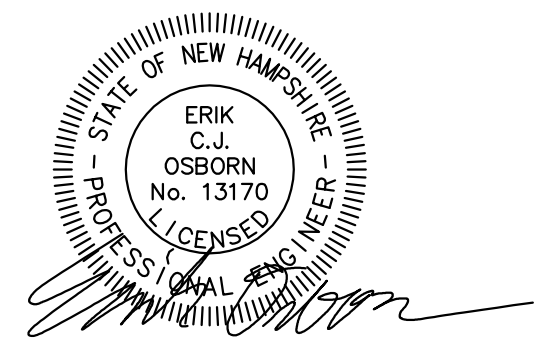


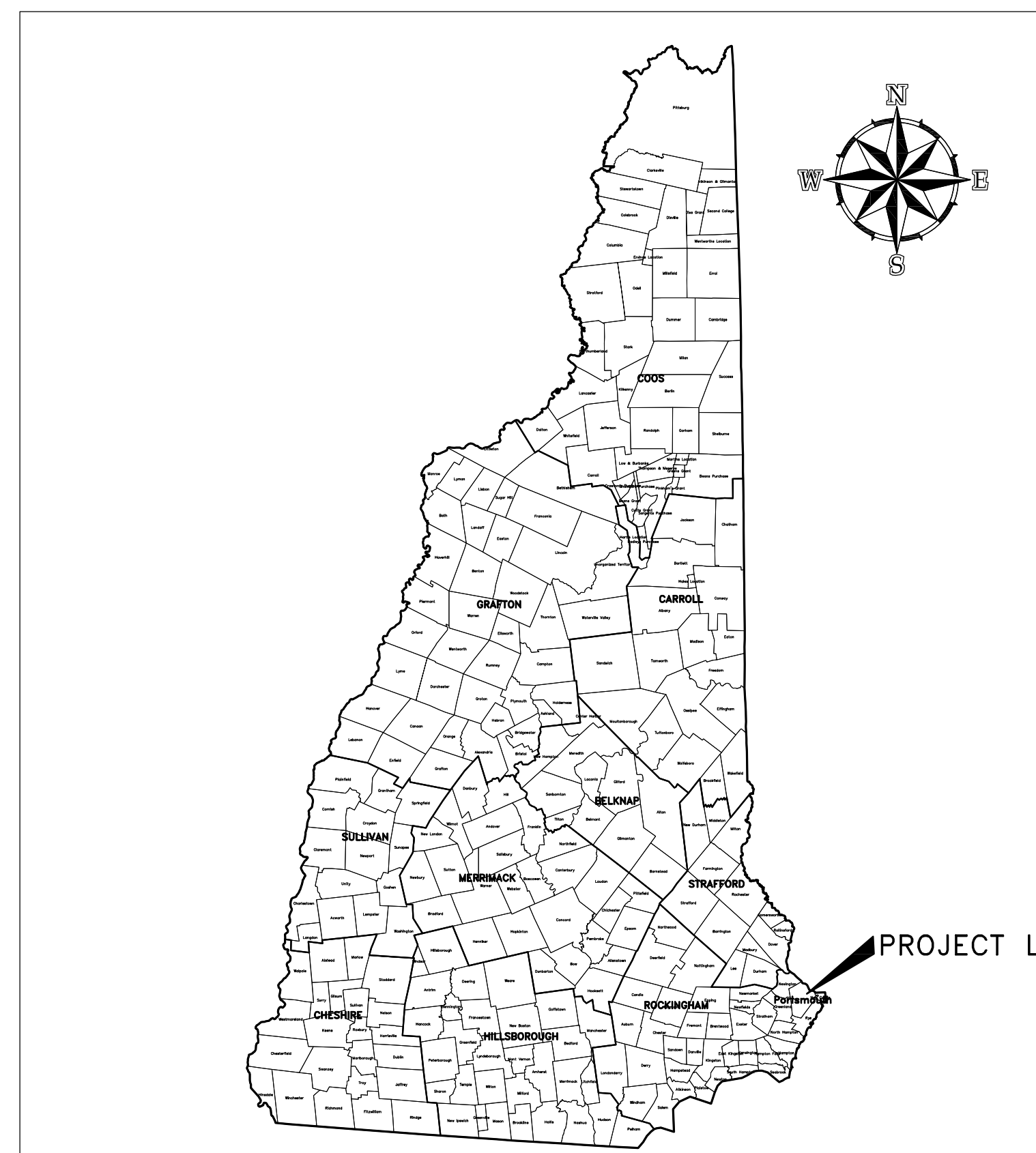
# CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS NEW HAMPSHIRE LAFAYETTE ROAD PUMP STATION UPGRADES



**PROJECT NO. 227872.00**

**BID SET**

**FEBRUARY 2017**



**PROJECT LOCATION MAP**

50 0 50 100  
scale mile



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Portland, Maine 04102  
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**COMMITMENT & INTEGRITY DRIVE RESULTS**



SITE LOCATION

SOURCE: USGS TOPOGRAPHIC MAP

**SITE LOCATION MAP**

1 0 1  
scale mile  
2000 0 2000 4000  
scale feet



### LEGEND

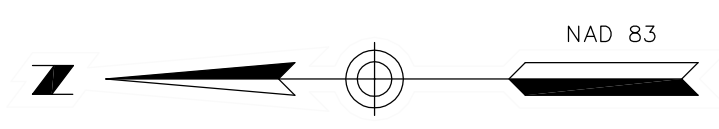
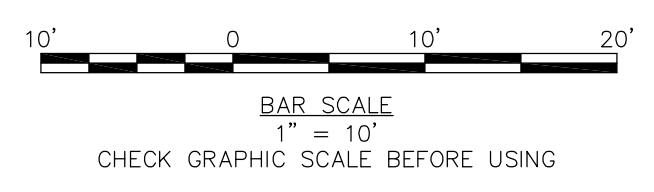
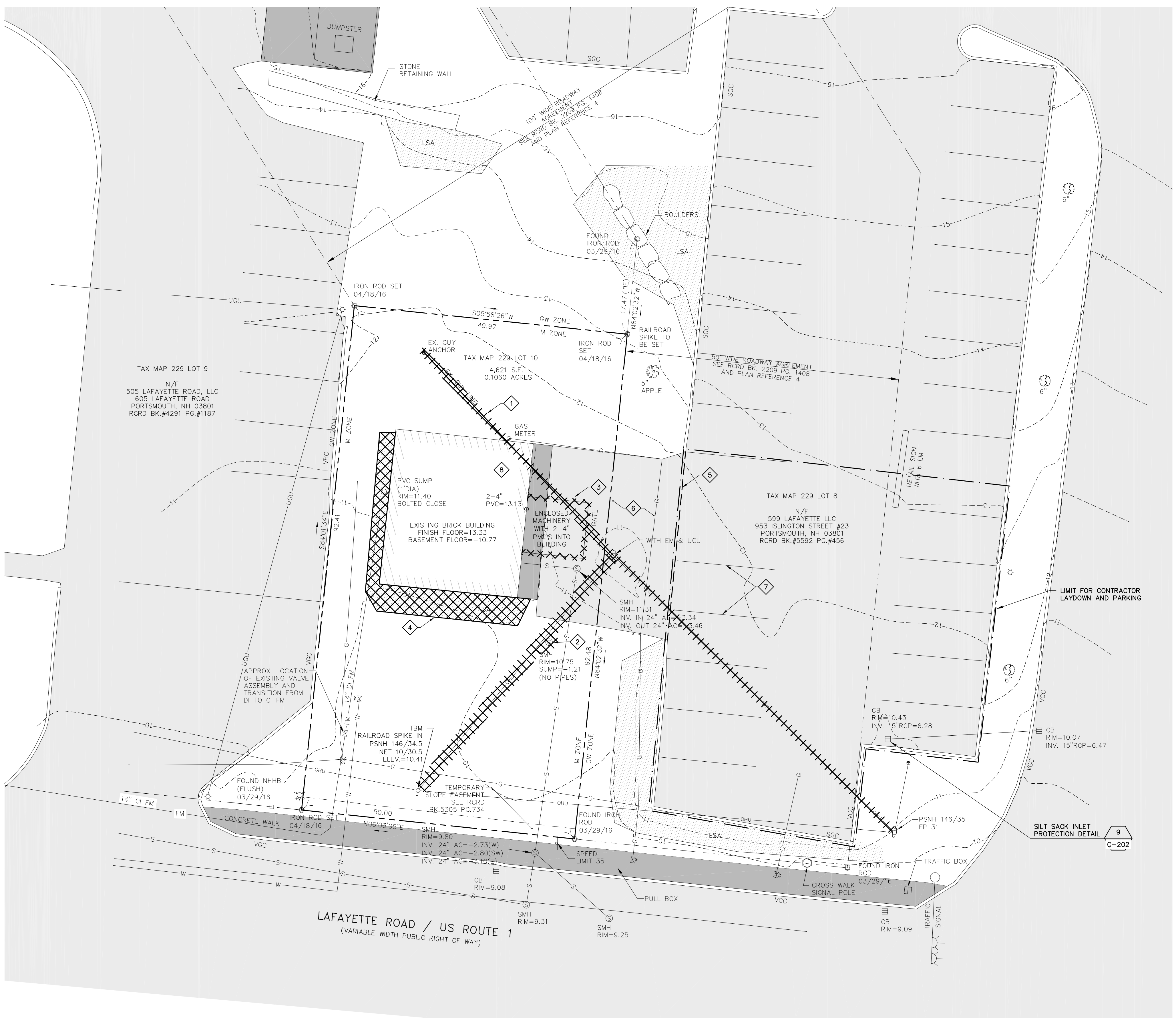
- PROPERTY LINE
- OHU OVERHEAD UTILITIES
- S SEWER LINE
- W WATER LINE
- UGU UNDERGROUND UTILITIES
- G GAS LINE
- FM FORCE MAIN
- CHAIN LINK FENCE
- WOOD STOCKADE FENCE
- UTILITY POLE
- GUY WIRE
- SEWER MANHOLE
- HYDRANT
- LIGHT POST ON CONCRETE BASE
- WATER VALVE
- GAS VALVE
- SIGN
- CATCH BASIN
- DECIDUOUS TREE
- TAX MAP 229 LOT 10 ASSESSOR'S MAP & LOT NUMBER
- CONCRETE
- LANDSCAPED AREA
- PAVEMENT
- ITEMS TO BE DEMOLISHED
- SAWCUT
- LIMIT OF CONSTRUCTION LAYDOWN

### ABBREVIATIONS

- AC ASBESTOS CONCRETE PIPE
- BK./PG. BOOK/PAGE
- CB CATCH BASIN
- DIA DIAMETER
- ELEV ELEVATION
- EM ELECTRIC METER
- GW GATEWAY ZONE
- GM GAS METER
- INV. INVERT
- LSA LANDSCAPED AREA
- M MUNICIPAL ZONE
- NET NEW ENGLAND TELEPHONE
- NHHB NEW HAMPSHIRE HIGHWAY BOUND
- N/F NOW OF FORMERLY
- PVC POLYVINYL CHLORINE
- PSMH PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
- RCP REINFORCED CONCRETE PIPE
- SGC SLOPED GRANITE CURB
- SMH SEWER MANHOLE
- S.F. SQUARE FEET
- TBM TEMPORARY BENCH MARK
- VBC VERTICAL BITUMINOUS CURB
- VCC VERTICAL CONCRETE CURB
- VGC VERTICAL GRANITE CURB
- UGU UNDERGROUND UTILITIES

### DEMOLITION KEYED NOTES

- 1 COORDINATE REMOVAL OF EXISTING GUY WIRE UTILITY POLE AND ASSOCIATED HARDWARE WITH EVERSOURCE. SEE ELECTRICAL DWGS.
- 2 REMOVE EXISTING MANHOLE FRAME, COVER AND MANHOLE CONE SECTION AND ABANDONED MANHOLE. INFILL WITH SUITABLE FILL AND PROVIDE 4" LOAM AND SEED.
- 3 REMOVE EXISTING CHAIN LINK ENCLOSURE AND EXISTING MACHINERY. SEE SHEET D-101.
- 4 REMOVE EXISTING LANDSCAPING
- 5 SAWCUT EXISTING PAVEMENT.
- 6 REMOVE EXISTING PAVEMENT.
- 7 REMOVE PAVEMENT MARKINGS.
- 8 CONTRACTOR TO COORDINATE WITH CITY REGARDING REMOVAL AND REINSTALLATION OF RAIN GAUGE.

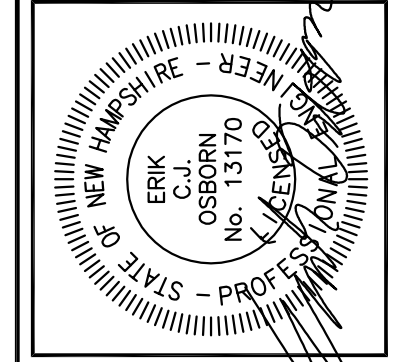


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REV	DESCRIPTION	DATE

DESIGNED BY: NTD  
DRAWN BY: NTD  
CHECKED BY: MKC  
2/28/2017 CD-101.DWG

## EXISTING SITE DEMOLITION PLAN

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

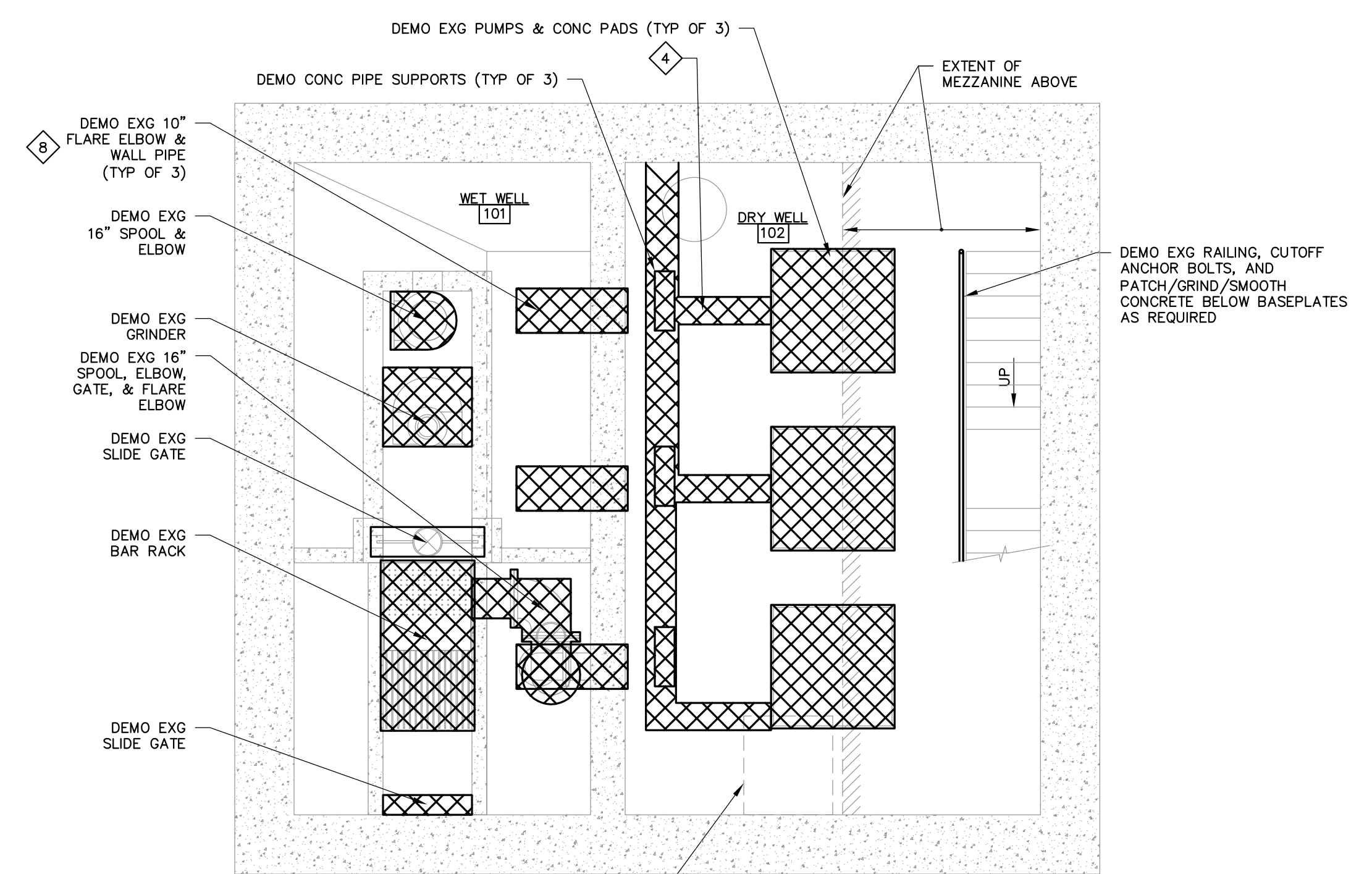
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: 1"=10'  
SHEET: 2 OF 67

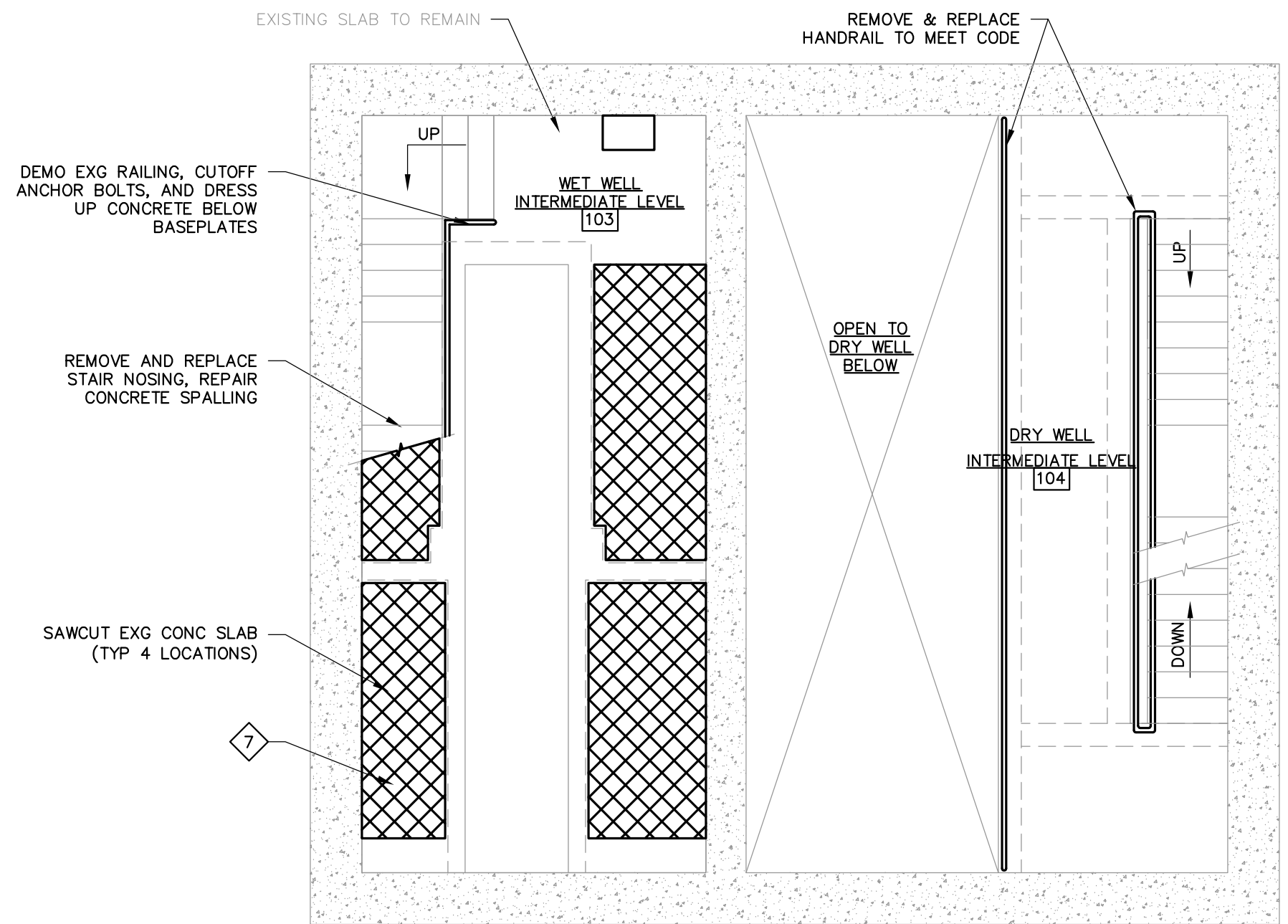
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BID SET

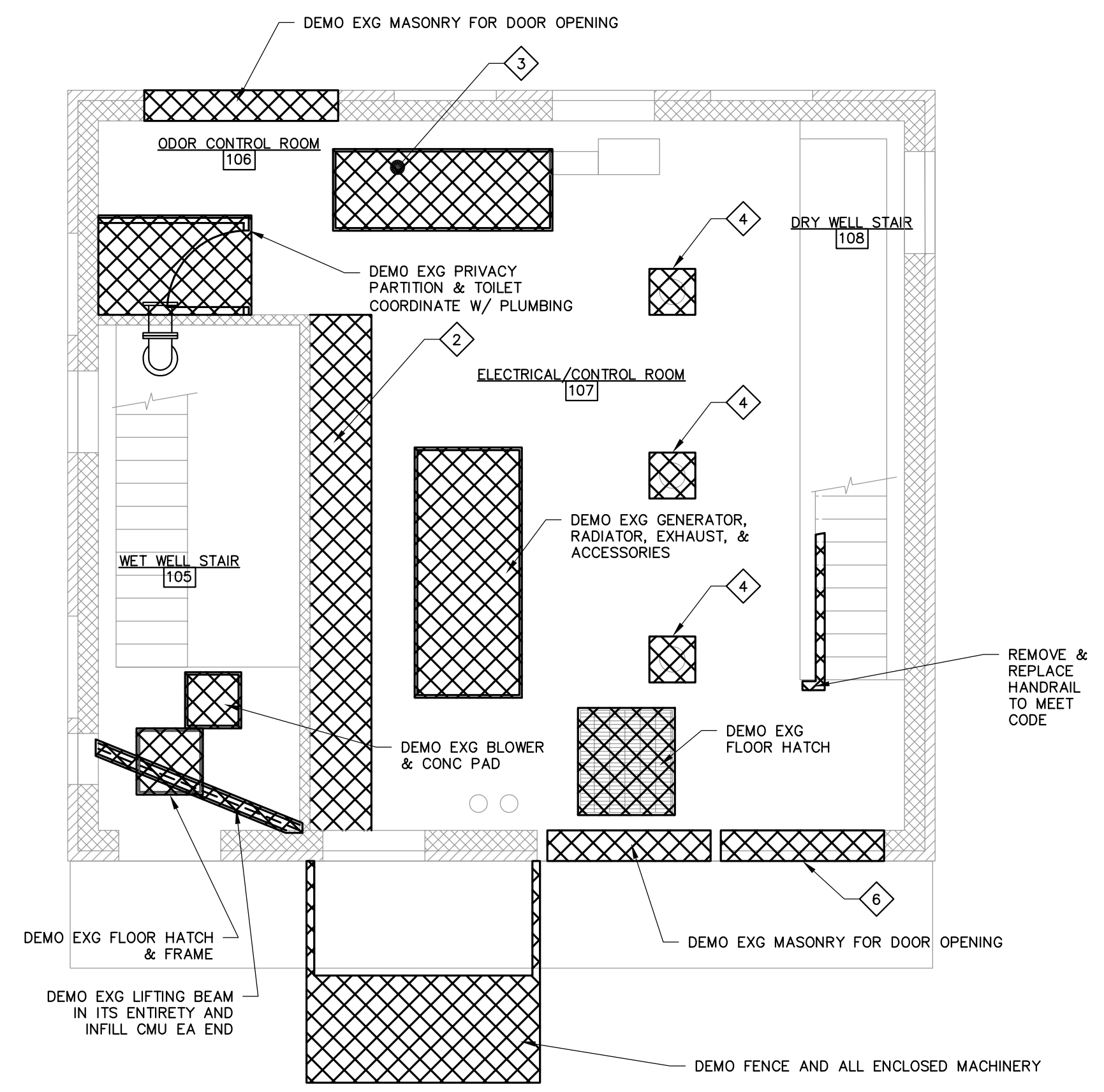
A  
 B  
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 D  
 \\woodardcurran.net\shares\Projects\227872\_Portsmouth\_NH - Lafayette\_Road\_P\_S\_Upgrade\wp\227872\_01\_Lafayette\_Rd\_P\_S\_Final\_Design\_Drawings\Civil\227872010-CD-101.dwg, Jan. 30, 2017 - 11:32pm



**BASEMENT LEVEL DEMOLITION PLAN**  
SCALE: 1/4" = 1'-0"

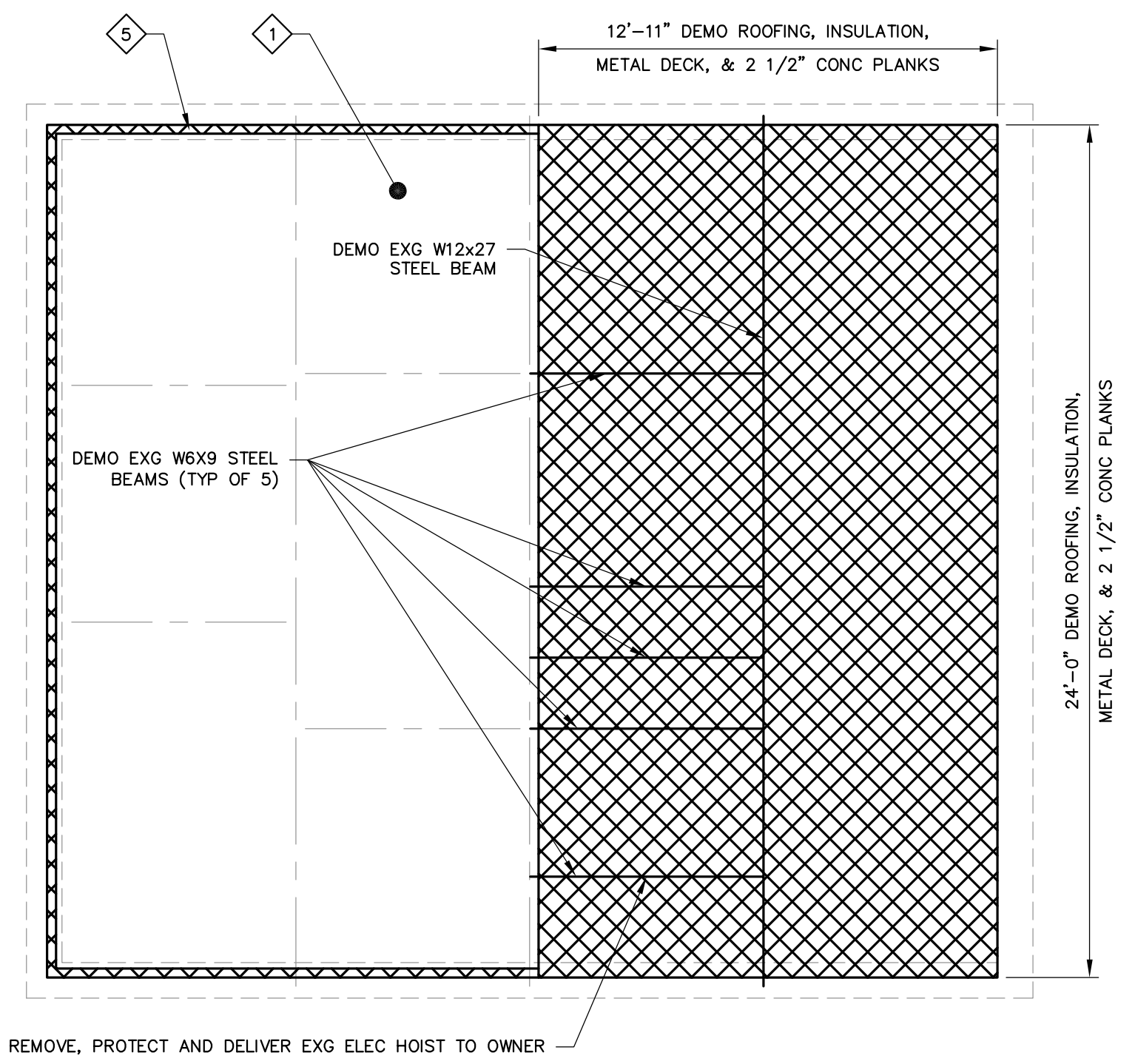


**INTERMEDIATE LEVEL DEMOLITION PLAN**  
SCALE: 1/4" = 1'-0"



NOTE: ALL DEFECTIVE CONCRETE SURFACES (HOLES, ANCHOR BOLTS, CRACKS, SPALLS, ETC) WHICH EXIST IN WALLS AND FLOORS WHERE EQUIPMENT OR ITEMS WERE DEMOLISHED SHALL BE REPAIRED/FILLED PER SPECIFICATION 03 01 05 AND CONCRETE REPAIR NOTES ON SHEET S-101.

**GRADE LEVEL DEMOLITION PLAN**  
SCALE: 1/4" = 1'-0"



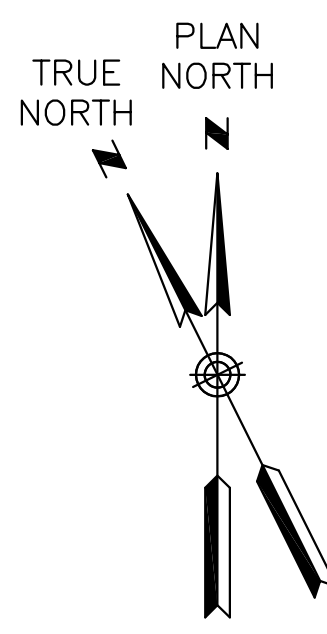
**ROOF DEMOLITION PLAN**  
SCALE: 1/4" = 1'-0"

**DEMOLITION KEYED NOTES**

- 1 DEMOLISH ALL EXISTING ROOFING MATERIALS INCLUDING BUT NOT LIMITED TO MEMBRANE ROOFING AND RIGID INSULATION DOWN TO EXISTING METAL DECK WHICH SHALL REMAIN.
- 2 DEMOLISH EXISTING ELECTRICAL GEAR EQUIPMENT PADS AS NEEDED TO SUIT NEW EQUIPMENT.
- 3 DEMOLISH EXISTING FUEL STORAGE TANK, ALL ASSOCIATED PIPING, ELECTRICAL LINES TO THEIR SOURCE, AND 2'-6"x2'-0" Wx1'-0" D CONCRETE PAD. RETURN RESIDUAL FUEL TO OWNER.
- 4 DEMOLISH EXISTING PUMPS, MOTORS, PIPING, VALVES, SHAFTS, ASSOCIATED GUARDS, ACCESSORIES, AND CONCRETE PADS.
- 5 SAW-CUT PERIMETER OF EXISTING 2 1/2" PRECAST ROOF PLANK AS REQUIRED FOR INSTALLATION OF NEW MASONRY AND REINFORCING. ALLOW A MINIMUM OF 2" BEARING TO REMAIN ALONG WEST WALL.
- 6 DEMOLISH EXISTING DOOR, FRAMES, LINTEL, AND INFILL WITH MASONRY TO MATCH EXISTING. PROVIDE SOLID GROUTED PIER WITH REINFORCING AS SHOWN ON STRUCTURAL DRAWINGS.
- 7 COORDINATE DEMOLITION OF EXISTING FLOOR SLAB WITH GRATING LAYOUT ON S-101. SAW-CUT USING TOOLS THAT RESULT IN CLEAN, SQUARE CORNERS - NO OVER-CUTS ARE PERMITTED BEYOND FINISHED OPENINGS. ANY SPALLING SHALL BE PATCHED. ANY CUT/EXPOSED REBAR SHALL BE REPAIRED AS FOLLOWS: CORE A 2" DIAMETER X 2" DEEP HOLE CENTERED ON REBAR; CHIP OUT ALL CONCRETE WITHIN CORE TO 2" DEPTH; BURN OR CUT BACK REBAR TO 2" DEPTH; PLUG 2" DIAMETER VOID WITH GROUT.
- 8 INSPECT CONDITION OF EXG WALL PIPE PRIOR TO DEMOLITION, IN THE PRESENCE OF THE ENGINEER. DEMOLISH EXG 10" FLARE ELBOW AND WALL PIPE. DEMOLITION SHALL NOT CUT AT EXISTING WALL REINFORCING AND SHALL BE DONE BY CHIPPING AROUND WALL PIPE. DEMOLITION METHOD SHALL BE APPROVED BY THE ENGINEER.

**LEGEND**

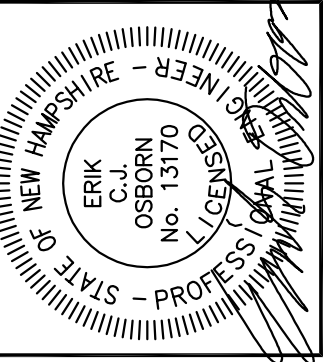
EQUIPMENT/ITEMS TO BE DEMOLISHED



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REV	DESCRIPTION	DATE

DESIGNED BY: SJJ  
DRAWN BY: SJJ

CHECKED BY: JPS/TCS  
DATE: 2/28/2017

**DEMOLITION PLANS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 3 OF 67

**D-101**

BID SET

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EXISTING DRY WELL EXHAUST FAN



EXISTING DRY WELL FAN AND DUCTING



EXISTING UNIT HEATER AND EXHAUST DUCTING

**HVAC DEMOLITION NOTES:**

- 1. THE INTENT OF THE DEMOLITION PLANS IS TO IDENTIFY EXISTING CONDITIONS. HOWEVER, ALL HVAC DEVICES MAY NOT NECESSARILY BE INDICATED ON THE DRAWINGS. FIELD VERIFY AND ADJUST WORK TO SUIT ALL CONDITIONS FOUND.
- 2. ALL ITEMS INDICATED FOR REMOVAL SHALL BE REMOVED WITH ALL ASSOCIATED HARDWARE AND ACCESSORIES COMPLETE BACK TO SOURCE. ALL FLOOR AND WALL PENETRATIONS NOT TO BE RE-USED SHALL BE IN-FILLED AND BROUGHT TO A FINISHED APPEARANCE.
- 7. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXISTING SITE CONDITIONS AND EXTENT OF HVAC DEMOLITION.

**HVAC KEYED NOTES:**

- 1 REMOVE AND DISPOSE OF EXISTING FAN W/ ALL APPURTENANCES AND CONTROLS.
- 2 REMOVE AND RETURN UNIT HEATER TO OWNER W/ ALL APPURTENANCES AND CONTROLS.
- 3 REMOVE AND DISPOSE OF EXISTING LOUVERS AND ASSOCIATED DAMPERS, FAN, AND DUCTWORK W/ ALL APPURTENANCES INCLUDING GRILLS AND DAMPERS.
- 4 REMOVE AND DISPOSE OF EXISTING LOUVERS AND ASSOCIATED DAMPERS, FAN, AND DUCTWORK W/ ALL APPURTENANCES INCLUDING GRILLS AND DAMPERS.
- 5 REMOVE AND DISPOSE GAS PIPING UP TO OUTSIDE METER. CAP PIPING AT METER.

**LEGEND**

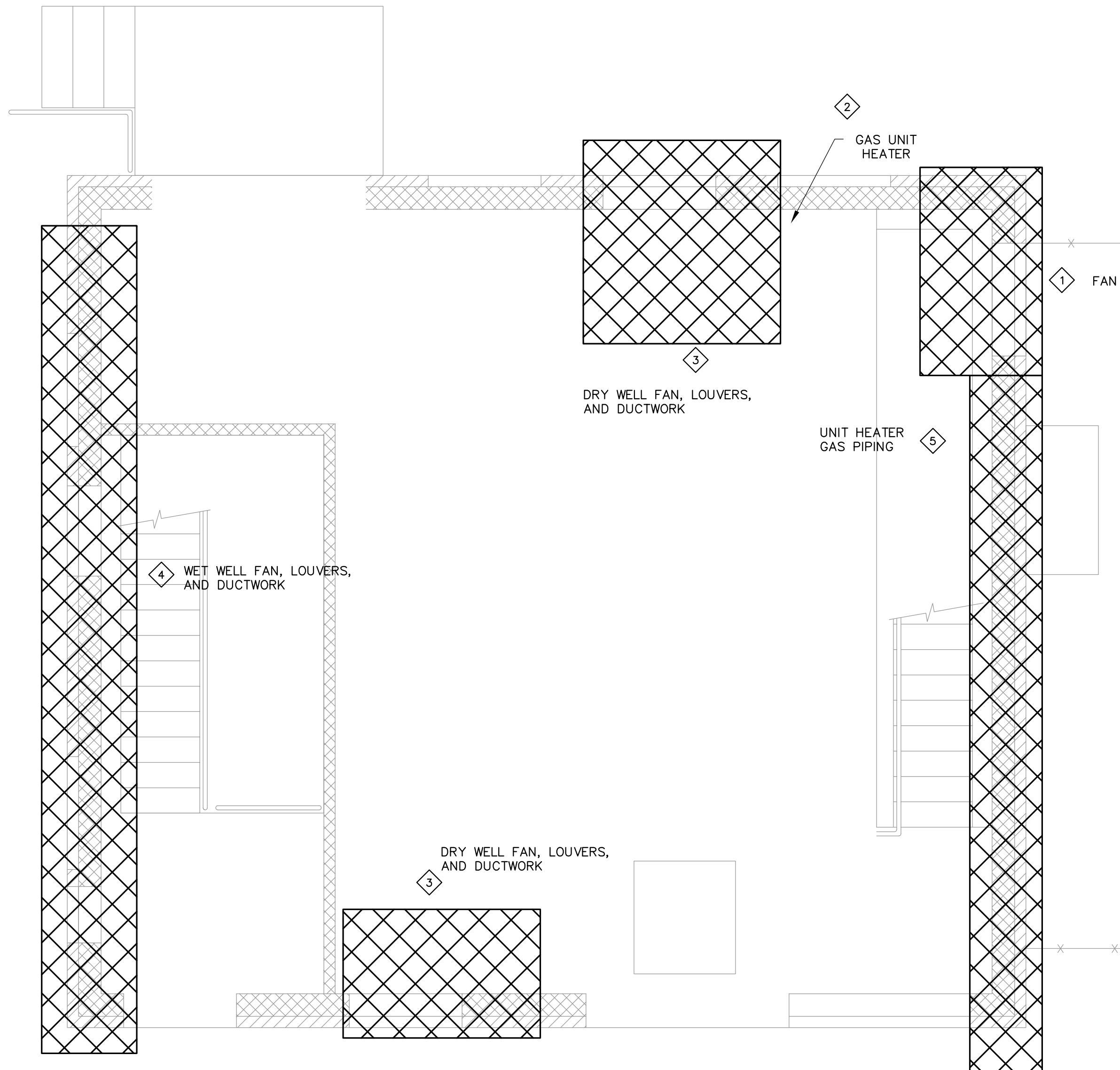
EQUIPMENT/ITEMS TO BE DEMOLISHED



DRY WELL DUCTING



EXHAUST DUCTING



**HVAC DEMOLITION PLAN**

SCALE: 3/8" = 1'-0"



EXTERIOR LOUVERS

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STATE OF NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER  
ERIK C. OSBORN  
No. 13170  
LEGEND

REV	DESCRIPTION	DATE

DESIGNED BY: BMT  
DRAWN BY: BMT  
CHECKED BY: MJS  
DATE: 2/28/17  
PROJECT: 227872-00

**HVAC DEMOLITION PLAN**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 4 OF 67

**D-102**

BID SET

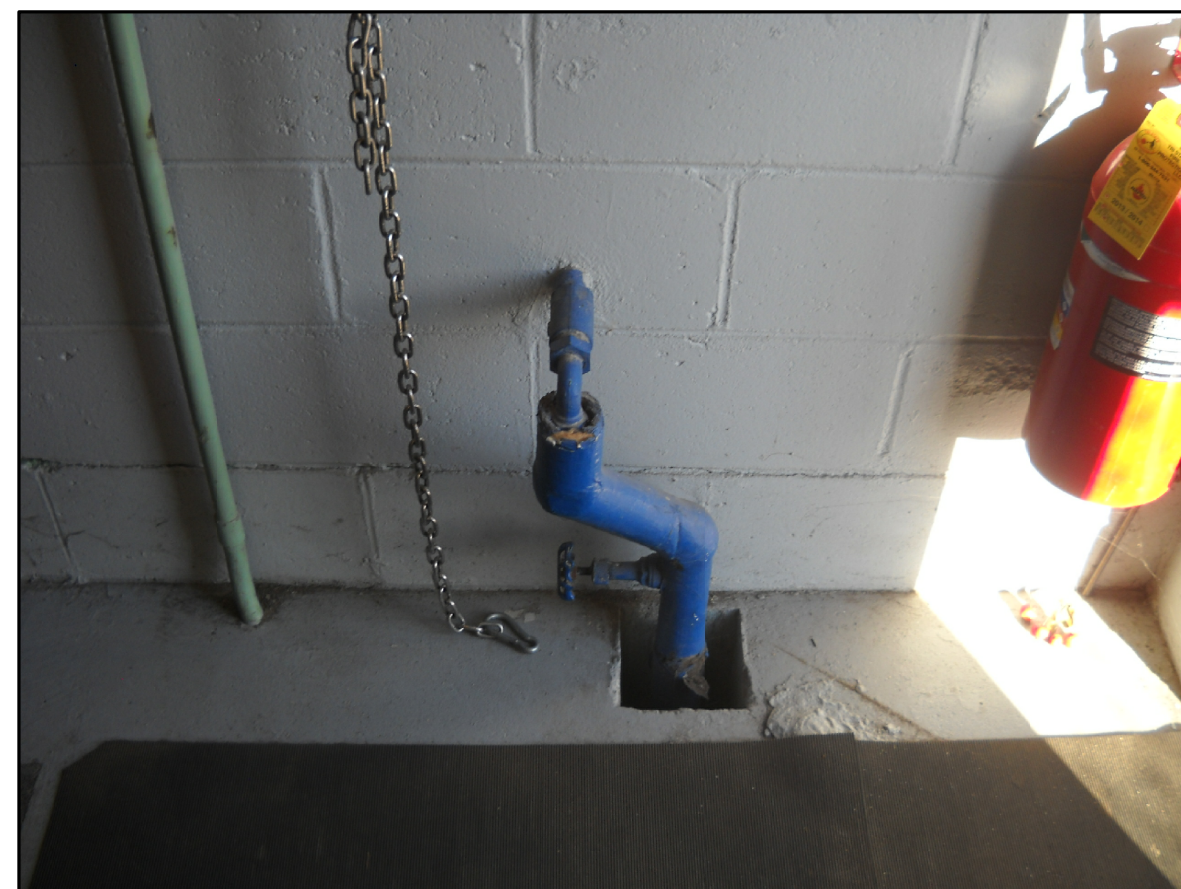
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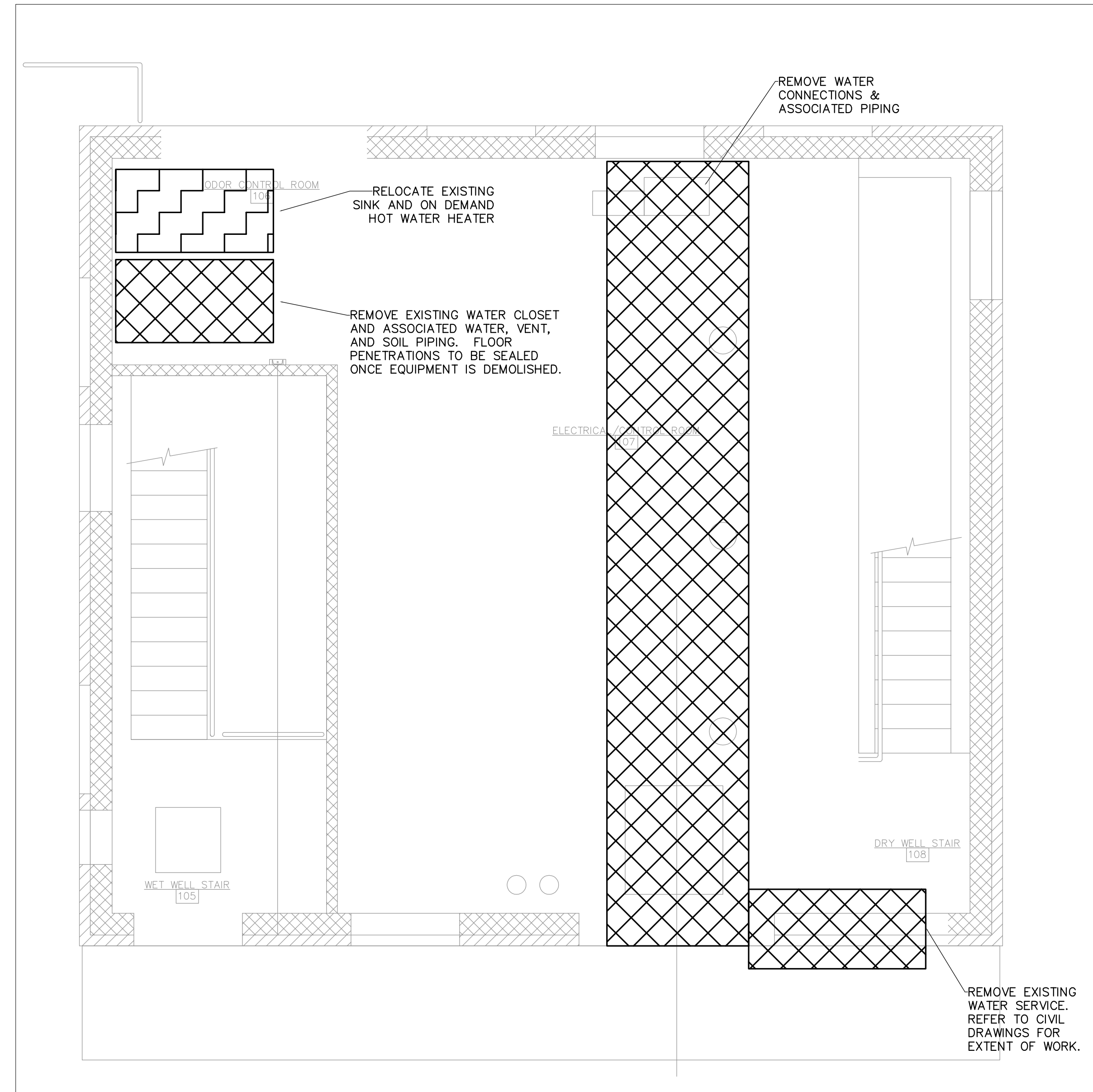
EXISTING WATER CLOSET, SINK, AND HOT WATER HEATER.



EXISTING HOSE BIBB CONNECT.



EXISTING WATER PIPING.



