GENERAL ABBREVIATIONS

A	ACCU	AIR COOLED CONDENSER UNIT
	ACU	AIR CONDITIONER UNIT (W/DX OR CHILL WTR COILS)
	AD	ACCESS DOOR
	AFF	ABOVE FINISHED FLOOR
	AG	ABOVE GRADE
	AHC	ABOVE HUNG CEILING
	AHU	AIR HANDLING UNIT
	AFG	ABOVE FINISHED GRADE
	AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
	AP	ACCESS PANEL
	APD	AIR PRESSURE DROP
	ATC	AUTOMATIC TEMPERATURE CONTROL
	AUTO	AUTOMATIC
	AUX	AUXILIARY
	AVG	AVERAGE
	AV	AUTOMATIC AIR RELEASE VENT
B	B TO B	BACK TO BACK
	BDD	BACKDRAFT DAMPER
	BBH	BASE BOARD HEATER
	BHP	BRAKE HORSEPOWER
	BMS	BUILDING MANAGEMENT SYSTEMS
	BOD	BOTTOM OF DUCT
	BOT	BOTTOM
	BTU	BRITISH THERMAL UNIT
C	CA	COMPRESSED AIR
	CD	CONTROL DAMPER
	CENT	CENTRIFUGAL
	CFM	CUBIC FEET PER MINUTE
	CGP	CHILLED WTR GLYCOL PUMP
	CHIL	CHILLER (WTR OR AIR COOLED)
	CHW	CHILLED WATER
	CHWS	CHILLED WATER SUPPLY
	CHWR	CHILLED WATER RETURN
	CL	CENTER LINE
	CO	CARBON MONOXIDE
	CTR	CENTER
	CMU	CONCRETE MASONRY UNIT
	CW	CLOCKWISE
D	D	DAMPER
	DB(A)	DECIBELS ("A" WEIGHTED)
	DB	DRY BULB
	DF	DESTRATIFICATION FAN
	DHU	DEHUMIDIFICATION UNIT
	DIA	DIAMETER
	DISCH	DISCHARGE
	DN	DOWN
	DP	DIFFERENTIAL PRESSURE
	DF	DESTRATIFICATION FAN
	DWG	DRAWING
	DIV	DIVISION
E	EUH	ELECTRIC UNIT HEATER
	EAT	ENTERING AIR TEMPERATURE
	EF	EXHAUST FAN
	EC	ELECTRIC CONVECTOR
	ECM	ELECTRONICALLY COMMUNICATED MOTOR
	EER	ENERGY EFFICIENY RATIO
	ERV	ENERGY RECOVERY VENTILATOR
	ENCL	ENCLOSURE
	ESS	EMERGENCY SHUT-OFF SWITCH
	ENT	ENTERING
	ELEC	ELECTRICAL
	EL	ELEVATION
	EMERG	EMERGENCY
	ESP	EXTERNAL STATIC PRESSURE
	EXP	EXPANSION/COMPRESSION TANK
	EWT	ENTERING WATER TEMPERATURE
	EPDM	ETHYLENE PROPYLENE DIENE MONOMER RUBBER
F	F	FAHRENHEIT
	FBV	FLOW BALANCE & SHUTOFF VALVE
	FC	FLEX CONNECTION
	FD	FLOOR DRAIN
	FLA	FULL LOAD AMPS
	FLR	FLOOR
	FOB	FLAT ON BOTTOM
	FOT	FLAT ON TOP
	FPM	FEET PER MINUTE
	FSD	FIRE SMOKE DAMPER
	FRP	FIBERGLASS REINFORCED PLASTIC
	FS	FLOW SENSOR
	FTR	FIN TUBE RADIATION
G	GA	GAUGE
	GPM	GALLONS PER MINUTE
	GUH	GAS-FIRED UNIT HEATER
	GV	GRAVITY VENTILATOR
H	H-O-A	HAND OFF AUTO
	HGR	HOT GLYCOL RETURN
	HGS	HOT GLYCOL SUPPLY
	HP	HORSEPOWER
	HUH	HYDRONIC UNIT HEATER
	HVAC	HEATING VENTILATING & AIR CONDITIONING
	HZ	HERTZ
I	ID	INSIDE DIAMETER
	IN	INCHES
	INS	INSULATE,INSULATION
	INSTR	INSTRUMENT(ATION)
K	KW	KILOWATTS
L	LAT	LEAVING AIR TEMPERATURE
	LBS	POUNDS
	LP	LOW PRESSURE
	LWT	LEAVING WATER TEMPERATURE
	LIN	LINEAR
	LVG	LEAVING
M	M	MOTOR
	MAU	MAKE-UP AIR UNIT
	MBH	THOUSAND BTU PER HOUR
	MOCP	MAXIMUM OVERCURRENT PROTECTION
	MAX	MAXIMUM
	MCC	MOTOR CONTROL CENTER
	MECH	MECHANICAL
	MFR	MANUFACTURER
	MIN	MINIMUM
	MISC	MISCELLANEOUS
	MCA	MINIMUM CIRCUIT AMPACITY
	MTD	MOUNTED
	MOD	MOTOR OPERATED DAMPER
N	NC	NORMALLY CLOSED
	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
	NO	NORMALLY OPEN
	NOM	NOMINAL
	NPT	AMERICAN NATIONAL TAPER PIPE THREAD
	NTS	NOT TO SCALE
O	OA	OUTSIDE AIR
	OAF	OUTSIDE AIR FILTER
	OAT	OUTSIDE AIR THERMOSTAT
	OBD	OPPOSED BLADE DAMPER
	OC	ON CENTER
	OD	OUTSIDE DIAMETER
	ODP	OPEN DRIP PROOF
	OED	OPEN ENDED DUCT
	OSHPD	OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
P	P	PHASE
	PD	PRESSURE DROP
	PROP	PROPELLER
	PSI	POUNDS PER SQUARE IN
	PSIA	PSI ABSOLUTE
	PSIG	PSI GAUGE
R	R	RADIUS
	RCU	REMOTE CONDENSING UNIT
	REQ'D	REQUIRED
	RAF	RETURN AIR FAN
	REG	REGISTER
	RH	RELATIVE HUMIDITY
	RPM	REVOLUTIONS PER MINUTE
	RTU	ROOF TOP UNIT
S	SA	SUPPLY AIR
	SAD	SUPPLY AIR DIFFUSER
	SEER	SEASON ENERGY EFFICIENY RATIO
	SF	SUPPLY FAN
	SCH	SCHEDULE
	SMACNA	SHEET METAL & AIR CONDITIONING NATIONAL ASSOCIATION
	SP	STATIC PRESSURE
	SS	STAINLESS STEEL
	SSI	SPLIT-SYSTEM INDOOR
	SSK	SERVICE SINK
	SSO	SPLIT-SYSTEM OUTDOR
	SR	SUPPLY REGISTER
T	TAF	TRANSFER AIR FAN
	TCP/IP	TRANSFER AIR FAN
	TD	TEMPERATURE DIFFERENCE
	TEAO	TOTALLY ENCLOSED AIR OVER
	TEFC	TOTALLY ENCLOSED FAN COOLED
	TEMP	TEMPERATURE
	TOS	TOP OF STEEL
	TXV	THERMAL EXPANSION VALVE
U	U	HEAT TRANSFER COEFFICIENT
	UH	UNIT HEATER
	UL	UNDERWRITERS LABORATORY
V	V	VOLTS
	VAV	VARIABLE AIR VOLUME
	VD	VOLUME DAMPER
	VEL	VELOCITY
	VAC	VOLTS ALTERNATING CURRENT
	VDC	VOLTS DIRECT CURRENT
W	W	WATTS
	W/	WITH
	W/O	WITHOUT
	WB	WET BULB
	WC	WATER COLUMN
	WMS	WIRE MESH SCREEN

SYMBOLS DUCT WORK

- MANUAL VOLUME DAMPER
- COMBINATION FIRE/SMOKE DAMPER -1.5(1-1/2HR RATED)
- MOTOR OPERATED DAMPER
- DIRECTION OF FLOW
- 12X20 — DUCT SIZE-FIRST NUMBER IS SIDE SHOWN
- 20X12 — DUCT SECTION, POSITIVE PRESS. FIRST NUMBER IS TOP
- 20X12 — DUCT SECTION, NEGATIVE PRESS. FIRST NUMBER IS TOP
- R — ELEVATION CHANGE (R) RISE, (D) DROP
- AD — ACCESS DOOR
- FC — FLEXIBLE CONNECTION
- FLEXIBLE DUCT
- DUCT LINING
- 20X12 16X8 — TRANSITION
- TURNING VANES
- 12X20 — SIDE MOUNTED DEVICE
- BOTTOM MOUNTED DEVICE

SPECIALITIES

- TO SPACE
- FROM SPACE
- U C — 1" UC 60 CFM — UNDERCUT DOOR
- 20X12 LD OR DG 200 CFM — LOUVER DOOR OR DOOR GRILLE
- POINT OF CONNECTION TO EXISTING
- LIMIT OF DEMOLITION

PIPE MATERIAL CODE

CU	COPPER
GS	GALVANIZED STEEL
PVC	POLYVINYL CHLORIDE
STL	BLACK STEEL
DI	DUCTILE IRON
PVC	POLYVINYL CHLORIDE

TYPICAL TAG

EG	TYPE OF DEVICE
20X20	SIZE
400 CFM	CAPACITY

REGISTER GRILLES AND DIFFUSERS

EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
RG	RETURN GRILLE
RR	RETURN REGISTER
SD	SUPPLY DIFFUSER
SG	SUPPLY GRILLE
SR	SUPPLY REGISTER
TG	TRANSFER GRILLE
WG	WALL GRILLE
DG	DOOR GRILLE

FLOW STREAM CODE

COND	CONDENSATE
EA	EXHAUST AIR
SA	SUPPLY AIR
RA	RETURN AIR
RS	REFRIGERANT SUCTION
FI	FILTERED INFLUENT
FW	FILTERED WATER
RW	RAW WATER
REC	RECYCLED WATER
RL	REFRIGERANT LIQUID
OA	OUTSIDE AIR

INSTRUMENTATION LEGEND

DIAGRAMS: X — INSTRUMENT TYPE; X — DIVISION FURNISHED BY

PLANS:
- X — ELEMENT (SENSOR)/TRANSMITTER
- X — SWITCH

CS	CURRENT SWITCH
DPS	DIFFERENTIAL PRESSURE SWITCH
EE	ENTHALPY ELEMENT (SENSOR)
ES	EMERGENCY SHUTOFF SWITCH
ET	ENTHALPY TRANSMITTER
FE	FLOW ELEMENT (SENSOR)
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
GE	GAS ELEMENT (SENSOR)
GT	GAS TRANSMITTER
MCC	MOTOR CONTROL CENTER
ME	MOISTURE ELEMENT (SENSOR)
MS	MOTOR STARTER
MT	MOISTURE TRANSMITTER
OS	OCCUPANCY SWITCH
PE	PRESSURE ELEMENT (SENSOR)
PI	PRESSURE INDICATOR (GAUGE)
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
R	RELAY
TE	TEMPERATURE ELEMENT (SENSOR)
TI	TEMPERATURE INDICATOR (THERMOMETER)
TS	TEMPERATURE SWITCH
TT	TEMPERATURE TRANSMITTER
SD	DUCT SMOKE SENSOR SWITCH

- M — ELECTRIC MOTOR
- A — MODULATING ACTUATOR WITH END SWITCH
- A — TWO POSITION ACTUATOR WITH END SWITCH

PANEL LEGEND

- DIAL
- G, PB — INDICATOR LAMP
  - G GREEN
  - R RED
  - A AMBER
  - PB INTEGRAL PUSHBUTTON
- R, PB — INDICATOR LAMP WITH PUSHBUTTON FUNCTIONALITY
- HS, HOA — HAND SWITCH
  - HOA HAND-OFF-AUTO
  - OA OFF-AUTO
  - PB PUSHBUTTON
  - OO ON-OFF

I/O LEGEND

- ANALOG INPUT
- ANALOG OUPUT
- DIGITAL INPUT
- DIGITAL OUPUT

GENERAL NOTES

1. HVAC EQUIPMENT DIMENSIONS, LOCATIONS, DUCTWORK AND PIPING SYSTEM LAYOUTS ARE BASED ON EQUIPMENT SELECTED BY THE ENGINEER. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT THAT REQUIRES AN ARRANGEMENT OR SPACE DIFFERING FROM THAT INDICATED ON THE DRAWINGS OR SPECIFIED, THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR APPROVAL, DETAILED ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, INSTRUMENTATION, HVAC AND ELECTRICAL DRAWINGS AND EQUIPMENT LISTS SHOWING ALL NECESSARY CHANGES AND EMBODYING ALL FEATURES FOR WHAT HE PROPOSES TO FURNISH. THIS INFORMATION SHALL INCLUDE BUT NOT BE LIMITED TO PLANS, SECTIONS, DETAILS, AND SCHEMATICS OF EQUIPMENT AND ALL APPURTENANCES. ALL SUCH CHANGES IF APPROVED BY THE ENGINEER, SHALL BE AT NO EXTRA COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME THE COST OF, AND THE RESPONSIBILITY FOR SATISFACTORILY ACCOMPLISHING ALL THE NECESSARY CHANGES CORRESPONDING TO THE DIMENSIONS AND CHARACTERISTICS OF THE EQUIPMENT SUBMITTED AND APPROVED BY THE ENGINEER. REFER TO SPECIFICATIONS FOR FURTHER DETAILS.
2. DIELECTRIC COUPLINGS, FLANGES OR UNIONS SHALL BE INSTALLED AT ALL CONNECTIONS OF COPPER PIPE TO OTHER TYPES OF METALLIC PIPING.
3. HVAC DRAWINGS DO NOT SHOW ALL DRAINS, VENTS, OFFSETS AND FITTINGS, SMALL PIPING ETC. REQUIRED FOR THE COMPLETE SYSTEM. HVAC PIPING AND DUCTWORK IS SHOWN APPROXIMATELY TO SCALE BUT SOME VALVES AND APPURTENANCES MAY BE OMITTED FOR THE SAKE OF CLARITY. THE CONTRACTOR SHALL FURNISH, INSTALL AND TEST ALL HVAC SYSTEMS SHOWN AND/OR AS DEFINED IN THE SPECIFICATIONS AND ON THE DRAWINGS TO PROVIDE THE COMPLETE SYSTEM.
4. NOT ALL AND ONLY CERTAIN TYPES OF SUPPORTS ARE SHOWN ON THE HVAC DRAWINGS. UNLESS OTHERWISE DETAILED ON THE DRAWINGS ALL PIPE AND DUCT SUPPORTS SHALL BE DESIGNED, FURNISHED AND INSTALLED BY THE CONTRACTOR AS SPECIFIED AND TO THE APPROVAL OF THE ENGINEER.
5. WHEN ENGINEERING SERVICES ARE SPECIFIED TO BE PROVIDED BY CONTRACTOR, CONTRACTOR SHALL RETAIN A LICENSED PROFESSIONAL ENGINEER TO PERFORM THE SERVICES. ENGINEER SHALL BE LICENSED AT THE TIME SERVICES ARE PERFORMED AND LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED. IF THE STATE ISSUES DISCIPLINE SPECIFIC LICENSES, ENGINEER SHALL BE LICENSED IN THE APPLICABLE DISCIPLINE. ENGINEER SHALL BE EXPERIENCED IN THE TYPE OF WORK BEING PERFORMED.
6. ENGINEERING WORK SHALL BE DONE ACCORDING TO THE APPLICABLE REGULATIONS FOR PROFESSIONAL ENGINEERS TO INCLUDE SIGNING, SEALING AND DATING DOCUMENTS.

NOTE:
THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS ARE SHOWN HERE APPEAR ON THE CONTRACT DRAWINGS.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
4-13-21

REV	DATE	BY	DESCRIPTION

SCALE: N.T.S.

WARNING: 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

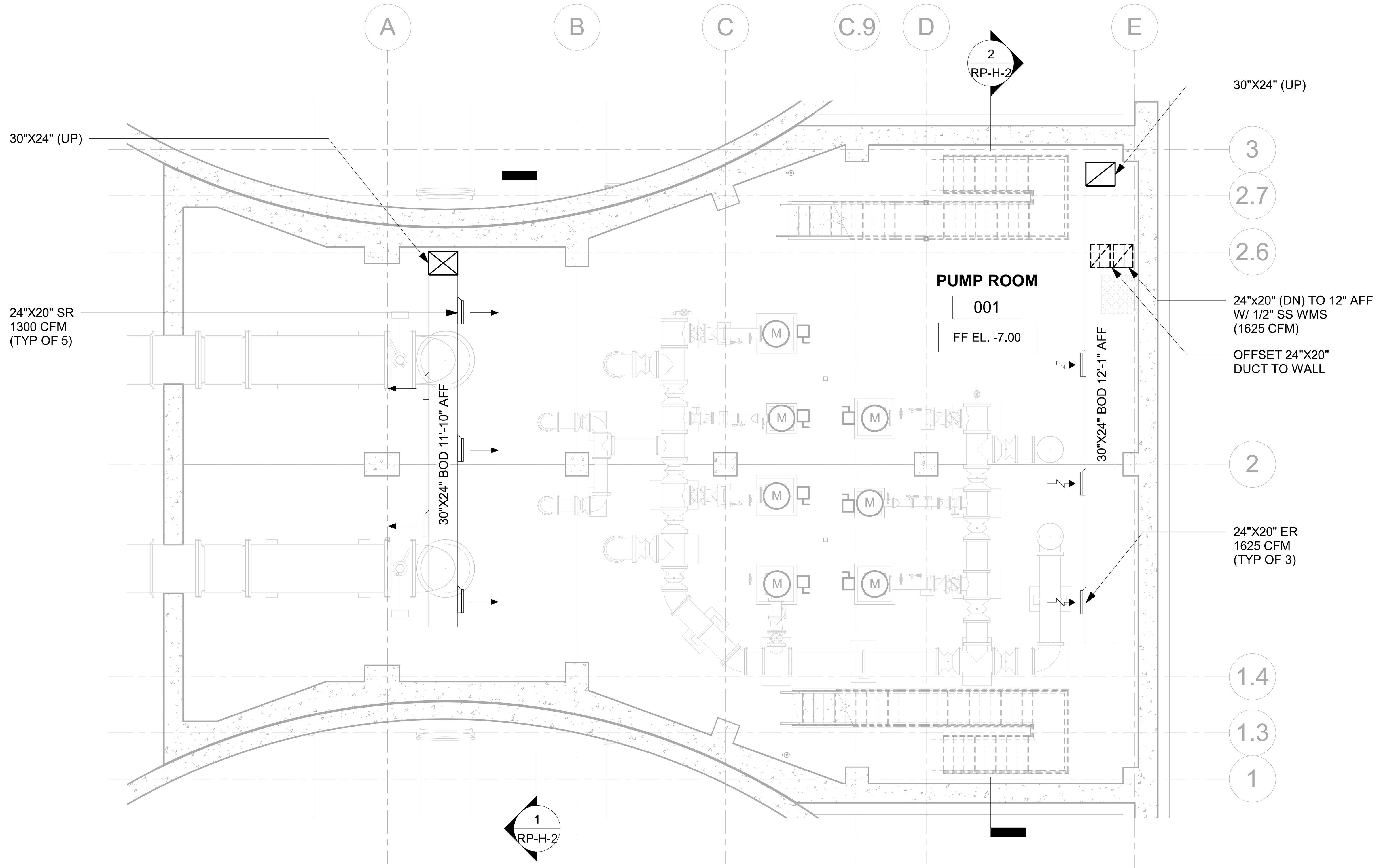
NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
HVAC

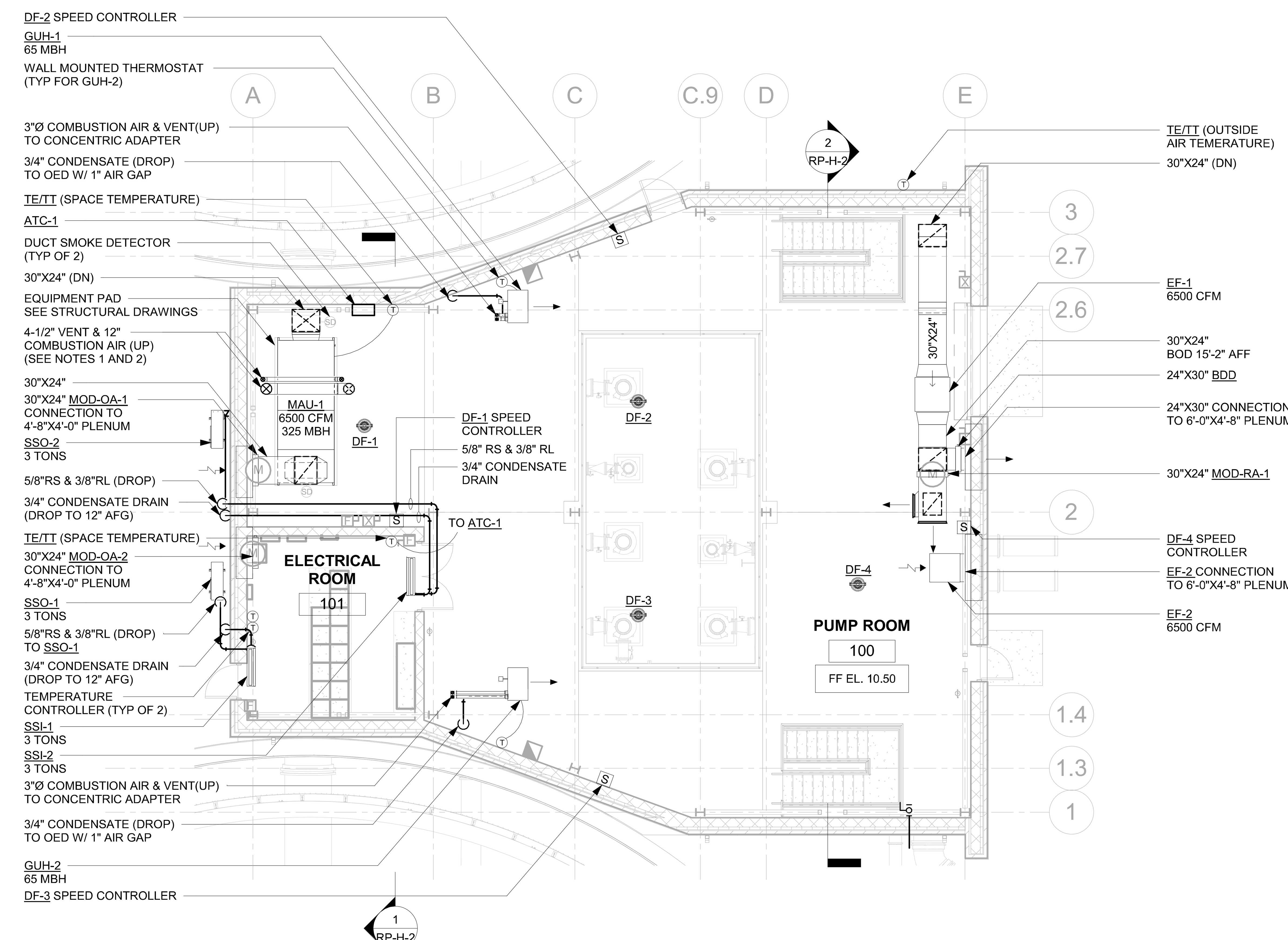
HVAC LEGEND, SYMBOLS, ABBREVIATIONS, AND NOTES

SHEET GD-H-1



LOWER LEVEL PLAN

1/8" = 1'-0"



FIRST FLOOR PLAN

1/8" = 1'-0"

NOTES:

1. TRANSITION FROM THE UNIT CONNECTION TO ROUND DUCT. A THIMBLE SHALL BE INSTALLED AT THE ROOF PENETRATION AND THE VENT SHALL TERMINATE A MINIMUM 12-INCHES ABOVE THE ROOF WITH A VENT CAP. THE VENT SHALL BE A SPECIAL GAS VENT LISTED FOR USE FOR CATEGORY III GAS APPLIANCES.

2. TRANSITION FROM THE UNIT CONNECTION TO ROUND DUCT. THE COMBUSTION AIR DUCT SHALL TERMINATE A MINIMUM 12-INCHES ABOVE THE ROOF WITH A RAIN CAP. THE COMBUSTION AIR DUCT SHALL BE STAINLESS STEEL.

GENERAL NOTES:

1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

0 4' 8' 16'

SCALE: 1/8" = 1'-0"

DANIEL FLAHERTY
No. 11935
REGISTERED
PROFESSIONAL ENGINEER
MECHANICAL

REV	DATE	BY	DESCRIPTION

SCALE: 1/8" = 1'-0"

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

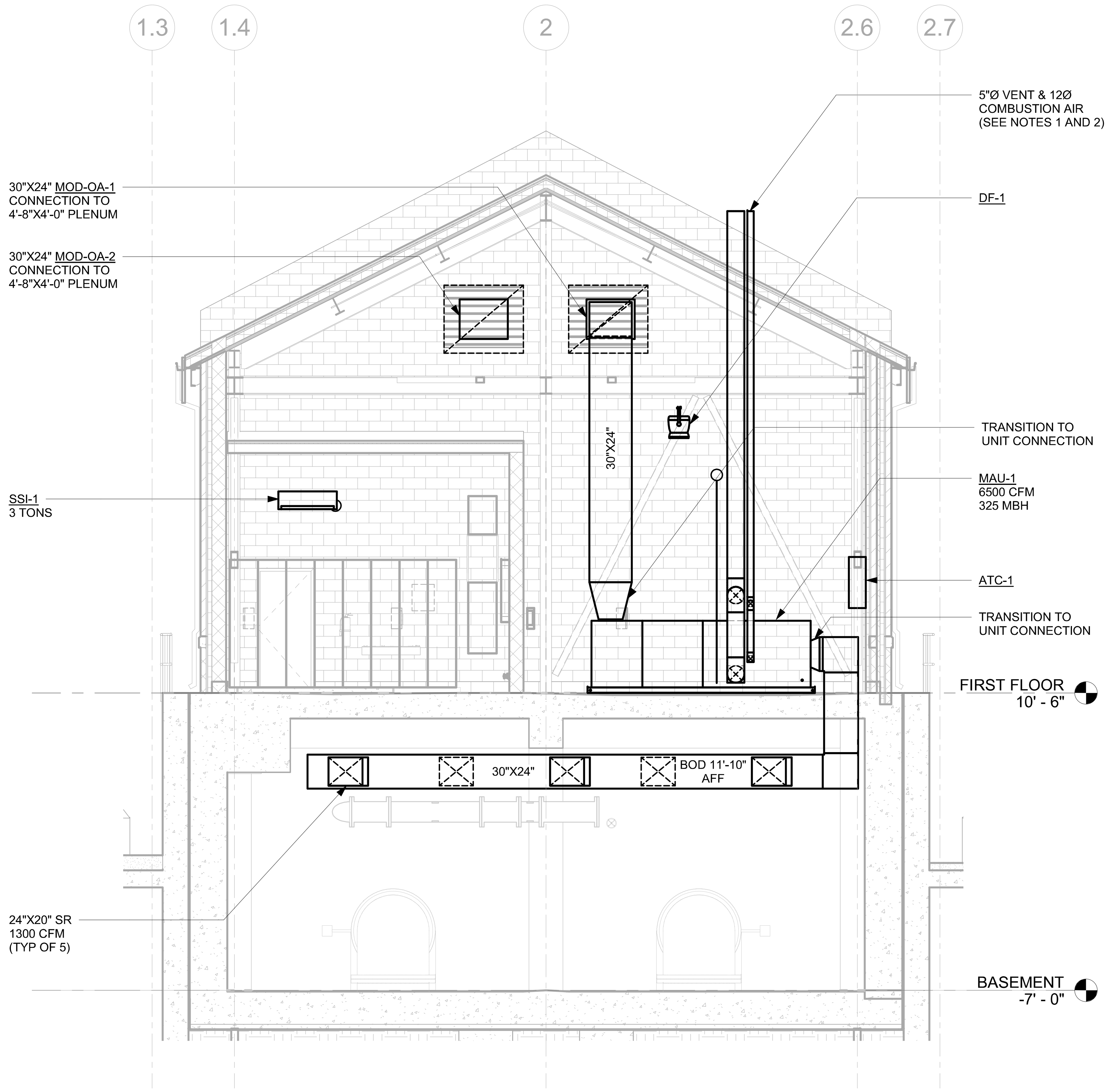
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

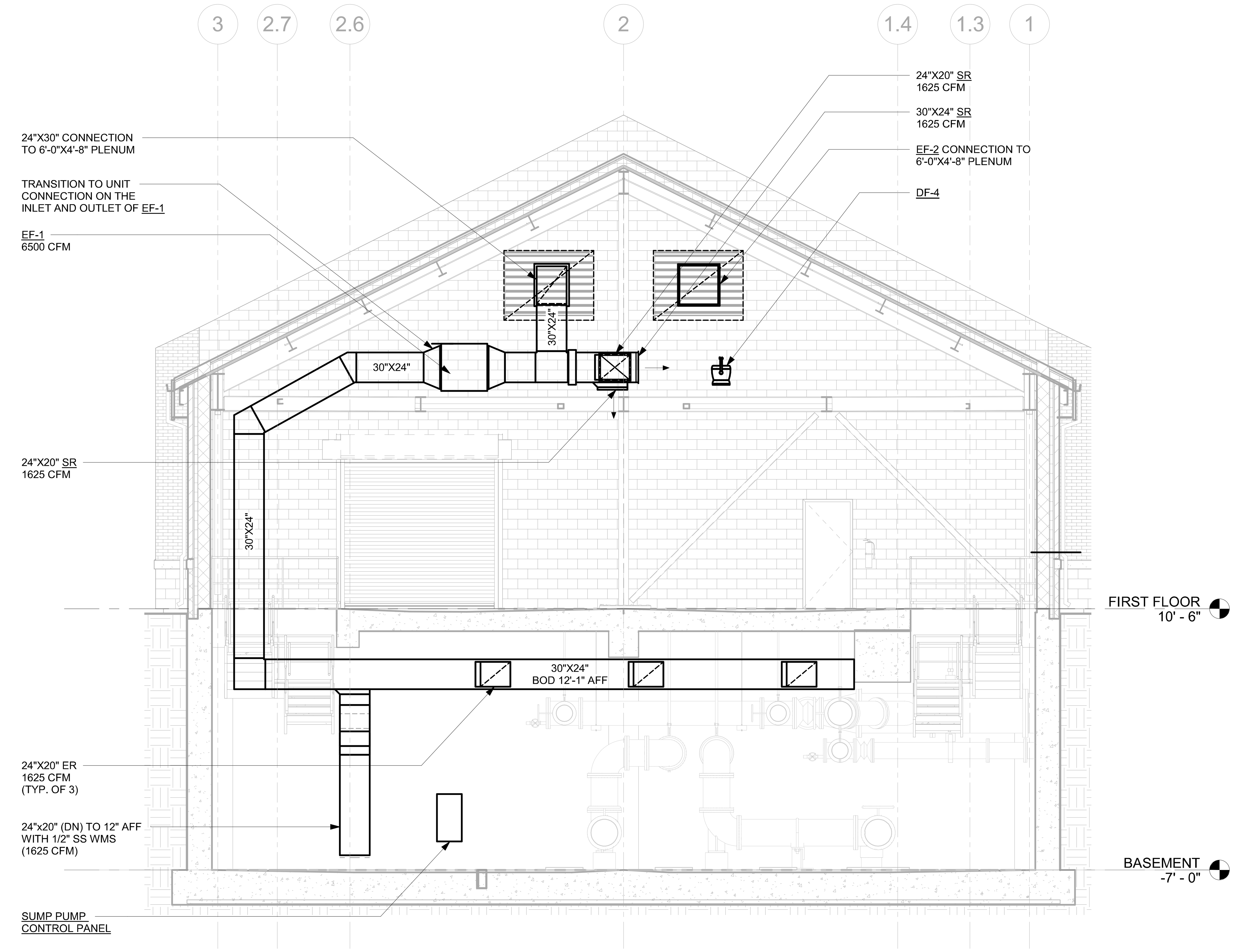
Stantec PARE

NBC CONTRACT NO 308.10C
HVAC
RETURN SLUDGE PUMP STATION NO. 3
FLOOR PLANS

SHEET RP-H-1

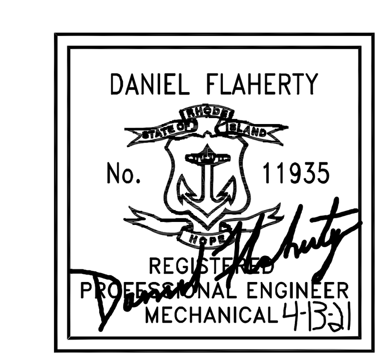


1 SECTION
RP-H-1 3/16" = 1'-0"



2 SECTION
RP-H-1 3/16" = 1'-0"

NOTES:
1. A THIMBLE SHALL BE INSTALLED AT THE ROOF PENETRATION AND THE VENT SHALL TERMINATE A MINIMUM 12-INCHES ABOVE THE ROOF WITH A VENT CAP. THE VENT SHALL BE A SPECIAL GAS VENT LISTED FOR USE FOR CATEGORY III GAS APPLIANCES.
2. THE COMBUSTION AIR DUCT SHALL TERMINATE A MINIMUM 12-INCHES ABOVE THE ROOF WITH A RAIN CAP. THE COMBUSTION AIR DUCT SHALL BE STAINLESS STEEL.



0 2' 4' 6' 10'
SCALE: 3/16" = 1'-0"

GENERAL NOTES:
1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

REV	DATE	BY	DESCRIPTION	SCALE	WARNING		FINAL DESIGN - MARCH 2021				SHEET
				3/16" = 1'-0"	0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	DESIGNED D. FLAHERTY DRAWN C. BRAITHWAITE CHECKED D. FLAHERTY		CDM Smith 260 West Exchange Street, Suite 300 Providence, RI 02903 Tel: (401) 751-5360	NARRAGANSETT BAY COMMISSION PHASE III COMBINED SEWER OVERFLOW PROGRAM Stantec PARE	NBC CONTRACT NO 308.10C HVAC RETURN SLUDGE PUMP STATION NO. 3 SECTIONS	RP-H-2

SPLIT SYSTEM INDOOR UNIT SCHEDULE														
MARK	LOCATION	TYPE	AIRFLOW (CFM)	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	REFRIGERANT	FILTER	V/P/HZ	MCA	MOCP	WEIGHT (LBS)	MRF	MODEL	NOTES
SSI-1	ELECTRICAL ROOM	WALL MOUNTED	920	34.2	38	R-410A	MERV 8	208/1/60	1	12	46	MITSUBISHI	PKA-A36KA6	1,2
SSI-2	ELECTRICAL ROOM	WALL MOUNTED	920	34.2	38	R-410A	MERV 8	208/1/60	1	12	46	MITSUBISHI	PKA-A36KA6	1,2

NOTES:

1. SEE SPECIFICATIONS SECTION 15816.10.
2. PROVIDE EPOXY COATING ON CONDENSER COILS.
3. PROVIDE WITH WIRED REMOTE CONTROLLER.

