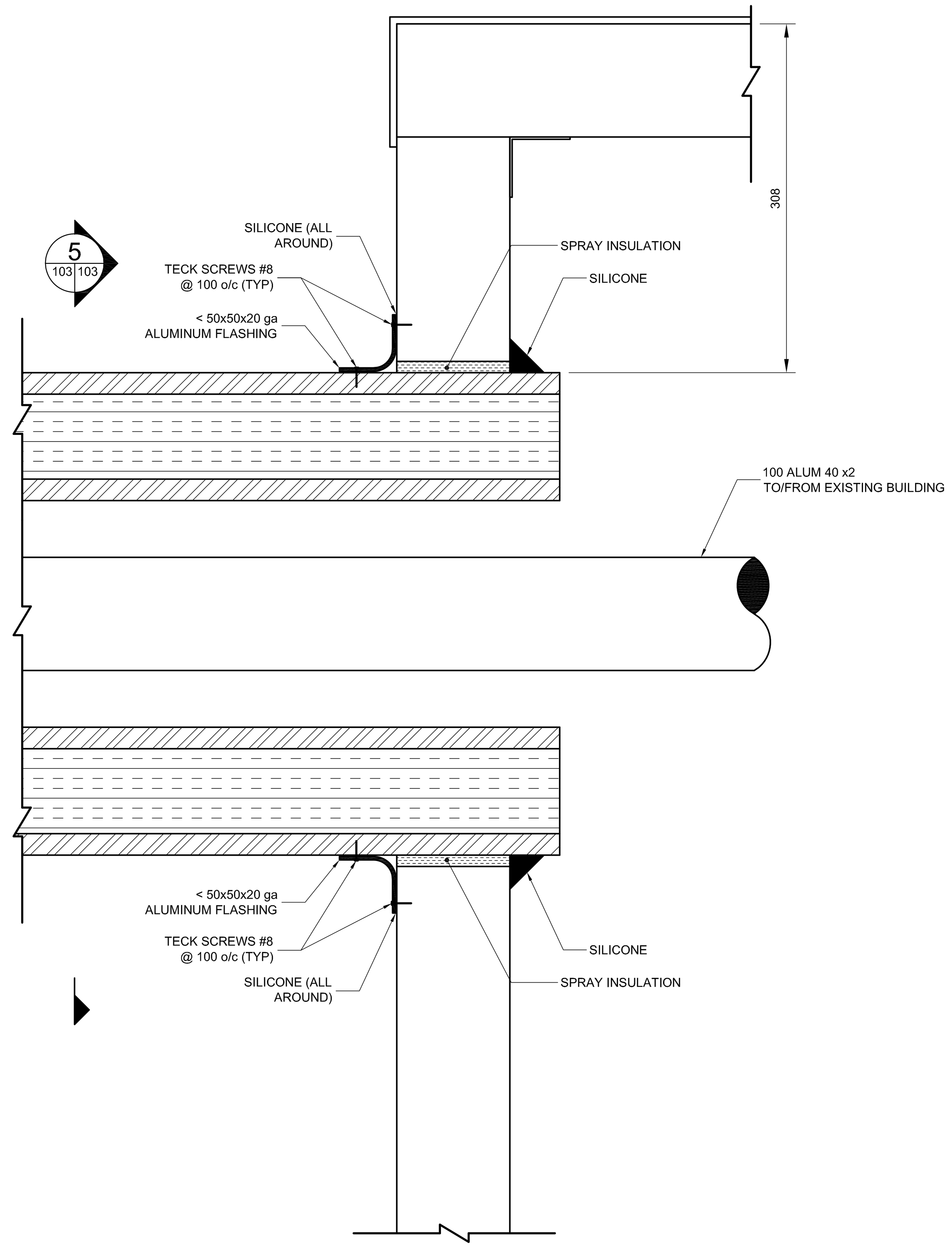
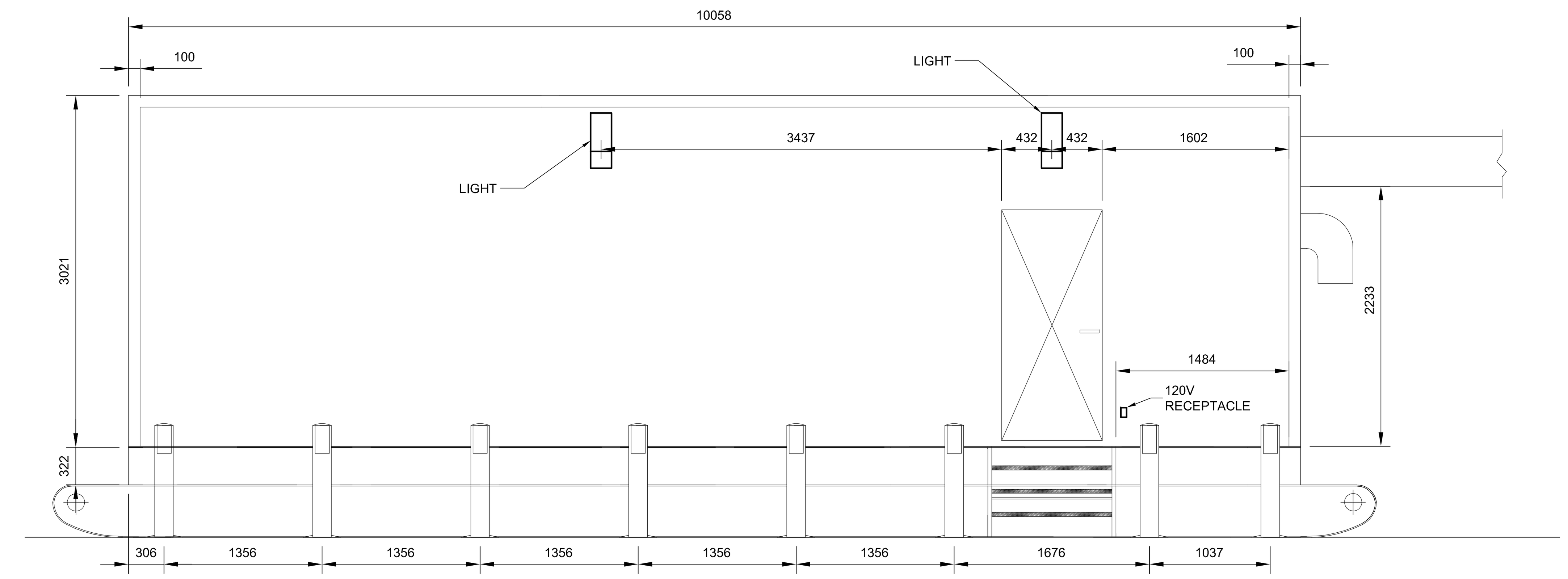
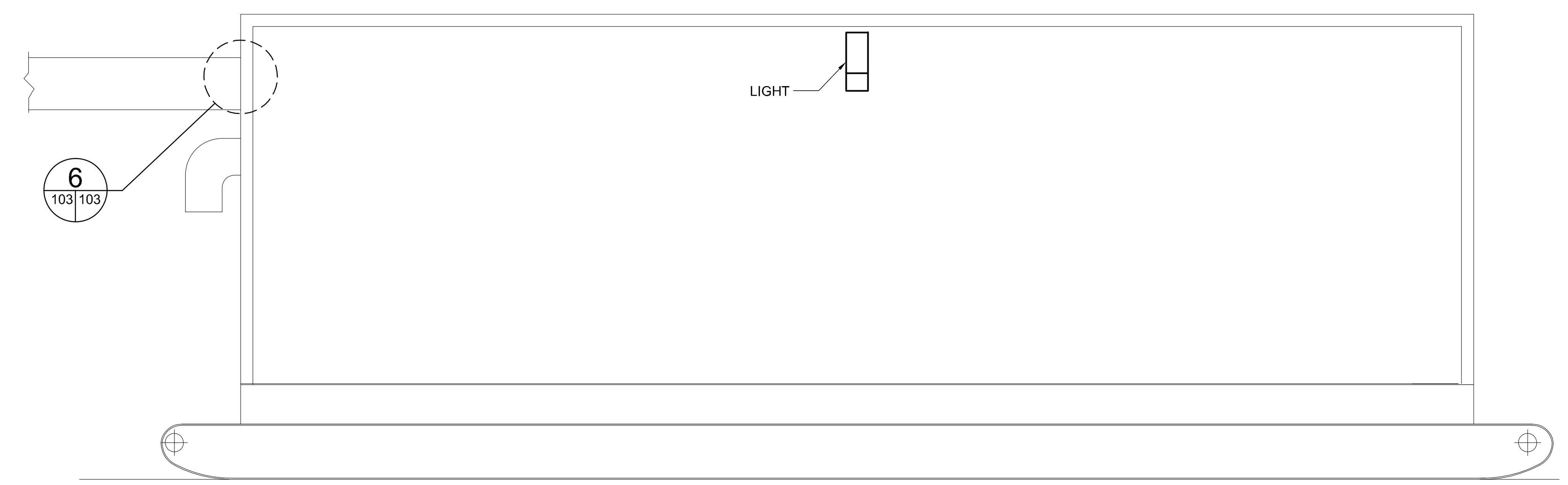


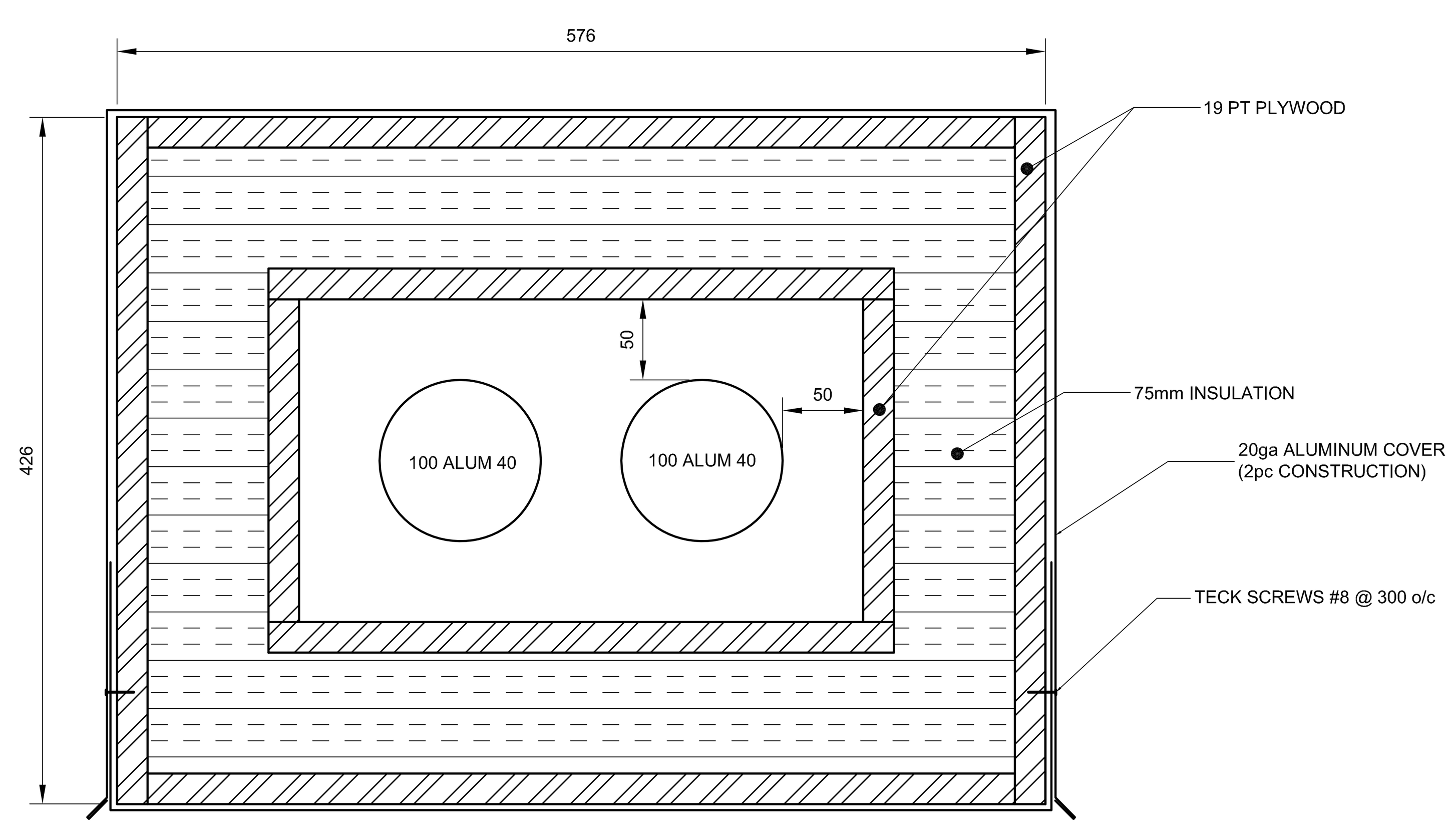
6 UTILIDOR BUILDING PENETRATION DETAIL
103 | 103 SCALE 1:4



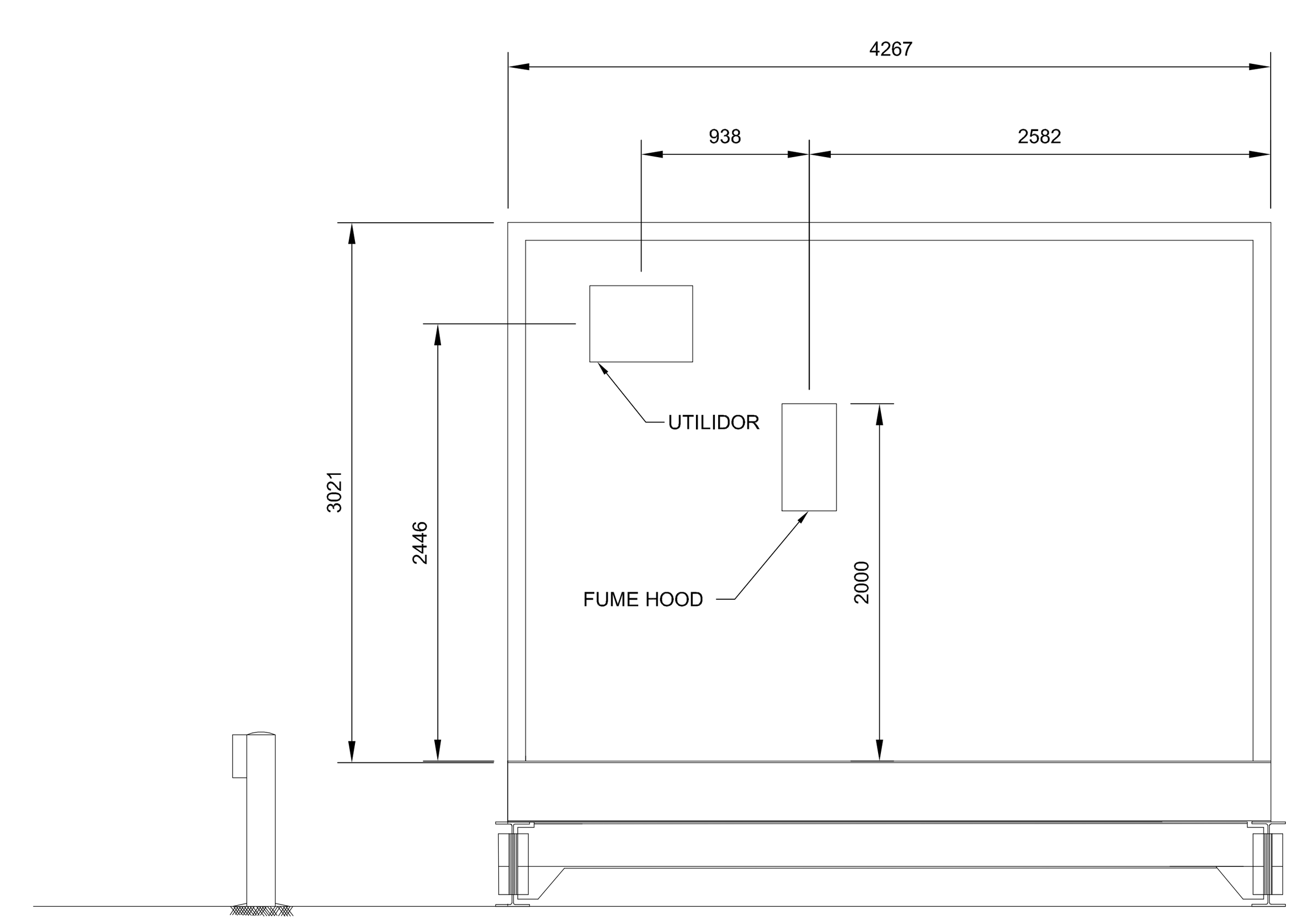
1 FILTRATION BUILDING FRONT ELEVATION
103 | 103 SCALE 1:40