**PLUMBING PLAN  
DEMOLITION**

SCALE: 3/8" = 1'-0"

**PLUMBING GENERAL NOTES**

1. ALL WORK SHALL CONFORM TO CURRENT NEW HAMPSHIRE CODES.
2. THE INTENT OF THE DEMOLITION PLAN IS TO IDENTIFY EXISTING CONDITIONS. HOWEVER, ALL PLUMBING DEVICES MAY NOT NECESSARILY BE INDICATED ON THE DRAWINGS. FIELD VERIFY AND ADJUST WORK TO SUIT ALL CONDITIONS FOUND.
3. ALL HATCHED ITEMS ARE TO BE REMOVED AND DISPOSED OR RELOCATED.
4. ALL ITEMS INDICATED FOR REMOVAL SHALL BE REMOVED WITH ALL ASSOCIATED HARDWARE AND ACCESSORIES COMPLETE BACK TO SOURCE. ALL FLOOR AND WALL PENETRATIONS NOT TO BE REUSED SHALL BE FILLED AND BROUGHT TO A FINISHED APPEARANCE.
5. DEMO ALL EXISTING PIPING FROM WATER METER TO EXISTING FIXTURES.
6. DEMO EXISTING WATER CLOSET AND RELOCATE EXISTING SINK.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXISTING SITE CONDITIONS AND EXTENT OF PLUMBING DEMOLITION.

**LEGEND**

- EQUIPMENT/ITEMS TO BE DEMOLISHED
- EQUIPMENT/ITEMS TO BE RELOCATED



EXISTING WATER SERVICE ENTRANCE.

A

B

C

D

\\woodardcurran.net\shared\Projects\227872\_PerkinsRoad\PS Upgrade\wfa\_227872\_01\_Lafayette\_Rd\PS Final Design\Drawings\Plumbing\227872\_P-1010.dwg, Jan 30, 2017 - 1:34pm

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STATE OF NEW HAMPSHIRE - PROFESSIONAL SEAL

ERIK C. W. OSBORN  
No. 13170  
LICENSED PLUMBER

REV	DESCRIPTION	DATE

DESIGNED BY: BMT  
DRAWN BY: BMT

CHECKED BY: MJS  
DATE: 2/28/17 P-1010.DWG

**PLUMBING  
DEMOLITION PLAN**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS NOTED
SHEET: 5 OF 67

**D-103**

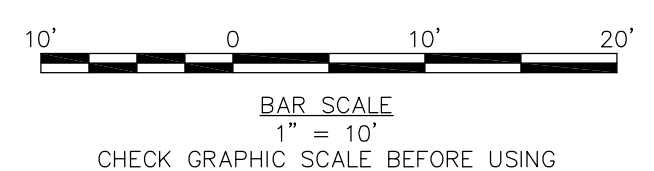
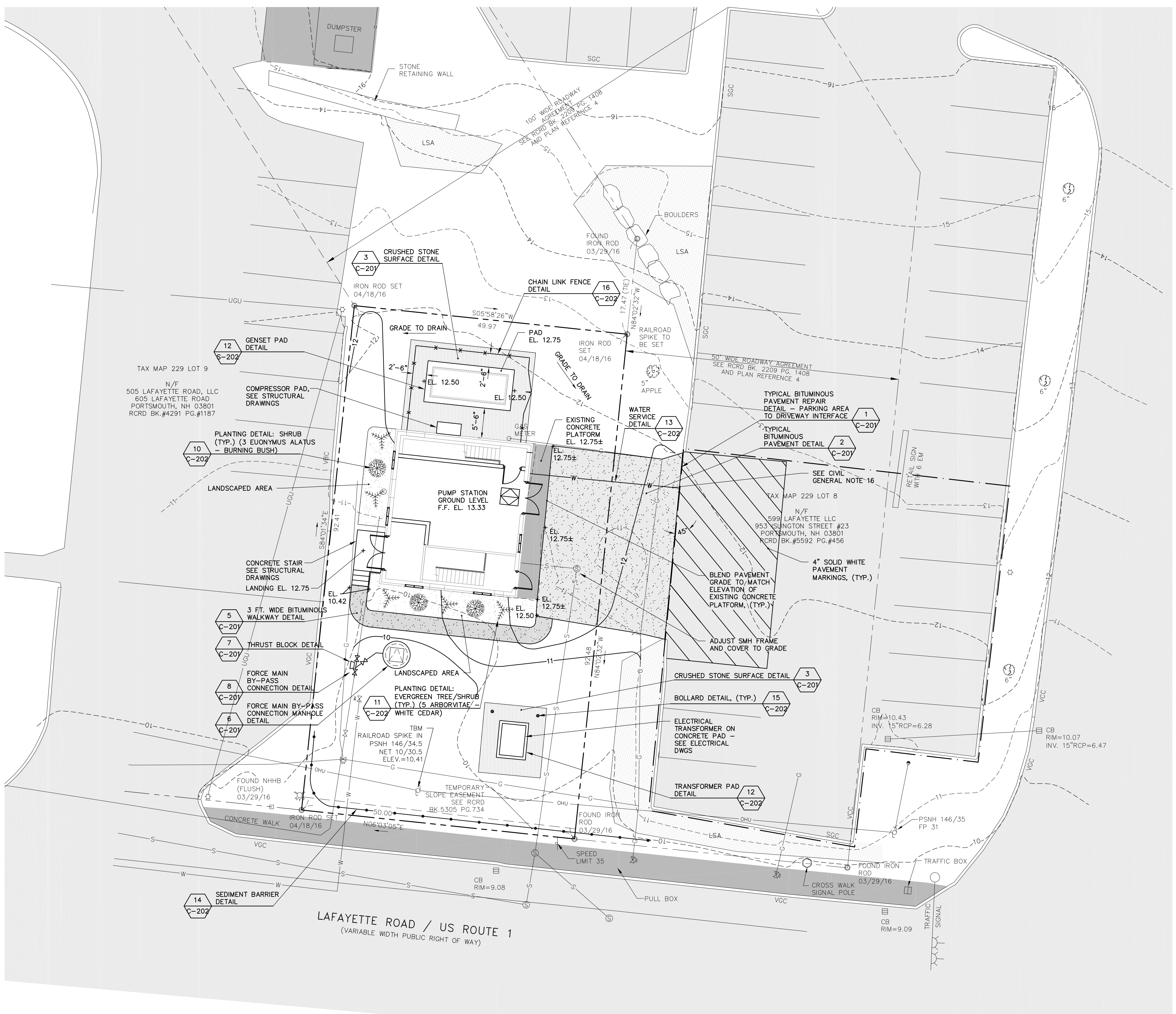
BID SET

LEGEND

- PROPERTY LINE
- OHU OVERHEAD UTILITIES
- S SEWER LINE
- W WATER LINE
- UGU UNDERGROUND UTILITIES
- G GAS LINE
- FM FORCE MAIN
- CHAIN LINK FENCE
- WOOD STOCKADE FENCE
- UTILITY POLE
- GUY WIRE
- SEWER MANHOLE
- HYDRANT
- LIGHT POST ON CONCRETE BASE
- WATER VALVE
- GAS VALVE
- SIGN
- CATCH BASIN
- DECIDUOUS TREE
- TAX MAP 229 LOT 10 ASSESSOR'S MAP & LOT NUMBER
- EXISTING CONCRETE
- EXISTING LANDSCAPED AREA
- PROPOSED LANDSCAPED AREA
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED CRUSHED STONE SURFACE
- PROPOSED SEDIMENT BARRIER
- LIMIT OF CONSTRUCTION LAYDOWN

CIVIL GENERAL NOTES

1. CONTRACTOR SHALL SAFELY SECURE THE SITE WITH SECURITY FENCING. SEE LIMITS OF CONSTRUCTION LAYDOWN. FENCING SHALL BE LOCKED DURING NON-WORK HOURS. OWNER SHALL BE PROVIDED KEYS TO SECURITY FENCING IN ORDER TO ACCESS THE PUMP STATION DURING NON-WORKING HOURS.
2. TOPOGRAPHIC WORK PERFORMED BY MFC AND DATED APRIL 8, 2016. ALL ELEVATIONS BASED UPON UNITED STATES GEOLOGICAL SURVEY (USGS) DATUM.
3. LOCATION OF UNDERGROUND UTILITIES (EXISTING PIPE, STRUCTURE, ELECTRICAL, ETC.) ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS PRIOR TO START OF CONSTRUCTION.
4. COORDINATE CONSTRUCTION ACTIVITY WITH UTILITY COMPANIES, "DIG SAFE", ENGINEER, AND OWNER. CONTRACTOR SHALL NOTIFY ALL UTILITIES PRIOR TO COMMENCING WORK TO ALLOW SUFFICIENT TIME TO LOCATE AND MARK THE LOCATION OF ALL BURIED UTILITIES. CONTRACTOR SHALL CONTACT "DIG SAFE" PRIOR TO ANY CONSTRUCTION ACTIVITIES. REPAIR OF ANY DAMAGED UTILITY WILL BE INCIDENTAL.
5. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL FINISH (GRAVEL, PAVEMENT, RIPRAP, GRASS, ETC.) UNLESS OTHERWISE NOTED ON THE PLANS. RESTORATION OF ALL AREAS DAMAGED BY CONTRACTOR OPERATIONS SHALL BE INCIDENTAL TO THE PROJECT.
6. EXISTING FACILITIES (I.E. TREES, POLES, SIGNS, CURBING, ETC.) SHALL BE REMOVED AND REPLACED OR PROTECTED AS REQUIRED DURING CONSTRUCTION. ASSOCIATED COSTS ARE INCIDENTAL TO THE PROJECT.
7. PROTECT AND DO NOT DISTURB PROPERTY IRONS AND MONUMENTS. IF DISTURBED, RESET AT CONTRACTOR'S EXPENSE, BY A LICENSED LAND SURVEYOR REGISTERED IN THE STATE OF NEW HAMPSHIRE.
8. ALL MATERIAL SHALL BE FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.
9. INSULATE ALL SEWER, FORCE MAINS, AND WATER MAINS WHICH HAVE LESS THAN 5 FEET OF COVER OR WHERE DIRECTED BY ENGINEER. RIGID INSULATION REQUIRED: 2 INCH THICK, BY 4 FT. WIDE, UNLESS OTHERWISE NOTED. COSTS ASSOCIATED WITH INSULATION ARE INCIDENTAL TO CONTRACT.
10. FOR DEMOLITION, SEE DEMOLITION SHEETS IN ADDITION TO SPECIFIC DRAWINGS.
11. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL SERVICE WORK AND REMOVAL OF UNUSED EXISTING POLES WITH EVERSOURCE. REFER TO ELECTRICAL DRAWINGS FOR MORE DETAILS.
12. CONTRACTOR OFFICES, STORAGE AND PARKING SHALL BE LOCATED WITHIN LIMITS INDICATED ON PLANS UNLESS OTHERWISE PERMITTED BY OWNER AND ENGINEER.
13. EROSION CONTROL REQUIREMENTS SHALL BE IN PLACE PRIOR TO THE START OF DEMOLITION ACTIVITIES.
14. HAZARDOUS MATERIAL ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
15. PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE TRAFFIC PAINT MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. LINE SHALL BE 4" WIDE DIAGONAL WHITE LINES 3'-0" ON CENTER BORDERED BY 4" WIDE WHITE LINES.
16. REMOVE AND REPLACE 2" WATER SERVICE TO EDGE OF PAVEMENT REPAIR. CONTRACTOR TO FIELD VERIFY SERVICE LOCATION.



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NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER

ERIC C. OSBORN  
No. 13170

STATE OF NEW HAMPSHIRE - REGISTERED PROFESSIONAL LAND SURVEYOR

ERIC C. OSBORN  
No. 13170

REV	DESCRIPTION	DATE

DESIGNED BY: NTD  
DRAWN BY: NTD  
CHECKED BY: MKC  
DATE: 2/29/2017

**PROPOSED SITE PLAN**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: 1"=10'
SHEET: 6 OF 67

**C-101**

BID SET

A

B

C

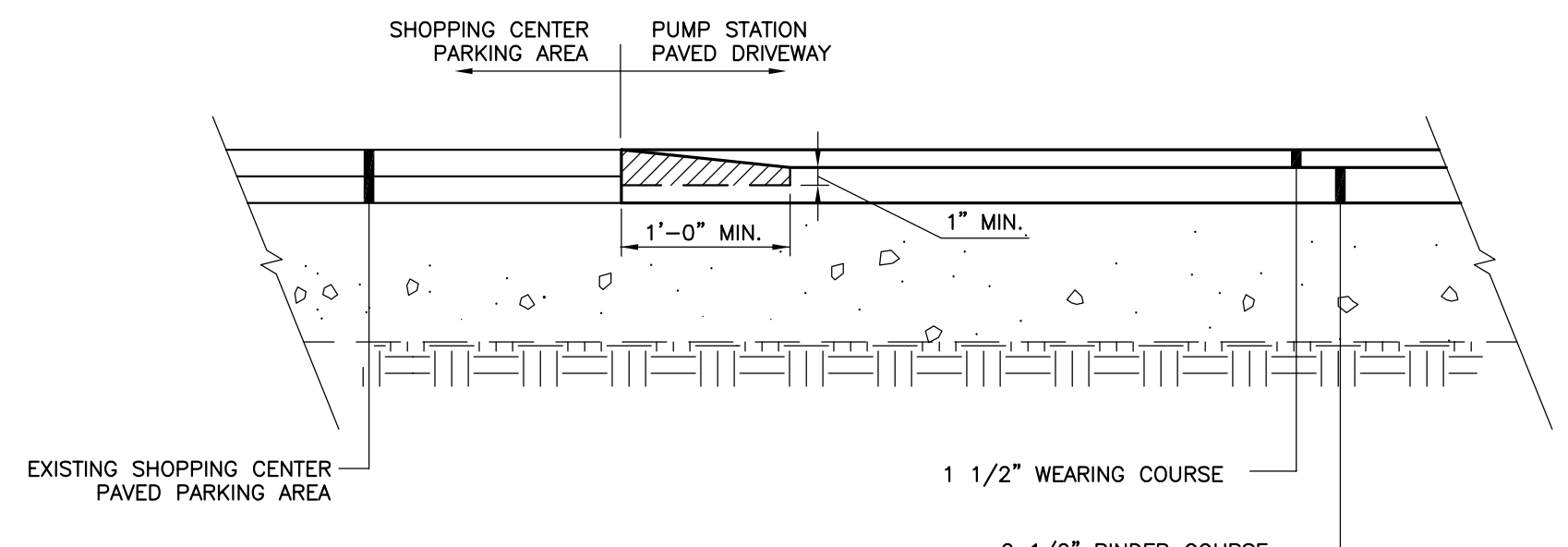
D

A

B

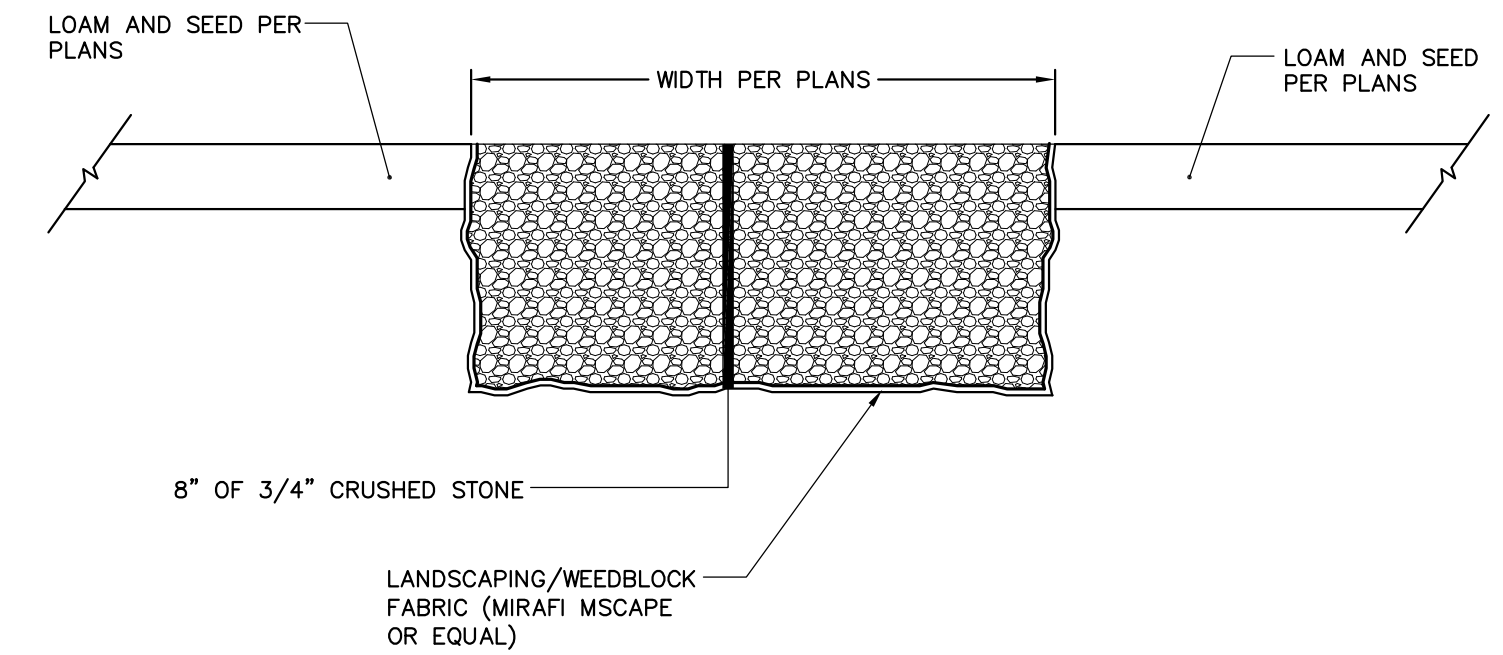
C

D

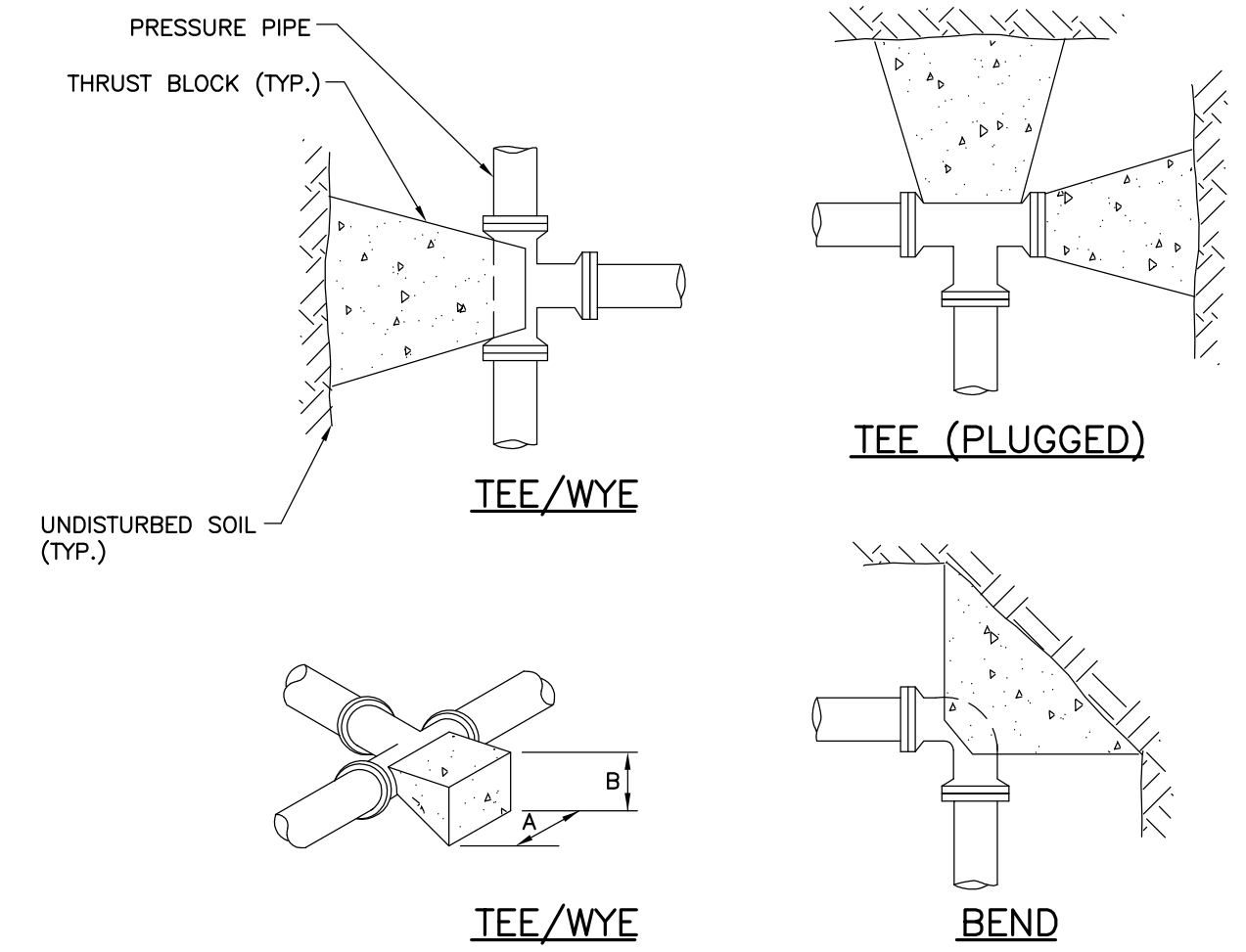


- NOTES:**
1. EXTEND NEW SURFACE PAVEMENT ACROSS JOINT TO COVER NEW BUTT JOINT
  2. PROVIDE TACK COAT ON ALL SURFACES OF EXISTING PAVEMENT TO BE COVERED
  3. ADJUST FRAMES, COVERS, AND VALVE BOXES AS NECESSARY TO MATCH FINAL PAVEMENT GRADE

**1 TYPICAL BITUMINOUS PAVEMENT REPAIR DETAIL - PARKING AREA TO DRIVEWAY INTERFACE**  
SCALE: N.T.S.



**3 CRUSHED STONE SURFACE DETAIL**  
SCALE: N.T.S.



**TABLE 1: 4" THRU 10" FITTINGS**

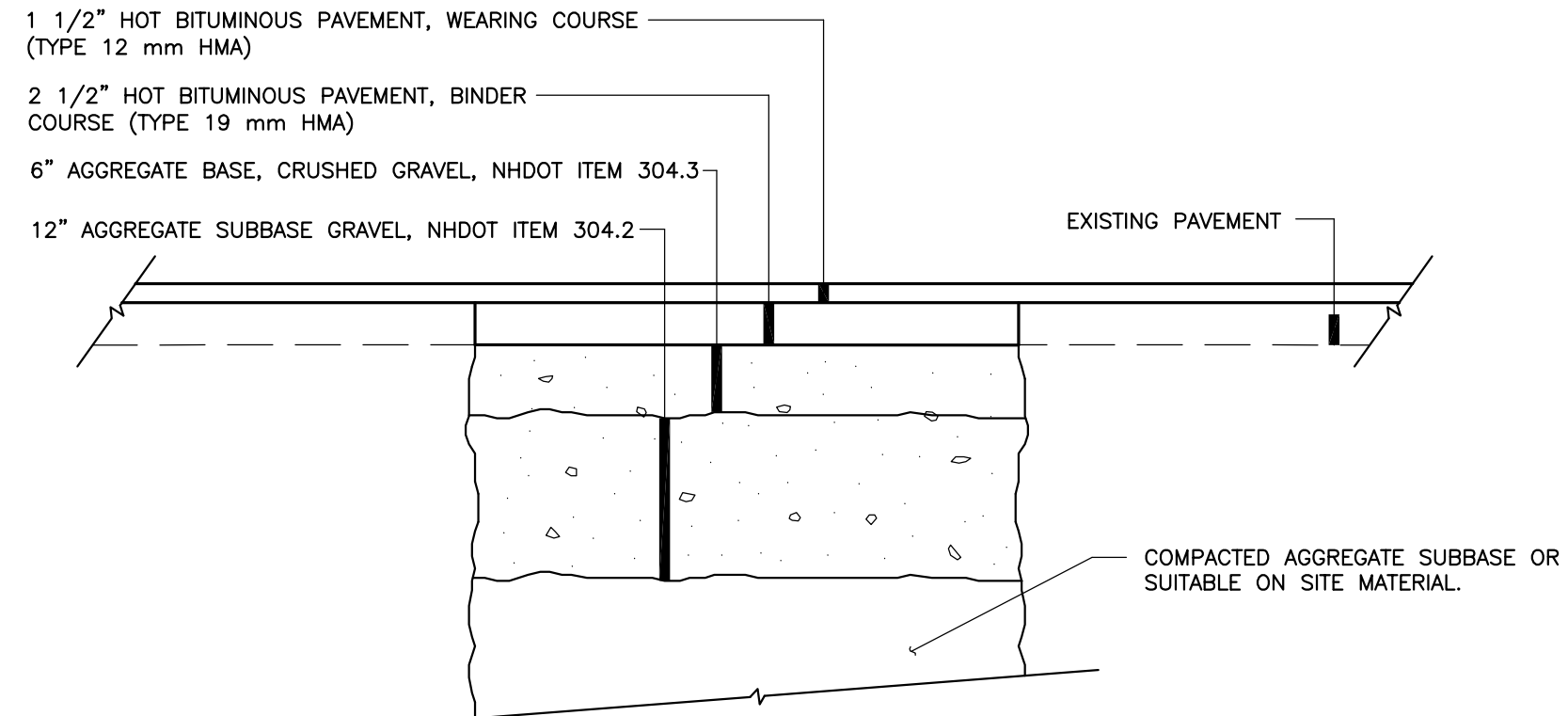
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	48"	24"	48"	24"
SAND	24"	24"	24"	24"
GRAVEL	24"	18"	24"	18"

**TABLE 2: 12" THRU 16" FITTINGS**

SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	60"	36"	72"	36"
SAND	36"	30"	48"	30"
GRAVEL	30"	24"	40"	24"

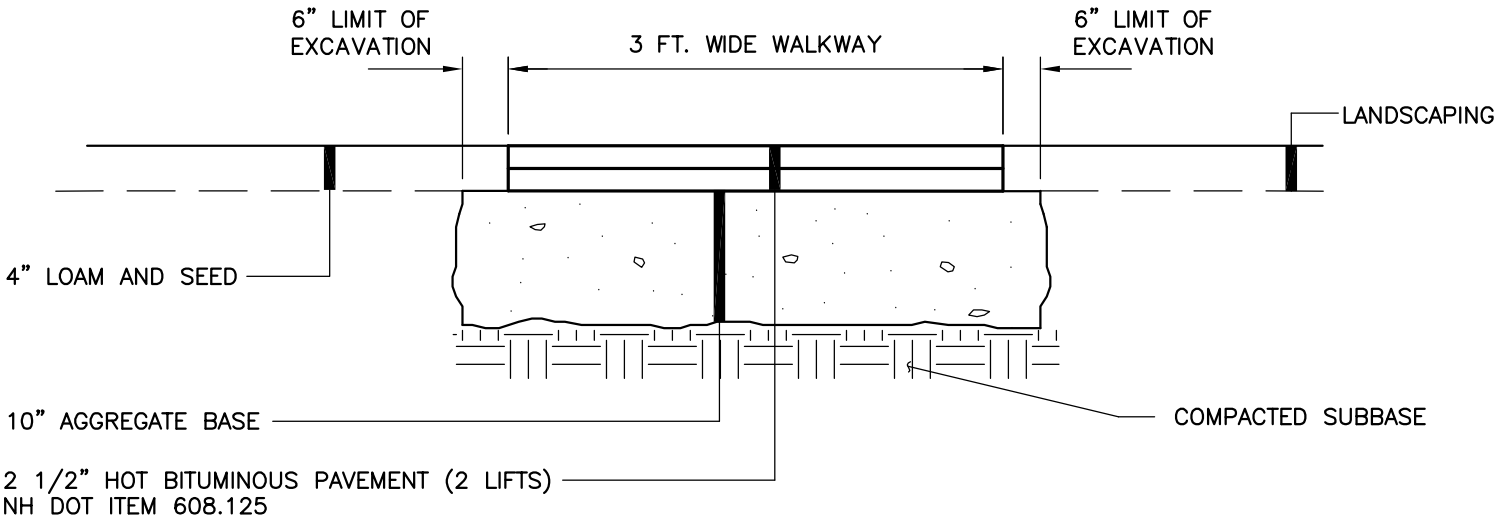
- NOTES:**
1. CONCRETE FOR ALL THRUST BLOCKS TO BE MINIMUM 3,000 PSI, 28 DAY STRENGTH, TYPE I CEMENT, 3/4" STONE.
  2. WHERE POSSIBLE, CONSTRUCT THRUST BLOCKS AGAINST UNDISTURBED SOIL. WHERE NOT POSSIBLE, PLACE FILL BETWEEN THE THRUST BLOCK AND THE UNDISTURBED SOIL, COMPACTED TO 90% STANDARD PROCTOR DENSITY.
  3. WRAP FITTINGS WITH POLYETHYLENE PRIOR TO CONSTRUCTING THRUST BLOCKS. NO JOINTS SHALL BE COVERED WITH CONCRETE.
  4. THRUST BLOCK DIMENSIONS ARE BASED ON A MAXIMUM PIPE PRESSURE OF 150 PSI.

**7 TYPICAL THRUST BLOCK DETAIL**  
SCALE: N.T.S.

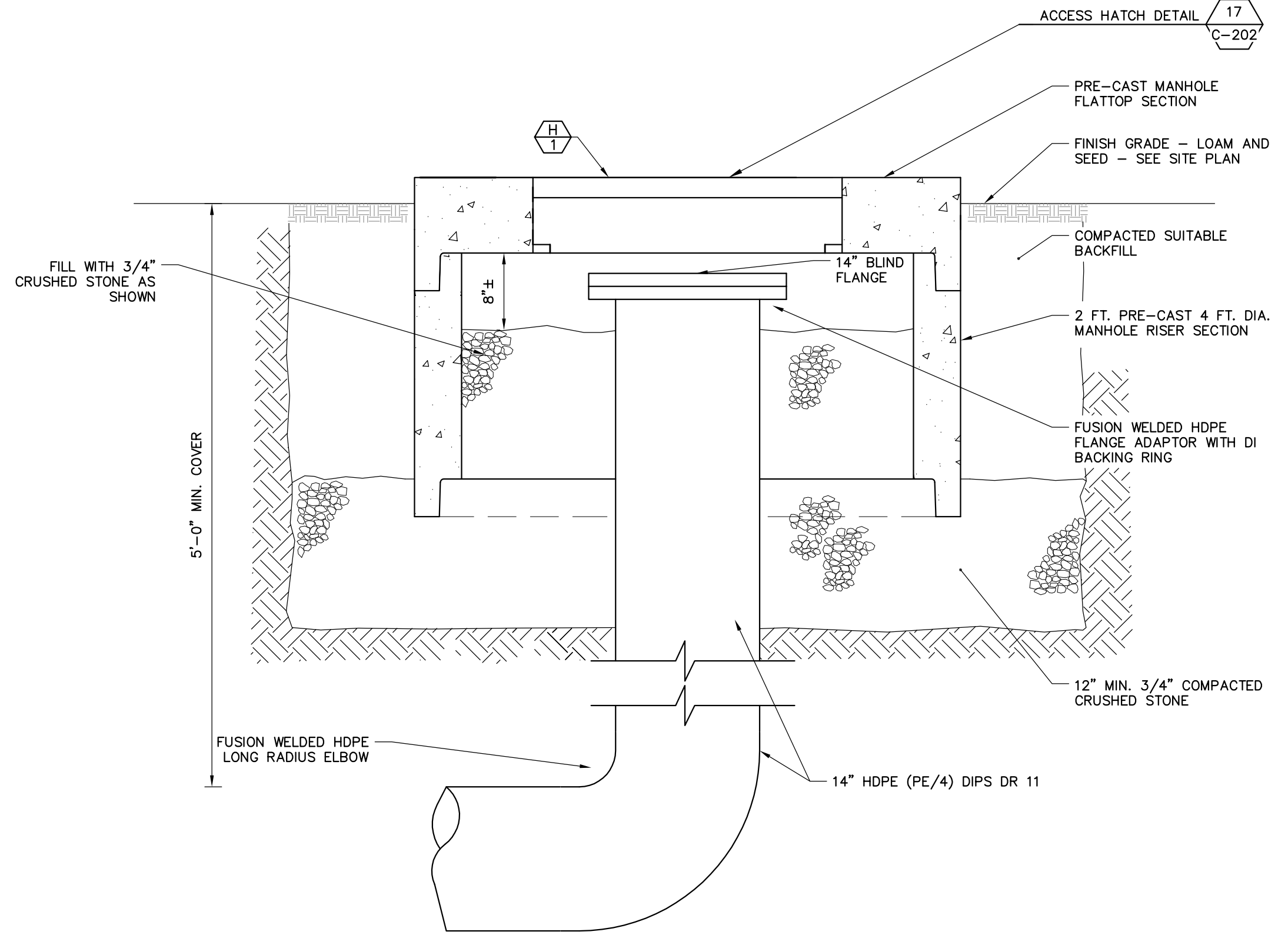


- NOTES:**
1. CUT EXISTING PAVEMENT TO STRAIGHT EVEN EDGE.
  2. MATCH EXISTING THICKNESS OF AGGREGATE SUBBASE.

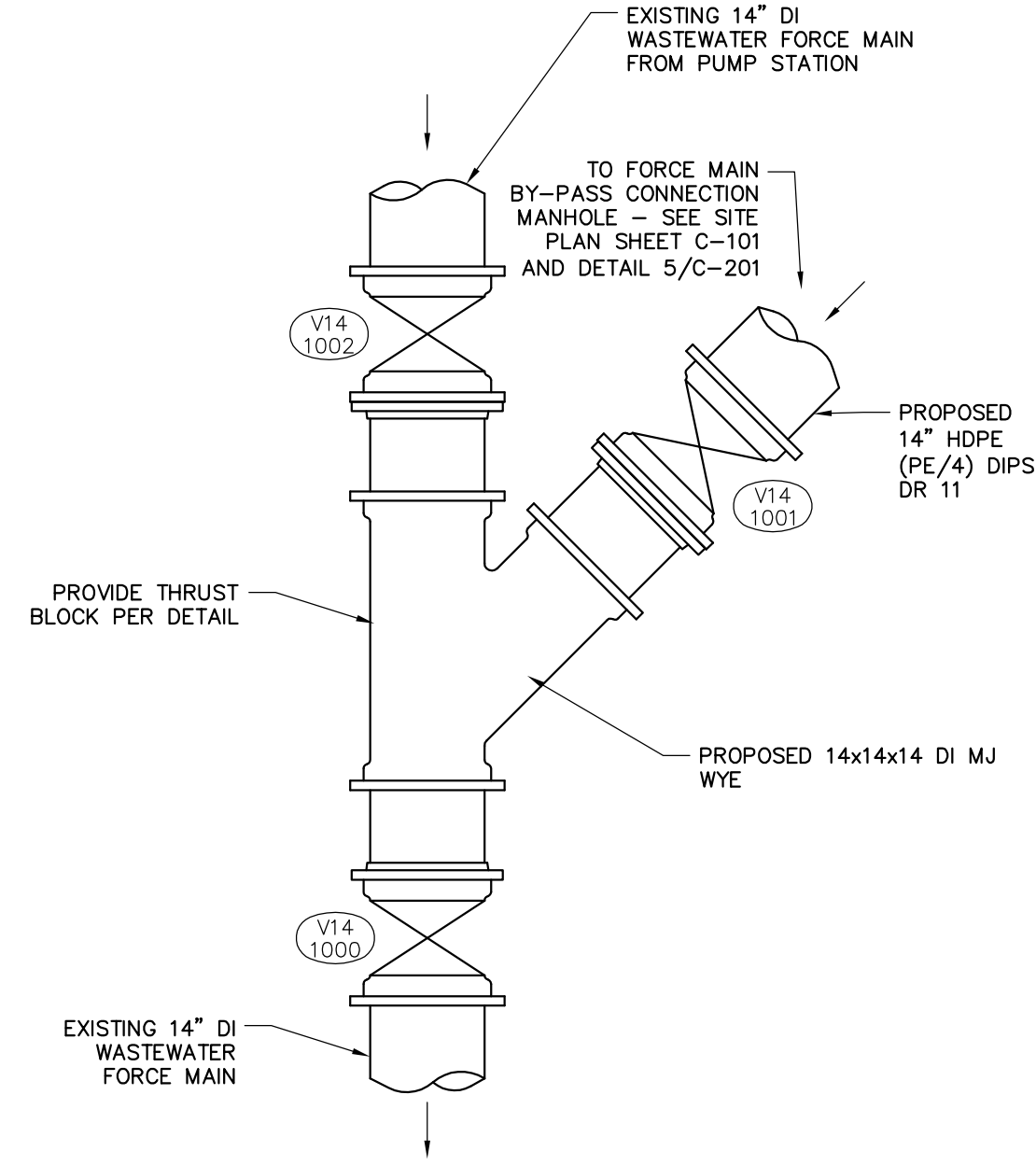
**2 TYPICAL BITUMINOUS PAVEMENT DETAIL - PARKING LOTS, AND DRIVEWAYS**  
SCALE: N.T.S.



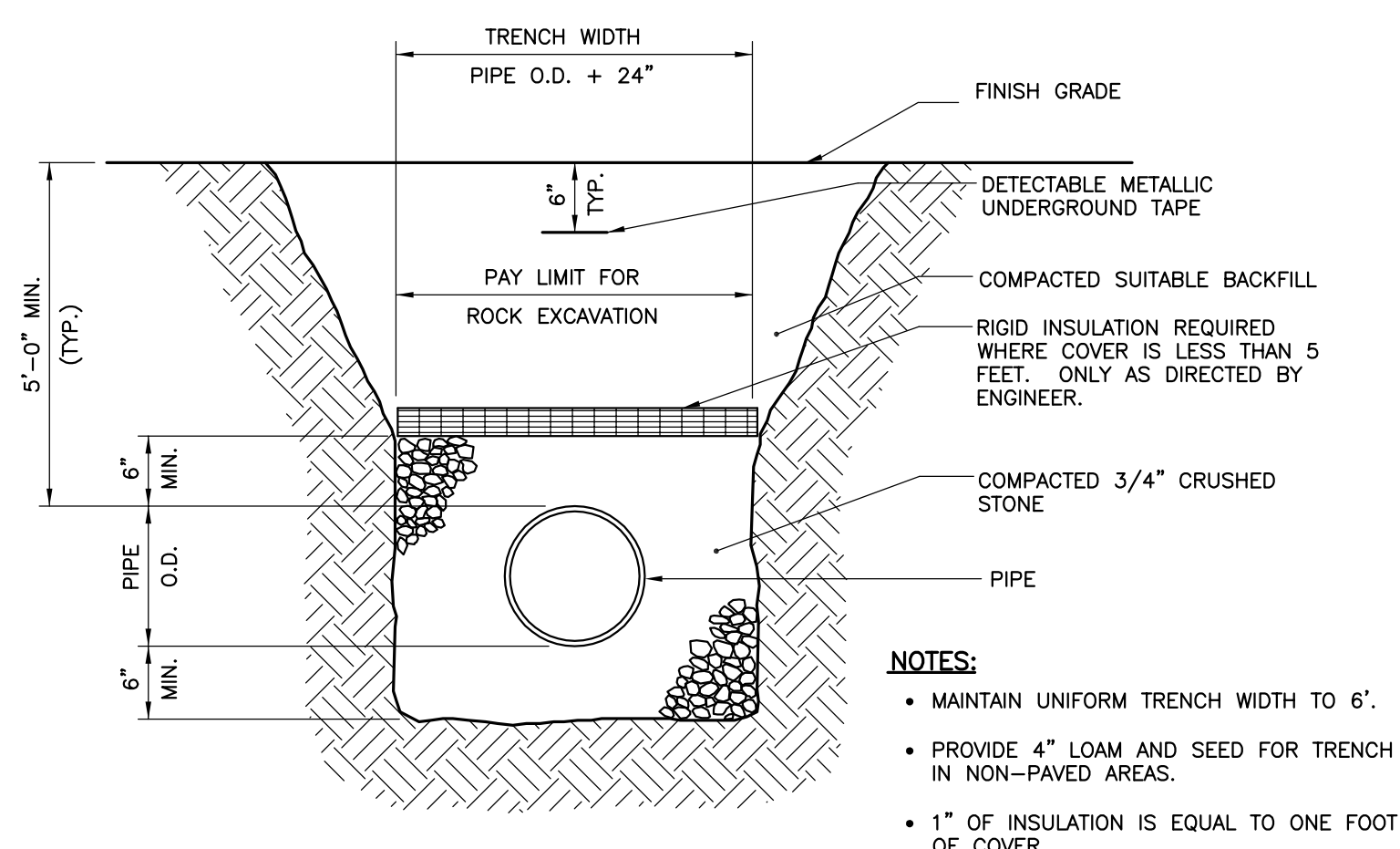
**5 3 FT. WIDE BITUMINOUS WALKWAY DETAIL**  
SCALE: N.T.S.



**6 FORCE MAIN BY-PASS CONNECTION MANHOLE DETAIL**  
SCALE: N.T.S.



**8 FORCE MAIN BY-PASS CONNECTION DETAIL**  
SCALE: N.T.S.



- NOTES:**
- MAINTAIN UNIFORM TRENCH WIDTH TO 6'.
  - PROVIDE 4" LOAM AND SEED FOR TRENCH IN NON-PAVED AREAS.
  - 1" OF INSULATION IS EQUAL TO ONE FOOT OF COVER.