SPLIT SYSTEM OUTDOOR UNIT SCHEDULE										
MARK	UNIT SERVED	TONNAGE	REFRIGERANT (LBS)	ELECTRICAL			WEIGHT (LBS)	MFR	MODEL	NOTES
				V/PH/HZ	MCA	MOCP				
SSO-1	SSI-1	3	12	208/1/60	25	31	265	MITSUBISHI	PUZ-A36NKA7	1
SSO-2	SSI-2	3	12	208/1/60	25	31	265	MITSUBISHI	PUZ-A36NKA7	1

NOTES:

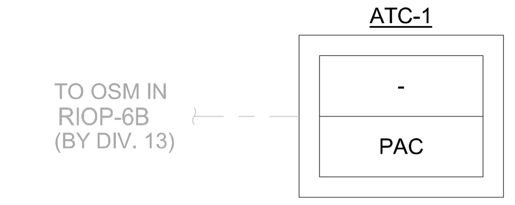
1. SEE SPECIFICATIONS SECTION 15816.10.

MOTOR OPERATED DAMPERS																
MARK	TYPE	UNIT SERVED	BLADE TYPE	BLADE ACTION	FRAME AND BLADE MATERIALS	AXEL MATERIAL	LINKAGE MATERIAL	DIMENSIONS		ACTUATOR TYPE	V	NEMA ENCLOSURE	FAIL POSITION	MFR	MODEL	NOTES
								HEIGHT (IN)	WIDTH (IN)							
MOD-OA-1	INTAKE	MAU-1	AIRFOIL	OPPOSED	ALUMINUM	PLATED STEEL	PLATED STEEL	30	24	2 POSITION	115	4X	CLOSE	RUSKIN	CD50	1
MOD-OA-2	INTAKE	-	AIRFOIL	OPPOSED	ALUMINUM	PLATED STEEL	PLATED STEEL	30	24	2 POSITION	115	4X	CLOSE	RUSKIN	CD50	1
MOD-RA-1	INTAKE	EF-1	AIRFOIL	OPPOSED	ALUMINUM	PLATED STEEL	PLATED STEEL	30	24	2 POSITION	115	4X	OPEN	RUSKIN	CD50	1

NOTES:

1. SEE SPECIFICATIONS SECTION 15922.

ATC-1



PUMP ROOM

CONTROLLER LEGEND:

ASC APPLICATION SPECIFIC CONTROLLER
NC NETWORK CONTROLLER
PAC PROGRAMMABLE APPLICATION CONTROLLER
OSM OPTICAL SWITCH MODULE

CABLE LEGEND:

SHIELDED TWISTED PAIR
ETHERNET
FIBER OPTIC

NETWORK

A – CONTROL DIAGRAM

NTS

METAL DUCTWORK AND INSULATION												
SYSTEM	SERVICE	DUCTWORK				INSULATION			JACKET		HANGERS, SUPPORTS, AND FASTENER MATERIAL	NOTES
		MATERIAL	PRESSURE CLASS	SEAL CLASS	SMACNA STANDARD	TYPE	MATERIAL	THICKNESS (IN)	FACTORY	FIELD		
EF-1	ALL	ALUMINUM	+/-2"	C	M&F	NONE	-	-	-	-	GALVANIZED	1
EF-2	EXHAUST PLENUM	ALUMINUM	+/-2"	C	M&F	NONE	-	-	-	-	GALVANIZED	1
MAU-1	ALL	ALUMINUM	+/-2"	B	M&F	NONE	-	-	-	-	GALVANIZED	1

NOTES:
1. INSULATE PORTION OF DUCTWORK BETWEEN LOUVER AND DAMPER WITH 2" MINERAL FIBER BOARD INSULATION.

MAKE-UP AIR UNIT																						
MARK	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	EAT DB (°F)	LAT DB (°F)	FAN PERFORMANCE							FILTER	MOTOR		ELECTRICAL				MFR	MODEL	NOTES
					AIRFLOW (CFM)	MAX OA (CFM)	MIN OA (CFM)	ESP (IN. WG)	TOTAL STATIC PRESSURE	MAXIMUM VELOCITY (FPM)	RPM		HP	RPM	V	P	HZ	MCA			
MAU-1	400	320	9	55	6500	6500	1625	2.00	3.19	428	1614	MERV 8	7.5	1800	460	3	60	10.9	TRANE	CSAA-10	1,2,3

NOTES:

1. SEE SPECIFICATIONS SECTION 15733.
2. PROVIDE LABEL THAT INDICATES UNIT IS POWERED FROM 2 SOURCES.
3. STAINLESS STEEL HEAT EXCHANGER.

EXHAUST FANS													
MARK	FAN CONFIGURATION	AIRFLOW (CFM)	ESP (IN WG)	BHP	MOTOR			ELECTRICAL			MFR	MODEL	NOTES
					ENCLOSURE	HP	RPM	V	P	HZ			
EF-1	INLINE	6500	1.00	2.07	TEFC	3	1725	460	3	60	GREENHECK	BSQ-240-30	1,2,3,4,5,6
EF-2	SIDEWALL	6500	0.25	0.59	TEFC	0.5	850	460	3	60	GREENHECK	AER-E30C-617-C5	1,7,8

NOTES:

1. SEE SPECIFICATIONS SECTION 15724.
2. PROVIDE NEMA PREMIUM EFFICIENCY MOTOR THAT MEETS NEMA TABLE 12-12.
3. PROVIDE NEMA-1 TOGGLE SWITCH.
4. PROVIDE MOUNTED AND WIRED JUNCTION BOX.
5. PROVIDE ALUMINUM FAN HOUSING CONSTRUCTION.
6. PROVIDE BEARINGS WITH GREASE FITTINGS OF L10 LIFE OF 100,000 HOURS.
7. PROVIDE MOTOR ACCESS FROM INTERIOR OF BUILDING.
8. PROVIDE WITH MODEL VCD PARALLEL BLADE DAMPER AND 115V ACTUATOR WITH END SWITCH OR A UNIT OF EQUAL SPECIFICATIONS.

DESTRATIFICATION FANS														
MARK	MOUNTING HEIGHT	PERFORMANCE			FAN		MOTOR ENCLOSURE	ELECTRICAL				WEIGHT (LBS)	MFR	MODEL	NOTES
		AIRFLOW (CFM)	RPM	DISCH. dBA	FAN DIA. (IN)	DRIVE		V	P	HZ	FLA				
DF-1	13'-0"	670	1590	44.3	17.5	DIRECT	TEAO	115	1	60	0.44	15	ZOOFANS	H30	1,2
DF-2	13'-0"	670	1590	44.3	17.5	DIRECT	TEAO	115	1	60	0.44	15	ZOOFANS	H30	1,2
DF-3	13'-0"	670	1590	44.3	17.5	DIRECT	TEAO	115	1	60	0.44	15	ZOOFANS	H30	1,2
DF-4	13'-0"	670	1590	44.3	17.5	DIRECT	TEAO	115	1	60	0.44	15	ZOOFANS	H30	1,2

NOTES:

1. SEE SPECIFICATIONS SECTION 15724.
2. PROVIDE WITH MODEL VS-5A WALL MOUNTED VARIABLE SPEED CONTROLLER OR A UNIT OF EQUAL SPECIFICATIONS.
3. PROVIDE WITH 3-PRONG PLUG.

GAS-FIRED UNIT HEATERS											
MARK	AIRFLOW (CFM)	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	MOTOR		ELECTRICAL			MOTOR ENCLOSURE	MFR	MODEL	NOTES
				HP	RPM	V	P	HZ				
GUH-1	1141	65	60.5	0.125	1625	115	1	60	TEFC	MODINE	PTC 65SS0111FBAC	1,2,3
GUH-2	1141	65	60.5	0.125	1625	115	1	60	TEFC	MODINE	PTC 65SS0111FBAC	1,2,3

NOTES:

1. SEE SPECIFICATIONS SECTION 15554.
2. PROVIDE ACID NEUTRALIZATION KIT.
3. PROVIDE CONDENSATE DRAIN KIT.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4-3-21

REV	DATE	BY	DESCRIPTION

SCALE 12" = 1'-0"

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

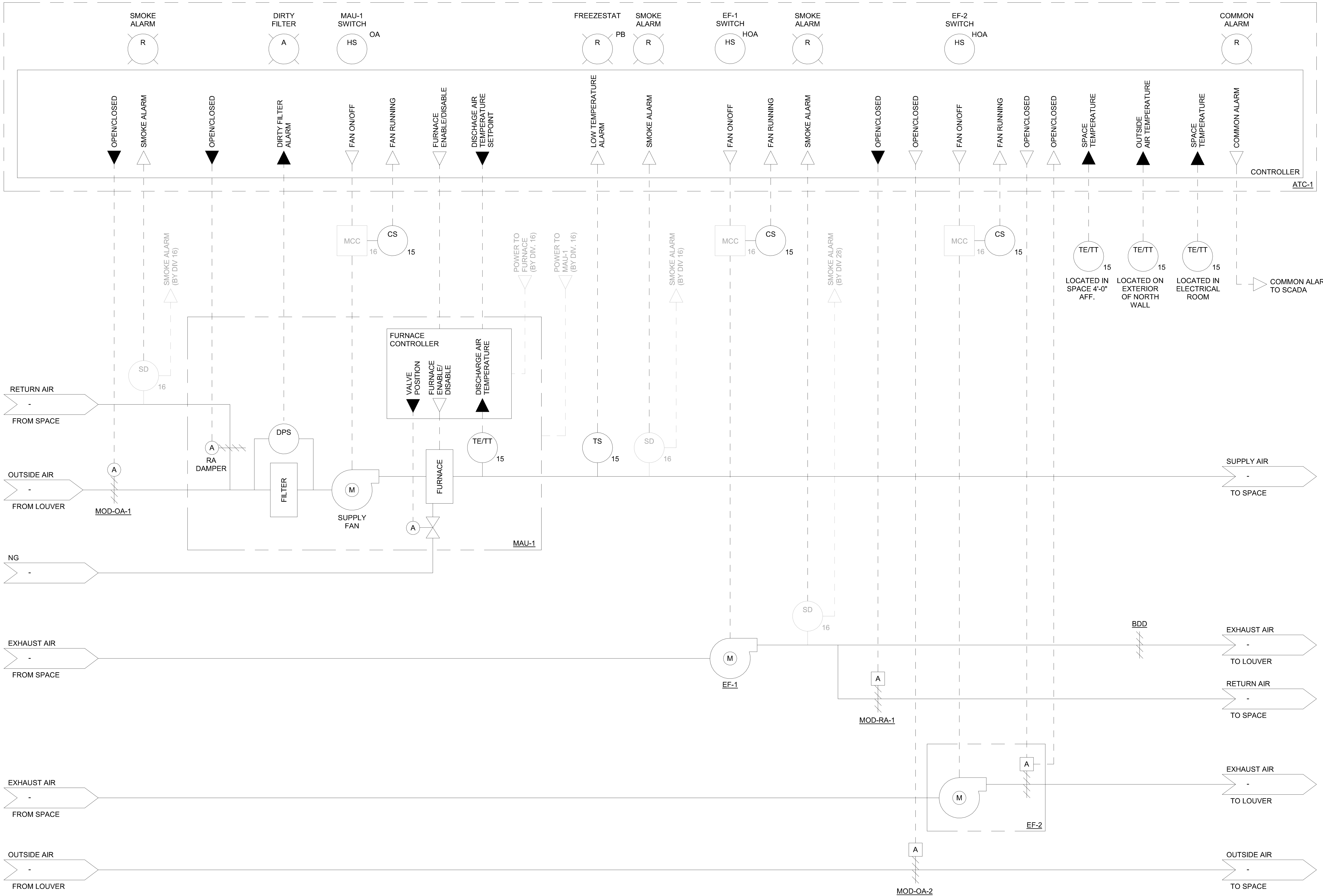
Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
HVAC
RETURN SLUDGE PUMP STATION NO. 3
HVAC SCHEDULES AND NETWORK DIAGRAM

SHEET
RP-H-3



MAU-1, EF-1 AND EF-2

A CONTROL DIAGRAM
NTS

MAU-1 SEQUENCE OF OPERATION:

OFF MODE
1. THE FAN IS OFF.
2. MIXING DAMPER IS FULL CLOSED TO OUTDOOR AIR.
3. FURNACE IS DISABLED.

AUTO MODE
1. THE FAN IS RUNNING.
2. WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 50°F:
   A. MIXING DAMPER MODULATES TO MAINTAIN SPACE TEMPERATURE SETPOINT (75°F ADJ.).
   B. FURNACE IS DISABLED.
3. WHEN OUTSIDE AIR TEMPERATURE IS BELOW 50°F:
   A. MIXING DAMPER IS OPEN TO MINIMUM OUTSIDE AIR POSITION (25% OUTSIDE AIR)
   B. FURNACE IS ENABLED TO MAINTAIN SPACE TEMPERATURE SETPOINT (55°F ADJ.).

SAFETIES AND ALARMS
1. WHEN THE FILTER DIFFERENTIAL PRESSURE SWITCH ALARMS (0.5" WG) AN AMBER PILOT LIGHT ILLUMINATES. THE ALARM AUTOMATICALLY RESETS.
2. WHEN FREEZESTAT ALARMS (40°F ADJ), THE FAN STOPS RUNNING AND A RED PILOT LIGHT ILLUMINATES.
   A. THE FREEZESTAT CAN BE MANUALLY BYPASSED BY PRESSING THE PUSHBUTTON INTEGRAL TO THE PILOT LIGHT.
   B. THE FREEZESTAT WILL HAVE AN ADJUSTABLE BYPASS TIMER (5 MIN).
3. WHEN THE SMOKE DETECTOR ALARMS:
   A. THE FAN STOPS RUNNING.
   B. THE MIXING DAMPER GOES TO THE FULL CLOSED POSITION.
   C. THE FURNACE IS DISABLED.
   D. THE RED PILOT LIGHT ILLUMINATES
   E. THE ALARM SIGNAL FOR THE SMOKE DETECTOR SHALL AUTOMATICALLY RESET.
4. WHEN ANY OF THE CONDITIONS LISTED BELOW OCCUR, THE RED COMMON ALARM PILOT LIGHT SHALL ILLUMINATE:
   A. THE FAN CURRENT SENSOR DOES NOT SENSE CURRENT WHEN THE FAN IS COMMANDED TO RUN AFTER A 5 MINUTE DELAY.
   B. THE SPACE TEMPERATURE IS 10°F ABOVE SETPOINT.
   C. THE SPACE TEMPERATURE IS 10°F BELOW SETPOINT.
   D. THE ELECTRICAL ROOM ALARM IS ACTIVATED.

EF-1 SEQUENCE OF OPERATION

OFF MODE
1. FAN IS OFF.
2. RETURN AIR DAMPER IS FULL OPEN.

HAND MODE
1. FAN IS RUNNNG.
2. RETURN AIR DAMPER IS FULL OPEN.

AUTO MODE
1. FAN IS INTERLOCKED TO RUN WHEN MAU-1 FAN IS RUNNING.
2. RETURN AIR DAMPER MODULATES INVERSELY WITH MAU-1 MIXING DAMPER.

SAFETIES AND ALARMS
1. WHEN THE SMOKE DETECTOR ALARMS:
   A. THE FAN STOPS RUNNING.
   B. THE RETURN DAMPER GOES TO THE FULL CLOSED POSITION.
   C. THE RED PILOT LIGHT ILLUMINATES
   D. THE ALARM SIGNAL FOR THE SMOKE DETECTOR SHALL AUTOMATICALLY RESET.

EF-2 SEQUENCE OF OPERATION

OFF MODE
1. THE FAN IS OFF.
2. THE INTAKE AND EXHAUST AIR DAMPERS ARE CLOSED.

HAND MODE
1. THE FAN IS RUNNNG.
2. THE INTAKE AND EXHAUST AIR DAMPERS ARE OPEN.

AUTO MODE
1. WHEN SPACE TEMPERATURE IS BELOW SETPOINT (90°F ADJ.):
   A. THE FAN IS OFF
   B. THE INTAKE AND EXHAUST AIR DAMPERS ARE CLOSED.
2. SPACE TEMPERATURE IS ABOVE SETPOINT (90°F ADJ.):
   A. THE FAN IS RUNNING.
   B. THE INTAKE AND EXHAUST AIR DAMPERS ARE OPEN.
3. WHEN THE FAN IS COMMANDED TO RUN IT SHALL NOT STOP UNTIL SPACE TEMPERATURE IS 5°F LESS THAN SETPOINT.

SAFETIES AND ALARMS
1. THE FAN SHALL NOT START UNTIL THE EXHAUST DAMPER IS PROVEN OPEN.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4/3/21

REV	DATE	BY	DESCRIPTION

SCALE 12" = 1'-0"

WARNING
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DESIGNED D. FLAHERTY
DRAWN B. BUCCHIANERI
CHECKED D. FLAHERTY

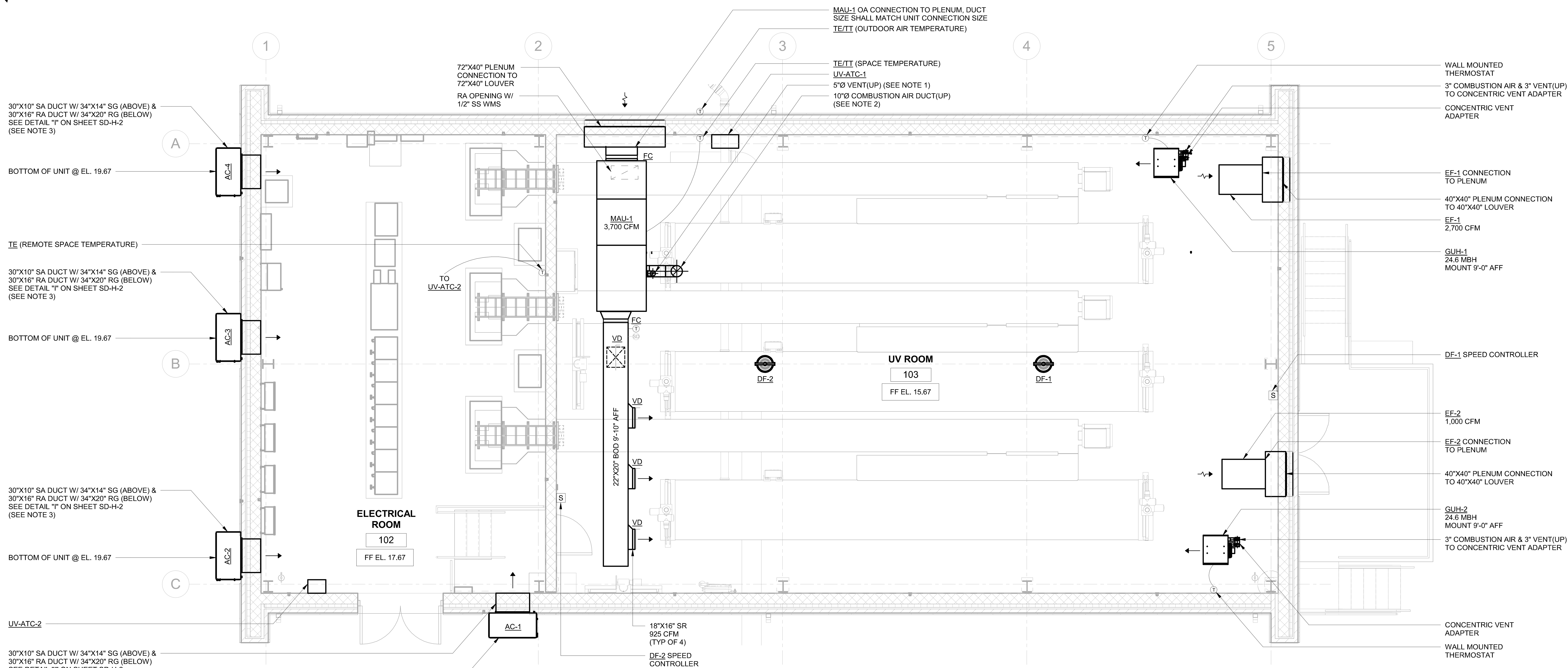
FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM
Stantec
PARE

NBC CONTRACT NO 308.10C
HVAC
RETURN SLUDGE PUMP STATION NO. 3
AUTOMATIC TEMPERATURE CONTROL DIAGRAM

SHEET
RP-H-4



FLOOR PLAN
1/4" = 1'-0"

NOTES:
1. TRANSITION FROM THE UNIT CONNECTION TO ROUND DUCT. A THIMBLE SHALL BE INSTALLED AT THE ROOF PENETRATION AND THE VENT SHALL TERMINATE A MINIMUM 12-INCHES ABOVE THE ROOF WITH A VENT CAP. THE VENT SHALL BE A SPECIAL GAS VENT LISTED FOR USE FOR CATEGORY III GAS APPLIANCES.
2. TRANSITION FROM THE UNIT CONNECTION TO ROUND DUCT. THE COMBUSTION AIR DUCT SHALL TERMINATE A MINIMUM 12-INCHES ABOVE THE ROOF WITH A RAIN CAP. THE COMBUSTION AIR DUCT SHALL BE STAINLESS STEEL.
3. SA DUCT AND RA DUCT SIZE SHALL MATCH UNIT CONNECTION SIZES AND TERMINATE AT THE INTERIOR FACE OF THE WALL WITH A SA GRILL AND A RA GRILL.

GENERAL NOTES:
1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

1/4" = 1'-0"
2 1 0 2 4

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4-13-21

REV	DATE	BY	DESCRIPTION

SCALE: 1/4" = 1'-0"

WARNING
0 ½ 1
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DESIGNED BY: B. BUCCHIANERI
DRAWN BY: B. BUCCHIANERI
SHEET CHK'D BY: D. FLAHERTY
CROSS CHK'D BY: W. MCCONNELL
APPROVED BY: D. FLAHERTY
DATE: APRIL 2021

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASTEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO 308.10C
UV DISINFECTION FACILITY
HVAC FLOOR PLAN

SHEET
UV-H-1

CDM Smith BIM 360 Project No: 93019-234214 & 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
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MAKEUP AIR UNITS

MARK	LOCATION	AREA SERVED	HEATING SECTION						FAN PERFORMANCE			MOTOR			ELECTRICAL										VIBRATION ISOLATION			FILTER			WEIGHT (LBS)	MFR	MODEL	NOTES
															SUPPLY FAN					GAS FURNACE														
			TYPE	BURNER TURNDOWN RATIO	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	EAT DB (°F)	LAT DB (°F)	AIRFLOW (CFM)	ESP (IN-WG)	RPM	HP	RPM	ENCLOSURE	V	P	HZ	MCA	MOCP	V	P	HZ	MCA	MOCP	BASE TYPE	ISO. TYPE	DEFLECTION (IN)	TYPE	MERV RATING	WIDTH (IN)				
MAU-1	UV ROOM	UV ROOM	NATURAL GAS, INDIRECT-FIRED	10:1	250	205	5	55.37	3,700	1	1,450	5	1,800	TEFC	460	3	60	8.4	15	115	1	60	2.8	15	A	2	0.75	PLEATED	8	2	1,328	TRANE	CSAA006	1

NOTES:
1. PROVIDE WITH OPPOSED BLADE DAMPERS ON THE RETURN AND OUTDOOR AIR OPENINGS.

THROUGH-THE-WALL AIR CONDITIONING UNITS

MARK	LOCATION	DISCHARGE	AIRFLOW (CFM)	COOLING									HEATING		DEHUMIDIFICATION			INDOOR OPERATION SOUND (dBa)	ELECTRICAL					FILTER			WEIGHT (LBS)	MFR	MODEL	NOTES
				TOTAL CAPACITY (BTUH)	SENSIBLE CAPACITY (BTUH)	LATENT CAPACITY (BTUH)	OUTDOOR DB (°F)	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	LAT WB (°F)	EFFICIENCY (EER)	TYPE	CAPACITY (KW)	MOISTURE REMOVAL (LB/HR)	SENSIBLE CAPACITY (BTUH)	LATENT CAPACITY (BTUH)		V	P	HZ	MCA	MOCP	TYPE	MERV RATING	WIDTH (IN)				
AC-1	ELECTRICAL ROOM	HORIZONTAL	1,750	57,730	42,723	15,007	95	80	67	57.8	56.9	11	ELECTRIC	9	24.6	3,800	26,100	56	460	3	60	18	20	PLEATED	2	1	612	BARD	W60ACDC09ZXXX5J	1,2,3,4,5,6,7
AC-2	ELECTRICAL ROOM	HORIZONTAL	1,750	57,730	42,723	15,007	95	80	67	57.8	56.9	11	ELECTRIC	9	-	-	-	56	460	3	60	18	20	PLEATED	2	1	562	BARD	W60AC-C09ZXXX5J	1,2,3,4,5,6,7
AC-3	ELECTRICAL ROOM	HORIZONTAL	1,750	57,730	42,723	15,007	95	80	67	57.8	56.9	11	ELECTRIC	9	24.6	3,800	26,100	56	460	3	60	18	20	PLEATED	2	1	612	BARD	W60ACDC09ZXXX5J	1,2,3,4,5,6,7
AC-4	ELECTRICAL ROOM	HORIZONTAL	1,750	57,730	42,723	15,007	95	80	67	57.8	56.9	11	ELECTRIC	9	-	-	-	56	460	3	60	18	20	PLEATED	2	1	562	BARD	W60AC-C09ZXXX5J	1,2,3,4,5,6,7

NOTES:
1. PROVIDE WITH TECHNICOAT COATING ON THE EVAPORATOR AND CONDENSER COILS OR A COATING OF EQUAL SPECIFICATIONS.
2. PROVIDE WITH ECONOMIZER AND EXHAUST AIR DAMPER FOR ROOM PRESSURIZATION RELIEF.
3. PROVIDE WITH LOW AMBIENT CONTROLS.
4. PROVIDE WITH HI PRESSURE SWITCH.
5. PROVIDE WITH LOW PRESSURE SWITCH.
6. PROVIDE WITH COMPRESSOR CONTROL MODULE.
7. PROVIDE AN ALARM RELAY.

GAS-FIRED UNIT HEATERS

MARK	LOCATION	VENT TYPE	HEAT EXCHANGER MATERIAL	BURNER MATERIAL	HEATING			FAN PERFORMANCE		MOTOR			ELECTRICAL			VIBRATION ISOLATION			WEIGHT (LBS)	MFR	MODEL	NOTES
					GAS INPUT (MBH)	GAS OUTPUT (MBH)	AFUE (%)	TYPE	AIRFLOW (CFM)	HP	RPM	ENCLOSURE	V	P	HZ	BASE TYPE	ISO. TYPE	DEFLECTION (IN)				
GUH-1	UV ROOM	SEPARATED COMBUSTION	SS	SS	30	24.6	82	PROP	505	1/15	1,550	TEFC	115	1	60	A	3	0.75	55	MODINE	HDS30	1,2,3,4
GUH-2	UV ROOM	SEPARATED COMBUSTION	SS	SS	30	24.6	82	PROP	505	1/15	1,550	TEFC	115	1	60	A	3	0.75	55	MODINE	HDS30	1,2,3,4

NOTES:
1. PROVIDE WITH CONCENTRIC VENT KIT.
2. PROVIDE WITH WALL MOUNTED THERMOSTAT.
3. PROVIDE WITH FOUR POINT SUSPENSION KIT.
4. PROVIDE WITH STEPDOWN TRANSFORMER.

FANS

MARK	LOCATION	CONFIGURATION	TYPE	FAN PERFORMANCE					MOTOR				ELECTRICAL			VIBRATION ISOLATION			WEIGHT (LBS)	MFR	MODEL	NOTES
				AIRFLOW (CFM)	ESP (IN-WG)	BHP	INLET dBA	RPM	DRIVE	ENCLOSURE	RPM	HP	V	P	HZ	BASE TYPE	ISO. TYPE	DEFLECTION (IN)				
EF-1	UV ROOM	SIDEWALL	EXHAUST	2,700	0.5	0.47	77	1,750	DIRECT	TEFC	1,750	1/2	208	1	60	A	2	0.25	222	GREENHECK	AER-E20C-315-A5	1,2,3,5
EF-2	UV ROOM	SIDEWALL	EXHAUST	1,000	0.5	0.2	66	1,160	DIRECT	TEFC	1,160	1/4	208	1	60	A	2	0.25	218	GREENHECK	AER-E20C-614-B4	1,2,4,5

NOTES:
1. PROVIDE WITH WALL HOUSING.
2. PROVIDE WITH BIRDSCREEN.
3. PROVIDE WITH MODEL VCD PARALLEL BLADE DAMPER AND 115V ACTUATOR WITH END SWITCH OR A UNIT OF EQUAL SPECIFICATIONS.
4. PROVIDE WITH MODEL WD BACKDRAFT DAMPER OR A UNIT OF EQUAL SPECIFICATIONS.
5. PROVIDE WITH PERMATECTOR COATING OR A COATING OF EQUAL SPECIFICATIONS.

METAL DUCTWORK AND INSULATION

SYSTEM	SERVICE	MATERIAL	DUCTWORK			INSULATION			JACKET		HANGERS, SUPPORTS AND FASTENER MATERIAL	NOTES
			PRESSURE CLASS	SEAL CLASS	SMACNA STANDARD	TYPE	MATERIAL	THICKNESS (IN)	FACTORY	FIELD		
EF-1	EXHAUST PLENUM	ALUMINUM	+/-2"	C	M&F	NONE	-	-	-	-	GALVANIZED	1
EF-2	EXHAUST PLENUM	ALUMINUM	+/-2"	C	M&F	NONE	-	-	-	-	GALVANIZED	1
MAU-1	ALL	ALUMINUM	+/-2"	B	M&F	NONE	-	-	-	-	GALVANIZED	1

NOTES:
1. INSULATE PORTION OF DUCTWORK BETWEEN LOUVER AND DAMPER WITH 2" MINERAL FIBER BOARD INSULATION.

DESTRATIFICATION FANS

MARK	LOCATION	MOUNTING HEIGHT (FT)	DIAMETER (IN)	FAN PERFORMANCE			MOTOR		ELECTRICAL				WEIGHT (LBS)	MFR	MODEL	NOTES
				AIRFLOW (CFM)	RPM	DISCHARGE SOUND (dBA)	DRIVE	ENCLOSURE	V	P	HZ	FLA				
DF-1	UV ROOM	22	17.5	588	1,641	38.3	DIRECT	TEAO	115	1	60	0.48	15	ZOOFANS	H25 AC	1,2
DF-2	UV ROOM	22	17.5	588	1,641	38.3	DIRECT	TEAO	115	1	60	0.48	15	ZOOFANS	H25 AC	1,2

NOTES:
1. SEE SPECIFICATIONS SECTION 15724.
2. PROVIDE WITH MODEL VS-5A WALL MOUNTED VARIABLE SPEED CONTROLLER.
3. PROVIDE WITH 3-PRONG PLUG.

VIBRATION CONTROLS

BASE		ISOLATOR	
TYPE	DESCRIPTION	TYPE	DESCRIPTION
A	NO BASE, ATTACH DIRECTLY TO STRUCTURE OR CURB	1	ELASTOMERIC ISOLATION PAD
B	STEEL RAILS OR STEEL BASE	2	ELASTOMERIC ISOLATION MOUNT OR HANGER
C	CONCRETE INERTIA BASE	3	SPRING MOUNT OR HANGER
D	CURB ISOLATION BASE	4	RESTRAINED SPRING MOUNT OR HANGER

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
4-13-21

CDM Smith BIM 360 Project No: 93019-234214 & 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
File: BIM 360://93019-234214 & 1469-230770 - Bucklin Point Clarifiers-RSPS & UV/HW2001UV.rvt
Plotted on: 4/13/2021 4:16:42 PM

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 ½ 1
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DESIGNED BY: B. BUCCHIANERI
DRAWN BY: B. BUCCHIANERI
SHEET CHK'D BY: D. FLAHERTY
CROSS CHK'D BY: W. MCCONNELL
APPROVED BY: D. FLAHERTY
DATE: APRIL 2021

FINAL DESIGN - MARCH 2021

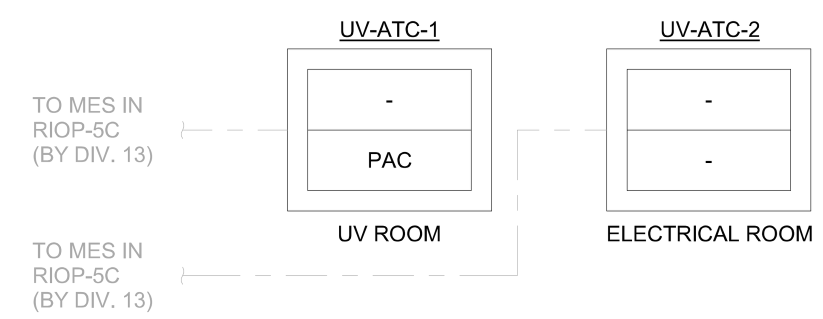
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASTEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO 308.10C
UV DISINFECTION FACILITY
HVAC SCHEDULES

SHEET
UV-H-2



CONTROLLER LEGEND:

- ASC APPLICATION SPECIFIC CONTROLLER
- NC NETWORK CONTROLLER
- PAC PROGRAMMABLE APPLICATION CONTROLLER
- MES MANAGED ETHERNET SWITCH

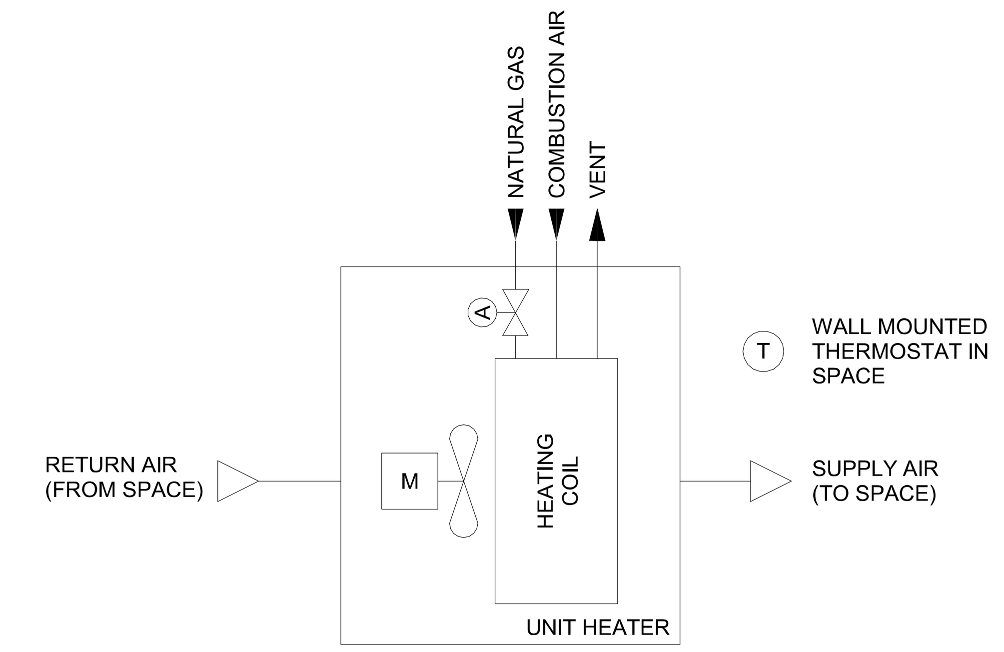
CABLE LEGEND:

- SHIELDED TWISTED PAIR
- ETHERNET
- FIBER OPTIC

NETWORK

A CONTROL DIAGRAM

NTS



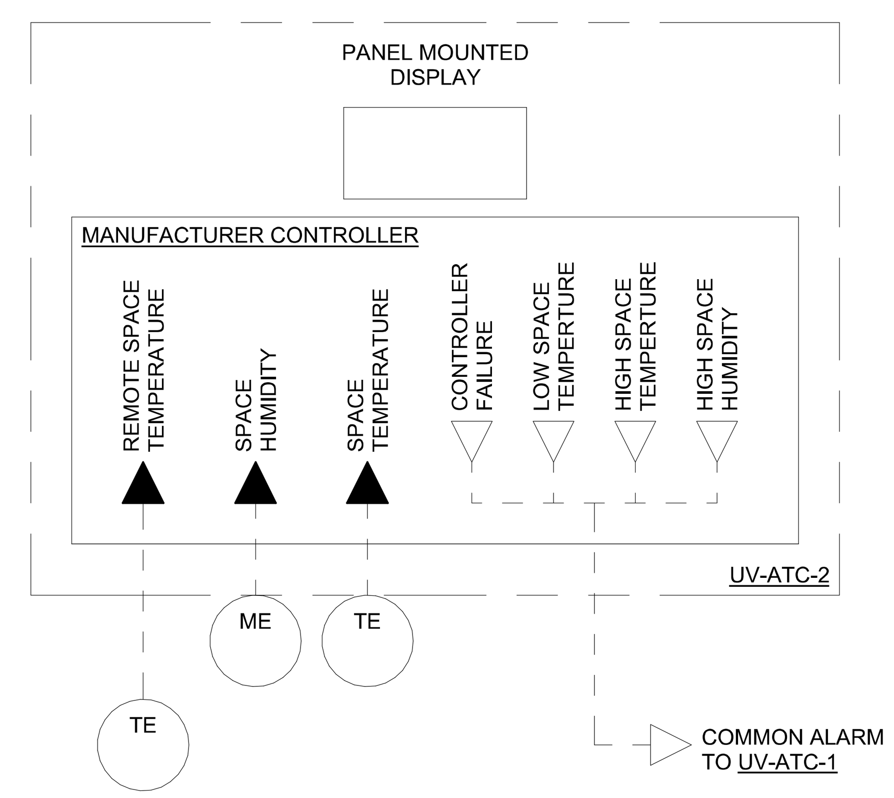
GUH-1 AND GUH-2 SEQUENCE OF OPERATION:

1. THE UNIT HEATER SHALL CYCLE IT'S INTERNAL COMPONENTS ON AND OFF TO MAINTAIN SPACE TEMPERATURE (ADJ.) AT THE USER DEFINED SETPOINT ON THE THERMOSTAT.