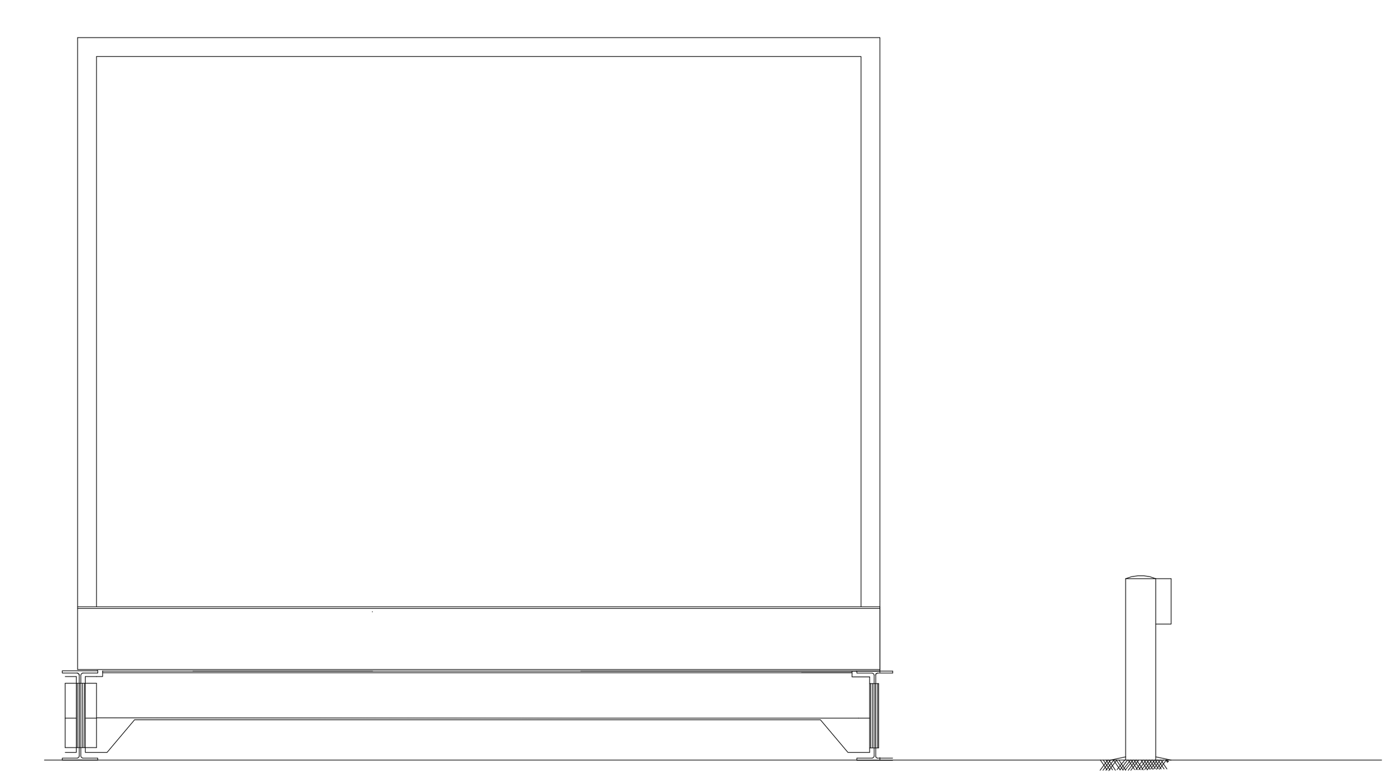
2 FILTRATION BUILDING BACK ELEVATION
103 | 103 SCALE 1:40



5 UTILIDOR DETAIL
103 | 103 SCALE 1:4



4 FILTRATION BUILDING RIGHT ELEVATION
103 | 103 SCALE 1:40



3 FILTRATION BUILDING LEFT ELEVATION
103 | 103 SCALE 1:40

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WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

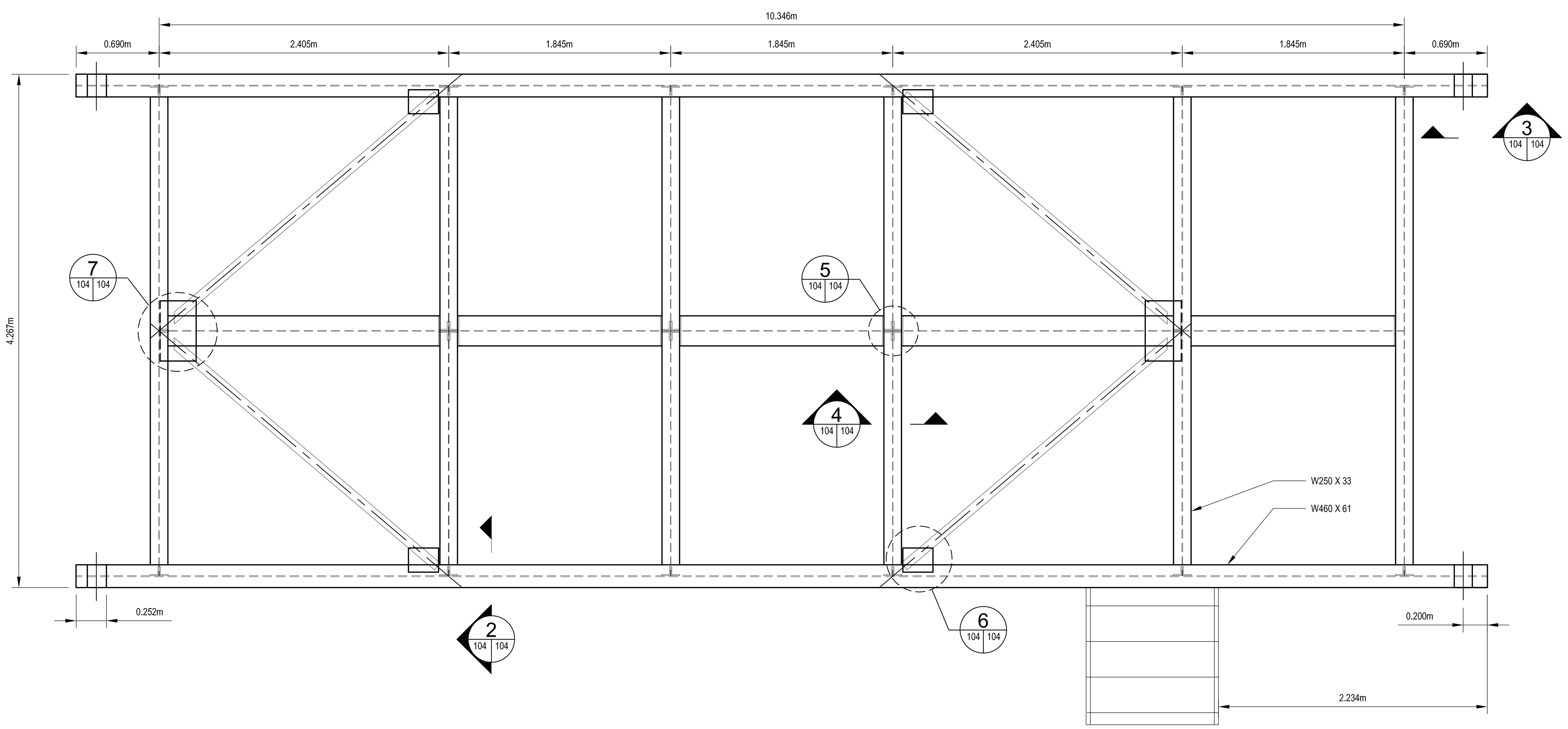
FILTRATION BUILDING ELEVATIONS

PROJECT NO. 07-8254-1000

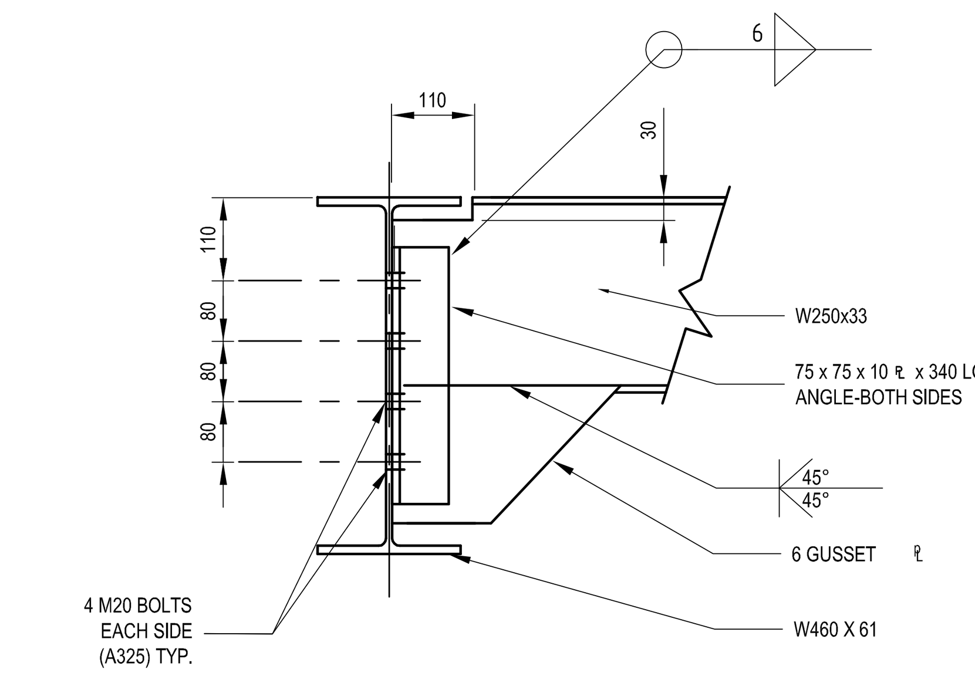
SHEET NO. 103

NOTES

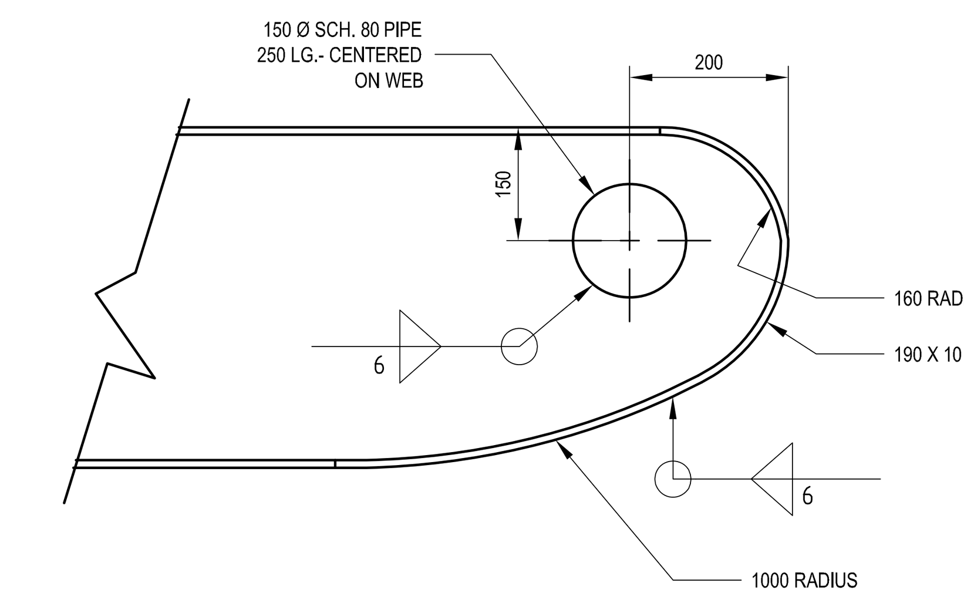
1. ALL STEEL TO BE 300 W.T.
2. ELECTRODES TO BE 480 XX.
3. SKID COMPONENT TO BE GALVANIZED.