**4 TYPICAL PIPE TRENCH DETAIL**  
SCALE: N.T.S.

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CONSULTING ENGINEERS

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NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER  
LEWIS C. OSBORN  
No. 13170  
STATE OF NEW HAMPSHIRE - PROFESSIONAL SEAL

REV	DESCRIPTION	DATE

DESIGNED BY: NTD  
DRAWN BY: NTD  
CHECKED BY: MKC  
2/28/2017-C-201.DWG

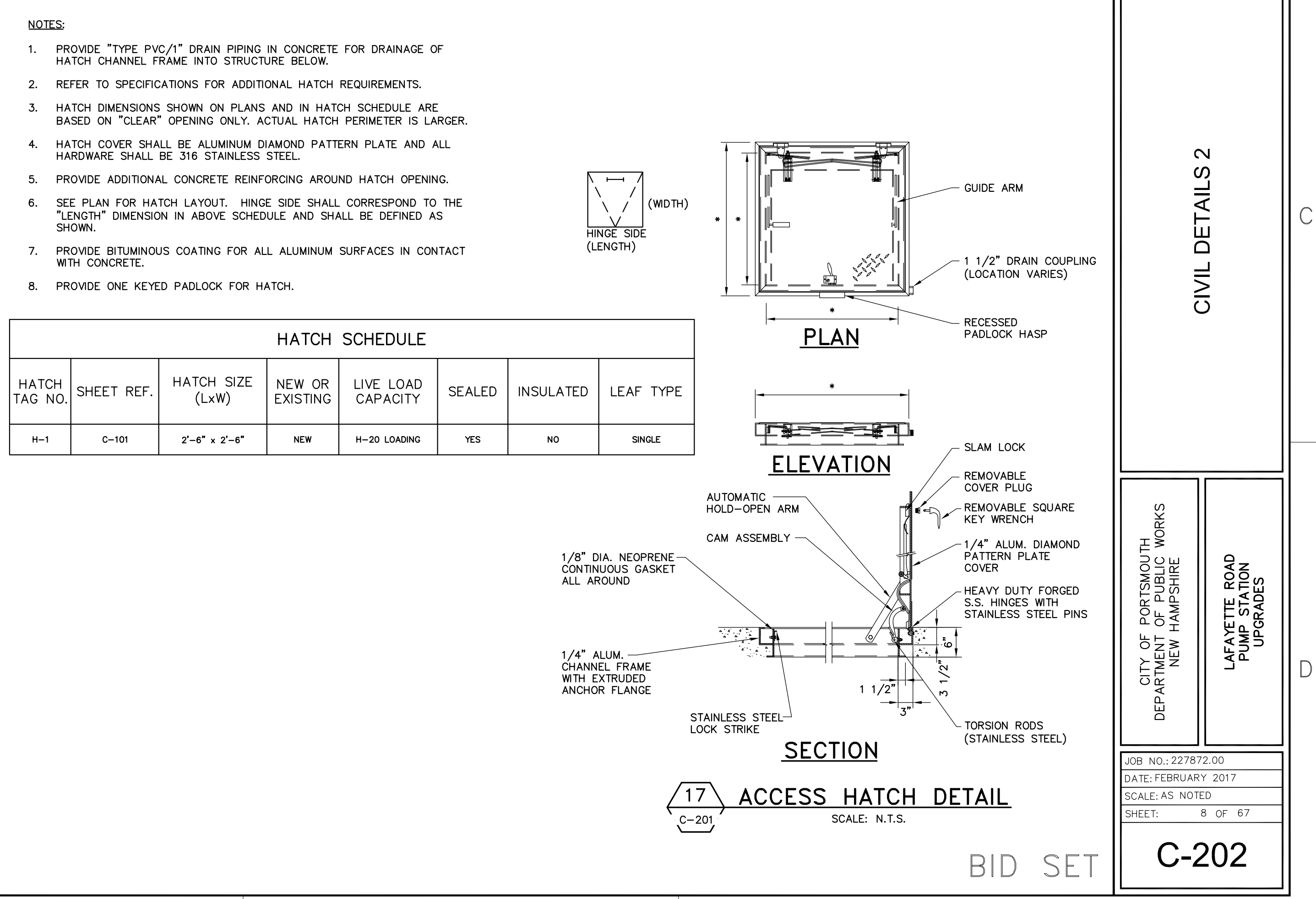
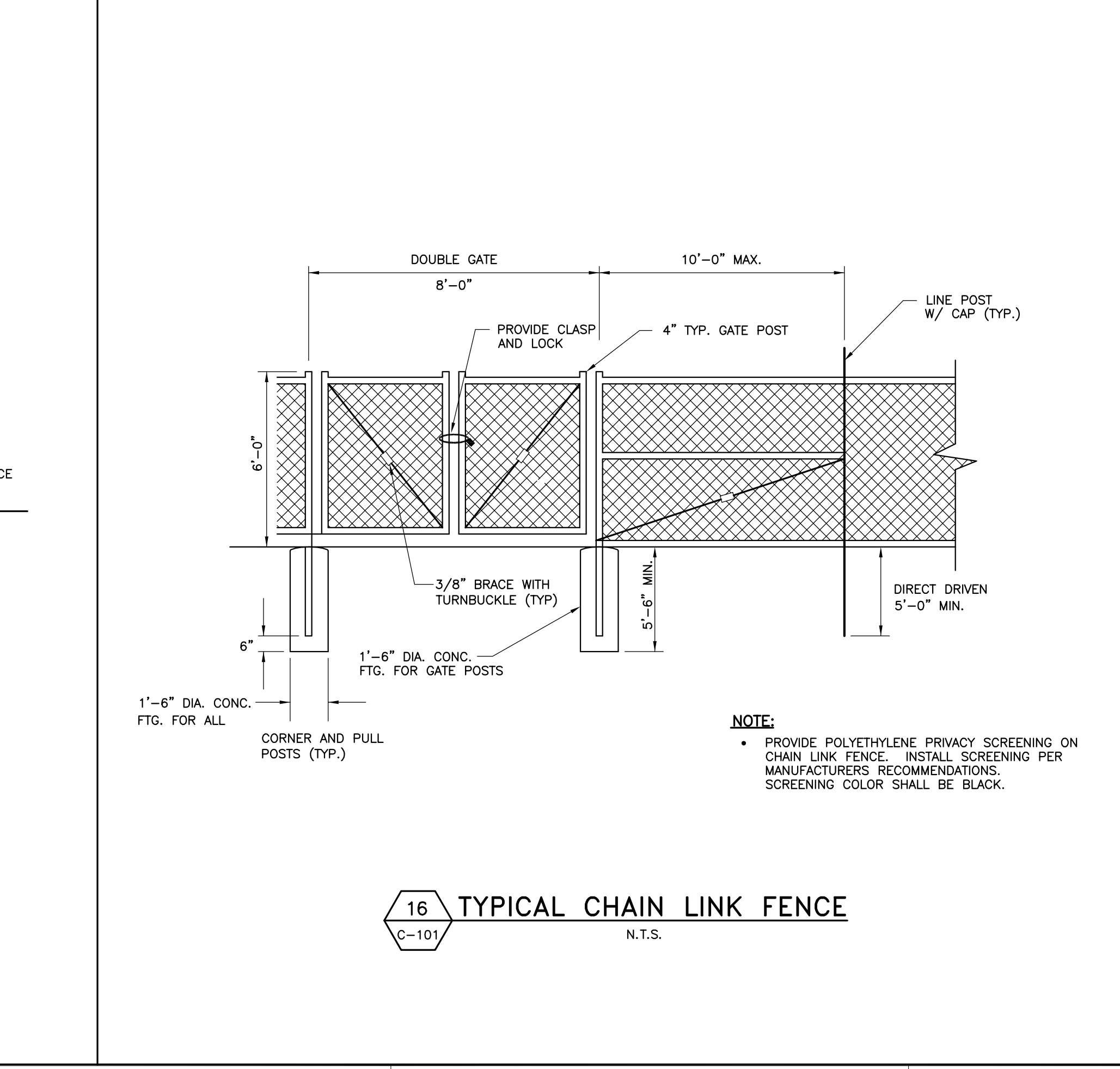
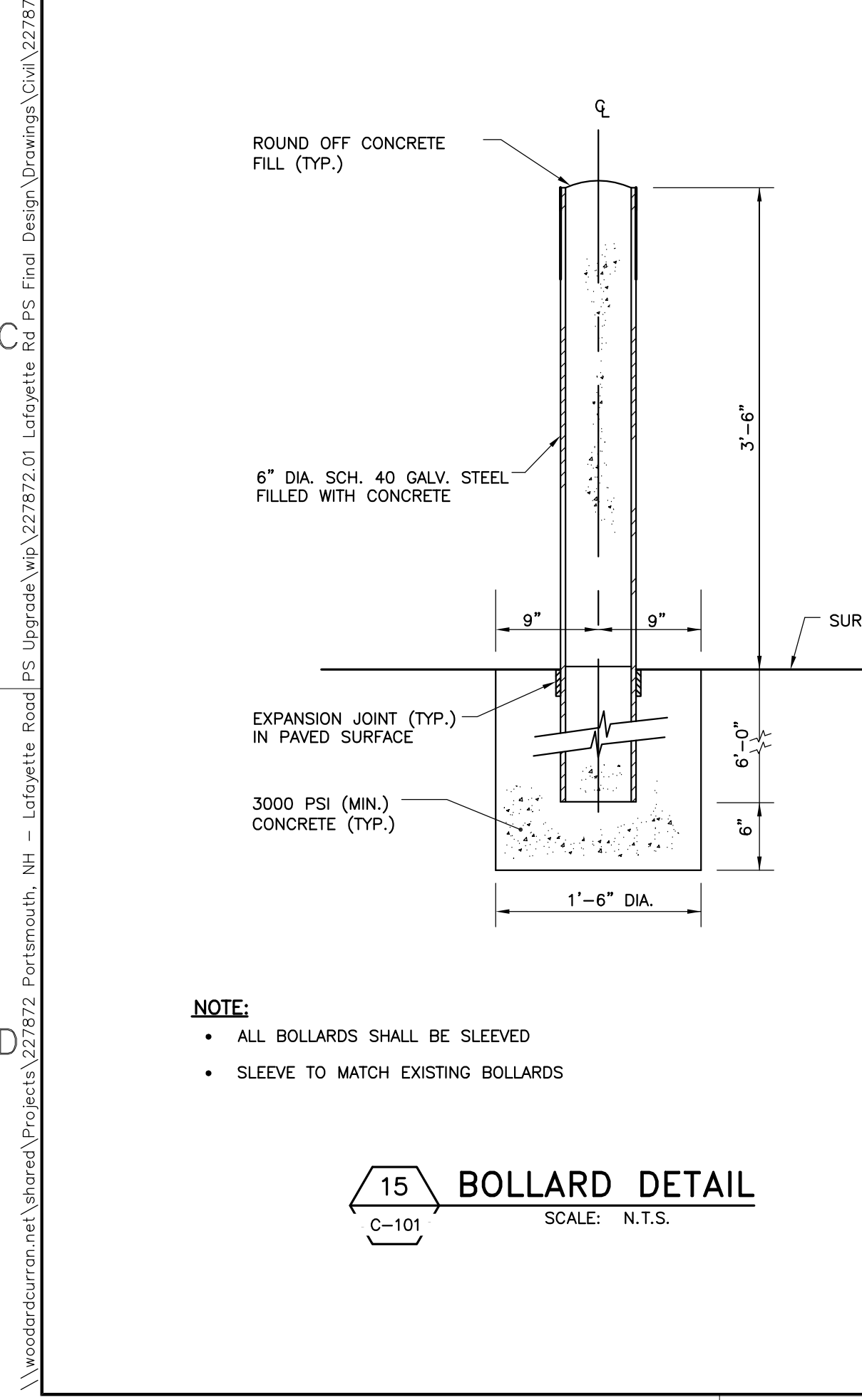
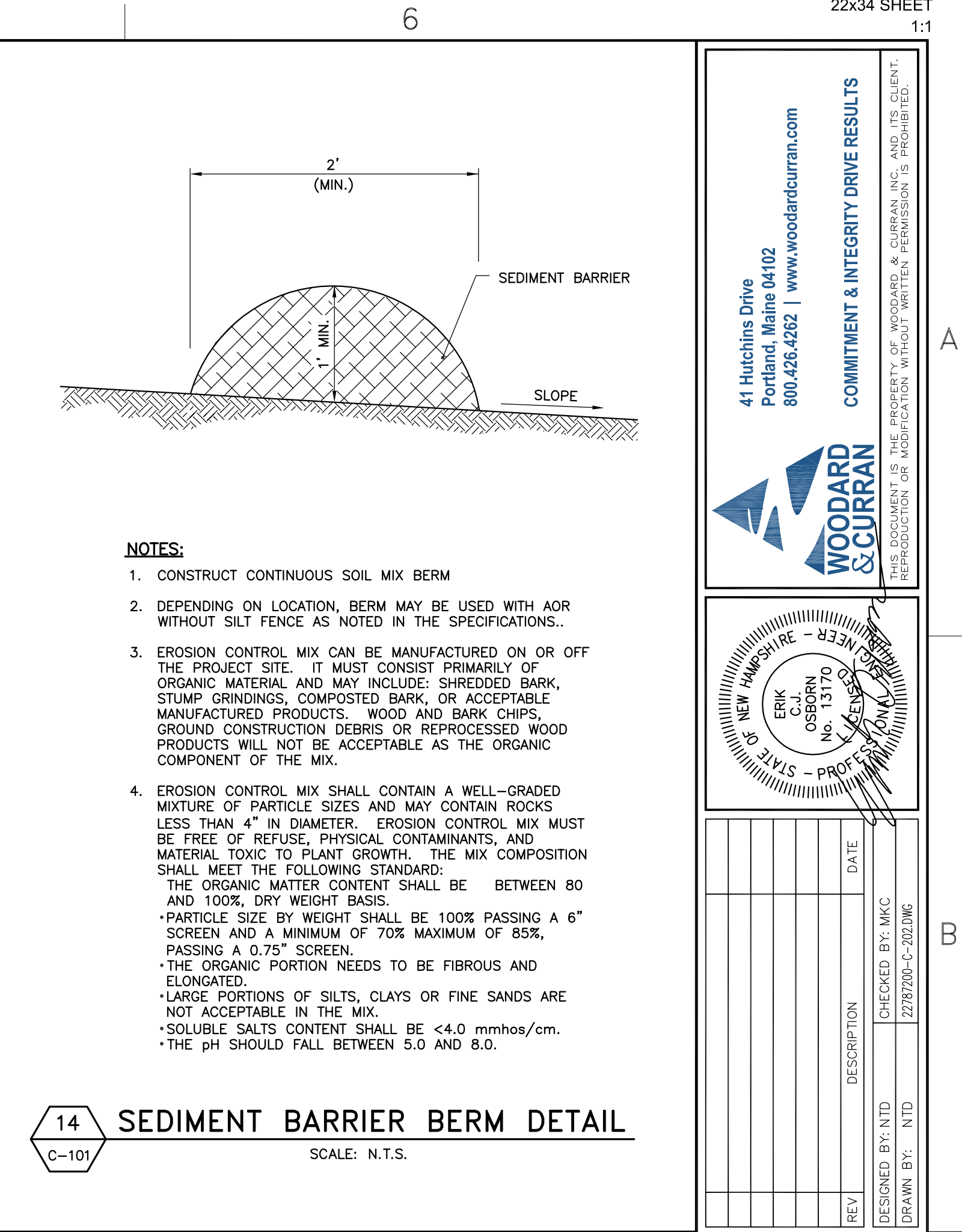
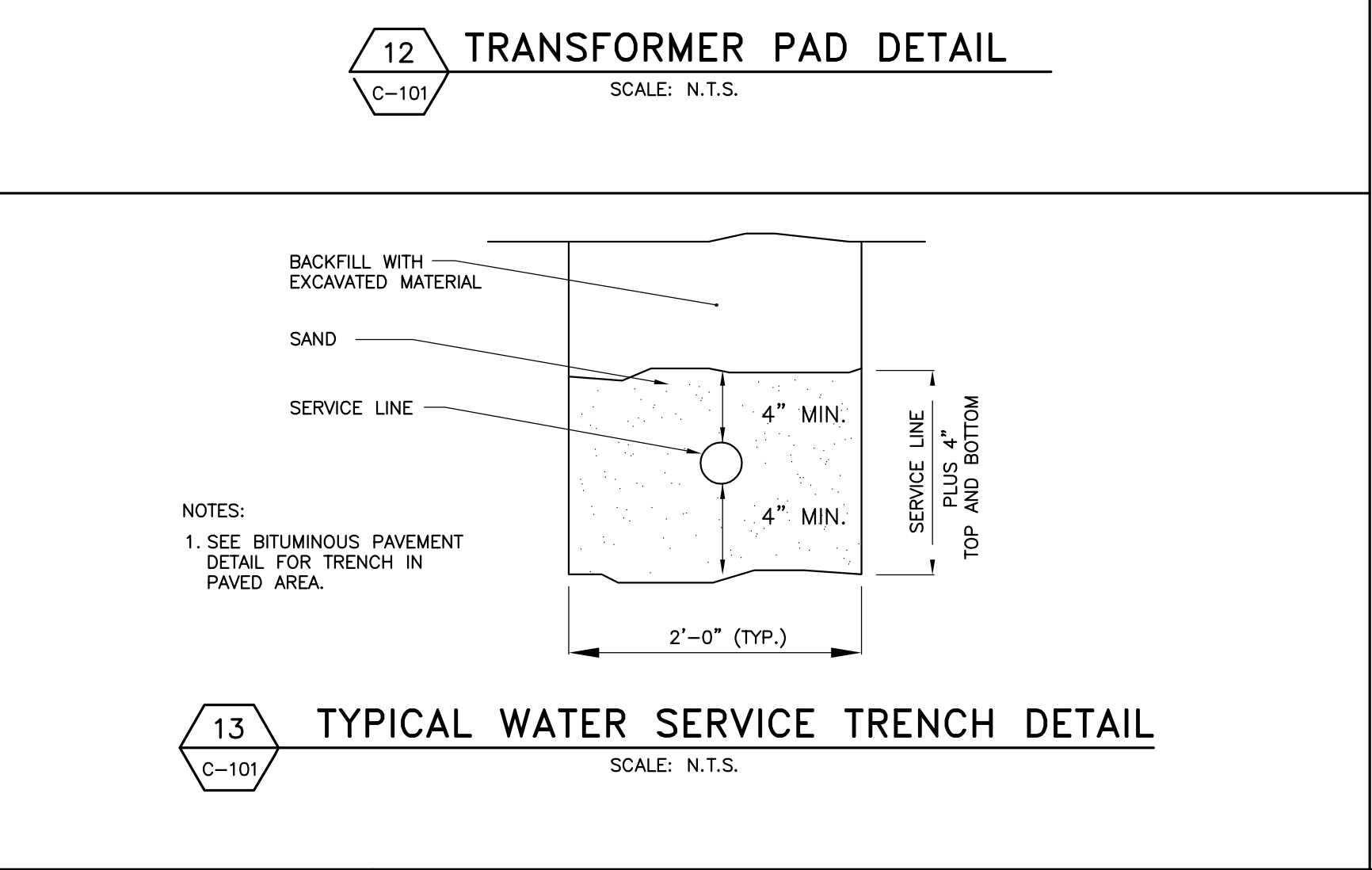
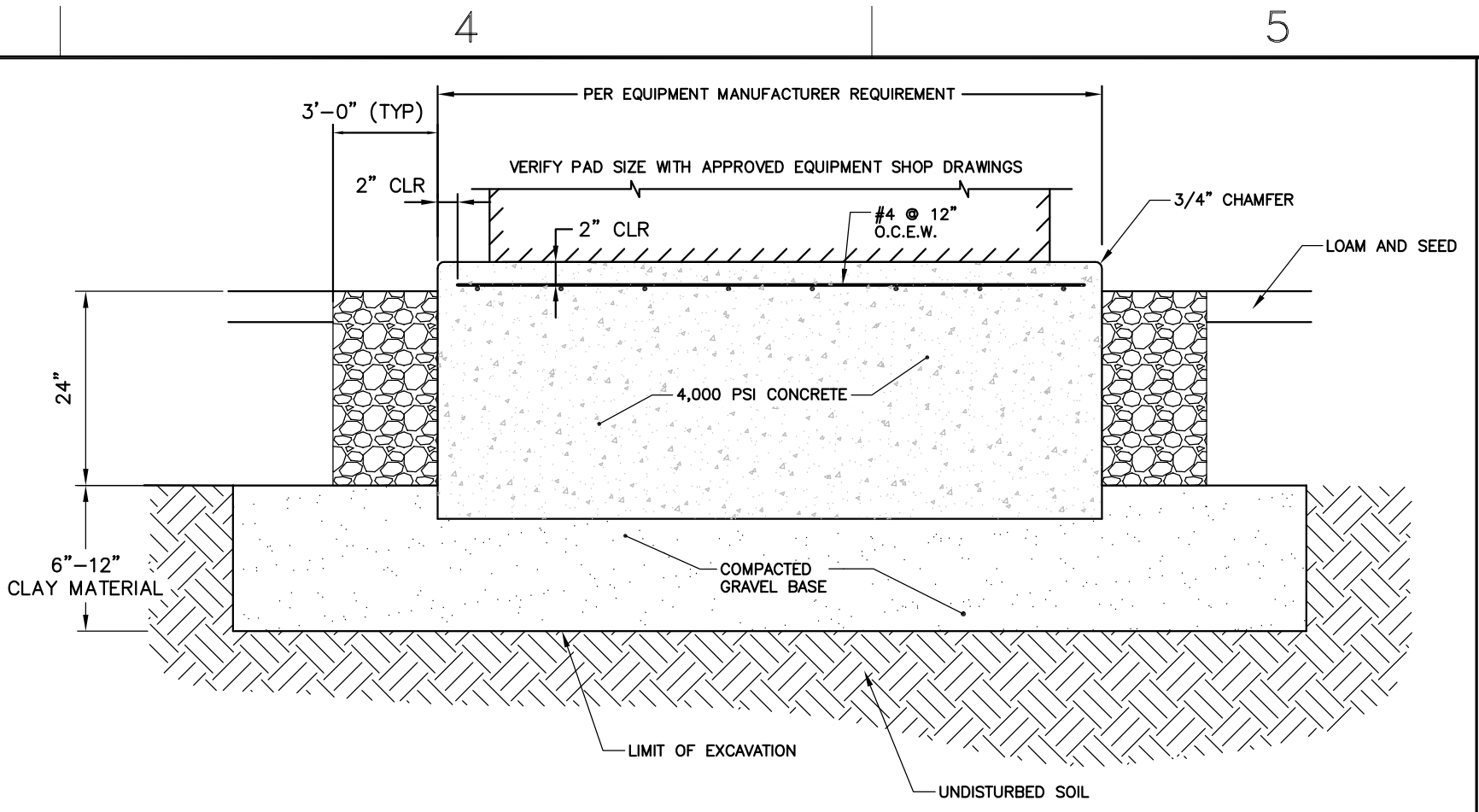
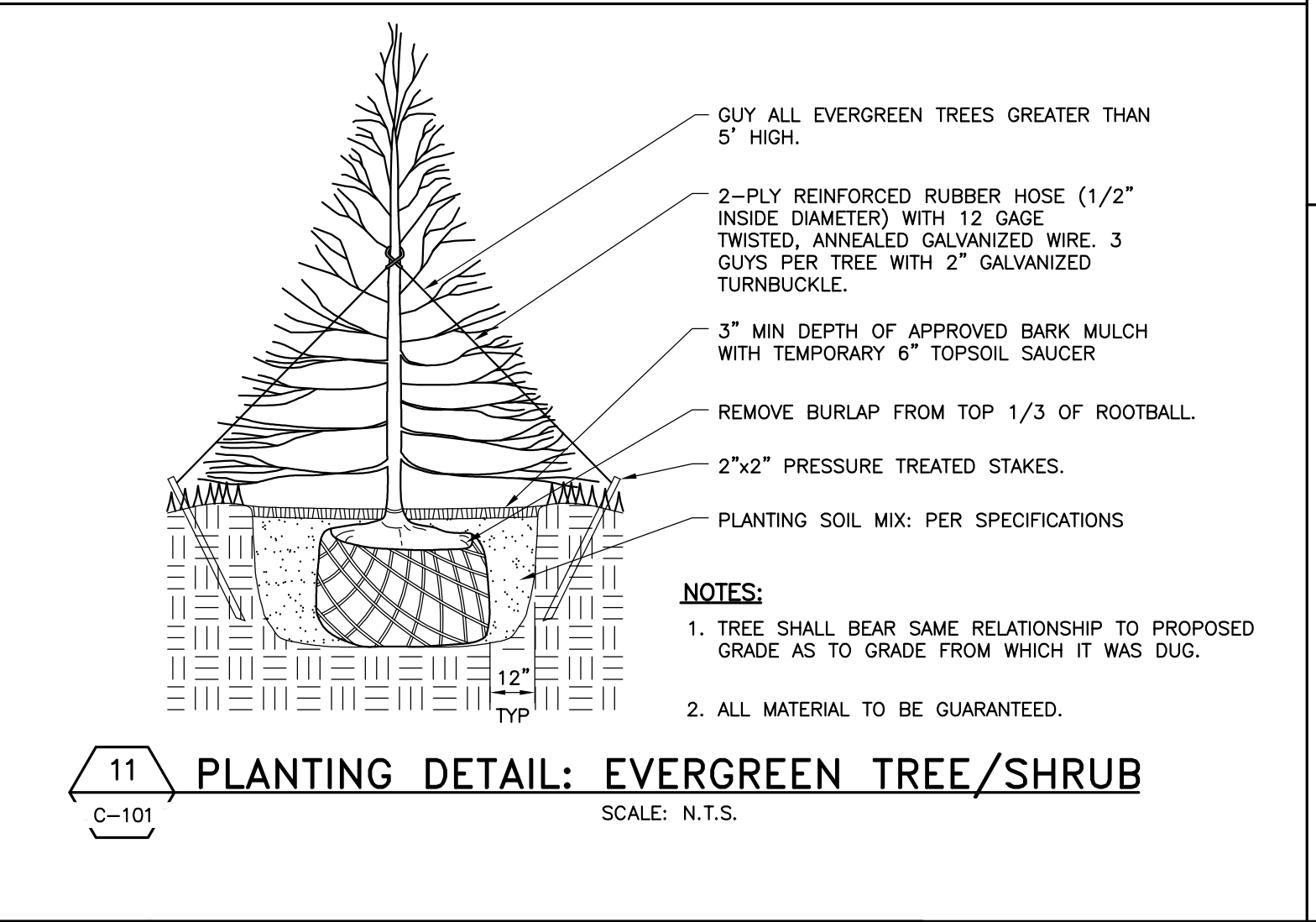
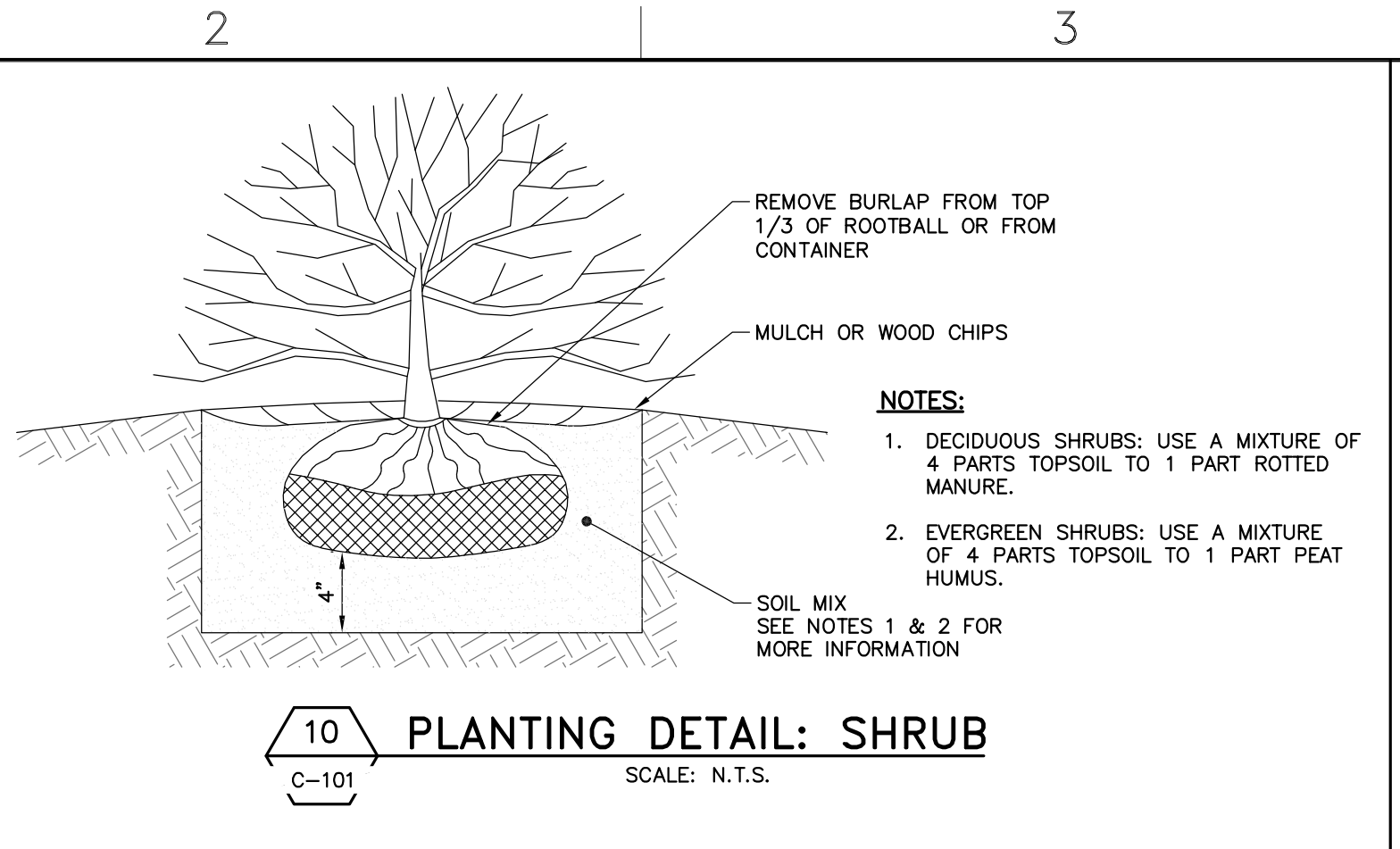
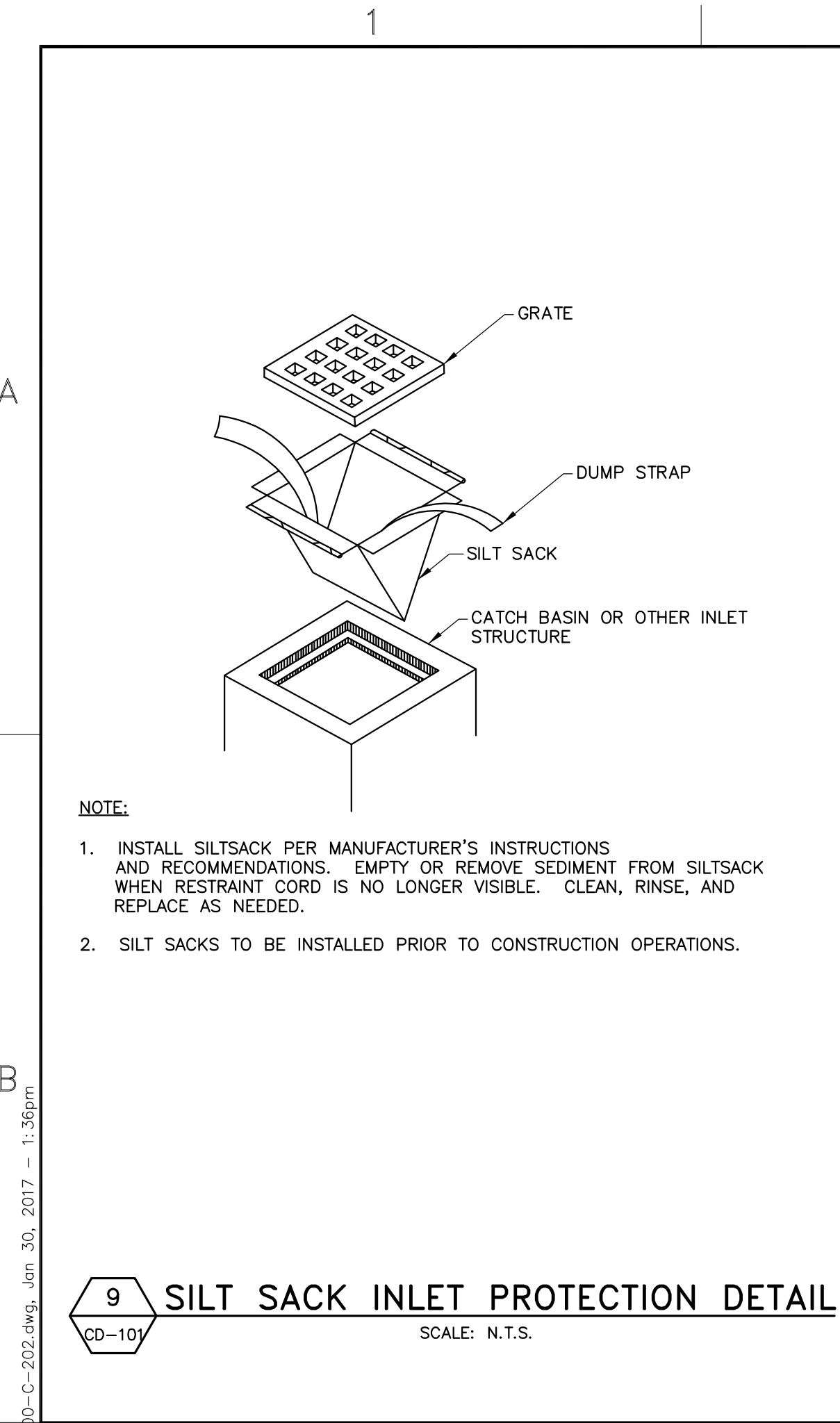
**CIVIL DETAILS 1**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 7 OF 67





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NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER  
ERIC C. OSBORN  
No. 13170  
STATE OF NEW HAMPSHIRE - PROFESSIONAL SEAL

REV	DESCRIPTION	DATE

DESIGNED BY: NTD  
DRAWN BY: NTD  
CHECKED BY: MKC  
2/28/2017

**CIVIL DETAILS 2**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 8 OF 67

**C-202**

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**STRUCTURAL AND ARCHITECTURAL ABBREVIATIONS**

+	AND	GA	GAUGE	R	RISE(R)
∠	ANGLE	GALV	GALVANIZED	REOF	REINFORCE, REINFORCING REQUIRED
⊙	AT	GC	GENERAL CONTRACTOR	REV	REVISION, REVISED
∅	DIAMETER	GR	GRADE	RM	ROOM
		GWB	GYPSUM WALLBOARD	RO	ROUGH OPENING
AB	ANCHOR BOLT	HARD	CONCRETE HARDENER	SCHED	SCHEDULE
ABV	ABOVE	HDWR	HARDWARE	SHT	SHEET
AFT	ABOVE FINISHED FLOOR	HGT	HEIGHT	SIM	SIMILAR
ALUM	ALUMINUM	HM	HOLLOW METAL	SJ	SAWED JOINT
		HOR	HORIZONTAL	SK	SINK
BCJ	BRICK CONTROL JOINT	HP	HIGH POINT	SPEC	SPECIFICATION, SPECIFIED
BD	BOARD	HR	HOUR	SS	STAINLESS STEEL
BLDG	BUILDING	IN	INCH(ES)	STD	STANDARD
BLK	BLOCK, BLOCKING	INSUL	INSULATE, INSULATION	STL	STEEL
BOF	BOTTOM OF FOOTING	JT	JOINT	STRU	STRUCTURE, STRUCTURAL
BP	BASE PLATE	LLH	LONG LEG HORIZONTAL	STWY	STAIRWAY
BRG	BEARING	LLV	LONG LEG VERTICAL	SUSP	SUSPEND(ED)
BRK	BRICK	LT	LINTEL	T	TREAD
		LP	LOW POINT	TEMP	TEMPERED, TEMPORARY
C TO C	CENTER TO CENTER	LP	LOW POINT	THK	THICK(NESS)
CEM	CEMENT	MAS	MASONRY	THR	THRESHOLD
CEM F	CEMENTITIOUS FINISH	MATL	MATERIAL	TOC	TOP OF CONCRETE
CHAM	CHAMFER	MAX	MAXIMUM	TOG	TOP OF GRATING
CJ	CONSTRUCTION JOINT	MCC	MOTOR CONTROL CENTER	TOM	TOP OF MASONRY
CL OR EQ	CENTER LINE	MFR	MANUFACTURER	TOS	TOP OF STEEL
CLG	CEILING	MIN	MINIMUM	TWF	THROUGH WALL FLASHING
CLKG	CAULKING	MISC	MISCELLANEOUS	TYP	TYPICAL
CMU	CONCRETE MASONRY UNIT	MO	MASONRY OPENING	UNO	UNLESS NOTED OTHERWISE
COMP	COMPRESSIBLE	MR	MOISTURE RESISTANT	VB	VAPOR BARRIER
CONC	CONCRETE	MTL	METAL	VERT	VERTICAL
CONT	CONTINUOUS—CONTINUE COURSES	NO	NUMBER	W	WIDTH, WIDE
CRS	COURSES	NOM	NOMINAL	W/	WITH
		NTS	NOT TO SCALE	W/A	WHERE APPLICABLE
DET	DETAIL	OC	ON CENTER	WD	WOOD
DIA	DIAMETER	OCEF	ON CENTER EACH FACE	WF	STEEL WIDE FLANGE
DIAG	DIAGONAL	OCEW	ON CENTER EACH WAY	W/O	WITHOUT
DIM	DIMENSION	OPNG	OPENING	WPRG	WATERPROOFING
DPRG	DAMP PROOFING	OPP	OPPOSITE	WWF	WELDED WIRE FABRIC
DN	DRAIN	OPP HD	OPPOSITE HAND		
DWG	DRAWING	PERIM	PERIMETER		
		PL	PLATE		
EA	EACH	PSF	POUNDS PER SQ FT		
EXP JT	EXPANSION JOINT	PT	POUNDS PER SQ IN		
EL	ELEVATION	PT	PRESSURE TREATED		
ELEC	ELECTRICAL	PWD	PAINTED PLYWOOD		
EOP	EQUIPMENT				
EXG	EXISTING				
EXP	EXPANSION OR EXPOSED				
FD	FLOOR DRAIN				
FE	FIRE EXTINGUISHER				
FF	FINISHED FLOOR				
FIN	FINISH(ED)				
FL	FLOOR				
FND	FOUNDATION				
FLR	FILLER				
FT	FOOT, FEET				
FXD	FIXED				

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

**MATERIALS**

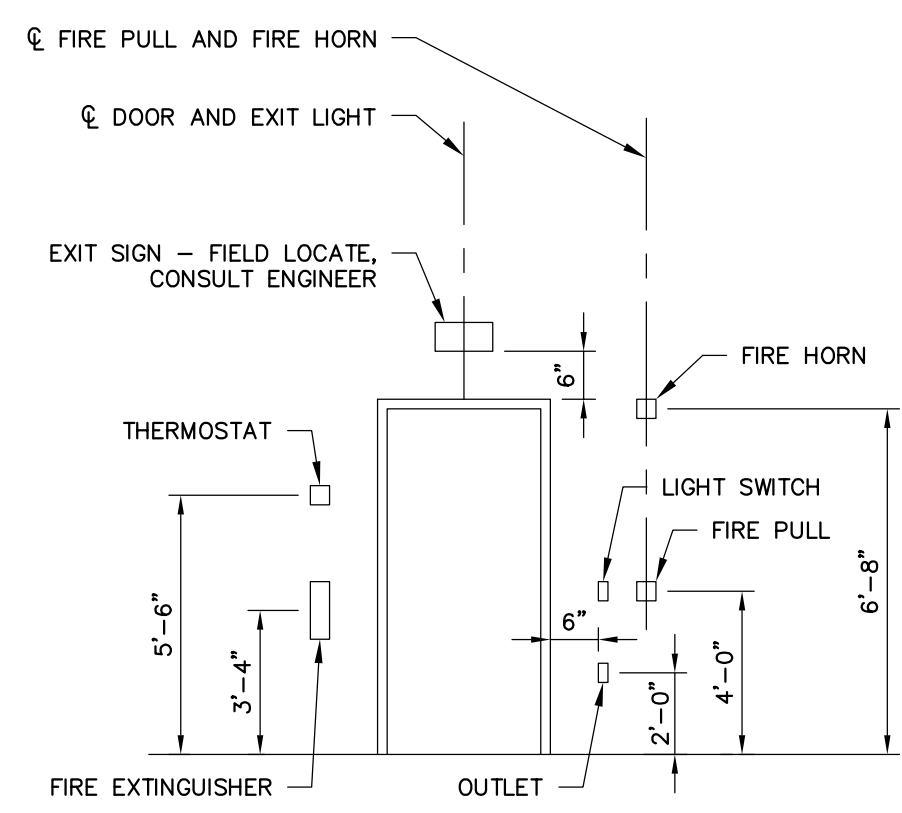
	EARTH, SOIL
	CRUSHED STONE
	STRUCTURAL FILL/GRAVEL
	BRICK
	CONCRETE MASONRY UNIT
	CONC CAST IN PLACE
	WOOD-BLOCKING
	PLYWOOD
	RIGID INSULATION
	BLANKET INSULATION
	STEEL
	ALUMINUM
	GROUT
	CAULK
	STRUCTURAL MEMBER

**SYMBOLS**

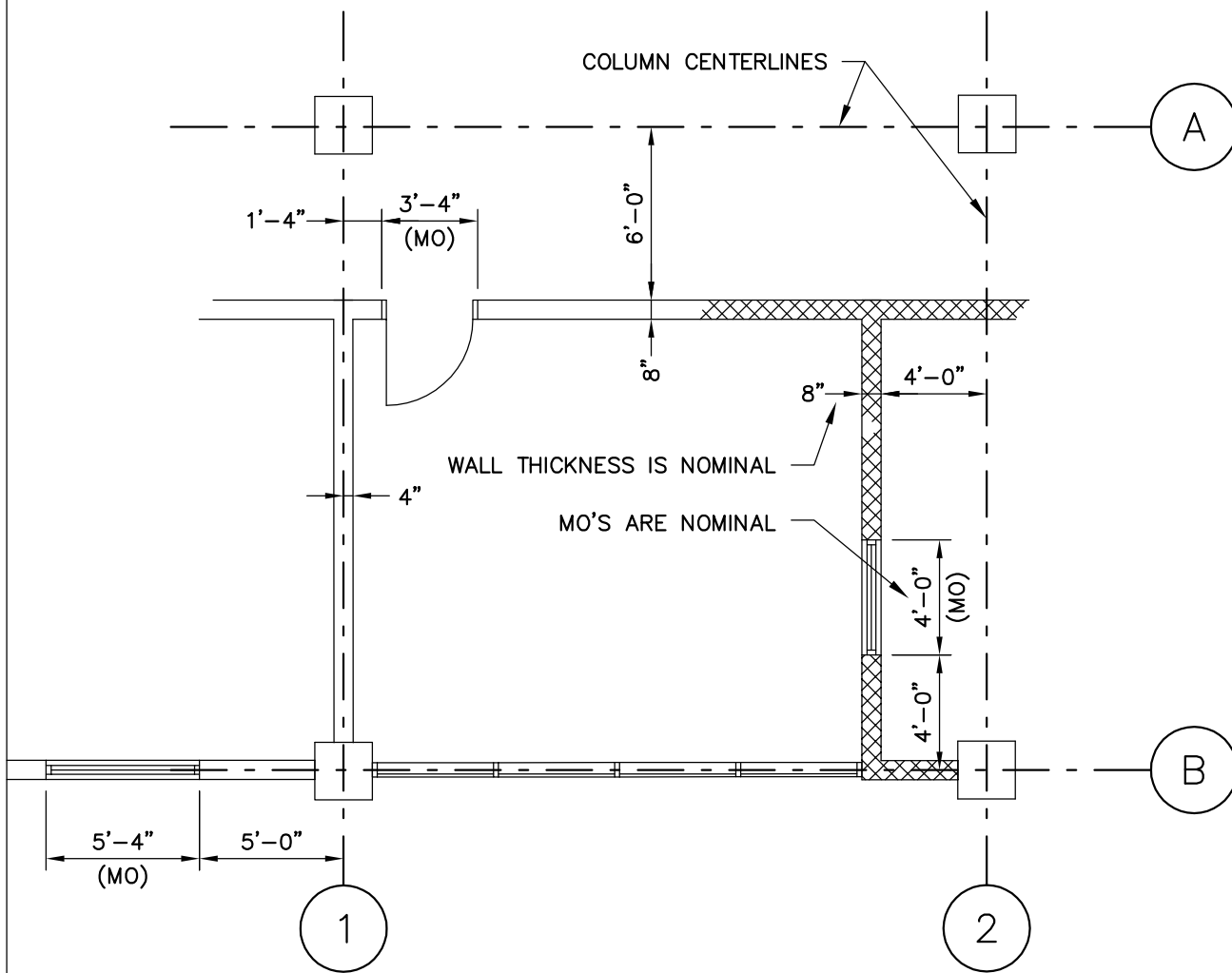
	SECTION NO	SECTION
	DETAIL NO	PLAN OR SECTION DETAIL
	E	COLUMN CENTER LINE
	101	ROOM NUMBER
	D-1	DOOR NUMBER

**OPENINGS**

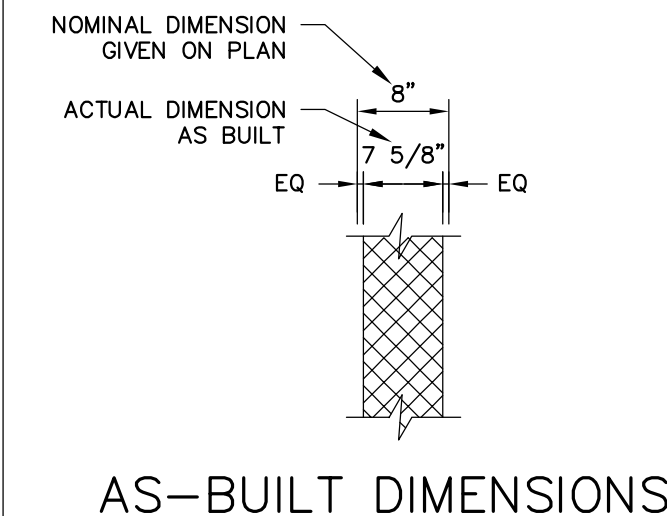
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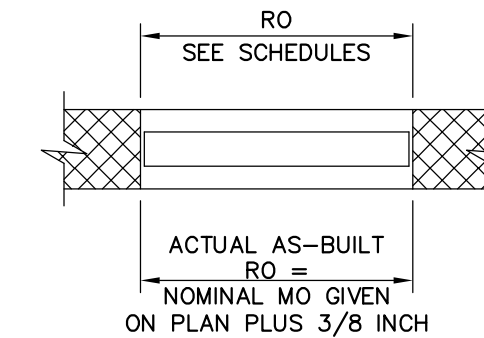
TYPICAL MOUNTING HEIGHTS



MODULAR DIMENSIONING SYSTEM  
(USED ON SMALL SCALE PLANS ONLY)



AS-BUILT DIMENSIONS



LOUVER OPENING IN PLAN

**BUILDING CODE SUMMARY:** 2006 INTERNATIONAL BUILDING CODE WITH CITY OF PORTSMOUTH BUILDING AMENDMENTS

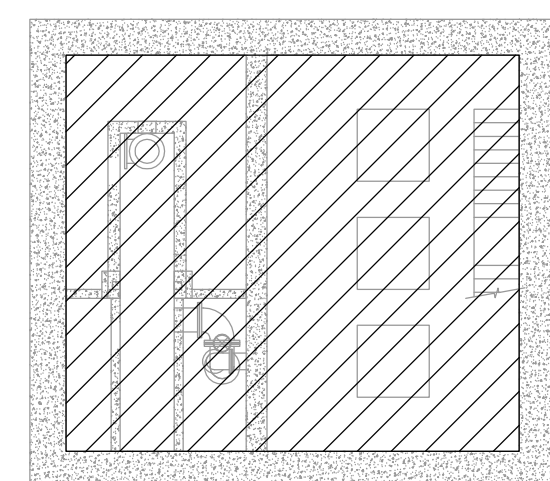
CODE REFERENCE	PUMP STATION
OCCUPANCY CLASSIFICATION	GROUP U UTILITY
CONSTRUCTION TYPE	TYPE 3B UNPROTECTED (602.3)
MAX ALLOWABLE HEIGHT/STORY AREA LIMIT	2 STORY, 55 FEET, 8,500 SF
PROPOSED BUILDING STORY AREA	1,244 SF
MAX FLOOR AREA PER OCCUPANT (TABLE 1004.1.1)	ACCESSORY STORAGE AREAS, MECHANICAL EQUIP ROOM - 300 GROSS
OCCUPANT LOAD PER STORY	5
NUMBER OF EXITS REQUIRED/PROPOSED (TABLE 1015.1)	WET WELL 1/1, ELECTRICAL/CONTROL ROOM 1/1, ODOR CONTROL ROOM 1/1
MINIMUM STAIR WIDTH (1009.1)	36 INCHES
FIRE RATING FOR EXTERIOR WALLS	0 HOURS
NFPA 820 AREA CLASSIFICATION	UNCLASSIFIED - ELECTRICAL/CONTROL ROOM CLASS 1, DIVISION 1 - DRY WELL, WET WELL & ODOR CONTROL
ACCESSIBLE BUILDING	N/A

**CODE SUMMARY LEGEND:**

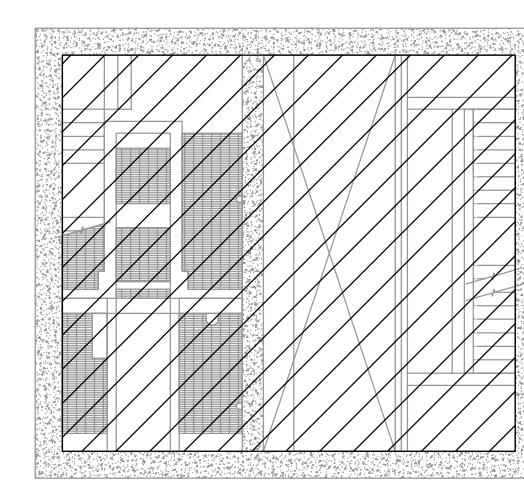
- 'U' (UTILITY) USE GROUP
- INDICATES BUILDING EXIT
- FIRE EXTINGUISHER LOCATION
- FE