GUH-1 AND GUH-2

B CONTROL DIAGRAM

NTS



AC-1,2,3,4 SEQUENCE OF OPERATIONS:

LEAD/LAG CONTROL

1. THE CONTROLLER ENABLES THE ACS ONE AT A TIME TO MEET THE SPACE TEMPERATURE AND HUMIDITY REQUIREMENTS OF THE SPACE.
2. THE CONTROLLER ROTATES THE LEAD AC WEEKLY TO OBTAIN EQUAL RUN TIME ON THE UNITS.

ALARMS

1. CONTROLLER FAILURE ALARM ACTIVATES IF CONTROLLER LOSES POWER OR COMMUNICATIN IS LOST BETWEEN COMPONENTS OF THE CONTROLLER.
2. LOW SPACE TEMPERATURE ALARM ACTIVATES AT 40°F.
3. HIGH SPACE TEMPERATURE ALARM ACTIVATES AT 90°F.
4. IF SPACE TEMPERATURE REACHES 100°F CONTROLLER ACTIVATES ON ALL UNITS FOR 100% VENTILATION.
5. HIGH HUMIDITY ALARM ACTIVATES AT 85% RH.

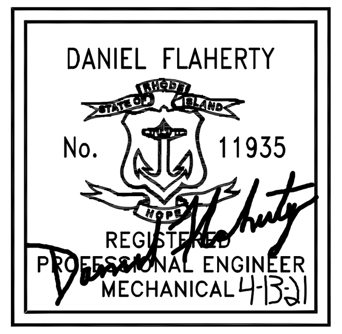
NOTES:

1. THE FOLLOWING COMPONENTS ARE FURNISHED BY THE AC MANUFACTURER:
   A. CONTROL PANEL ENCLOSURE (UV-ATC-2).
   B. AC CONTROLLER.
   C. ENCLOSURE MOUNTED HUMIDITY AND TEMPERATURE SENSOR.
   D. REMOTE SPACE TEMPERATURE SENSOR.
2. INSTALL REMOTE TEMPERATURE SENSOR WHERE IDENTIFIED ON PLANS. INSTALL WIRING PER MANUFACTURER RECOMMENDATIONS.
3. CONTROLLER ALARM OUTPUTS SPECIFIED ARE JUMPERED TOGETHER TO PROVIDE A SINGLE COMMON ALARM TO SPECIFIED CONTROLLER.
4. CONTROLLER HAS AN ETHERNET REMOTE COMMUNICATION PORT WITH PREPROGRAMMED SCREENS FOR ACS.

AC-1,2,3,4

C CONTROL DIAGRAM

NTS



REV	DATE	BY	DESCRIPTION

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DESIGNED BY:	B. BUCCHIANERI
DRAWN BY:	B. BUCCHIANERI
SHEET CHK'D BY:	D. FLAHERTY
CROSS CHK'D BY:	W. MCCONNELL
APPROVED BY:	D. FLAHERTY
DATE:	APRIL 2021

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
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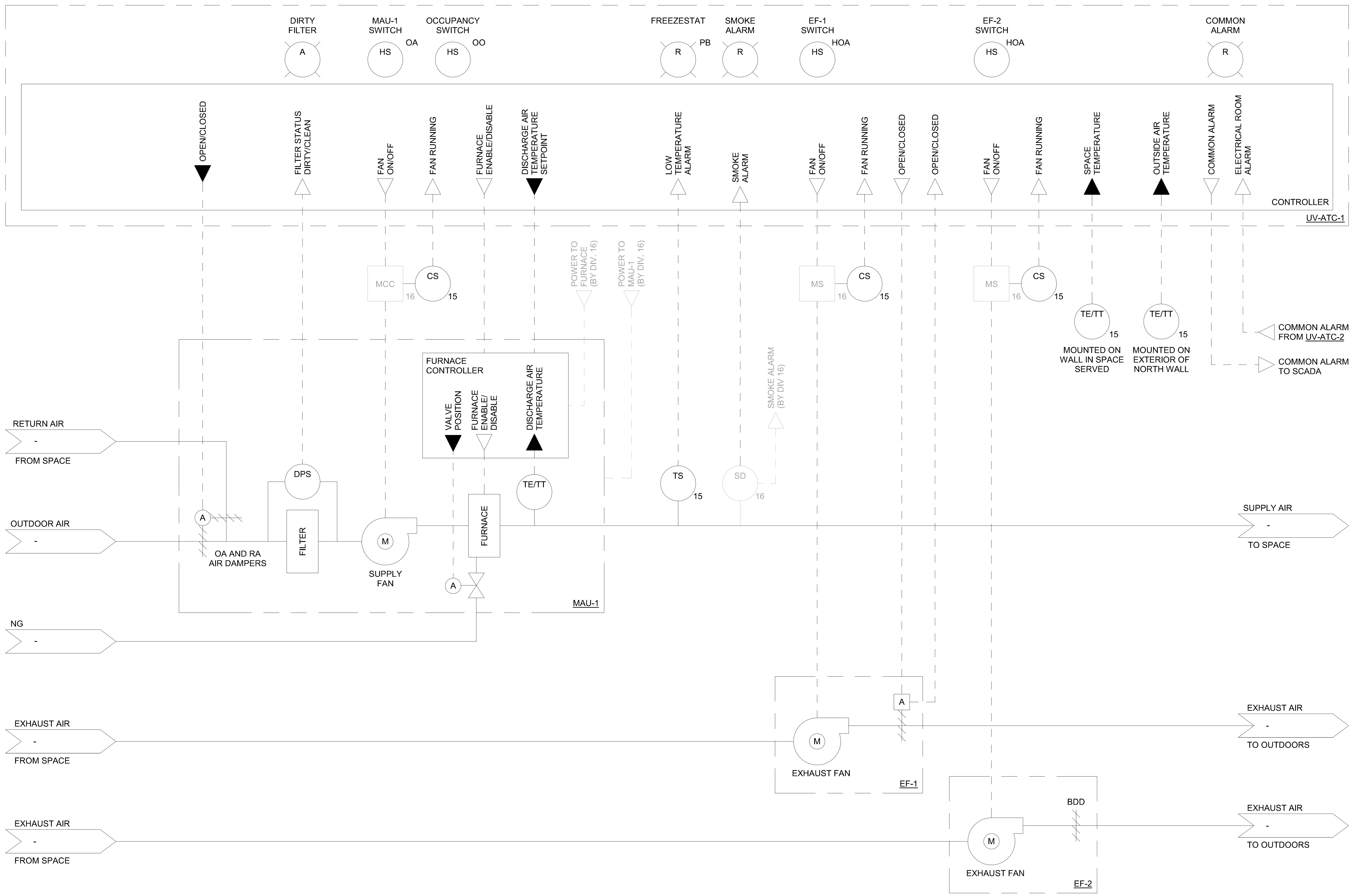
NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASTEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO 308.10C

UV DISINFECTION FACILITY
AUTOMATIC TEMPERATURE CONTROL DIAGRAMS I

SHEET UV-H-3



MAU-1, EF-1 AND EF-2

A CONTROL DIAGRAM

NTS

MAU-1 SEQUENCE OF OPERATIONS:

OFF MODE:
1. MAU-1 SHALL BE OFF.
2. THE OUTDOOR AIR DAMPER SHALL BE FULLY CLOSED.
3. THE RETURN AIR DAMPER SHALL BE FULLY OPEN.
4. THE HEATING CONTROLS SHALL BE DISABLED.

AUTO MODE:
1. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 55°F(ADJ.):
   A. MAU-1 SHALL BE ON.
   B. THE OUTDOOR AIR DAMPER SHALL BE FULLY OPEN.
   C. THE RETURN AIR DAMPER SHALL BE FULLY CLOSED.
   D. THE HEATING CONTROLS SHALL BE DISABLED.
2. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 55°F(ADJ.) AND THE SPACE IS OCCUPIED:
   A. MAU-1 SHALL BE ON.
   B. THE OUTDOOR AIR DAMPER SHALL BE FULLY OPEN.
   C. THE RETURN AIR DAMPER SHALL BE FULLY CLOSED.
   D. THE HEATING CONTROLS SHALL BE ENABLED.
3. WHEN THE OUTSIDE AIR TEMPERTAURE IS BELOW 55°F(ADJ.) AND THE SPACE IS UNOCCUPIED:
   A. MAU-1 SHALL BE ON.
   B. THE OUTDOOR AIR DAMPER SHALL BE OPEN TO 25%.
   C. THE RETURN AIR DAMPER SHALL BE OPEN TO 75%.
   D. THE HEATING CONTROLS SHALL BE ENABLED.

HEATING:
1. WHEN HEATING CONTROLS ARE ENABLED MAU-1'S INTERNAL CONTROLS SHALL MAINTAIN DISCHARGE AIR TEMPERATURE.
2. THE DISCHARGE AIR TEMPERATURE SHALL BE RESET BASED ON THE SPACE TEMPERATURE.

SAFETIES AND ALARMS:
1. WHEN THE FILTER DIFFERENTIAL PRESSURE SWITCH ALARMS (0.05" IN. WG) AN AMBER PILOT LIGHT SHALL ILLUMINATE. THE ALARM SHALL AUTOMATICALLY RESET.
2. WHEN THE FREEZESTAT ALARMS, THE SUPPLY FAN SHALL STOP AND AN AMBER PILOT LIGHT SHALL ILLUMINATE. THE FREEZESTAT SHALL HAVE A FIVE (5) MINUTE BYPASS TIMER. THE FREEZESTAT SHALL BE MANUALLY BYPASSED BY PRESSING THE PUSHBUTTON INTEGRAL TO THE PILOT LIGHT.
3. WHEN THE SMOKE DETECTOR ALARMS:
   A. THE SUPPLY FAN SHALL STOP RUNNING.
   B. THE OUTDOOR AIR DAMPER SHALL BE FULLY CLOSED.
   C. THE HEATING CONTROLS SHALL BE DISABLED.
   D. THE RED PILOT LIGHT SHALL ILLUMINATE.
   E. THE ALARM SIGNAL FOR THE SMOKE DETECTOR SHALL AUTOMATICALLY RESET.
4. WHEN ANY OF THE CONDITIONS LISTED BELOW OCCUR, THE RED COMMON ALARM PILOT LIGHT SHALL ILLUMINATE:
   A. THE FAN CURRENT SENSOR DOES NOT SENSE CURRENT WHEN THE FAN IS COMMANDED TO RUN AFTER A 5 MINUTE DELAY.
   B. THE SPACE TEMPERATURE IS 10°F ABOVE SETPOINT.
   C. THE SPACE TEMPERATURE IS 10°F BELOW SETPOINT.
   D. THE ELECTRICAL ROOM ALARM IS ACTIVATED.

EF-1 SEQUENCE OF OPERATIONS:

HAND MODE:
1. EF-1 SHALL BE ON.
2. THE EXHAUST AIR DAMPER SHALL BE OPEN.

OFF MODE:
1. EF-1 SHALL BE OFF.
2. THE EXHAUST AIR DAMPER SHALL BE CLOSED.

AUTO MODE:
1. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 55°F(ADJ.):
   A. EF-1 SHALL BE ON.
   B. THE EXHAUST AIR DAMPER SHALL BE OPEN.
2. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 55°F(ADJ.) AND THE SPACE IS OCCUPIED:
   A. EF-1 SHALL BE ON.
   B. THE EXHAUST AIR DAMPER SHALL BE OPEN.
3. WHEN THE OUTSIDE AIR TEMPERTAURE IS BELOW 55°F(ADJ.) AND THE SPACE IS UNOCCUPIED:
   A. EF-1 SHALL BE OFF.
   B. THE EXHAUST AIR DAMPER SHALL BE CLOSED.

EF-2 SEQUENCE OF OPERATIONS:

HAND MODE:
1. EF-2 SHALL BE ON.

OFF MODE:
1. EF-2 SHALL BE OFF.

AUTO MODE:
1. WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 55°F(ADJ.):
   A. EF-2 SHALL BE ON.
2. WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 55°F(ADJ.) AND THE SPACE IS OCCUPIED:
   A. EF-2 SHALL BE ON.
3. WHEN THE OUTSIDE AIR TEMPERTAURE IS BELOW 55°F(ADJ.) AND THE SPACE IS UNOCCUPIED:
   A. EF-2 SHALL BE ON.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
4/13/21

REV	DATE	BY	DESCRIPTION

SCALE: 12" = 1'-0"

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED BY: B. BUCCHIANERI
DRAWN BY: B. BUCCHIANERI
SHEET CHK'D BY: D. FLAHERTY
CROSS CHK'D BY: W. MCCONNELL
APPROVED BY: D. FLAHERTY
DATE: APRIL 2021

FINAL DESIGN - MARCH 2021

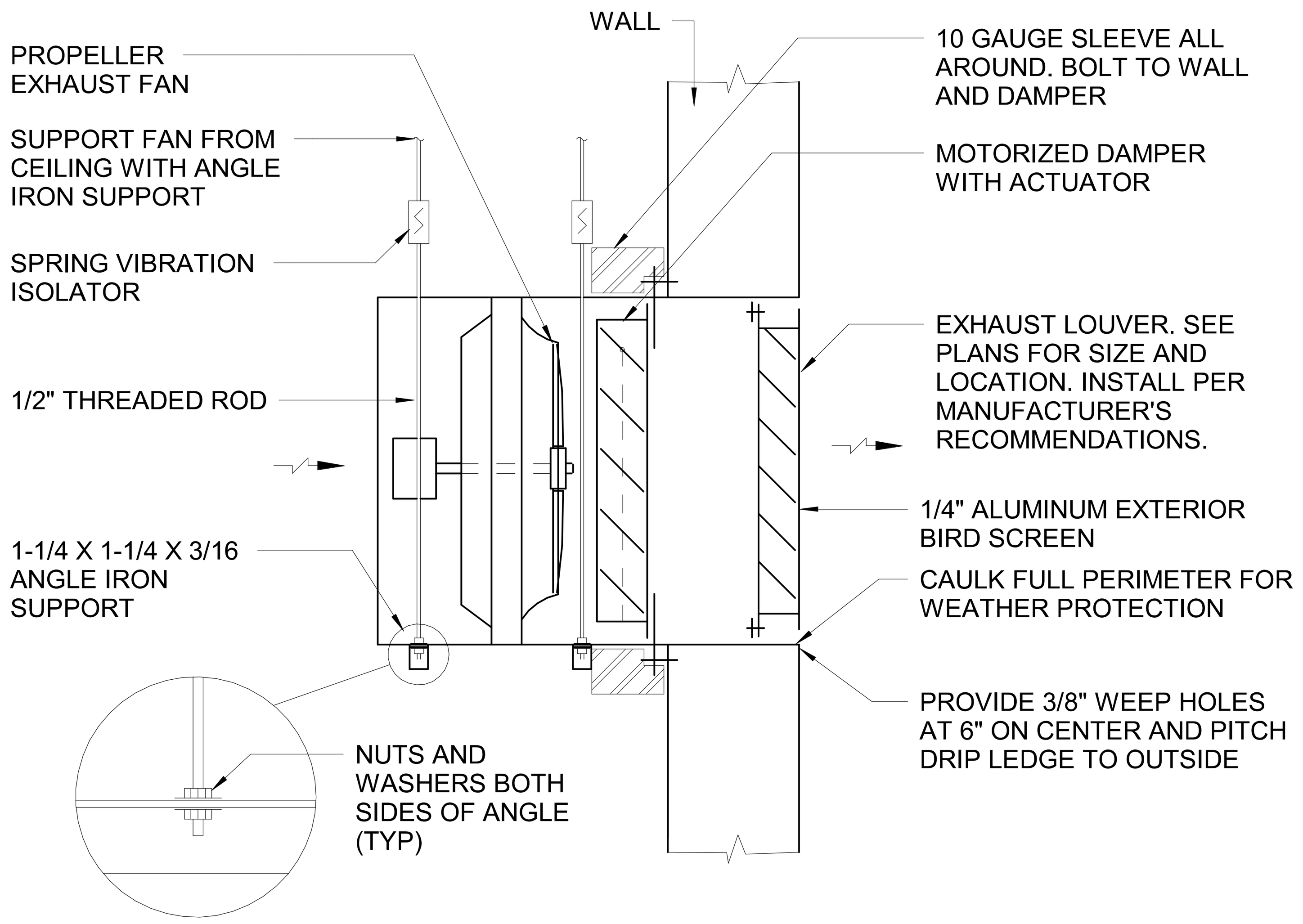
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASTEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

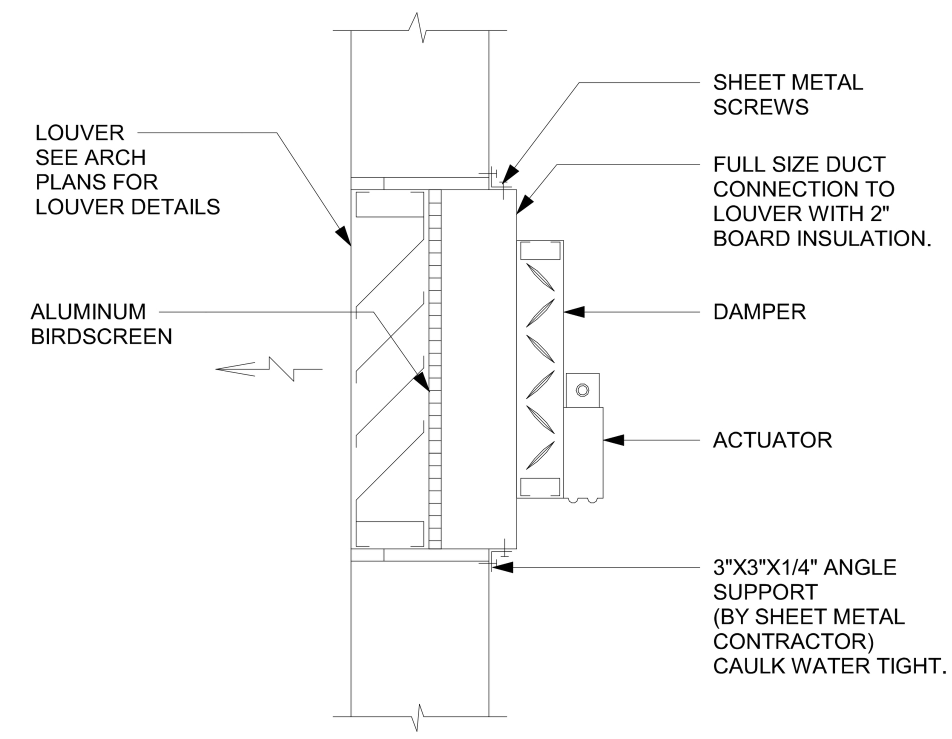
NBC CONTRACT NO 308.10C
UV DISINFECTION FACILITY
AUTOMATIC TEMPERATURE CONTROL
DIAGRAMS II

SHEET
UV-H-4



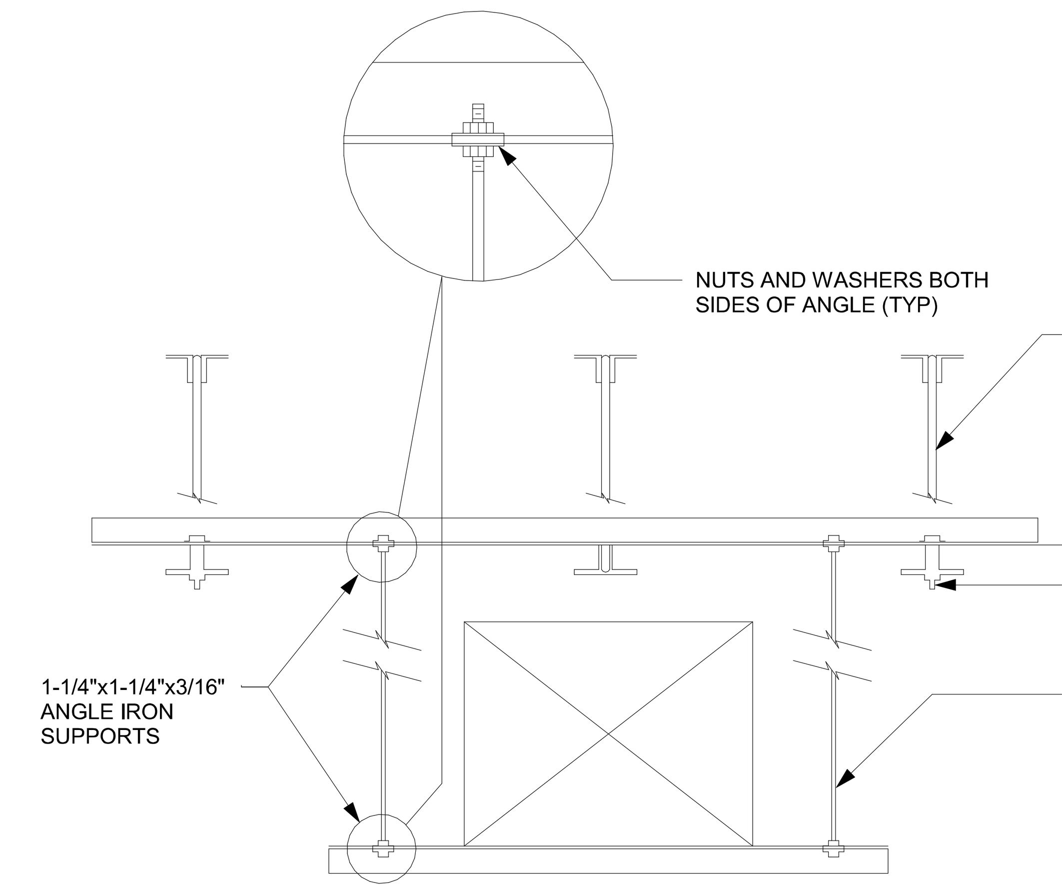
WALL MOUNTED EXHAUST FAN

A DETAIL
NTS



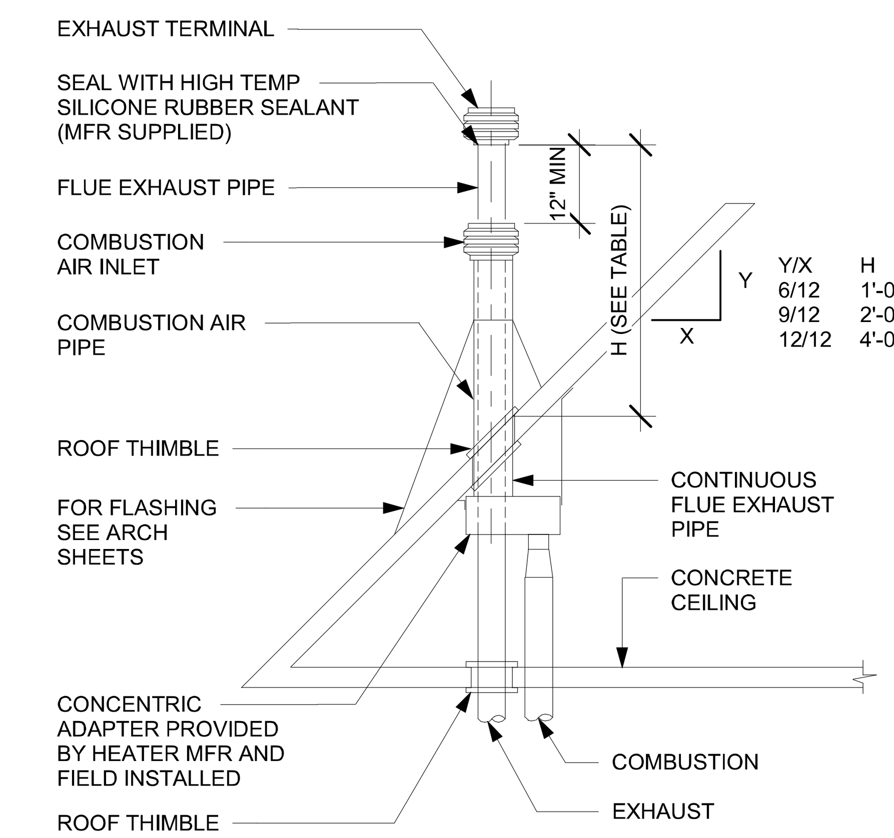
LOUVER WITH MOTORIZED DAMPER MOUNTING

B DETAIL
NTS



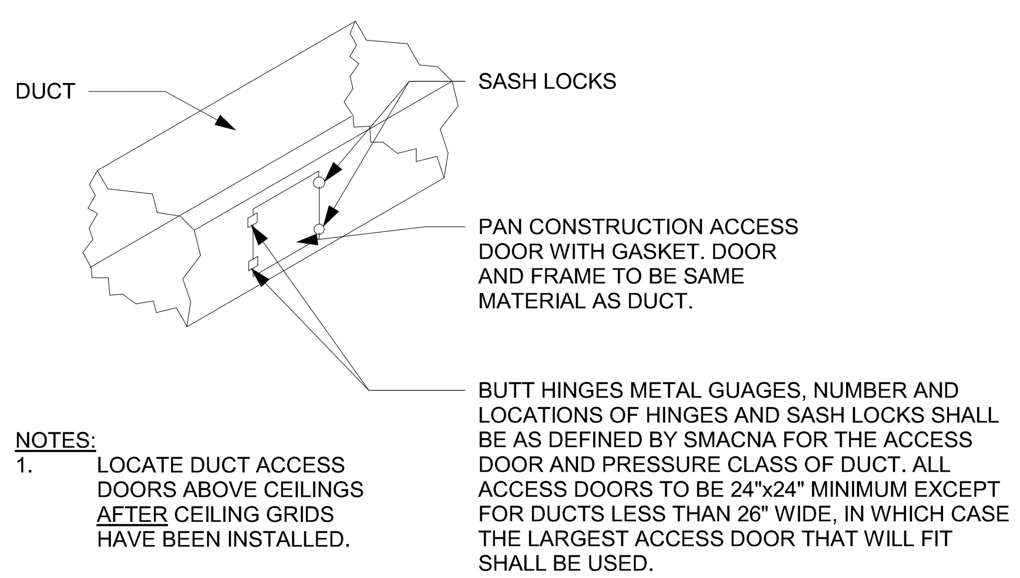
DUCT HANGER

C DETAIL
NTS



CONCENTRIC VENT W/ PITCHED ROOF

D DETAIL
NTS

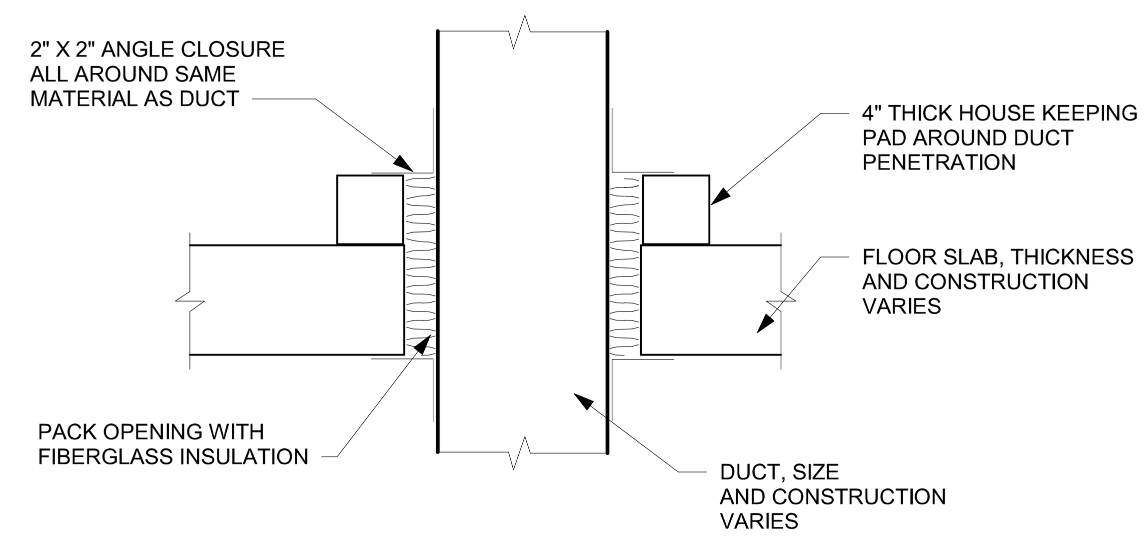


NOTES:

1. LOCATE DUCT ACCESS DOORS ABOVE CEILINGS AFTER CEILING GRIDS HAVE BEEN INSTALLED.

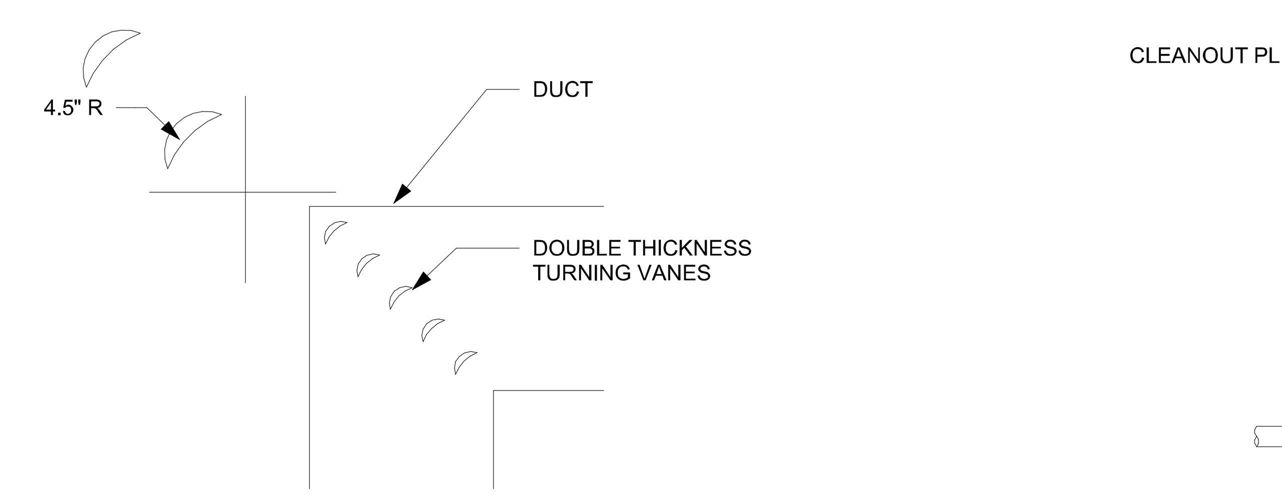
DUCT ACCESS DOOR SHEET METAL DUCTWORK

E DETAIL
NTS



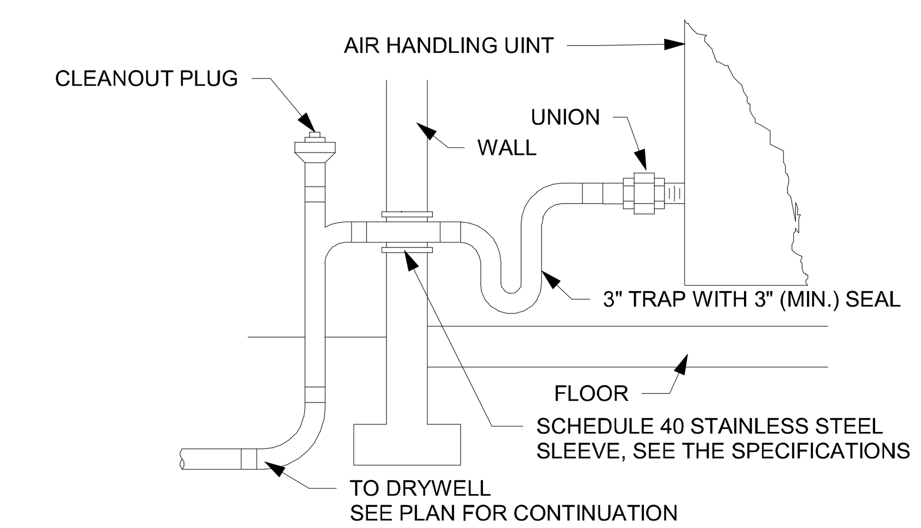
DUCT PENETRATION THRU FLOOR

F DETAIL
NTS



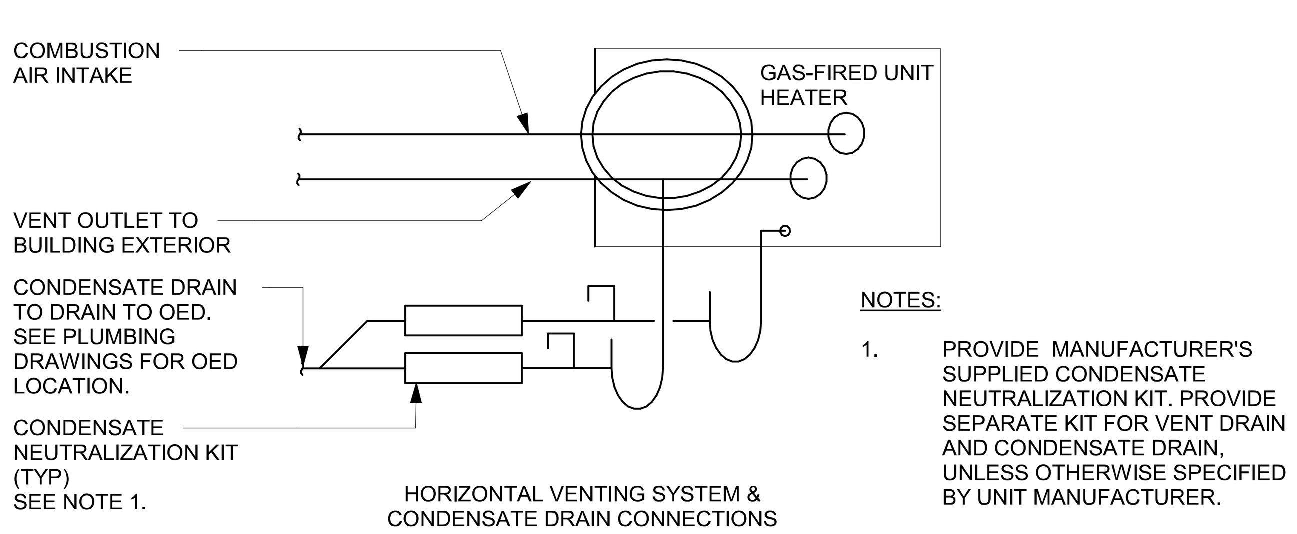
SHEET METAL DUCT TURNING VANES

G DETAIL
NTS



CONDENSATE DRAIN

H DETAIL
NTS

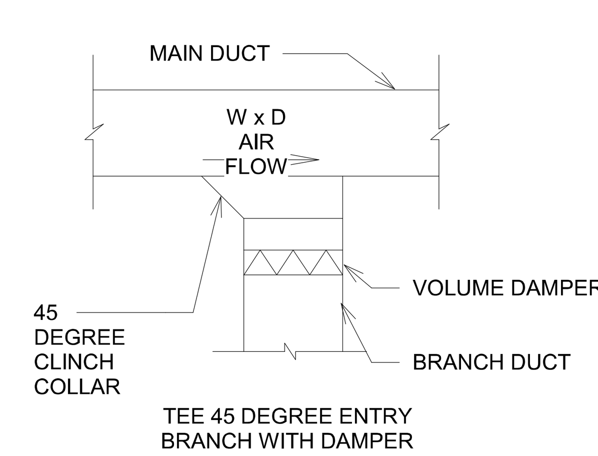


NOTES:

1. PROVIDE MANUFACTURER'S SUPPLIED CONDENSATE NEUTRALIZATION KIT. PROVIDE SEPARATE KIT FOR VENT DRAIN AND CONDENSATE DRAIN, UNLESS OTHERWISE SPECIFIED BY UNIT MANUFACTURER.