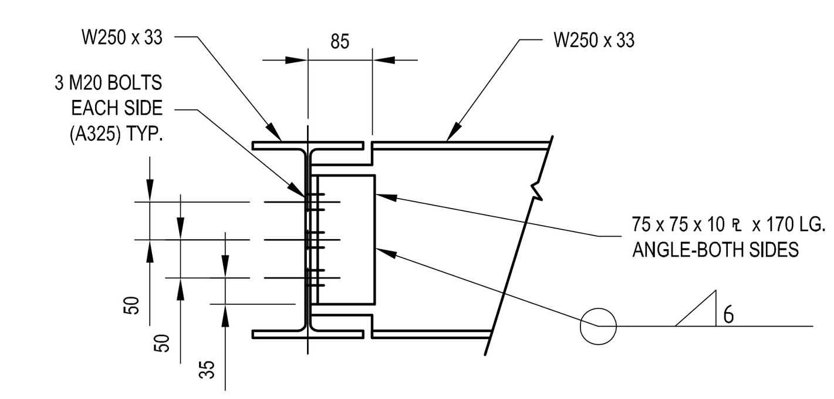
1 BUILDING SKID PLAN
SCALE 1:30



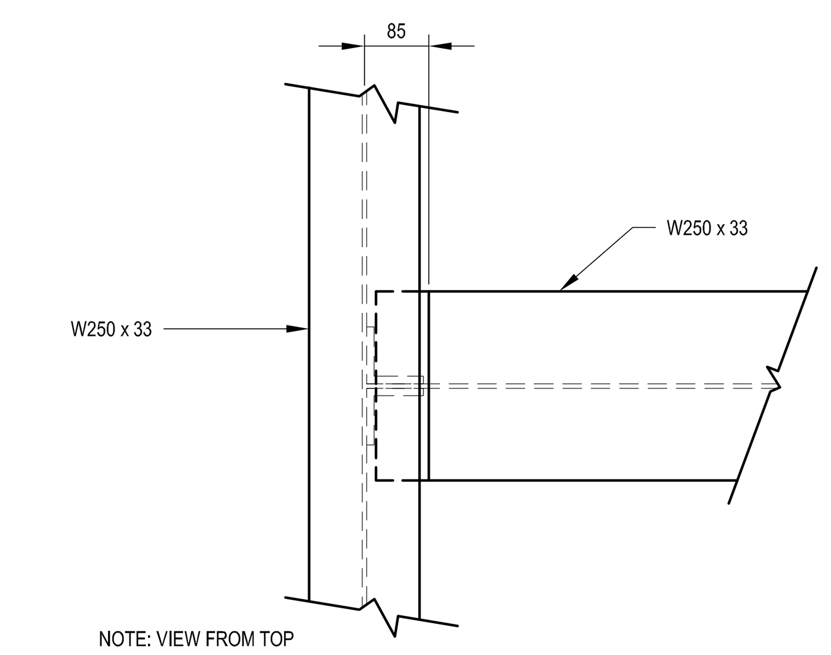
2 SKID SECTION
SCALE 1:10



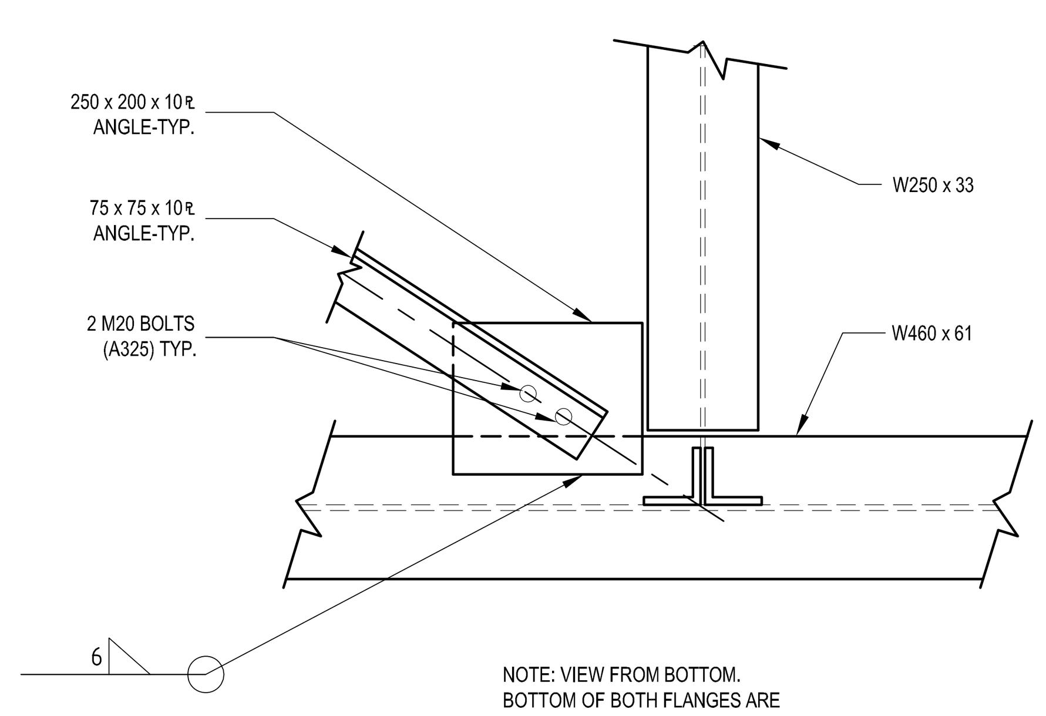
3 SKID ENDS SECTION
SCALE 1:10



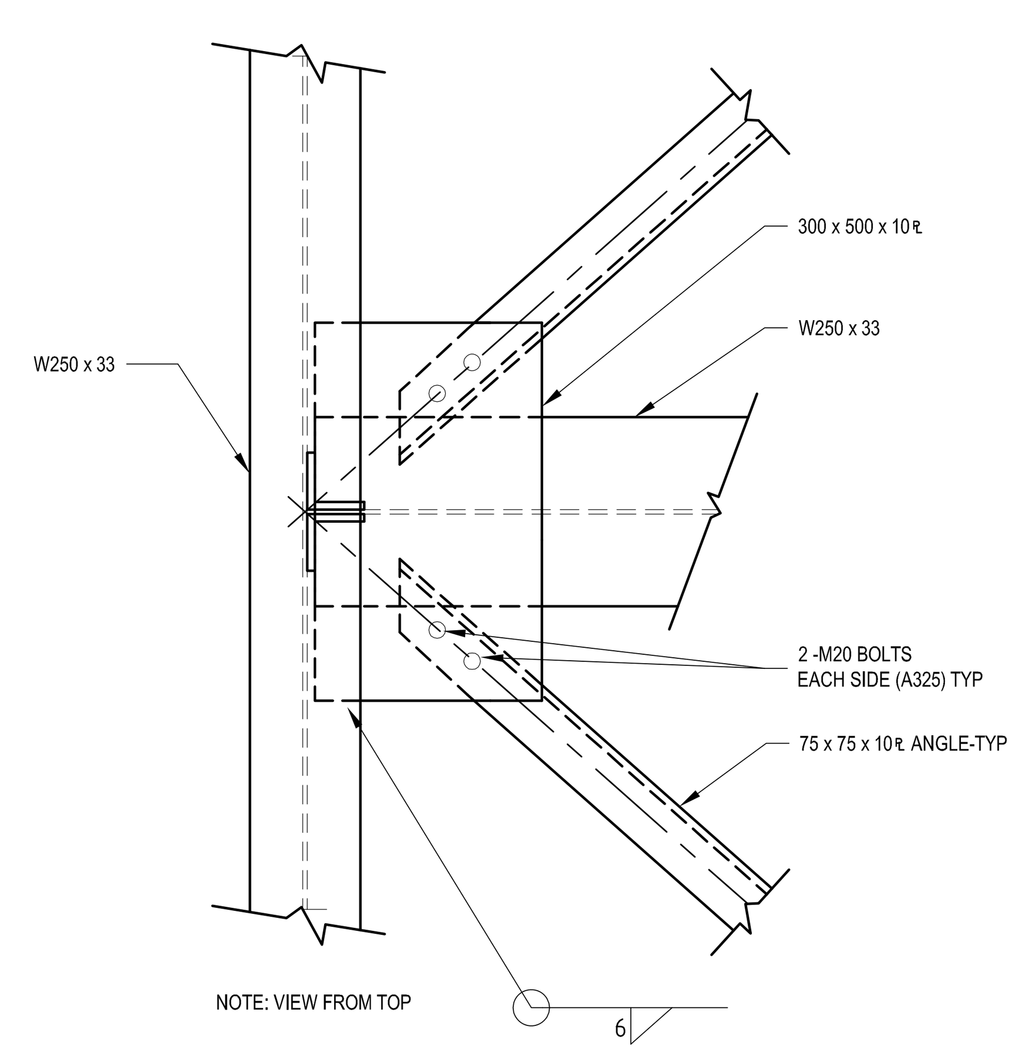
4 SUPPORT BEAM SECTION
SCALE 1:10



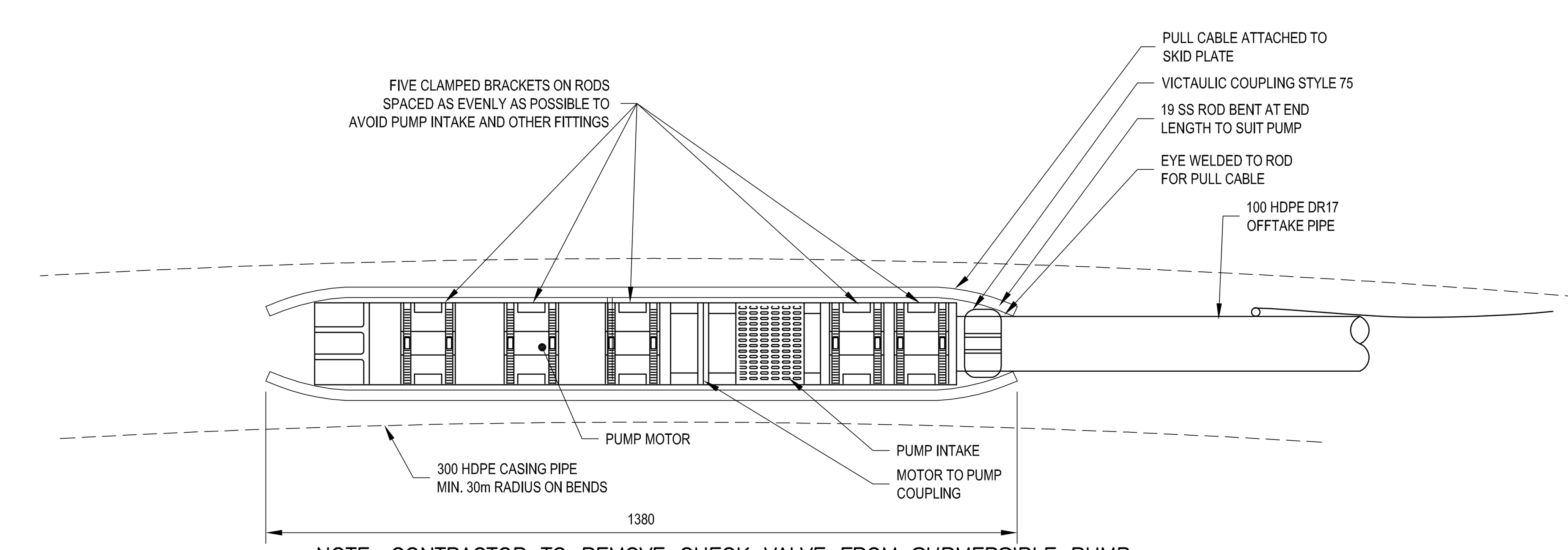
5 SKID SUPPORT DETAIL
SCALE 1:10



6 SKID SUPPORT DETAIL
SCALE 1:10



7 SKID SUPPORT DETAIL
SCALE 1:10



NOTE: CONTRACTOR TO REMOVE CHECK VALVE FROM SUBMERSIBLE PUMP DURING INSTALLATION

8 PUMP SKID DETAIL
SCALE 1:10

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DATE: APRIL 2008	
SCALE: AS SHOWN	

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

METAL SKID PLAN & DETAILS AND PUMP SKID DETAIL

PROJECT NO. 07-8254-1000

SHEET NO. **104**

4920 47TH STREET, YELLOWKNIFE NT, X1A 2P1, PHONE 867.920.4555

PROCESS LEGEND – MISCELLANEOUS

EQUIPMENT FRAGMENT No. DESIGNATION

LLLL–S–PPP–EEE##

- LOCATION ELEMENT
- SECTION ELEMENT
- PROCESS
- EQUIPMENT

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

NON PROCESS RELATED EQUIPMENT

(ie. PANEL, SUMP PUMP, ETC.)

LLL–B##–EEE##

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

PIPING LINE DESIGNATION

50–PAC–CS#C+E+I

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

PIPE SIZE CONVERSION

IMPERIAL(in)	METRIC(mm)	IMPERIAL(in)	METRIC(mm)
1/8	3	14	350
1/4	6	15	380
3/8	10	16	400
1/2	12	18	450
3/4	20	20	500
1	25	24	600
1–1/4	32	30	750
1–1/2	40	36	900
2	50	42	1050
2–1/2	65	48	1200
3	75	54	1350
4	100	60	1500
5	125	66	1650
6	150	72	1800
8	200	78	2000
10	250	84	2100
12	300		

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

PIPE MATERIAL ABBREVIATIONS

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

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

PROCESS LEGEND – SERVICE ABBREVIATIONS

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

PROCESS LEGEND – VALVE SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
VGA*	GATE	VGL*	GLOBE
VTW*	THREE–WAY	VAN*	ANGLE
VBA*	BALL	VPL*	PLUG
VBU*	BUTTERFLY	VSQ*	STOP COCK
VKG*	KNIFE GATE	VNE*	NEEDLE
VDM*	DIAPHRAGM	VPN*	PINCH
VMU*	MUD	VSQ*	SQUARE HEAD COCK
VSC*	SWING CHECK	VSC*	SPRING CHECK
VSC*	WEIGHTED CHECK	VEC*	ELECTRIC CHECK
VDC*	DOUBLE DOOR CHECK	VBC*	BALL CHECK
VFP*	FLAP	VFS*	FOOT VALVE/ STRAINER
VAC*	AIR VACUUM	VAV*	AIR & VACUUM
VAR*	AIR RELEASE	VSR*	SAFETY RELIEF
PRV*	PRESSURE REDUCING (SELF CONTAINED)	PRV*	PRESSURE REDUCING
BPV*	BACK PRESSURE (SELF CONTAINED)	BPV*	BACK PRESSURE
SG*	STOP GATE	AWG*	ADJUSTABLE WEIR GATE
SLG*	SLIDE GATE	STL*	STOP LOGS
VRO*	ROTARY	VHYD*	YARD HYDRANT
	DAMPER		

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

PROCESS LEGEND – VALVE ACTUATORS

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

NOTE : GATE VALVES ARE USED FOR ILLUSTRATION PURPOSES ONLY

PROCESS LEGEND – EQUIPMENT

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

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

PROCESS LEGEND – P & ID SYMBOL DESIGNATIONS

SYMBOL	DESCRIPTION
	PRIMARY FLOW LINE
	SECONDARY FLOW LINE
	TERTIARY LINE
	EXISTING PRIMARY FLOW LINE
	EXISTING SECONDARY FLOW LINE
	EXISTING TERTIARY LINE
	FUTURE LINE
	DIRECTION OF FLOW
2% SLOPE	DIRECTION OF SLOPE
	CONNECTION LINE
	LINES CROSSING OVER (BREAK VERTICAL LINE)
	CHANNEL
TEXT TEXT	LINE CONTINUATION– TO ANOTHER DRAWING
TEXT TEXT	LINE CONTINUATION– FROM ANOTHER DRAWING
SS PVC	LINE SPECIFICATION CHANGE
	PNEUMATIC LINE
	ELECTRICAL SIGNAL
	HYDRAULIC LINE
	INSULATED LINE
E	INSULATED LINE WITH ELECTRIC TRACING
	FLEXIBLE LINE

PROCESS LEGEND – INSTRUMENTATION

INSTRUMENTATION DESIGNATION – TYPICAL LETTER COMBINATION

FIRST–LETTERS	INITIATING OR MEASURED VARIABLE	CONTROLLERS INDICATING	CONTROLLERS BLIND	READOUT DEVICES INDICATING	SWITCHES AND ALARM DEVICES* HIGH**	SWITCHES AND ALARM DEVICES* LOW**	SWITCHES AND ALARM DEVICES* COMB	TRANSMITTERS INDICATING	TRANSMITTERS BLIND	PRIMARY ELEMENT	VIEWING DEVICE, GLASS	SAFETY DEVICE	VALVE
A ***	ANALYSIS	AIC	AC	AI	ASH	ASL	ASHL	AIT	AT	AE			
D	DENSITY	DIC	DC	DI	DSH	DSL	DSHL	DIT	DT	DE			
F	FLOW RATE	FIC	FC	FI	FSH	FSL	FSHL	FIT	FT	FE	FG		FCV
H	HAND ON/OFF	HIC	HC										HV
I	CURRENT	IIC		II	ISH	ISL	ISHL	IIT	IT	IE			
L	LEVEL	LIC	LC	LI	LSH	LSL	LSHL	LIT	LT	LE	LG		LCV
M	MOTORIZED												MV
P	PRESSURE/ VACUUM	PIC	PC	PI	PSH	PSL	PSHL	PIT	PT	PE		PSV,PSE	PCV
PD	PRESSURE, DIFFERENTIAL	PDIC	PDC	PDI	PDSH	PDSL		PDIT	PDT	PE			PDCV
S	SPEED/ FREQUENCY	SIC	SC	SI	SSH	SSL	SSHL	SIT	ST	SE			SCV
T	TEMPERATURE	TIC	TC	TI	TSH	TSL	TSHL	TIT	TT	TE		TSE	TCV
V	VIBRATION			VI	VSH	VSL	VSHL	VIT	VT	VE			
W	WEIGHT/FORCE	WIC	WC	WI	WSH	WSL	WSHL	WIT	WT	WE			WCV
Y	STATUS	YIC	YC	YI	YSH	YSL			YT	YE			
Z	POSITION/ DIMENSION	ZIC	ZC	ZI	ZSH	ZSL	ZSHL	ZIT	ZT	ZE			ZCV

WATER TREATMENT

***	DESCRIPTION
pH	pH
CLR	CHLORINE RESIDUAL
CLC	CHLORINE LEAK
Tu	TURBIDITY
OZR	OZONE RESIDUAL
OZL	OZONE LEAK
SCD	STREAMING CURRENT DETECTOR
ALU	ALUMINUM
COL	COLOUR
F	FLUORIDE
CON	CONDUCTIVITY
SBI	SLUDGE BLANKET INTERFACE

WASTEWATER

***	DESCRIPTION
pH	pH
CLR	CHLORINE RESIDUAL
CLC	CHLORINE LEAK
CB	COMBUSTION GAS
H2S	HYDROGEN SULPHIDE
CO	CARBON MONOXIDE
CH4	METHANE
DO	DISSOLVED OXYGEN
ALU	ALUMINUM
Tu	TURBIDITY
SS	SUSPENDED SOLIDS

NOTE :

THIS TABLE IS NOT ALL–INCLUSIVE.

*A, ALARM, THE ANNUNCIATING DEVICE, MAY BE USED IN THE SAME FASHION AS S, SWITCH, THE ACTUATING DEVICE.

**THE LETTERS H AND L MAY BE OMITTED IN THE UNDEFINED CASE.

GENERAL INSTRUMENTATION

SYMBOL	DESCRIPTION	GROUP
	MOUNTED LOCALLY	INSTRUMENT SYMBOLS
	MOUNTED ON FACE OF PANEL	INSTRUMENT SYMBOLS
	MOUNTED BEHIND PANEL DOOR	INSTRUMENT SYMBOLS
	SCADA INPUT/OUTPUT	SCADA SYMBOL
	NOT ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL SYMBOLS OR SHARED INSTRUMENTS
	ACCESSIBLE TO OPERATOR	DISTRIBUTED CONTROL SYMBOLS OR SHARED INSTRUMENTS
	AUXILIARY LOCATION	DISTRIBUTED CONTROL SYMBOLS OR SHARED INSTRUMENTS
	NOT ACCESSIBLE TO OPERATOR	PROGRAMMABLE CONTROLLER SYMBOLS
	ACCESSIBLE TO OPERATOR	PROGRAMMABLE CONTROLLER SYMBOLS
	PILOT LIGHT	

SYMBOL	DESCRIPTION	GROUP
AND	LOGIC GATE – AND (INTERLOCK IS EFFECTIVE ONLY IF ALL INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
OR	LOGIC GATE – OR (INTERLOCK IS EFFECTIVE IF ONE OR MORE INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
XOR	LOGIC GATE – OR (INTERLOCK IS EFFECTIVE IF ONE OR MORE INPUTS ARE ACTIVE)	INTERLOCK SYMBOLS
I	COMPLEX OR UNDEFINED INTERLOCK	INTERLOCK SYMBOLS
n	PANEL NUMBER n	AUTOMATION SYMBOLS
n	MOTOR CONTROL CENTRE NUMBER n	AUTOMATION SYMBOLS
n	PROGRAMMABLE CONTROLLER I/O RACK NUMBER n	AUTOMATION SYMBOLS
	SUPPLIED AND INSTALLED BY OTHER DIVISIONS. CONNECTED BY THIS DIVISION.	AUTOMATION SYMBOLS
R	RESET FOR LATCH TYPE ACTUATOR	MISCELLANEOUS SYMBOLS
P	PURGE OR FLUSHING DEVICE	MISCELLANEOUS SYMBOLS

PROCESS LEGEND – PRIMARY FLOW ELEMENTS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	WEIR	F	SNAP–ON FLOW METER
	INSERT VENTURI		SONIC FLOW METER
	PITOT TUBE (SINGLE)	M	MAGNETIC FLOW METER
	PITOT TUBE (AVERAGING)		ORIFICE PLATE
	FLUME	FG	FLOW SIGHT GLASS
	TURBINE / PROPELLER	FG	ROTAMETER
	POSITIVE DISPLACEMENT		STATIC INLINE MIXER
	GUAGE INDICATOR		

PROCESS LEGEND – MISCELLANEOUS SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
S.P.	SAMPLE POINT (12mm)		UNION
D.P.	DRAIN POINT (MIN. 12mm)		HOSE CONNECTION
	IN LINE STRAINER		EYEWASH
	DRAIN / OVERFLOW		

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Nunavut

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DESIGN | REVIEWED BY | DRAWN | CHECKED BY

DATE: APRIL 2008

SCALE: N.T.S.