**GENERAL NOTES:**

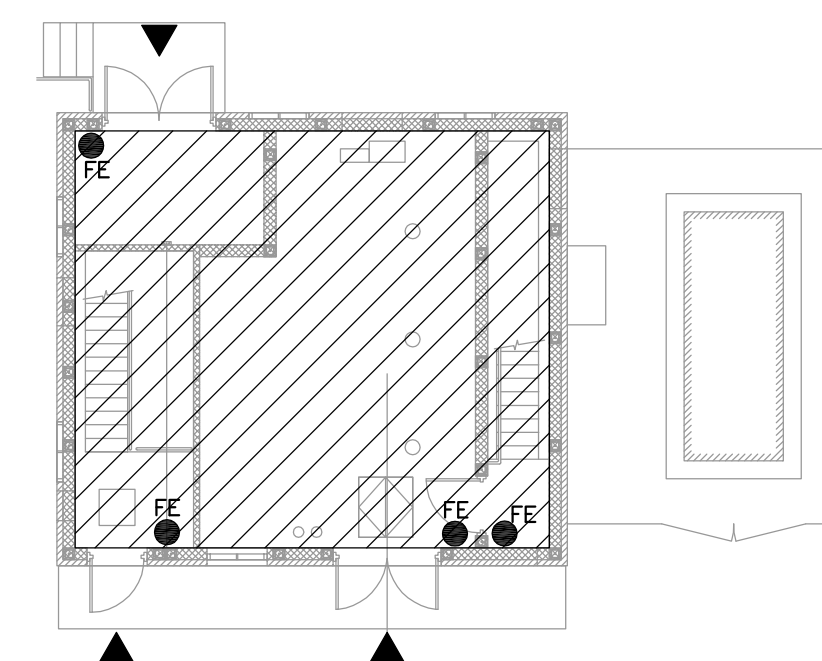
- REINFORCED CONCRETE:**
  - COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS - 4,500 PSI
  - CONCRETE DESIGN AS PER ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES AND SHALL BE TIGHTNESS TESTED ACCORDING TO ACI 350.1-10 PER PROJECT SPECIFICATIONS.
  - REINFORCEMENT: ASTM A615 GRADE 60 - ALL SPLICES CLASS B (U.N.O.). REINFORCEMENT SHALL BE DETAILED, FABRICATED, AND PLACED AS PER ACI 315 DETAILING MANUAL.
  - PROVIDE 3/4" CHAMFER ON EXPOSED EDGES OF CONCRETE, U.N.O.
  - CONCRETE TESTING OF SLUMP, AIR CONTENT, TEMPERATURE, AND COMPRESSIVE STRENGTH TEST CYLINDERS SHALL BE PERFORMED AS SPECIFIED AND PAID FOR BY CONTRACTOR.
  - NEW WET WELL BAFFLE WALL SHALL BE TIGHTNESS TESTED, AND LEAKS REPAIRED AT CONTRACTOR'S OWN EXPENSE. WALL CONCRETE SHALL ACHIEVE 100% OF SPECIFIED COMPRESSIVE STRENGTH PRIOR TO TESTING.
  - TIGHTNESS TESTING SHALL BE IN ACCORDANCE WITH ACI-350.1-10 "SPECIFICATION FOR TIGHTNESS TESTING OF ENVIRONMENTAL ENGINEERING CONCRETE CONTAINMENT STRUCTURES" CHAPTER 2, PART 1 QUALITATIVE CRITERIA AND PART 2 QUANTITATIVE CRITERIA. WOODARD & CURRAN WILL PROVIDE FIELD TESTING FORMS TO BE COMPLETED BY CONTRACTOR AND FILED FOR RECORD TO DOCUMENT THE TESTING REQUIREMENTS.
- PENETRATIONS AND EQUIPMENT PADS:**
  - CONTRACTOR TO VERIFY THE NUMBER, SIZE, AND LOCATIONS OF ALL EQUIPMENT PADS AND PENETRATIONS THROUGH FLOOR SLABS, WALLS, CEILINGS AND ROOF PRIOR TO CONCRETE PLACEMENT (REFER TO MECHANICAL, HVAC, PLUMBING, AND ELECTRICAL DRAWINGS). ALL PENETRATIONS AND EQUIPMENT PADS ARE NOT SHOWN ON THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
  - PROVIDE WATERTIGHT SEAL FOR ALL PIPE PENETRATIONS IN WALLS AND FLOORS.
  - PROVIDE ADDITIONAL REINFORCEMENT AT WALL AND SLAB OPENINGS PER STANDARD DETAILS.
  - ALL PENETRATIONS THROUGH FIRE-RATED WALL SHALL BE FIRESTOPPED WITH APPROVED SEALANT TO MEET GIVEN FIRE RATING.
- MASONRY:**
  - ALL MASONRY MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 530.
  - CONCRETE MASONRY UNITS SHALL BE ASTM C90. JOINT REINFORCING SHALL BE ASTM A82. PORTLAND CEMENT SHALL BE ASTM C150 TYPE I OR II. GROUT SHALL BE ASTM C476 TYPE 1. MORTAR SHALL BE ASTM C270 TYPE S. MORTAR SHALL NOT BE USED WHERE GROUT IS SPECIFIED.
  - ALL REINFORCING SHALL BE ASTM A615, GRADE 60.
  - MASONRY SHALL BE LAID IN RUNNING BOND, UNLESS NOTED OTHERWISE, AND SHALL HAVE CORNER AND END BLOCKS AT CORNERS, ENDS, AND OPENINGS. JOINTS SHALL BE TOOLED CONCAVE.
  - HORIZONTAL JOINT REINFORCING SHALL BE GALVANIZED LADDER TYPE REINFORCING WITH #1.7 WIRES. JOINT REINFORCING SHALL BE INSTALLED IN EVERY OTHER COURSE JOINT. PROVIDE JOINT REINFORCING IN TWO ADJACENT COURSES ABOVE AND BELOW ALL WALL OPENINGS. CORNERS AND INTERSECTIONS SHALL HAVE PREFABRICATED UNITS. END LAPS SHALL BE 6".
  - FILL CONCRETE CORES WITH GROUT AT BEAM, JOIST AND LINTEL BEARINGS.
  - BRICK: ASTM C 216, GRADE SW, TYPE FBS, STANDARD MODULAR SIZE (4" X 8" X 2 2/3" HIGH NOMINAL).
- MASONRY SPLICE LENGTHS SHALL BE PER IBC 2107.3.**
  - #4 2'-6" MINIMUM
  - #5 3'-3" MINIMUM
  - #6 3'-9" MINIMUM
  - #7 4'-5" MINIMUM
- WOOD FRAMING:**
  - ROOF CONSTRUCTION SHALL BE 5/8" CDX PLYWOOD WITH PANEL CLIPS AT EDGES PER APA STANDARDS. ATTACH PLYWOOD WITH 10d COMMON NAILS AT 6" OC AT ALL SUPPORTS AND ALONG FULL PERIMETER OF ROOF. PLYWOOD BLOCKING IS NOT REQUIRED.
  - ATTACH END OF ALL ROOF TRUSSES TO DOUBLE TOP PLATE WITH SIMPSON STRONG-TIE H10A METAL FRAMING ANCHOR OR EQUAL WITH A MINIMUM UPLIFT CAPACITY OF 1015 LBS.
  - MINIMUM ATTACHMENT OF ALL LUMBER SHALL BE PER "TABLE 2304.9.1 FASTENING SCHEDULE" OF THE 2006 INTERNATIONAL BUILDING CODE.
  - ALL NAILS SHALL BE GALVANIZED AND SIZED AS FOLLOWS:
    - 8d (2 1/2" x 0.131")
    - 10d (3" x 0.148")
- ALUMINUM CONSTRUCTION:**
  - ALUMINUM GRATING SHALL BE LIGHT DUTY 19-SGI-4 EXTRUDED I-BAR GRATING W/ STRIATED TOP AND BOTTOM FLANGES FOR BUILT-IN SKID RESISTANCE. DEPTH PER DRAWINGS. FACTORY BANDED ALL SIDES AND ALL PENETRATIONS. MAXIMUM GAP BETWEEN PANELS AND ABUTTING SURFACES 1/4-INCH. GRATING SPAN PER DRAWINGS.
  - GRATING ATTACHMENT: 316 SS ATTACHMENT CLIPS AT FOUR CORNERS AND ONE CLIP MIDDLE OF EACH PANEL AT ALL INTERMEDIATE SUPPORTS.
  - ALL ALUMINUM EMBEDDED OR IN CONTACT WITH CONCRETE SHALL BE COATED WITH BITUMASTIC PAINT.
- DESIGN LOADS (2006 INTERNATIONAL BUILDING CODE W/ CITY AMENDMENTS):**
  - ROOF TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING LOADS:
    - GROUND SNOW LOAD, Pg = 50 PSF
    - SNOW EXPOSURE, Ce = 1.0
    - SNOW IMPORTANCE FACTOR, I = 1.1
    - SNOW THERMAL FACTOR, Ct = 1.1
    - ROOF SNOW LOAD, Pf = Ps = 42.4 PSF (MIN)
    - UNBALANCED SNOW = DESIGN FOR UNBALANCED SNOW LOADS PER CODE
    - TOP CHORD DEAD LOAD = 10 PSF
    - BOTTOM CHORD DEAD LOAD = 10 PSF
    - BOTTOM CHORD LIVE LOAD = 20 PSF
    - WIND LOADS = SEE WIND LOAD REQUIREMENTS LISTED BELOW
  - WIND: V = 100 MPH, EXPOSURE B, IMPORTANCE FACTOR = 1.15, MEAN ROOF HEIGHT = 17 FT
  - SEISMIC: Ss = 0.356, S1 = 0.078, SITE CLASS=D  
Sds = 0.36, Sd1 = 0.125  
SEISMIC IMPORTANCE FACTOR = 1.25  
SEISMIC DESIGN CATEGORY C;  
SFRS = ORDINARY PLAIN MASONRY SHEAR WALLS  
R = 1.5; Cs = 0.30; SEISMIC BASE SHEAR = 26.5 KIPS
  - GRATING LIVE LOAD = 250 PSF



PUMP STATION BASEMENT LEVEL PLAN

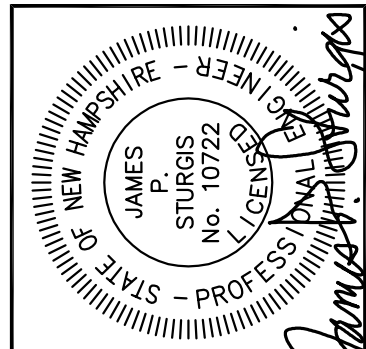


PUMP STATION INTERMEDIATE LEVEL PLAN



PUMP STATION GRADE LEVEL PLAN

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Portland, Maine 04102  
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REV	DESCRIPTION	DATE

DESIGNED BY: MDLM / JPS  
CHECKED BY: MDLM / JPS  
DRAWN BY: DMB  
2/27/2010-A-001.DWG

**STRUCTURAL & ARCHITECTURAL NOTES, LEGEND, & ABBREVIATIONS**

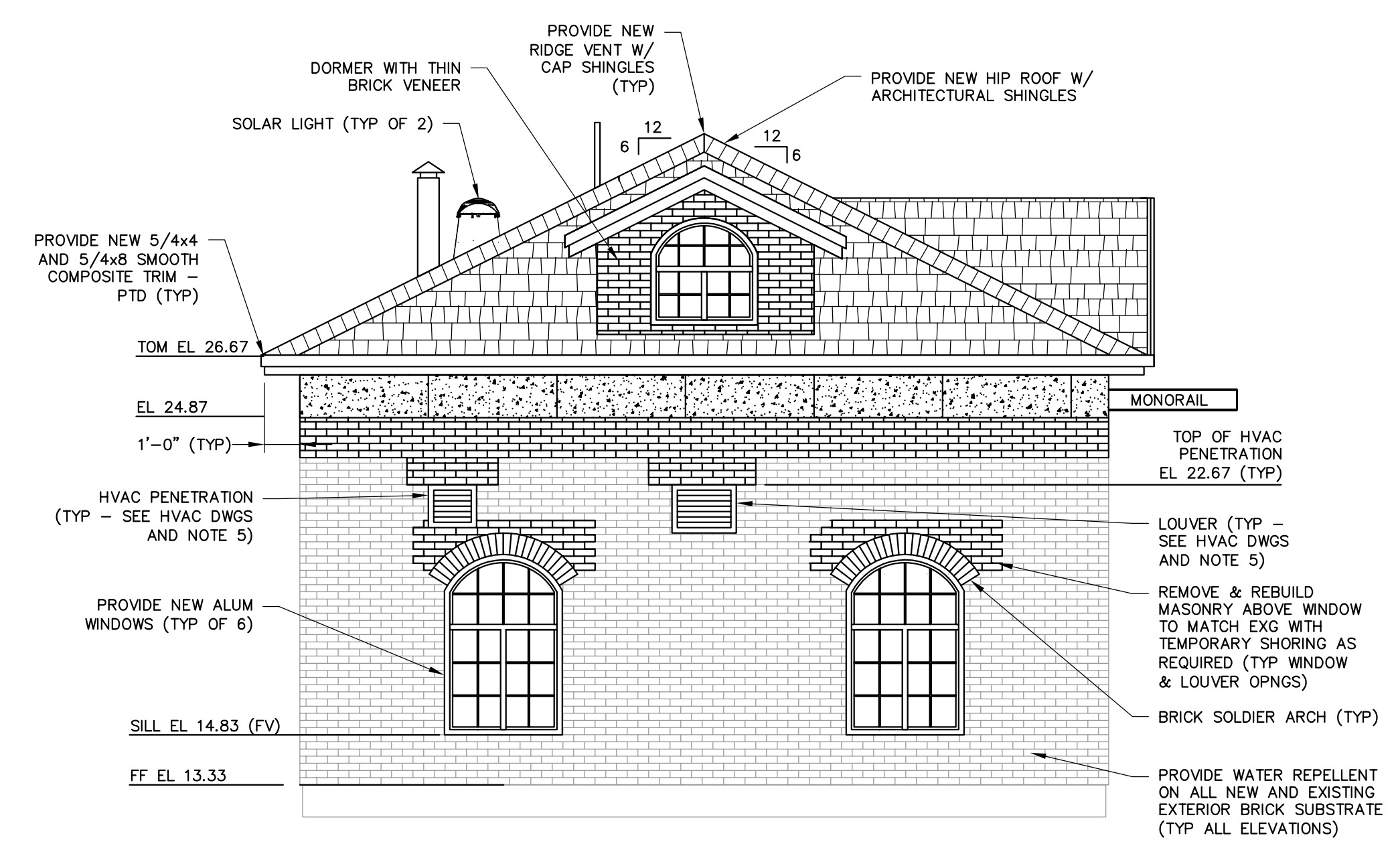
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

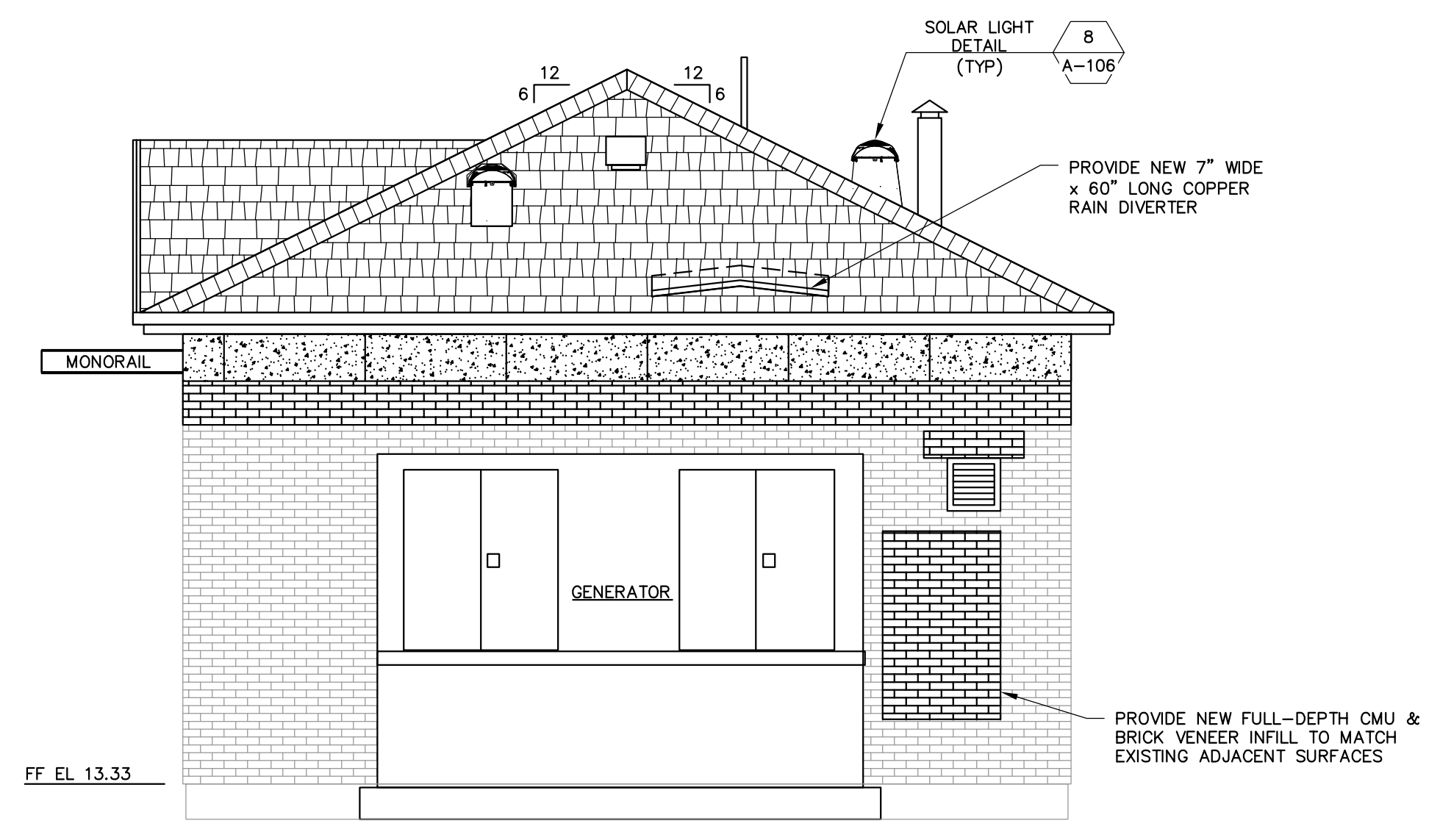
JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 9 OF 67

**A-001**

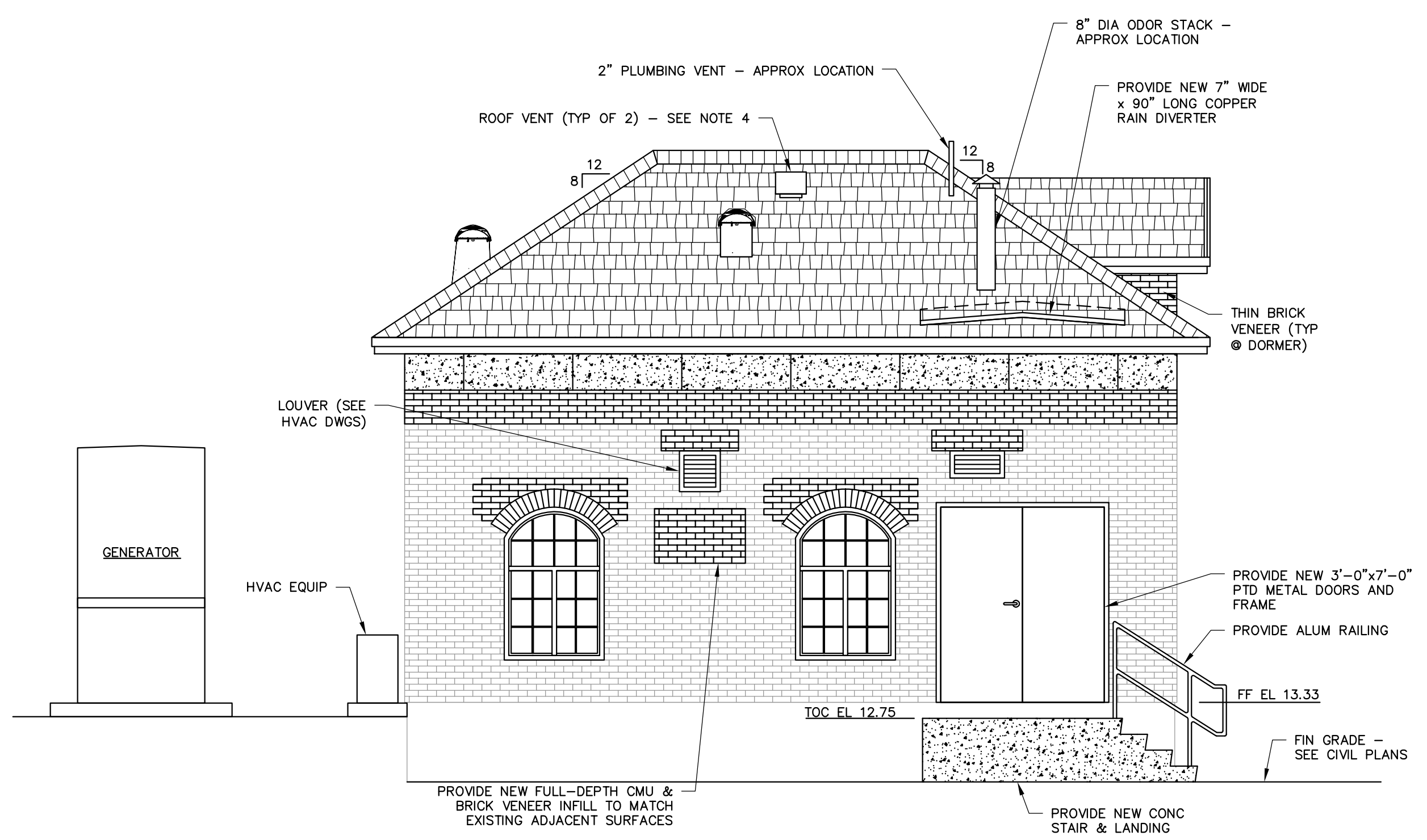
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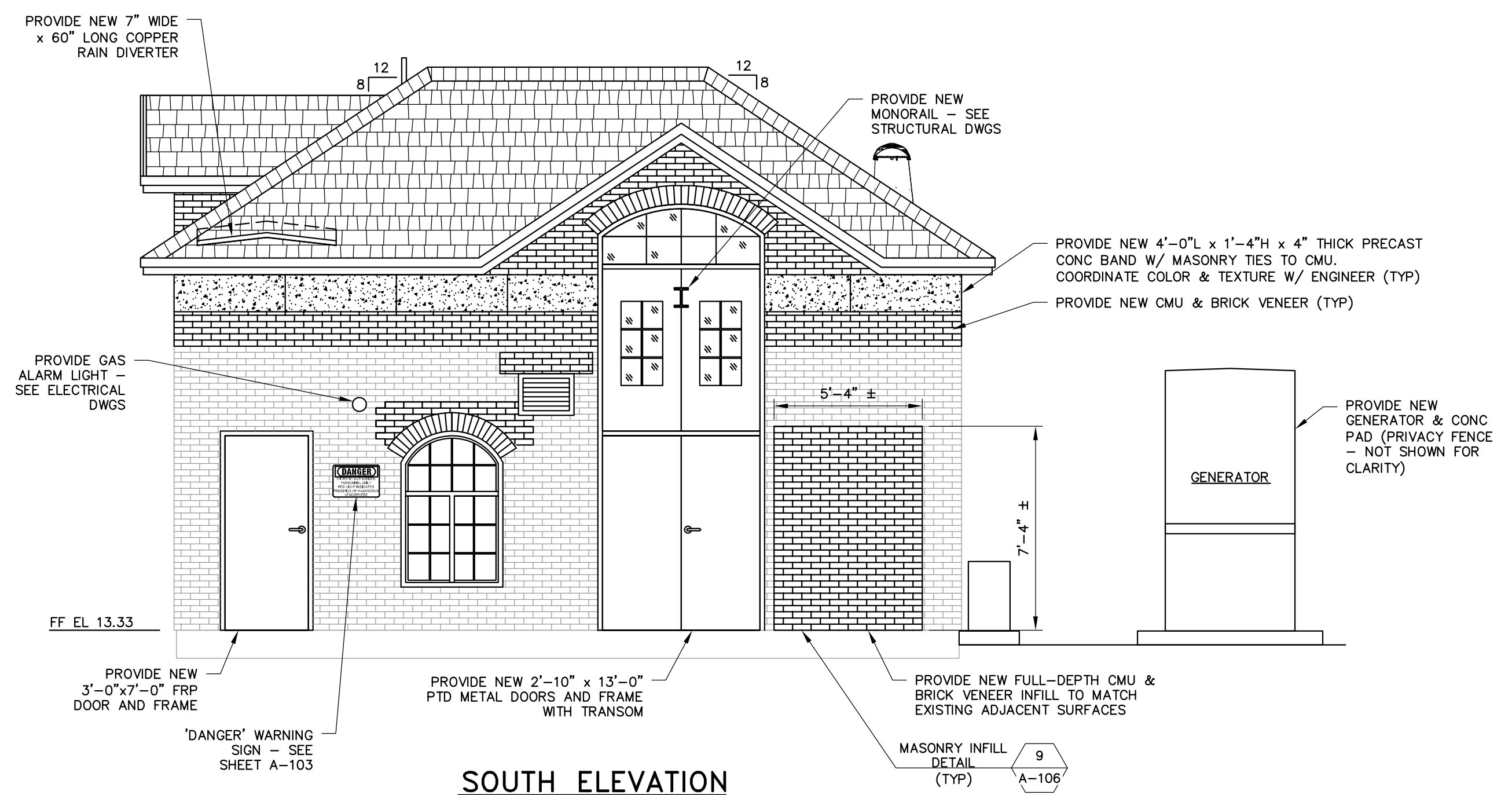
**WEST ELEVATION**  
SCALE: 1/4" = 1'-0"



**EAST ELEVATION**  
SCALE: 1/4" = 1'-0"

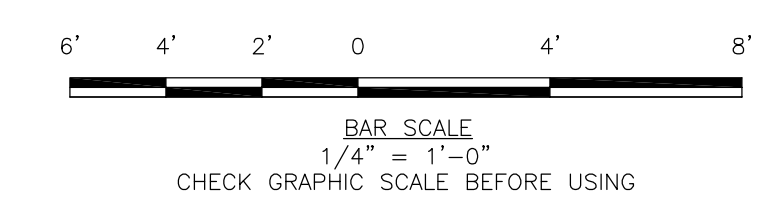


**NORTH ELEVATION**  
SCALE: 1/4" = 1'-0"



**SOUTH ELEVATION**  
SCALE: 1/4" = 1'-0"

- NOTES:**
- ALL NEW BRICK AND MORTAR SHALL MATCH EXISTING BRICK AND MORTAR IN COLOR, SIZE, TEXTURE, SHEEN, AND APPEARANCE, AS APPROVED BY THE ENGINEER AND OWNER.
  - MASONRY SUBCONTRACTOR SHALL CONSTRUCT A MINIMUM 4'x4' MOCK-UP PANEL TO OBTAIN OWNER APPROVAL PRIOR TO THE START OF WORK. APPROVED MOCK-UP PANEL SHALL SERVE AS THE BASIS FOR THE ACCEPTED WORKMANSHIP AND APPEARANCE OF ALL PROPOSED MASONRY.
  - PROVIDE PAINTED COMPOSITE TRIM AS SHOWN AND AS SPECIFIED. ALL TRIM SHALL BE INSTALLED USING STAINLESS STEEL FINISH NAILS. ALL JOINTS AND SEAMS IN TRIM BOARDS SHALL HAVE BACKER ROD AND SEALANT PRIOR TO FINISH PAINTING. COLOR SELECTED BY OWNER.
  - ROOF VENT: SHALL BE EQUAL TO SLP150 SLANT-BACK PLASTIC ROOF VENT MANUFACTURED BY AIR VENT INC. OR EQUAL. EACH ROOF VENT SHALL HAVE A MINIMUM NET FREE AREA OF 150 SQUARE INCHES. ALL INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR A COMPLETE, WATERTIGHT SYSTEM.
  - HVAC WALL PENETRATION LAYOUT: CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL HVAC WALL PENETRATIONS TO ENSURE THEY ARE BETWEEN REINFORCED CMU PIERS AS SHOWN ON SHEET S-102.



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NEW HAMPSHIRE REGISTERED PROFESSIONAL ENGINEER

JAMES P. STURGIS  
No. 10722

REV	DESCRIPTION	DATE

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2/28/2017 10:10:10 AM

**PUMP STATION ELEVATIONS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

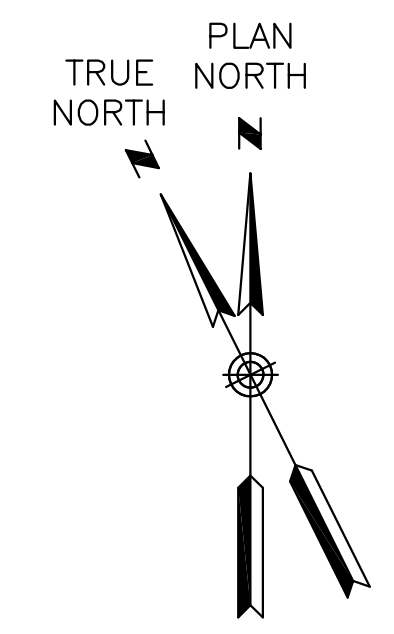
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 10 OF 67

**A-101**

BID SET

\\woodardcurran.net\shares\Projects\227872\_Portsmouth\_NH - Lafayette\_Road\PS\_Upgrade\wpb\227872\_01\_Lafayette\_Rd\_PSW\_Final\_Design\_Drawings\Architectural\22787200-A-101.dwg, Jan 30, 2017, 1:36pm

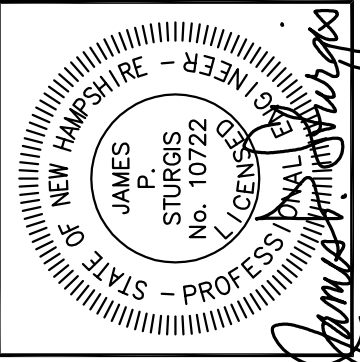


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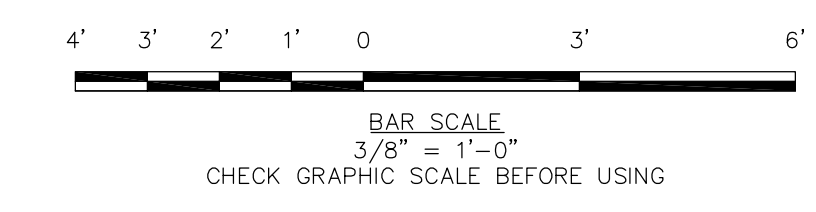
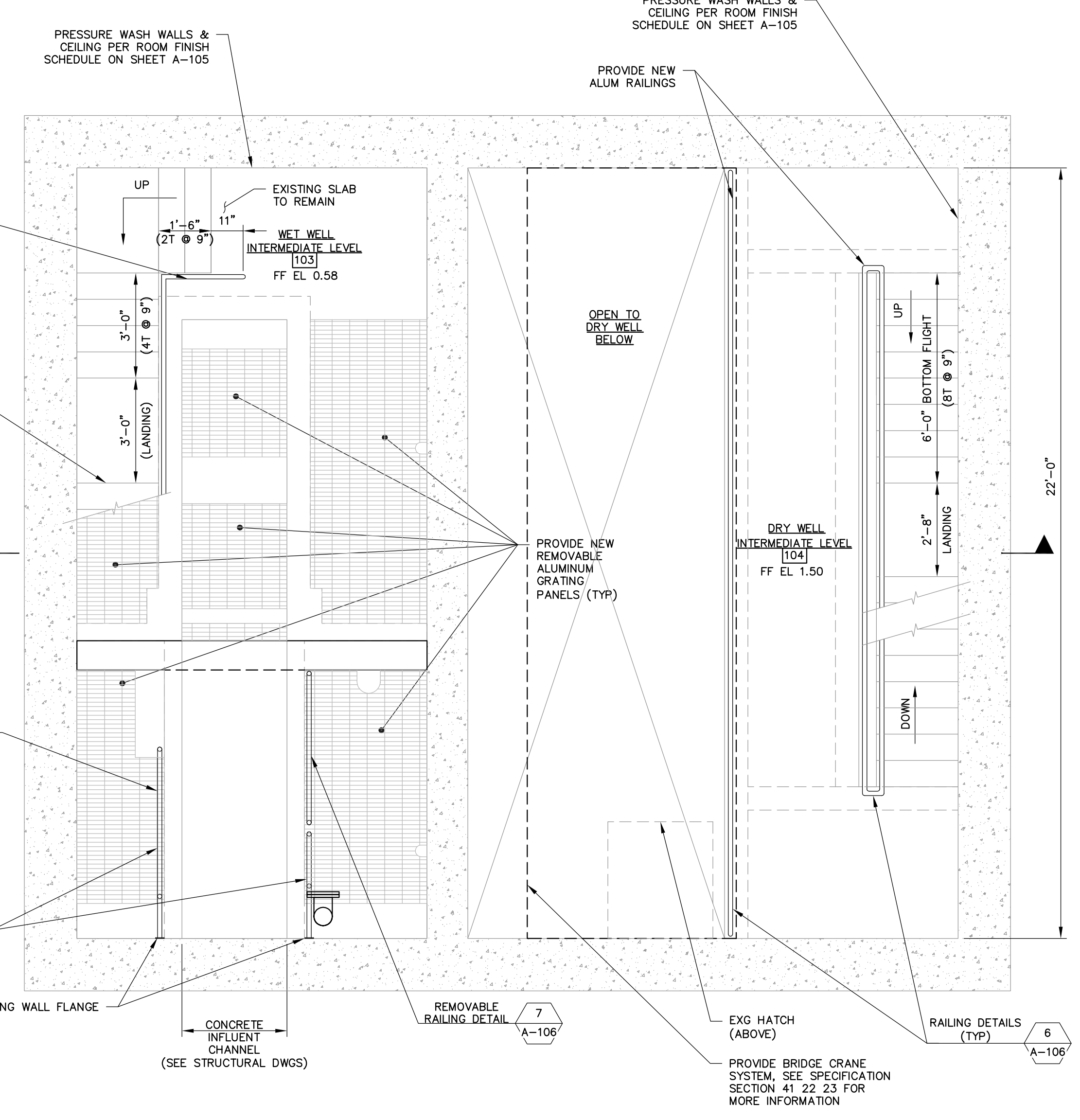
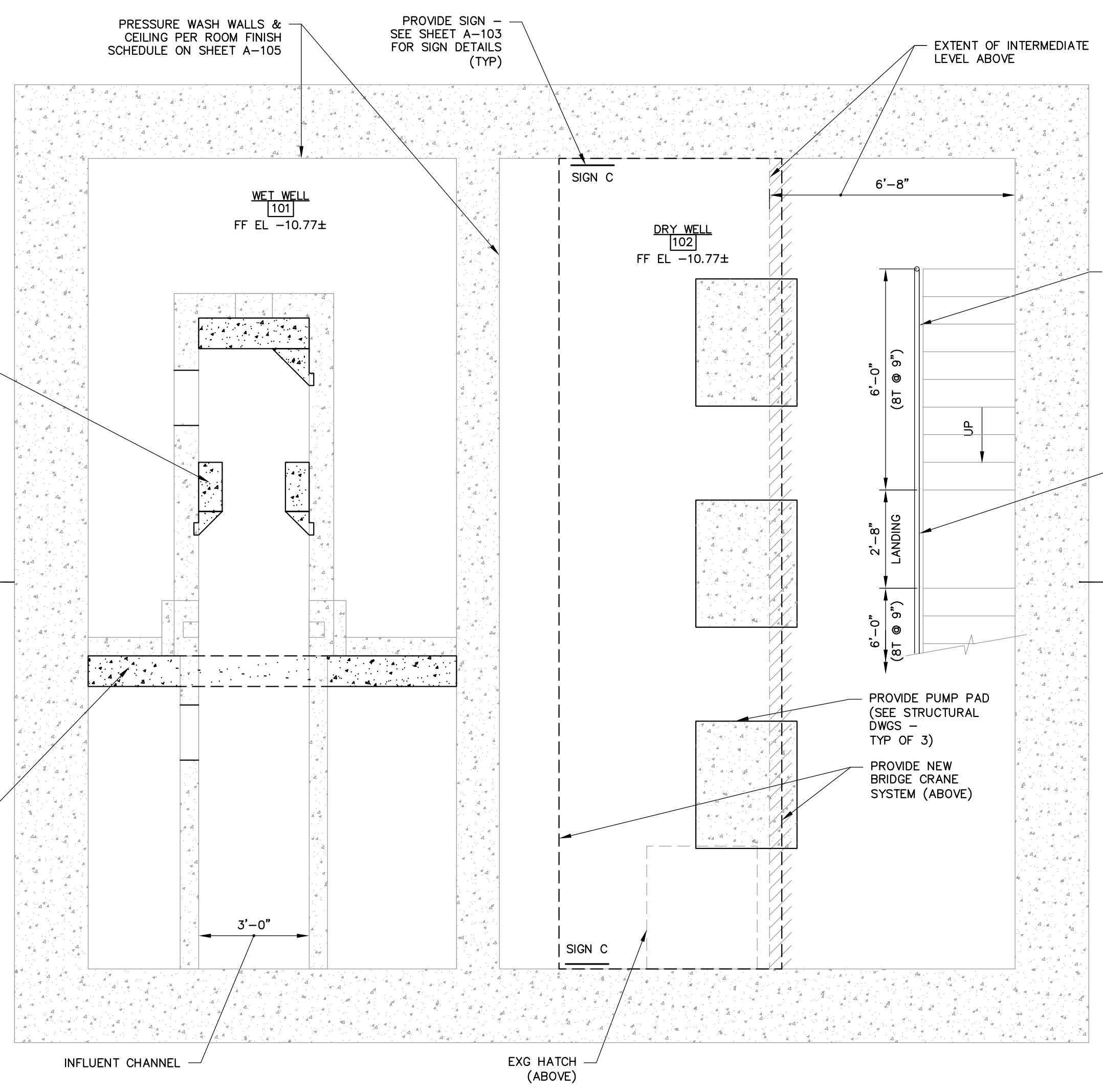
**PUMP STATION BASEMENT & INTERMEDIATE LEVEL PLANS**

CITY OF PORTSMOUTH  
 DEPARTMENT OF PUBLIC WORKS  
 NEW HAMPSHIRE

LAFAYETTE ROAD  
 PUMP STATION  
 UPGRADES

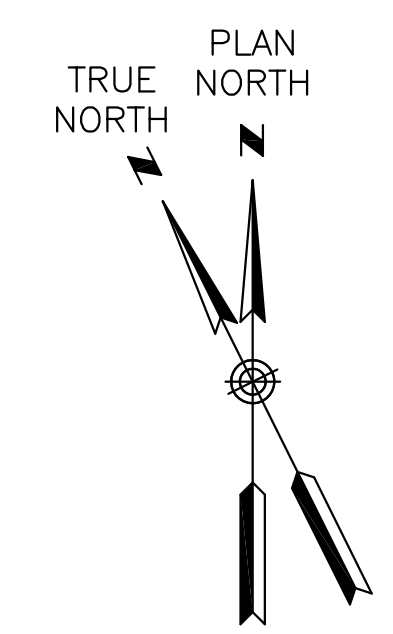
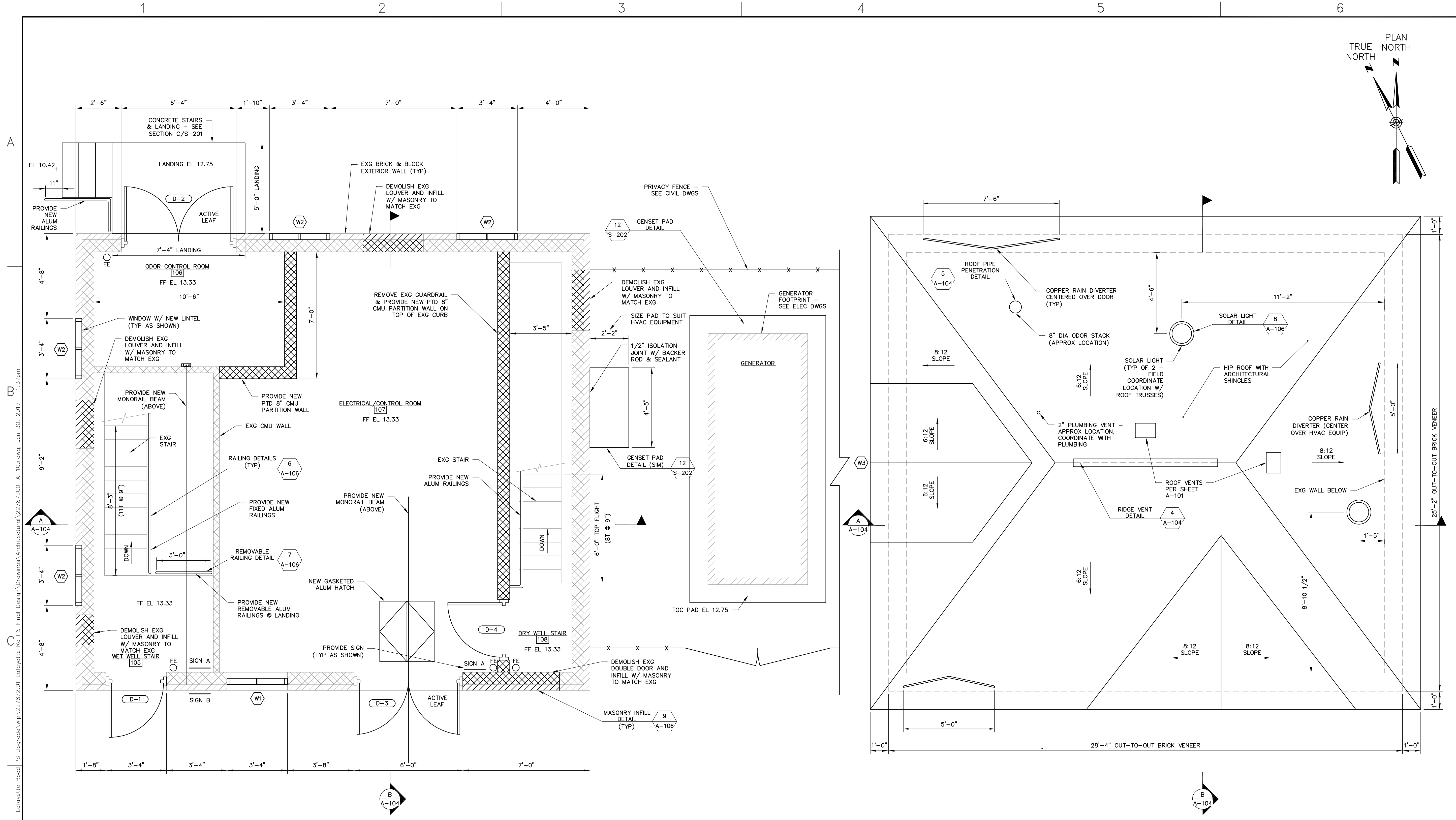
JOB NO.: 227872.00  
 DATE: FEBRUARY 2017  
 SCALE: AS NOTED  
 SHEET: 11 OF 67

**A-102**



BID SET

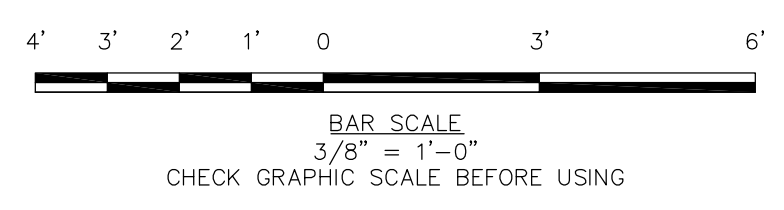
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**GRADE LEVEL FLOOR PLAN**  
SCALE: 3/8" = 1'-0"

- PLAN NOTES:**
1. PREPARE AND PAINT ALL WALLS AND CEILINGS PER ROOM FINISH SCHEDULE ON SHEET A-105.