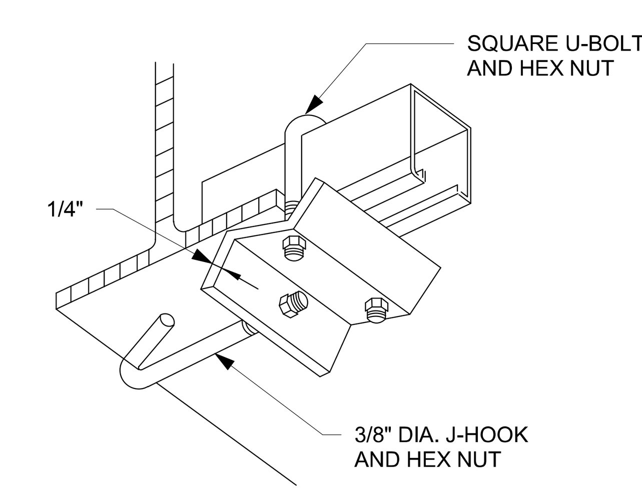
CONDENSING GAS UNIT HEATER CONDENSATE DRAIN

I DETAIL
NTS



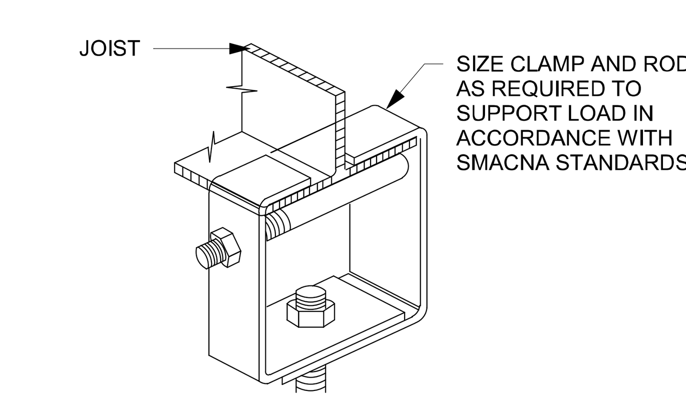
TEE 45 DEGREE ENTRY BRANCH WITH DAMPER

J DETAIL
NTS



CHANNEL CLAMPED TO JOIST

K DETAIL
NTS



DUCT HANGER ATTACHMENT TO JOIST

L DETAIL
NTS

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4/3/21

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DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

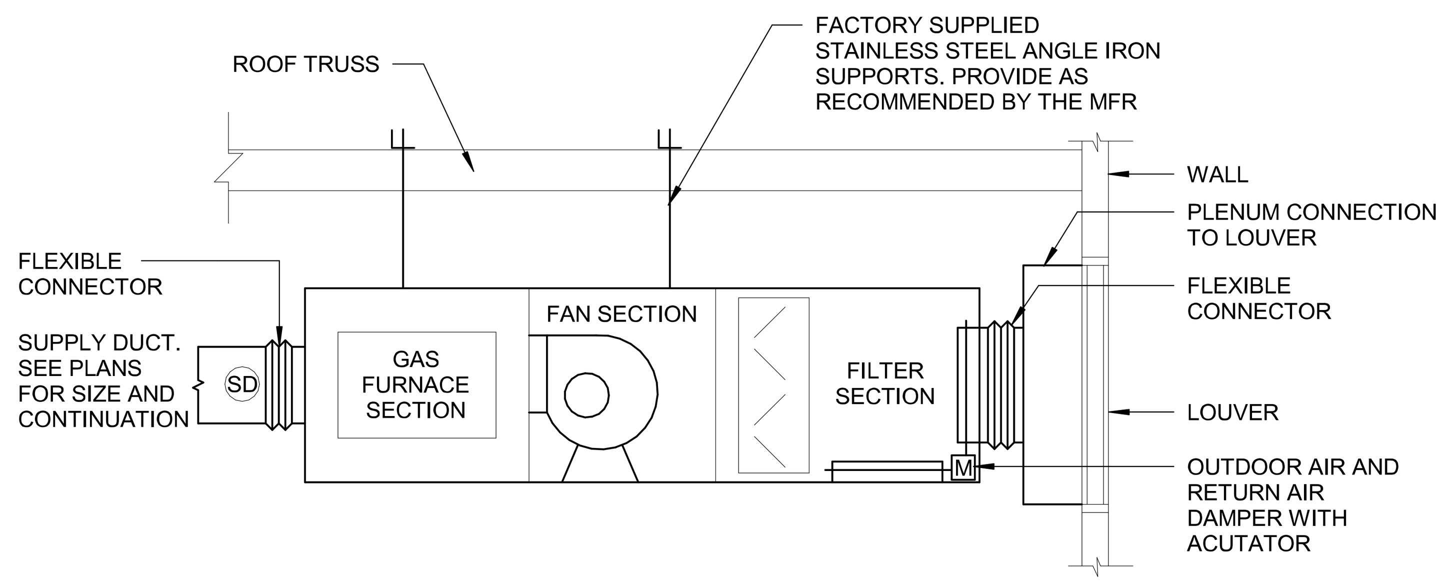
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec
PARE

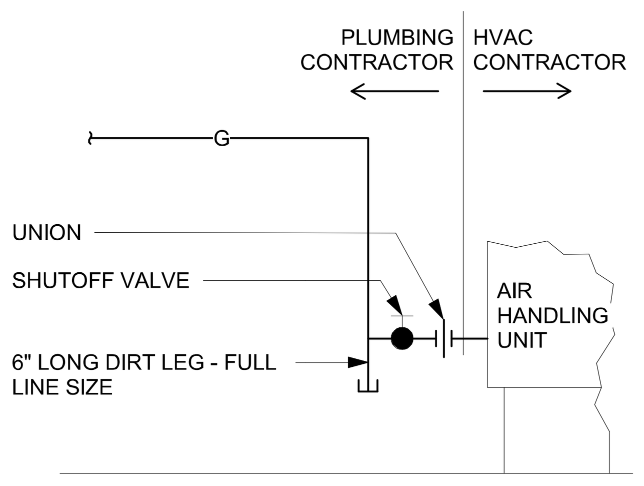
NBC CONTRACT NO 308.10C
HVAC
HVAC DETAILS I

SHEET
SD-H-1



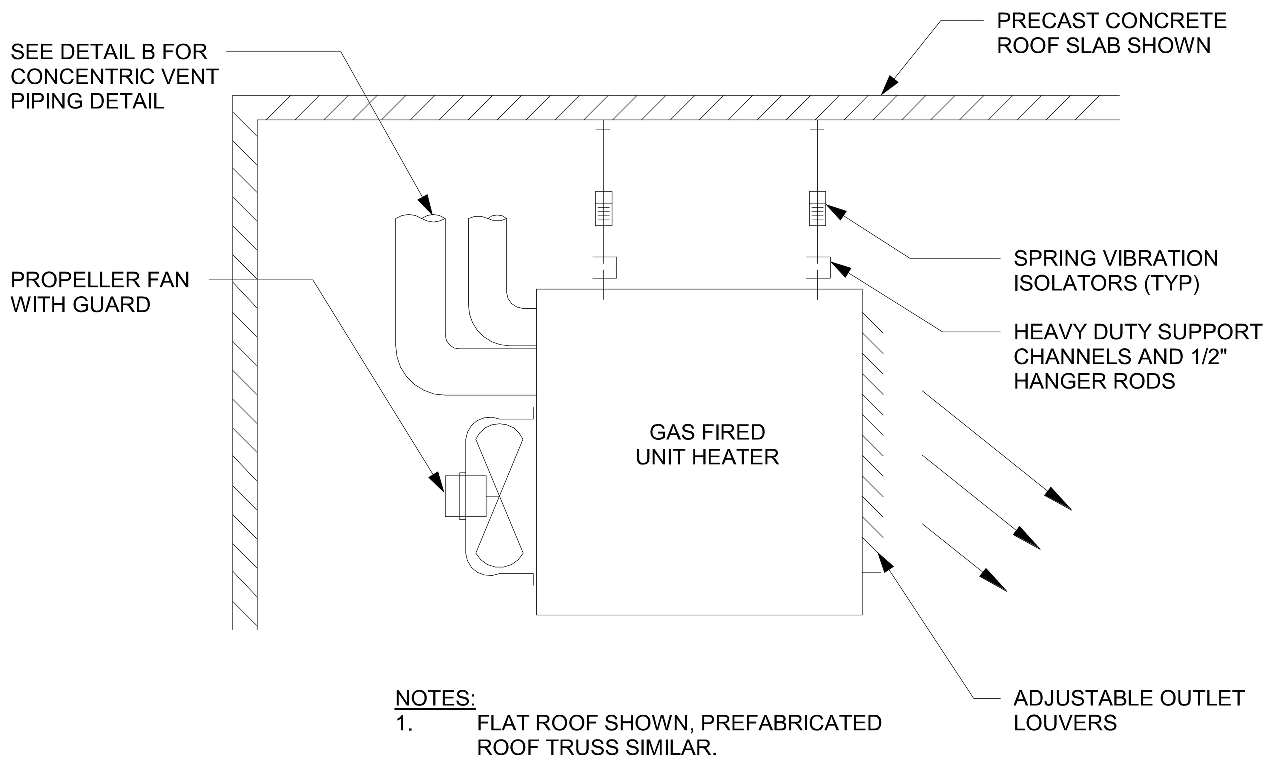
INDOOR SUSPENDED MAKEUP AIR UNIT

A DETAIL
NTS



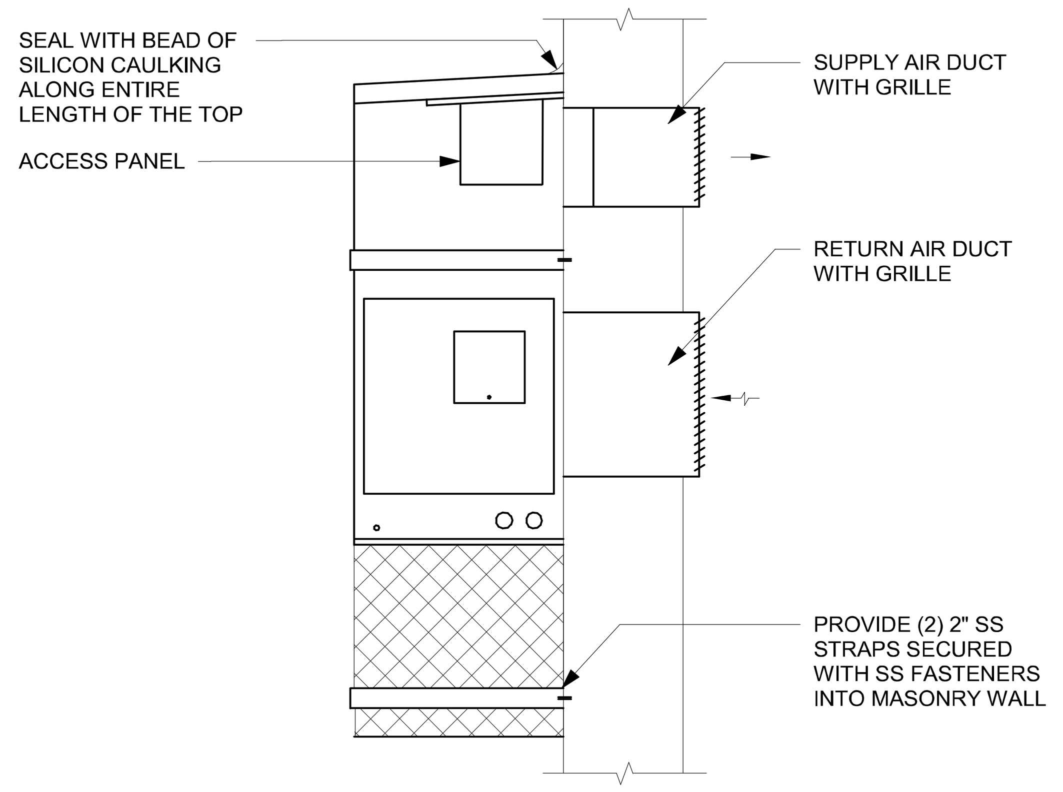
GAS CONNECTION

B DETAIL
NTS



GAS-FIRED UNIT HEATER

C DETAIL
NTS



THROUGH-THE-WALL AC UNIT

D DETAIL
NTS

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
4/3/21

REV	DATE	BY	DESCRIPTION

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DESIGNED D. FLAHERTY
DRAWN B. BUCCHIANERI
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

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260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
HVAC

HVAC DETAILS II

SHEET SD-H-2

GENERAL ABBREVIATIONS

A	AD	ACCESS DOOR
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	AP	ACCESS PANEL
	@	AT
	AV	AUTOMATIC AIR RELEASE VENT
	ATC	AUTOMATIC TEMPERATURE CONTROL CONTRACTOR
	AW	ACID WASTE
B	BFP	BACK FLOW PREVENTER
	BTM	BOTTOM
	BLDG	BUILDING
	BOP	BOTTOM OF PIPE
C	℄	CENTER LINE
	CA	COMPRESSED AIR
	CI	CAST IRON
	CO	CLEAN OUT
	CO	CNG OIL
	COND	CONDENSATE DRAIN
	CP	CONTROL PANEL
	CS	CUP SINK
	CONT	CONTINUOUS
	CU FT	CUBIC FEET
	CW	COLD WATER
	CG	CHASSIS GREASE
D	DCVA	DOUBLE CHECK VALVE ASSEMBLY
	DIA	DIAMETER
	DI	DUCTILE IRON
	DN	DOWN
	DO	DIESEL OIL
	DWG	DRAWING
	DHU	DEHUMIDIFICATION UNIT
E	E	EMERGENCY WATER
	EFBS	EMERGENCY FACE BODY SPRAY
	EFF	EFFICIENCY
	EC	ELECTRICAL CONTRACTOR / ENGINE COOLANT
	EWC	ELECTRIC WATER COOLER
	EL.	ELEVATION
	EO	ENGINE OIL
	EWT	ENTERING WATER TEMPERATURE
	EWH	EXTERIOR WALL HYDRANT
	ES/EWU	EYE SHOWER/EYE WASH UNIT
F	F	FAHRENHEIT
	FPM	FEET PER MINUTE
	FIN	FINISHED
	FHC	FIRE HOSE CABINET
	FLEX	FLEX CONNECTION
	FL	FLOOR
	FCO	FLOOR CLEAN OUT
	FD	FLOOR DRAIN
	FAS	FLOW ALARM SWITCH
	FLA	FULL LOAD AMPS
G	GPM	GALLONS PER MINUTE
	G	GAS PIPING
	GC	GENERAL CONTRACTOR
	GO	GEAR OIL
	GC	GENERAL CONTRACTOR
	GW	GLASSWARE WASHER
	GUH	GAS-FIRED UNIT HEATER
H	HZ	HERTZ
	HP	HORSEPOWER
	HB	HOSE BIBB
	HEV	HOSE END VALVE
	HWR	HOT WATER RETURN
	HWS	HOT WATER SUPPLY
	HC	HVAC CONTRACTOR
	HP	HEAT PUMP
	HS	HOSE STATION
I	IM	ICE MAKER
	ID	INSIDE DIAMETER
	I.E.	INVERT ELEVATION
	IPS	IRON PIPE SIZE
K	KW	KILOWATT
	KS	KITCHEN SINK
L	LAV	LAVATORY
	LWT	LEAVING WATER TEMPERATURE
	LBV	LOCKABLE BALL VALVE
	LRA	LOCKED ROTOR AMPS
M	M	MOTOR
	MAX	MAXIMUM
	MBH	THOUSAND BTU PER HOUR
	MCA	MINIMUM CIRCUIT AMPACITY
	MFG	MANUFACTURER
	MIN	MINIMUM
	MISC	MISCELLANEOUS
	MO	MASONRY OPENING
	MR	MOP RECEPTOR
N	NO	NUMBER
O	ORL	OVERFLOW ROOF LEADER
	ORD	OVERFLOW ROOF DRAIN
	OED	OPEN EQUIPMENT DRAIN
	O.C.	ON CENTER
	OD	OUTSIDE DIAMETER
P	P	PROTECTED WATER
	PC	PLUMBING CONTRACTOR
	PD	PUMPED DISCHARGE
	PG	PRESSURE GAUGE
	PH	PHASE
	PSI	POUNDS PER SQUARE INCH
	PSIA	PSI ABSOLUTE
	PSIG	PSI GAUGE
	P&T	PRESSURE & TEMPERATURE
	PVC	POLYVINYL CHLORIDE
	PRV	PRESSURE REGULATING VALVE
R	RH	RADIANT HEATER
	RLA	RUNNING LOAD AMPS
	RPM	REVOLUTIONS PER MINUTE
	RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
	RTU	ROOF TOP UNIT
	RD	ROOF DRAIN
	RWC	ROOF WATER CONDUCTOR
S	S	SOIL PIPING
	SCO	SANITARY CLEAN OUT
	SH	SHOWER
	SQ	SQUARE
	SSK	SERVICE SINK
	SS	STAINLESS STEEL
	ST	STORM
T	T	THERMOMETER
	TD	TRENCH DRAIN
	THK	THICK(NESS)
	TYP	TYPICAL
	TMV	THERMOSTATIC MIXING VALVE
	TW	TEPID WATER
	TWR	TEPID WATER RETURN
U	UH	UNIT HEATER
	UL	UNDERWRITERS LABORATORY
	UR	URINAL
V	V	VENT PIPING
	VB	VACUUM BREAKER
	VTR	VENT THROUGH ROOF
W	W	WASTE PIPING
	W/	WITH
	WC	WATER CLOSET
	W.C.	WATER COLUMN
	WH	WATER HEATER
	WCO	WALL CLEAN OUT
	WHS	WASH HOSE STATION
	WM	WASHING MACHINE
	WOB	WASTE OIL BURNER
	WO	WASTE OIL

SYMBOLS

- DEMOLITION
- NEW WORK
- COLD WATER (POTABLE)
- HOT WATER (POTABLE)
- TW — TEPID WATER
- TWR — TEPID WATER RETURN
- SOIL OR WASTE ABOVE (BELOW GRADE)
- SOIL OR WASTE BELOW (BELOW GRADE)
- AW — ACID WASTE
- VENT
- FLOW ARROW
- E — EMERGENCY WATER
- F — FIRE SERVICE
- P — PROTECTED WATER (NON-POTABLE)
- RL — RAIN LEADER PIPING
- ORL — OVERFLOW RAINLEADER PIPING
- PD — PUMP DISCHARGE
- WASTE TRAP
- BALL VALVE
- LOCKABLE BALL VALVE
- CHECK VALVE
- PLUG VALVE
- PRESSURE REGULATOR
- PRESSURE REDUCING VALVE
- BALANCING VALVE
- FLOW ALARM SWITCH
- AV — AUTOMATIC AIR RELEASE VENT
- GATE VALVE (NC) WITH HOSE CONNECTOR
- CAP
- CLEANOUT
- BOTTOM CONNECTION
- TOP CONNECTION
- ELBOW UP OR RISE
- ELBOW DOWN OR DROP
- 45° DROP
- REDUCER-CONCENTRIC
- REDUCER-ECCENTRIC STRAIGHT INVERT
- REDUCER-ECCENTRIC STRAIGHT CROWN
- TEE UP
- TEE DOWN
- PRESSURE GAGE AND COCK
- UNION - SCREWED
- STRAINER
- TH — THERMOMETER
- EMERGENCY SHOWER/ EYEWASH UNIT (ES/EWU)
- EYE FACE BODY SPRAY (EFBS)
- FLOOR CLEANOUT
- WATER PROOF SLEEVE
- FLOOR DRAIN
- TRENCH DRAIN
- OPEN END DRAIN
- EQUIPMENT PROVIDED UNDER PLUMBING SECTION
- EQUIPMENT PROVIDED BY OTHERS REQUIRING PLUMBING CONNECTIONS
- AREA OF DEMOLITION: AREA OF SPRINKLER COVERAGE
- SS — SUPERVISORY SWITCH
- T — TRANSFORMER

GENERAL NOTES

1. EQUIPMENT AND PIPING SYSTEM LAYOUTS ARE DIAGRAMMATIC AND INTENDED TO SHOW PIPING AND DUCT BASIS OF DESIGN. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT THAT REQUIRES AN ARRANGEMENT OR SPACE DIFFERING FROM THAT INDICATED ON THE DRAWINGS OR SPECIFIED, THEY SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR APPROVAL, DETAILED ARCHITECTURAL, STRUCTURAL, PLUMBING, HVAC AND ELECTRICAL DRAWINGS AND EQUIPMENT LISTS SHOWING ALL NECESSARY CHANGES AND EMBODYING ALL FEATURES OF THE EQUIPMENT HE PROPOSES TO FURNISH. THIS INFORMATION SHALL INCLUDE BUT NOT BE LIMITED TO PLANS, SECTIONS, DETAILS, AND SCHEMATICS OF ALL APPURTENANCES REQUIRED. SUCH CHANGES IF APPROVED BY THE ENGINEER SHALL BE AT NO EXTRA COST TO THE OWNER. THE CONTRACTOR SHALL ASSUME THE COST OF, AND THE RESPONSIBILITY FOR SATISFACTORILY ACCOMPLISHING ALL THE NECESSARY CHANGES CORRESPONDING TO THE DIMENSIONS AND CHARACTERISTICS OF THE EQUIPMENT SUBMITTED INCLUDING CHANGES TO ALL OTHER TRADES TO SATISFACTION OF ENGINEER. REFER TO SPECIFICATIONS FOR FURTHER DETAILS.
2. CONTRACTOR SHALL PROVIDE A METHOD OF PROCEDURE AND A SCHEDULE PER THE REQUIREMENTS OF DIVISION 1 SPECIFICATIONS
3. ALL WORK, INCLUDING BUILDING SERVICES AND UTILITY SHUTDOWNS, SHALL BE COORDINATED AND SCHEDULED WITH THE OWNER.
4. CONTRACTOR SHALL REMOVE CONSTRUCTION DEBRIS AND ALL OTHER DEBRIS MADE DURING THE WORK THEY HAVE COMPLETED, AT THE END OF EACH WORK DAY.
5. ELEVATIONS ARE GIVEN AS REFERENCE FOR THE INTENDED ROUTING OF THE NEW WORK. THE PC SHALL COORDINATE THE EXACT ROUTING. ALL WORK SHALL BE INSTALLED WITH THE PROPER PITCH. COORDINATE WITH OTHER TRADES AND EXISTING CONDITIONS TO AVOID INTERFERENCES.
6. ACCESS DOORS SHALL BE INSTALLED ADJACENT TO ALL VALVES, CONTROL DEVICES, ETC. PROVIDE FIRE RATED ACCESS DOORS IN ALL LOCATIONS WHICH PENETRATE FIRE-RATED CEILINGS, WALLS OR FLOORS. COORDINATE ACCESS DOOR LOCATIONS WITH GENERAL CONTRACTOR.
7. PLUMBING EQUIPMENT, PIPING, ETC. SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS OR IN ELECTRICAL ROOMS.
8. COORDINATE ALL MOTOR SIZES, STARTERS, DISCONNECT SWITCHES, CONTROLS, ETC. WITH ELECTRICAL PRIOR TO THE RELEASE OF ANY EQUIPMENT.
9. WHERE PIPING PENETRATES A RATED PARTITION THE CONTRACTOR SHALL MAINTAIN INTEGRITY OF THE PARTITIONS USING U.L. APPROVED SEALING METHODS TO MATCH THE PARTITION RATING.
10. PC SHALL PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS AS REQUIRED IN FINAL ROUTING OF PIPING.
11. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
12. EXISTING GRADES, STRUCTURES, ELEVATIONS, PIPING AND UTILITIES ARE INDICATED IN THEIR APPROXIMATE LOCATIONS ON THE PLANS; HOWEVER, THE INFORMATION IS NOT GUARANTEED TO BE CORRECT AND/OR COMPLETE, HAVING BEEN PLOTTED FROM AVAILABLE DRAWINGS, RECORDS AND SURVEYS. ALL SUCH DATA SHALL BE VERIFIED IN THE FIELD BY THE PC PRIOR TO FABRICATION AND CONSTRUCTION. THE EXISTENCE OF STRUCTURES, PIPING, ETC. WHICH ARE NOT SHOWN AND WHICH MAY BE ENCOUNTERED WILL NOT BE A BASIS FOR A CLAIM FOR EXTRA WORK.
13. SANITARY WASTE PIPE IS SLOPED AT 1/8" PER FOOT.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL

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SCALE: N.T.S.

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DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

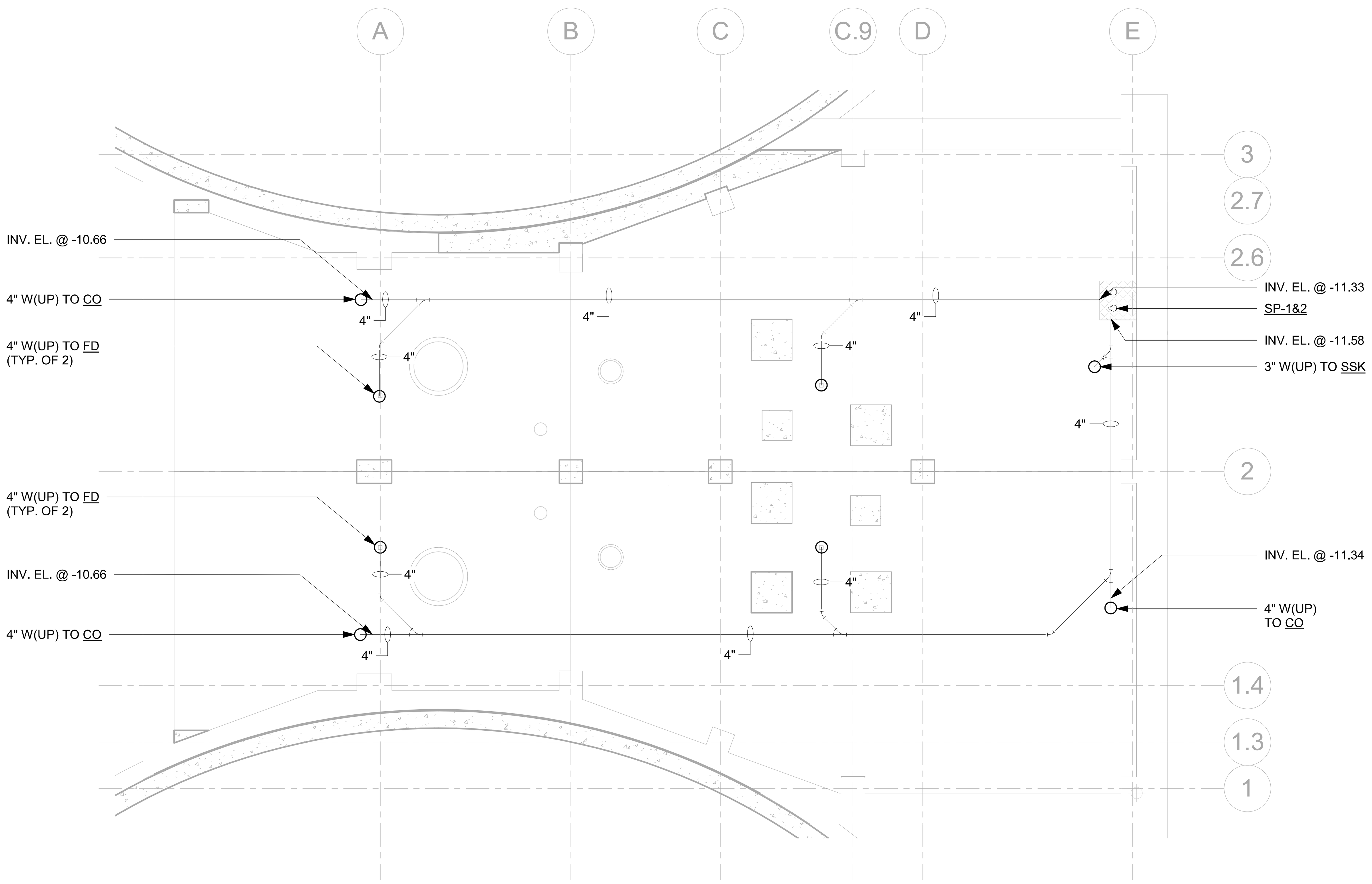
Stantec PARE

NBC CONTRACT NO 308.10C
PLUMBING

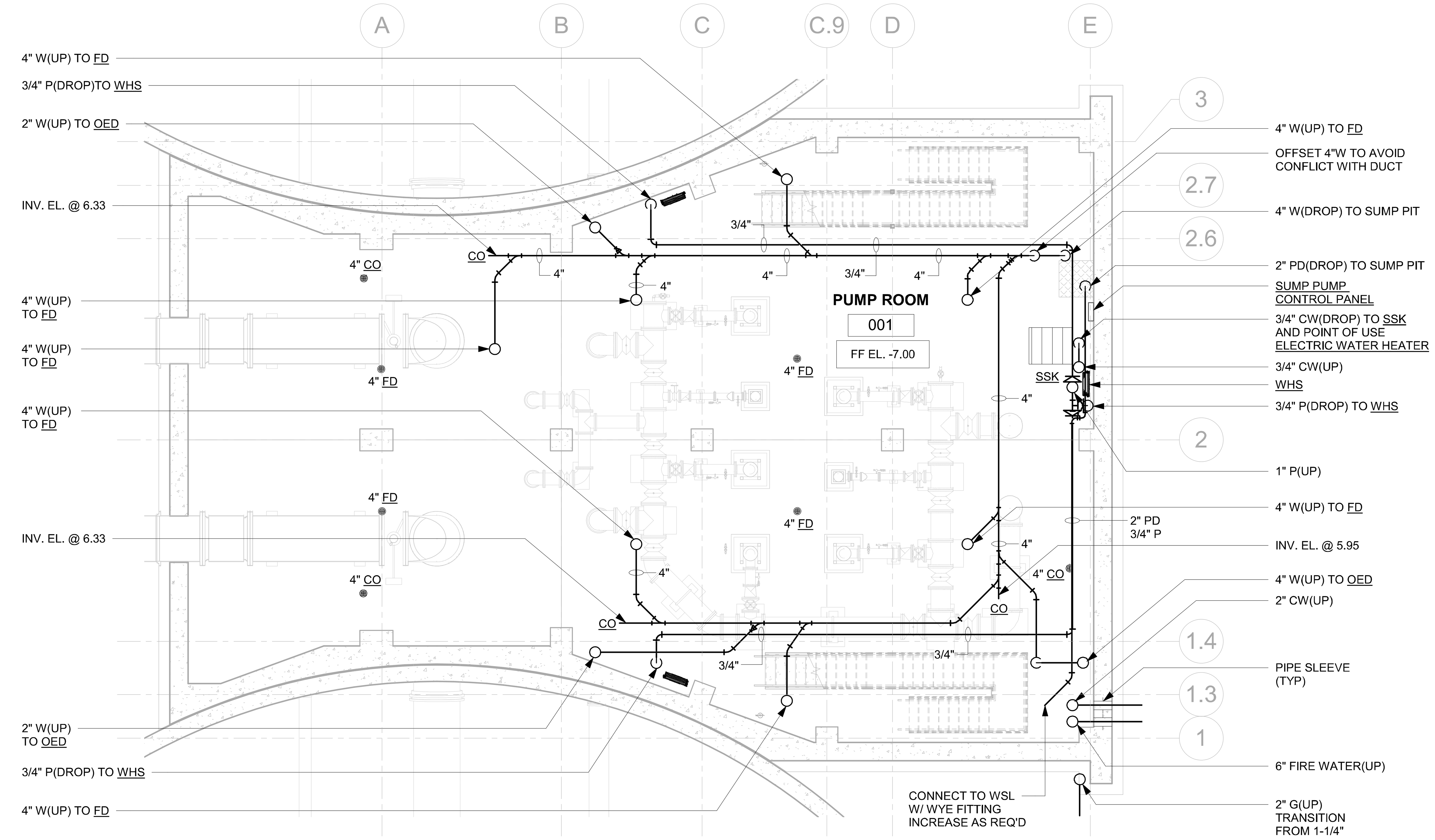
PLUMBING LEGEND, SYMBOLS, ABBREVIATIONS, AND NOTES

SHEET GD-P-1

GENERAL NOTES:
1. THE DRAINAGE SYSTEM FOR THE LOWER LEVEL AND FIRST FLOOR IS DESIGNED AS AN INDIRECT WASTE SYSTEM. IT IS ONLY CAPABLE OF RECEIVING CLEAR WATER WASTE FROM EQUIPMENT DRAINAGE AND WASHDOWN. TRAPS AND VENT PIPING ARE NOT REQUIRED.
2. THE INDIRECT WASTE SYSTEM DRAINS TO THE WASTE SLUDGE (WSL) PIPING WHICH REINTRODUCES THE DRAINAGE BACK INTO THE WASTEWATER TREATMENT PROCESS WHERE IT ORIGINATED. THIS DESIGN IS AN ALTERNATIVE ENGINEERED SYSTEM PER SECTION 3.16 OF THE SBC-3 RHODE ISLAND STATE PLUMBING CODE.