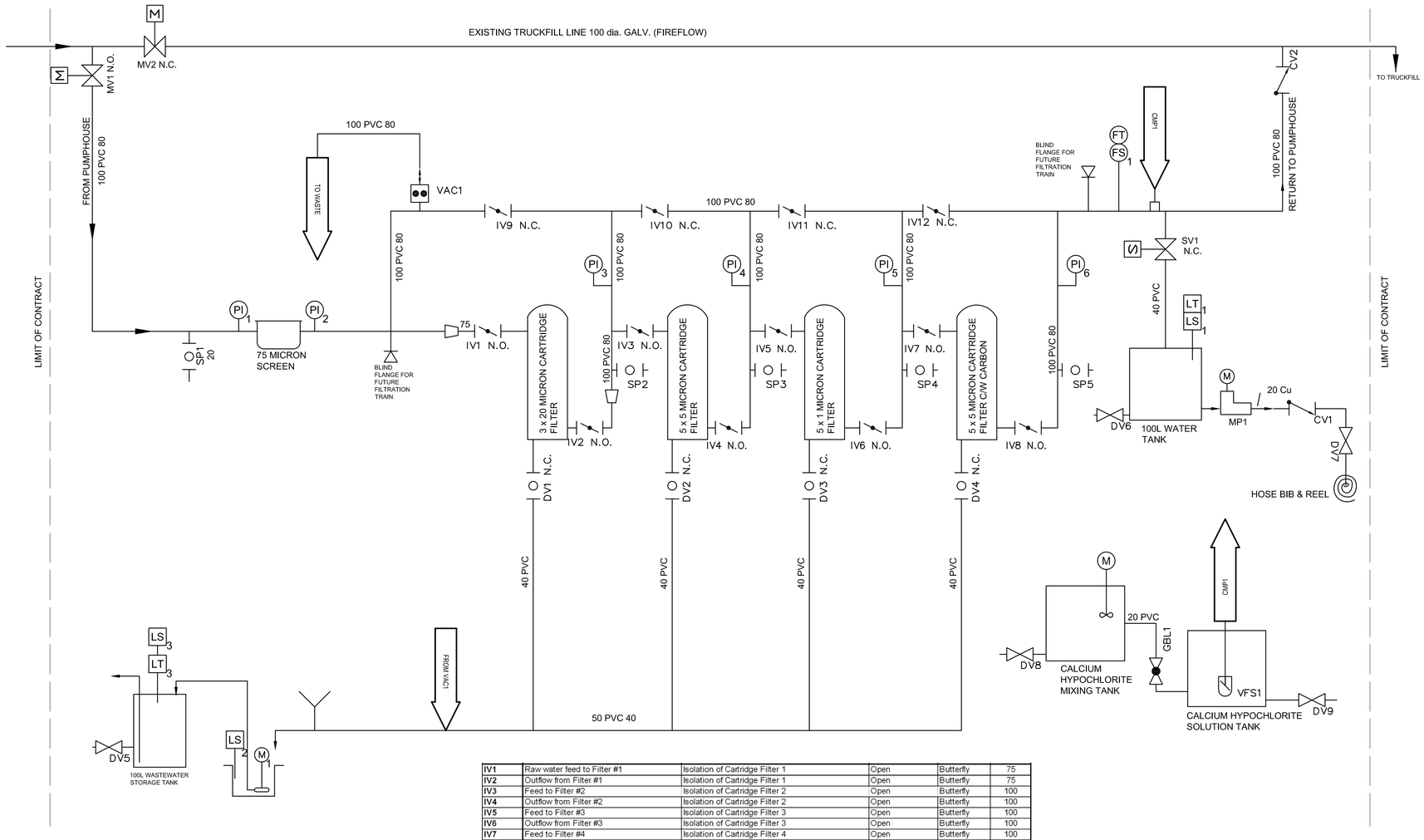
WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

P & ID PROCESS LEGEND

PROJECT NO. 07-8254-1000

SHEET NO. 201

4920 47TH STREET, YELLOWKNIFE NT, X1A 2P1, PHONE 867.920.4555



Notes:

1) Coordinate instrument installation with electrical and mechanical

2) Install instruments to manufacturer recommendations

3) Piping materials - see specifications

4) Install flanges and unions as required to facilitate equipment removal and maintenance

5) Install valve tags per specifications

6) Label all equipment per specifications

IV1	Raw water feed to Filter #1	Isolation of Cartridge Filter 1	Open	Butterfly	75
IV2	Outflow from Filter #1	Isolation of Cartridge Filter 1	Open	Butterfly	75
IV3	Feed to Filter #2	Isolation of Cartridge Filter 2	Open	Butterfly	100
IV4	Outflow from Filter #2	Isolation of Cartridge Filter 2	Open	Butterfly	100
IV5	Feed to Filter #3	Isolation of Cartridge Filter 3	Open	Butterfly	100
IV6	Outflow from Filter #3	Isolation of Cartridge Filter 3	Open	Butterfly	100
IV7	Feed to Filter #4	Isolation of Cartridge Filter 4	Open	Butterfly	100
IV8	Outflow from Filter #4	Isolation of Cartridge Filter 4	Open	Butterfly	100
IV9	Outflow By-Pass Filter #1	By-pass of Filter 1	Closed	Butterfly	100
IV10	Outflow from filter by-pass line	By-pass of Filter 2	Closed	Butterfly	100
IV11	Outflow from filter by-pass line	By-pass of Filter 3	Closed	Butterfly	100
IV12	Outflow from filter by-pass line	By-pass of Filter 4	Closed	Butterfly	100
DV1	Filter #1	Drain	Closed	Ball	40
DV2	Filter #2	Drain	Closed	Ball	40
DV3	Filter #3	Drain	Closed	Ball	40
DV4	Filter #4	Drain	Closed	Ball	40
DV5	Wastewater Storage Tank	Drain	Closed	Gate	50
DV6	Water Storage Tank	Drain	Closed	Gate	20
DV7	Feed to Hose Bib & Reel	Drain	Closed	Gate	20
DV8	Calcium Hypochlorite Mixing Tank	Drain	Closed	Gate	20
DV9	Calcium Hypochlorite Solution Tank	Drain	Closed	Gate	20
CV1	Feed to Hose Bib & Reel	Prevents backfow into pump	Closed	Swing Check	20
SV1	Feed Line to Hose Bib & Reel	Controls flow to hose	Closed	Solonoid	40
VAC1	Raw Water Line	Bypass to Waste	Closed	Vacuum	100
SP1	Raw Water Line	Sampling Port - Filter Screen	Closed	Ball	20
SP2	Outlet of Filter #1	Sampling Port - Filter 1	Closed	Ball	20
SP3	Outlet of Filter #2	Sampling Port - Filter 2	Closed	Ball	20
SP4	Outlet of Filter #3	Sampling Port - Filter 3	Closed	Ball	20
SP5	Outlet of Filter #4	Sampling Port - Filter 4	Closed	Ball	20

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REVIEWED BY	GS
DRAWN	JMS
CHECKED BY	GS
DATE	APRIL 2008
SCALE	N.T.S.

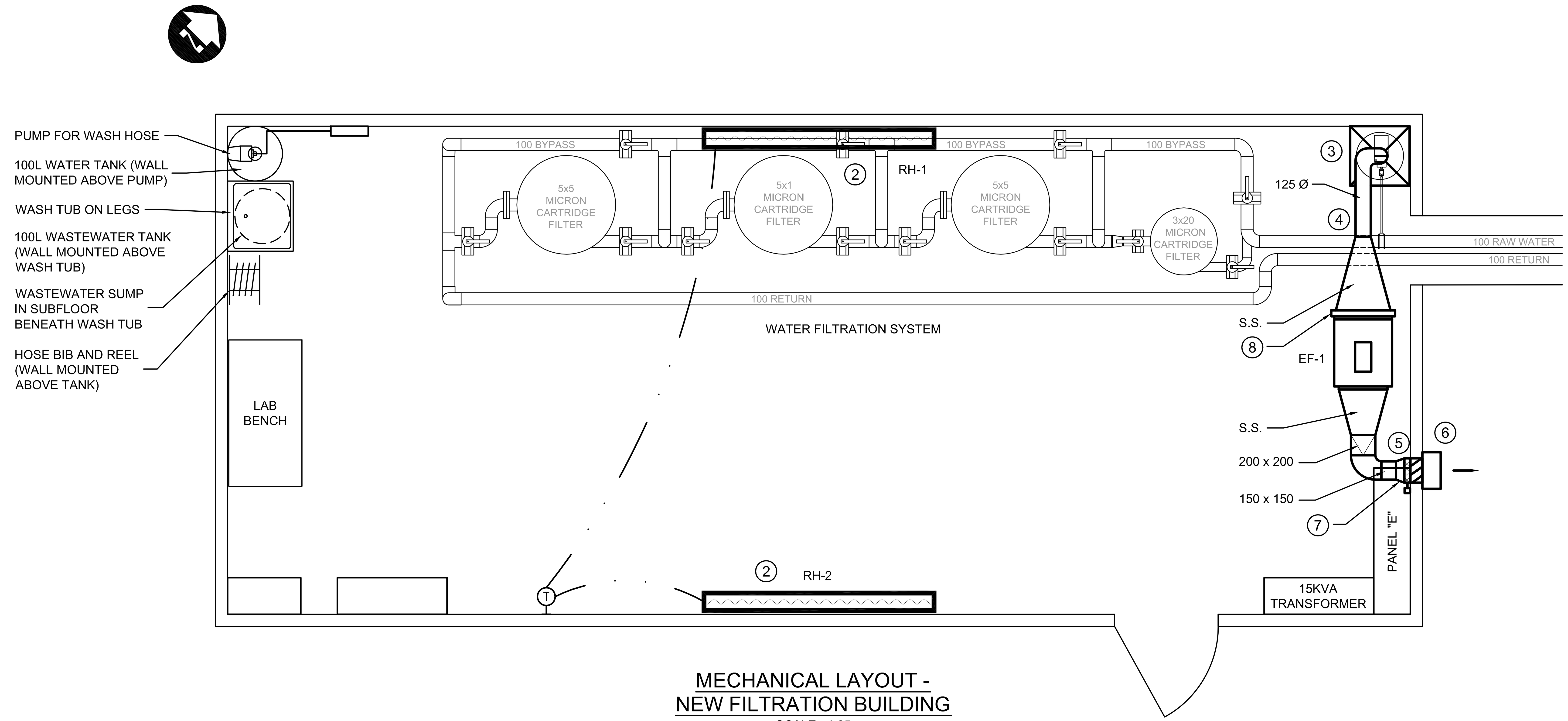
WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

PROJECT NO. 07-8254-1000

PROCESS WATER FLOW SCHEMATIC

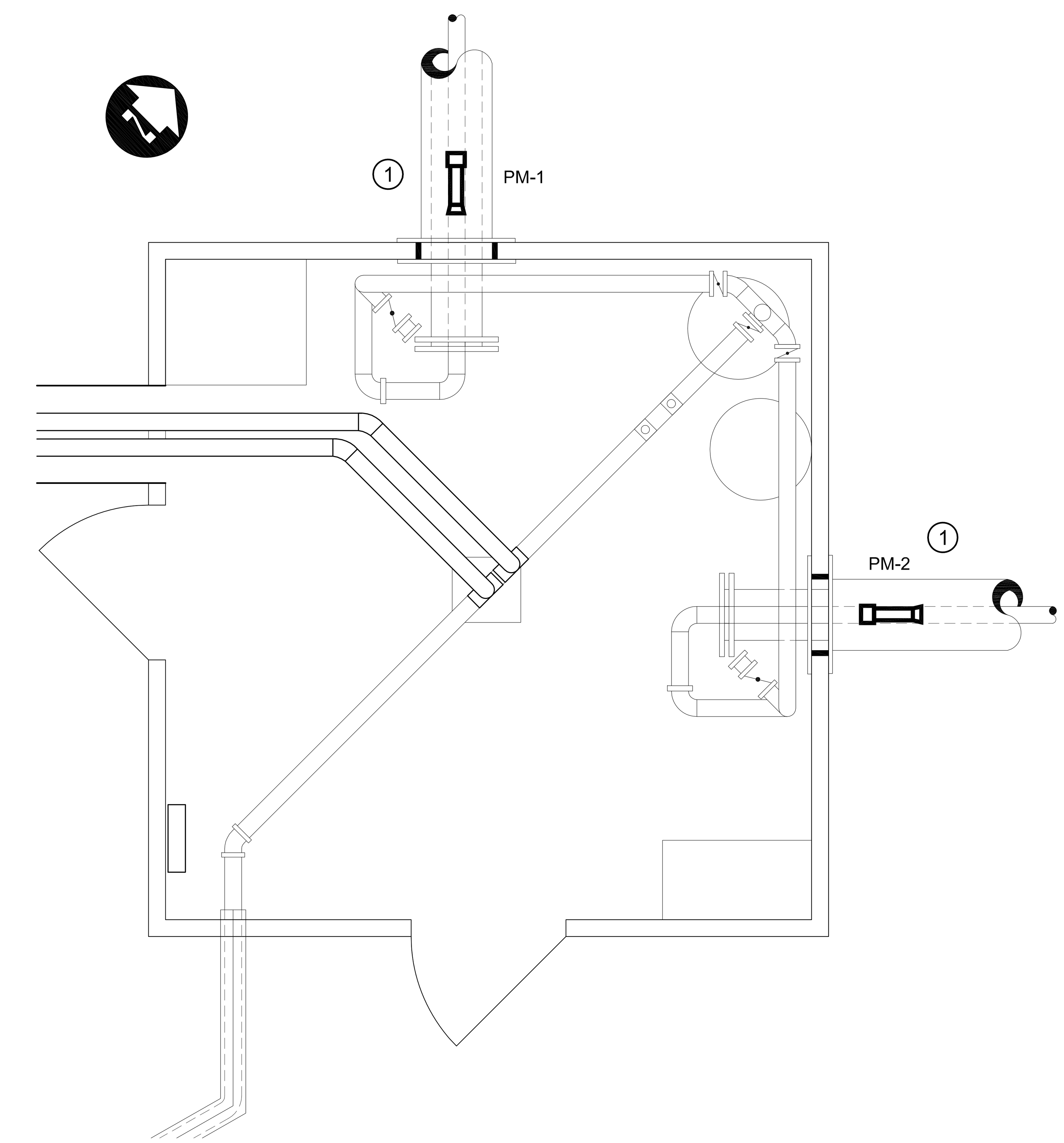
SHEET NO. 202

File Name:g:\cad\07\8254\tender\process water flow schematic.dwg



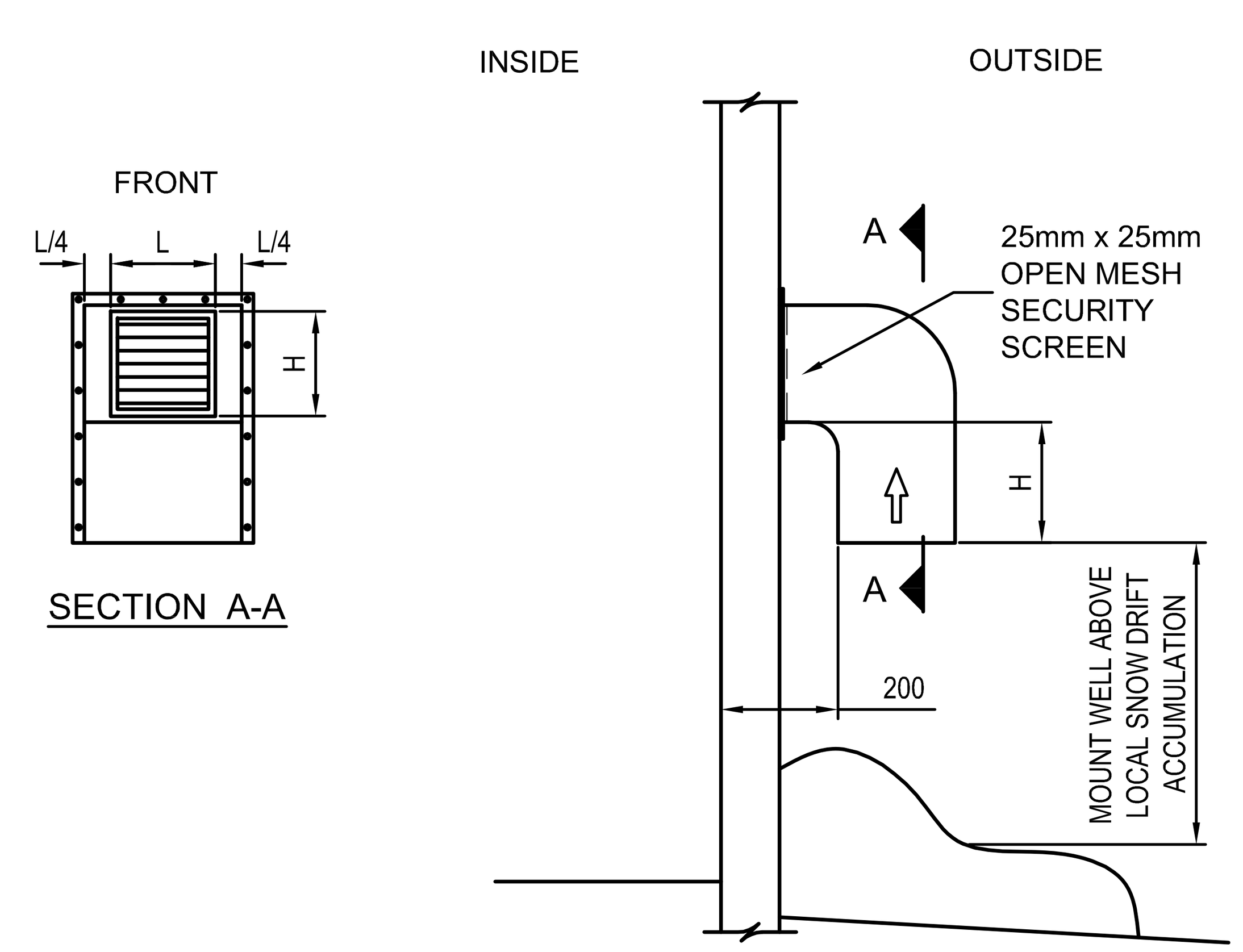
MECHANICAL LAYOUT - NEW FILTRATION BUILDING

SCALE: 1:25



MECHANICAL LAYOUT - EXISTING TRUCKFILL BUILDING

SCALE: 1:25



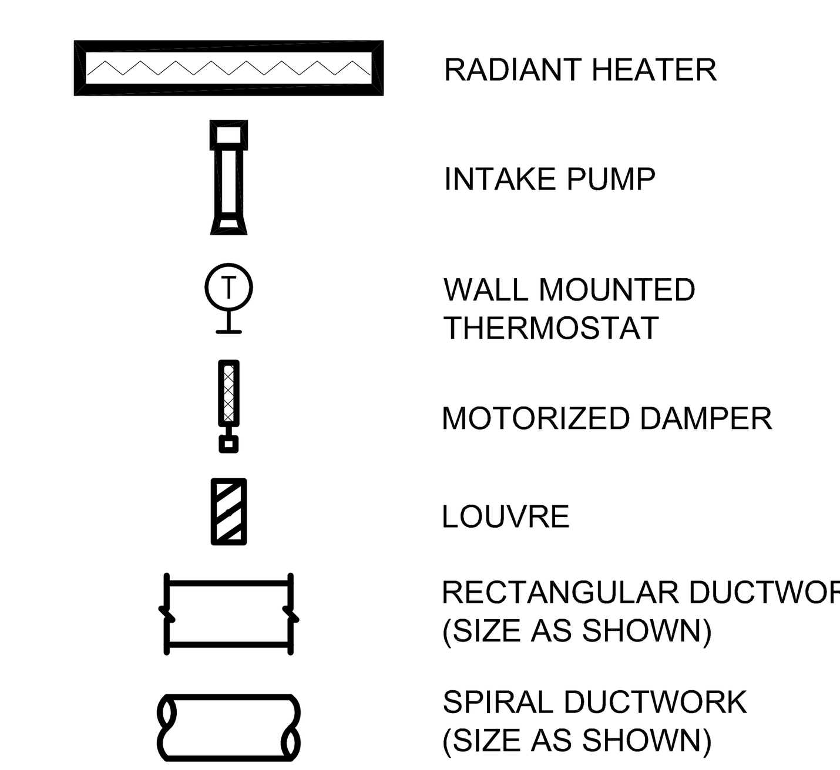
DISCHARGE HOOD DETAIL

N.T.S.