**ROOF PLAN**  
SCALE: 3/8" = 1'-0"



**CAUTION**  
MONORAIL BEAM  
TOTAL LIFT CAPACITY  
1-TON

**SIGN A**  
QUANTITY: 2  
PROVIDE SIGN (SHOWN ABOVE) IN CLEARLY VISIBLE LOCATION ON WALL AS SHOWN.  
SIGN SHALL BE MCMASTER-CARR 14"x10" PLASTIC "CAUTION" SIGN, CUSTOMIZED AS SHOWN, OR APPROVED EQUAL

**DANGER**  
ENTRY BY AUTHORIZED PERSONNEL ONLY  
RED LIGHT INDICATES PRESENCE OF HAZARDOUS ATMOSPHERE

**SIGN B**  
QUANTITY: 1  
PROVIDE SIGN (SHOWN ABOVE) IN CLEARLY VISIBLE LOCATION ON WALL AS SHOWN.  
SIGN SHALL BE MCMASTER-CARR 20"x14" ALUMINUM "DANGER" SIGN, CUSTOMIZED AS SHOWN, OR APPROVED EQUAL

**CAUTION**  
BRIDGE CRANE  
TOTAL LIFT CAPACITY  
1 TON

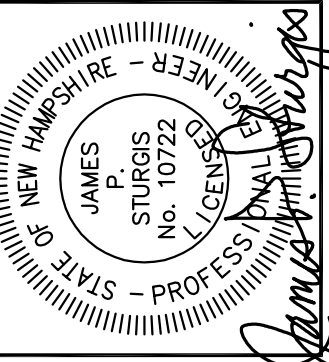
**SIGN C**  
QUANTITY: 2  
PROVIDE SIGN (SHOWN ABOVE) IN CLEARLY VISIBLE LOCATION ON WALL AS SHOWN.  
SIGN SHALL BE MCMASTER-CARR 14"x10" PLASTIC "CAUTION" SIGN, CUSTOMIZED AS SHOWN, OR APPROVED EQUAL

**SIGN DETAILS**

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**PUMP STATION GRADE LEVEL & ROOF PLANS**

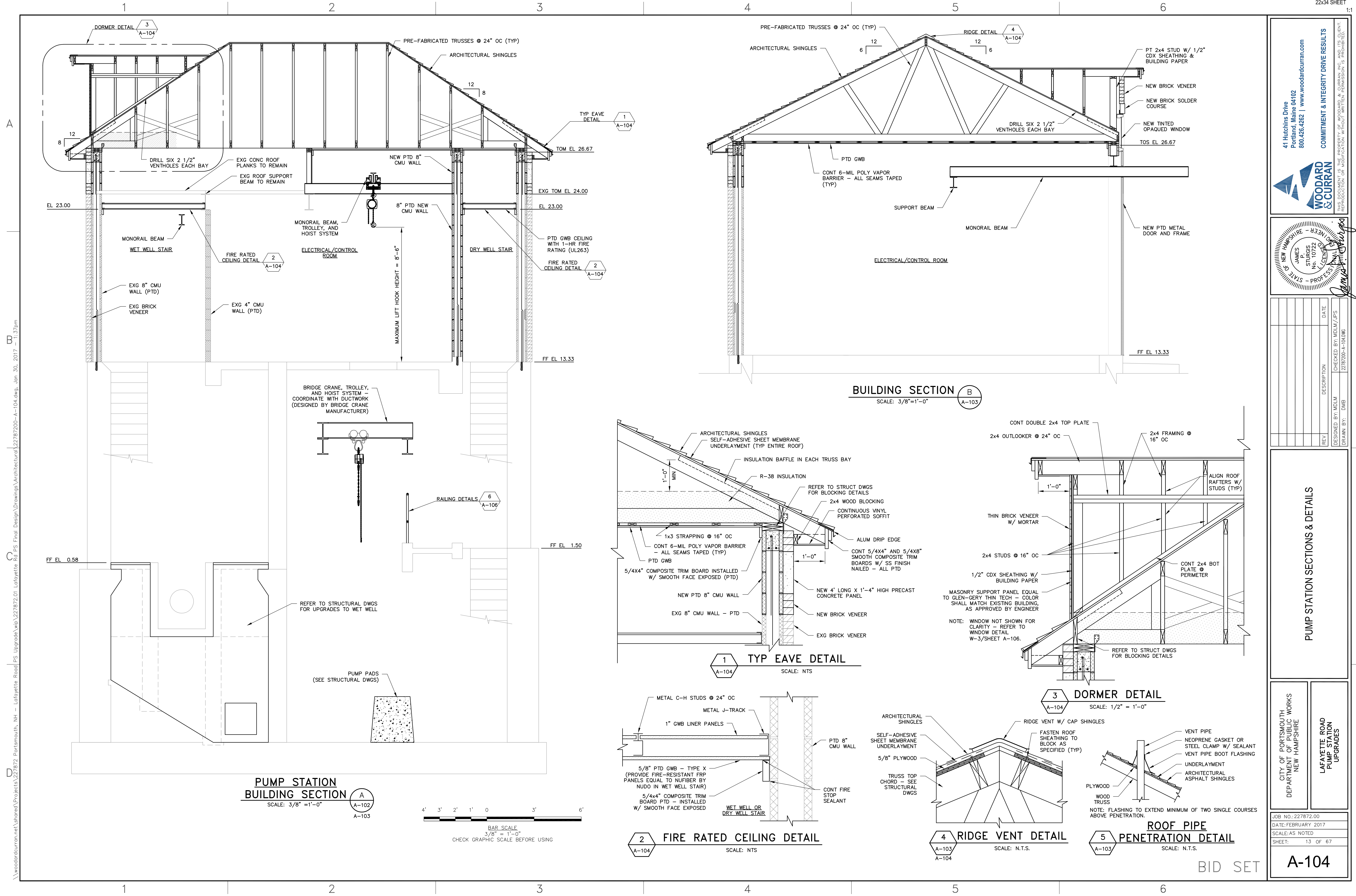
CITY OF PORTSMOUTH  
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NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 12 OF 67

**A-103**

BID SET



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NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER

JAMES P. STURGIS  
 No. 10722

DESIGNED BY: MDLM / JPS  
 CHECKED BY: MDLM / JPS  
 DRAWN BY: DMB

REV	DESCRIPTION	DATE

**PUMP STATION SECTIONS & DETAILS**

CITY OF PORTSMOUTH  
 DEPARTMENT OF PUBLIC WORKS  
 NEW HAMPSHIRE

LAFAYETTE ROAD  
 PUMP STATION  
 UPGRADES

JOB NO.: 227872.00  
 DATE: FEBRUARY 2017  
 SCALE: AS NOTED  
 SHEET: 13 OF 67

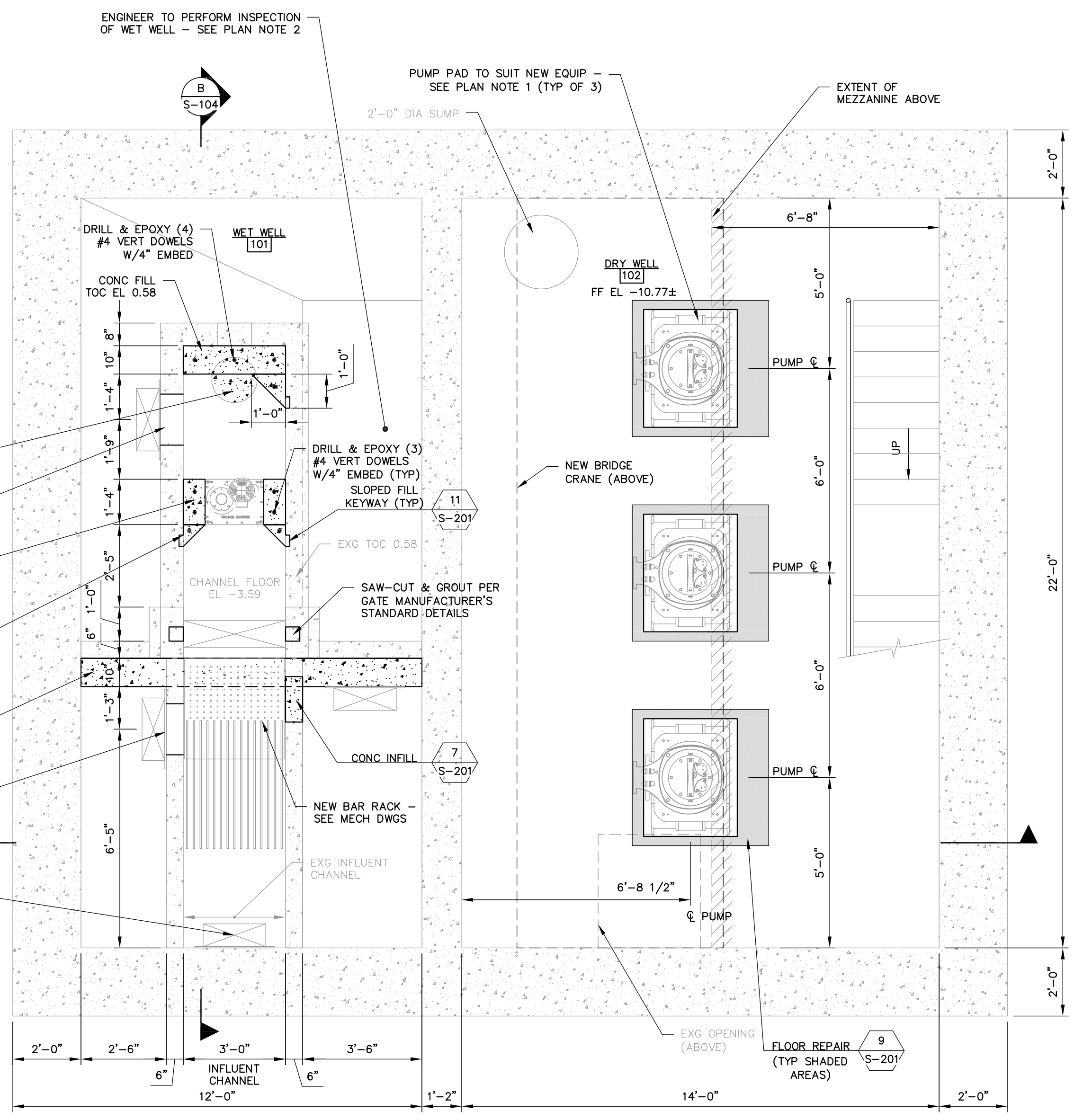
**A-104**

BID SET



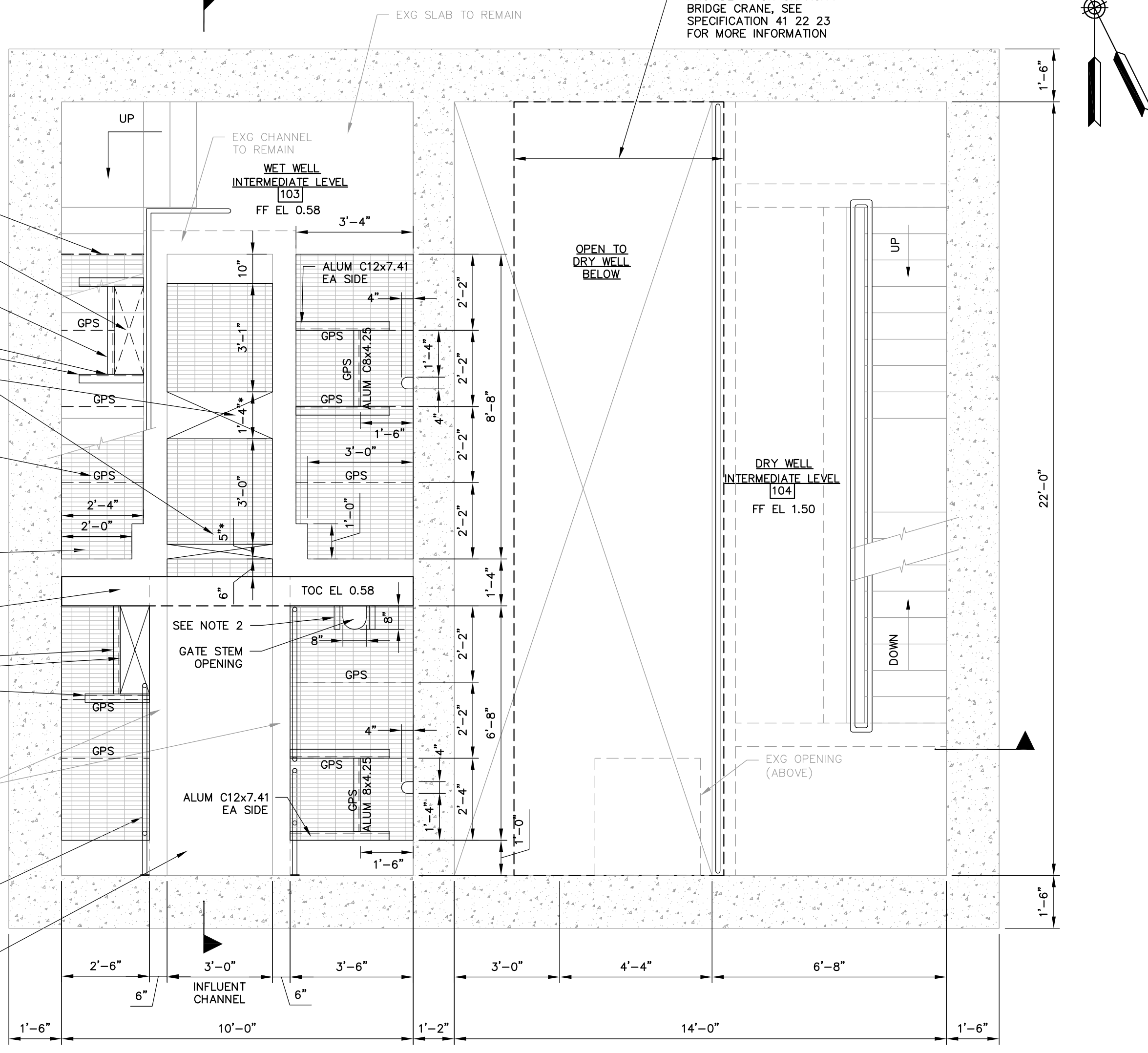






- PLAN NOTES:**
- CONTRACTOR TO COORDINATE CONCRETE PUMP PEDESTAL SIZE AND HEIGHT WITH EQUIPMENT. PROVIDE EITHER MONOLITHIC REINFORCED CONCRETE PUMP PEDESTAL FOR PUMP BASEPLATE PER MANUFACTURER'S DETAILS, OR EQUIPMENT PAD PER DETAIL ON S-201 FOR STEEL PUMP STAND AS REQUIRED BY THE PUMP MANUFACTURER.
  - WET WELL INSPECTION:** UPON REMOVAL OF EXISTING SLAB, CONTRACTOR SHALL CLEAN WET WELL AND PROVIDE LIGHTING AND SAFE ACCESS FOR ENGINEER TO ENTER THE WET WELL AND PERFORM AN INSPECTION. ALL CONCRETE DEFECTS IDENTIFIED BY THE ENGINEER DURING THE INSPECTION SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE UNIT PRICE REPAIR ITEMS.

**BASEMENT LEVEL FLOOR PLAN**  
SCALE: 3/8" = 1'-0"



- NOTES:**
- CONTRACTOR TO COORDINATE GRATING OPENINGS AND ALUM FRAMING BELOW WITH ACTUAL SLIDE GATE DIMENSIONS.
  - PROVIDE STAINLESS STEEL MSS SP-69 (TYPE 31) BRACKETS TO SUPPORT GRATING EITHER SIDE OF GATE ACTUATOR. FASTEN TO BAFFLE WALL WITH 316 STAINLESS STEEL EXPANSION ANCHORS.

**INTERMEDIATE LEVEL FLOOR PLAN**  
SCALE: 3/8" = 1'-0"

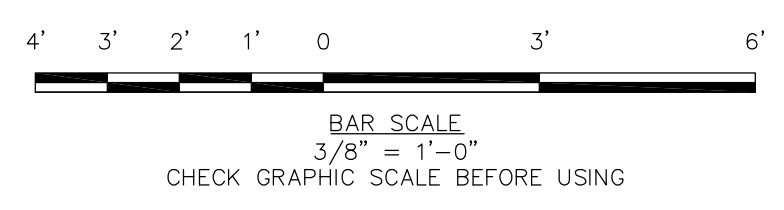
**CONCRETE REPAIR NOTES**

- A. GENERAL REQUIREMENTS:**
- ALL MATERIAL SHALL BE FURNISHED BY THE CONTRACTOR AND ALL DEMOLITION, SURFACE PREPARATION, AND OTHER WASTE DEBRIS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED FACILITY BY THE CONTRACTOR, UNLESS NOTED OTHERWISE. COSTS ASSOCIATED WITH TESTING AND/OR CHARACTERIZATION OF WASTE DEBRIS, AS MAY BE REQUIRED TO PERMIT DISPOSAL AT THE APPROPRIATE WASTE FACILITY, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
  - CARE SHALL BE TAKEN WHEN WORKING WITH OR AROUND ALL EXISTING MATERIALS. DAMAGE TO EXISTING MATERIALS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. RESTORE ALL AREAS DISTURBED BY THE WORK TO MATCH EXISTING CONSTRUCTION/FINISH.
  - ANY WORK DETERMINED TO BE DEFECTIVE/INCOMPLETE BY THE ENGINEER SHALL BE REPAIRED, REWORKED AND/OR COMPLETED AS PER THE APPROVAL OF THE ENGINEER.
- B. PRODUCT INSTALLATION:** ALL PRODUCTS SPECIFIED SHALL BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS, INCLUDING SURFACE PREPARATION, MATERIAL COMPATIBILITY, APPLICATION, AND CURING. SHOULD ANY FIELD CONDITIONS OR COMPATIBILITY ISSUES EXIST THAT MAY PREVENT INSTALLATION OF ANY ONE OF THESE ITEMS PER MANUFACTURER'S RECOMMENDATIONS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
- C. CONFINED SPACE ENTRY:** CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AS PART OF BASE BID ALL NECESSARY EQUIPMENT, MONITORING AND LABOR AS REQUIRED TO COMPLY WITH ALL RELEVANT O.S.H.A. AND OTHER REGULATIONS FOR CONFINED SPACE ENTRY. THIS APPLIES TO NOT ONLY CONTRACTOR PERSONNEL BUT ALSO ALL INSPECTION, OWNER, AND ENGINEERING PERSONNEL THAT REQUIRE OR REQUEST ENTRY INTO CONFINED SPACES.
- D. TEMPERATURE MAINTENANCE, HEATING, DEHUMIDIFICATION, AND WEATHER PROTECTION:** CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AS PART OF BASE BID ALL LABOR, EQUIPMENT, AND TEMPORARY ENCLOSURES FOR WEATHER PROTECTION, HEATING, DEHUMIDIFICATION, AND TEMPERATURE MAINTENANCE DURING THE WORK, IN ACCORDANCE WITH ALL RELATED OSHA AND OTHER REGULATIONS FOR HEATING PROCEDURES. WEATHER PROTECTION AND TEMPERATURE CONTROL DURING SURFACE PREPARATION, INSTALLATION, AND CURING SHALL BE MAINTAINED WITHIN THE SPECIFIED TEMPERATURE RESTRICTIONS AS RECOMMENDED BY EACH PRODUCT MANUFACTURER.

- E. SURFACE CLEANING:** THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING EXISTING COATINGS AND PROVIDING A DETAILED CLEANING AND SURFACE PREPARATION AS REQUIRED TO COMPLY WITH THE SPECIFIC MANUFACTURER'S RECOMMENDATIONS FOR PROPOSED REPAIR PRODUCTS.
- F. POTABLE WATER:** POTABLE WATER SHALL BE USED FOR ALL WET WELL CLEANING. ON-SITE WATER SOURCE(S) SUCH AS HYDRANTS SHALL BE COORDINATED AND APPROVED BY THE OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXTENSION HOSE AND CONNECTION DEVICES NECESSARY TO CONNECT TO SITE WATER SOURCES. IF USE OF HYDRANTS IS NOT PRACTICAL, CONTRACTOR SHALL PROVIDE OTHER MEANS OF POTABLE WATER SUPPLY AS REQUIRED TO COMPLETE THE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH PAYMENT FOR WATER AS PART OF BASE BID.
- G. 3-YEAR WARRANTY FOR ALL REPAIR WORK IN CONTRACT:** CONTRACTOR SHALL PROVIDE THE OWNER WITH A WRITTEN WARRANTY TO COVER FULL LABOR AND MATERIALS DURING THE WARRANTY PERIOD, AS REQUIRED TO REPAIR/REPLACE ANY DEFECTS OR FAILURES OBSERVED RELATIVE TO ALL SPECIFIED REPAIR ITEMS INCLUDED IN THIS SCOPE OF WORK. WARRANTY FAILURE SHALL BE DEFINED AS: POLYURETHANE CRACK INJECTION - LEAKING CRACKS; SPALL REPAIR - SPALLING, CRACKING, DELAMINATING, OR OTHER VISIBLE OR DISBONDING DEFECTS. WARRANTY PERIOD SHALL BE THREE (3) YEARS. WARRANTY SHALL INCLUDE REPAIR TYPES 'A', AND POLYURETHANE CRACK INJECTION.
- H. PRE-CONSTRUCTION CONDITION SURVEY:** PRIOR TO THE START OF THE WORK, THE REPAIR CONTRACTOR AND ENGINEER SHALL CONDUCT A WALK-THROUGH SURVEY OF ALL REPAIR AREAS. DURING THE SURVEY, ALL REPAIR AREAS SHALL BE IDENTIFIED AND DELINEATED FOR REPAIR TYPES.

**REPAIR TYPE SPECIFICATION (UNIT PRICE BID ITEMS)**

- A. 75 SF OF REPAIR TYPE 'A' - SHALLOW CONCRETE SPALL REPAIR (TROWEL):** THIS REPAIR APPLIES FOR SURFACE SPALL REPAIR (ASSUME AN AVERAGE DEPTH OF 2"). AS SHOWN ON THE PLANS, ALL HOLLOW, UNSOUND, DETERIORATED, AND/OR SPALLED CONCRETE SURFACES OR ANY PITS, VOIDS, EXPOSED REBAR, OR OTHERWISE RECESSED (NON-FLUSH) AREAS OF CONCRETE WALLS SHALL BE PREPARED BY SAW-CUTTING THE SPALL PERIMETER TO A MINIMUM DEPTH OF 1/4" AND CHIPPING OUT ALL CONCRETE WITHIN PERIMETER SAW-CUT TO A MINIMUM DEPTH OF 1/4". PATCH PREPARED, SPALLED AREA WITH PREMIUM REPAIR MORTAR EQUAL TO "MASTEREMACO T1061" BY BASF, "SIKATOP 123 PLUS" BY SIKA CORPORATION, OR APPROVED EQUAL. REPAIR SHALL HAVE A STEEL-TROWEL FINISH PLUMB, SQUARE, AND/OR FLUSH WITH ALL ADJACENT CONCRETE SURFACES. REFER TO SPECIFICATION SECTION 03 01 05 FOR TREATMENT OF EXPOSED REBAR AND FURTHER REQUIREMENTS. SURFACE PREPARATION AND APPLICATION SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS. UPON COMPLETION OF PATCH REPAIRS, ENGINEER SHALL SOUND ALL PATCH AREAS. ANY HOLLOW/UN SOUND PATCHES SHALL BE RE-DONE AT NO ADDITIONAL EXPENSE AS REQUIRED TO ACHIEVE A SOUND, WELL-BONDED REPAIR PATCH.
- REINFORCEMENT FOR REPAIR TYPE 'A' SPALL REPAIRS:** SALVAGE EXISTING REBAR WHERE POSSIBLE. DO NOT CUT EXISTING REBAR DURING SURFACE PREPARATION. ANY EXISTING REBAR THAT HAS GREATER THAN 20% CROSS-SECTIONAL LOSS SHALL BE REPLACED IN KIND AS DIRECTED BY THE ENGINEER, AS PART OF UNIT PRICE BID COST.
- B. 50 LF OF REPAIR TYPE 'B' POLYURETHANE CRACK INJECTION:** INJECT CRACKS IN EXISTING WET WELL WALLS AS SPECIFIED IN SECTION 03 63 00. INJECTION OF NEW CAST-IN-PLACE BAFFLE WALL (AS REQUIRED DURING TIGHTNESS TESTING) SHALL BE INCIDENTAL TO CONTRACT.



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NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER  
JAMES P. STURGIS  
No. 10722

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DRAWN BY: SJT

**PUMP STATION BASEMENT & INTERMEDIATE LEVEL STRUCTURAL PLANS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872-00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 16 OF 67

**S-101**

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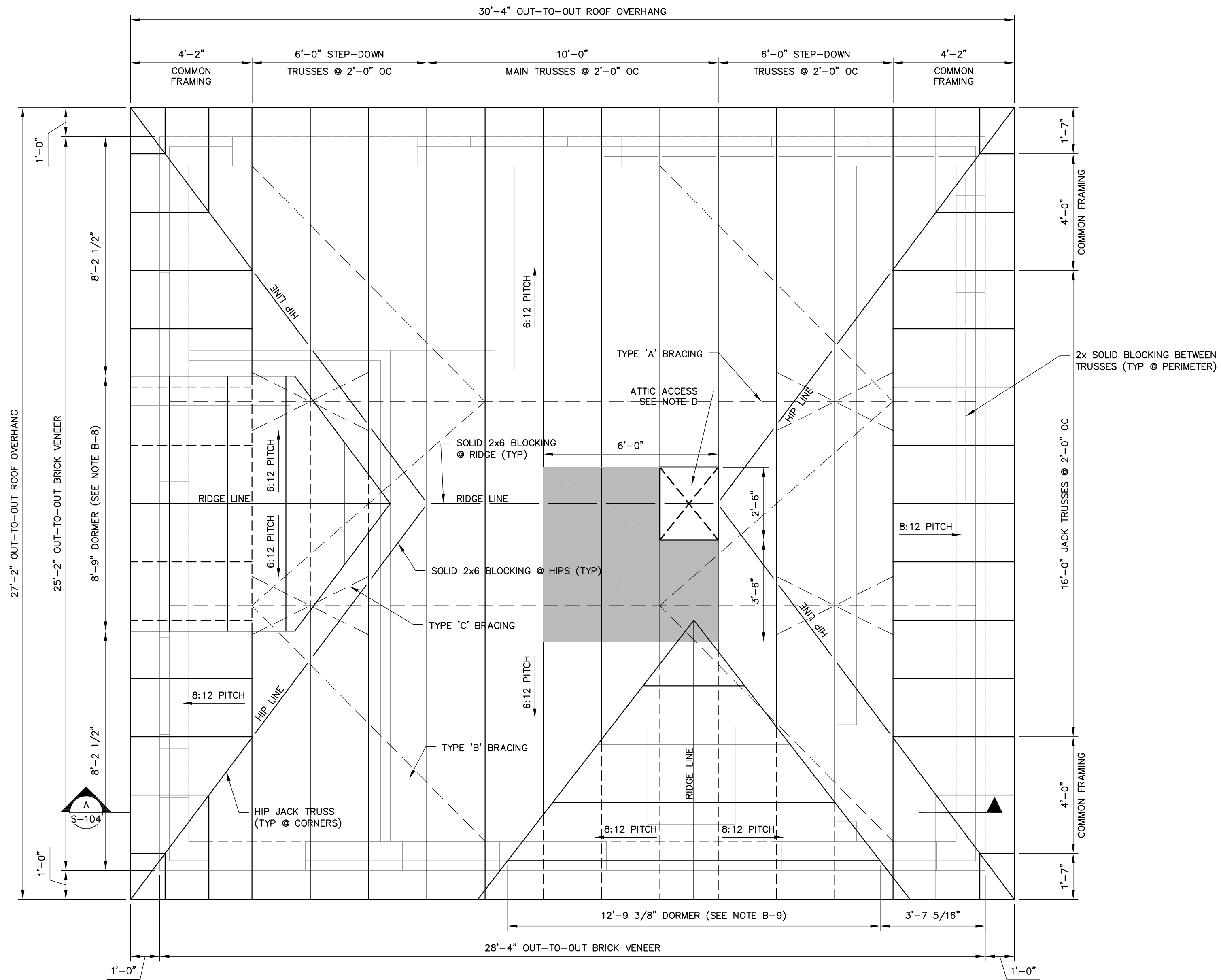
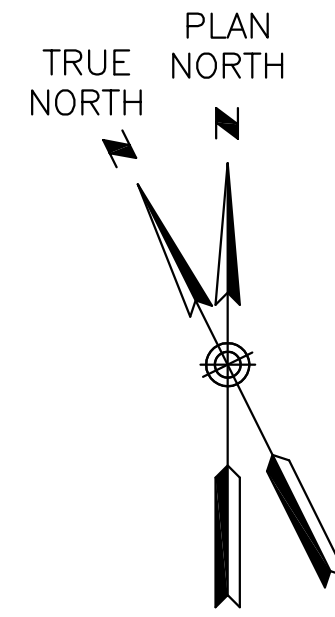


ROOF NOTES:

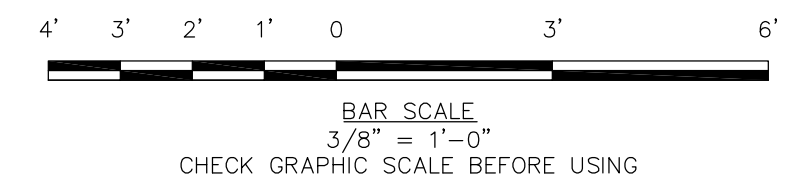
- A. ROOF CONSTRUCTION SHALL BE 5/8" CD-X PLYWOOD, GRADE PS-1 SHEATHING ON WOOD TRUSSES AS SHOWN WITH 10d NAILS @ 6" OC ALL EDGES/12" OC FIELD. PROVIDE PLYWOOD PANEL CLIPS AT MIDSPAN OF UNSUPPORTED EDGES.
- B. WOOD TRUSS:
  - 1. NOTE TO TRUSS DESIGNER/MANUFACTURER: ALTERNATE TRUSS LAYOUT WILL BE CONSIDERED AND SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL.
  - 2. HURRICANE TIES: PROVIDE H10A CONNECTOR FOR EACH SINGLE-PLY TRUSS AND H10-2 CONNECTOR FOR EACH MULTI-PLY BY SIMPSON STRONG-TIE AT EACH BEARING CONNECTION OR APPROVED EQUAL.
  - 3. DESIGN LOADS AT EACH BEARING REACTION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. TRUSS ANCHORAGE TIES MAY REQUIRE MODIFICATION BASED ON SHOP DRAWING REVIEW.
  - 4. SEE TRUSS BRACING SCHEDULE, THIS SHEET, FOR DIRECTION ON BRACING REQUIREMENTS.
  - 5. DESIGN TRUSSES FOR THE FOLLOWING LOADS IN ADDITION TO DESIGN LOADS ON SHEET A-001:
    - \* DEAD LOAD = 10 PSF TOP CHORD
    - \* DEAD LOAD = 10 PSF BOTTOM CHORD
    - \* DEAD LOAD = 5 PSF TRUSSES AND MISC
    - \* LIVE LOAD = 20 PSF ACCESS AREA
  - 6. TRUSS MANUFACTURER TO DESIGN FOR SNOW DRIFT AND UNBALANCED SNOW LOAD PER IBC 2009.
- 7. SUBMIT DESIGN CALCULATIONS AND DRAWINGS STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROJECT STATE.
- 8. DORMER ASSEMBLY, INCLUDING VERTICAL SIDE WALLS, SHALL BE DESIGNED AND PROVIDED BY TRUSS MANUFACTURER AS PART OF ROOF SYSTEM DESIGN.
- 9. DORMER ASSEMBLY, INCLUDING VERTICAL SIDE WALLS, SHALL BE DESIGNED AND PROVIDED BY TRUSS MANUFACTURER AS PART OF ROOF SYSTEM DESIGN.
- D. ATTIC ACCESS PANEL IN PROCESS ROOM CEILING:
  - 1. PROVIDE (1) 30-INCH (CLEAR) X 24" ATTIC ACCESS DOORS, AS SHOWN ON THE ROOF FRAMING PLAN. PANEL SHALL BE A "PUSH-UP" PANEL CONSTRUCTED OF 1/2" A-C PLYWOOD TOP AND BOTTOM THRU-BOLTED TOGETHER W/ 4" RIGID POLYSTYRENE INSULATION IN BETWEEN. PROVIDE GALVANIZED STEEL GRAB BAR HANDLE ON THE EXPOSED SIDE, PROVIDE FINISH ON UNDERSIDE TO MATCH CEILING. PROVIDE TRIM AROUND OPENING ON ALL SIDES.
  - 2. WITHIN ATTIC, PROVIDE A 4'-0" WIDE PERIMETER PLATFORM WITH 3/4" PLYWOOD ON TWO SIDES OF OPENING. SUPPORT PLYWOOD ON WOOD FRAMING ABOVE. BOTTOM JOIST CHORDS OF SUFFICIENT DEPTH AS REQUIRED TO STAY ABOVE INSULATION.

PERMANENT TRUSS BRACING SCHEDULE		
TYPE	DESCRIPTION	REMARKS
'A'	LATERAL BOTTOM CHORD BRACING: CONTINUOUS 2x4 ON TOP OF BOTTOM CHORD AT MAX 10'-0" INTERVALS ALIGNED WITH TRUSS PANEL POINTS.	ANCHOR TO EACH TRUSS AND END WALL WITH MIN. 2-16d NAILS. LAP BRACING OVER MIN 2 TRUSSES.
'B'	DIAGONAL BOTTOM CHORD BRACING: 2x4 DIAGONAL BRACING ON TOP OF BOTTOM CHORD AT MAX 20'-0" OC AND EACH END OF BUILDING, MEETING AT TRUSS PANEL POINTS.	ANCHOR TO EACH TRUSS BOTTOM CHORD WITH MIN. 2-16d NAILS. INSTALL BRACING AT APPROX. 45° TO TRUSSES.
'C'	VERTICAL WEB PLANE X-BRACING: 2x4 X-BRACING AT MAX 20'-0" INTERVALS AND AT EACH END OF BUILDING. (TYP. ALONG EACH TYPE 'A' BRACING LINE AT VERTICAL TRUSS WEBS AND AT TRUSS LAPS).	ANCHOR TO EACH VERTICAL TRUSS WEB MEMBER WITH MIN. 2-16d NAILS. INSTALL BRACING AT APPROX. 45° TO TRUSSES.

NOTE: THE BRACING SHOWN ON THE DRAWINGS AND IN THE ABOVE TABLE SHALL BE PERMANENT BRACING. ALL BRACING SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH WTCA SUMMARY SHEET BCS-B.3. TEMPORARY BRACING SHALL BE THE CONTRACTOR'S RESPONSIBILITY. ADDITIONAL PERMANENT BRACING SHALL BE PROVIDED IF REQUIRED BY TRUSS MANUFACTURER.



ROOF FRAMING PLAN  
SCALE: 3/8" = 1'-0"



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STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

JAMES P. STURGIS  
No. 10722

REV	DESCRIPTION	DATE

DESIGNED BY: SJJ  
DRAWN BY: SJJ  
CHECKED BY: JPS  
2/28/2017 5:10:10 AM

PUMP STATION  
ROOF FRAMING PLAN

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS NOTED
SHEET: 18 OF 67

S-103

BID SET

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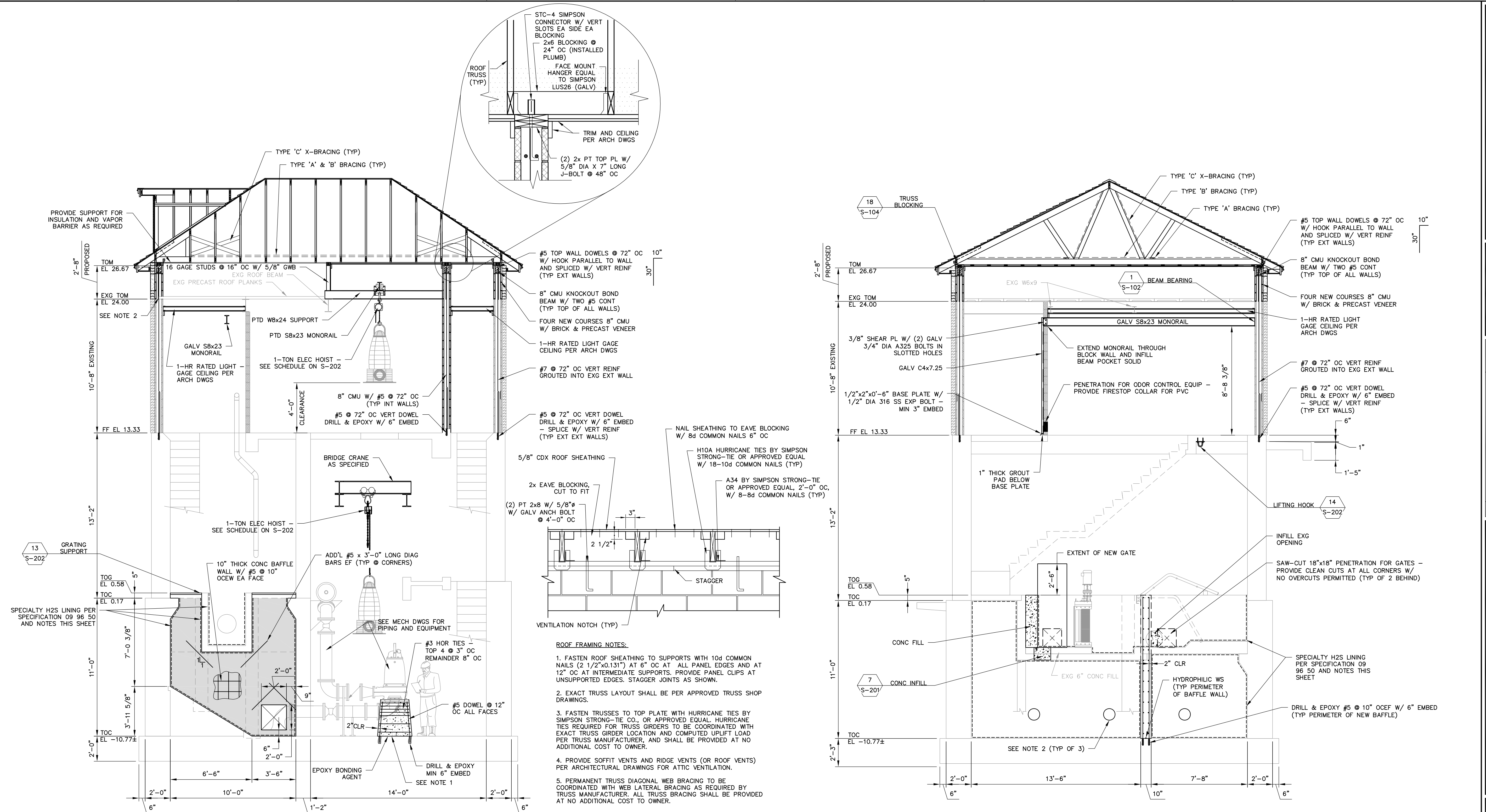
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CITY OF PORTSMOUTH  
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LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 19 OF 67

**S-104**



- ROOF FRAMING NOTES:**
- FASTEN ROOF SHEATHING TO SUPPORTS WITH 10d COMMON NAILS (2 1/2" x 0.131") AT 8" OC AT ALL PANEL EDGES AND AT 12" OC AT INTERMEDIATE SUPPORTS. PROVIDE PANEL CLIPS AT UNSUPPORTED EDGES. STAGGER JOINTS AS SHOWN.
  - EXACT TRUSS LAYOUT SHALL BE PER APPROVED TRUSS SHOP DRAWINGS.
  - FASTEN TRUSSES TO TOP PLATE WITH HURRICANE TIES BY SIMPSON STRONG-TIE CO. OR APPROVED EQUAL. HURRICANE TIES REQUIRED FOR TRUSS GIRDERS TO BE COORDINATED WITH EXACT TRUSS GIRDER LOCATION AND COMPUTED UPLIFT LOAD PER TRUSS MANUFACTURER, AND SHALL BE PROVIDED AT NO ADDITIONAL COST TO OWNER.
  - PROVIDE SOFFIT VENTS AND RIDGE VENTS (OR ROOF VENTS) PER ARCHITECTURAL DRAWINGS FOR ATTIC VENTILATION.
  - PERMANENT TRUSS DIAGONAL WEB BRACING TO BE COORDINATED WITH WEB LATERAL BRACING AS REQUIRED BY TRUSS MANUFACTURER. ALL TRUSS BRACING SHALL BE PROVIDED AT NO ADDITIONAL COST TO OWNER.
  - ALL HARDWARE, INCLUDING NAILS, SHALL BE HOT DIP GALVANIZED.

**18 TRUSS BLOCKING**  
SCALE: 3/4" = 1'-0"

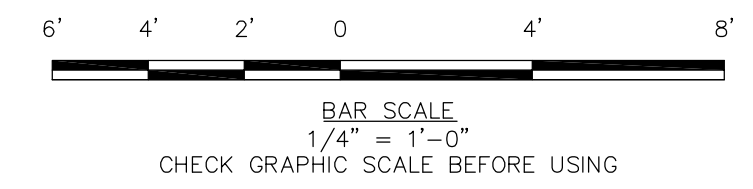
- NOTES:**
- CONTRACTOR TO COORDINATE CONCRETE PUMP PEDESTAL SIZE AND HEIGHT WITH EQUIPMENT. PROVIDE EITHER MONOLITHIC REINFORCED CONCRETE PUMP PEDESTAL FOR PUMP BASEPLATE PER MANUFACTURER'S DETAILS, OR EQUIPMENT PAD PER DETAIL ON S-201 FOR STEEL PUMP STAND AS REQUIRED BY THE PUMP MANUFACTURER.
  - TRIM PLANKS AS REQUIRED TO INSTALL NEW REINFORCING IN EXISTING CMU CORES. ALLOW A MINIMUM 2" OF BRACING TO REMAIN AS NOTED ON D-101.

**SECTION A**  
SCALE: 1/4" = 1'-0"  
S-101  
S-102

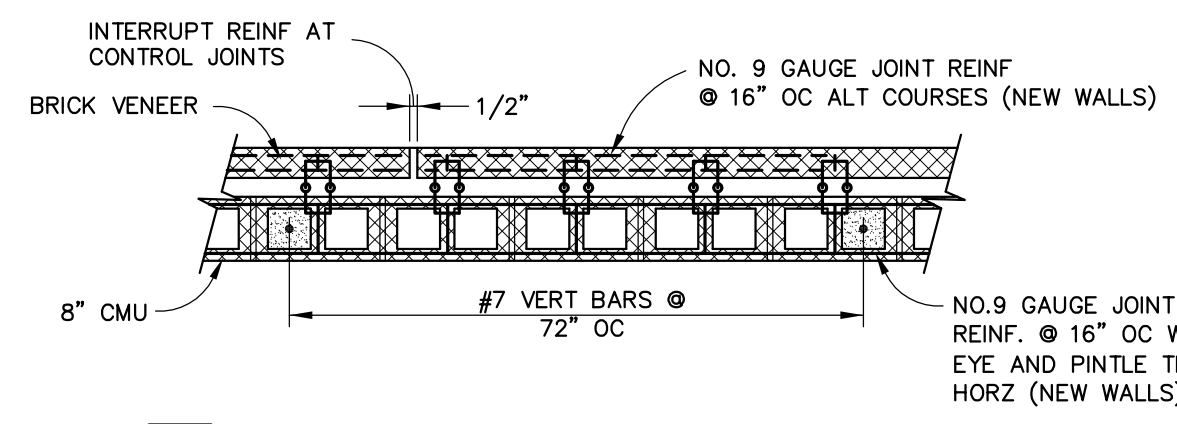
**SPECIALTY H2S LINING NOTES (BID ALTERNATE):**

- SCOPE OF WORK.** PROVIDE SURFACE PREPARATION AND LINING SYSTEM APPLICATION FOR ALL EXPOSED CONCRETE BELOW THE WET WELL GRATING, AND WITHIN THE INFLUENT CHANNEL (INCLUDING TESTING, HEATING AND DEHUMIDIFICATION). ALL COATINGS WORK SHALL BE PERFORMED AS SPECIFIED IN SECTION 09 96 50, AS SHOWN ON THE DRAWINGS, AND IN ACCORDANCE WITH THE COATING MANUFACTURER'S RECOMMENDATIONS. PROVIDE 3-YEAR MANUFACTURER'S AND CONTRACTOR'S WARRANTIES AS SPECIFIED.
- PRIOR TO THE START OF COATINGS WORK, THE CONTRACTOR SHALL PREPARE A MINIMUM 5'x5' MOCK-UP PANEL FOR REVIEW BY ENGINEER, SHOWING THE INTENDED SURFACE PREPARATION EFFORT, COATING APPLICATION, AND COATING FINISH. COATING FINISH SHALL BE SMOOTH, PLUMB, UNIFORM, AND FREE OF ANY DEFECTS, SUCH AS RUNS, DRIPS, HOLIDAYS, LICKS, HONEYCOMBS, RECESSED AREAS, OR HIGH SPOTS. THIS MOCK-UP PANEL CAN BE DONE ON THE WET WELL AS PART OF THE PERMANENT COATING SYSTEM.
- SURFACE PREPARATION, COATING APPLICATION, AND COATING TERMINATIONS SHALL BE PERFORMED TO THE SATISFACTION OF THE OWNER, ENGINEER, COATINGS MANUFACTURER, AND INDEPENDENT COATINGS INSPECTOR. ANY DEFECTS IN COATINGS APPLICATION AND WORKMANSHIP SHALL BE REPAIRED AS APPROVED BY THE ENGINEER.
- INDEPENDENT COATINGS INSPECTOR** SHALL BE PROVIDED AND PAID FOR BY THE OWNER. CONTRACTOR SHALL BE RESPONSIBLE TO CLOSELY AND ACCURATELY COORDINATE INSPECTION POINTS WITH INDEPENDENT COATINGS INSPECTOR, ENGINEER AND OWNER AND HAVE COATED STRUCTURES READY FOR INSPECTIONS. IF CONTRACTOR MISREPRESENTS THE COMPLETED STATUS OF WORK RESULTING IN ADDITIONAL UNPLANNED INSPECTOR VISITS, THE CONTRACTOR SHALL BE RESPONSIBLE TO REIMBURSE OWNER FOR COSTS ASSOCIATED WITH ANY EXTRA INSPECTION TRIPS.

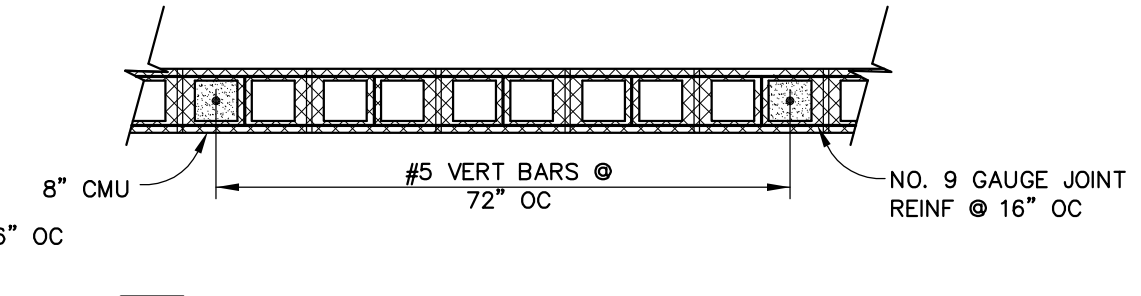
**SECTION B**  
SCALE: 1/4" = 1'-0"  
S-101  
S-102  
S-103



**BID SET**



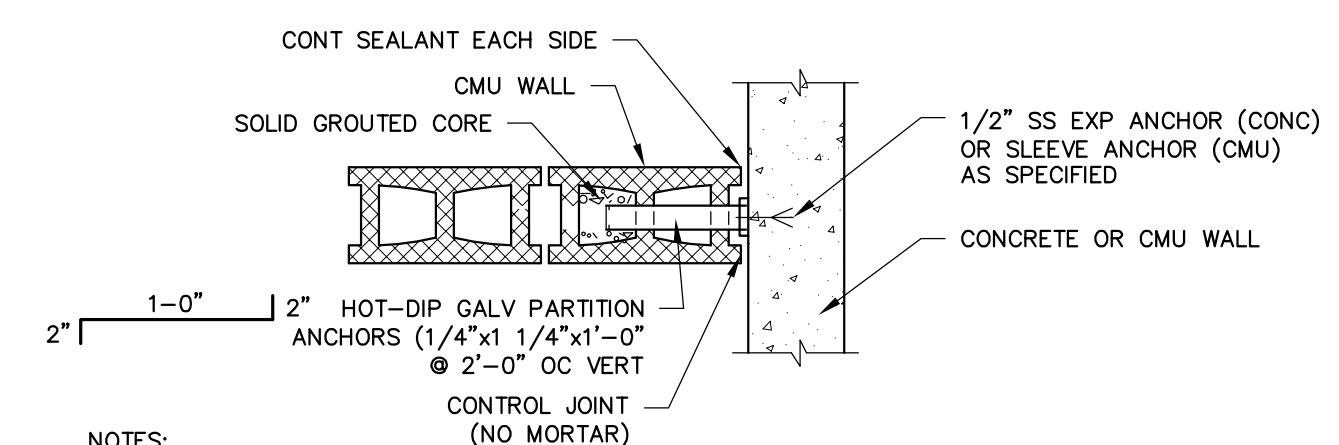
**3 EXTERIOR MASONRY WALL**  
S-102 SCALE: NTS



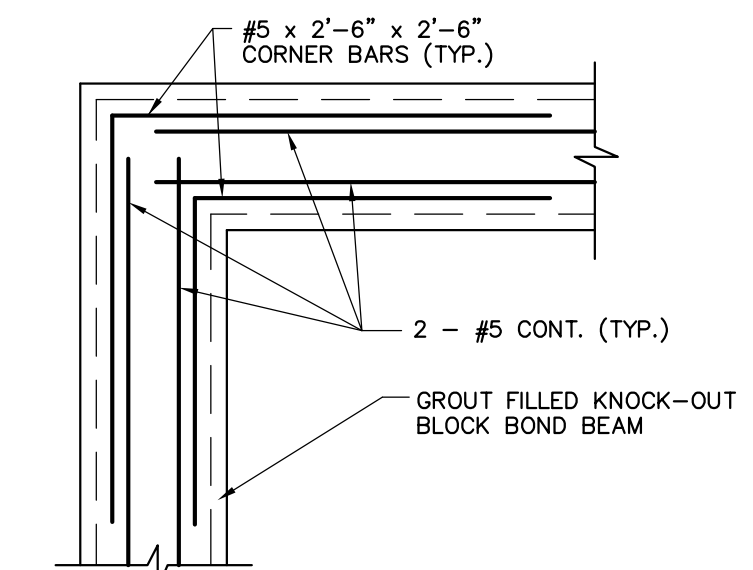
**4 INTERIOR MASONRY WALL**  
S-102 SCALE: NTS

**NOTES:**

- VERTICAL REINFORCING SHALL BE LAID OUT SUCH THAT CORNERS, INTERSECTIONS, WITHIN 8" OF WALL ENDS, AND WITHIN 8" OF EACH SIDE OF CONTROL JOINTS ARE REINFORCED. EACH SIDE OF OPENINGS WIDER THAN 16" SHALL BE REINFORCED WITHIN 16" OF EACH FACE OF OPENING.
- VERTICAL REINFORCING AT SIDES OF OPENINGS SHALL EXTEND UP TO THE NEXT FLOOR OR ROOF LEVEL.
- PROVIDE 2-#5 HORIZONTAL BARS AT BOTTOM OF OPENINGS TALLER THAN 16". EXTEND BOTTOM BARS 25" PAST, AND LINTEL BARS 40 BAR DIAMETERS PAST, EACH FACE OF OPENING, EXCEPT AT CONTROL JOINTS AND ISOLATION JOINTS.
- SEE DETAILS FOR WALL REINFORCING AT STEEL LINTELS.
- PROVIDE 2-#5 HORIZONTAL BARS AT KNOCK-OUT BLOCK BOND BEAM AT TOP OF ALL WALLS, CONTINUOUS AT CONTROL JOINTS.