BURIED PIPING PLAN
1/8" = 1'-0"



LOWER LEVEL PLAN
1/8" = 1'-0"

NOTES:
1. SERVICE SINK (SSK) SHALL BE ELKAY MODEL ESS-2520C, 25-IN X 19-IN 1/2-IN ROLL RIM STAINLESS STEEL SERVICE SINK WITH KOHLER K-8908 FAUCET, THREADED SPOUT, PAIL HOOK, VACUUM BREAKER, WALL BRACE AND LOOSE KEY STOPS IN SHANKS.

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4/13/21

GENERAL NOTES:
1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

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CHECKED D. FLAHERTY

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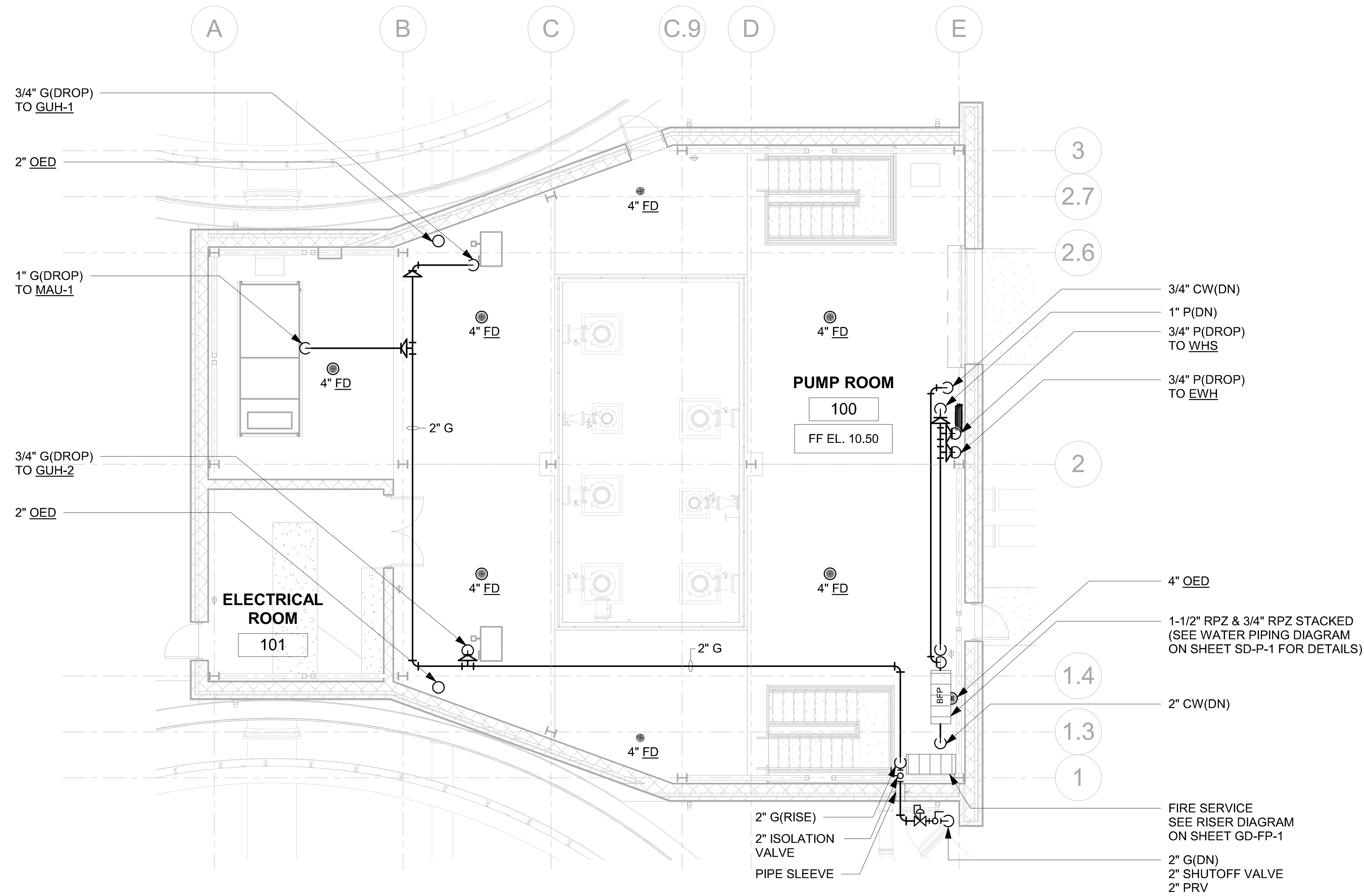
Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
PLUMBING
RETURN SLUDGE PUMP STATION NO. 3
BURIED PIPING AND LOWER LEVEL PLANS

SHEET RP-P-1



FIRST FLOOR PLAN

1/8" = 1'-0"

NOTES:

1. CONTRACTOR TO CONFIRM WITH THE UTILITY AND OWNER THAT THE MASTER METER AND REGULATOR, LOCATED AT THE HEAT EXCHANGER BUILDING, HAS BEEN UPGRADED TO PROVIDE THE ADDITIONAL NATURAL GAS LOADS OF THIS PROJECT.

GENERAL NOTES:

1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

0 4' 8' 16'

SCALE: 1/8" = 1'-0"

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

REV	DATE	BY	DESCRIPTION

SCALE: 1/8" = 1'-0"

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED: D. FLAHERTY
DRAWN: C. BRAITHWAITE
CHECKED: D. FLAHERTY

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

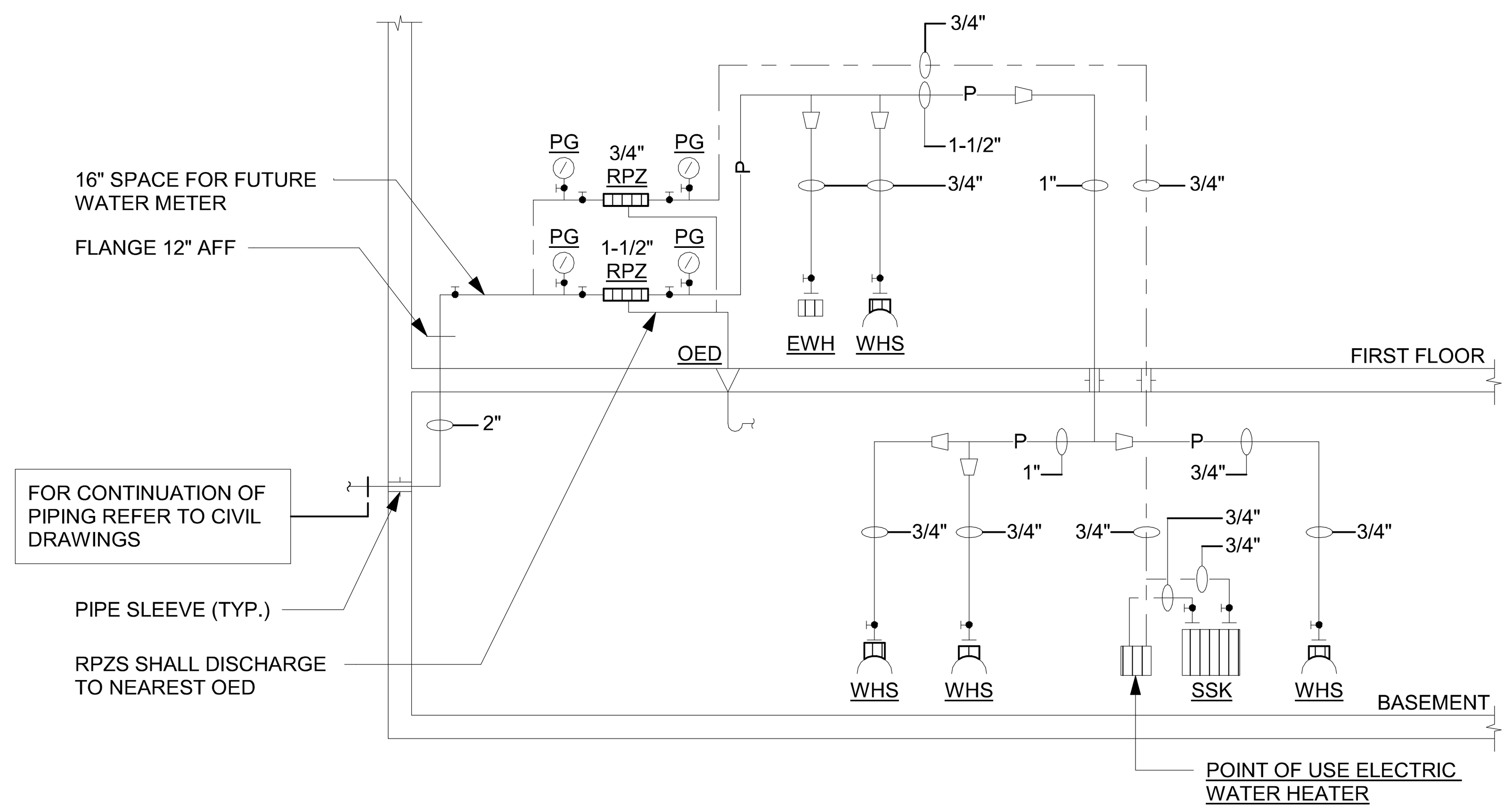
Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec
PARE

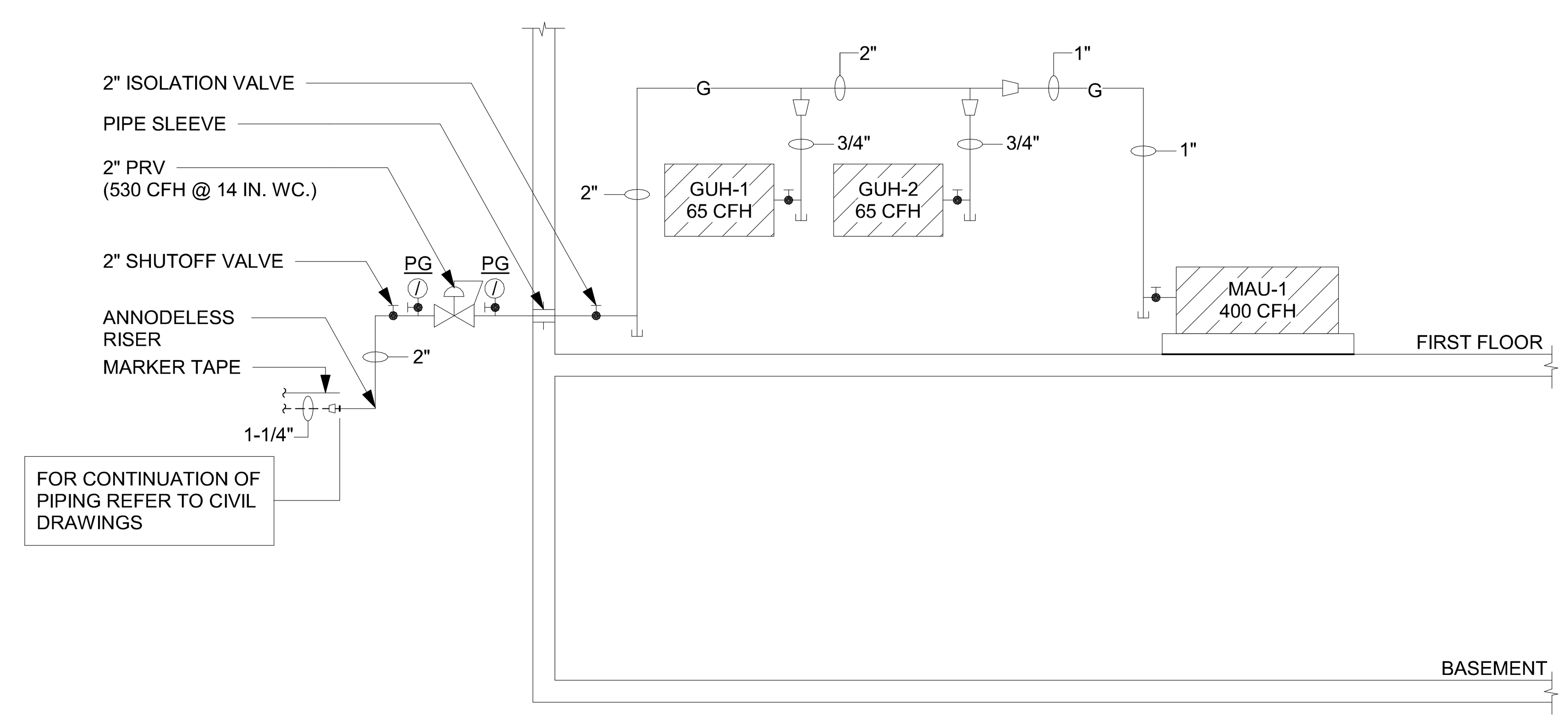
NBC CONTRACT NO 308.10C
PLUMBING
RETURN SLUDGE PUMP STATION NO. 3
FIRST FLOOR PLAN

SHEET
RP-P-2



RETURN SLUDGE PUMP STATION NO. 3 - WATER PIPNG DIAGRAM

NTS



RETURN SLUDGE PUMP STATION NO. 3 - GAS PIPING DIAGRAM

NTS

NOTES:

1. LINE SIZE ISOLATION VALVES AND UNIONS SHALL BE INSTALLED ON THE BRANCH LINES TO EACH GAS-FIRED UNIT.

2. CONTRACTOR TO CONFIRM WITH THE UTILITY AND OWNER THAT THE MASTER METER AND REGULATOR, LOCATED AT THE HEAT EXCHANGER BUILDING, HAS BEEN UPGRADED TO PROVIDE THE ADDITIONAL NATURAL GAS LOADS OF THIS PROJECT.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL
4/13/21

REV	DATE	BY	DESCRIPTION

SCALE: NTS

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED D. FLAHERTY
DRAWN B. BUCCHIANERI
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

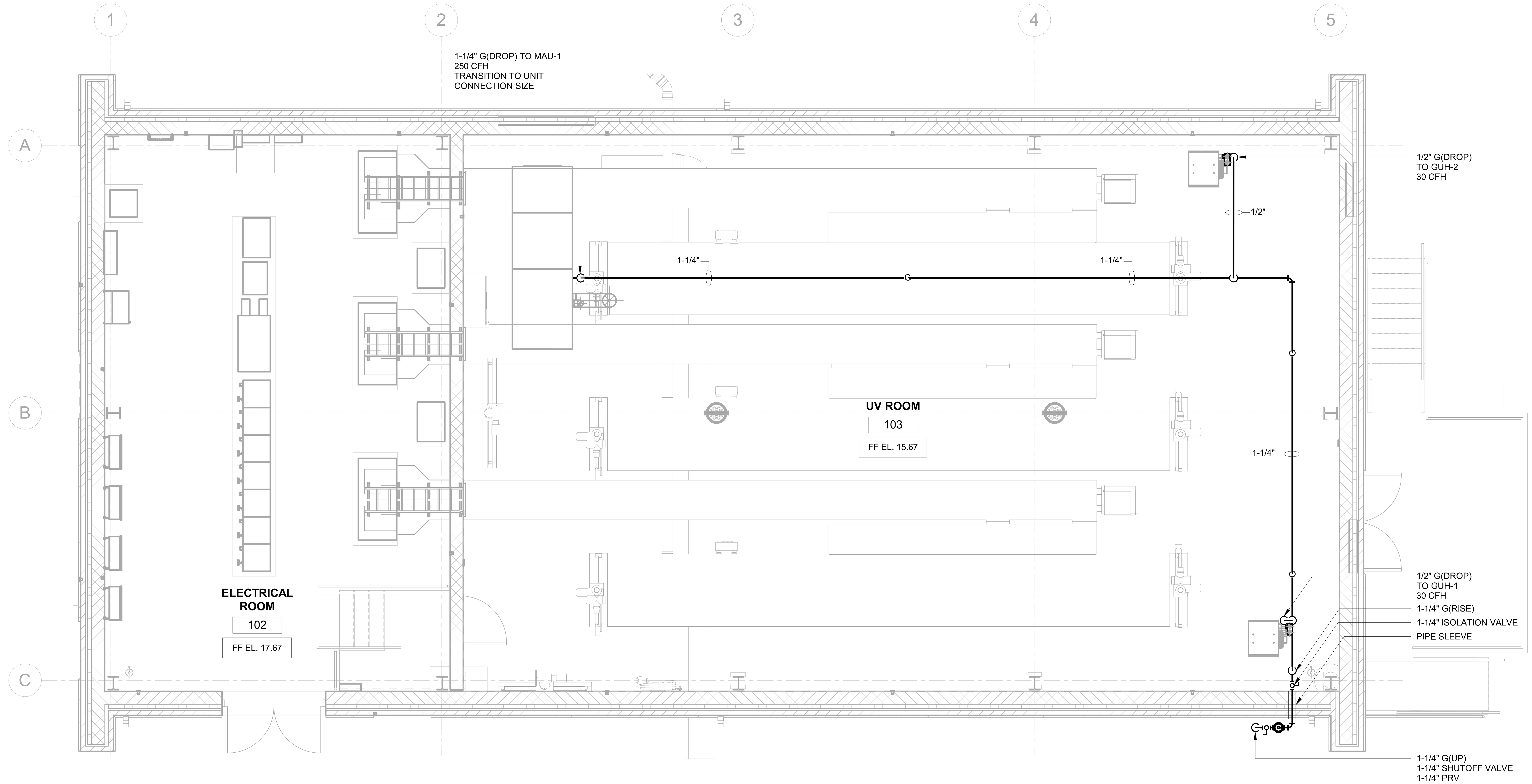
NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Narragansett Bay Commission

Stantec
PARE

NBC CONTRACT NO 308.10C
PLUMBING
RETURN SLUDGE PUMP STATION NO. 3
WATER AND GAS PIPING DIAGRAMS

SHEET
RP-P-3



FLOOR
PLAN
1/4" = 1'-0"

NOTES:
1. CONTRACTOR TO CONFIRM WITH THE UTILITY AND OWNER THAT THE MASTER METER AND REGULATOR, LOCATED AT THE HEAT EXCHANGER BUILDING, HAS BEEN UPGRADED TO PROVIDE THE ADDITIONAL NATURAL GAS LOADS OF THIS PROJECT.

GENERAL NOTES:
1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

1/4" = 1'-0"
2 1 0 2 4

DANIEL FLAHERTY
No. 11935
REGISTERED
PROFESSIONAL ENGINEER
MECHANICAL 4/13/21

CDM Smith BIM 360 Project No: 93019-234214 & 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
File: BIM 360://93019-234214 & 1469-230770 - Bucklin Point Clarifiers-RSPS & UV/HW2001UV.rvt
Plotted on: 4/13/2021 4:17:29 PM

REV	DATE	BY	DESCRIPTION

SCALE	1/4" = 1'-0"
WARNING	0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE
DESIGNED BY:	B. BUCCHIANERI
DRAWN BY:	B. BUCCHIANERI
SHEET CHK'D BY:	D. FLAHERTY
CROSS CHK'D BY:	W. MCCONNELL
APPROVED BY:	D. FLAHERTY
DATE:	APRIL 2021

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASTEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION
FACILITY

NBC CONTRACT NO 308.10C
UV DISINFECTION FACILITY
PLUMBING FLOOR PLAN

SHEET
UV-P-1

SEE ELECTRICAL DRAWINGS FOR LOCATIONS OF NEW CONDUIT

TEMPORARILY REMOVE GAS PIPING, SHUTOFF VALVE AND PRESSURE REDUCING VALVE FOR INSTALLATION OF NEW ELECTRICAL CONDUIT. PATCH EXISTING PIPE PENETRATION.

DRY WEATHER EFFLUENT PUMP STATION W/ UV - EXTERIOR EXISTING

A DETAIL
–
NTS

RELOCATE GAS PIPING, SHUTOFF VALVE AND PRESSURE REDUCING VALVE. FINAL SERVICE LOCATION AND PIPE PENETRATION TO BE VERIFIED IN FIELD TO AVOID ELECTRICAL CONDIUT AND STRUCTURAL COLUMNS.

DRY WEATHER EFFLUENT PUMP STATION W/ UV - EXTERIOR NEW WORK

B DETAIL
–
NTS

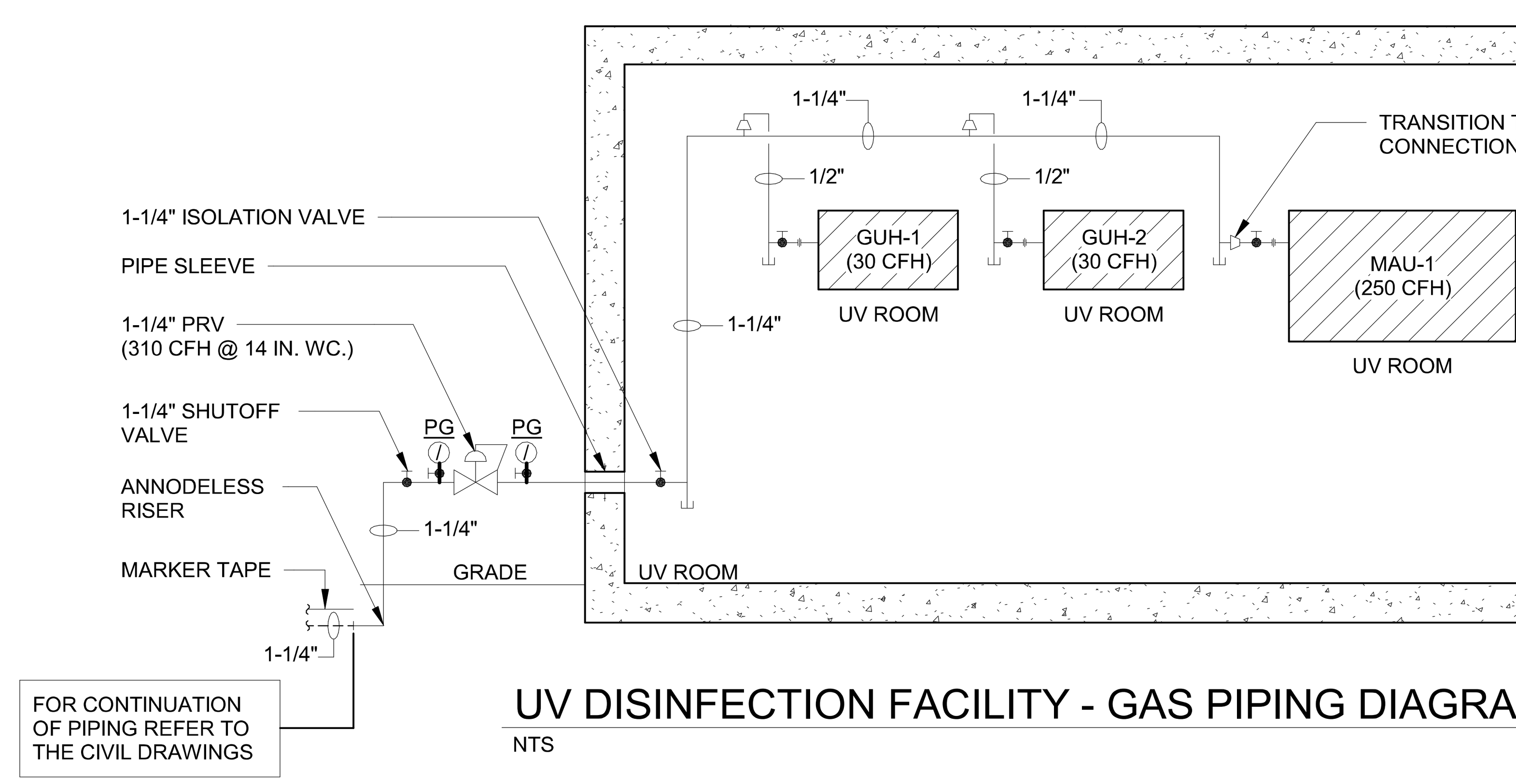
PATCH EXISTING PIPE PENETRATION

RECONNECT GAS PIPING FROM NEW LOCATION. LINE SIZE TO MATCH EXISTING PIPING.

NEW PIPE PENETRATION. SIZE AS REQUIRED AND SEAL PER SPECIFICATIONS.

DRY WEATHER EFFLUENT PUMP STATION W/ UV - INTERIOR

C DETAIL
–
NTS



UV DISINFECTION FACILITY - GAS PIPING DIAGRAM

NTS

NOTES:

1. LINE SIZE ISOLATION VALVES AND UNIONS SHALL BE INSTALLED ON THE BRANCH LINES TO EACH GAS-FIRED UNIT.
2. CONTRACTOR TO CONFIRM WITH THE UTILITY AND OWNER THAT THE MASTER METER AND REGULATOR, LOCATED AT THE HEAT EXCHANGER BUILDING, HAS BEEN UPGRADED TO PROVIDE THE ADDITIONAL NATURAL GAS LOADS OF THIS PROJECT.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4/13/21

CDM Smith BIM 360 Project No: 93019-234214 & 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
File: BIM 360://93019-234214 & 1469-230770 - Bucklin Point Clarifiers-RSPS & UV/HW2001UV.rvt
Plotted on: 4/13/2021 4:17:34 PM

REV	DATE	BY	DESCRIPTION

SCALE: 12" = 1'-0"

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED BY:	B. BUCCHIANERI
DRAWN BY:	B. BUCCHIANERI
SHEET CHK'D BY:	D. FLAHERTY
CROSS CHK'D BY:	W. MCCONNELL
APPROVED BY:	D. FLAHERTY
DATE:	APRIL 2021

FINAL DESIGN - MARCH 2021

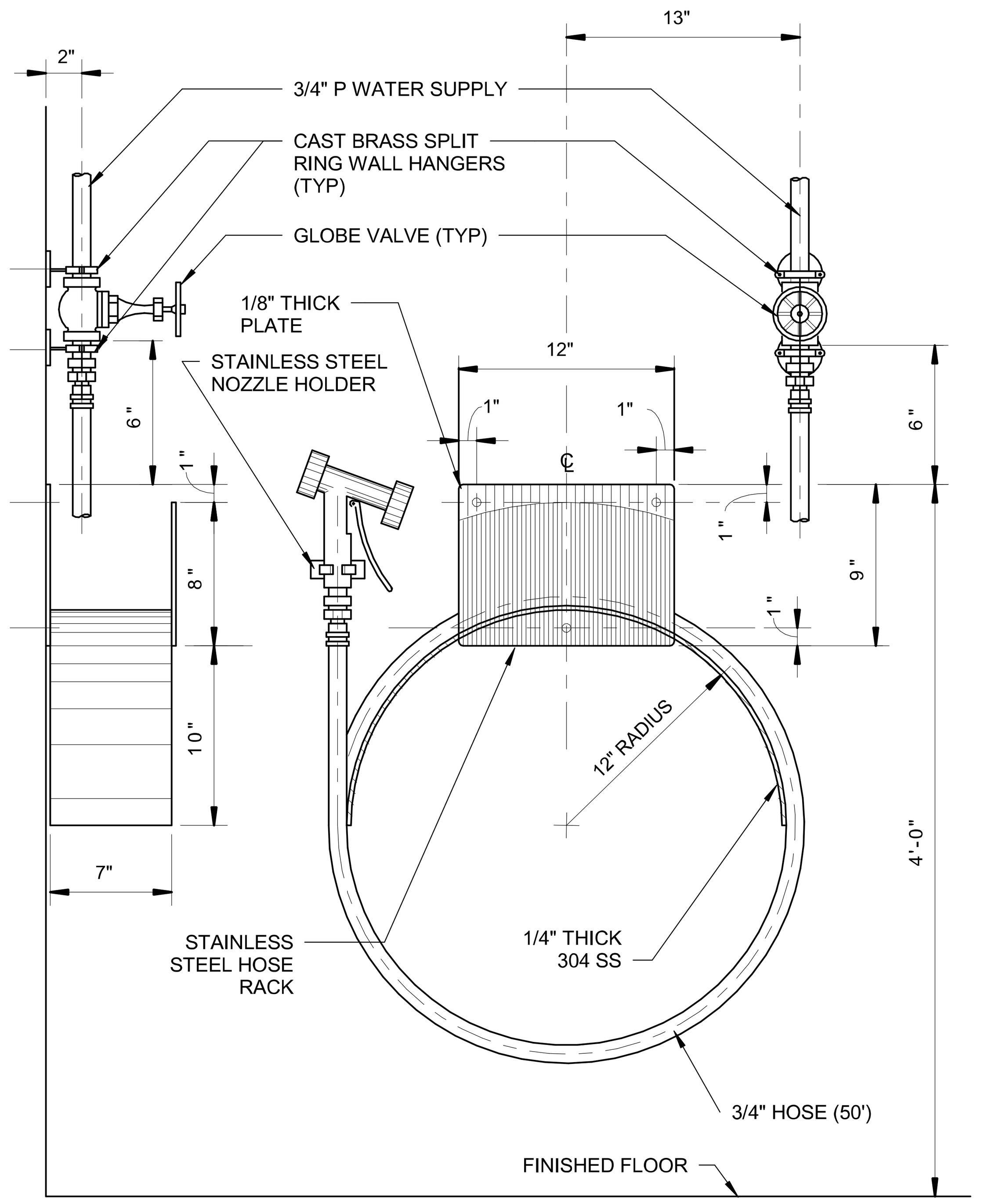
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASTEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

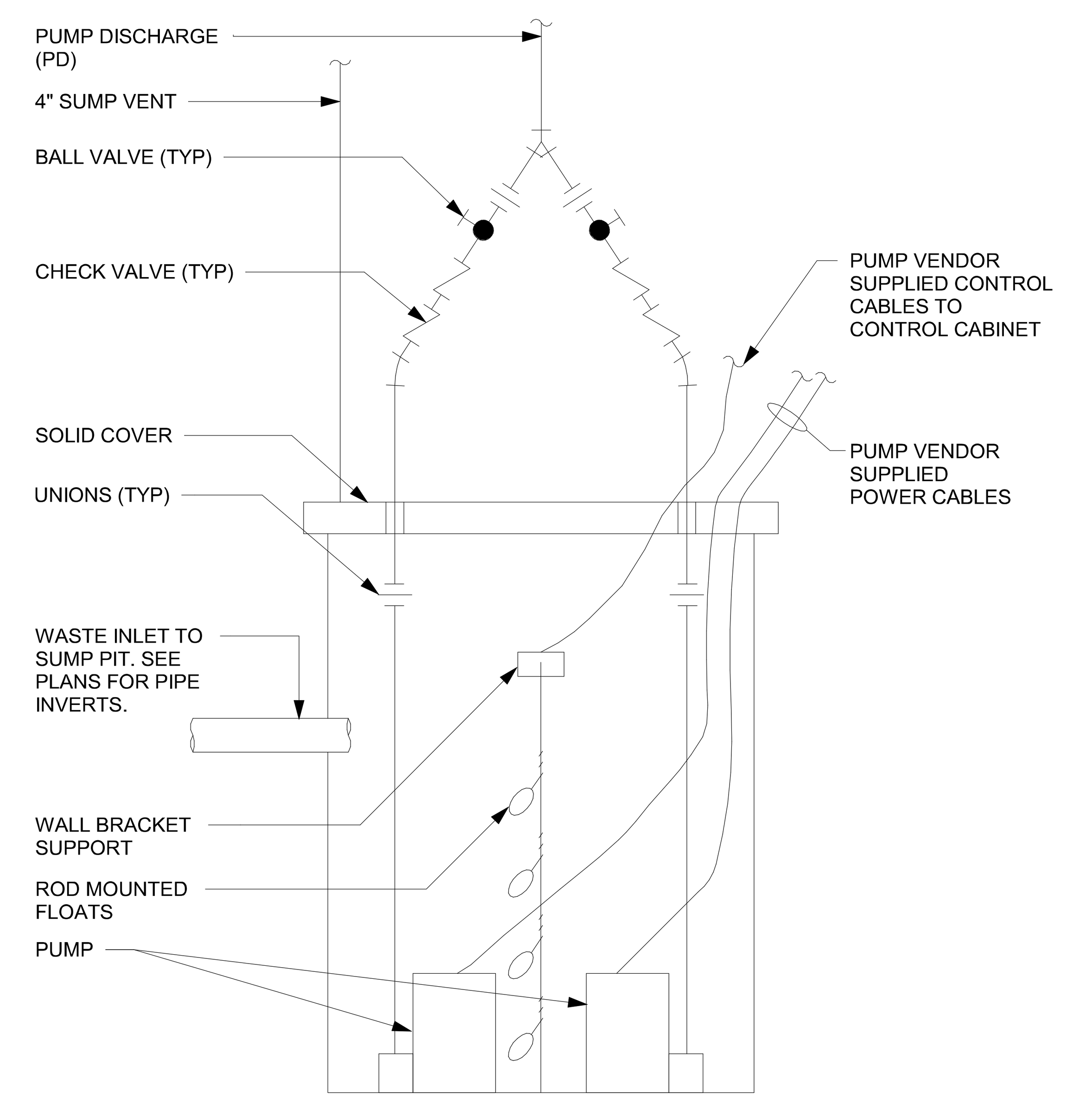
NBC CONTRACT NO 308.10C
UV DISINFECTION FACILITY AND DRY WEATHER EFFLUENT PUMP STATION W/ UV DETAILS AND GAS PIPING DIAGRAM