NOTES:

1. REMOVE EXISTING SUBMERSIBLE INTAKE PUMPS AND PROVIDE NEW 15 HP PUMPS; TO BE INSTALLED IN THE EXISTING INTAKE LINE. SEE EQUIPMENT SCHEDULE FOR DETAILED DESCRIPTION.
2. 5.0KW RADIANT ELECTRIC HEATER MOUNTED ON WALL BELOW CEILING.
3. STAINLESS STEEL CHLORINE TANK HOOD TO BE INSTALLED 1200mm A.F.F..
4. RUN EXHAUST DUCT OVER PROCESS PIPING AND CO-ORDINATE WITH LIGHTING.
5. EXHAUST DAMPER ACCEPTABLE PRODUCT: RUSKIN MODEL CD36 LOW LEAKAGE CONTROL DAMPER C/W BELIMO 120V AC MOTOR
6. EXHAUST LOUVRE ACCEPTABLE PRODUCT: E.H. PRICE MODEL K6774X (S.S.) SEE DISCHARGE HOOD DETAIL.
7. PROVIDE 25mm THERMAL INSULATION ON THE EXHAUST DUCT FROM EF-1 DISCHARGE TO THE INTERIOR WALL.
8. PROVIDE 25mm FILTER AND FILTER RACK, ACCESS FROM THE SIDE, ON SUCTION OF EF-1.

LEGEND



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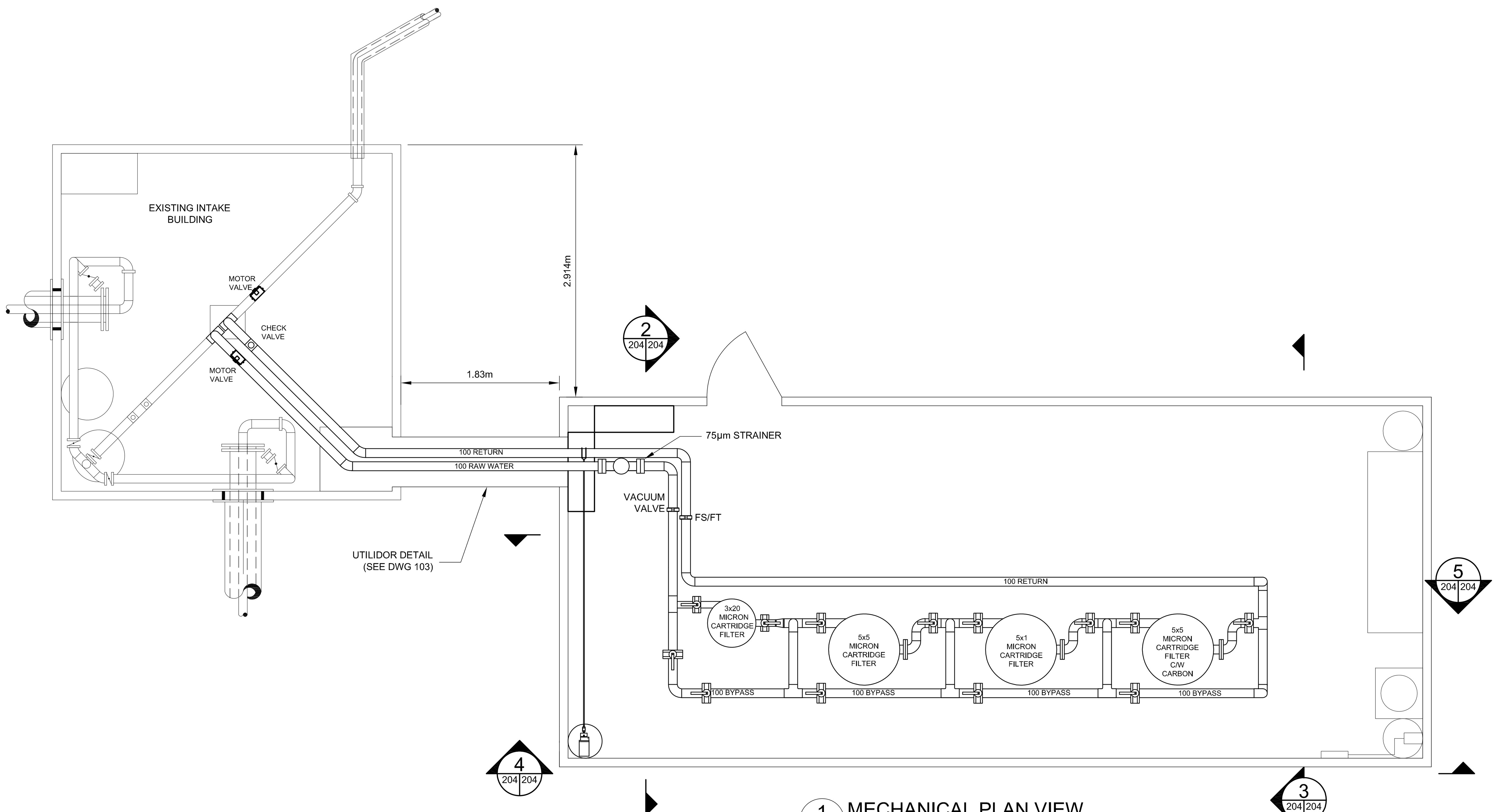
DRAWN: ACP	CHECKED BY: WCDD
DATE: APRIL 2008	
SCALE: AS SHOWN	

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

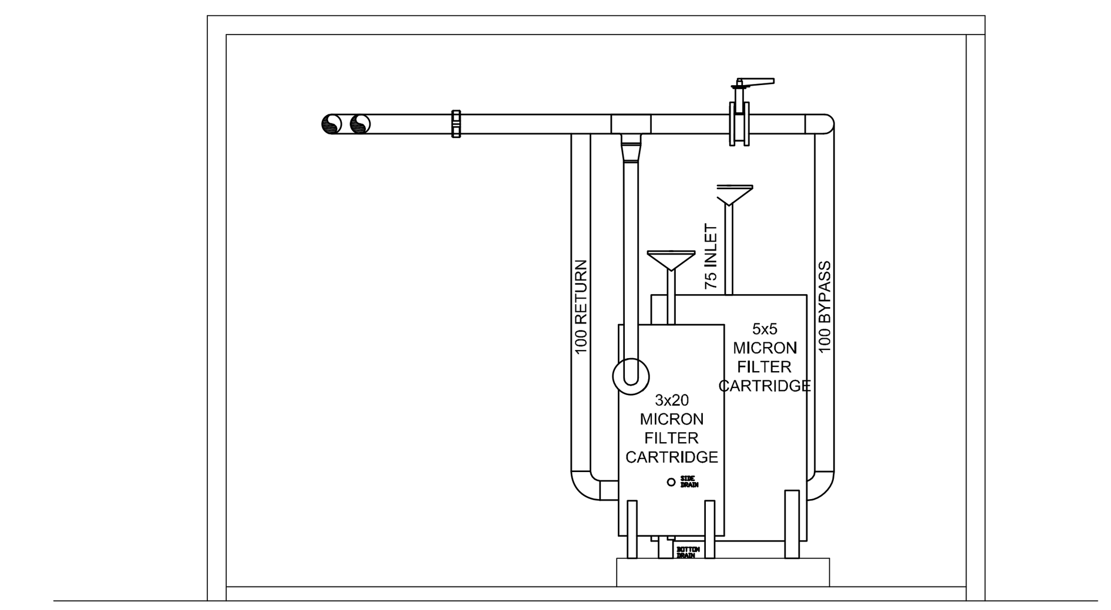
PROJECT NO. 07-8254-1000

BUILDING MECHANICAL

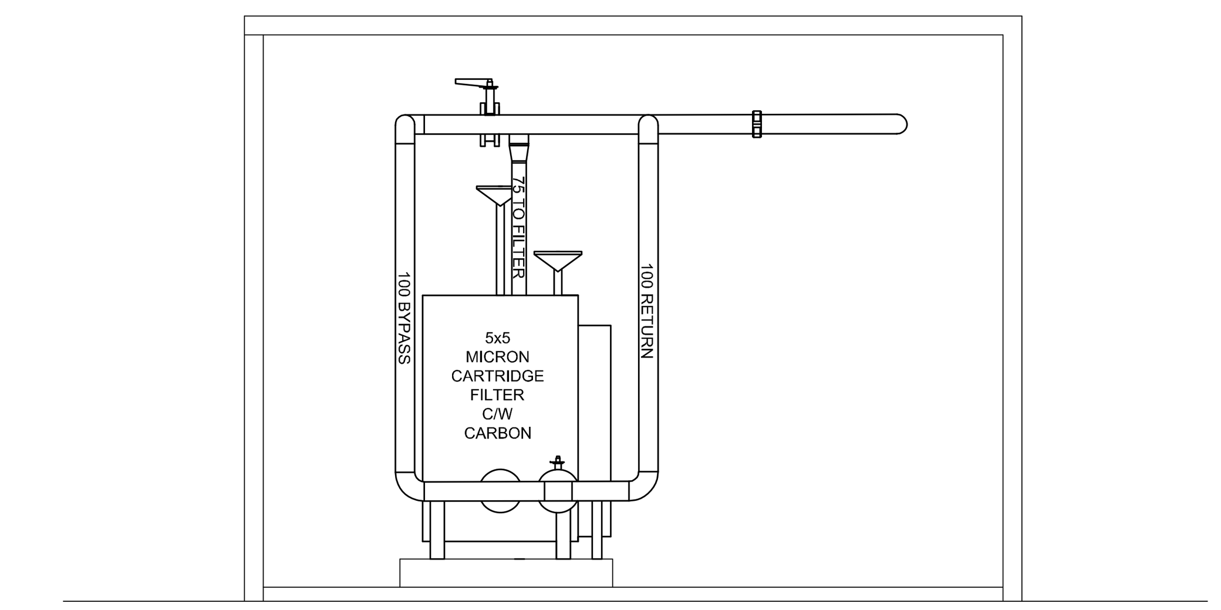
SHEET NO. 203



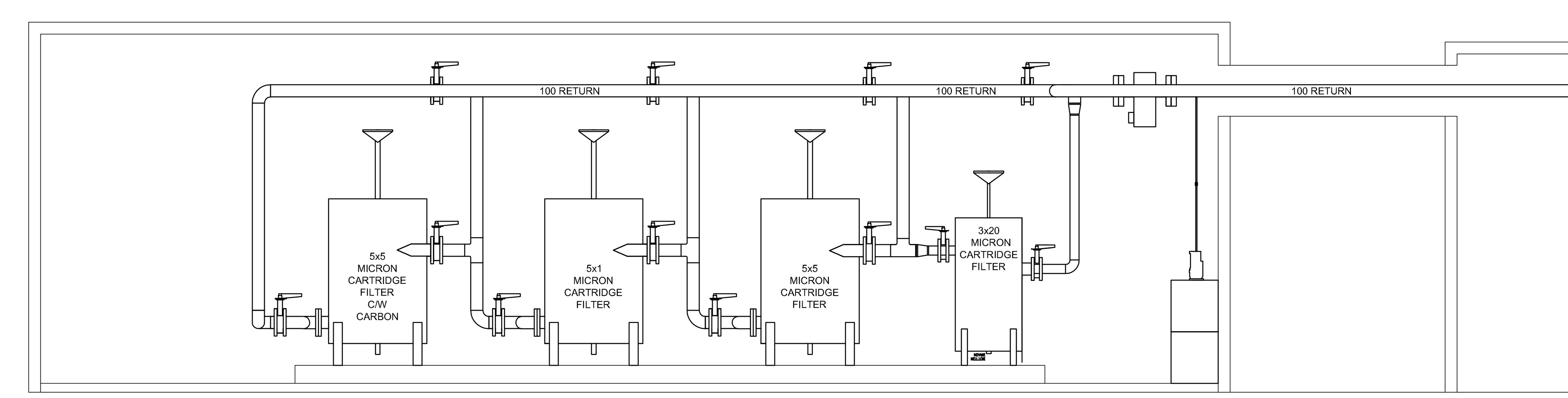
1 MECHANICAL PLAN VIEW 204 204 SCALE 1:40



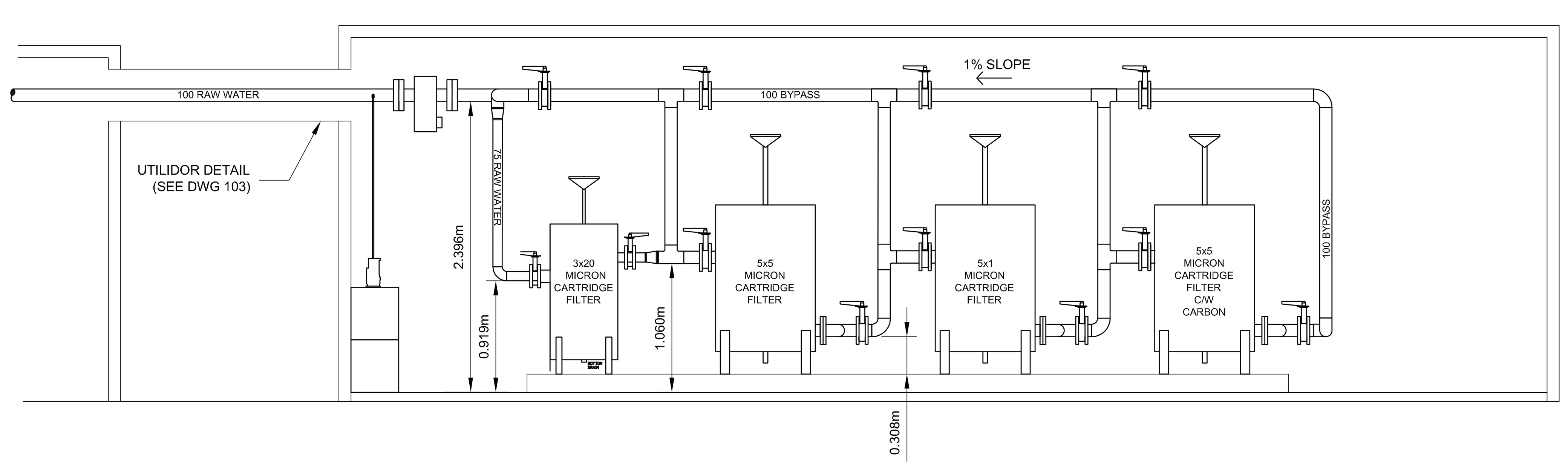
2 LEFT ELEVATION 204 204 SCALE 1:40



3 RIGHT ELEVATION 204 204 SCALE 1:40



5 BACK ELEVATION 204 204 SCALE 1:40



4 FRONT ELEVATION 204 204 SCALE 1:40

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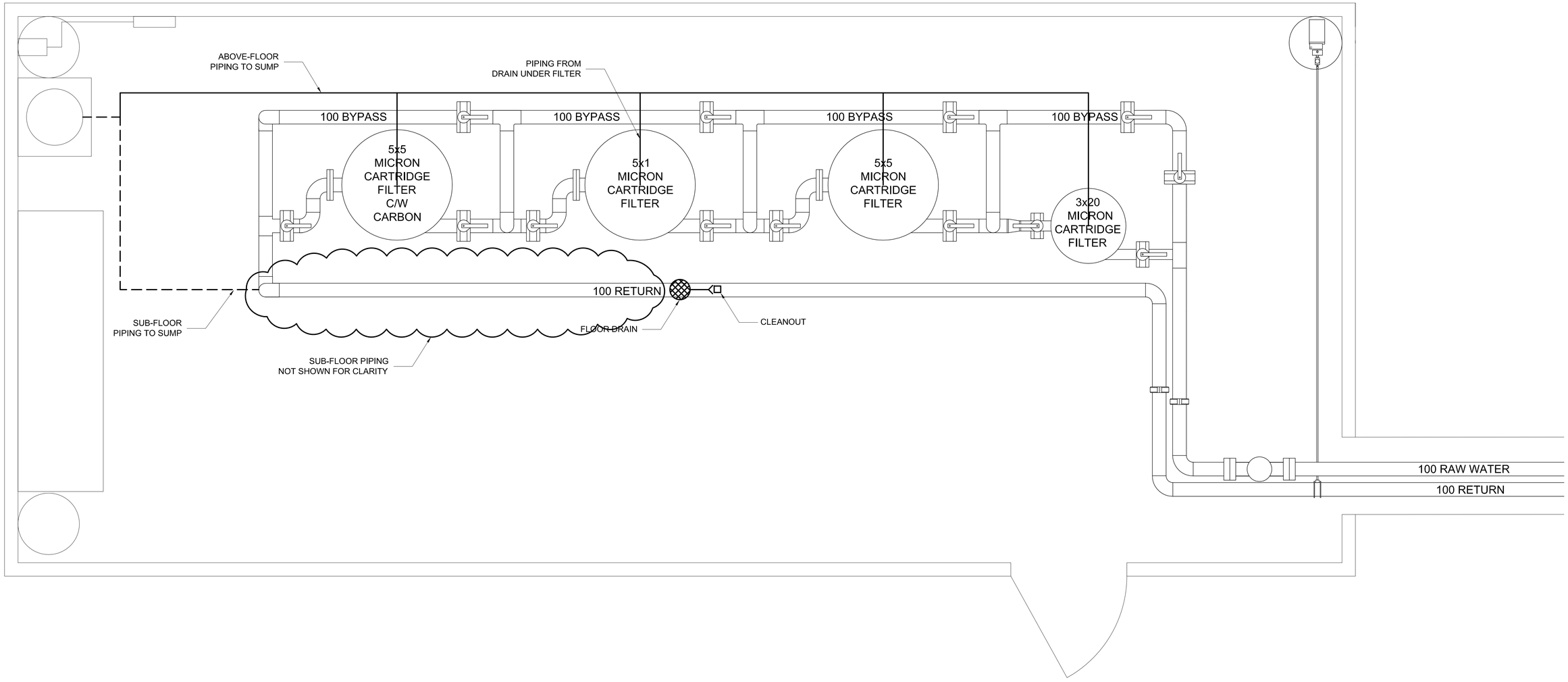
DRAWN: NTB	CHECKED BY: GS
DATE: APRIL 2008	
SCALE: AS SHOWN	

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

FILTRATION SYSTEM

PROJECT NO. 07-8254-1000

SHEET NO. 204



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G. STRONG
N.W.T.