**5 CMU WALL ANCHORAGE**  
S-102 SCALE: NTS

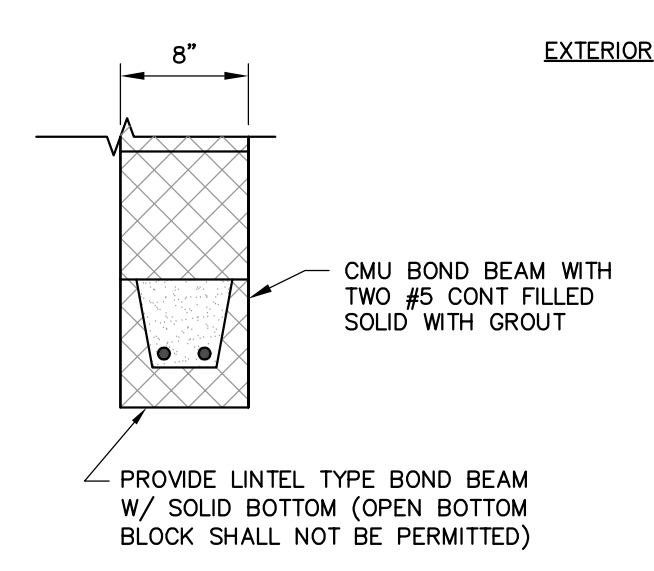


**6 CMU BOND BEAM CORNER BARS**  
S-102 SCALE: NTS

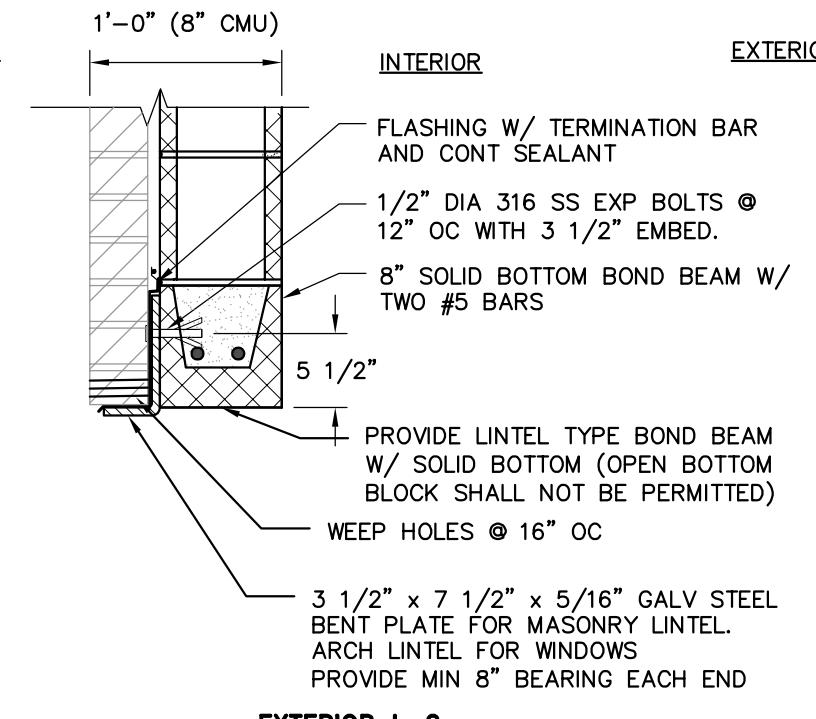
LINTEL SCHEDULE				
MARK	SPAN L (FT.)	TYPE	LINTEL	REMARKS
L-1	L ≤ 4'-0"	INTERIOR W/ 8" CMU WALL	8" DEEP CMU BOND BEAM W/ TWO #5 BOT	SEE TYPICAL LINTEL DETAILS THIS SHEET
L-2	L ≤ 4'-0"	EXTERIOR W/ 8" CMU WALL	8" DEEP CMU BOND BEAM W/ TWO #5 BOT & GALV 5/16" BENT PLATE	SEE TYPICAL LINTEL DETAILS THIS SHEET
L-3	4'-0" < L ≤ 9'-4"	EXTERIOR W/ 8" CMU WALL	GALV W8x24 WITH 5/16" BOT PLATE	BEARING PL 3/8"x7"x1'-4" W/ TWO 3/4" DIA 8" STUDS 8" OC @ EA END

**LINTEL SCHEDULE NOTES:**

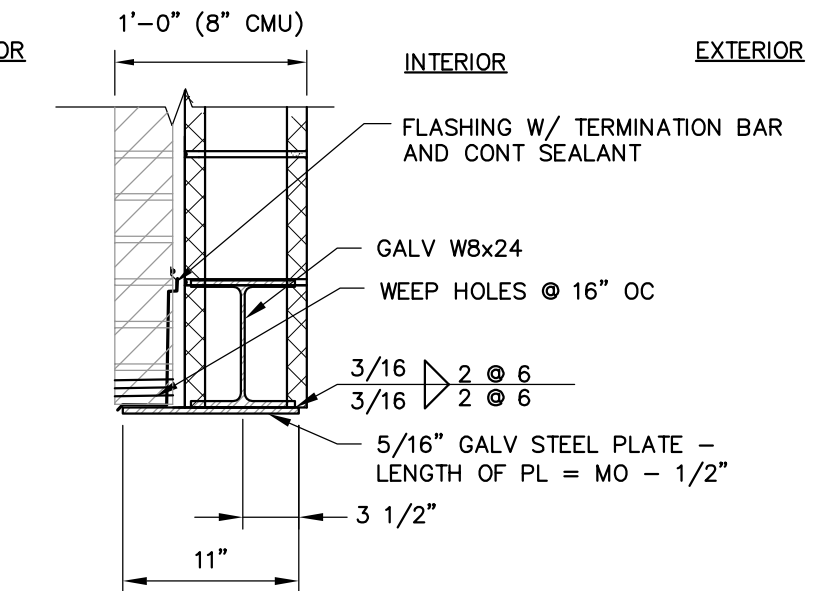
- SPAN L SHALL BE THE MEASURED CLEAR OPENING.
- CUT BLOCK IF REQUIRED TO PROVIDE SPECIFIED DOOR OPENING.
- MIN 8" BEARING FOR ALL LINTELS WITH GROUTED/REINFORCED CORE BELOW BEARING.
- PROVIDE LINTELS FOR ALL MASONRY WALL OPENINGS LARGER THAN 16" IN WIDTH, REFER TO HVAC AND MECHANICAL DRAWINGS FOR OTHER WALL OPENINGS NOT SHOWN ON STRUCTURAL AND ARCHITECTURAL OPENINGS.
- PROVIDE BEARING PLATES W/ 1/4" WELDS @ L-3 EACH END
- INFILL W-SHAPE LINTELS WITH CMU USING CORRUGATED TIES FASTENED TO WEB OF MEMBER 16" OC.
- REFER TO SHEET S-102 FOR LINTEL LOCATIONS.



**INTERIOR L-1**

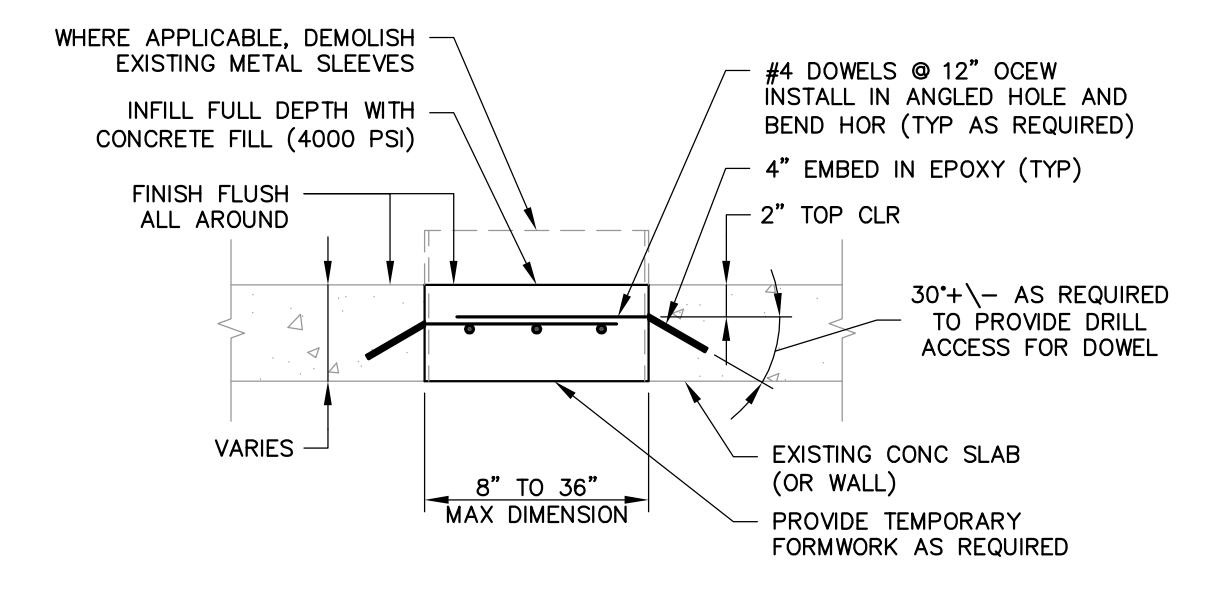


**EXTERIOR L-2**

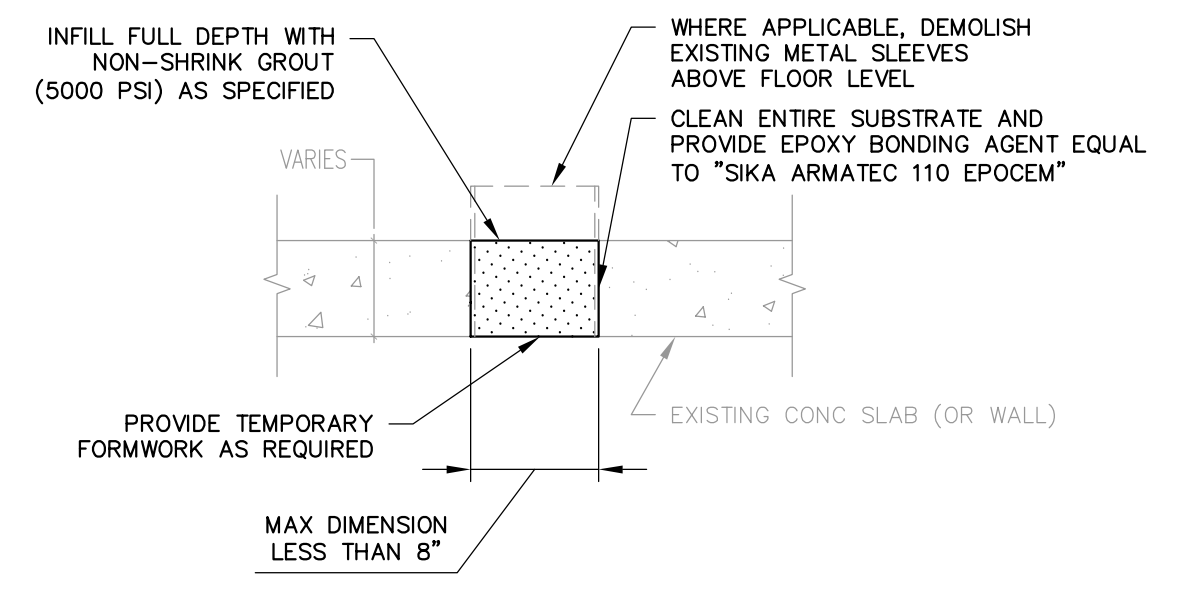


**EXTERIOR L-3**

**10 TYPICAL LINTELS**  
S-102 SCALE: NTS



**TYPE A**

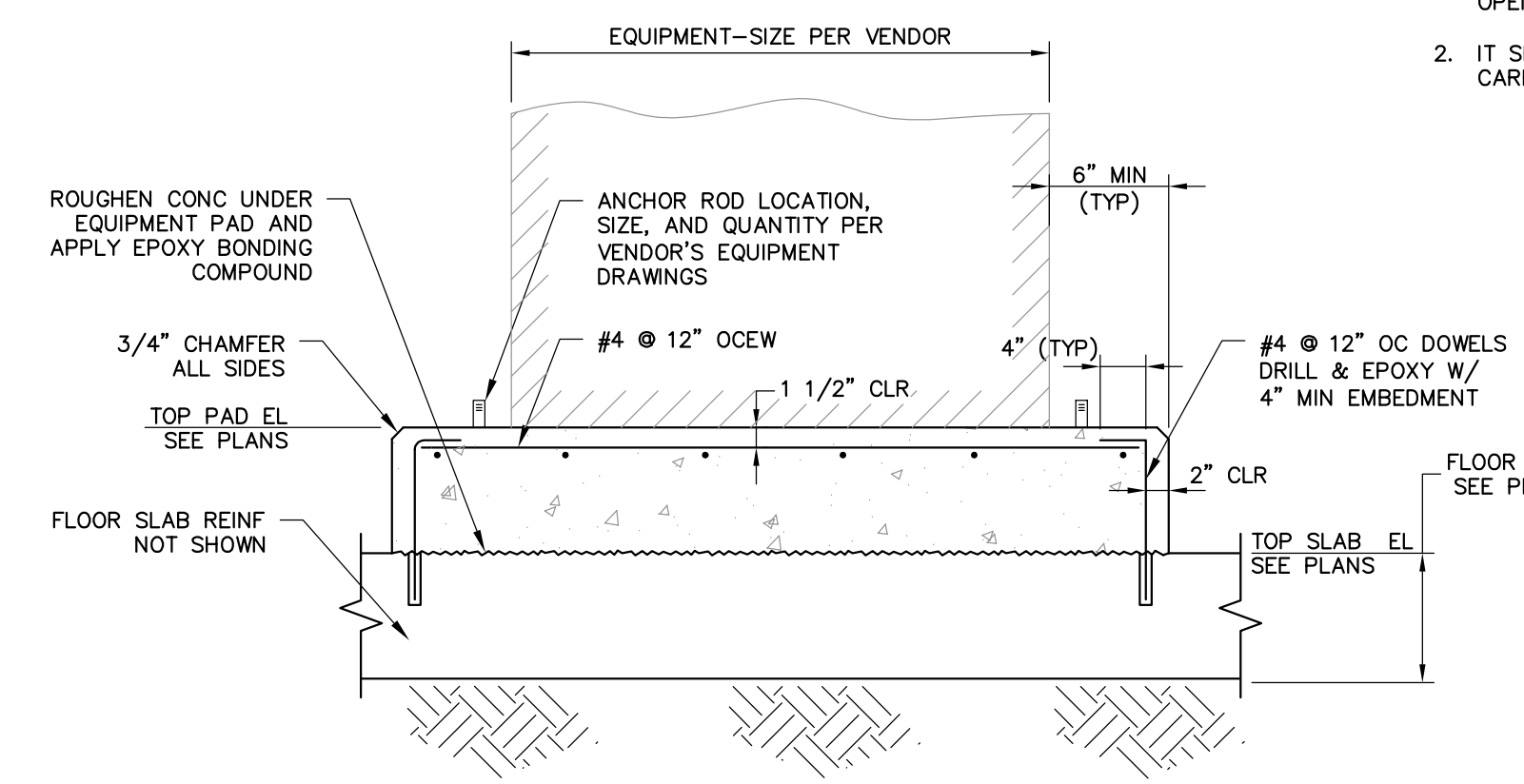


**TYPE B**

**NOTES:**

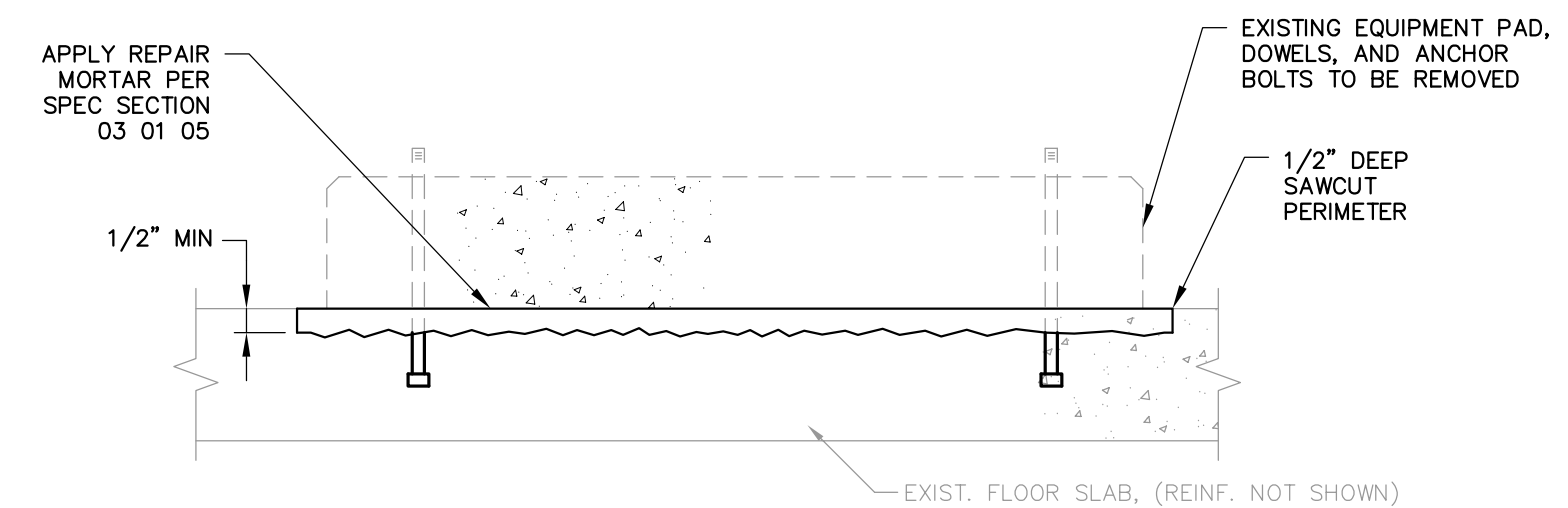
- TYPE 'A' AND 'B' CONCRETE INFILLS SHALL APPLY TO ALL EXISTING ABANDONED FLOOR OR WALL OPENINGS IN ALL BUILDING WALLS/SLABS AND ALL TANKS. OPENING SIZE SHALL DETERMINE WHICH DETAIL TYPE APPLIES.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO QUANTIFY OPENINGS AND CARRY COSTS TO INFILL ALL ABANDONED OPENINGS.

**7 CONCRETE INFILL**  
S-101 S-102 S-104 SCALE: 1" = 1'-0"



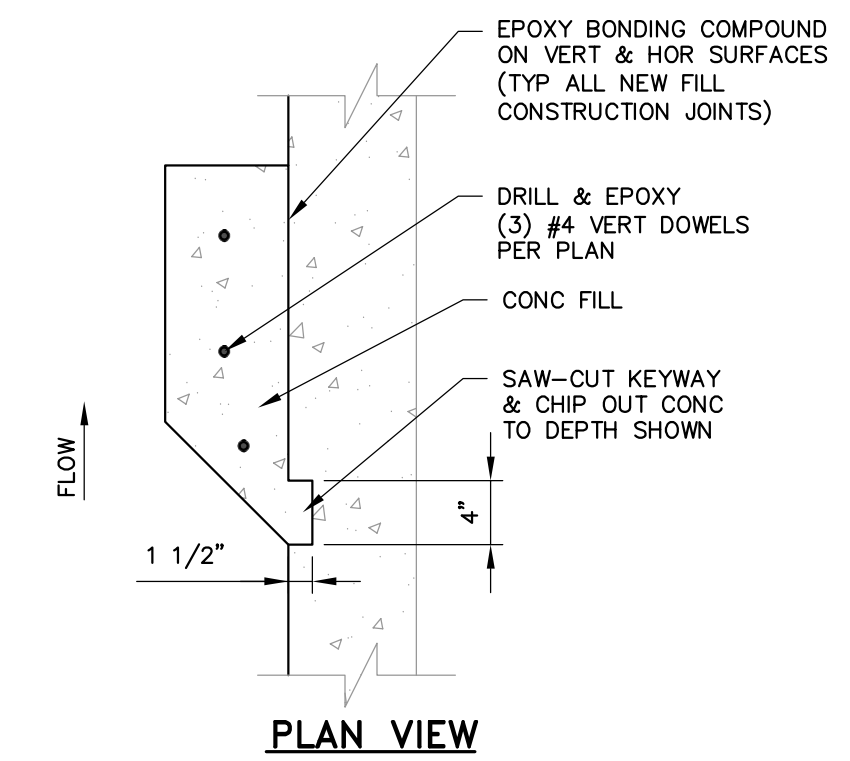
**8 INTERIOR EQUIP PAD**  
S-102 SCALE: NTS

- SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS, QUANTITIES, AND LAYOUT.
- PAD SHALL PROJECT A MINIMUM OF 6" BEYOND EQUIPMENT FOOTPRINT UNO.
- TOP OF PAD SHALL BE LEVEL WITHIN 1/8-INCH.
- PROVIDE SACK-RUBBED FINISH TO ALL EXPOSED SIDES OF EQUIPMENT PAD AND A TROWEL FINISH TO THE TOP SURFACE.
- MECHANICAL EQUIPMENT PADS SHALL BE 6-INCH THICK AND ELECTRICAL EQUIPMENT PADS SHALL BE 4" THICK, UNO.
- PROVIDE SAWED JOINT (SJ) IN EQUIPMENT PADS, IF SHOWN AND NOTED ON PLANS.
- APPLY SEALURE AND SEAL COMPOUND TO EQUIPMENT PAD SURFACES PRIOR TO EQUIPMENT INSTALLATION.

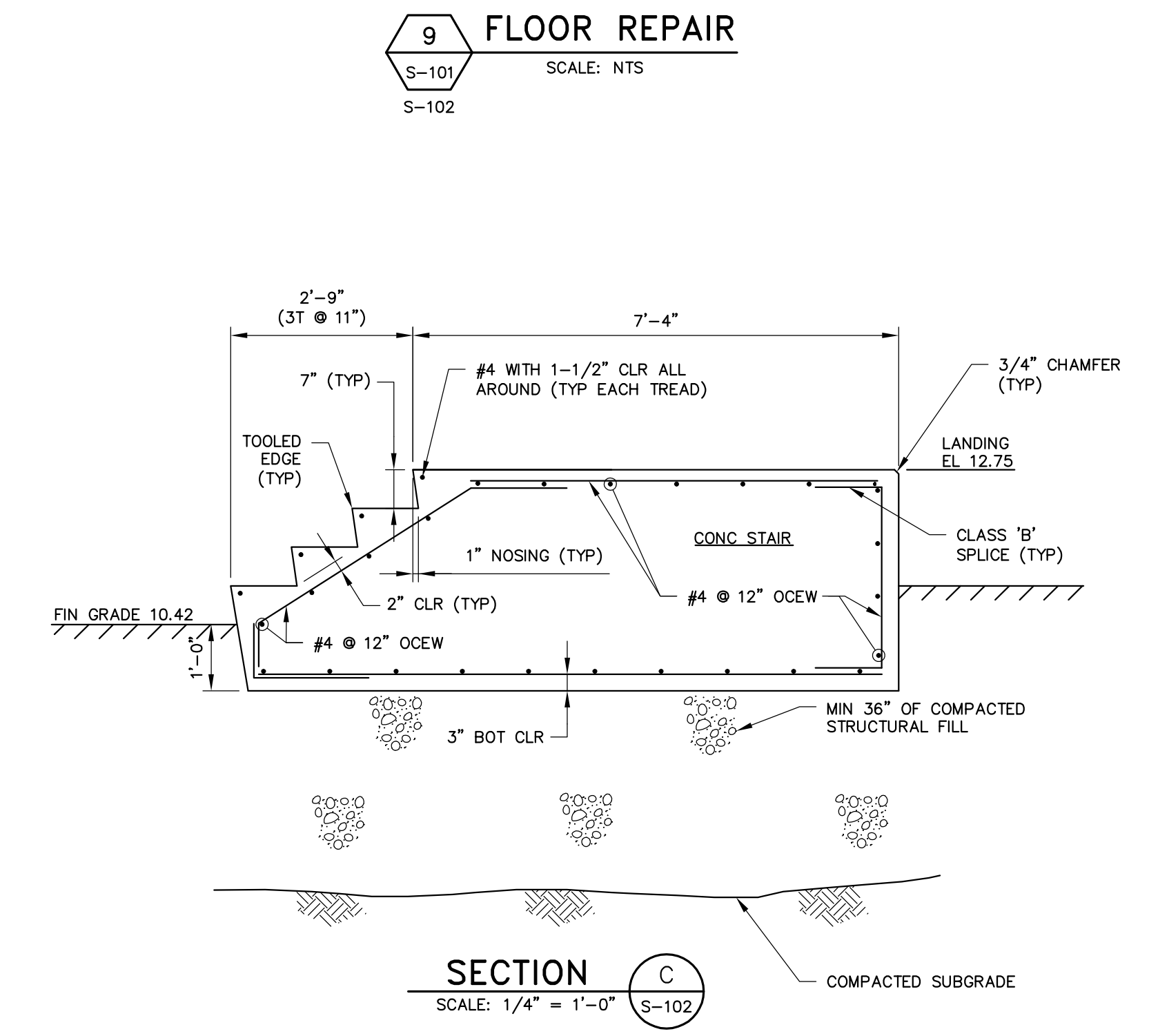


**9 FLOOR REPAIR**  
S-101 S-102 SCALE: NTS

- REMOVE REINFORCING DOWELS (NOT SHOWN) AND ANCHOR BOLTS TO A DEPTH OF 2" BELOW FLOOR ELEVATION.
- EXISTING SLAB REINFORCING SHALL REMAIN AND SHALL NOT BE DAMAGED.
- FINISHED SURFACE OF REPAIR MORTAR SHALL BE SMOOTH (WITH NO TROWEL MARKS, PITS, VOIDS, OR OTHER VISIBLE DEFECTS) AND LEVEL WITHIN 1/8" OR LESS AND SHALL BE FLUSH W/ EXISTING FF ON ALL SIDES.



**11 SLOPED FILL KEYWAY**  
S-101 SCALE: 1" = 1'-0"



**SECTION C**  
SCALE: 1/4" = 1'-0" S-102

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NEW HAMPSHIRE - REGISTERED PROFESSIONAL ENGINEER

JAMES P. STURGIS  
No. 10722

REV	DESCRIPTION	DATE

CHECKED BY: JPS  
2/28/2017  
DRAWN BY: SJT

**STRUCTURAL DETAILS 1**

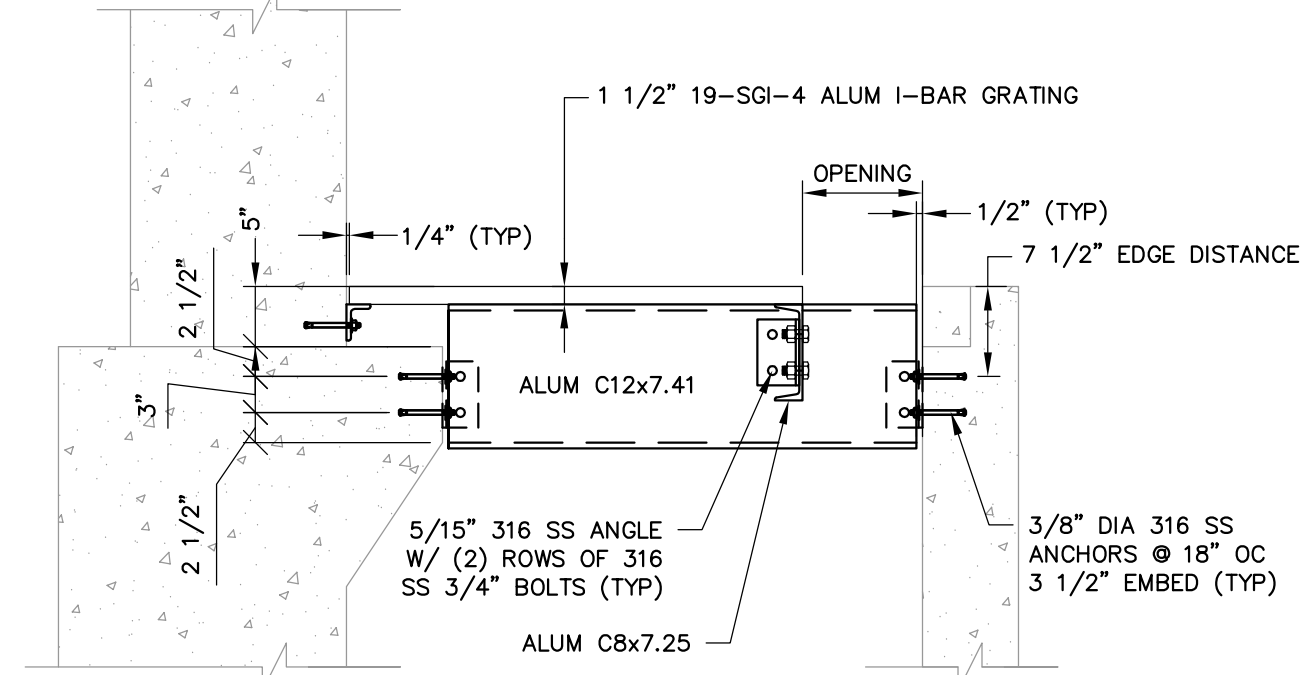
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 20 OF 67

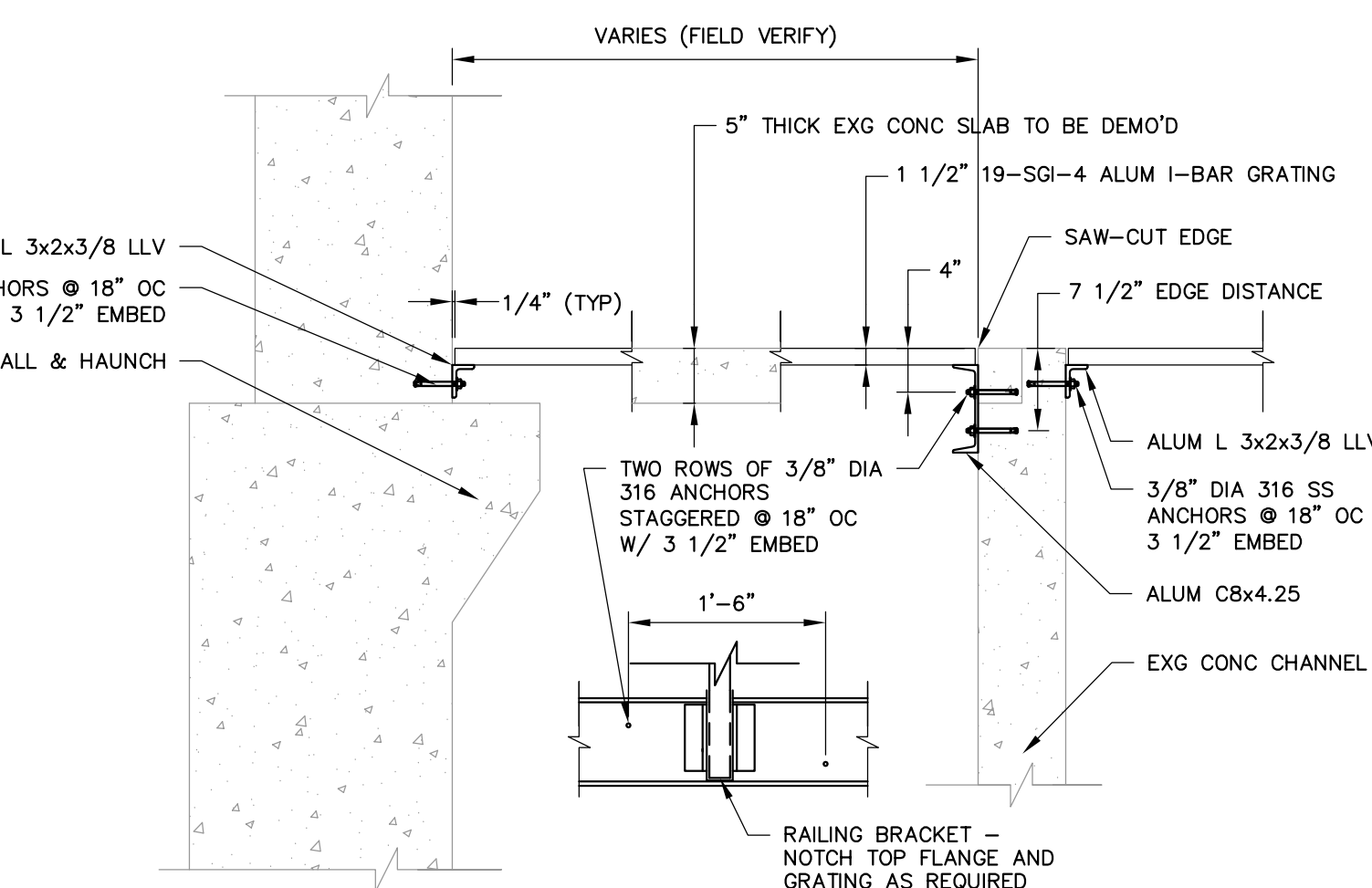
**S-201**

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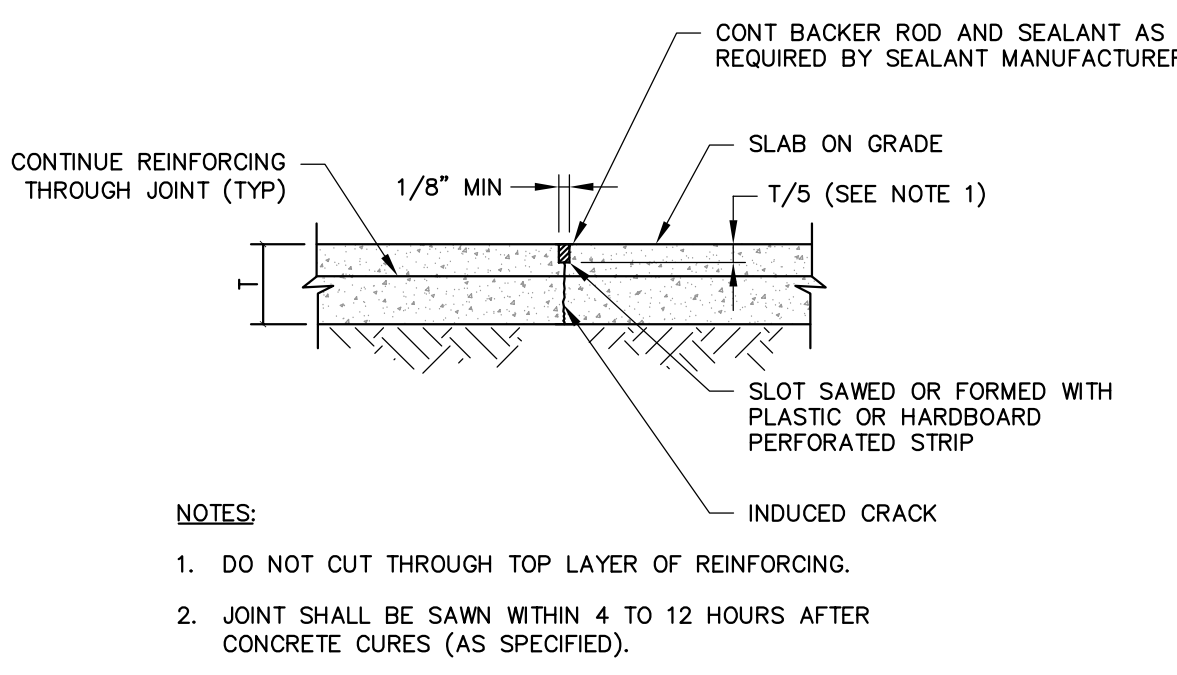


**13 GRATING SUPPORT**  
SCALE: 3/4" = 1'-0"

- NOTES:**
1. BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM F593 & F594.
  2. 316 SS WASHERS ARE REQUIRED UNDER ALL BOLT HEADS AND NUTS.
  3. ALL ALUMINUM SHALL BE 6061-T6.
  4. COAT ALL ALUMINUM IN CONTACT WITH CONCRETE WITH BITUMASTIC PAINT.

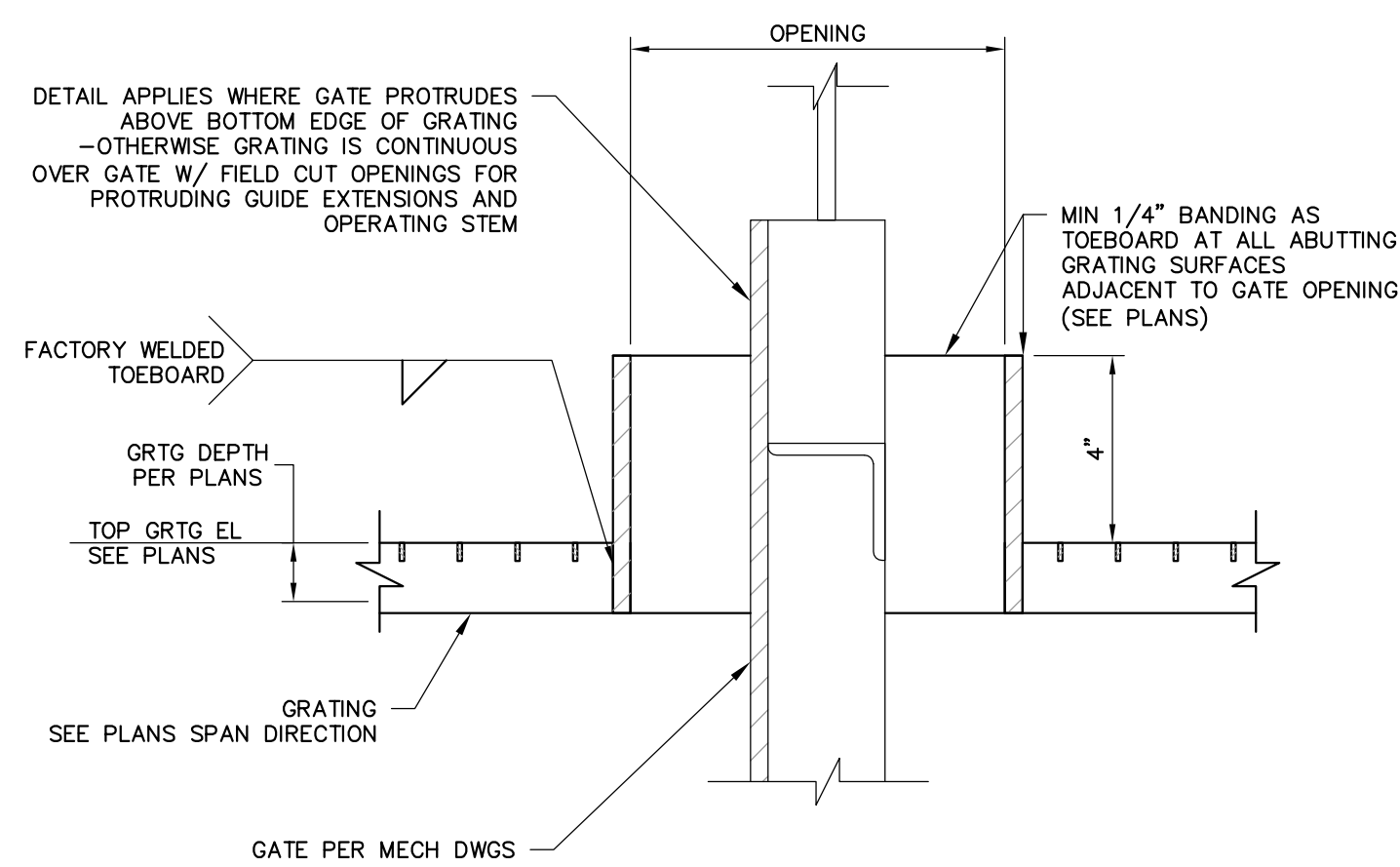


**14 LIFTING HOOK**  
SCALE: 3" = 1'-0"



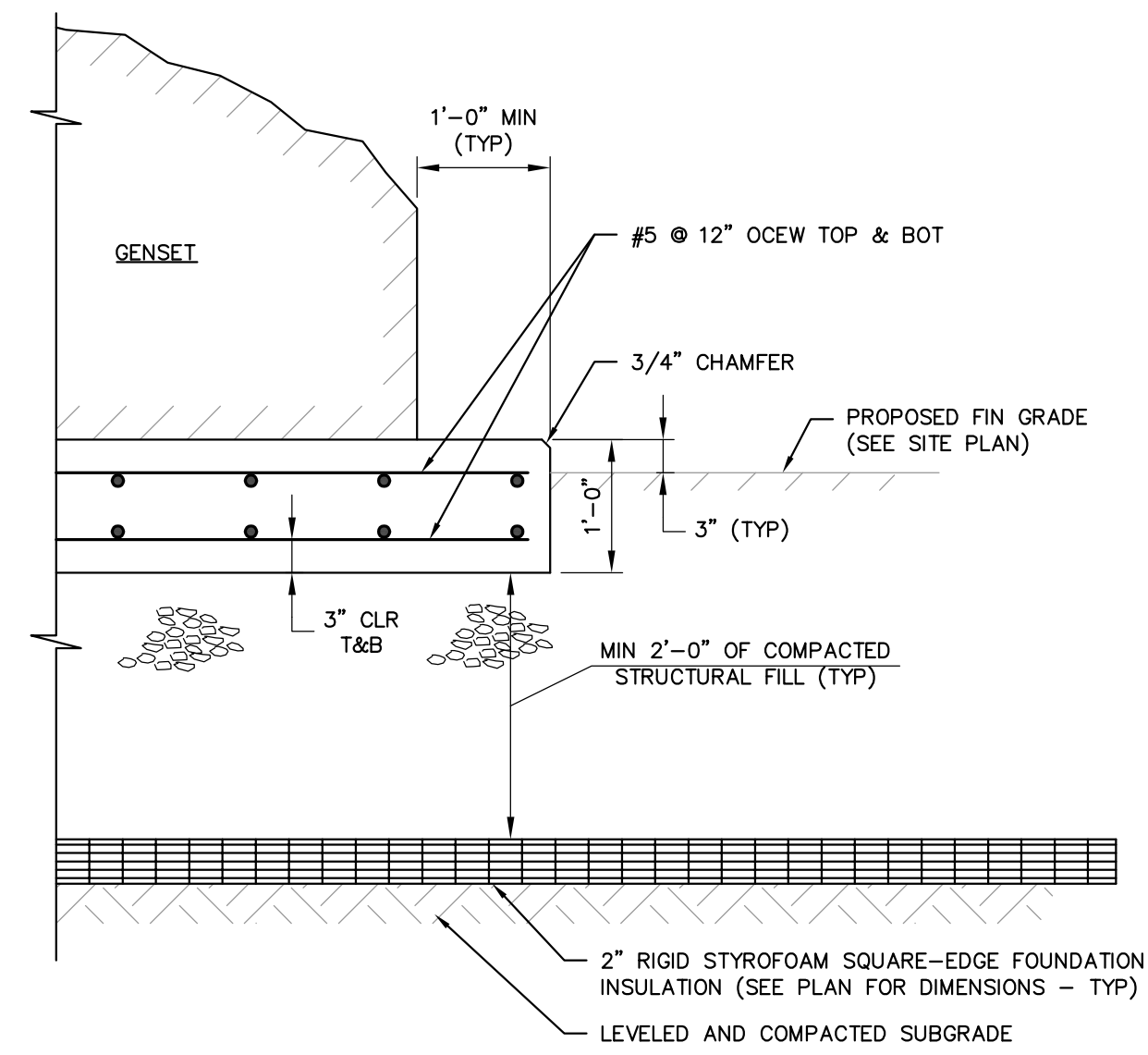
**16 SAWED JOINT**  
SCALE: NTS

- NOTES:**
1. DO NOT CUT THROUGH TOP LAYER OF REINFORCING.
  2. JOINT SHALL BE SAWN WITHIN 4 TO 12 HOURS AFTER CONCRETE CURES (AS SPECIFIED).

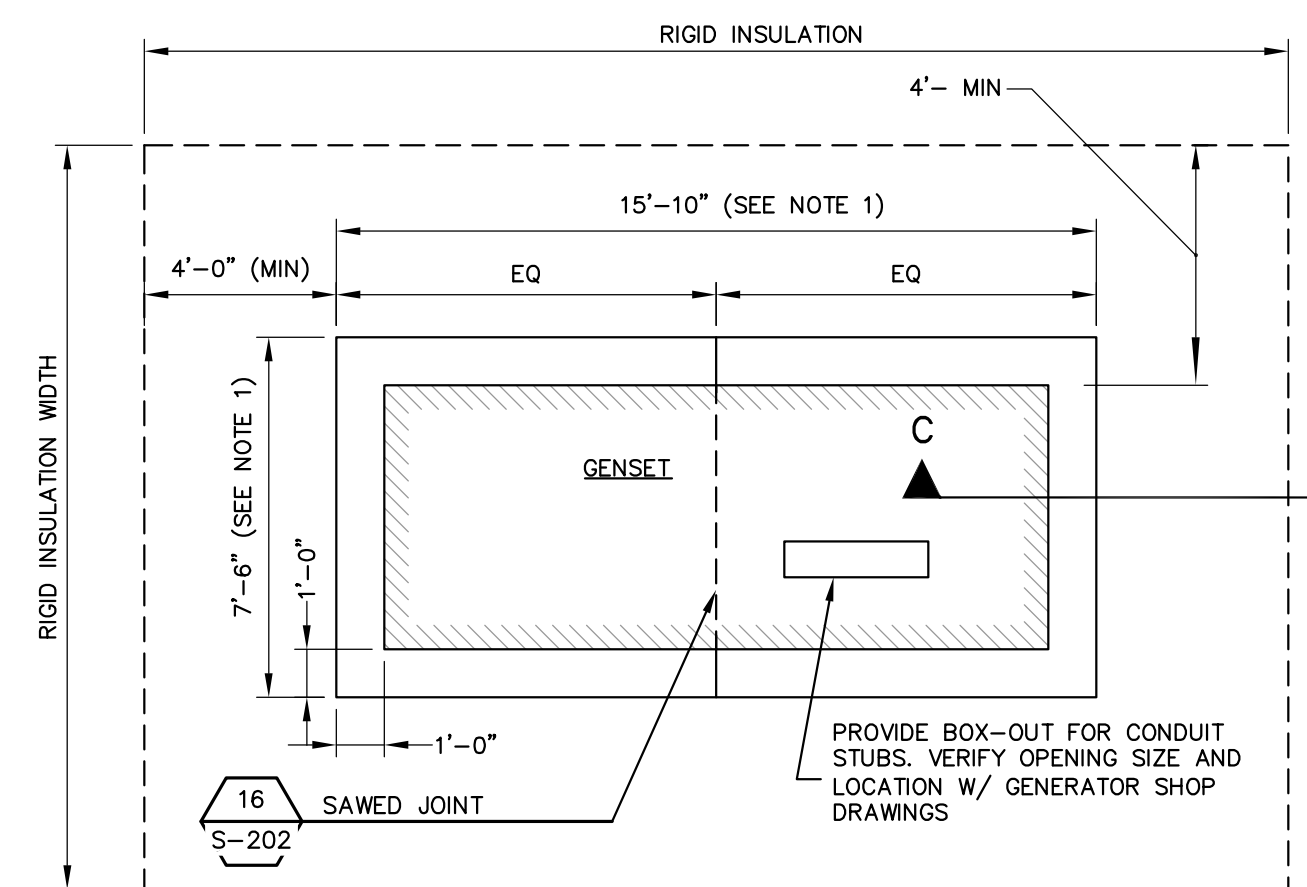


**17 MECHANICAL GATE OPENING**  
SCALE: 1/2" = 1'-0"

- DETAIL APPLIES WHERE GATE PROTRUDES ABOVE BOTTOM EDGE OF GRATING - OTHERWISE GRATING IS CONTINUOUS OVER GATE W/ FIELD CUT OPENINGS FOR PROTRUDING GUIDE EXTENSIONS AND OPERATING STEM**
- FACTORY WELDED TOEBOARD
- GRTG DEPTH PER PLANS
- TOP GRTG EL SEE PLANS
- GRATING SEE PLANS SPAN DIRECTION
- GATE PER MECH DWGS
- MIN 1/4" BANDING AS TOEBOARD AT ALL ABUTTING GRATING SURFACES ADJACENT TO GATE OPENING (SEE PLANS)



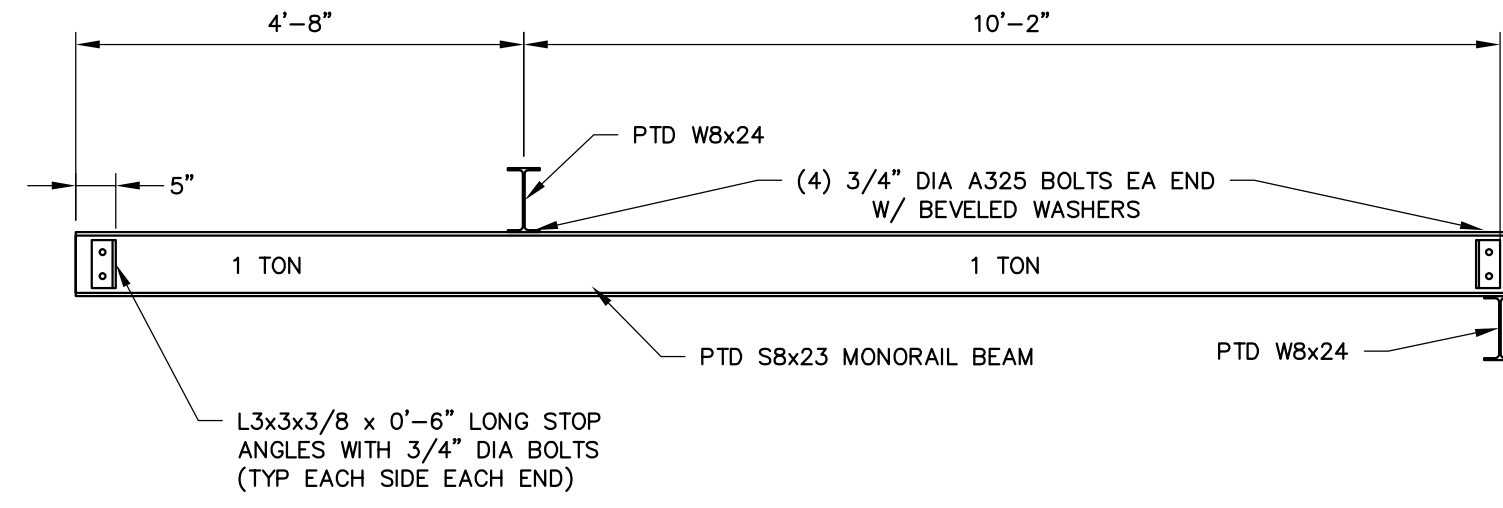
**SECTION C-C**  
SCALE: 3/4" = 1'-0"



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

- NOTES:**
1. CONTRACTOR SHALL FIELD VERIFY GENSET SIZE WITH SHOP DRAWINGS.
  2. GENERATOR MUST BE SPACED A MINIMUM OF 5'-0" FROM STRUCTURES PER NFPA 37.
  3. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS, QUANTITIES, AND LAYOUT.
  2. PAD SHALL PROJECT A MINIMUM OF 6" BEYOND EQUIPMENT FOOTPRINT UNO.
  3. TOP OF PAD SHALL BE LEVEL WITHIN 1/8-INCH.
  4. PROVIDE SACK-RUBBED FINISH TO ALL EXPOSED SIDES OF EQUIPMENT PAD AND A TROWEL FINISH TO THE TOP SURFACE.
  5. PROVIDE SAWED JOINT (SJ) IN EQUIPMENT PADS, IF SHOWN AND NOTED ON PLANS.
  6. SEAL CONCRETE WITH CURE AND SEAL COMPOUND OR WATERPROOFING COMPOUND AS SPECIFIED TO EQUIPMENT PAD SURFACES PRIOR TO EQUIPMENT INSTALLATION.