SHEET
UV-P-2



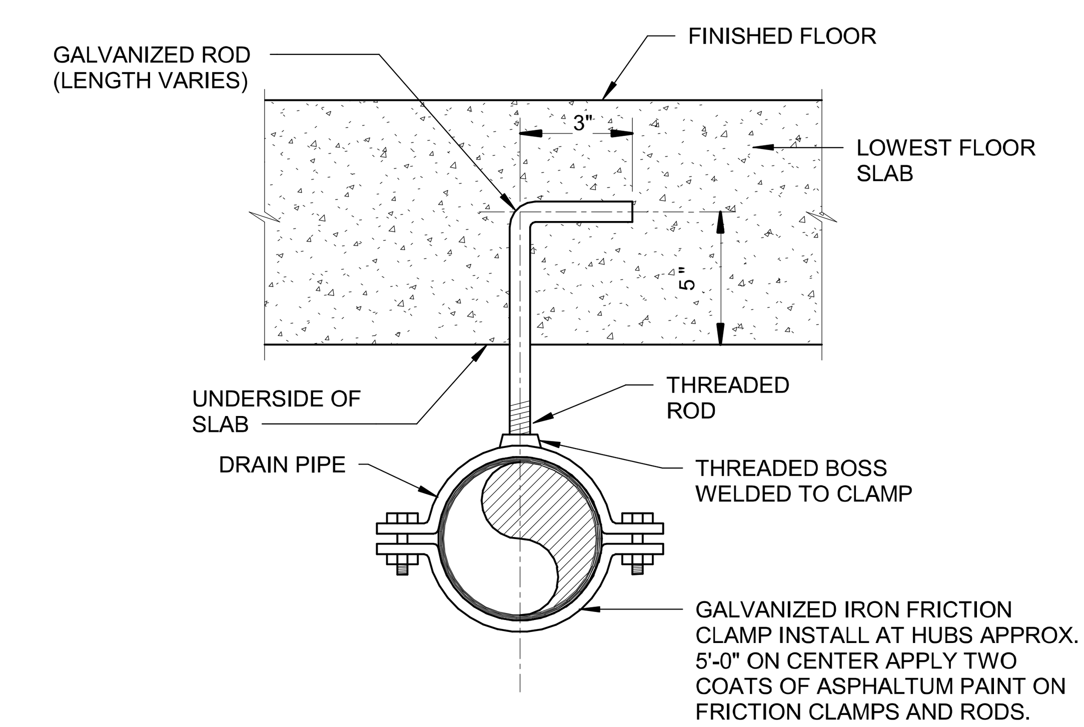
WASH HOSE STATION

A DETAIL
NTS



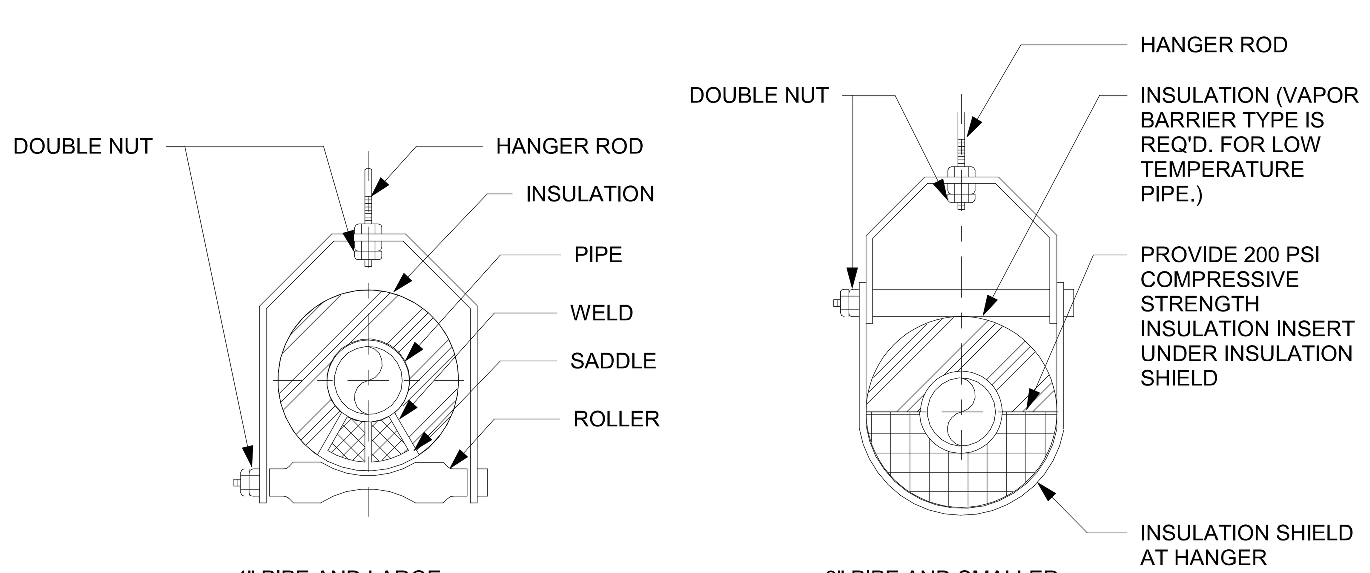
DUPLEX SUMP PUMP

B DETAIL
NTS



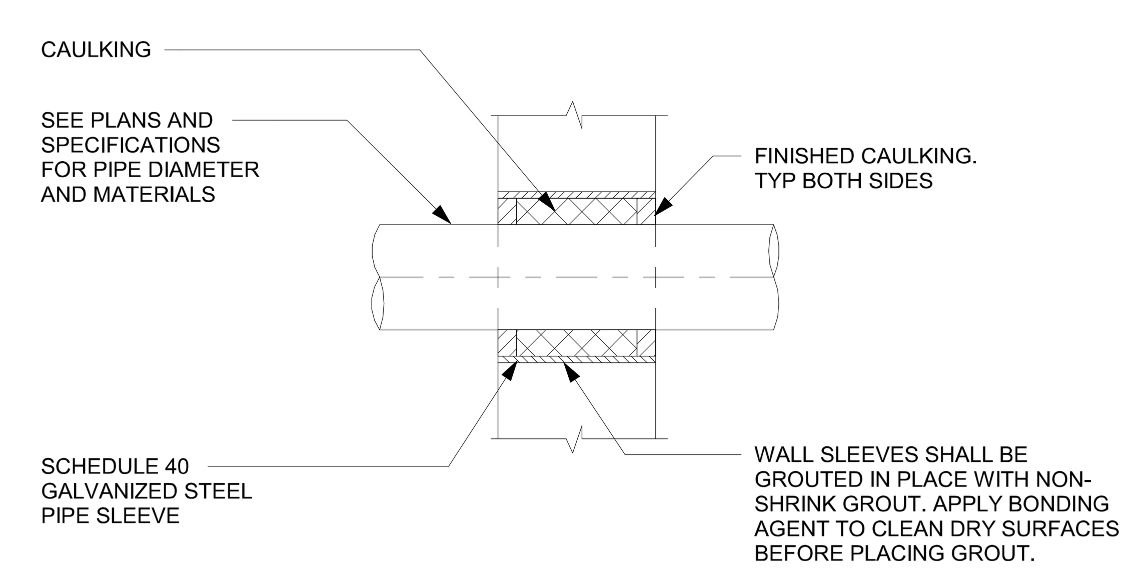
PIPE SUPPORT BURIED UNDER SLAB

C DETAIL
NTS



PIPE HANGER WITH INSULATION

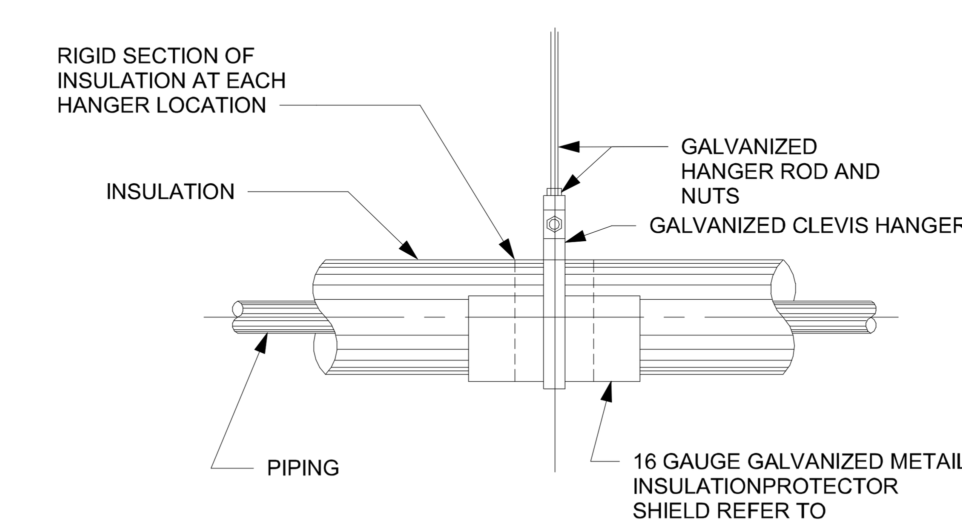
D DETAIL
NTS



NOTE:
1. PIPE SLEEVE SHALL BE TWO PIPE SIZES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE OR INSULATION.

PLUMBING PIPE SLEEVE THROUGH WALL

E DETAIL
NTS



HANGER SUPPORT SYSTEM INSULATED HORIZONTAL PIPING

F DETAIL
NTS

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
4/13/21

REV	DATE	BY	DESCRIPTION

SCALE: 12" = 1'-0"

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

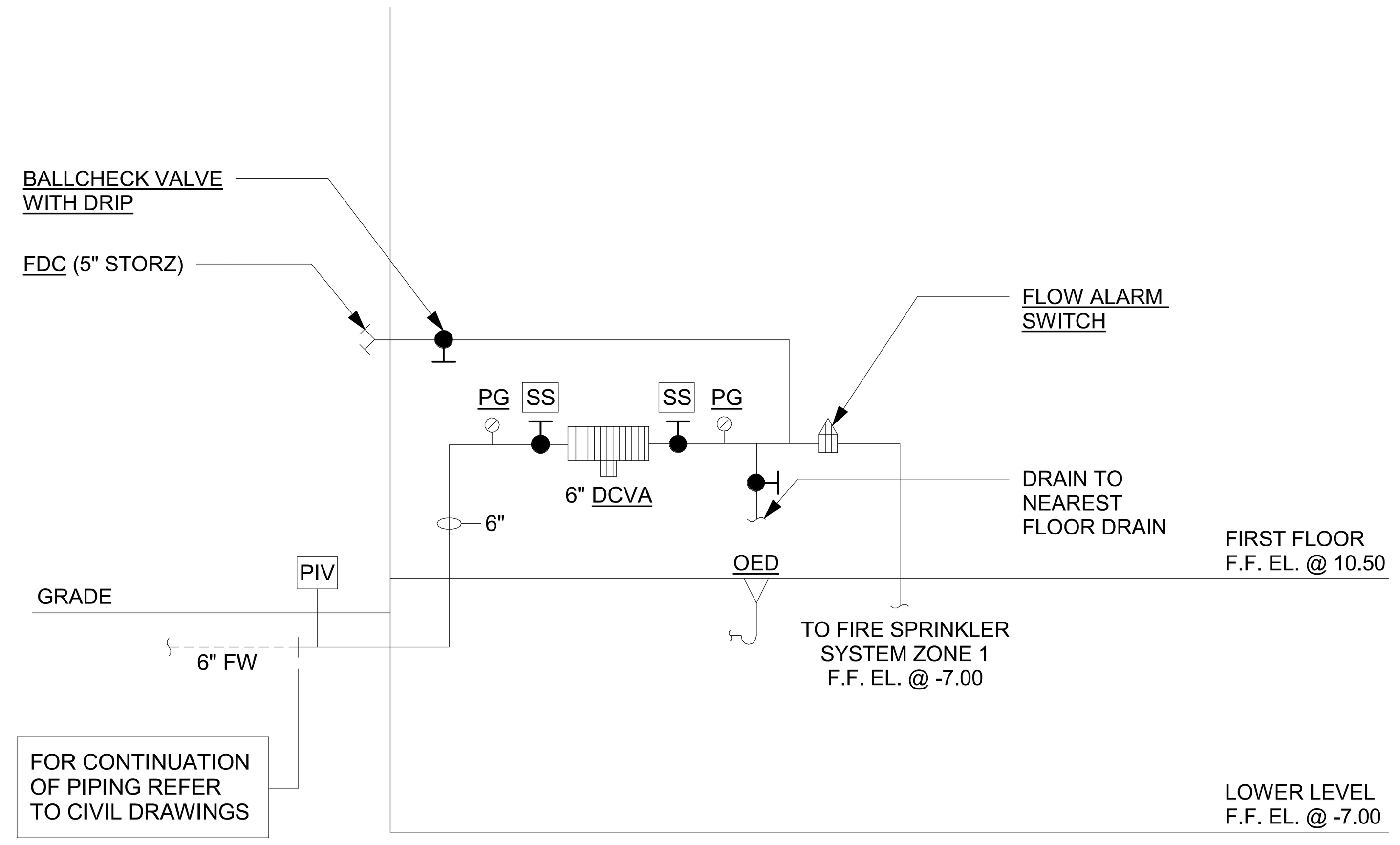
NBC CONTRACT NO 308.10C
PLUMBING
PLUMBING DETAILS

SHEET SD-P-1

FIRE SUPRESSION SYSTEM SCHEDULE						
ZONE NO.		SYSTEM LOCATION	AREA SERVED	SYSTEM TYPE	OCCUPANCY HAZARD CLASSIFICATION	REMARKS
1		PUMP ROOM 100	PUMP ROOM 001	WET SPRINKLER	ORDINARY HAZARD GROUP I	0.15 GPM/SQ. FT. OVER 2,000 SQ. FT.

LEGEND

FDC	FIRE DEPARTMENT CONNECTION
FW	FIRE WATER
DCVA	DOUBLE CHECK VALVE ASSEMBLY
PG	PRESSURE GAUGE
SS	SUPERVISORY/TAMPER SWITCH
FS	FLOW SWITCH
PIV	POST-INDICATOR VALVE
	CONTROL VALVE
	CHECK VALVE
	PRE-ACTION VALVE
	FIRE DEPARTMENT CONNECTION
	DENOTES SPRINKLERED AREAS



FIRE PROTECTION RISER DIAGRAM

NTS

NOTES:
1. ALL VALVES SHALL HAVE SUPERVISORY SWITCHES.

DANIEL FLAHERTY
No. 11935
REGISTERED PROFESSIONAL ENGINEER MECHANICAL

REV	DATE	BY	DESCRIPTION

SCALE: N.T.S.

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED D. FLAHERTY
DRAWN C. BRAITHWAITE
CHECKED D. FLAHERTY

FINAL DESIGN - MARCH 2021

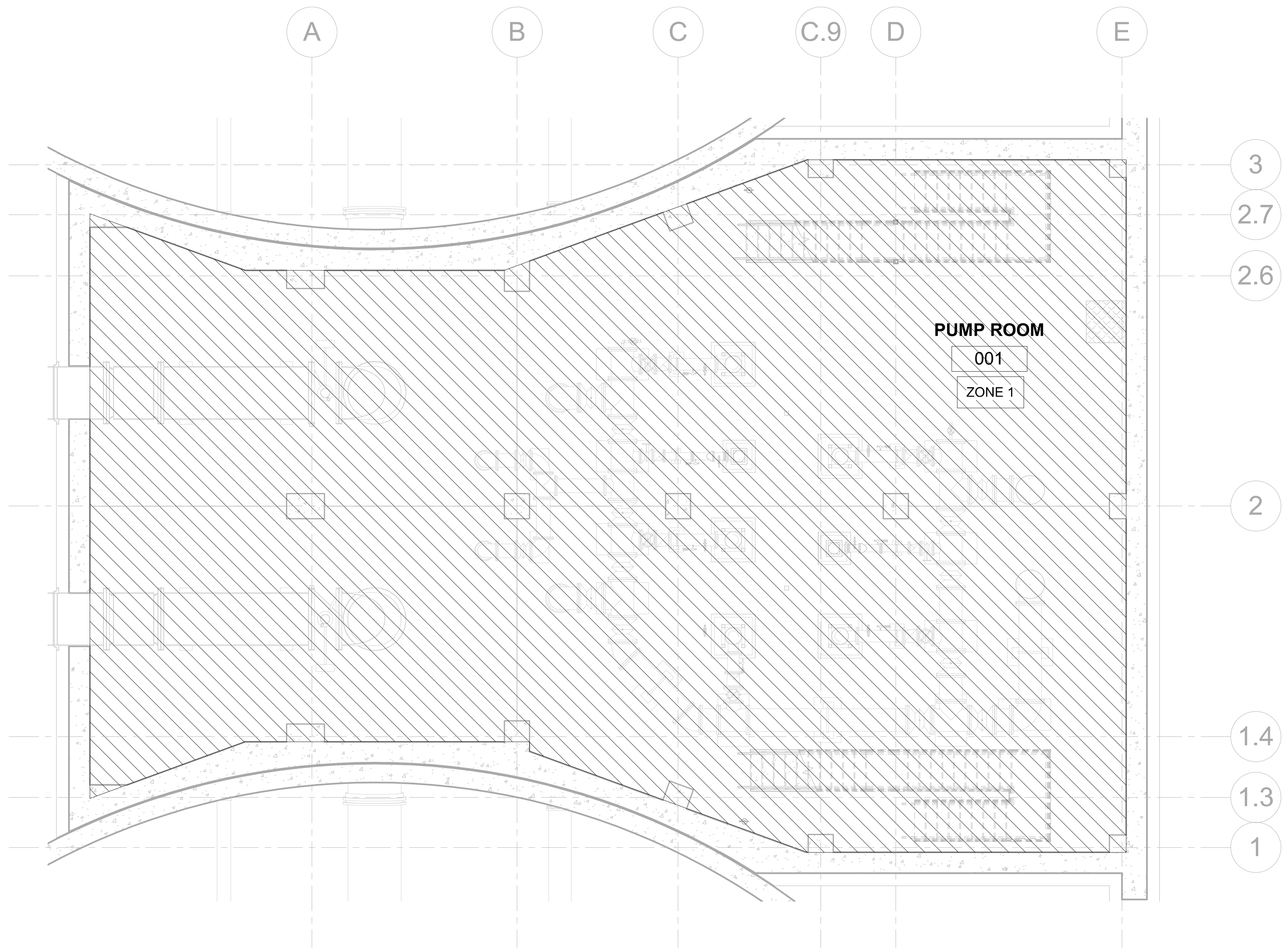
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

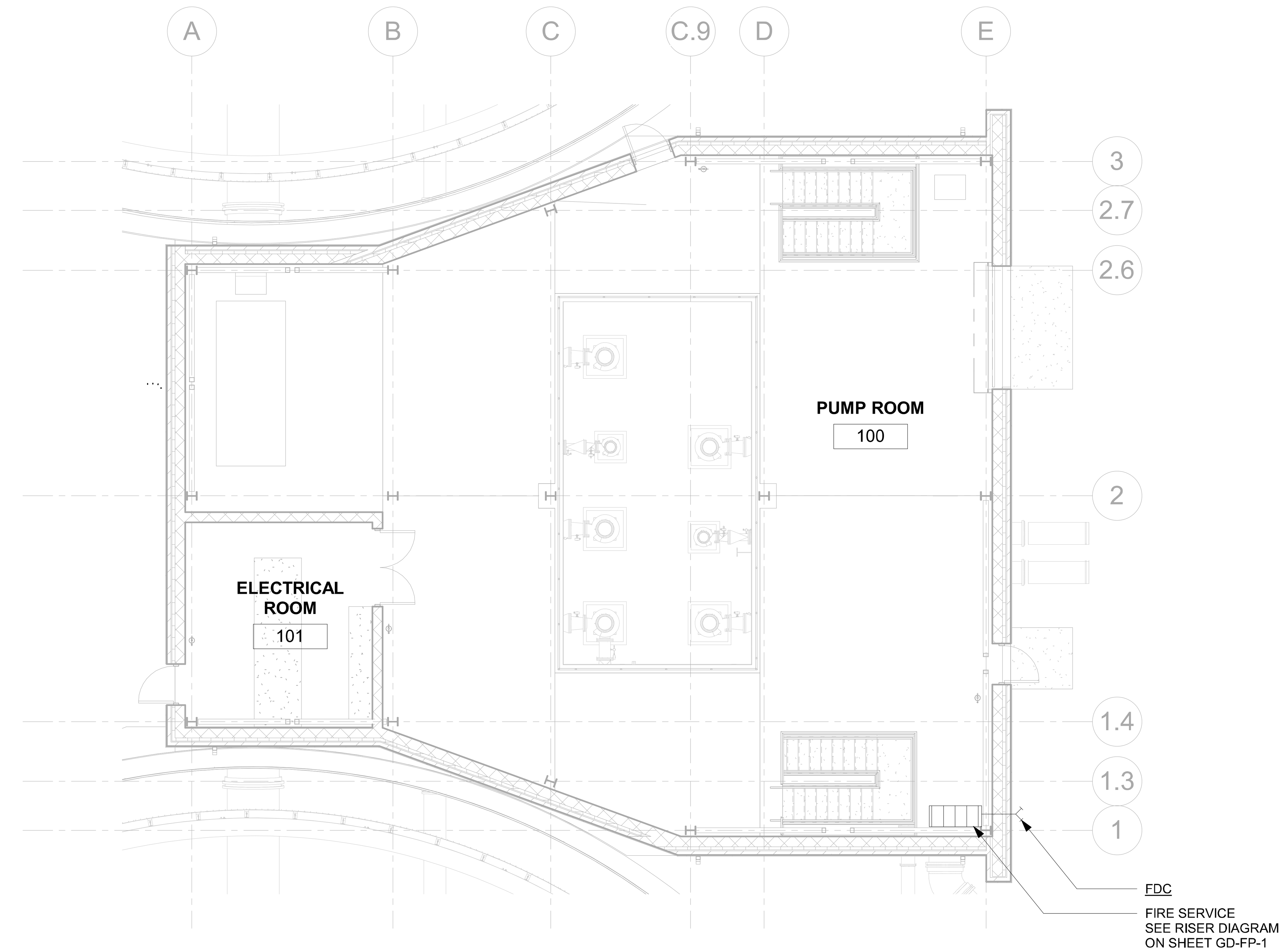
Stantec PARE

NBC CONTRACT NO 308.10C
FIRE PROTECTION
RETURN SLUDGE PUMP STATION NO. 3
FIRE PROTECTION LEGEND, ABBREVIATIONS, RISER DIAGRAM, SCHEDULE, AND NOTES

SHEET GD-FP-1



LOWER LEVEL PLAN
1/8" = 1'-0"



FIRST FLOOR PLAN
1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

DANIEL FLAHERTY
No. 11935
REGISTERED
PROFESSIONAL ENGINEER
MECHANICAL

GENERAL NOTES:
1. ELEVATIONS SHOWN ARE IN FEET AND REFERENCED TO NGVD 1929.

REV	DATE	BY	DESCRIPTION	SCALE	WARNING		
				1/8" = 1'-0"	0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	DESIGNED D. FLAHERTY DRAWN C. BRAITHWAITE CHECKED D. FLAHERTY	FINAL DESIGN - MARCH 2021

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

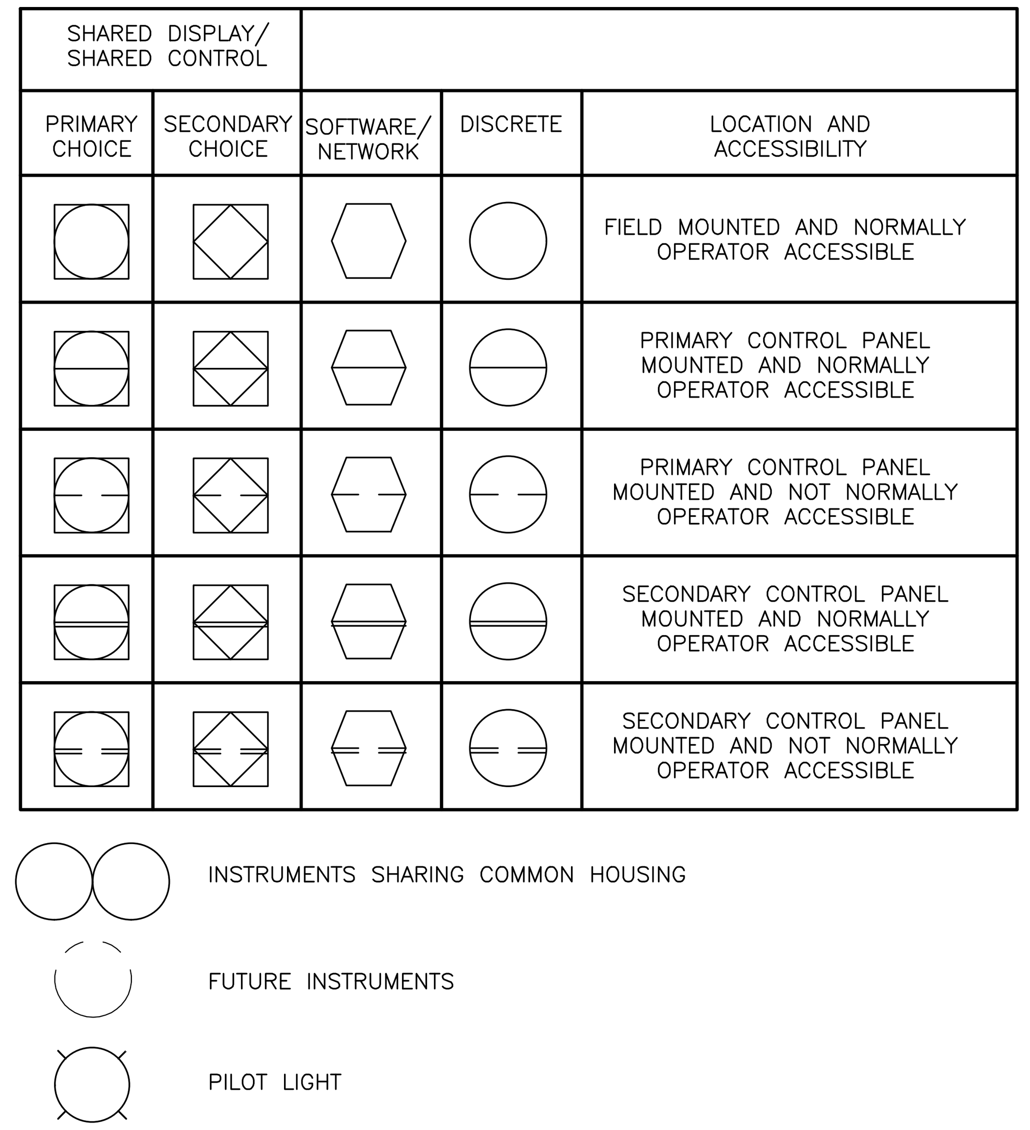
NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec
PARE

NBC CONTRACT NO 308.10C
FIRE PROTECTION
RETURN SLUDGE PUMP STATION NO. 3
FLOOR PLANS

SHEET
RP-FP-1

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

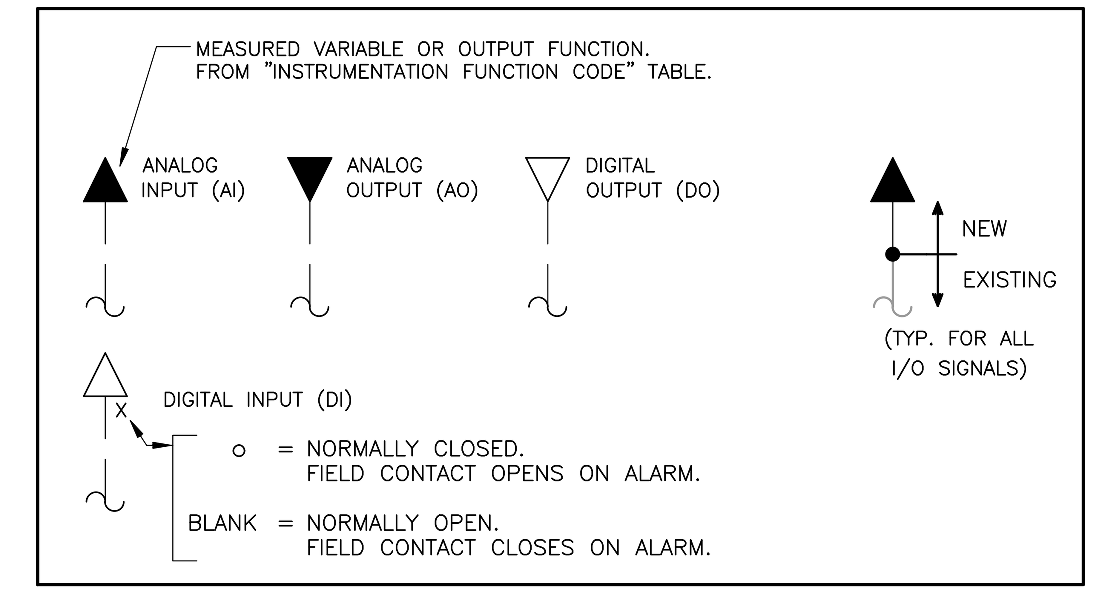


INSTRUMENTATION FUNCTION CODE

	FIRST LETTERS		SUCCEEDING LETTERS		
	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
	MEASURED/INITIATING VARIABLE	VARIABLE MODIFIER	READOUT/PASSIVE FUNCTION	OUTPUT/ACTIVE FUNCTION	FUNCTION MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		REMOTE/AUTO		
C	USER'S CHOICE		HAND/MANUAL	CONTROL	CLOSED
D	USER'S CHOICE	DIFFERENCE, DIFFERENTIAL			DEVIATION
E	VOLTAGE		SENSOR, PRIMARY ELEMENT		
F	FLOW, FLOW RATE	RATIO	FAULT		OFF
G	USER'S CHOICE		GLASS, GAUGE, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER		SCAN		
K	TIME, SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL				LOW
M	MOISTURE		MOMENTARY		MIDDLE, INTERMEDIATE
N	USER'S CHOICE		SOURCE	USER'S CHOICE	ON
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT (TEST CONNECTION)		
Q	TORQUE	INTEGRATE, TOTALIZE	INTEGRATE, TOTALIZE		
R	RADIATION		RUN		RECORD
S	SPEED, FREQUENCY	SAFETY		SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V	VIBRATION			VALVE	
W	WEIGHT, FORCE		WELL, PROBE		
X	ALARM STATE	X–AXIS	ACCESSORY DEVICES, UNCLASSIFIED (1)	UNCLASSIFIED (1)	UNCLASSIFIED (1)
Y	EVENT, STATE, PRESENCE	Y–AXIS		AUXILIARY DEVICES	
Z	POSITION, DIMENSION	Z–AXIS, SAFETY INSTRUMENT SYSTEM		DRIVER, ACTUATOR, UNCLASSIFIED, FINAL CONTROL ELEMENT	

TABLE NOTES:
(1) WHEN USED SYMBOL OR SIGNAL LINE IS ANNOTATED.

I/O SIGNALS



GENERAL NOTES

1. THIS LEGEND APPLIES TO P&IDS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

2. IN GENERAL THIS LEGEND SHEET AND THE P&IDS ARE BASED ON THE INTERNATIONAL SOCIETY OF AUTOMATION (ISA) STANDARDS FOR PRACTICES FOR INSTRUMENTATION. SOME MODIFICATIONS, ADDITIONS AND ALTERATIONS HAVE BEEN MADE AS REQUIRED TO ACCOMODATE PROJECT REQUIREMENTS.

3. SOME PROCESS ITEMS SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS ARE NOT SHOWN ON THE P&IDS.

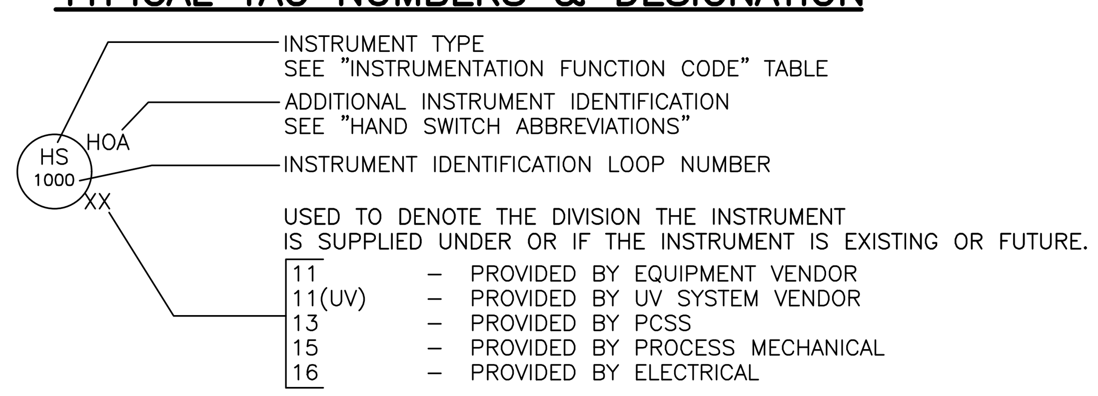
4. SEE ELECTRICAL AND MECHANICAL SHEETS AND SPECIFICATIONS FOR ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS.

5. LIGHTER WEIGHT LINES, SHOWN AS ———, INDICATE EQUIPMENT, INSTRUMENTS OR PIPING THAT ARE EXISTING. WEIGHTED LINES, SHOWN AS ——— OR HEAVIER ———, INDICATE EQUIPMENT, INSTRUMENTS OR PIPING THAT ARE NEW. DASHED WEIGHTED LINES, SHOWN AS — – – —, INDICATED EQUIPMENT, INSTRUMENTS OR PIPING THAT ARE GROUPED AS A PACKAGE.