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REVIEWED BY	GS
DRAWN	NTB
CHECKED BY	GS
DATE	APRIL 2008
SCALE	1:150

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

DOMESTIC PLUMBING

PROJECT NO. **07-8254-1000**

SHEET NO. **205**

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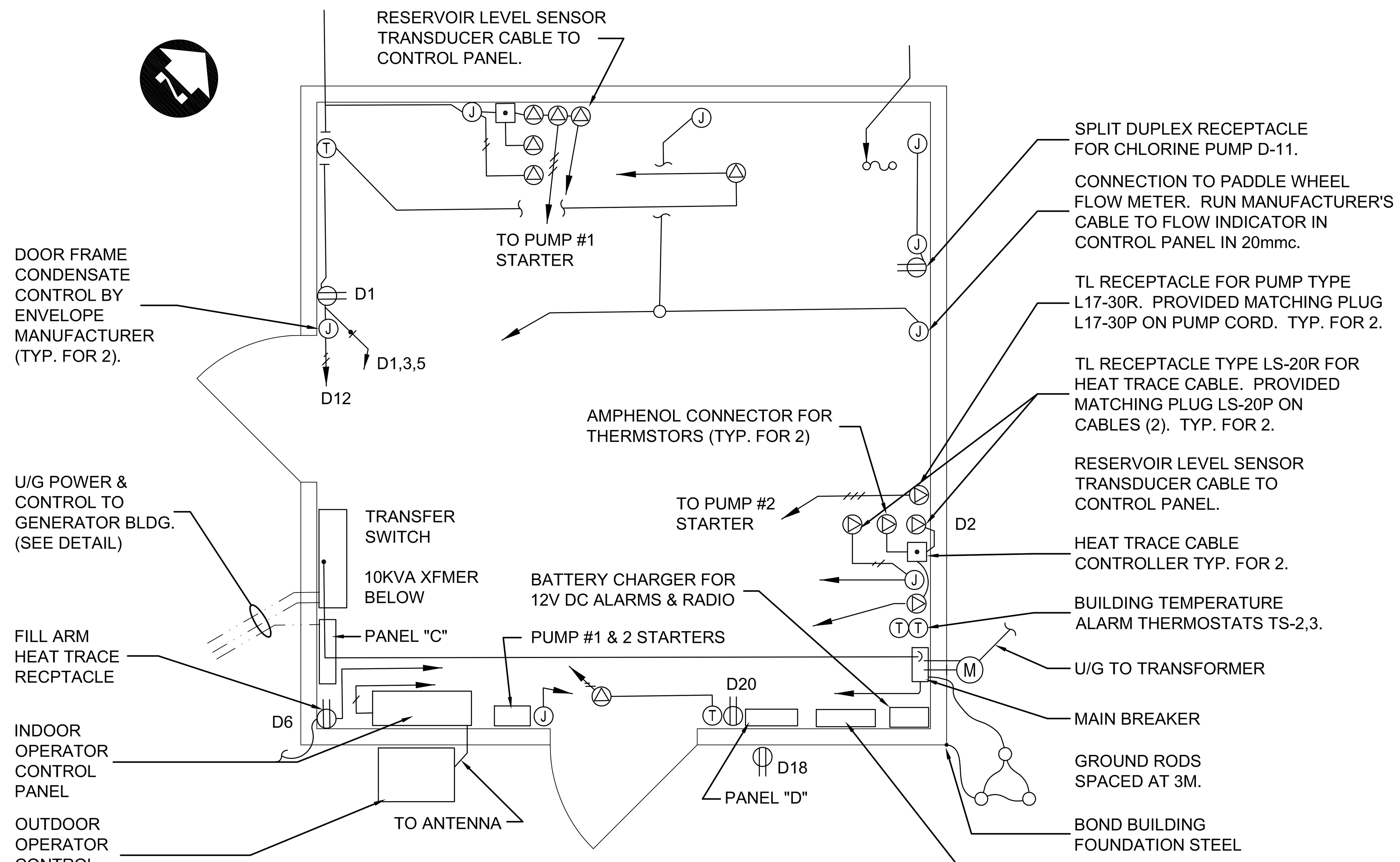
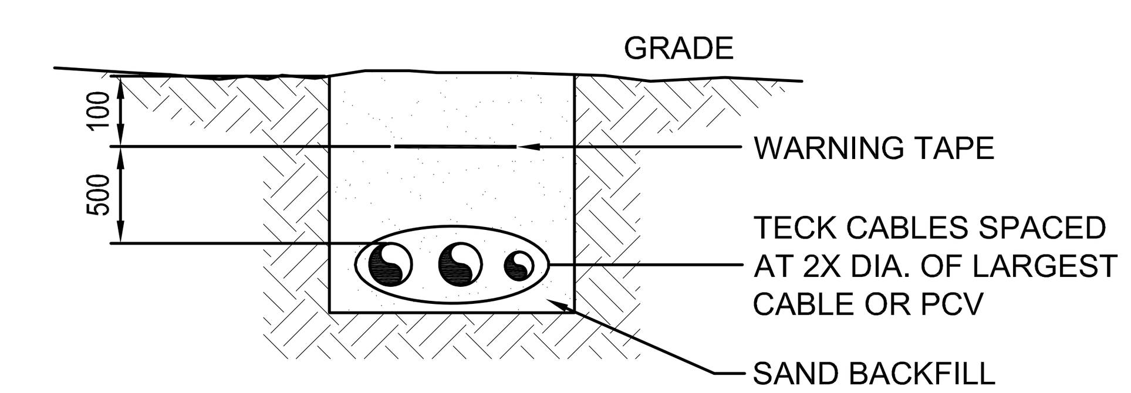


EXISTING POWER LAYOUT
SCALE: 1:25

NOTES:

1. EXISTING ACROSS THE LINE STARTERS FOR SUBMERSIBLE INTAKE PUMPS TO BE REMOVED.
2. REMOVE EXISTING EMERGENCY BATTERY PACK.
3. EXISTING 7 1/2 HP INTAKE PUMPS TO BE REMOVED BY THE MECHANICAL CONTRACTOR.

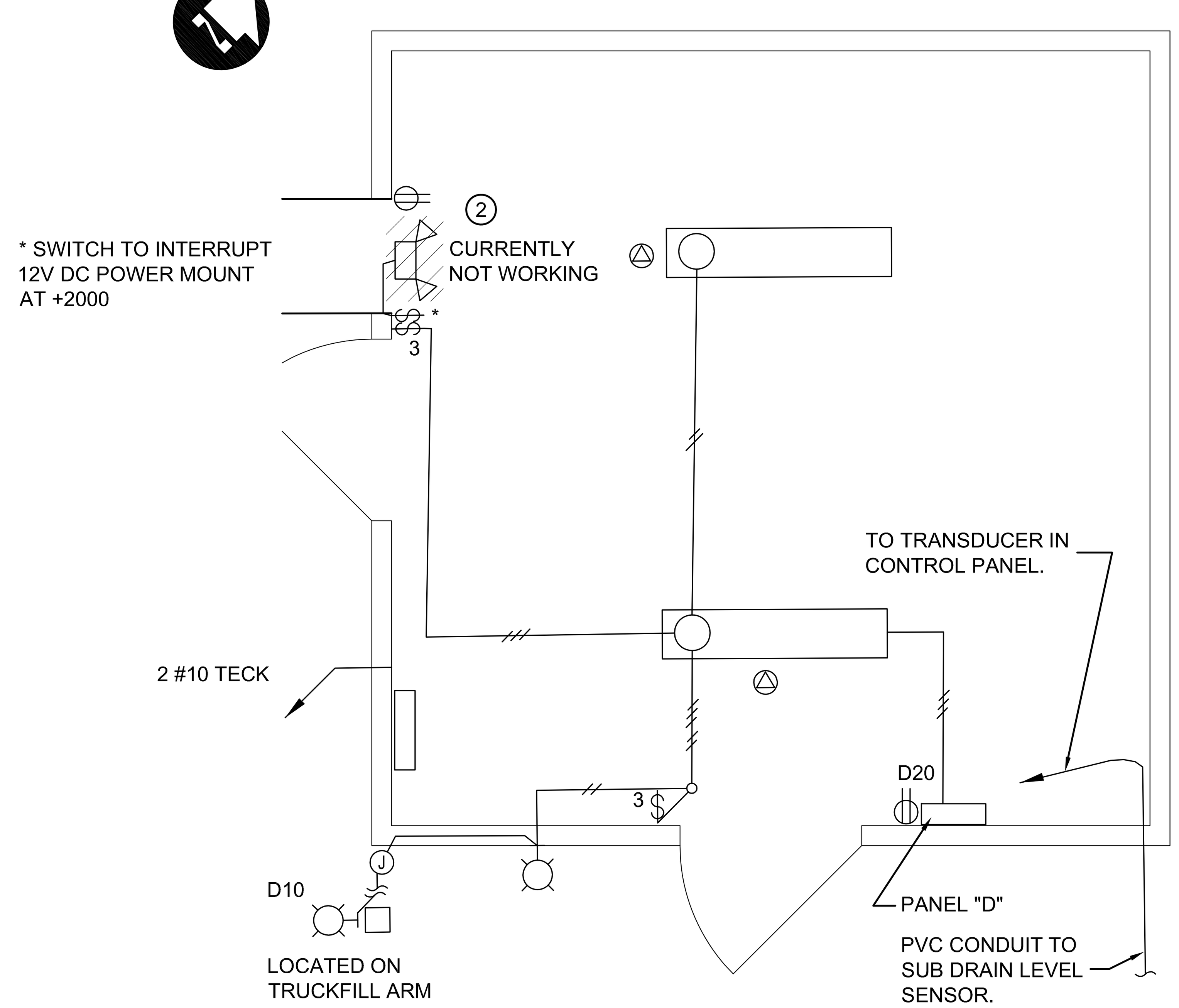


EXISTING UNDERGROUND CABLE DETAIL
N.T.S.

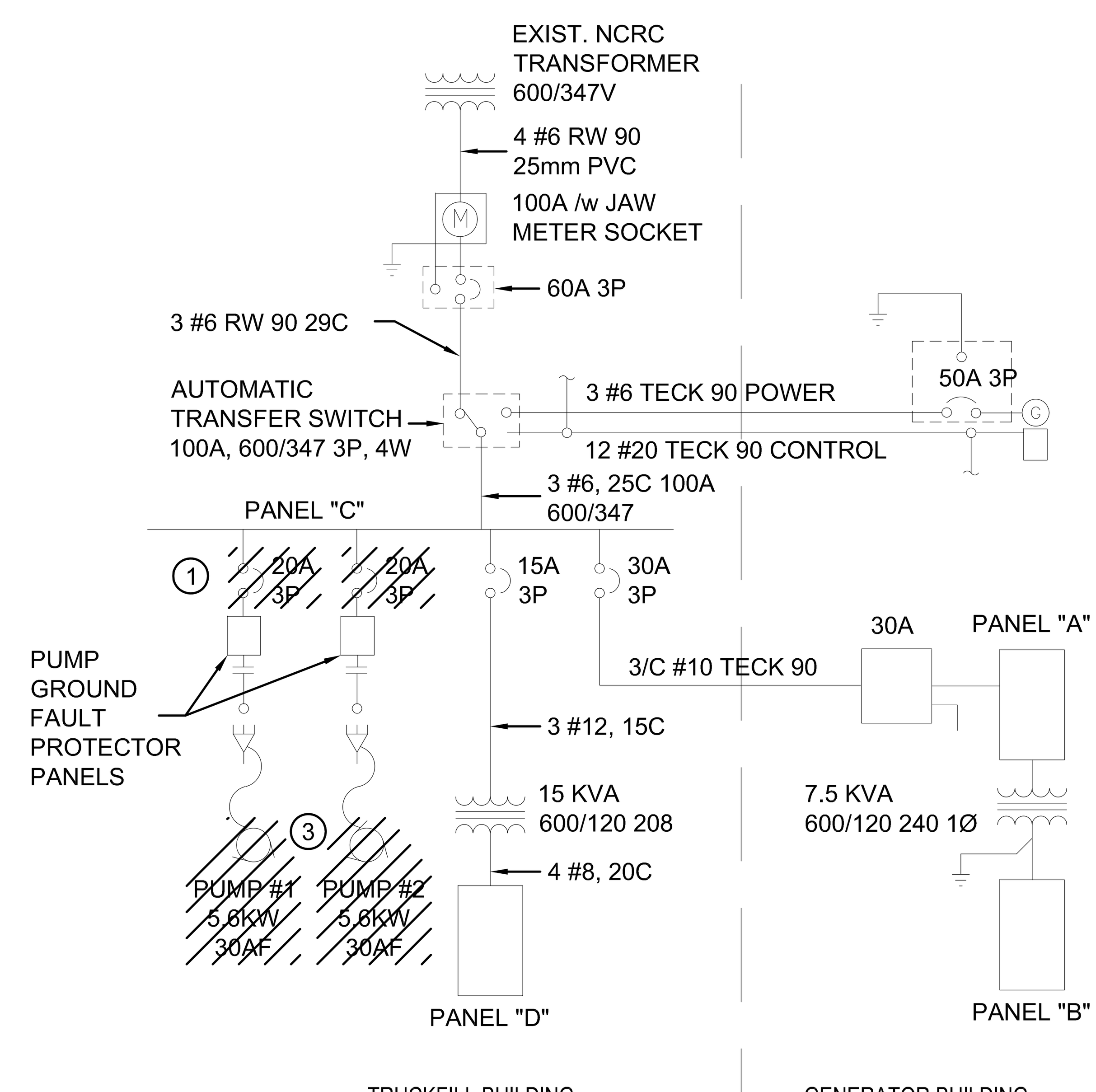
VOLTS: 600/347	PANEL: 'C'	TYPE: SQUARE D COL
PHASE: 3	LOCATION: SOUTH WALL	MAINS: 225
WIRE: 4	FEED: 15 kVA	ENTRY: SURFACE

DESCRIPTION	POLE	AMP	CCT. No.	CCT. No.	AMP	POLE	DESCRIPTION
PUMP #1	3	20	1	2	30	3	PANEL A/B GENERATOR BUILDING
PUMP #1	3	20	3	4	30	3	PANEL A/B GENERATOR BUILDING
PUMP #1	3	20	5	6	30	3	PANEL A/B GENERATOR BUILDING
PUMP #2	3	20	7	8	15	3	15kVA TRANSFORMER
PUMP #2	3	20	9	10	15	3	15kVA TRANSFORMER
PUMP #2	3	20	11	12	15	3	15kVA TRANSFORMER
SPARE			13	14	15	3	FLUORIDE SHED
SPARE			15	16	15	3	FLUORIDE SHED
SPARE			17	18	15	3	FLUORIDE SHED
SPARE			19	20			SPARE
SPARE			21	22			SPARE
SPARE			23	24			SPARE
SPARE			25	26			SPARE
SPARE			27	28			SPARE
SPARE			29	30			SPARE
SPARE			31	32			SPARE
SPARE			33	34			SPARE
SPARE			35	36			SPARE
SPARE			37	38			SPARE
SPARE			39	40			SPARE
SPARE			41	42			SPARE

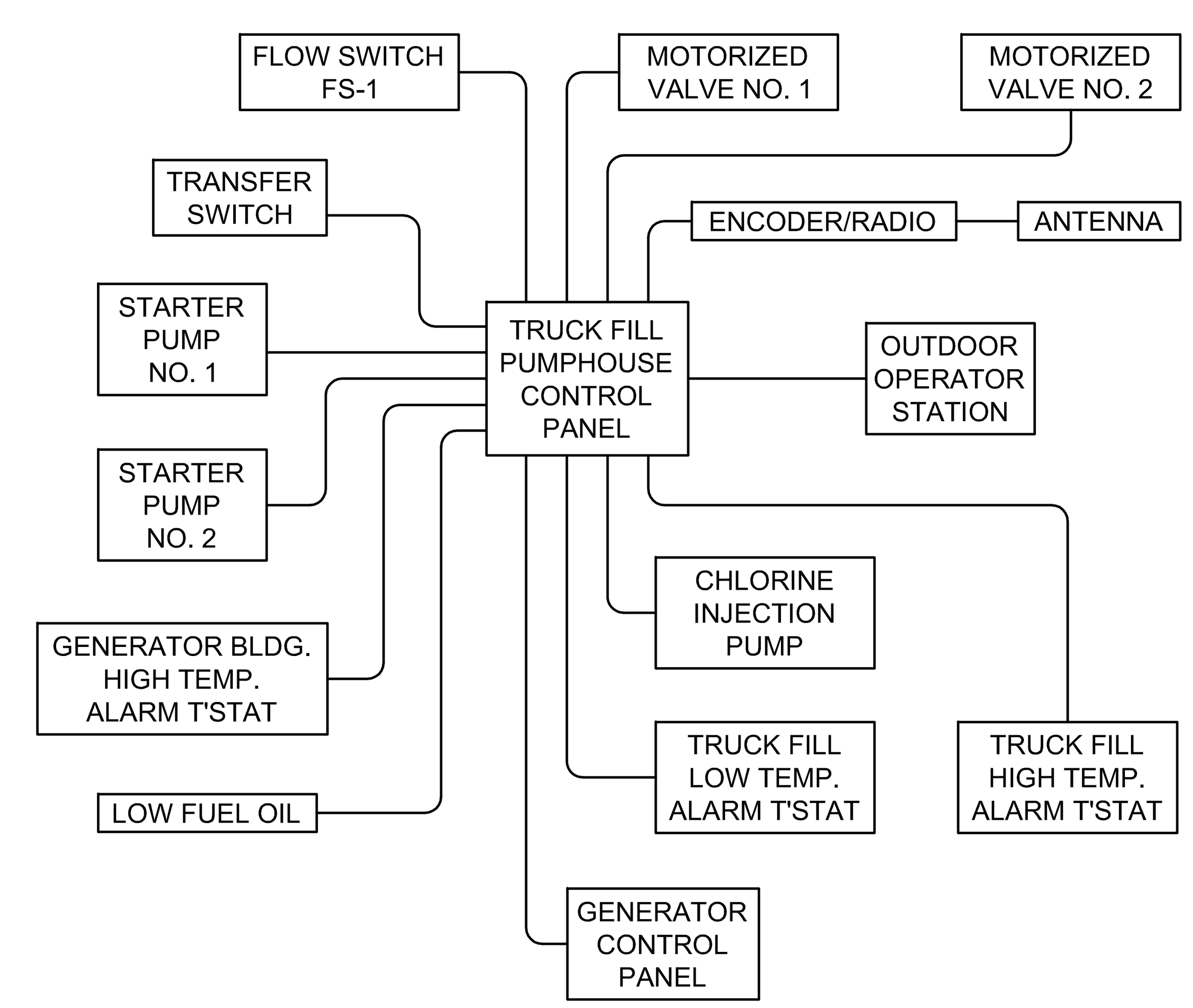
EXISTING PANEL SCHEDULE



EXISTING LIGHTING LAYOUT
SCALE: 1:25



EXISTING SINGLE LINE DIAGRAM
N.T.S.