**12 GENSET PAD**  
SCALE: AS NOTED



**15 MONORAIL**  
SCALE: 1/2" = 1'-0"

- ELECTRICAL/CONTROL ROOM MONORAIL**
- NOTES:**
1. LABEL CAPACITY OF EACH MONORAIL BEAM WITH 3" TALL LETTERING COLORED SAFETY YELLOW ON EACH SIDE CLEARLY VISIBLE FROM STANDING POSITION ON GROUND BELOW.
  2. SEE SPECIFICATIONS FOR DRY WELL MONORAIL.

HOIST SCHEDULE						
LOCATION	TYPE	CAPACITY	VOLTAGE	MIN CHAIN LENGTH	PENDENT LENGTH	REMARKS
ELECTRICAL/CONTROL ROOM	ELECTRIC HOIST & TROLLEY	1-TON	480V	50 FEET	6 FEET	
DRY WELL (MAIN PUMPS)	ELECTRIC HOIST & TROLLEY	1-TON	480V	24 FEET	18 FEET	NEMA RATED ELEC EQUIP
WET WELL STAIR	NO HOIST MANUAL TROLLEY	1-TON	N/A	N/A	N/A	

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NEW HAMPSHIRE REGISTERED PROFESSIONAL ENGINEER

JAMES P. STURGIS  
No. 10722

REV	DESCRIPTION	DATE

DESIGNED BY: SJT  
DRAWN BY: SJT  
CHECKED BY: JPS  
DATE: 2/28/2017

**STRUCTURAL DETAILS 2**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

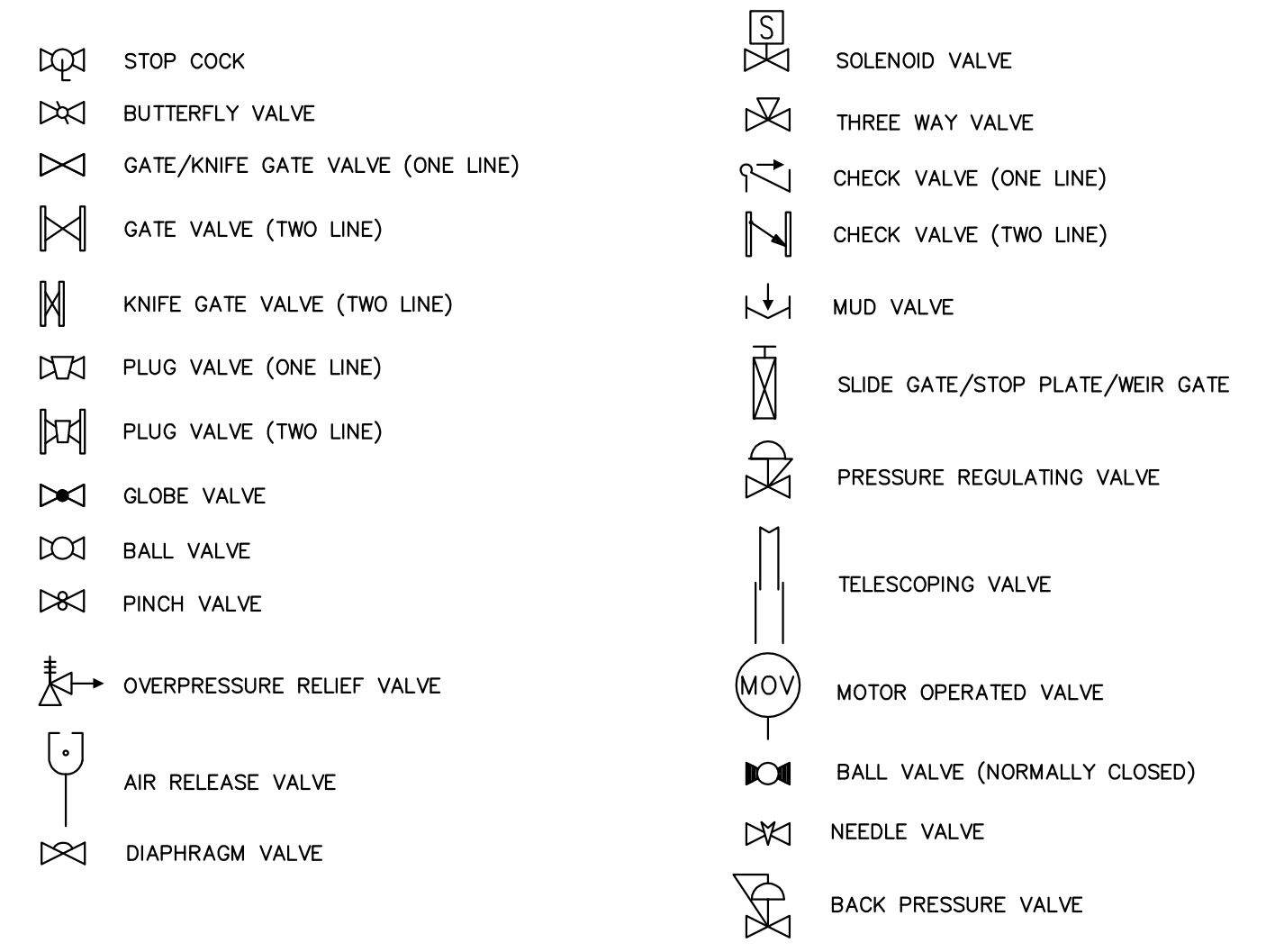
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
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SHEET: 21 OF 67

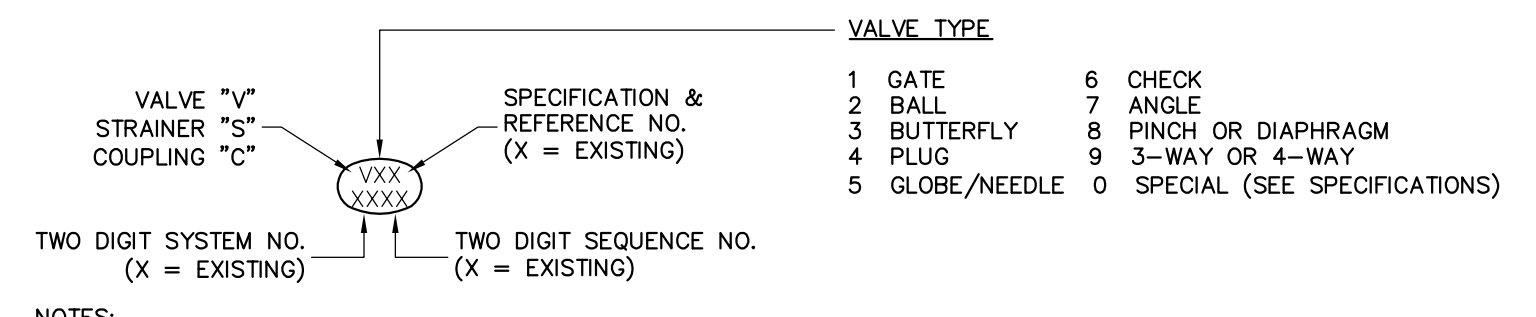
MECHANICAL GENERAL NOTES

- 1. IF THE CONTRACTOR PROPOSES TO FURNISH EQUIPMENT OR STRUCTURES THAT REQUIRE AN ARRANGEMENT OR SPACE WHICH DIFFERS FROM THAT WHICH HAS BEEN SPECIFIED OR INDICATED ON THE CONTRACT DRAWINGS...
2. THE FOLLOWING MECHANICAL DRAWINGS MAY NOT SHOW ALL VALVES, GAUGES, SWITCHES, OPERATORS, DRAINS, VENTS, COUPLINGS, ETC., AS REQUIRED FOR COMPLETE AND OPERATIONAL SYSTEMS...
3. EXTERIOR PIPING IS GENERALLY SHOWN ON THE CIVIL DRAWINGS.
4. SIZES OF EQUIPMENT FOUNDATIONS AND CONCRETE PADS WHICH HAVE BEEN INDICATED ON THE DRAWINGS ARE APPROXIMATE. EXACT DIMENSIONS FOR ALL FOUNDATIONS AND CONCRETE PADS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD FOR THE SPECIFIC EQUIPMENT PROVIDED...
5. NOT ALL AND ONLY CERTAIN TYPES OF PIPING SUPPORTS HAVE BEEN SHOWN ON THE DRAWINGS. PIPE SUPPORTS WHICH HAVE BEEN INDICATED ON THE DRAWINGS ARE SHOWN TO CONVEY THE INTENT OF THE PROCESS MECHANICAL DESIGN FOR A PARTICULAR SYSTEM...
6. NOT ALL AND ONLY CERTAIN TYPES OF VALVE AND GATE OPERATORS (EG. HAND WHEELS, CHAIN WHEELS, HAND CRANKS, MOTOR OPERATORS, LEVERS, ETC.) HAVE BEEN SHOWN FOR CLARITY. ALL VALVE AND GATE OPERATORS SHALL BE LOCATED TO ALLOW CONVENIENT AND UNOBSTRUCTED ACCESS FOR OPENING/CLOSING THE FINAL INSTALLED ORIENTATION OF ALL OPERATORS SHALL BE AS APPROVED BY THE ENGINEER...
7. THE CONTRACTOR SHALL FIELD LOCATE AND PROVIDE TAGS ON ALL PROCESS VALVES. THE PROCESS VALVE IDENTIFICATION NUMBERS AND TAGS SHALL BE AS INDICATED ON THE DRAWINGS. REFER TO THE CONTRACT SPECIFICATIONS FOR ADDITIONAL DETAILS. SUBMIT SAMPLE TAG NUMBERING FOR REVIEW PRIOR TO ORDERING.
8. PORTIONS OF NON-PROCESS MECHANICAL PIPING (HVAC AND PLUMBING) MAY BE SHOWN ON THE MECHANICAL DRAWINGS FOR CLARITY AND COORDINATION BETWEEN DISCIPLINES DURING CONSTRUCTION. REFER TO THE APPROPRIATE DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
9. ALL PROCESS PIPING SYSTEMS SHALL BE PROVIDED WITH VENTS AT HIGH POINTS AND DRAINS AT LOW POINTS. PROVIDE ADDITIONAL VENT AND DRAIN CONNECTIONS AS INDICATED ON THE DRAWINGS. FIELD ROUTE DRAIN PIPING TO END TERMINATION AS DIRECTED BY ENGINEER OR AS INDICATED ON THE DRAWINGS.
10. ALL PIPING SHALL BE INSTALLED SUCH THAT ANY PIPE, LAYER OF PIPING, OR EQUIPMENT CAN BE REMOVED WITHOUT DISTURBING REMAINING/ADJACENT PIPING AND ASSOCIATED PIPE SUPPORTS.
11. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS ALL FLOOR, CONCRETE WALL/TANK, AND CMU WALL PENETRATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS. IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY SUBSTITUTE ALTERNATE PENETRATION METHODS PROVIDED THAT THEY MEET THE INTENDED DESIGN REQUIREMENTS AND FUNCTIONALITY.
12. THE NUMBER OF UNIONS AND COUPLINGS SHOWN IS APPROXIMATE. THE CONTRACTOR SHALL PROVIDE ALL UNIONS OR DISMANTLING COUPLINGS WHETHER THEY HAVE BEEN SHOWN ON THE DRAWINGS OR NOT. UNIONS AND DISMANTLING COUPLINGS SHALL BE PROVIDED ON ALL PIPING WITH WELDED, THREADED, OR SOLVENT CEMENTED JOINTS: AT ALL EQUIPMENT CONNECTIONS, AT A MINIMUM OF EVERY 50 LINEAR FEET, AND IN BRANCH LINES TO ALLOW CONVENIENT REMOVAL OF PIPING, EQUIPMENT, AND APPURTENANCES.
13. ALL EXISTING INFORMATION ON THE DRAWINGS IS SHOWN WITH A LIGHTER LINE WEIGHT.
14. ALL BURIED CONNECTIONS TO ALL STRUCTURES SHALL BE PROVIDED WITH SLEEVE TYPE COUPLINGS LOCATED APPROXIMATELY FOUR (4) FEET FROM THE RESPECTIVE EXTERIOR WALL. SLEEVE TYPE COUPLINGS SHALL ALLOW FOR DIFFERENTIAL SETTLEMENT OF INTERIOR AND EXTERIOR PIPING. ALL COUPLED CONNECTIONS SHALL BE LOCATED ON THE EXTERIOR OF STRUCTURES IN THE YARD. PROVIDE TRANSITION SLEEVE TYPE COUPLINGS AS REQUIRED AND AS INDICATED ON THE DRAWINGS TO ACCOMMODATE PIPING TRANSITIONS OF DIFFERENT SIZES AND MATERIALS. ALL STAINLESS STEEL PIPING SHALL BE CONNECTED USING 304L STAINLESS STEEL SLEEVE COUPLINGS.
15. PROVIDE CAST/DUCTILE IRON WALL CASTINGS, STAINLESS STEEL PIPE SLEEVES, OR HDPE PIPE SLEEVES FOR ALL PIPE PENETRATIONS MADE THROUGH CONCRETE FOUNDATIONS, WALLS, AND SLABS. ALL WALL SLEEVES AND WALL CASTINGS SHALL HAVE INTEGRAL WATER STOPS. REFER TO THE DRAWINGS FOR LOCATIONS OF PENETRATIONS. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL PENETRATIONS THROUGH EXISTING STRUCTURAL WALLS, FOUNDATIONS, AND SLABS SHALL BE CORE DRILLED AND SEALED WITH MECHANICAL SEALS. ALL OPENINGS SHALL BE COMPATIBLE WITH REQUIRED PIPING AND STANDARD SEAL SIZES.
16. ALL FLOW MEASURING ELEMENTS SHALL BE LOCATED A MINIMUM OF FIVE PIPE DIAMETERS UPSTREAM AND THREE PIPE DIAMETERS DOWNSTREAM OF ANY HYDRAULIC DISTURBANCE, EXCEPT IN SITUATIONS WHERE DIMENSIONAL CONSTRAINTS PRECLUDE THE MINIMUM SEPARATION DISTANCES. IN SEPARATION CASES WITH LESS THAN THE MINIMUM, THE CONTRACTOR SHALL CONSULT THE ENGINEER FOR REVIEW OF THE LAYOUT.
17. INSTALL CORPORATION COCKS ON ALL BUILDING AND STRUCTURE INTERIOR PIPING HIGH POINTS TO PREVENT AIR BINDING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT NUMBER AND LOCATION OF ALL CORPORATION COCKS BASED UPON THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS AND THE ACTUAL FIELD ROUTING OF PIPING. FIELD VERIFY ALL LOCATIONS WITH THE ENGINEER PRIOR TO INSTALLATION. EACH MANUAL AIR RELEASE SHALL INCLUDE A 1/2" CORPORATION COCK AND TYPE V26 STAINLESS STEEL BALL VALVE.
18. AFTER INSTALLATION IS COMPLETE ALL PIPING SYSTEMS SHALL BE PRESSURE TESTED. ALL LEAKS OR OTHER ASSOCIATED DEFECTS SHALL BE CORRECTED AND THE PIPING SHALL BE RETESTED AT NO ADDITIONAL COST TO THE OWNER. REFER TO SPECIFICATION SECTION 40 05 13 "PROCESS PIPE AND FITTINGS" FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
19. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS; PROVIDE REINFORCED CONCRETE PADS UNDER ALL EQUIPMENT, CONTROL PANELS, PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC. REFER TO THE MECHANICAL AND STRUCTURAL DRAWINGS FOR PAD LOCATIONS AND ADDITIONAL DETAILS. PROVIDE A MINIMUM THICKNESS OF 4 INCHES. PROVIDE INCREASED PAD THICKNESS AS INDICATED ON THE DRAWINGS.
20. WRITTEN DIMENSIONS SHALL PREVAIL OVER SCALED DIMENSIONS. FIELD VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
21. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS; ALL REDUCTION FITTINGS SHALL BE CONCENTRIC TYPE. WHEN SPECIFIED OR INDICATED ON THE DRAWINGS, PROVIDE ECCENTRIC (ECC) REDUCERS. ALL REDUCERS SHALL BE OF THE SAME MATERIAL AS THE CONNECTING PIPING UNLESS OTHERWISE INDICATED. ECCENTRIC REDUCERS IN HORIZONTAL PIPING SHALL BE INSTALLED WITH THE FLAT SIDE UP.
22. ALL PENETRATIONS BETWEEN AREAS CLASSIFIED AS HAZARDOUS (CLASS 1, DIVISION 1 & CLASS 1, DIVISION II) AND UNCLASSIFIED AREAS SHALL BE SEALED "GAS TIGHT".
23. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL METALLIC PIPING SHALL BE CONNECTED USING STANDARD ANSI FLANGED CONNECTIONS OR WELDED CONNECTIONS. PLASTIC PIPING CONNECTIONS SHALL BE SOLVENT CEMENT WELDED. PROVIDE FLANGED ATTACHMENTS AS REQUIRED AND AS INDICATED ON THE DRAWINGS FOR CONNECTION TO EQUIPMENT AND APPURTENANCES. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, THE USE OF ALTERNATE JOINING METHODS, INCLUDING BUT NOT LIMITED TO; COUPLINGS, FLANGED ADAPTORS, AND/OR GROOVED "VICTAULIC TYPE" CONNECTIONS SHALL NOT BE ACCEPTABLE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER.
24. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL ADAPTORS, FITTINGS, AND ADDITIONAL PIPING AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. THE USE OF UNI-FLANGES SHALL NOT BE ACCEPTABLE UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS.
25. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ALL BURIED PIPING SHALL BE ROUTED TO PENETRATE THROUGH BUILDING FOUNDATION WALLS. ROUTING OF PIPING THROUGH OR UNDER FOOTINGS SHALL NOT BE ACCEPTABLE UNLESS APPROVED IN WRITING BY THE ENGINEER. ROUTE PIPE UP VERTICALLY FOR A LENGTH AS REQUIRED AND PROVIDE ALL FITTINGS AND APPURTENANCES TO ALLOW FOR A PERPENDICULAR PENETRATION WITH THE RESPECTIVE BUILDING FOUNDATION WALL. PROVIDE 2 INCH RIGID FOAM INSULATION AS REQUIRED FOR ALL PIPING WHICH HAS LESS THAN FOUR (4) FEET OF COVER. REFER TO THE CIVIL DRAWINGS FOR ADDITIONAL DETAILS AND REQUIREMENTS. FIELD VERIFY THE LOCATION OF ALL PENETRATIONS WITH THE ENGINEER.

VALVE SYMBOLS



VALVE, STRAINER & COUPLING TAG SYMBOL KEY



- VALVE TYPE LIST: 1 GATE, 2 BALL, 3 BUTTERFLY, 4 PLUG, 5 GLOBE/NEEDLE, 6 CHECK, 7 ANGLE, 8 PINCH OR DIAPHRAGM, 9 3-WAY OR 4-WAY, 0 SPECIAL (SEE SPECIFICATIONS).
- NOTES: 1. REFER TO SPECIFICATION 40 05 23 "PROCESS VALVES AND STRAINERS FOR ADDITIONAL DETAILS AND REQUIREMENTS." 2. REFER TO SPECIFICATION 40 05 14 "PROCESS PIPE COUPLINGS & CONNECTORS FOR ADDITIONAL DETAILS AND REQUIREMENTS."

VALVE, STRAINER & COUPLING TYPE LISTING

SPECIALTY VALVES (TYPE V0#)

- V00 - BACK PRESSURE VALVE
V01 - METALLIC PRESSURE REGULATING VALVE
V02 - PVC PRESSURE REGULATING VALVE
V03 - BACK FLOW PREVENTER (RPZ)
V04 - METALLIC PRESSURE RELIEF VALVE
V05 - PVC PRESSURE RELIEF VALVE
V06 - WASTEWATER AIR RELEASE VALVE
V07 - WASTEWATER AIR & VACUUM VALVE
V08 - WASTEWATER COMBINATION AIR VALVE
V09 - TELESCOPING VALVE

PLUG VALVES (TYPE V4#)

- V40 - METALLIC PLUG VALVE (FLANGED)
V41 - BURIED PLUG VALVE (MECHANICAL JOINT)
V42 - MUD VALVE (PLUG TYPE DRAIN VALVE)
V43 - NOT USED
V44 - NOT USED
V45 - NOT USED
V46 - NOT USED
V47 - NOT USED
V48 - NOT USED
V49 - NOT USED

GATE VALVES (TYPE V1#)

- V10 - KNIFE GATE VALVE (RESILIENT SEATED)
V11 - KNIFE GATE VALVE (METAL SEATED)
V12 - GATE VALVE (RESILIENT SEATED)
V13 - GATE VALVE (METAL SEATED)
V14 - BURIED GATE VALVE (RESILIENT SEATED)
V15 - BURIED GATE VALVE (DOUBLE METAL DISK)
V16 - PVC GATE VALVE
V17 - BURIED INSERTION GATE VALVE (RESILIENT SEATED)
V18 - NOT USED
V19 - NOT USED

GLOBE & NEEDLE VALVES (TYPE V5#)

- V50 - METALLIC GLOBE VALVE
V51 - PVC GLOBE VALVE
V52 - METALLIC NEEDLE VALVE
V53 - NOT USED
V54 - NOT USED
V55 - NOT USED
V56 - NOT USED
V57 - NOT USED
V58 - NOT USED
V59 - NOT USED

BALL VALVES (TYPE V2#)

- V20 - PVC BALL VALVE (TRUE UNION SOCKET)
V21 - PVC BALL VALVE (FLANGED)
V22 - PVC BALL VALVE (THREADED)
V23 - METALLIC BALL VALVE (FLANGED)
V24 - METALLIC BALL VALVE (THREADED)
V25 - STAINLESS STEEL BALL VALVE (FLANGED)
V26 - STAINLESS STEEL BALL VALVE (THREADED)
V27 - NOT USED
V28 - NOT USED
V29 - NOT USED

CHECK VALVES (TYPE V6#)

- V60 - PVC BALL CHECK VALVE
V61 - PVC SWING CHECK VALVE
V62 - METALLIC SWING CHECK VALVE
V63 - METALLIC FLAP CHECK VALVE
V64 - DOUBLE DISK SWING CHECK VALVE
V65 - SLANTING DISK SWING CHECK VALVE
V66 - WAFER STYLE SILENT CHECK VALVE
V67 - GLOBE STYLE SILENT CHECK VALVE
V68 - METALLIC BALL CHECK VALVE
V69 - DUCK BILL CHECK VALVE

BUTTERFLY VALVES (TYPE V3#)

- V30 - METALLIC BUTTERFLY VALVE (LIQUID SERVICE)
V31 - METALLIC BUTTERFLY VALVE (LIQUID SERVICE >24")
V32 - METALLIC BUTTERFLY VALVE (AIR SERVICE)
V33 - PVC BUTTERFLY VALVE (LIQUID SERVICE)
V34 - PVC BUTTERFLY VALVE (AIR "DAMPER" SERVICE)
V35 - METALLIC BUTTERFLY VALVE (BURIED LIQUID SERVICE)
V36 - METALLIC BUTTERFLY VALVE (BURIED AIR SERVICE)
V37 - NOT USED
V38 - NOT USED
V39 - NOT USED

FLUID DESIGNATIONS

- AE - AERATION TANK EFFLUENT
AS - ALUMINUM SULFATE
BIS - SODIUM BISULFITE
BYP - BYPASS LINE
CN - CENTRATE
CW - COLD TOWN WATER (COLD)
DRN - DRAIN
DS - DEWATERED SLUDGE (CAKE)
EFF - FINAL EFFLUENT
FOL - FERRIC CHLORIDE
FES - FINAL EFFLUENT SAMPLE
GRT - GRIT SLURRY
HWE - HEADWORKS EFFLUENT
HYP - SODIUM HYPOCHLORITE
IR - INTERNAL RECYCLE
IS - INFLUENT SAMPLE
LPA - LOW PRESSURE AIR
ML - MIXED LIQUOR
NPW - PLANT WATER (TREATED EFFLUENT)
OO - ODOROUS AIR "FOUL"
OV - OVERFLOW
OX - OXIDANT CHEMICAL
P - PERMEATE
PE - PRIMARY EFFLUENT
PL - POLYMER SOLUTION
PSC - PRIMARY SCUM
PS - PRIMARY SLUDGE
PCW - RECYCLED WATER
RAS - RETURN ACTIVATED SLUDGE
RIF - RAW INFLUENT WASTE WATER
RWW - RAW WASTE WATER
SC - SCUM
SCR - SCREENINGS
SD - STORM DRAIN
SE - SECONDARY EFFLUENT
SEP - SEPTAGE
SH - SODIUM HYDROXIDE (CAUSTIC)
SN - SUPERNATANT
SPD - SUMP PUMP DISCHARGE
SS - SANITARY SEWER
SSC - SECONDARY SCUM
SSL - SECONDARY SLUDGE
SW - SEAL WATER
TE - TERTIARY EFFLUENT
TKD - TANK DRAIN
TSL - TERTIARY SLUDGE
TW - POTABLE TOWN WATER (COLD)
UD - UNDERDRAIN
V - VENT
WAS - WASTE ACTIVATED SLUDGE

EQUIPMENT DESIGNATIONS

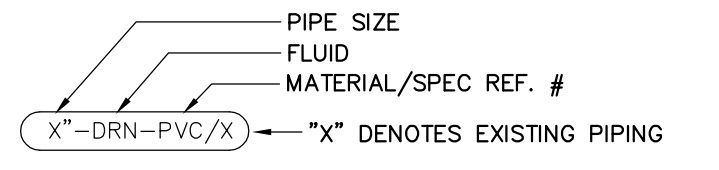
- AC - AIR COMPRESSOR
AG - AGITATOR
B - BLOWER
CBA - COARSE BUBBLE AERATION SYSTEM
CC - CROSS COLLECTOR
CF - CENTRIFUGE
CY - CONVEYOR
CY - GRIT CYCLONE
D - DECANTER
DC - DAVIT CRANE
EF - EXHAUST FAN
EUH - ELECTRIC UNIT HEATER
FA - FLOATING AERATOR
FBA - FINE BUBBLE AERATION SYSTEM
FM - FLOATING MIXER
G - GRINDER
GC - GRIT CLASSIFIER
GN - GENERATOR
H - HEATER
HD - HEAT DETECTOR
HT - HEAT TRACING
ICM - INDUCTION CHEMICAL MIXER
M - MOTOR
MC - MACERATOR
MOD - MOTOR OPERATED DAMPER
MV - MOTOR-OPERATED VALVE
MX - MIXER (VERTICAL SHAFT)
O - ODOUR CONTROL SYSTEM
P - PUMP
PC - PRIMARY CLARIFIER
PL - POLYMER FEED SYSTEM
S - SCREEN
SC - SECONDARY CLARIFIER
SD - SMOKE DETECTOR
SCL - SCUM COLLECTOR
SG - SLIDE GATE
SLG - SLUDGE GATE
SM - SUBMERSIBLE MIXER
SMP - SAMPLER
SP - STOP PLATE
SRS - SEPTAGE RECEIVING STATION
T - TANK
WG - WEIR GATE
WP - WASH PRESS

GENERAL ABBREVIATIONS

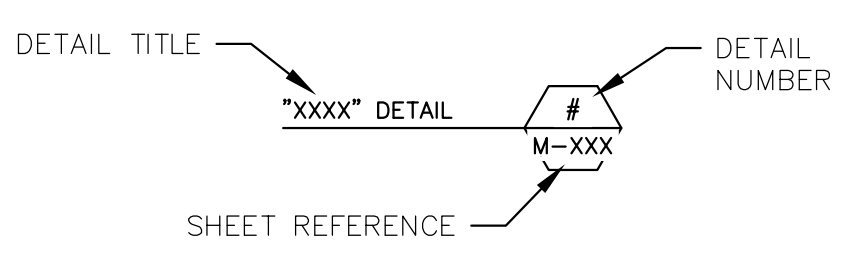
- ACFM - ACTUAL CUBIC FEET PER MINUTE
AFF - ABOVE FINISHED FLOOR
ALGNMT - ALIGNMENT
BF - BLIND FLANGE
ECC - ECCENTRIC
EL - ELEVATION
FF - FINISHED FLOOR
FLG - FLANGE
FL - FLOOR
FS - FLOW SWITCH
GPD - GALLONS PER DAY
GPH - GALLONS PER HOUR
GPM - GALLONS PER MINUTE
HB - HOSE BIB
HWL - HIGH WATER LEVEL
ICFM - INLET CUBIC FEET PER MINUTE
INCL - INCLUDED WITH PURCHASED EQUIPMENT
INVT - INVERT
LWL - LOW WATER LEVEL
MGD - MILLION GALLONS PER DAY
HB - HOSE BIB
HWL - HIGH WATER LEVEL
ICFM - INLET CUBIC FEET PER MINUTE
INCL - INCLUDED WITH PURCHASED EQUIPMENT
INVT - INVERT
LWL - LOW WATER LEVEL
MGD - MILLION GALLONS PER DAY
MLG/L - MILLIGRAMS PER LITER
MHW - MEAN HIGH WATER
MJ - MECHANICAL JOINT
MLW - MEAN LOW WATER
MSL - MEAN SEA LEVEL
NTS - NOT TO SCALE
O.C. - OVERLOAD
O.C. - ON CENTER
PE - PLAIN END
PLC - PROGRAMMABLE LOGIC CONTROLLER
PPD - POUND PER DAY
PSIA - POUNDS PER SQUARE INCH ABSOLUTE
PSIG - GAUGE POUNDS PER SQUARE INCH
RED - REDUCER
SOFM - CUBIC FEET PER MINUTE (STANDARD CONDITIONS)
SCH - SCHEDULE
SP - SET POINT (TYPICAL)
STDBY - STANDBY
TDH - TOTAL DYNAMIC HEAD
TYP - TYPICAL
UNO - UNLESS NOTED OTHERWISE
VCP - VENDOR SUPPLIED CONTROL PANEL
WS - WATER SURFACE
MA - MILLIAMPER

PIPE MATERIALS

- CJ/1 - COPPER PIPE & TUBING
DI/1 - DUCTILE IRON PIPE (FLANGED)
DI/2 - DUCTILE IRON PIPE (MECHANICAL JOINT)
PVC/1 - PVC PIPE (SOCKET WELDED)
PVC/2 - PVC TUBING
PVC/3 - PVC DOUBLE CONTAINMENT PIPE
PVC/4 - PVC PIPE (CPVC)
PVC/5 - PVC PIPE (BURIED GRAVITY FLOW)
PVC/6 - PVC PIPE (BURIED FORCE MAIN)
SS/1 - STAINLESS STEEL PIPE (SCH. 10S)
SS/2 - STAINLESS STEEL PIPE (SCH. 40)
SS/3 - STAINLESS STEEL TUBING
SS/4 - STAINLESS STEEL HOSE
CS/1 - CARBON STEEL PIPE
GCS/X - GALVANIZED CARBON STEEL PIPE (EXISTING)
PE/1 - POLYETHYLENE PIPING (FUSION WELDED)
PE/2 - POLYETHYLENE TUBING (HIGH DENSITY)
PE/3 - POLYETHYLENE TUBING (LOW DENSITY)
PE/4 - POLYETHYLENE PIPING (BURIED)



MECHANICAL DETAIL REFERENCE



PROCESS PIPE INSULATION TYPE LISTING

- I/1 - FIBROUS GLASS PIPE INSULATION
I/2 - ELASTOMERIC FOAM PIPE INSULATION
I/3 - MINERAL WOOL PIPE INSULATION
I/4 - POLYISOCYANURATE PIPE INSULATION

INSULATION JACKET TYPE LISTING

- J/1 - PVC INSULATION JACKET
J/2 - ALUMINUM INSULATION JACKET
J/3 - STAINLESS STEEL JACKET
J/4 - SHEET MEMBRANE JACKET

NOTES:

- 1. REFER TO SPECIFICATION 40 42 13 "PROCESS PIPE INSULATION" FOR ADDITIONAL DETAILS AND REQUIREMENTS.

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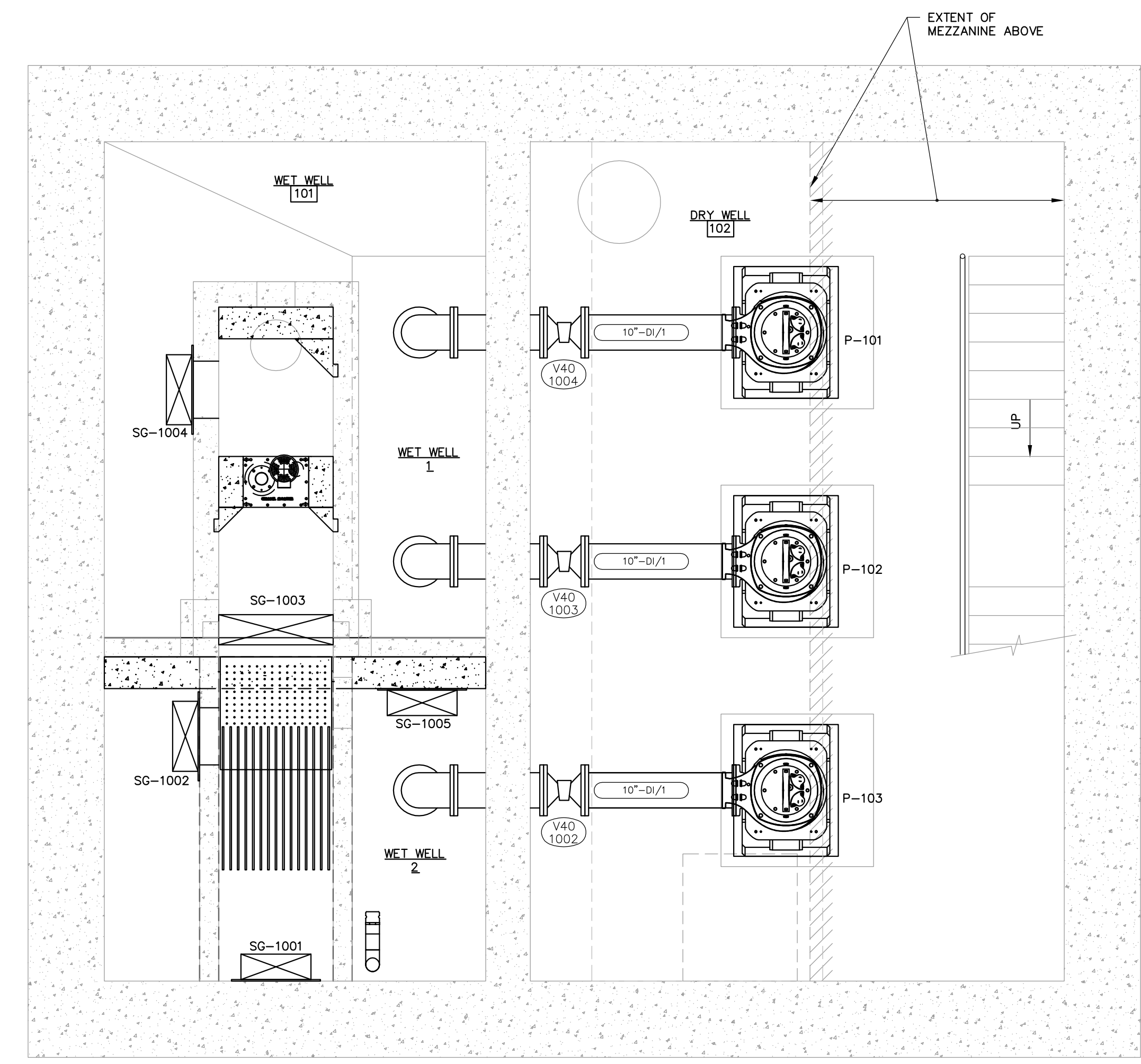
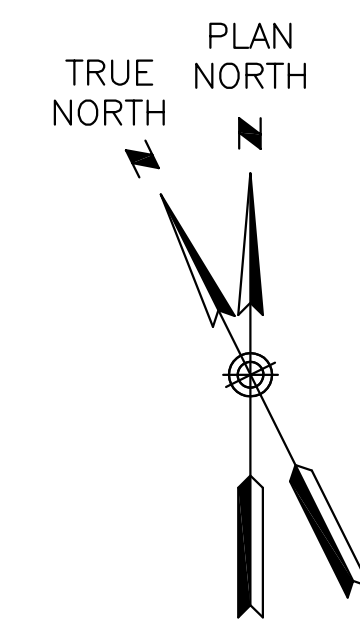
Professional Engineer Seal for State of New Hampshire, License No. 13170, signed by Jeffrey A. Woodard.

Revision table with columns: REV, DESCRIPTION, DATE. Includes fields for DESIGNED BY: ECO, CHECKED BY: TCS, DRAWN BY: FT/DMB, and project number 22787200-M-001.dwg.

MECHANICAL LEGEND, ABBREVIATIONS & NOTES. Includes project name: LAFAYETTE ROAD PUMP STATION UPGRADES.

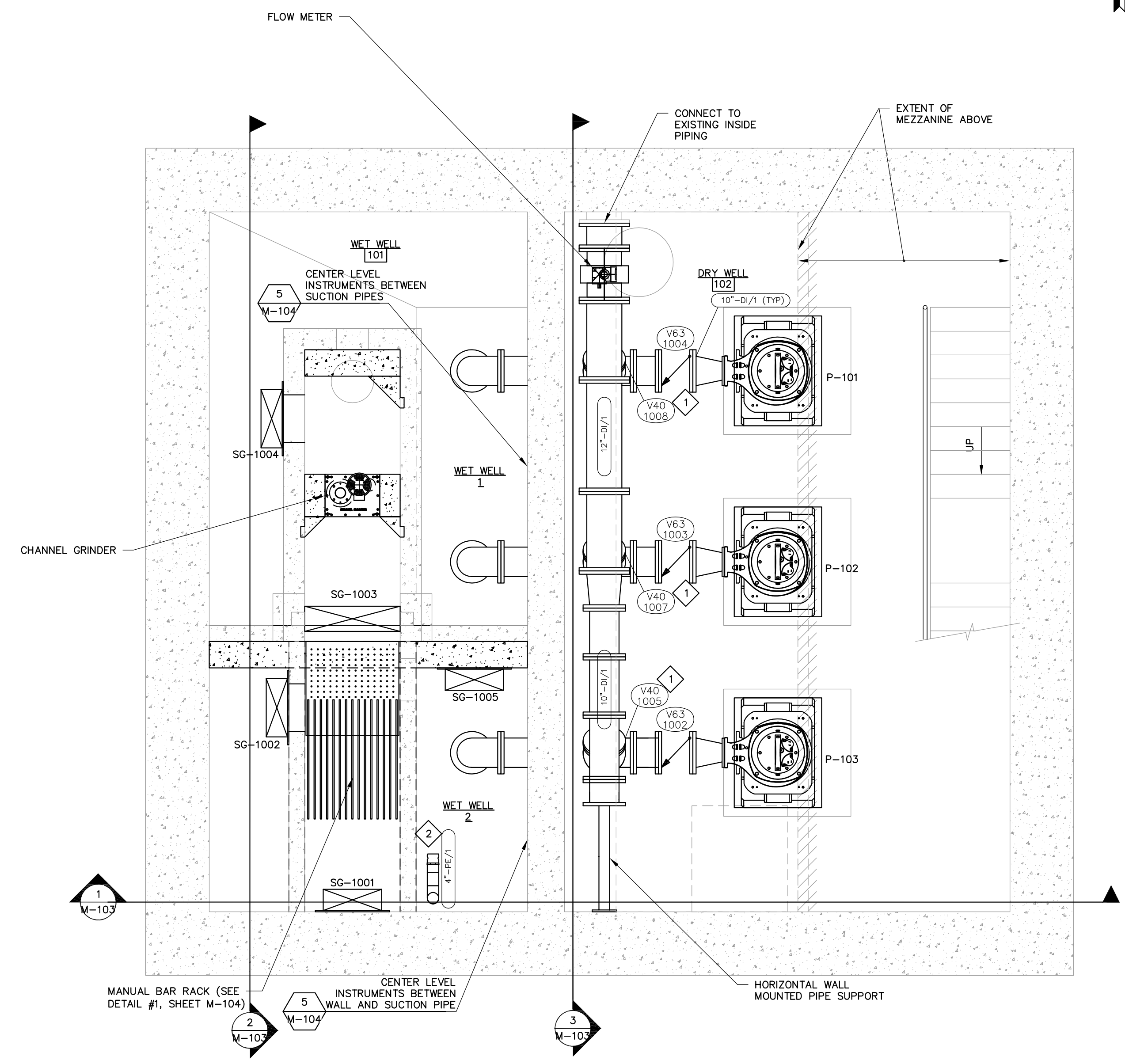
Project information: CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, NEW HAMPSHIRE. JOB NO.: 227872-00, DATE: FEBRUARY 2017, SCALE: XXX, SHEET: 22 OF 67.

BID SET M-001



**BASEMENT LEVEL FLOOR PLAN – SUCTION PIPING**

SCALE: 3/8" = 1'-0"  
DISCHARGE PIPING NOT SHOWN FOR CLARITY

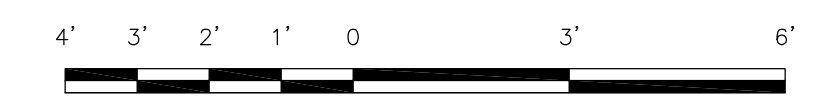


**BASEMENT LEVEL FLOOR PLAN – DISCHARGE PIPING**

SCALE: 3/8" = 1'-0"  
NOT ALL SUCTION PIPING SHOWN FOR CLARITY

**KEYED NOTES:**

- 1 PROVIDE CHAIN WHEEL ACTUATOR.
- 2 STANDPIPE WITH MALE CAMLOCK FITTING ON INSIDE AND FEMALE CAMLOCK FITTING ON OUTSIDE OF BUILDING. WELDED HDPE DIPS DRILL.



BAR SCALE  
3/8" = 1'-0"  
CHECK GRAPHIC SCALE BEFORE USING

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STATE OF NEW HAMPSHIRE  
PROFESSIONAL ENGINEER  
OSBORN  
No. 13170

REV	DESCRIPTION	DATE
DESIGNED BY: TCS	CHECKED BY: TCS	
DRAWN BY: FF/DMB		2/28/2017

**PUMP STATION BASEMENT AND INTERMEDIATE LEVEL PLANS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

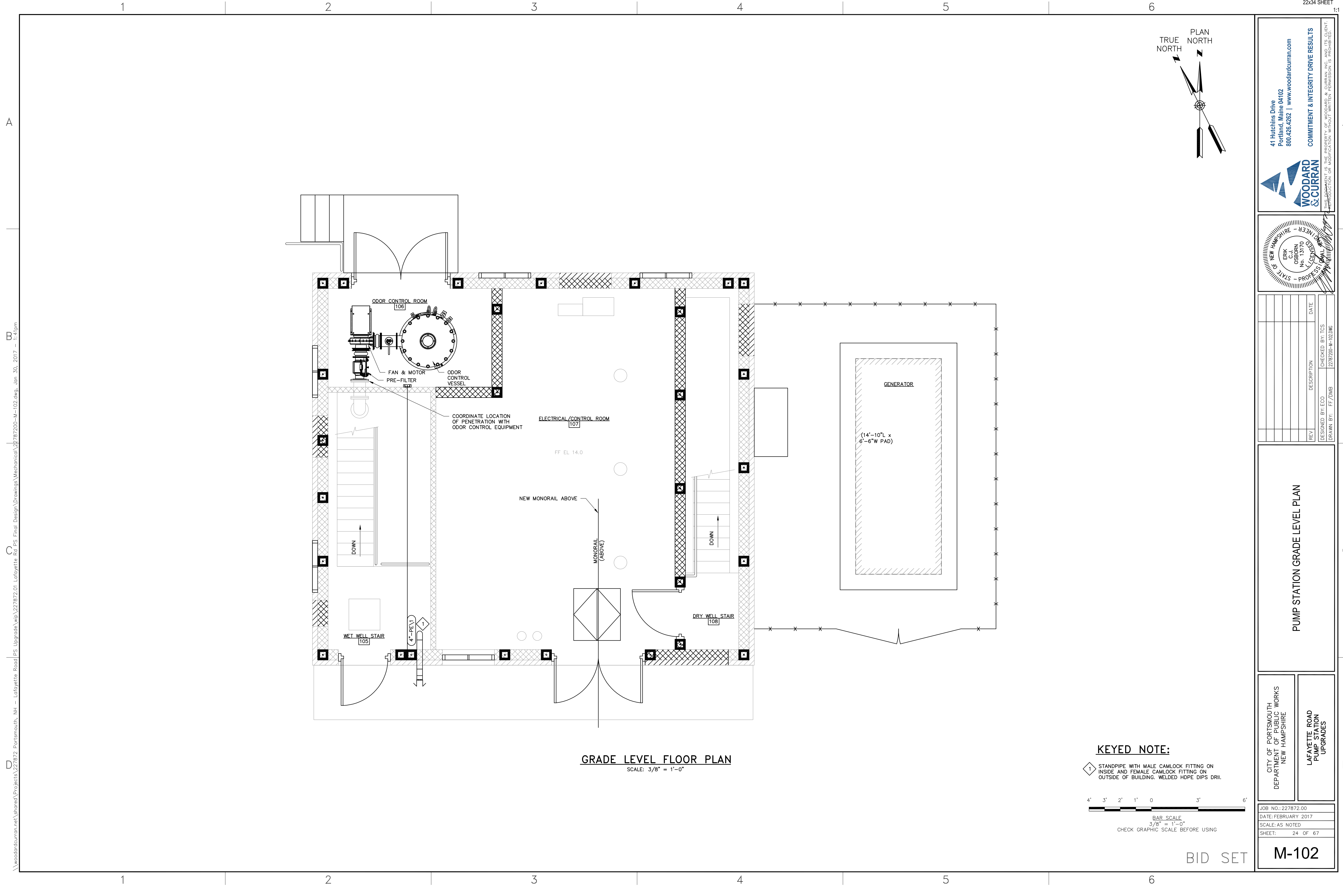
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 23 OF 67

**M-101**

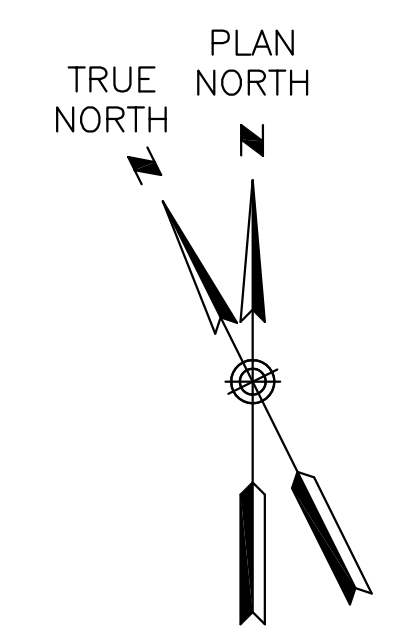
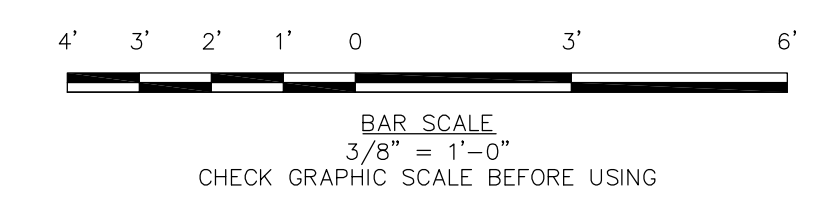
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**GRADE LEVEL FLOOR PLAN**  
SCALE: 3/8" = 1'-0"

**KEYED NOTE:**  
 1 STANDPIPE WITH MALE CAMLOCK FITTING ON INSIDE AND FEMALE CAMLOCK FITTING ON OUTSIDE OF BUILDING. WELDED HDPE DIPS DRILL.