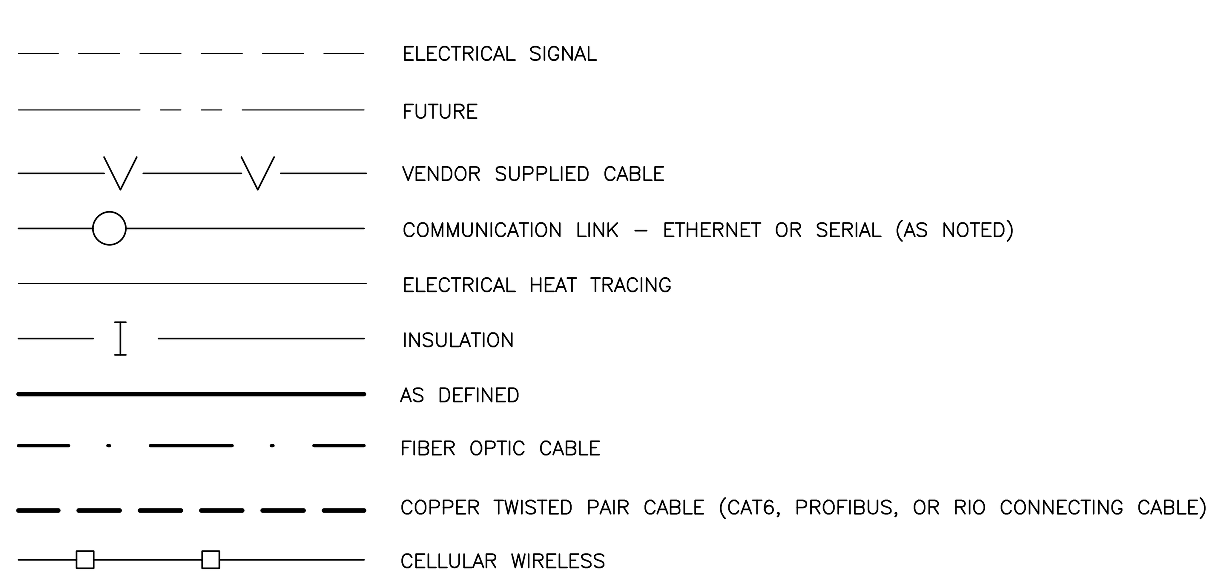
ELECTRICAL / AIR SOURCES

- UPS ——► UPS SOURCE (VOLTAGE AS NOTED)
- ES ——► NON–UPS ELECTRICAL SOURCE (VOLTAGE AS NOTED)
- LP ——► LOOP POWER EQUIPMENT

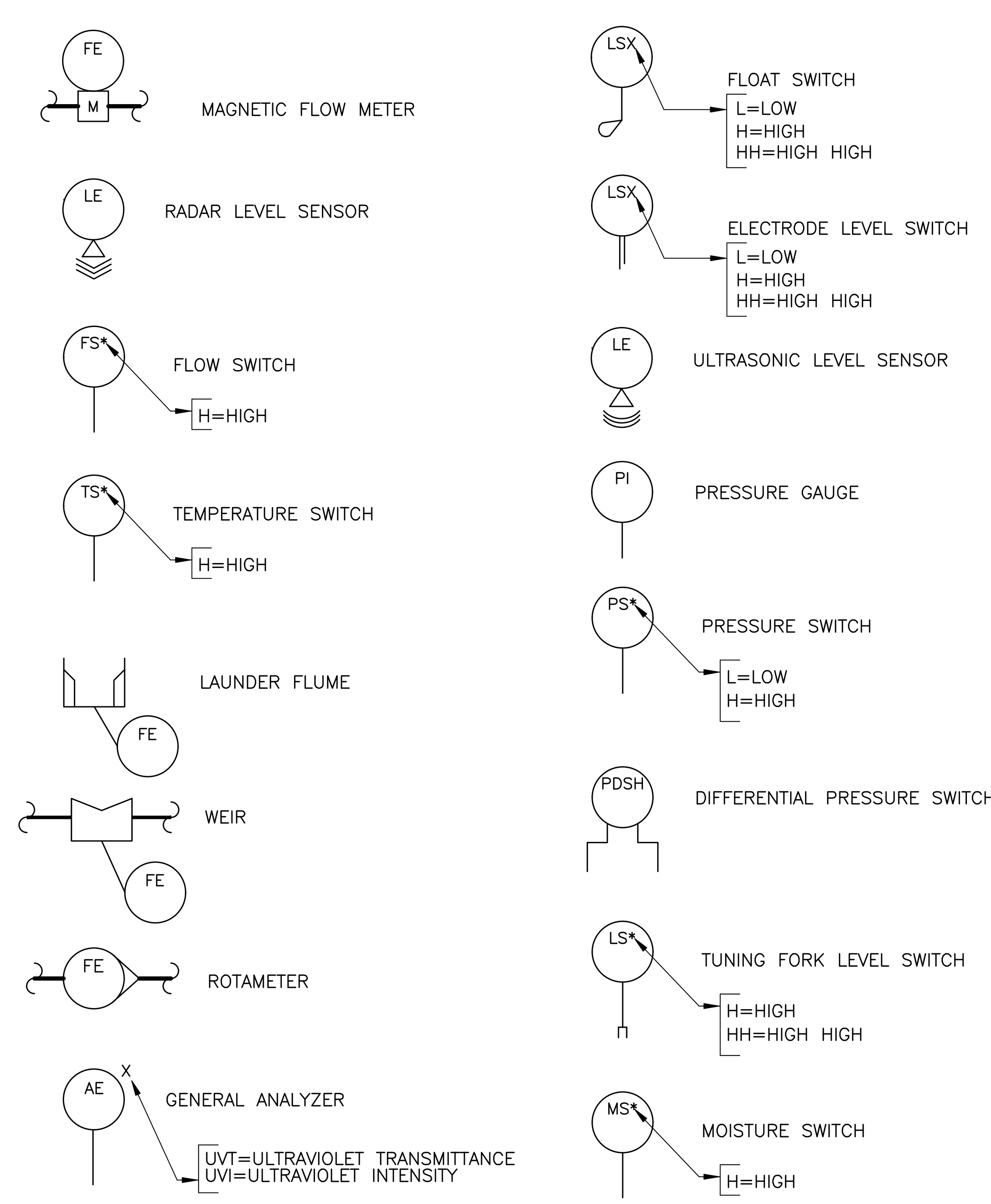
TYPICAL TAG NUMBERS & DESIGNATION



INSTRUMENT LINE SYMBOLS



PRIMARY ELEMENTS



HAND SWITCH ABBREVIATIONS

ACK.	=	ACKNOWLEDGE/SILENCE
E–STOP	=	EMERGENCY STOP
HA	=	HAND/AUTO
HOA	=	HAND/OFF/AUTO
HOR	=	HAND/OFF/REMOTE
INTER.	=	INTERMEDIATE POSITION
I/B	=	INVERTER/BYPASS
LOR	=	LOCAL/OFF/REMOTE
LR	=	LOCAL/REMOTE
OCA	=	OPEN/CLOSE/AUTO
OSC	=	OPEN/STOP/CLOSE
O/L	=	OVERLOAD
RSL	=	RAISE/STOP/LOWER
SRTC	=	SPRING RETURN TO CENTER
SS	=	START/STOP

GENERAL ABBREVIATIONS

ACK	ACKNOWLEDGE
ADH	HARDWARE ALARM DIALER
AI	ANALOG INPUT
AO	ANALOG OUTPUT
ATS	AUTOMATIC TRANSFER SWITCH
CNV	PROTOCOL CONVERTER
CPU	CENTRAL PROCESSING UNIT
DI	DIGITAL OR DISCRETE INPUT
DO	DIGITAL OR DISCRETE OUTPUT
DWEPS	DRY WEATHER EFFLUENT PUMP STATION
FC	FAIL CLOSED
FDES	FIELD DEVICE ETHERNET SWITCH
FMC	FIBER OPTIC MEDIA CONVERTER
FO	FAIL OPEN OR FIBER OPTIC
FOPP	FIBER OPTIC PATCH PANEL
HIM	HUMAN INTERFACE MODULE
HMI	HUMAN MACHINE INTERFACE
IT	INFORMATION TECHNOLOGY
LCP	LOCAL CONTROL PANEL
MCC	MOTOR CONTROL CENTER
MDI	INTERNET MODEM
MDR	RADIO MODEM
MDV	VOICE MODEM
MES	MANAGED ETHERNET SWITCH
MS	MOTOR STARTER
MTU	MASTER TELEMETRY UNIT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OIT	OPERATOR INTERFACE TERMINAL
OPC	OPEN PLATFORMS COMMUNICATIONS
OWS	OPERATOR WORKSTATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
PS	POWER SUPPLY
RIO	REMOTE INPUT/OUTPUT
RSPS	RETURN SLUDGE PUMP STATION
RTR	ROUTER
RTU	REMOTE TERMINAL UNIT
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SCC	ULTRAVIOLET SYSTEM CONTROL CENTER
SPD	SURGE PROTECTION DEVICE
SRV	SERVER
TEX	TELEPHONE EXCHANGE
UES	UNMANAGED ETHERNET SWITCH
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
UV	ULTRA VIOLET
VFD	VARIABLE FREQUENCY DRIVE

PIPE SERVICE IDENTIFICATION

DEC	DECANT
DR	DRAIN
DWE	DRY WEATHER EFFLUENT
EFF	EFFLUENT
EFW	EFFLUENT FLUSHING WATER
INF	INFLUENT
LPA	LOW PRESSURE AIR
OV	OVERFLOW
ML	MIXED LIQUOR
POL	POLYMER
PPW	PROTECTED PLANT WATER
PS	PRIMARY SLUDGE
PSC	PRIMARY SCUM
RSL	RETURN SLUDGE
SAS	SODA ASH SOLUTION
SC	SCUM
SLG	SLUDGE
SPL	SAMPLE
TPS	THICKENED PRIMARY SLUDGE
TS	THICKENED SLUDGE
VT	VENT
WSL	WASTE SLUDGE

PIPE SPECIFICATION IDENTIFICATION

304L	TYPE 304L STAINLESS STEEL
304SS	TYPE 304 STAINLESS STEEL
ACP	ASBESTOS CEMENT PIPE
CIP	CAST IRON PIPE
CU	COPPER
DI	DUCTILE IRON
FRP	FIBERGLASS REINFORCED PLASTIC
FEP	FLUORINATED ETHYLENE PROPYLENE LINED POLYETHYLENE TUBING
GS	GALVANIZED CARBON STEEL
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
PVDF	POLYVINYLIDENE FLUORIDE
RCP	REINFORCED CONCRETE PIPE
SS	TYPE 316 STAINLESS STEEL
STL	STEEL

6/9/22
ERIC J. SILVERMAN
No. 7090
REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

PIPE LINE SYMBOLS

- PIPE UNION
- BUSHING
- FLEXIBLE BELLOWS TYPE COUPLING
- FLEXIBLE COUPLING (GENERAL SYMBOL)
- QUICK CONNECT TYPE COUPLING
- HOSE CONNECTION
- Y-STRAINER
- REDUCER/ENLARGER
- ECCENTRIC REDUCER/ENLARGER
- AIR FILTER
- SS DI PIPE MATERIAL TRANSFER
- THREADED CAP
- BLIND FLANGE
- CONTINUED PIPE
- ANNULAR SEAL
- DIAPHRAGM SEAL
- EQUIPMENT DRAIN
- OPEN EQUIPMENT DRAIN
- DIFFUSER
- BASKET STRAINER
- FILTER
- PRESSURE REGULATOR
- HOSE
- PULSATION DAMPNER
- MAJOR PROCESS LINE
- MINOR PROCESS LINE
- DOUBLE WALLED PIPE
- DWG NO. TO/FROM LOCATION — DRAWING CONTINUATION

GATE SYMBOLS

- SLUICE GATE (SLG)
- SLIDE GATE (SG)
- WEIR SLIDE GATE (WSG)
- BULK HEAD GATE/STOP LOG (BHG)

VALVE SYMBOLS

- GATE VALVE (GV)
- PLUG VALVE (PV)
- BUTTERFLY VALVE (BFV)
- BALL VALVE (BV)
- BACK FLOW PREVENTER VALVE (BFPV)
- GLOBE VALVE (GLV)
- PINCH VALVE (PCHV)
- DIAPHRAGM VALVE (DV)
- SWING CHECK VALVE (CV)
- BALL CHECK VALVE (BCV)
- DUCK BILL CHECK VALVE (DBCV)
- S SOLENOID VALVE (SV)
- TELESCOPIC VALVE (TV)
- NEEDLE VALVE (NV)
- KNIFE VALVE (KNV)
- MUD VALVE (MV)
- PRESSURE REGULATING VALVE (PREGV)
- BACK PRESSURE REGULATING VALVE (BPV)
- DIFFERENTIAL PRESSURE REGULATING VALVE W/ EXTERIOR TAPS
- SELF-CONTAINED DIFFERENTIAL PRESSURE REGULATING VALVE
- S SELF-CONTAINED DIFFERENTIAL PRESSURE REGULATING VALVE (SOLENOID OPERATED)
- ARV AIR RELEASE VALVE (ARV)
- PRV PRESSURE RELIEF VALVE (PRV)
- VACUUM RELIEF VALVE (VRV)
- AIR-VACUUM RELEASE VALVE (AVRV)

VALVE ACTUATORS

- HAND (MANUALLY) OPERATED
- DIAPHRAGM, SPRING OPPOSED
- DIAPHRAGM, PRESSURE-BALANCED
- M ROTARY MOTOR. (SHOWN TYPICALLY WITH ELECTRIC SIGNAL. MAY BE HYDRAULIC OR PNEUMATIC)
- S SOLENOID
- E/H ELECTROHYDRAULIC

TYPICAL PIPE TAG NUMBERS & DESIGNATION

6"-RW-DI

- FLOW DIRECTION
- SPEC
- SERVICE (SEE TABLE, THIS SHEET)
- SIZE

TYPICAL EQUIPMENT TAG NUMBERS & DESIGNATION

P-1000

- EQUIPMENT IDENTIFICATION (FIRST TWO DIGITS DENOTE ASSOCIATED AREA)
- EQUIPMENT TYPE

MISCELLANEOUS SYMBOLS

- M — MOTOR
- MCC — INDICATES INTERLOCK OR LOGIC IN A MOTOR CONTROL CENTER
- I — INDICATES GENERAL OR MISCELLANEOUS HARDWIRED INTERLOCK
- MS — MOTOR STARTER
- VFD — VARIABLE FREQUENCY DRIVE WITH KEYPAD

PROCESS EQUIPMENT SYMBOLS

PARTIAL LIST
ADDITIONAL SYMBOLS MAY BE SHOWN ON THE FLOW DIAGRAMS

- CENTRIFUGAL PUMP
- SUBMERSIBLE PUMP
- DISC PUMP
- M ARCHIMEDES SCREW PUMP
- MIXER
- CLARIFIER
- GRINDER
- PROGRESSIVE CAVITY PUMP

6/9/22
ERIC J. SILVERMAN
No. 7090
REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

REV	DATE	BY	DESCRIPTION	SCALE	WARNING		FINAL DESIGN - JUNE 2022				
				NTS	0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	DESIGNED P. JENKINS DRAWN P. JENKINS CHECKED E. SILVERMAN		CDM Smith 260 West Exchange Street, Suite 300 Providence, RI 02903 Tel: (401) 751-5360	Narragansett Bay Commission	NARRAGANSETT BAY COMMISSION PHASE III COMBINED SEWER OVERFLOW PROGRAM Stantec PARE	NBC CONTRACT NO 308.10C INSTRUMENTATION AND CONTROL LEGEND II	SHEET I-2

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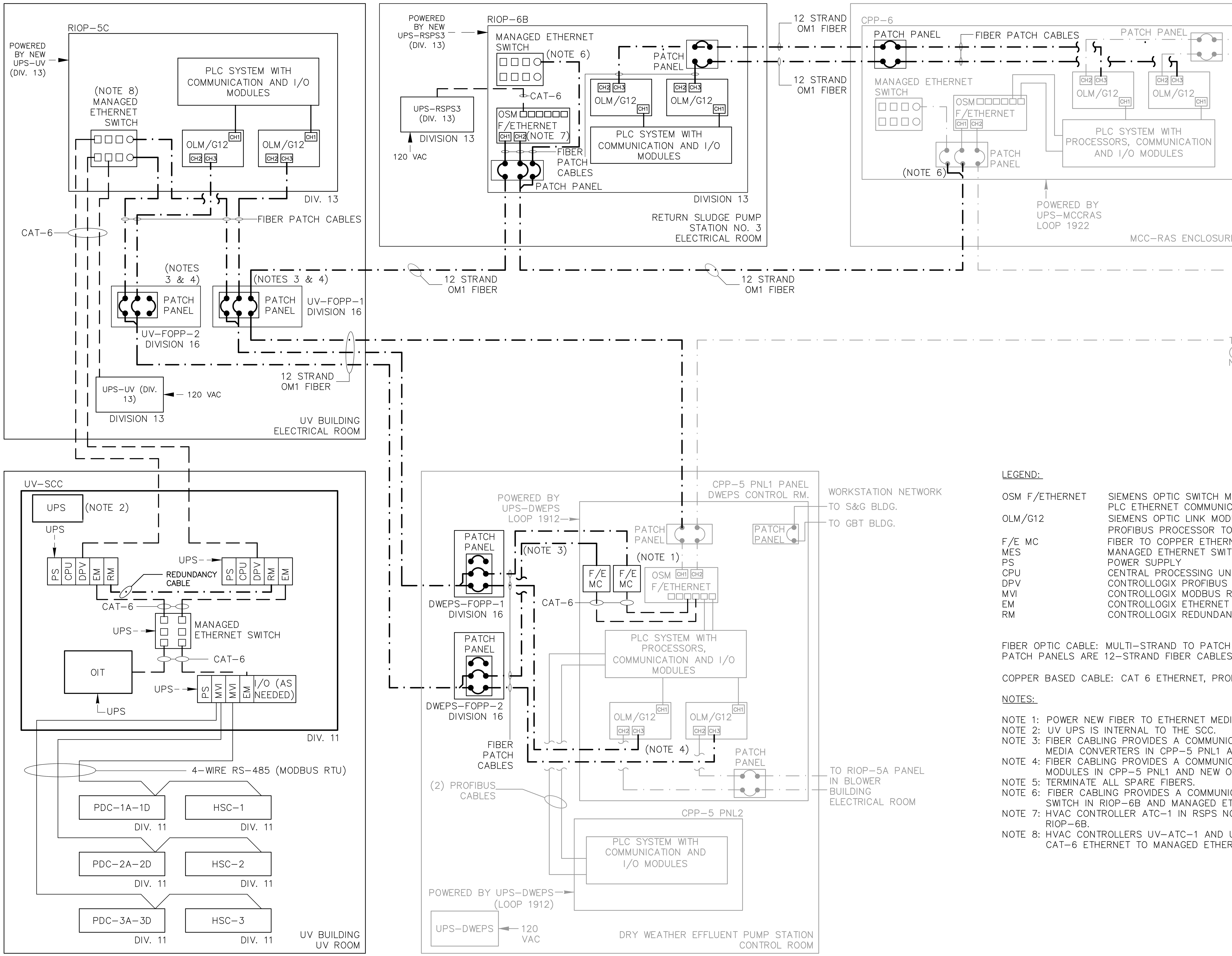

LEGEND:

OSM F/ETHERNET	SIEMENS OPTIC SWITCH MODULE (OSM) USED TO CONNECT THE SIEMENS PLC ETHERNET COMMUNICATION MODULES TO SCADA NETWORK.
OLM/G12	SIEMENS OPTIC LINK MODULE (OLM) USED TO CONNECT THE SIEMENS PROFIBUS PROCESSOR TO I/O RACKS USING FIBER OPTIC CABLE.
F/E MC	FIBER TO COPPER ETHERNET MEDIA CONVERTER.
MES	MANAGED ETHERNET SWITCH
PS	POWER SUPPLY
CPU	CENTRAL PROCESSING UNIT
DPV	CONTROLLOGIX PROFIBUS COMMUNICATION MODULE
MVI	CONTROLLOGIX MODBUS RTU COMMUNICATION MODULE
EM	CONTROLLOGIX ETHERNET MODULE
RM	CONTROLLOGIX REDUNDANCY MODULE

FIBER OPTIC CABLE: MULTI-STRAND TO PATCH CORDS. ALL FIBER OPTIC CABLES BETWEEN PATCH PANELS ARE 12-STRAND FIBER CABLES

COPPER BASED CABLE: CAT 6 ETHERNET, PROFIBUS OR REMOTE I/O CONNECTING CABLE

NOTES:

NOTE 1: POWER NEW FIBER TO ETHERNET MEDIA CONVERTERS FROM EXISTING UPS-DWEPS.
NOTE 2: UV UPS IS INTERNAL TO THE SCC.
NOTE 3: FIBER CABLING PROVIDES A COMMUNICATION LINK BETWEEN NEW FIBER TO ETHERNET MEDIA CONVERTERS IN CPP-5 PNL1 AND MES IN RIOP-5C.
NOTE 4: FIBER CABLING PROVIDES A COMMUNICATION LINK BETWEEN EXISTING OPTIC LINK MODULES IN CPP-5 PNL1 AND NEW OPTIC LINK MODULES IN RIOP-5C.
NOTE 5: TERMINATE ALL SPARE FIBERS.
NOTE 6: FIBER CABLING PROVIDES A COMMUNICATION LINK BETWEEN NEW MANAGED ETHERNET SWITCH IN RIOP-6B AND MANAGED ETHERNET SWITCH IN CPP-6.
NOTE 7: HVAC CONTROLLER ATC-1 IN RSPS NO. 3 BUILDING VIA CAT-6 ETHERNET TO OSM IN RIOP-6B.
NOTE 8: HVAC CONTROLLERS UV-ATC-1 AND UV-ATC-2 IN UV BUILDING CONNECTED VIA CAT-6 ETHERNET TO MANAGED ETHERNET SWITCH IN RIOP-5C.

6/9/22
ERIC J. SILVERMAN No. 7090 REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

REV	DATE	BY	DESCRIPTION

SCALE: NTS

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DESIGNED P. JENKINS
DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith, 260 West Exchange Street, Suite 300, Providence, RI 02903, Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL
CONTROL SYSTEM ARCHITECTURE

SHEET I-3

SHEET KEYNOTES

A. PROVIDE NEW CONTROL WIRING. TERMINATE NEW WIRES AT EXISTING I/O LOCATIONS. CONTROL WIRING FOR SCREW PUMPS 2 & 3 TO REMAIN.

B. INSTRUMENTATION TO BE POWERED BY ASSOCIATED VFD OR STARTER.

C. GREASE PUMP CONTROL PANEL TO BE POWERED BY THE GREASE PUMP MOTOR STARTER.

D. LSHH-106 TO BE REPOSITIONED FOR ACTUATION AT A NEW ALARM POINT. SEE SPECIFICATION SECTION 13614 FOR NEW ACTUATION POINT. DO NOT CUT LEVEL SWITCH CABLE. BUNDLE EXCESS LEVEL SWITCH CABLE SLACK.

E. LIT-105 AND ASSOCIATED PLC INPUT TO BE RECONFIGURED FOR NEW LEVEL RANGE. SEE SPECIFICATION SECTION 13614 FOR NEW LEVEL RANGE.

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DESIGNED P. JENKINS
DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

INFLUENT PUMP STATION
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-4

SHEET KEYNOTES

A. PROVIDE EXPANSION I/O MODULES TO EXISTING PLC AS NEEDED TO ACCOMMODATE NEW SIGNALS.

B. TWO FLUMES SHALL BE INSTALLED FOR EACH CLARIFIER (510-XA AND 510-XB, WHERE X INDICATES THE CLARIFIER NUMBER). SEE MECHANICAL DRAWINGS FOR INSTALLATION LOCATION.

C. MODIFY CPP-6 TO ADD TERMINALS, 2A FUSES, AND WIRING AS NECESSARY TO PROVIDE LIT/FIT WITH 120VAC UPS POWER.

REV	DATE	BY	DESCRIPTION

SCALE: NTS

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DESIGNED P. JENKINS
DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

EXISTING FINAL CLARIFIERS NOS. 1-4
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-5

SHEET KEYNOTES

A. PROVIDE EXPANSION I/O MODULES TO EXISTING PLC AS NEEDED TO ACCOMMODATE NEW SIGNALS.

B. TWO FLUMES SHALL BE INSTALLED FOR EACH CLARIFIER (510-XA AND 510-XB, WHERE X INDICATES THE CLARIFIER NUMBER). SEE MECHANICAL DRAWINGS FOR INSTALLATION LOCATION.

C. MODIFY CPP-6 TO ADD TERMINALS, 2A FUSES, AND WIRING AS NECESSARY TO PROVIDE LIT/FIT WITH 120VAC UPS POWER.

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DESIGNED P. JENKINS
DRAWN A. PRABHAKARAN
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER
OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

EXISTING FINAL CLARIFIERS 5 & 6
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-6

SHEET KEYNOTES

A. VALVE LOCAL CONTROL STATION (LCS) SHALL BE INTEGRAL TO VALVE ACTUATOR. COORDINATE LCS REQUIREMENTS WITH DIVISION 11.

B. CONFIGURE VALVE ACTUATORS SUCH THAT, UPON A LOSS OF THE VALVE POSITION SETPOINT SIGNAL, THE ACTUATOR MAINTAINS THE CURRENT VALVE POSITION.

C. SPRAYER PROXIMITY SWITCH AND SOLENOID VALVE SHALL BE POWERED FROM SPRAYER CONTROL PANEL.

D. EQUIPMENT LOCAL CONTROL STATIONS (LCS) SHALL BE POWERED FROM EQUIPMENT STARTER.

E. TWO FLUMES SHALL BE INSTALLED FOR EACH CLARIFIER (510-XA AND 510-XB, WHERE X INDICATES THE CLARIFIER NUMBER). SEE MECHANICAL DRAWINGS FOR INSTALLATION LOCATION.

F. TRANSMITTER RELAY CONTACTS FOR LOW-LEVEL INTERLOCK TO BE FAIL-SAFE. CONTACTS OPEN ON ALARM OR LOSS OF TRANSMITTER POWER.

REV	DATE	BY	DESCRIPTION

SCALE: NTS

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DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

FINAL CLARIFIERS NOS. 7 & 8
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-7

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DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec
PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

EXISTING RETURN SLUDGE PUMPING STATIONS NO. 1 AND 2
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-8

SHEET KEYNOTES

A. TYPICAL FOR LOOPS 530-3, 530-4, AND 540-8 THRU 12: THE FIELD INSTRUMENTATION AND EQUIPMENT LISTED BELOW SHALL BE POWERED FROM THE EQUIPMENT VFD.
- LOW PRESSURE SWITCH (PSL)
- MOTOR HIGH TEMPERATURE SWITCH (TSH)
- EMERGENCY STOP (HS)

B. 2" FLUSHING CONNECTION.

REV	DATE	BY	DESCRIPTION

SCALE: NTS

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DRAWN A. PRABHAKARAN
CHECKED E. SILVERMAN

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CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

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PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

RETURN SLUDGE PUMP STATION NO. 3
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-9

REV	DATE	BY	DESCRIPTION

SCALE: NTS

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DESIGNED P. JENKINS
DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

CENTER PIPE GALLERY
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-10

SHEET KEYNOTES

A. VALVE LOCAL CONTROL STATION (LCS) SHALL BE INTEGRAL TO VALVE ACTUATOR. COORDINATE LCS REQUIREMENTS WITH DIVISION 11.

B. NEW SECTION OF 2" PVC PIPING TO FACILITATE INSTALLATION OF NEW 30" RSL PIPE.

REV	DATE	BY	DESCRIPTION

SCALE: NTS

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DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

AERATION TANKS
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-11

6/9/22

ERIC J. SILVERMAN
No. 7090
REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

CDM Smith ProjectWise Project No: 93019-234214, NARRAGANSETT BAY COMMISSION, PHASE III COMBINED SEWER OVERFLOW PROGRAM
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DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec
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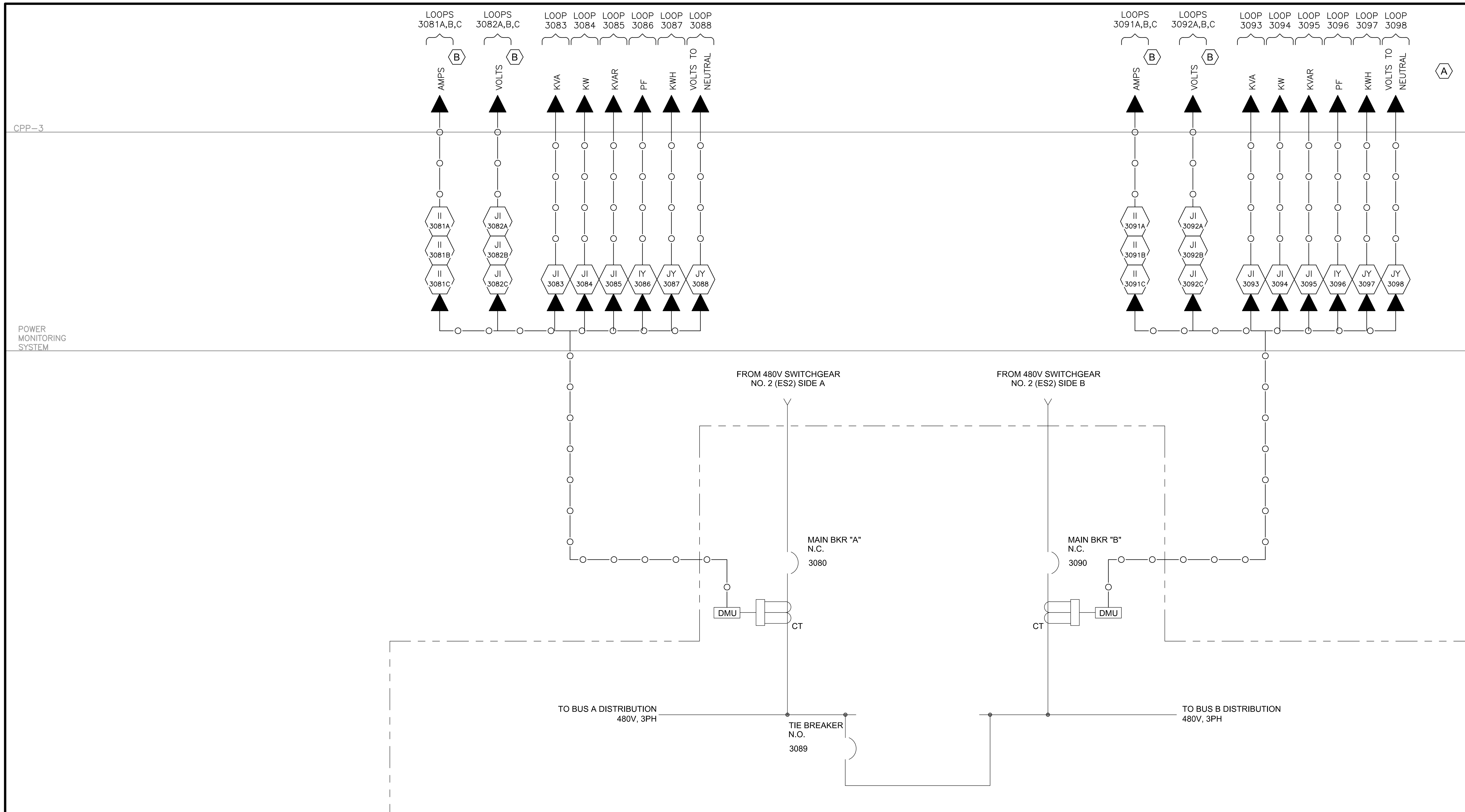
INSTRUMENTATION AND CONTROL

MISCELLANEOUS
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-12



SHEET KEYNOTES

A. NEW POINTS ADDED TO SCADA. EXISTING COMMUNICATION FROM CAT 6 POWER MONITORING ETHERNET SWITCH TO CPP-3 ETHERNET SWITCH.

B. VOLTAGE AND AMPERAGE MONITORED FOR ALL THREE PHASES.

6/9/22

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CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec
PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL

MCC-RSL POWER MONITORING
PROCESS & INSTRUMENTATION DIAGRAM

SHEET I-13

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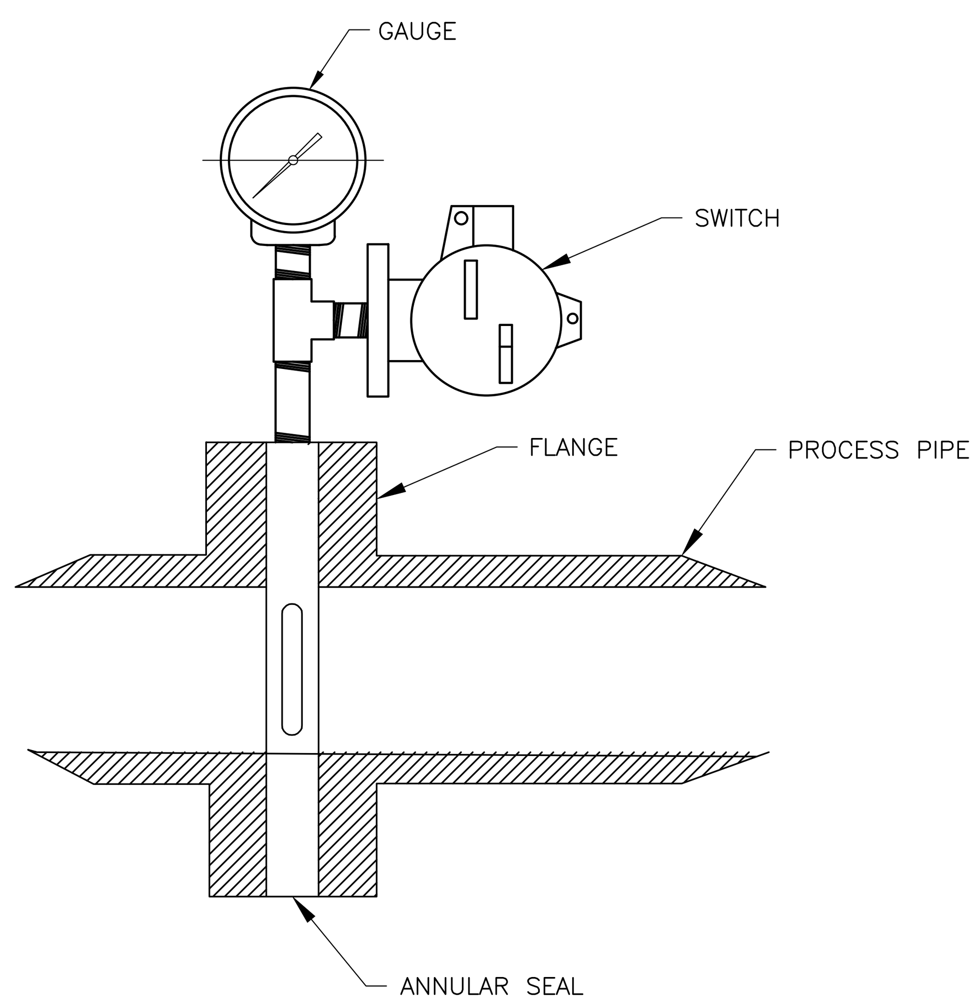
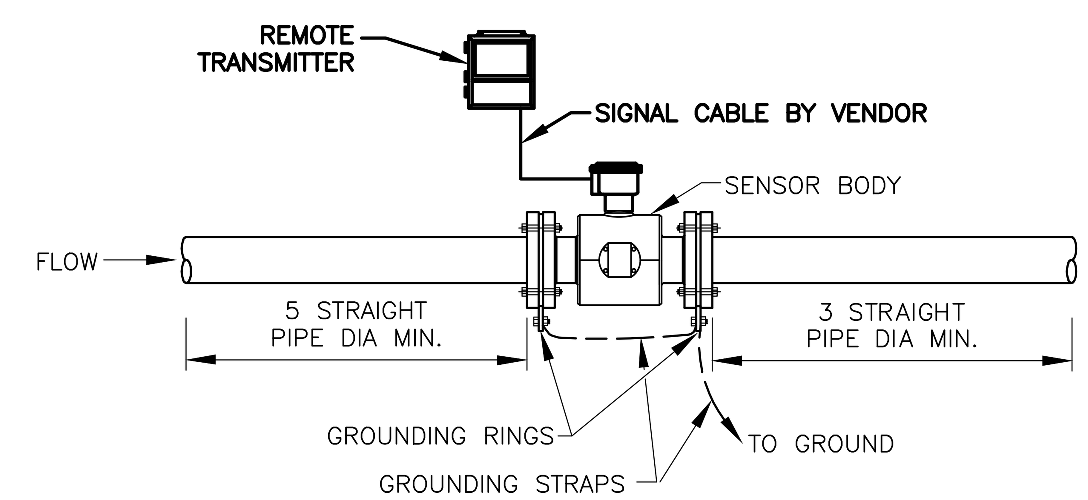


NOTES:

1. FOR PROPER OPERATION, EVACUATE SECTION BETWEEN DIAPHRAGM AND PRESSURE DEVICE OF AIR AND SEAL WITH OIL.
2. FOR PRESSURE TREE INSTALLATIONS WITH ONLY A PRESSURE GAUGE, REMOVE TEE FITTING AND PRESSURE SWITCH FROM THE ABOVE SHOWN INSTALLATION.
3. MANUFACTURE AND INSTALL ASSEMBLY SUCH THAT PRESSURE GAUGE IS ORIENTED VERTICALLY.