EXISTING CONTROL SCHEMATIC
N.T.S.

LEGEND

- DUPLEX RECEPTACLE
- SWITCH
- FLOURESCENT LIGHT
- INCANDESCENT LIGHT
- EXIT SIGN LIGHT
- EMERGENCY LIGHT WITH BATTERY PACK
- METER SOCKET
- THERMOSTAT
- DIRECT CONNECTION/ SPECIALTY RECEPTACLE
- JUNCTION BOX
- PUSH BUTTON SWITCH
- INTAKE PUMP

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DESIGN: MCL — REVIEWED BY: WCDD
DRAWN: ACP — CHECKED BY: WCDD
DATE: APRIL 2008
SCALE: AS SHOWN

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

EXISTING PLANS DETAILS AND SCHEMATICS

PROJECT NO. 07-8254-1000

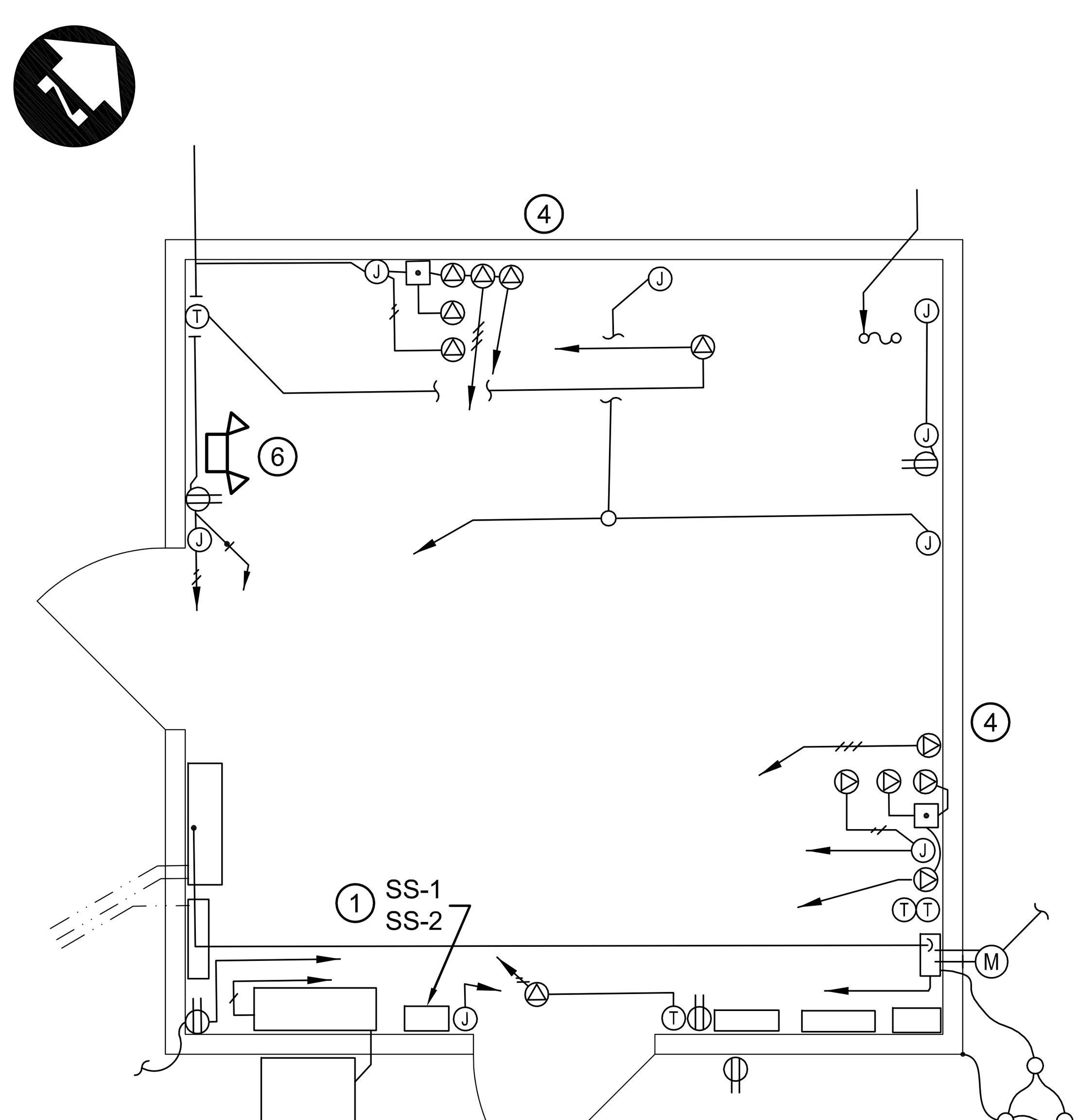
SHEET NO. 301

VOLTS: 120/208	PANEL: 'D'	TYPE: SQUARE D COL
PHASE: 3	LOCATION: TRUCK FILL BDG	MAINS: 100
WIRE: 4	FEED: 10kVA TRANSFORMER	ENTRY: BOTTOM

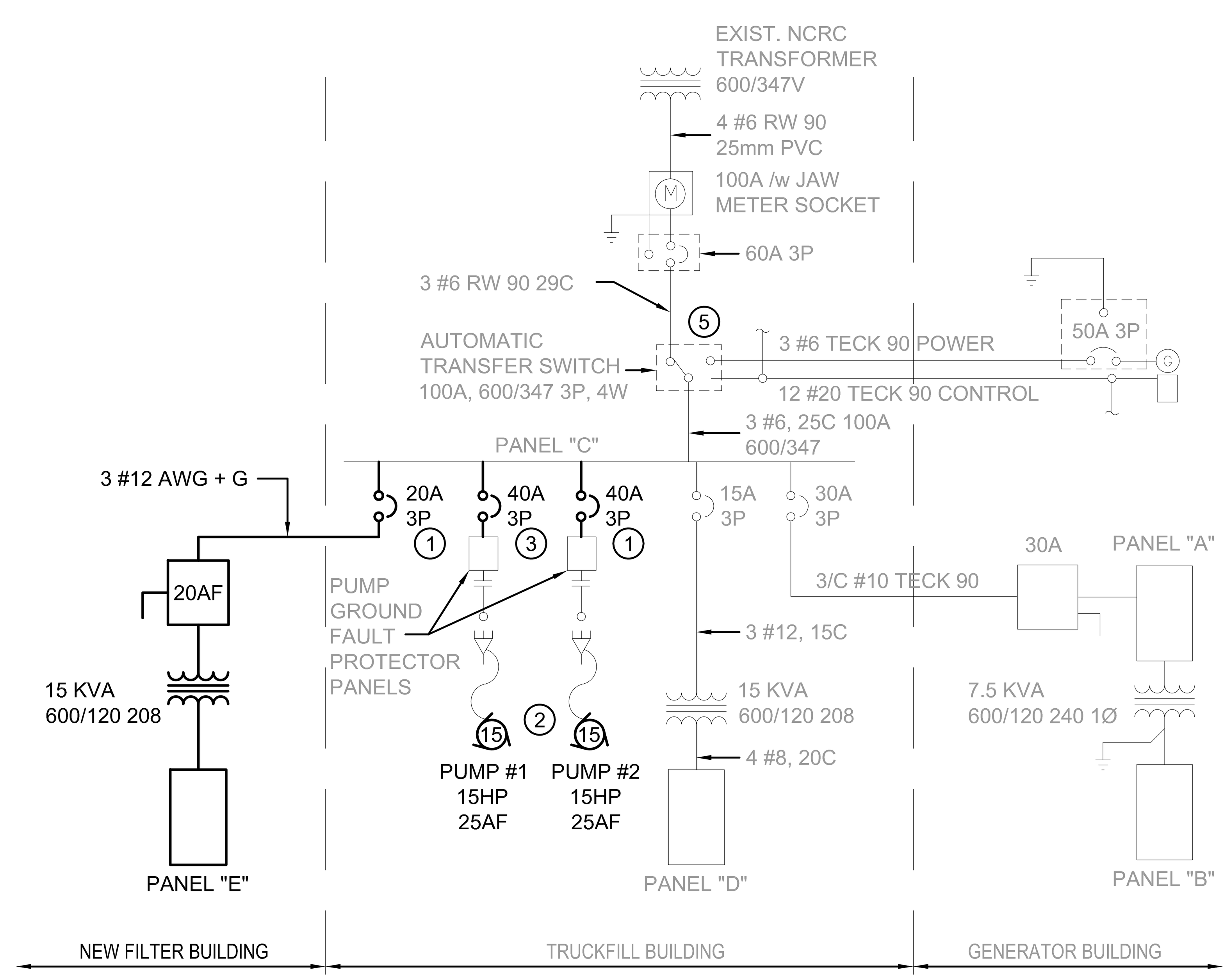
DESCRIPTION	POLE	AMP	CCT. No.	CCT. No.	AMP	POLE	DESCRIPTION
RECEPTACLE	1	15	1	2	30	1	HEAT TRACE-DUTY (CELL2)
HEAT TRACE-DUTY (CELL1)	1	30	3	4	30	1	HEAT TRACE-STANDBY (CELL2)
HEAT TRACE-STANDBY (CELL1)	1	30	5	6	15	1	HEAT TRACE-ARM
CONTROL PNL	1	15	7	8	15	1	BATTERY CHARGER
LIGHTING	1	15	9	10	15	1	EXT. LIGHTING
CHLORINE PUMP	1	15	11	12	15	1	DOOR HTRS
HEATER 1	2	15	13	14	15	1	MV1
HEATER 1	2	15	15	16	15	1	MV2
HEATER 2	2	15	17	18	15	1	EXT. RECEPTACLE
HEATER 2	2	15	19	20	15	1	RECEPTACLE
BATTERY PACK	1	15	21	22	15	1	**MV3**
SPARE			23	24	15	1	**MV4**
SPARE			25	26			SPARE
SPARE			27	28			SPARE

VOLTS: 600/347	PANEL: 'C'	TYPE: SQUARE D COL
PHASE: 3	LOCATION: SOUTH WALL	MAINS: 225
WIRE: 4	FEED: 15 kVA	ENTRY: SURFACE

DESCRIPTION	POLE	AMP	CCT. No.	CCT. No.	AMP	POLE	DESCRIPTION
PUMP #1	3	**25**	1	2	30	3	PANEL A/B GENERATOR BUILDING
PUMP #1	3	**25**	3	4	30	3	PANEL A/B GENERATOR BUILDING
PUMP #1	3	**25**	5	6	30	3	PANEL A/B GENERATOR BUILDING
PUMP #2	3	**25**	7	8	15	3	15kVA TRANSFORMER
PUMP #2	3	**25**	9	10	15	3	15kVA TRANSFORMER
PUMP #2	3	**25**	11	12	15	3	15kVA TRANSFORMER
15kVA TRANSFORMER – FILTER BLDG.	3	20	13	14	15	3	FLUORIDE SHED
15kVA TRANSFORMER – FILTER BLDG.	3	20	15	16	15	3	FLUORIDE SHED
15kVA TRANSFORMER – FILTER BLDG.	3	20	17	18	15	3	FLUORIDE SHED
SPARE			19	20			SPARE
SPARE			21	22			SPARE
SPARE			23	24			SPARE
SPARE			25	26			SPARE
SPARE			27	28			SPARE
SPARE			29	30			SPARE
SPARE			31	32			SPARE
SPARE			33	34			SPARE
SPARE			35	36			SPARE
SPARE			37	38			SPARE
SPARE			39	40			SPARE
SPARE			41	42			SPARE



EXISTING TRUCKFILL BUILDING
N.T.S.



SINGLE LINE DIAGRAM
N.T.S.

NOTES:

1. PROVIDE NEW SOLID STATE SOFT STARTERS FOR NEW 15HP INTAKE PUMPS. INSTALL IN EXISTING STARTER CABINET. SEE EQUIP. SCHEDULE.
2. NEW 15 HP INTAKE PUMPS TO BE INSTALLED BY THE MECHANICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR TO PROVIDE 3-#10 AWG WIRING FOR THE NEW PUMPS.
3. THE ELECTRICAL CONTRACTOR TO CONFIRM THAT THE EXISTING GROUND FAULT PROTECTION CAN ACCOMODATE THE NEW 15 HP PUMPS.
4. AFTER NEW INTAKE PUMPS ARE INSTALLED, THE ELECTRICAL CONTRACTOR TO CONFIRM THAT THE HEAT TRACE SYSTEMS ARE OPERATING EFFECTIVELY.
5. PROVIDE AUXILLARY CONTACT IN TRANSFER SWITCH TO LOCK OUT OPERATION OF RADIANT HEATER 1 (RH-1) WHEN EMERGENCY GENERATOR IS IN OPERATION.
6. PROVIDE NEW EMERGENCY BATTERY PACK.
7. ALL ELECTRICAL EQUIPMENT TO BE NEMA 4X RATED IN ACCORDANCE WITH ELECTRICAL AND ELECTRONIC MANUFACTURERS' ASSOCIATION OF CANADA (EEMAC).

LEGEND

- DUPLEX RECEPTACLE
- SWITCH
- FLOURESCENT LIGHT
- INCANDESCENT LIGHT
- EXIT SIGN LIGHT
- EMERGENCY LIGHT WITH BATTERY PACK
- METER SOCKET
- THERMOSTAT
- DIRECT CONNECTION/ SPECIALTY RECEPTACLE
- JUNCTION BOX
- PUSH BUTTON SWITCH
- INTAKE PUMP (HP NOTED)

THE ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOLOGISTS and GEOPHYSICISTS OF THE NORTHWEST TERRITORIES
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REGISTERED PROFESSIONAL ENGINEER W. C. D. DeGAGNE LICENSEE N.W.T.

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DESIGN	REVIEWED BY
MCL	WCDD
DRAWN	CHECKED BY
ACP	WCDD

DATE: APRIL 2008

SCALE: N.T.S.

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

DIAGRAMS SCHEMATICS AND PANEL SCHEDULE

PROJECT NO. 07-8254-1000

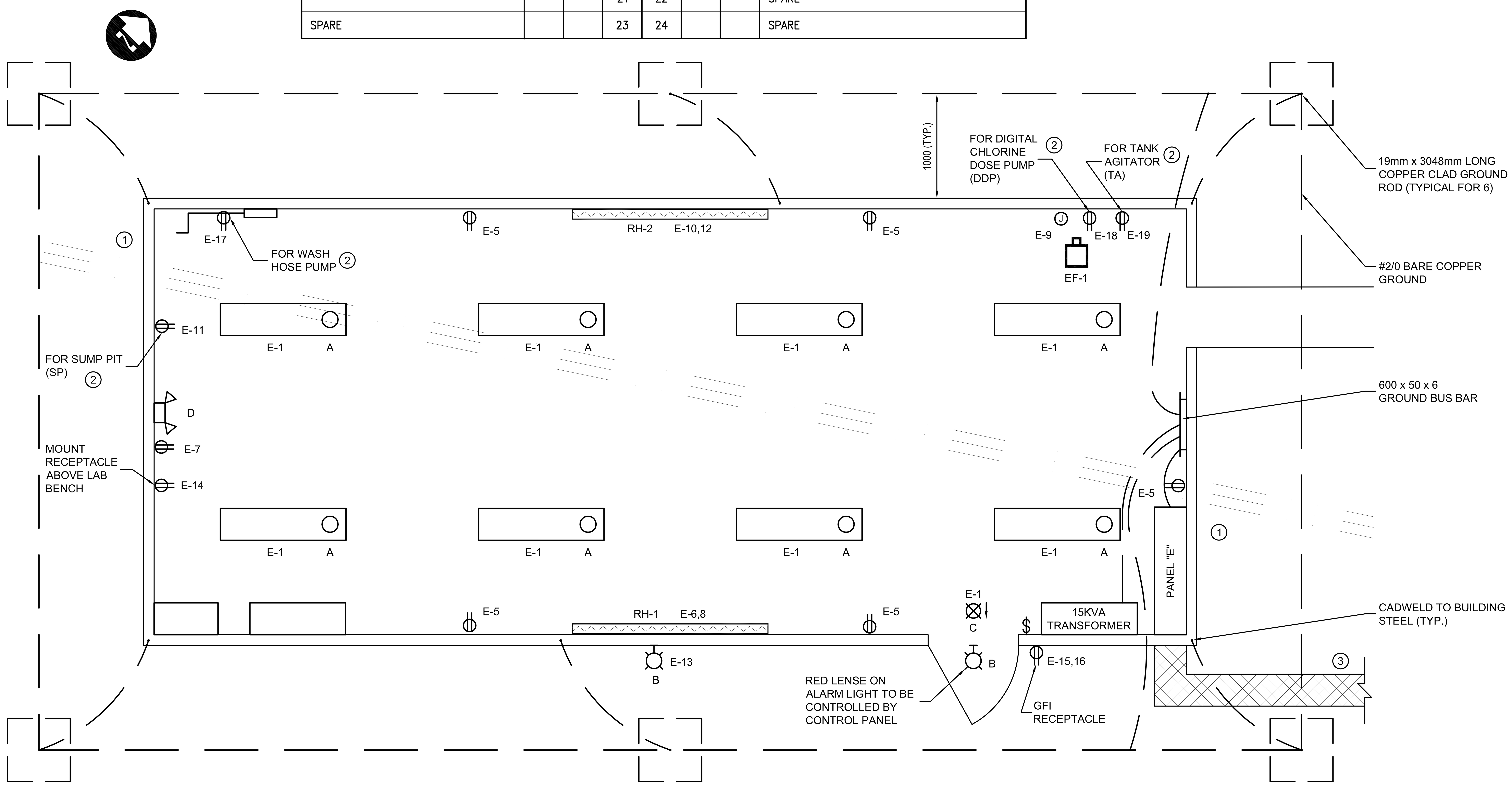
SHEET NO. 302

VOLTS: 600/120/208	PANEL: 'E'	TYPE: SQUARE D COL
PHASE: 3	LOCATION: SOUTH WALL	MAINS: 225
WIRE: 4	FEED: 15 kVA	ENTRY: SURFACE

DESCRIPTION	POLE	AMP	CCT. No.	CCT. No.	AMP	POLE	DESCRIPTION
LIGHTING	1	15	1	2	15	1	SPARE
CHLORINATION SYSTEM	1	15	3	4	15	1	SPARE
RECEPTACLES	1	15	5	6	15	2	RADIANT HEATER – RH–1
BATTERY PACK RECEPTACLES	1	15	7	8	15	2	RADIANT HEATER – RH–1
CHLORINE EXHAUST FAN EF–1	1	15	9	10	15	2	RADIANT HEATER – RH–2
SUMP PIT RECEPTACLE SP	1	15	11	12	15	2	RADIANT HEATER – RH–2
EXTERIOR LIGHTING	1	15	13	14	15	1	LAB BENCH RECEPTACLE
EXTERIOR RECEPTACLES			15	16	15	1	EXTERIOR RECEPTACLES
DOMESTIC WATER PUMP RECEPTACLE			17	18	15	1	DIGITAL CHLORINE DOSE PUMP RECEPTACLE DDP
TANK AGITATOR RECEPTACLE TA			19	20			
			21	22			SPARE
SPARE			23	24			SPARE

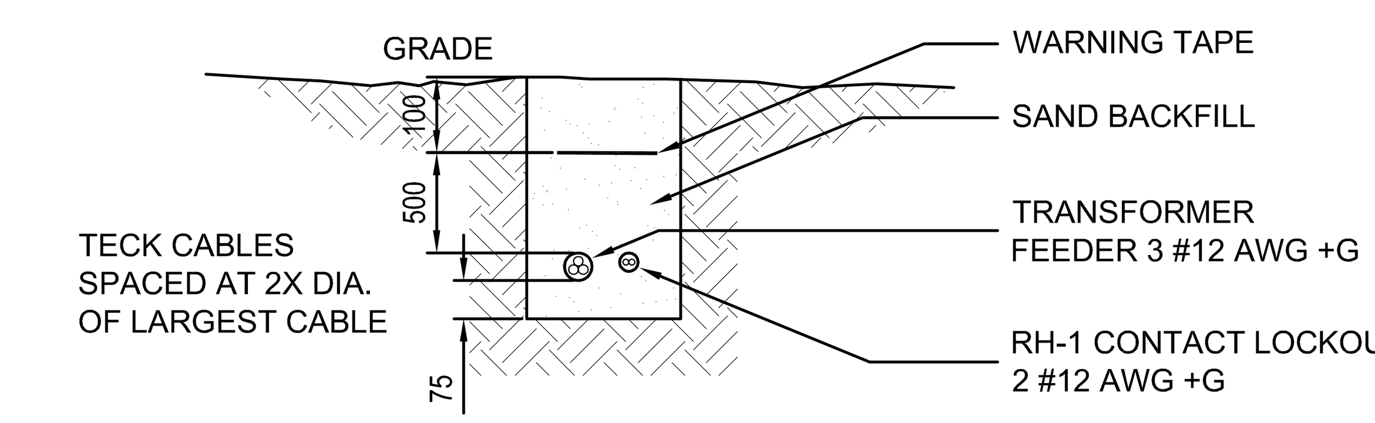
NOTE:

1. PROVIDE A WARNING SIGN ON SIDE OF NEW BUILDING THAT STATES EXISTING UNDERGROUND CONDUIT/CONDUCTORS RUN UNDERNEATH THE NEW BUILDING.
2. CO-ORDINATE RECEPTACLE PLACEMENT WITH ON SITE LOCATION OF MECHANICAL EQUIPMENT BEING SERVED.
3. UNDERGROUND CABLE FROM PANEL 'C' IN TRENCH (SEE DETAIL THIS DRAWING). CO-ORDINATE INSTALLATION WITH EXISTING UNDERGROUND CABLES.



LIGHTING AND POWER LAYOUT

SCALE: 1:25



UNDERGROUND CABLE DETAIL

N.T.S.

LEGEND

- DUPLEX RECEPTACLE
- SWITCH
- FLOURESCENT LIGHT
- INCANDESCENT LIGHT
- EXIT SIGN LIGHT
- EMERGENCY LIGHT WITH BATTERY PACK
- METER SOCKET
- THERMOSTAT
- DIRECT CONNECTION/ SPECIALTY RECEPTACLE
- JUNCTION BOX
- PUSH BUTTON SWITCH
- INTAKE PUMP

DILLON CONSULTING LIMITED 495 RICHMOND STREET, LONDON, ONTARIO, N6A 5A9, PHONE (519) 438-6192, FAX (519) 672-8209

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REGISTERED PROFESSIONAL ENGINEER W. C. D. DeGAGNE LICENSEE N.W.T.

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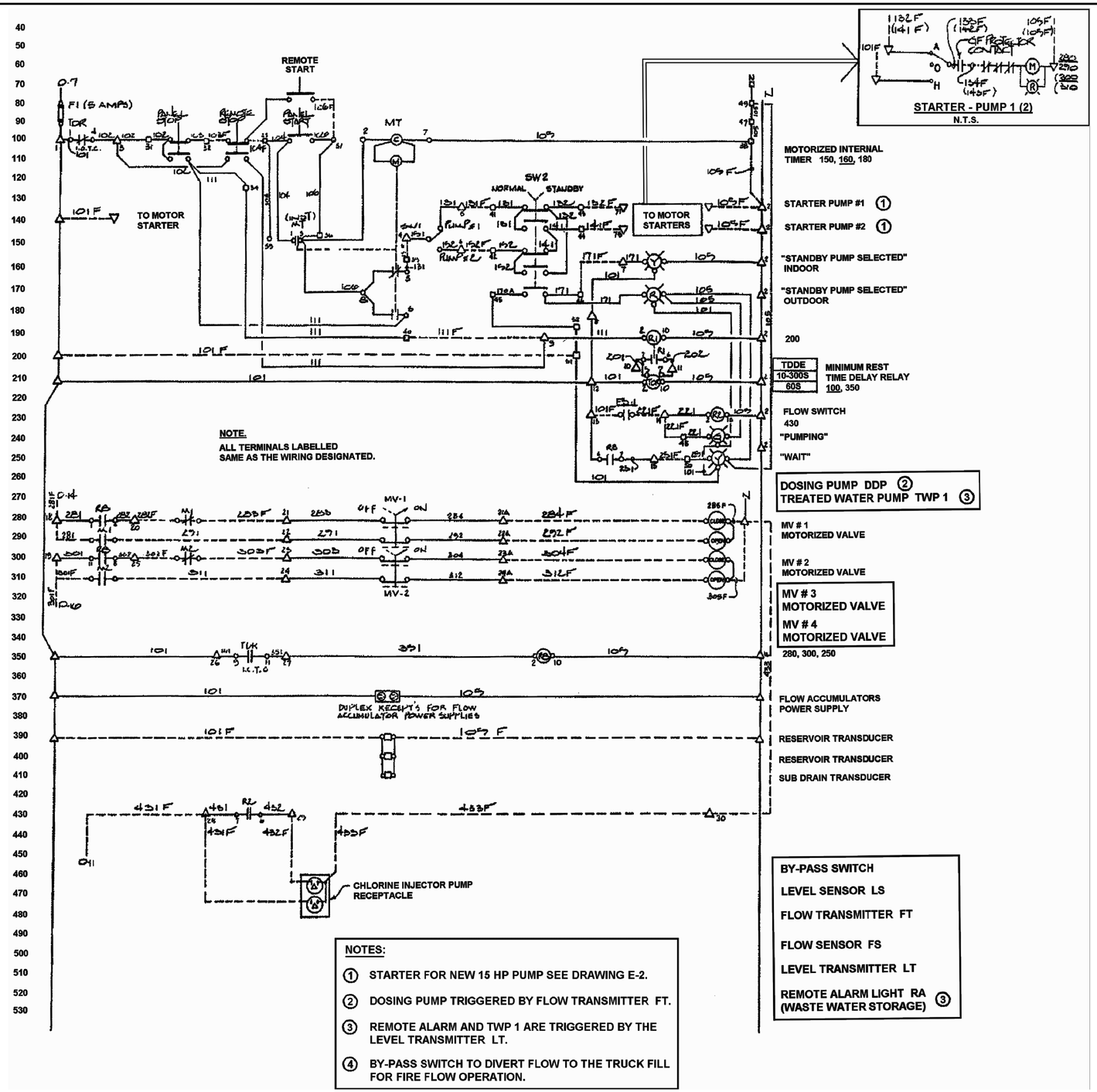
DRAWN: ACP	CHECKED BY: WCDD
DATE: APRIL 2008	
SCALE: AS SHOWN	

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

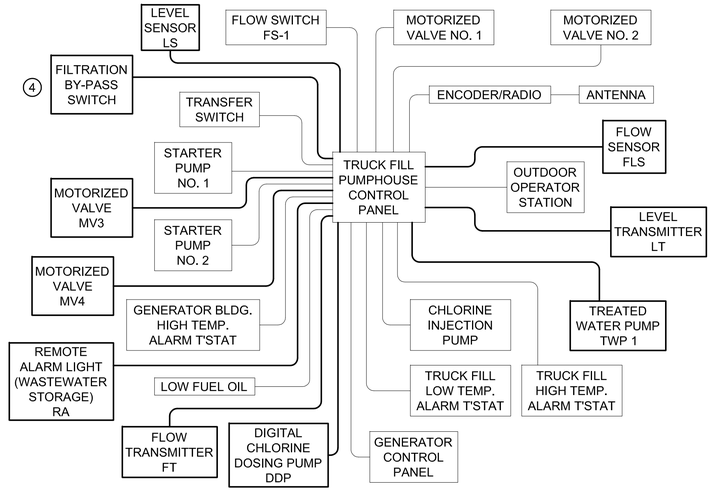
NEW FILTRATION BUILDING ELECTRICAL

PROJECT NO. 07-8254-1000

SHEET NO. 303



AC SCHEMATIC DIAGRAM - PUMPHOUSE CONTROLS



NEW CONTROL SCHEMATIC
N.T.S.

GENERAL NOTES:

THE EXISTING CONTROL PANEL WILL BE MODIFIED TO INCLUDE THE NEW PROCESS EQUIPMENT. THE NEW COMPONENTS ARE SHOWN IN THE "NEW CONTROL SCHEMATIC". THE CONTRACTOR WILL INCORPORATE THESE NEW FEATURES INTO THE WIRING DIAGRAM AND SUBMIT THE NEW WIRING DIAGRAM FOR APPROVAL AT THE SHOP DRAWING REVIEW STAGE.

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DRAWN ACP | CHECKED BY WCDD
DATE APRIL 2008
SCALE N.T.S.

WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

PROJECT NO. 07-8254-1000

WIRING CONTROLS AND SCHEMATICS

SHEET NO. 304

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	LUMINARIE SCHEDULE							
TYPE	SIZE (mm)	WATTAGE	LAMPS	VOLTAGE	LENS	MOUNTING	MANUFACTURER	COMMENTS
A	300 X 1200	32W/CW T8 OCTRON	2	120	-	SURFACE (CEILING)	LITHONIA 2LB-2-32-120-GEB10IS CSA	-18C ELECTRONIC BALLAST
B	260 X 360	70W HPS CLEAR	1	120	POLYCARB WIRE CAGE	SURFACE (WALL):	HOLOPHANE WP2B-070HP-12-B2-PA	-30C BALLAST C/W CAT.NO.13004 PHOTO-CELL
C	241 X 273	12W HALOGEN	2	120	-	SURFACE (WALL):	LITHONIA TITAN M1272-120-CS-M1212-CSA	-
D	311X197	1W LED	MULTIPLE	120		SURFACE (CEILING)	LITHONIA LK-S-W-1-R-120-ELN-CSA	DC SOCKET C/W 12V LAMP

LUMINAIRE SCHEDULE

Tag	Name	Equipment Characteristics	Manufacturer	Model No.	Operating Equipment Weight	Electrical	Motor (KW)	Motor (HP)	Remarks
FT	Filter System Flow Transmitter	Convert the signal from all Signet flow sensors, into a 4 to 20 mA signal for long distance.	Signet	8550	-	12-24 VDC +/- 10%, regulated			New Flow Transmitter to be controlled through the Pump House Control System and to be mounted in the existing panel
FLS	Stainless Steel High Performance Paddlewheel Flow Sensor	Enabling flow measurement of 0.1 to 6 m/s.	Signet	2540	-	5 to 24 VDC 1.5mA max			New Flow Sensor to be mounted in the common existing water line, and controlled through the Pump House Control System.
LS LT	Water Tank Level Sensor/ Level Transmitter		Flygt	LSU 100	-	12-40VDC, two wire system			To be mounted in the water tank, and controlled through the Pump House Control System.
PM1	Submersible Intake Pump #1	357 US gpm at 111' Head, 3450 RPM	Grundfos	192430C2 SP 95-2-B	-	575/3Ø/60		15	To be Controlled through the Pump House Control System
PM2	Submersible Intake Pump #2	357 US gpm at 111' Head, 3450 RPM	Grundfos	192430C2 SP 95-2-B	-	575/3P/60		15	To be Controlled through the Pump House Control System
SP	Sump Pit	20 US gpm at 15' Head	Grundfos	SU332AV	-	115V, 1phase		1/3	Complete with level control switch
BN	Basin	18" x 30", 30 gallons,	Grundfos	96001004	-	-	-	-	
P1	Domestic Water Pump	Intermittent duty 2.5 GPM at 20 psi Head	SHURflo	2088-492-144	-	120/1Ø/60		-	Compete with Adjustable Pressure Switch and Check Valve
CCF	Activated Carbon Cartridges		Harmsco Hurricane		-	-	-	-	To be selected
SNK	Laundry tub (Sink)	514mm x 438mm x 330mm Overall height is 883mm	Fiat Products	FL-1 Floor mounted serv-a-sink	-	-	-	-	
TA	Tank Agitator	1725 RPM, Pumps 436 gallons per minute	Dynamix	MMX-21O3D-99S7DD	-	120/1Ø/60		1/3 HP	Complete with switch
CT	Cylindrical Tanks		Polyrama Plastics		-	-	-	-	To be selected
BSK	Basket Strainers		Hayward		-	-	-	-	To be selected
PPC	Polypleat-Cartridges		Danamark Watercare		-	-	-	-	To be selected
DDP	Digital Chlorine Dosing Pump	16 Lph at 43.5 psi	Grundfos	M 209-20D E41 D00 R00 P03		120/1Ø/60			To be Controlled through the Pump House Control System via the Flow Transmitter
SBH	Swing Bolt Housings		Danamark Watercare		-	-	-	-	To be selected
SS1	Motor Soft Starter 1		Allen Bradley	150-C19NCD	-	120/1Ø/60			To be Installed in existing Starter Cabinet
SS2	Motor Soft Starter 2		Allen Bradley	150-C19NCD	-	120/1Ø/60			To be Installed in existing Starter Cabinet
EF-1	Chlorine Exhaust Fan	115 CFM at 0.02 E.S.P.	Loren-Cook	60TCNB	-	120/1Ø/60		0.25	To be controlled by light switch. Complete with: back draft damper; explosion proof motor; belt guard; AMCA A construction, and; Phenolic epoxy coating
RH-1	Radiant Electric Heater	5.0 kW	Chromalox	KRR6504C131	22 lbs	240/1Ø/60	5.0		Wall Mounted, Complete with Field Installed Thermostat. Unit to be locked out when the emergency generator is operating
RH-2	Radiant Electric Heater	5.0 kW	Chromalox	KRR6504C131	22 lbs	240/1Ø/60	5.0		Wall Mounted, Complete with Field Installed Thermostat

EQUIPMENT SCHEDULE

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WATER SUPPLY FILTRATION SYSTEM
ARVIAT, NUNAVUT

SCHEDULES

PROJECT NO. 07-8254-1000

SHEET NO. 305