PRESSURE TRANSMITTER/SWITCH/GAUGE (WITH DIAPHRAGM SEAL)

DETAIL A –
NTS

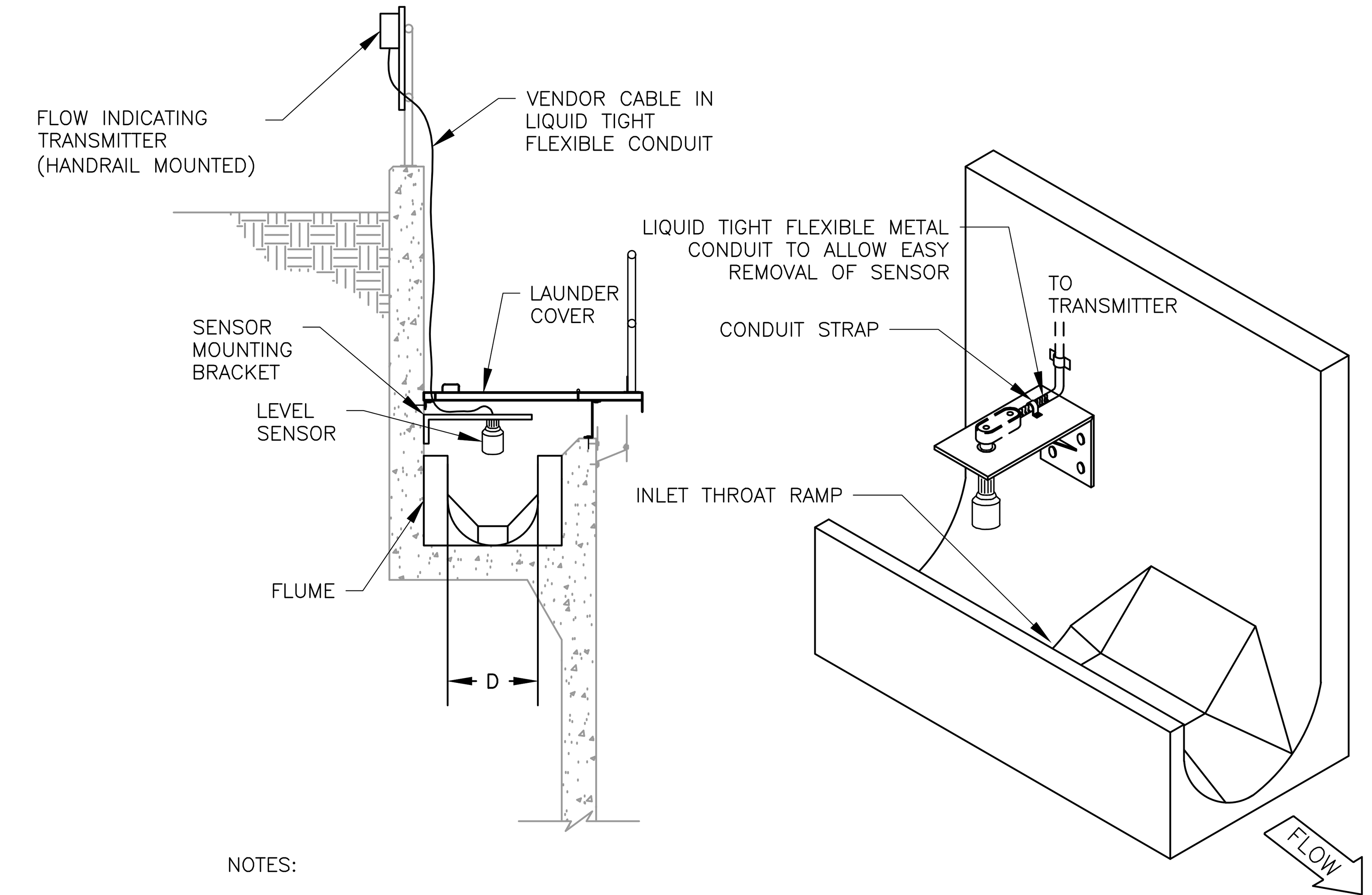


NOTES:

1. PROVIDE GROUNDING RING(S) AS RECOMMENDED BY MANUFACTURER.
2. PROVIDE SENSOR LINING TO PREVENT BUILDUP ON METER.

MAGNETIC FLOW METER

DETAIL B –
NTS

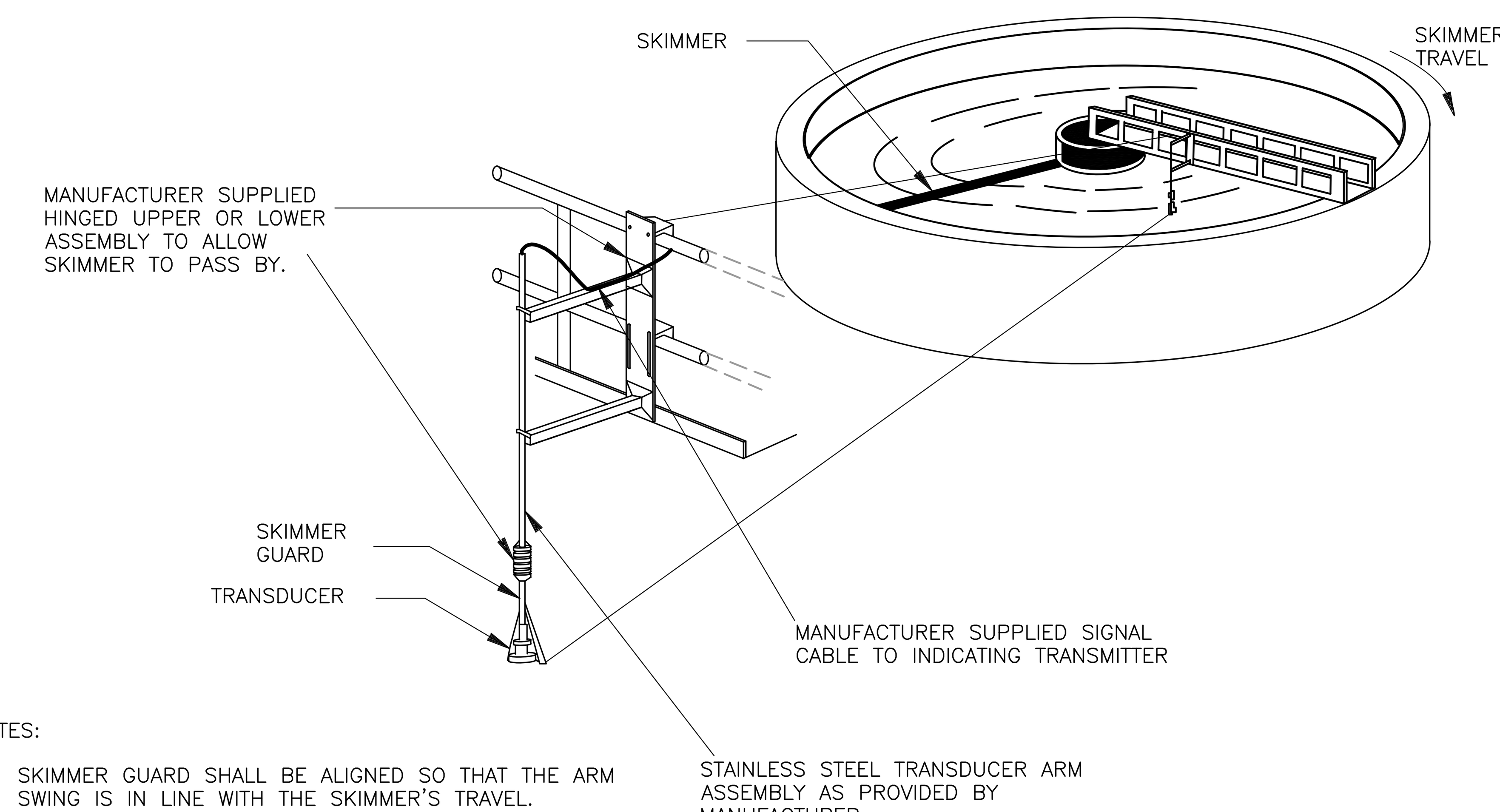


NOTES:

1. MOUNTING HARDWARE TO BE PROVIDED BY SENSOR MANUFACTURER. ALL MOUNTING HARDWARE TO BE 316 SS.
2. MOUNT LEVEL SENSOR IN THE MIDDLE OF THE WIDTH OF THE CHANNEL.
3. MOUNT LEVEL SENSOR D/2 LENGTH UPSTREAM OF THE BEGINNING OF THE INLET THROAT RAMP.

FLUME AND RADAR FLOW METER

DETAIL C –
NTS

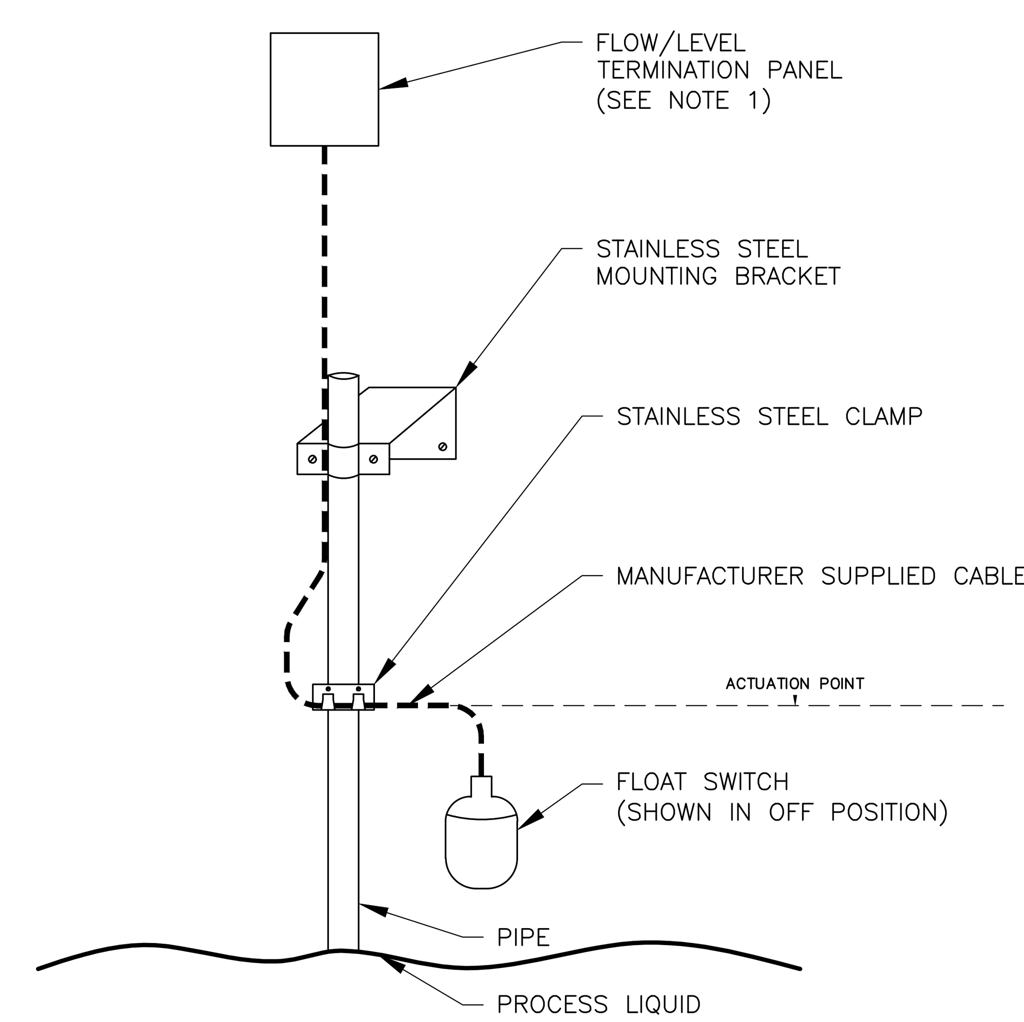


NOTES:

1. SKIMMER GUARD SHALL BE ALIGNED SO THAT THE ARM SWING IS IN LINE WITH THE SKIMMER'S TRAVEL.
2. TRANSDUCER MOUNTING SHALL BE COORDINATED WITH PLANT STAFF SUCH THAT THE TRANSDUCER FACE IS IMMERSED INTO THE CLARIFIER WATER IN ALL BASIN LEVEL CONDITIONS AS REQUIRED BY THE MANUFACTURER.
3. ROUTE TRANSDUCER CABLE FROM TRANSDUCER ARM THROUGH FLEXIBLE CONDUIT TO THE JUNCTION BOX (IF REQUIRED) IN A MANNER THAT DOES NOT INTERFERE WITH ARM MOTION.
4. ALL MOUNTING HARDWARE AND ASSEMBLIES SHALL BE 316 STAINLESS STEEL.

SLUDGE BLANKET LEVEL INSTRUMENT INSTALLATION

DETAIL D –
NTS

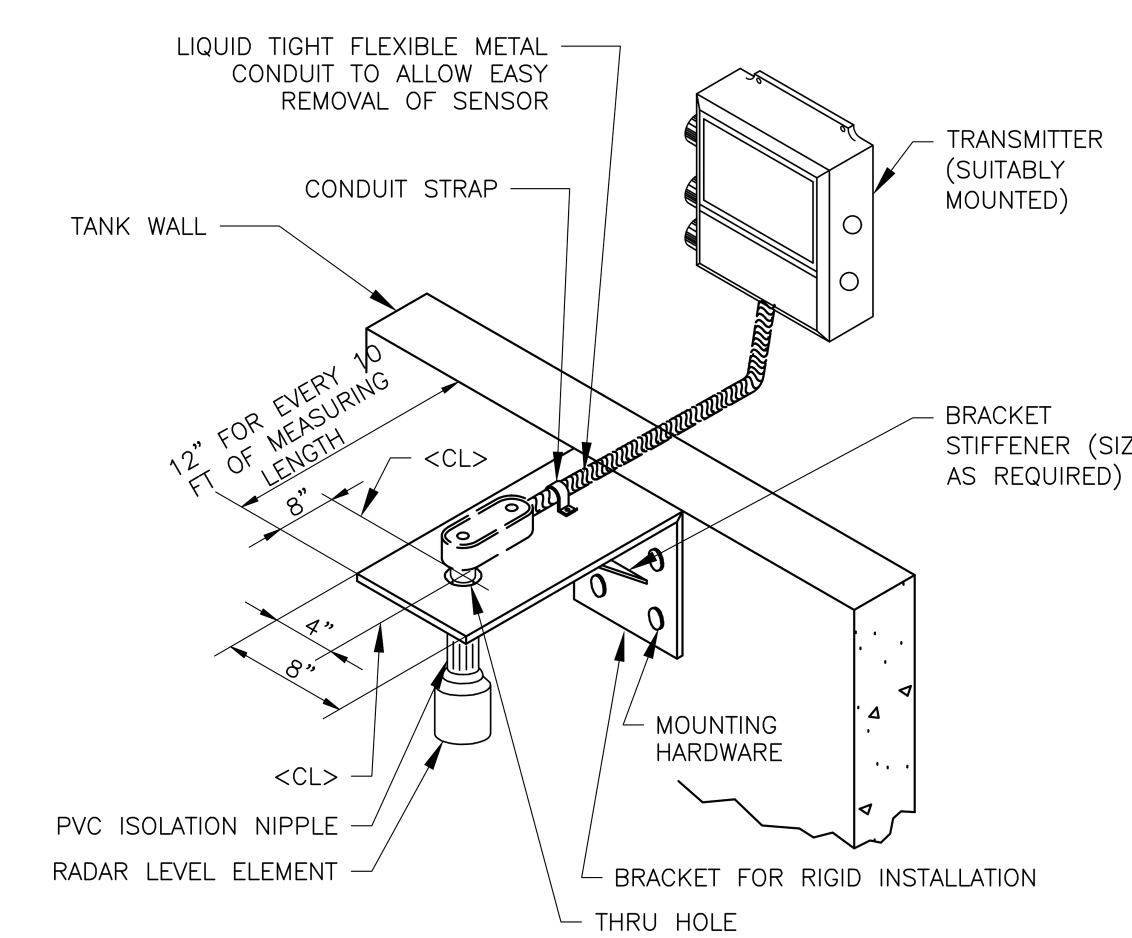


NOTES:

1. PROVIDE 15" X 15" MINIMUM SIZED FLOAT TERMINATION PANEL. PROVIDE J–HOOK INSIDE PANEL TO COIL EXTRA CABLE. PROVIDE TERMINATION BLOCKS. ALL CABLES AND WIRES SHALL BE LABELED.

FLOAT SWITCH (POLE MOUNTED)

DETAIL E –
NTS



RADAR LEVEL (OPEN CHANNEL/WALL MOUNT)

DETAIL F –
NTS

6/9/22
ERIC J. SILVERMAN
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REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

CDM Smith ProjectWise Project No: 93019-234214, NARRAGANSETT BAY COMMISSION, PHASE III COMBINED SEWER OVERFLOW PROGRAM
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DESIGNED P. JENKINS
DRAWN P. JENKINS
CHECKED E. SILVERMAN

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
PHASE III COMBINED SEWER OVERFLOW PROGRAM

Stantec PARE

NBC CONTRACT NO 308.10C
INSTRUMENTATION AND CONTROL
INSTALLATION DETAILS

SHEET I-14

NOTES:

1. "X" IN UV-SCC LOOP NUMBERS INDICATES UV CHANNEL BANK. "X" MAY BE A, B, C, OR D.
2. ALL UV-SCC I/O ACCESSIBLE TO SCADA NETWORK AND SYSTEM THROUGH FIBER/ETHERNET CONNECTIONS TO CPP-5 PNL1. SEE CONTROL SYSTEM ARCHITECTURE FOR DETAILS.
3. GATE LOCAL CONTROL STATION (LCS) IS INTEGRAL TO THE SLIDE GATE (SG) ACTUATOR.
4. 24VDC IS FED FROM ASSOCIATED PDC.
5. 120VAC UPS POWER FROM UV-SCC UPS.
6. GATE PROVIDED BY UV SYSTEM VENDOR (DIV. 11(UV)).

6/9/22

ERIC J. SILVERMAN No. 7090 REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

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DESIGNED BY: P. JENKINS
DRAWN BY: A. ALTHOUR
SHEET CHK'D BY: E. SILVERMAN
CROSS CHK'D BY: W. MCCONNELL
APPROVED BY: E. SILVERMAN
DATE: MAY 2022

FINAL DESIGN - JUNE 2022

CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO. 308.10C
ULTRAVIOLET DISINFECTION FACILITY
UV SYSTEM
PROCESS AND INSTRUMENTATION DIAGRAM

SHEET UV-I-1

CDM Smith ProjectWise Project No: 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
File: UV-I-1.DWG; Saved by: JENKINSP, 4/28/2022 11:44 AM; Plotted on: 6/10/2022 2:42 PM

NOTES:

1. TRANSMITTER RELAY CONTACTS FOR LOW-LEVEL INTERLOCK TO BE FAIL-SAFE. CONTACTS OPEN ON ALARM OR LOSS OF TRANSMITTER POWER.
2. GATE LOCAL CONTROL STATION (LCS) IS INTEGRAL TO THE SLIDE GATE (SG) ACTUATOR.
3. DRAIN PUMP DISCHARGE PIPING AND REDUCER SIZE TO BE BASED ON PUMP MANUFACTURER'S DISCHARGE SIZE.

6/9/22

ERIC J. SILVERMAN No. 7090 REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

REV	DATE	BY	DESCRIPTION

SCALE: NTS

WARNING: 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED BY: P. JENKINS
DRAWN BY: P. JENKINS
SHEET CHK'D BY: E. SILVERMAN
CROSS CHK'D BY: W. MCCONNELL
APPROVED BY: E. SILVERMAN
DATE: MAY 2022

FINAL DESIGN - JUNE 2022

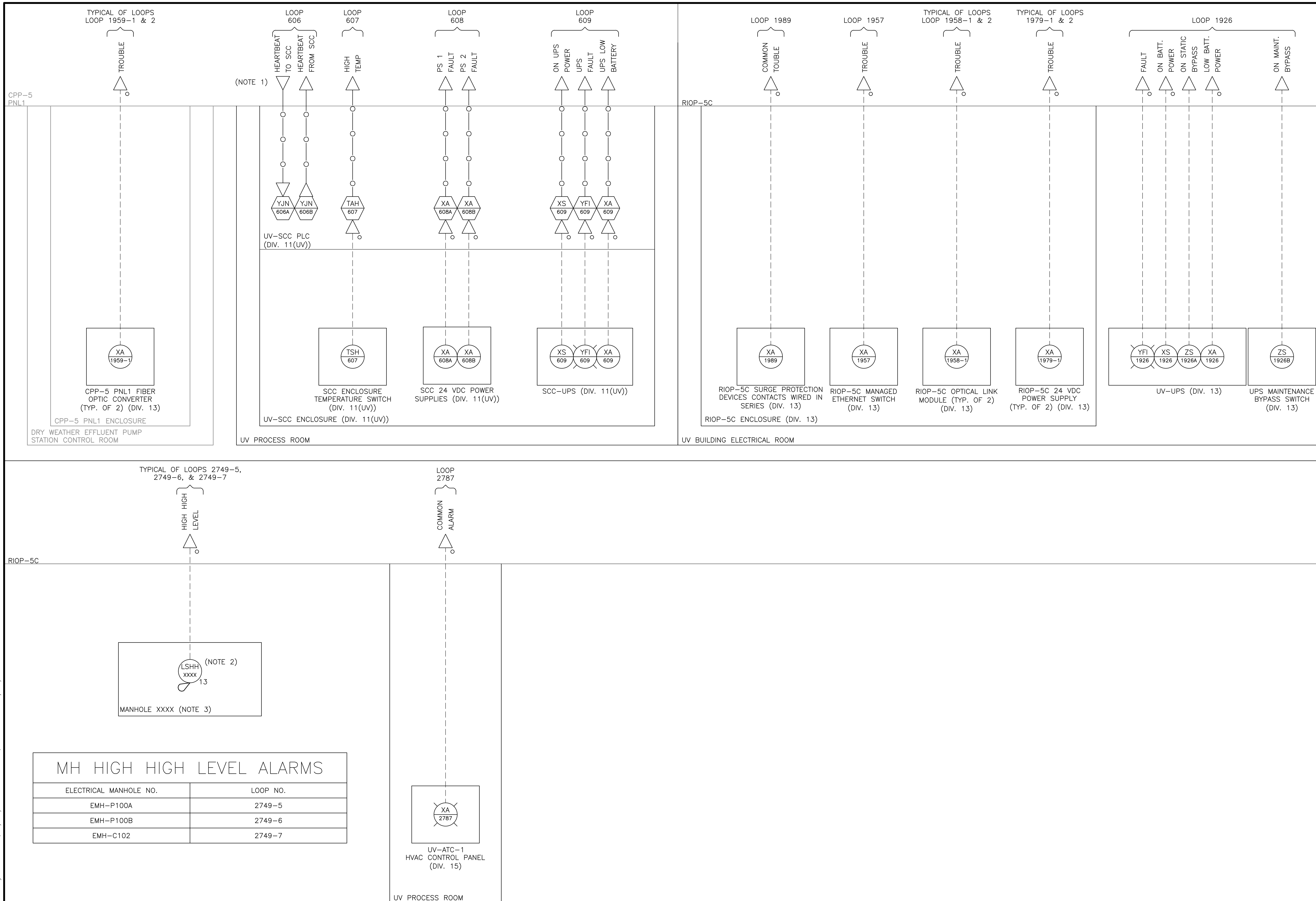
CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
Tel: (401) 751-5360

Narragansett Bay Commission

NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO. 308.10C
ULTRAVIOLET DISINFECTION FACILITY
EFFLUENT FLOOD PUMP STATION
PROCESS & INSTRUMENTATION DIAGRAM

SHEET UV-I-2



NOTES:

1. ALL UV SCC I/O ACCESSIBLE TO SCADA NETWORK AND SYSTEM THROUGH ETHERNET CONNECTIONS TO CPP-5 PNL1. SEE CONTROL SYSTEM ARCHITECTURE FOR DETAILS.
2. SEE TABLE FOR LOOP NUMBER.
3. SEE TABLE FOR MANHOLE NUMBER.

MH HIGH HIGH LEVEL ALARMS

ELECTRICAL MANHOLE NO.	LOOP NO.
EMH-P100A	2749-5
EMH-P100B	2749-6
EMH-C102	2749-7

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260 West Exchange Street, Suite 300
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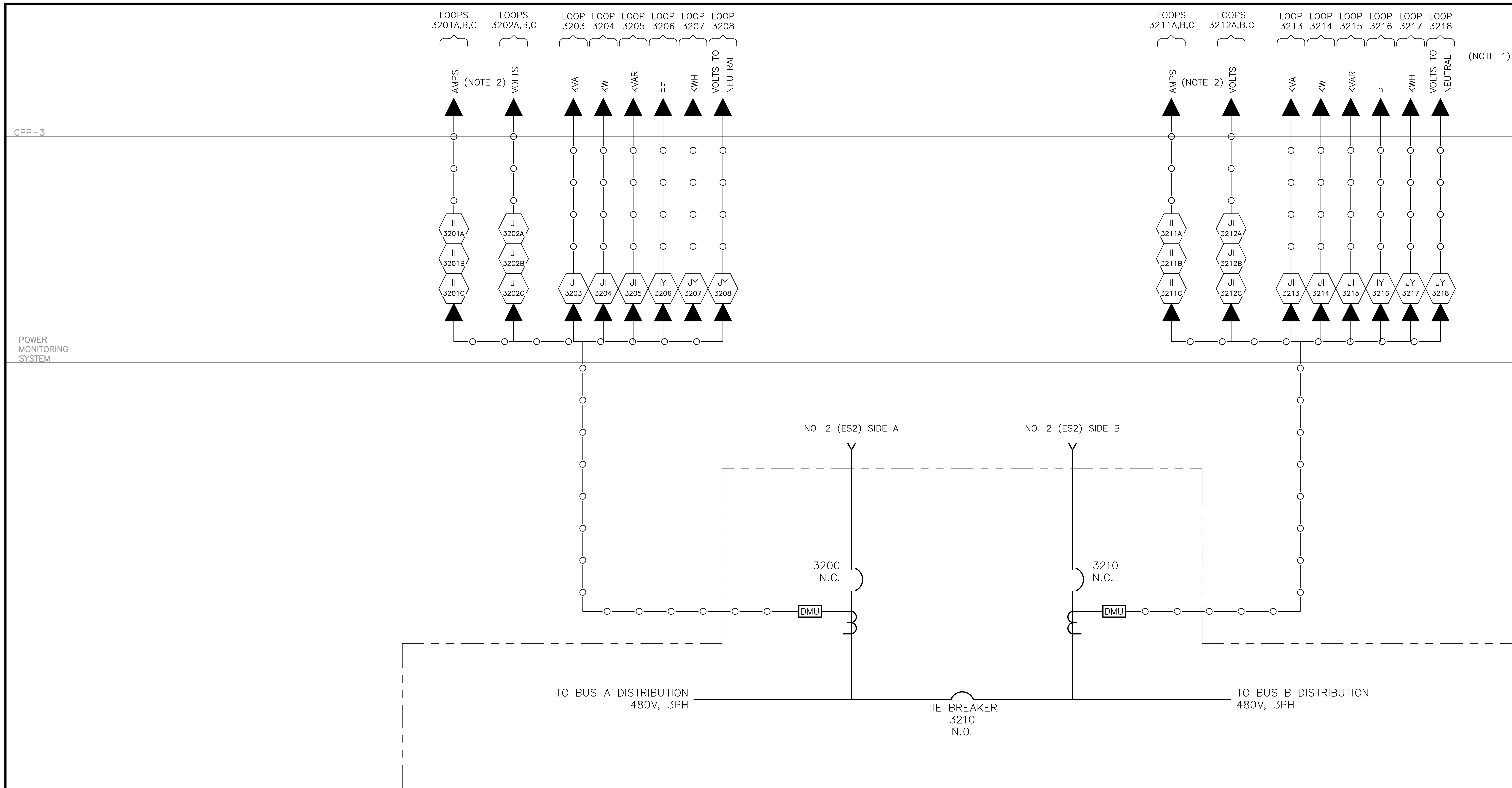
BUCKLIN POINT
WASEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO. 308.10C
ULTRAVIOLET DISINFECTION FACILITY
MISCELLANEOUS IO
PROCESS & INSTRUMENTATION DIAGRAM

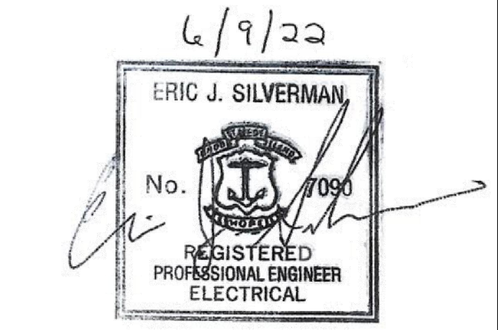
SHEET UV-I-3



NOTES:

1. NEW I/O ADDED TO SCADA EXISTING COMMUNICATIONS FROM POWER MONITORING ETHERNET SWITCH TO CPP-3 ETHERNET SWITCH.
2. VOLTAGE AND AMPERAGE MONITORED FOR ALL THREE PHASES.

6/9/22



CDM Smith ProjectWise Project No: 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
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REV	DATE	BY	DESCRIPTION

SCALE: NTS

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260 West Exchange Street, Suite 300
Providence, RI 02903
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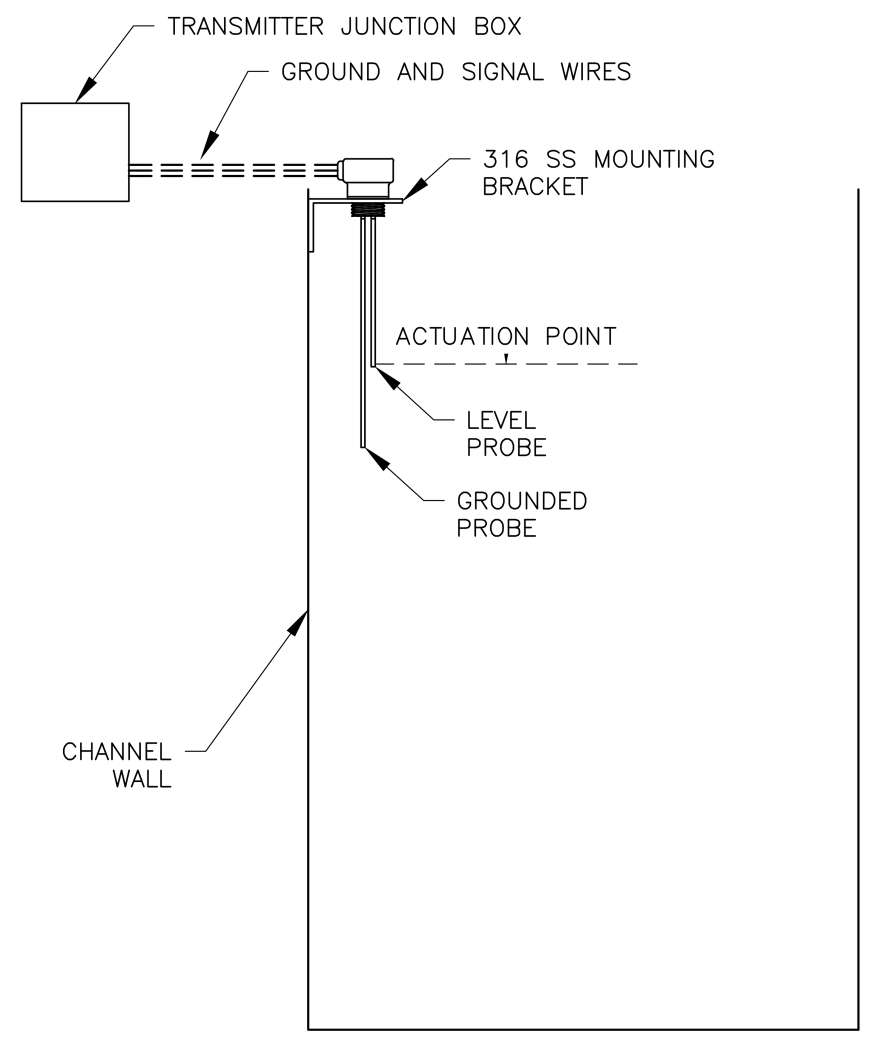
NARRAGANSETT BAY COMMISSION
BUCKLIN POINT
WASEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO. 308.10C
ULTRAVIOLET DISINFECTION FACILITY
MCC - UV POWER MONITORING
PROCESS & INSTRUMENTATION DIAGRAM

SHEET
UV-I-4

NOTES:
1. REFER TO I-14 FOR RADAR LEVEL SENSOR AND FLOAT SWITCH INSTALLATION DETAILS.



ELECTRODE LEVEL SWITCHES

DETAIL A –
NTS

6/9/22
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CDM Smith ProjectWise Project No: 1469-230770, NARRAGANSETT BAY COMMISSION, BUCKLIN POINT WASTEWATER TREATMENT FACILITY
File: UV-I-5.DWG; Saved by: JENKINSP, 4/28/2022 11:46 AM; Plotted on: 6/10/2022 2:43 PM

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CDM Smith
260 West Exchange Street, Suite 300
Providence, RI 02903
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BUCKLIN POINT
WASEWATER TREATMENT FACILITY
ULTRAVIOLET DISINFECTION FACILITY

NBC CONTRACT NO. 308.10C

INSTALLATION DETAILS

SHEET
UV-I-5

NOTES:

1. LIT/FIT-630 AND LE-630 REPLACE EXISTING LEVEL-BASED FLOW ELEMENT AND TRANSMITTER (FIT-630 AND FE-630B). NEW FLOW SIGNAL REPLACES OLD FLOW SIGNAL, BUT WILL BE WIRED TO EXISTING SPARE I/O. MAINTAIN EXISTING INSTRUMENTATION, SIGNAL, AND ASSOCIATED CONTROL LOGIC UNTIL NEW INSTRUMENTATION HAS BEEN FULLY TESTED. REFER TO SPECIFICATION SECTION 13612.

6/9/22

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DRY WEATHER EFFLUENT PUMP STATION
PROCESS AND INSTRUMENTATION DIAGRAM

SHEET EP-I-1