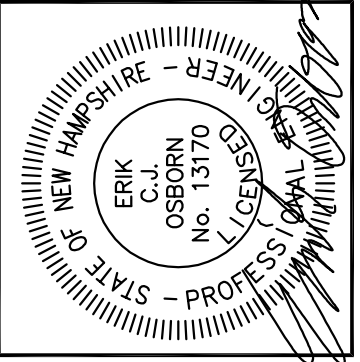


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DRAWN BY: FF/DMB	2/28/2017-M-102.DWG	

**PUMP STATION GRADE LEVEL PLAN**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

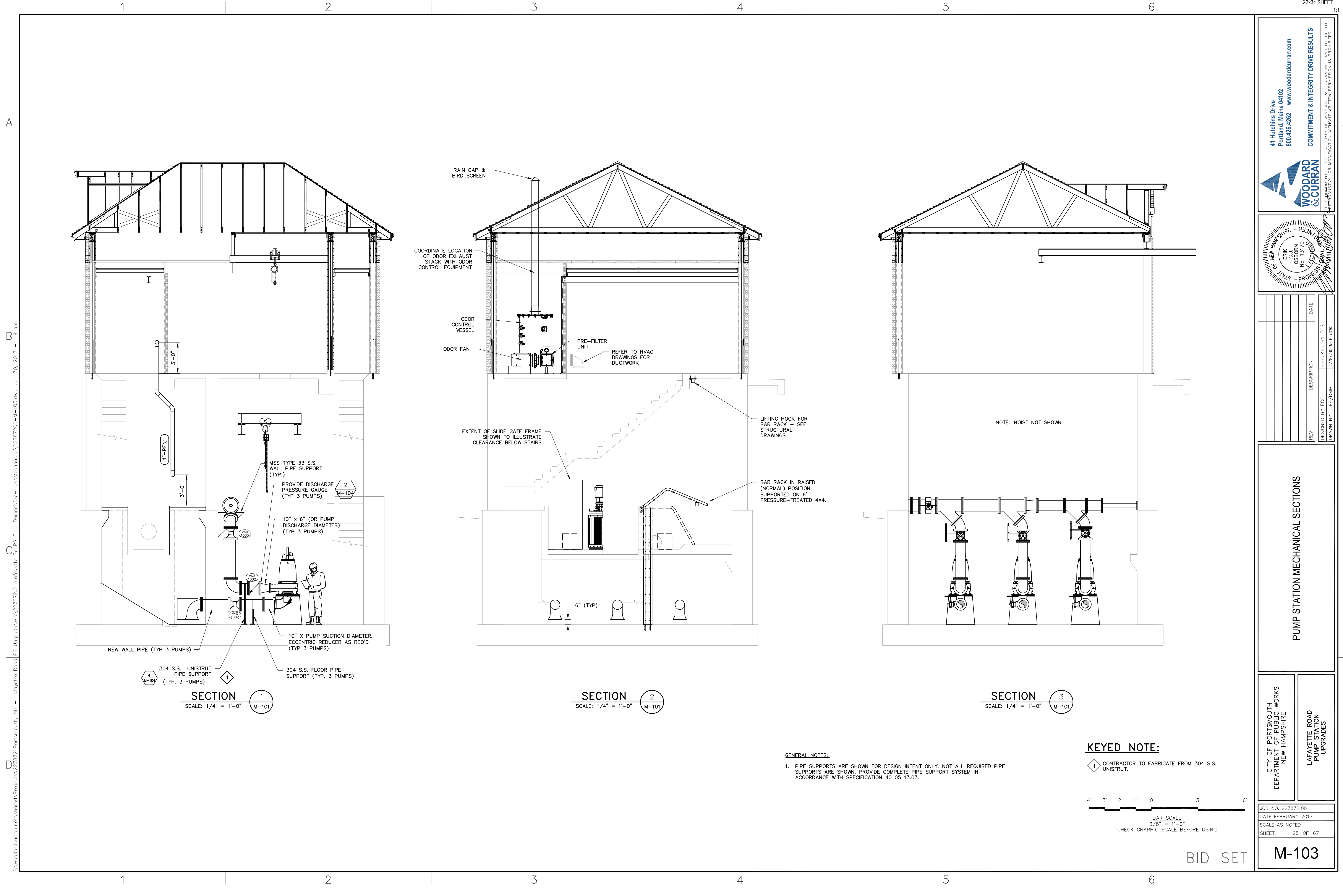
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS NOTED
SHEET: 24 OF 67

**M-102**

BID SET

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**SECTION 1**  
SCALE: 1/4" = 1'-0"  
M-101

**SECTION 2**  
SCALE: 1/4" = 1'-0"  
M-101

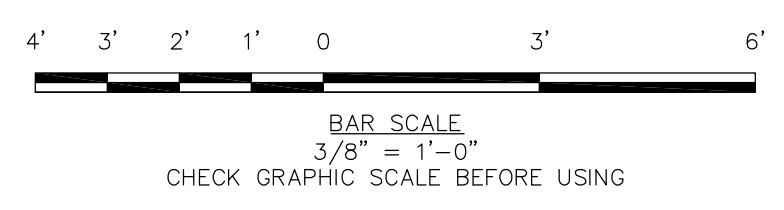
**SECTION 3**  
SCALE: 1/4" = 1'-0"  
M-101

**GENERAL NOTES:**

- PIPE SUPPORTS ARE SHOWN FOR DESIGN INTENT ONLY. NOT ALL REQUIRED PIPE SUPPORTS ARE SHOWN. PROVIDE COMPLETE PIPE SUPPORT SYSTEM IN ACCORDANCE WITH SPECIFICATION 40 05 13.03.

**KEYED NOTE:**

1 CONTRACTOR TO FABRICATE FROM 304 S.S. UNISTRUT.

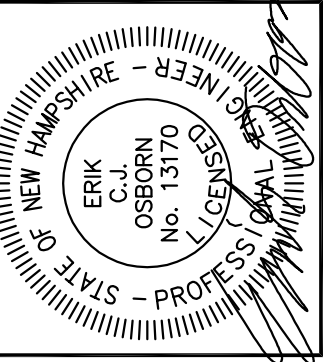


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**PUMP STATION MECHANICAL SECTIONS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

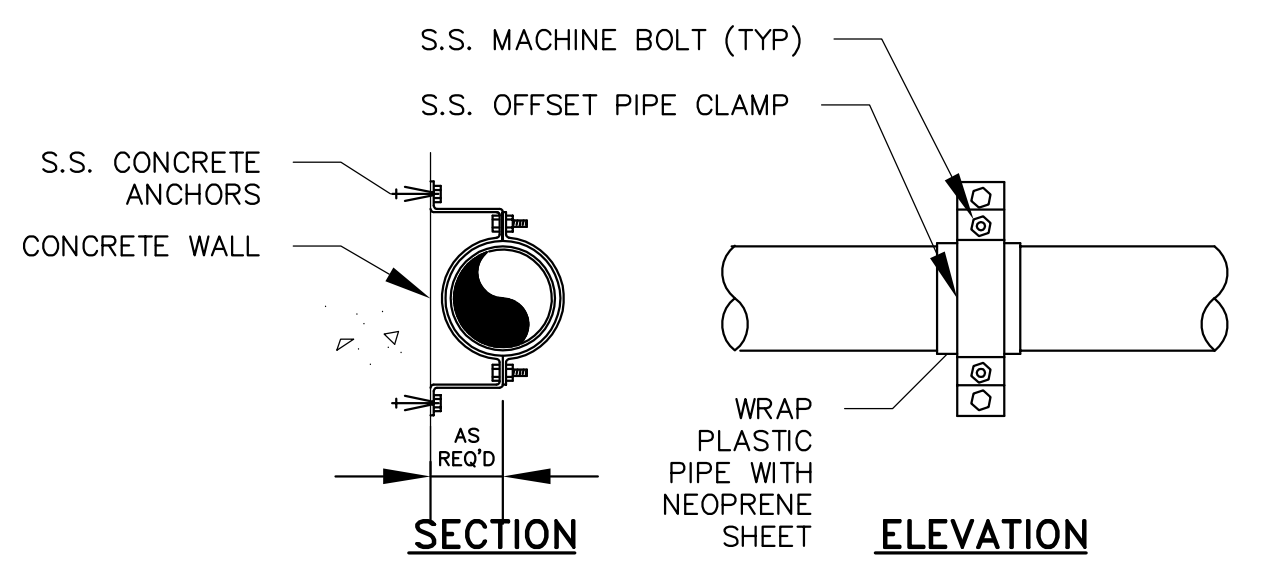
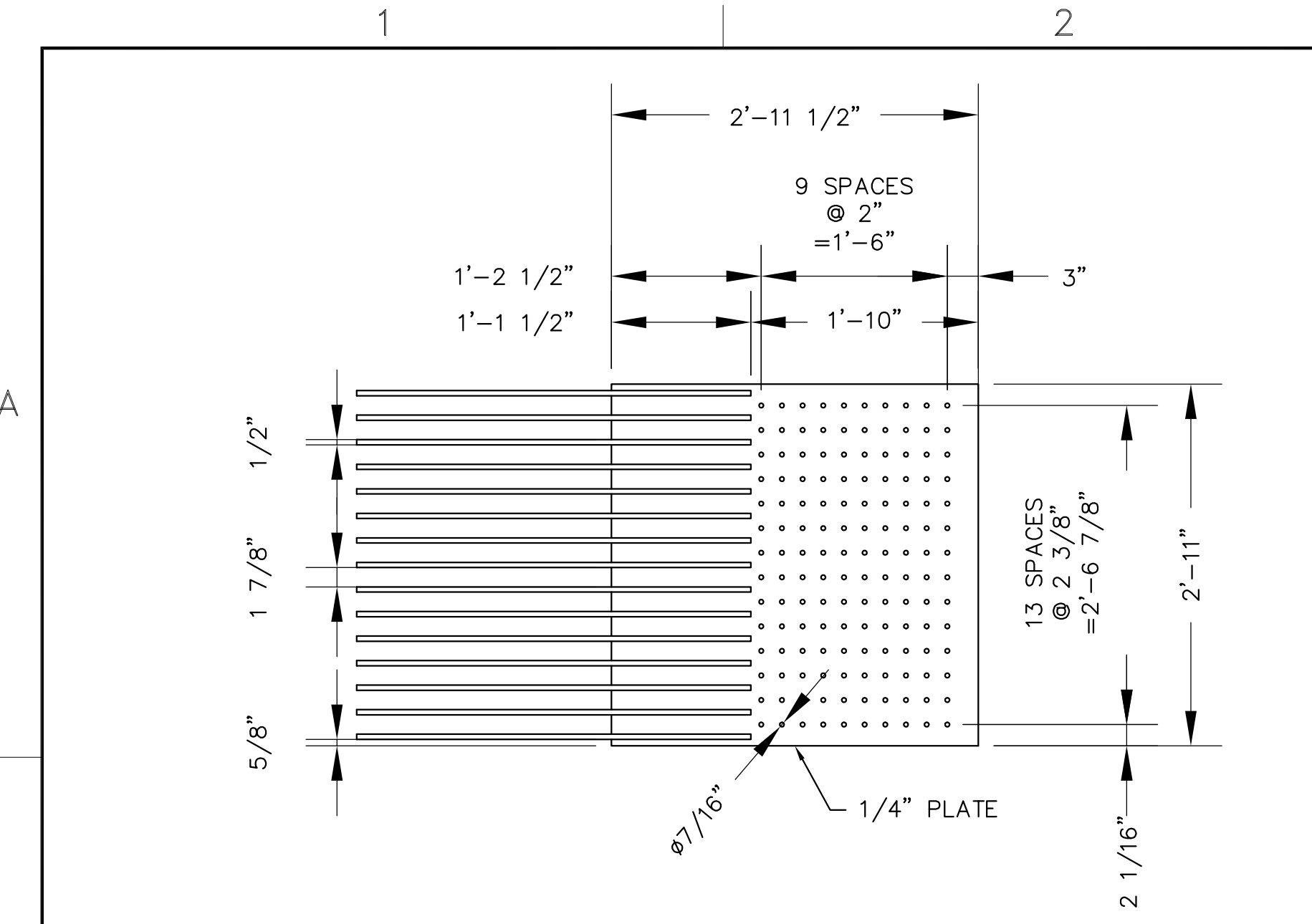
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 25 OF 67

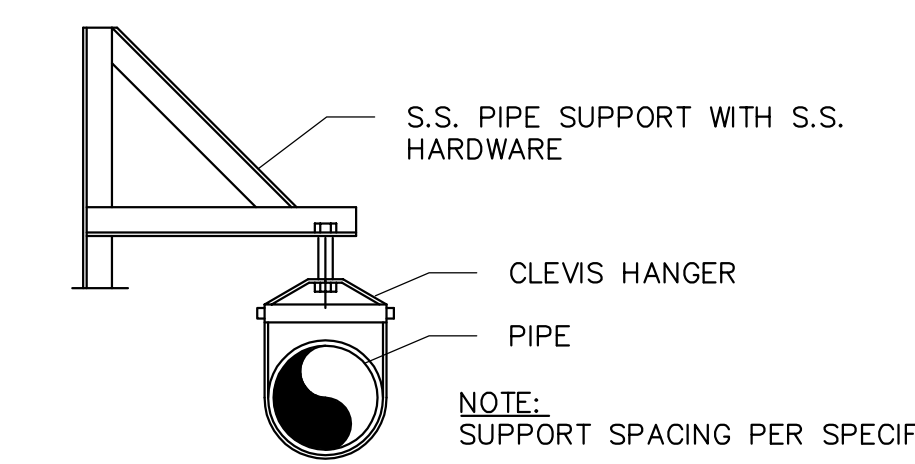
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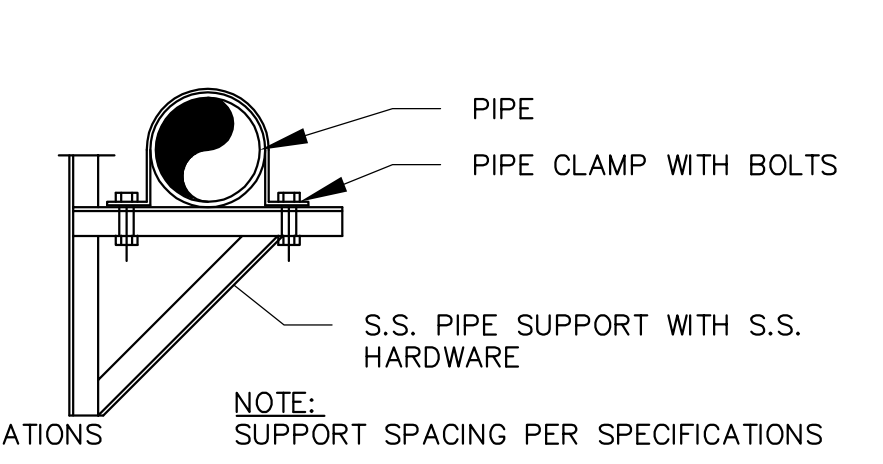
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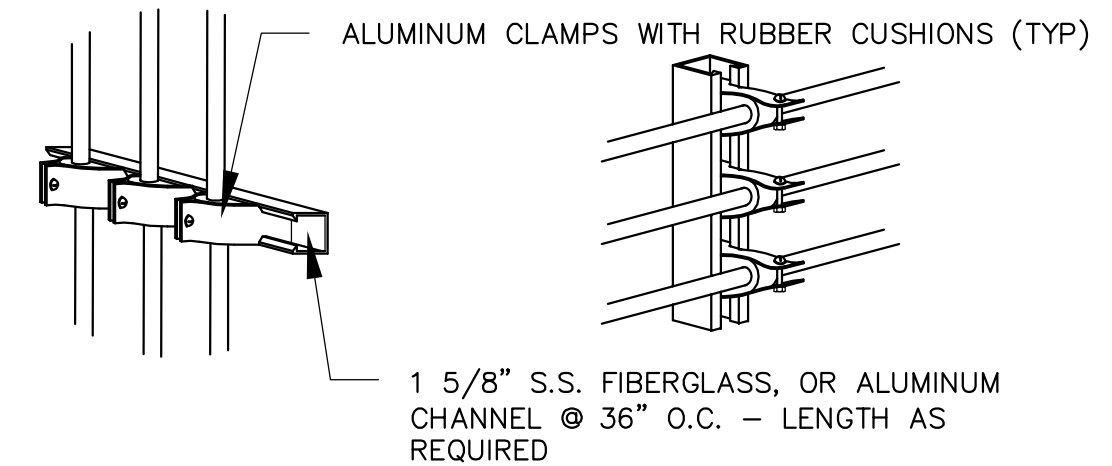
**WALL PIPE SUPPORT**  
N.T.S.



**WALL PIPE SUPPORT DETAIL**  
N.T.S.

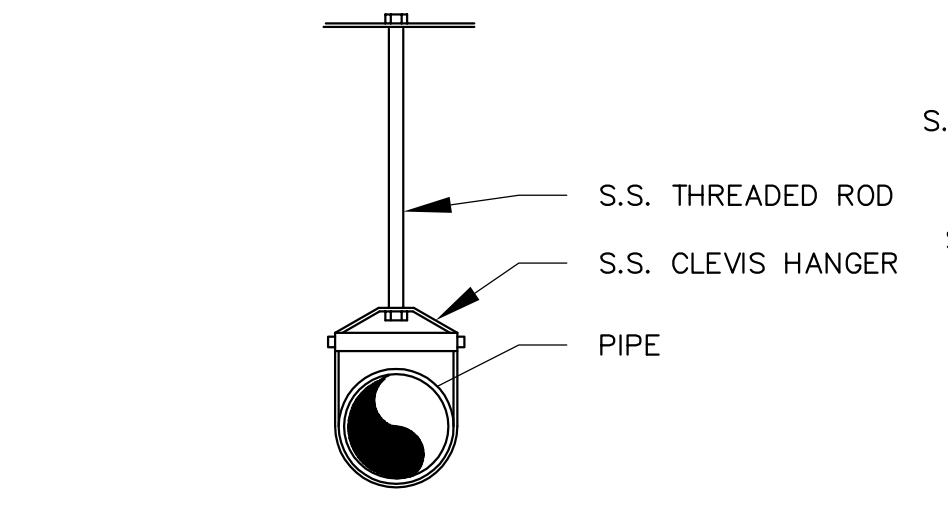


**WALL PIPE SUPPORT DETAIL**  
N.T.S.

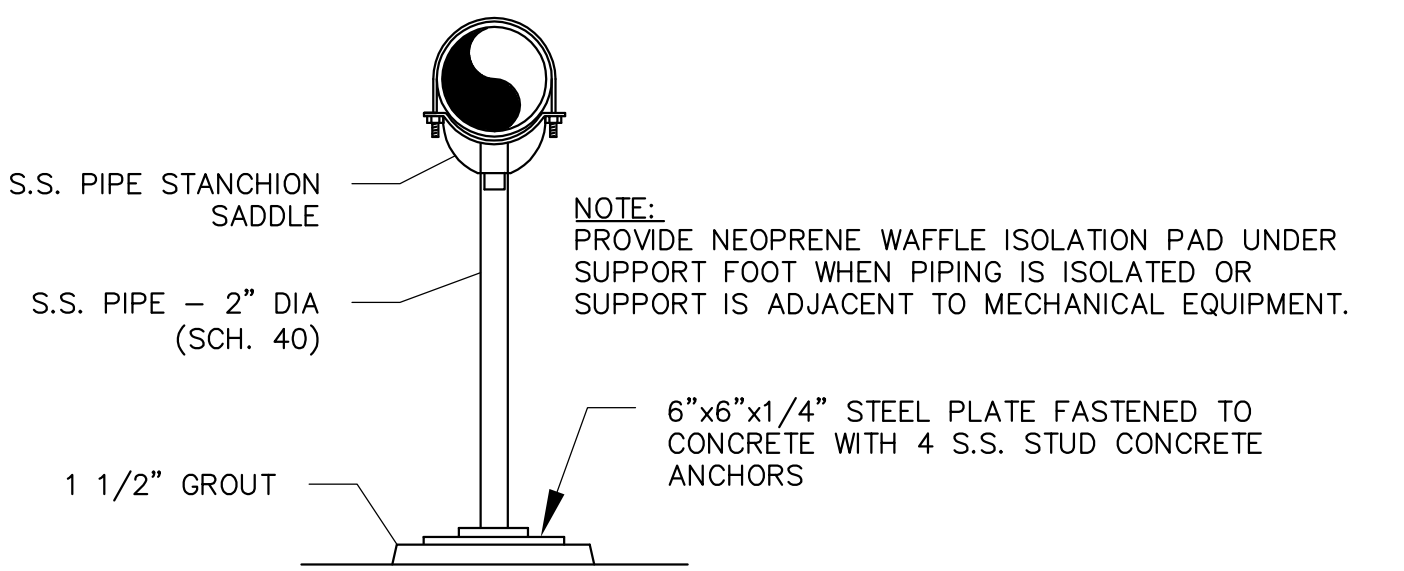


**VERTICAL PIPING RUN      HORIZONTAL PIPING RUN**  
N.T.S.

**MULTIPLE PIPE SUPPORT DETAIL**  
N.T.S.



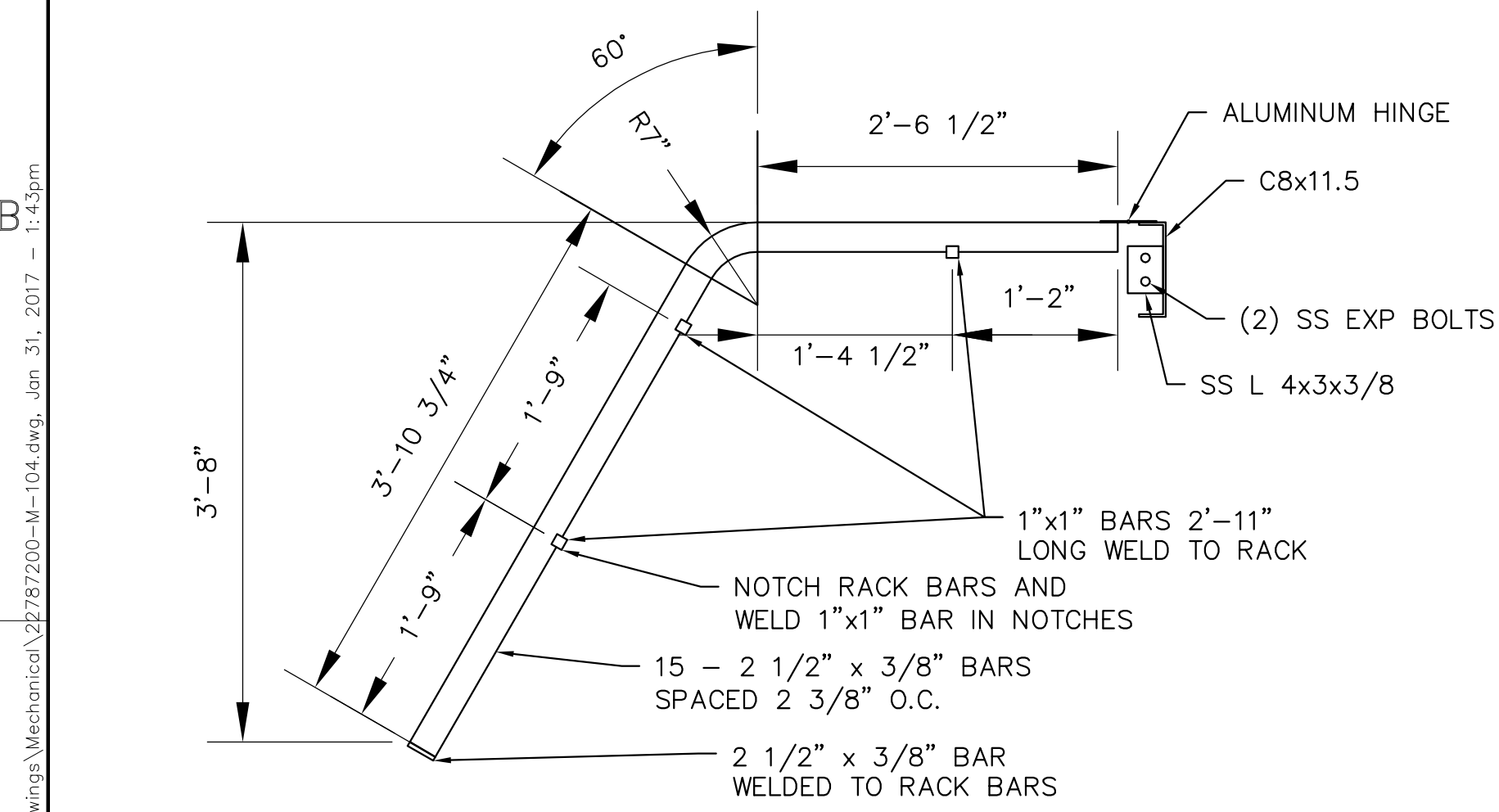
**CEILING PIPE SUPPORT DETAIL**  
N.T.S.



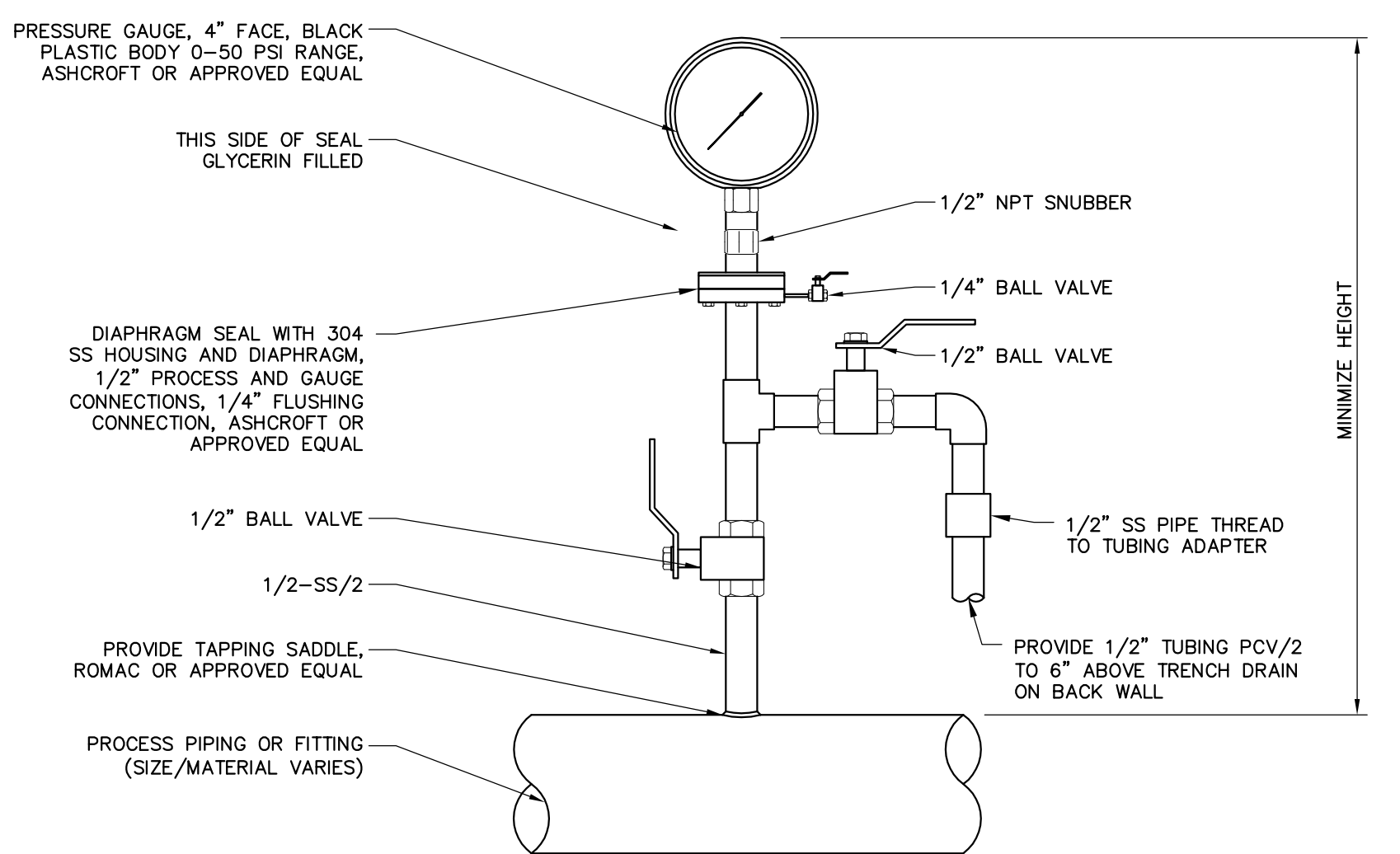
**PIPE FLOOR SUPPORT DETAIL**  
N.T.S.

**3 PIPE SUPPORT DETAIL**  
SCALE: N.T.S.  
(PROVIDE PIPE SUPPORTS AS SPECIFIED)

- NOTES:**
- REFER TO SPECIFICATION 40 05 13.03 PROCESS PIPE SUPPORTS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
  - ALL ATTACHMENT HARDWARE SHALL BE 316 S.S.
  - ALL INTERIOR PIPE SUPPORTS SHALL BE 304L S.S.
  - ALL EXTERIOR AND SUBMERGED PIPE SUPPORTS SHALL BE 316 S.S.

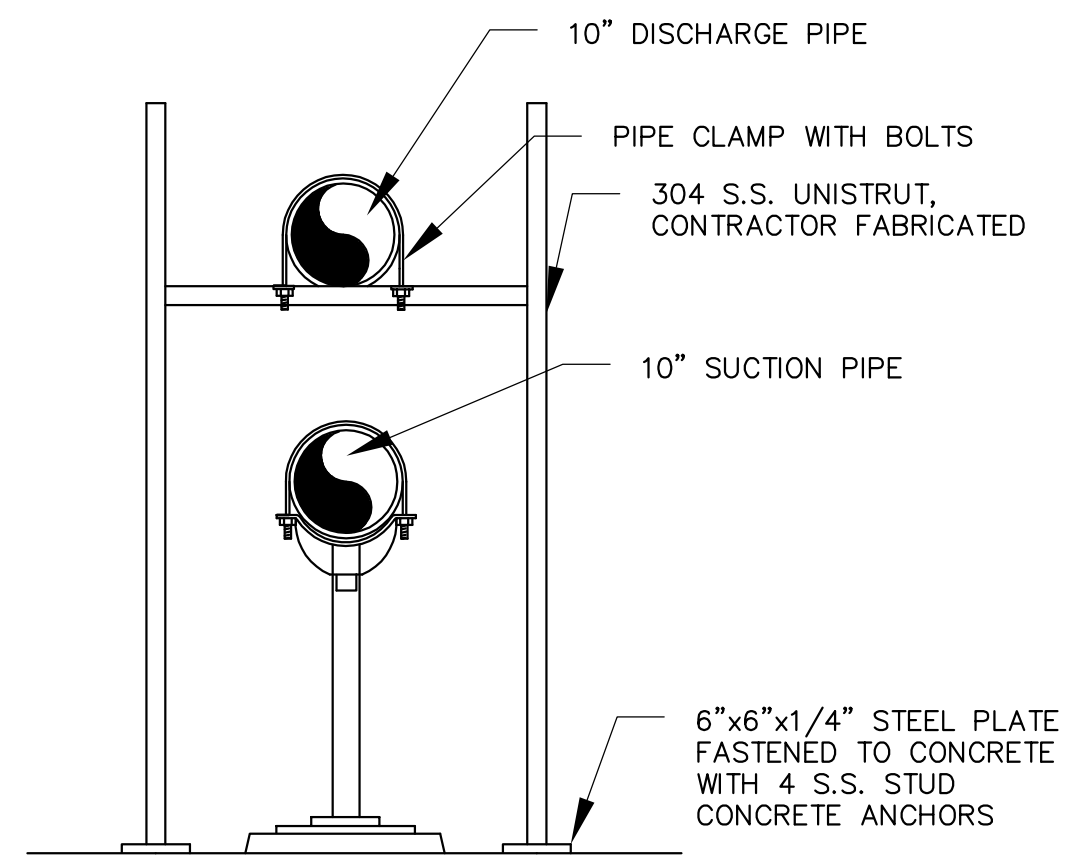


**1 ALUMINUM BAR RACK DETAIL**  
SCALE: 1/4" = 1"



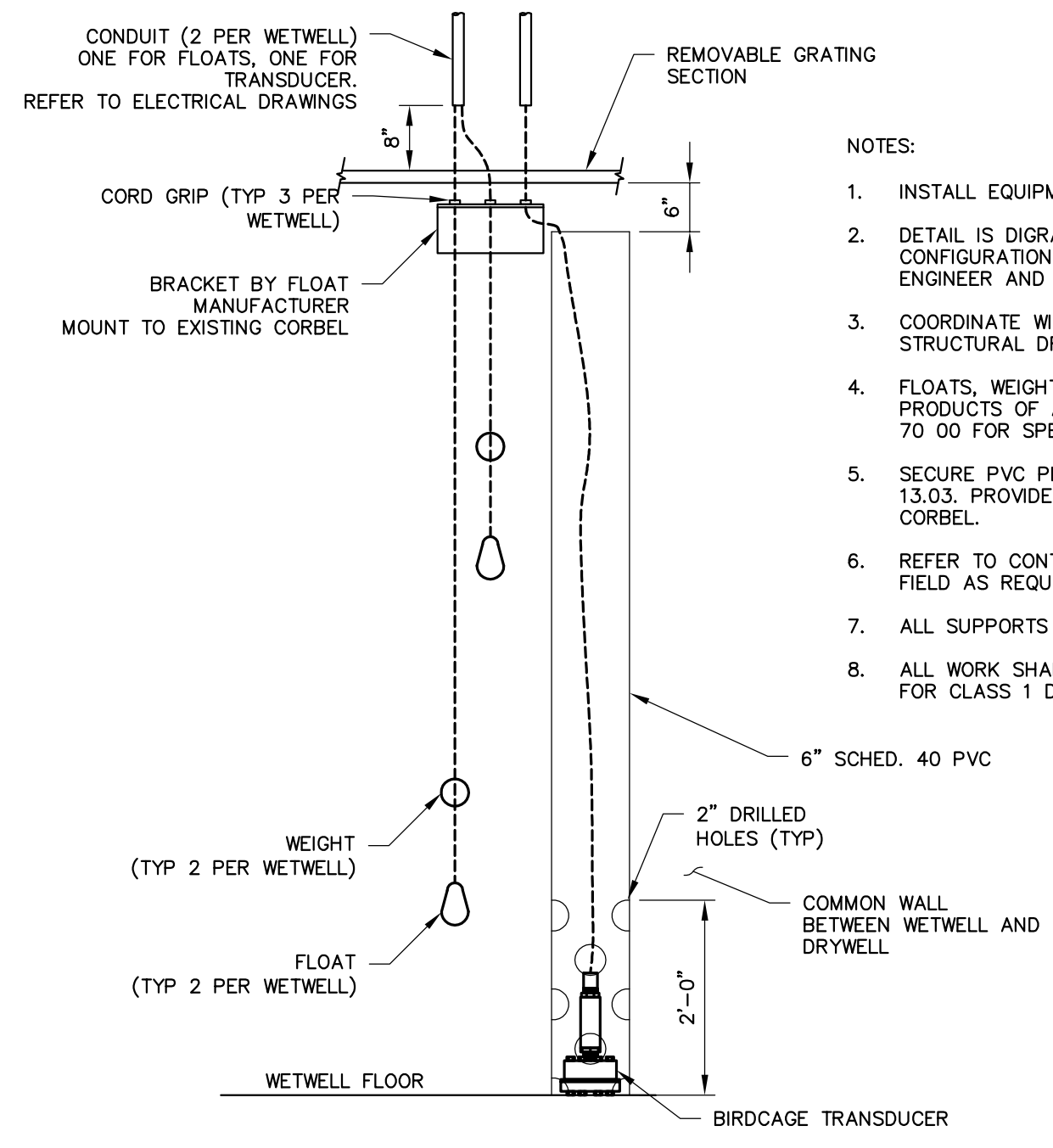
- NOTES:**
- ALL PIPE 1/2"-SS/2 UNLESS NOTED OTHERWISE.
  - ALL VALVES TYPE V26.

**2 PRESSURE GAUGE DETAIL**  
SCALE: N.T.S.



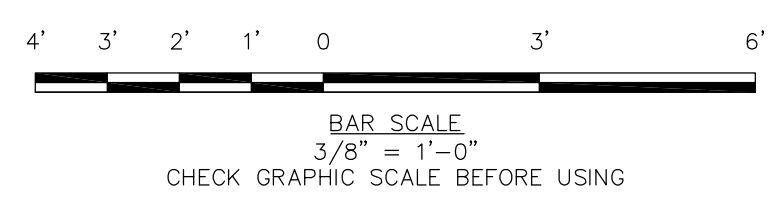
**4 DISCHARGE PIPE SUPPORT DETAIL**  
SCALE: N.T.S.

- NOTES:**
- REFER TO SPECIFICATION 40 05 13.03 PROCESS PIPE SUPPORTS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
  - ALL ATTACHMENT HARDWARE SHALL BE 316 S.S.
  - ALL INTERIOR PIPE SUPPORTS SHALL BE 304L S.S.



- NOTES:**
- INSTALL EQUIPMENT FOR EASY ACCESS BY OWNER'S STAFF.
  - DETAIL IS DIAGRAMATIC ONLY. VERIFY SITE CONDITIONS AND CONFIRM FINAL CONFIGURATION INCLUDING MOUNTING LOCATIONS AND HEIGHTS IN FIELD WITH ENGINEER AND OWNER.
  - COORDINATE WITH AND MODIFY GRATING PENETRATIONS AS REQUIRED. SEE STRUCTURAL DRAWINGS.
  - FLOATS, WEIGHTS, BRACKETS, AND CORD GRIPS SHALL BE STANDARD PRODUCTS OF A SINGLE MANUFACTURER. REFER TO INSTRUMENTATION SPEC 40 70 00 FOR SPECIFIC REQUIREMENTS.
  - SECURE PVC PIPE TO WALL WITH STANDARD PIPE SUPPORTS PER SPEC 40 05 13.03. PROVIDE SUPPORTS OF SUFFICIENT LENGTH TO EXTEND PAST EXISTING CORBEL.
  - REFER TO CONTROL NARRATIVE FOR FLOAT MOUNTING HEIGHTS. ADJUST IN FIELD AS REQUIRED.
  - ALL SUPPORTS AND HARDWARE SHALL BE 316 STAINLESS STEEL.
  - ALL WORK SHALL CONFORM TO REQUIREMENTS OF NATION ELECTRICAL CODE FOR CLASS 1 DIVISION 1 HAZARDOUS AREAS.

**5 WETWELL LEVEL CONTROL EQUIPMENT INSTALLATION DETAIL**  
SCALE: N.T.S.



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NEW HAMPSHIRE - 4815  
OSBORN No. 13170  
LICENSED PROFESSIONAL ENGINEER  
STATE OF NEW HAMPSHIRE

REV	DESCRIPTION	DATE

DESIGNED BY: ECO  
DRAWN BY: FF/DMB  
CHECKED BY: TCS  
22/34 SHEET

**PUMP STATION MECHANICAL DETAILS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

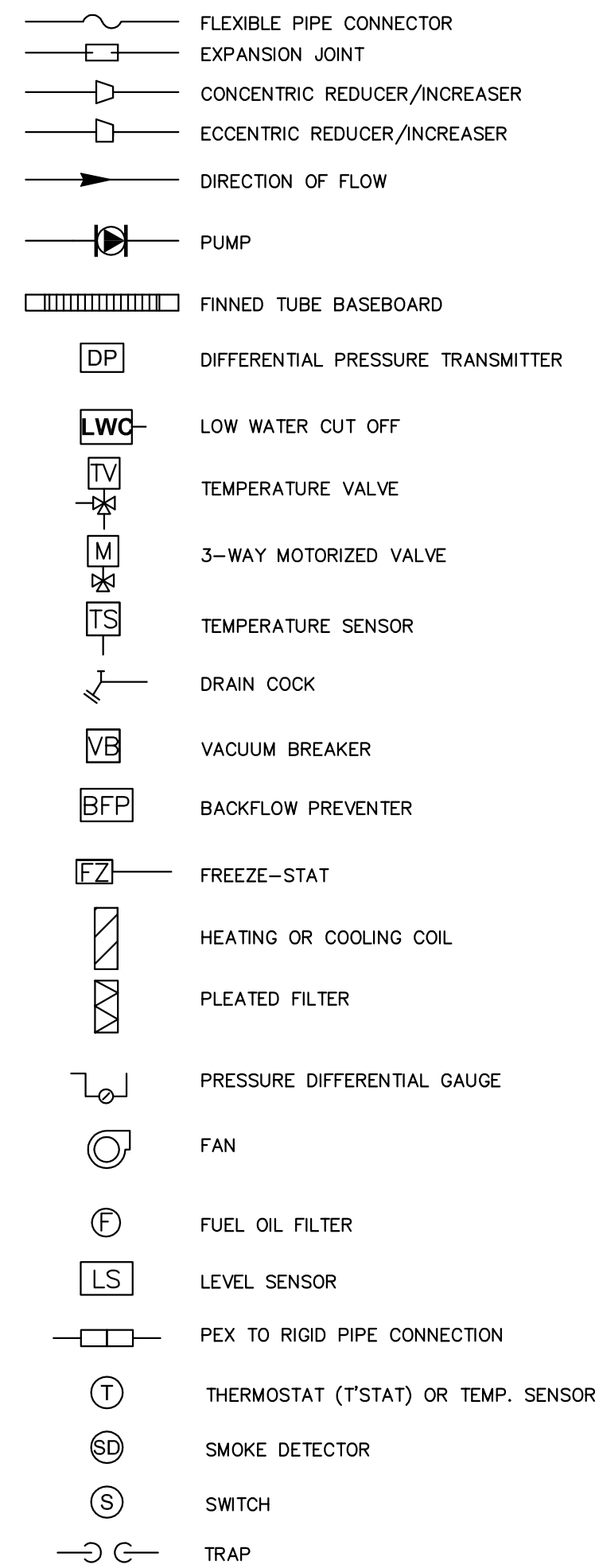
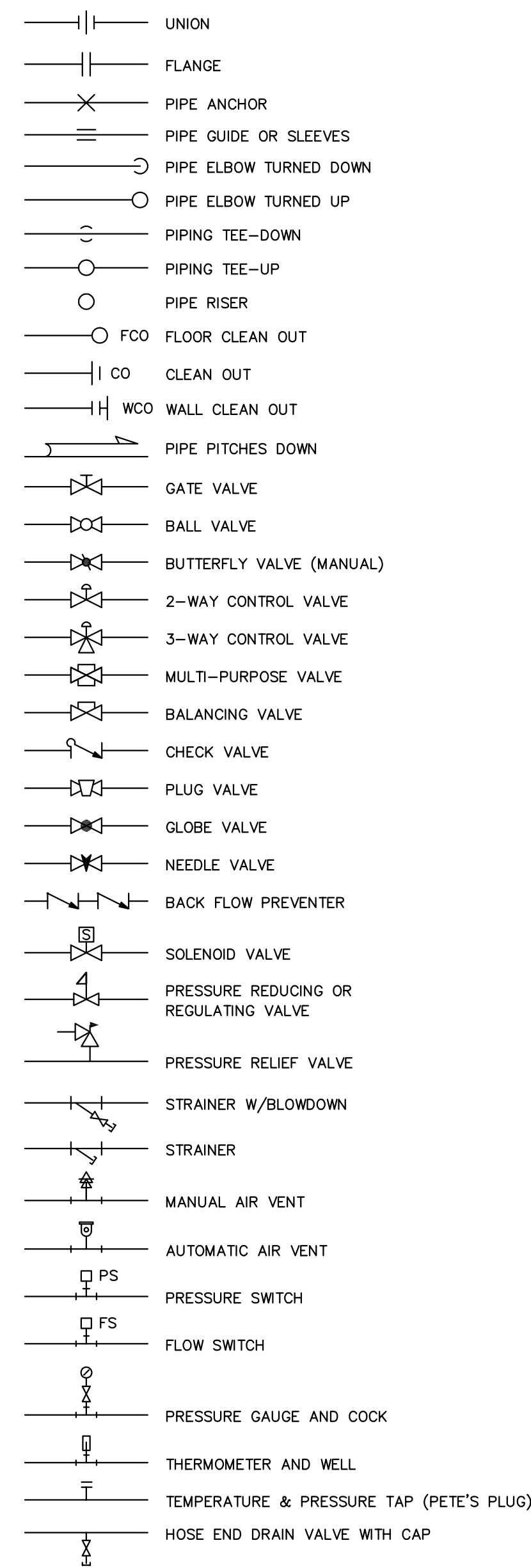
JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 26 OF 67

**M-104**

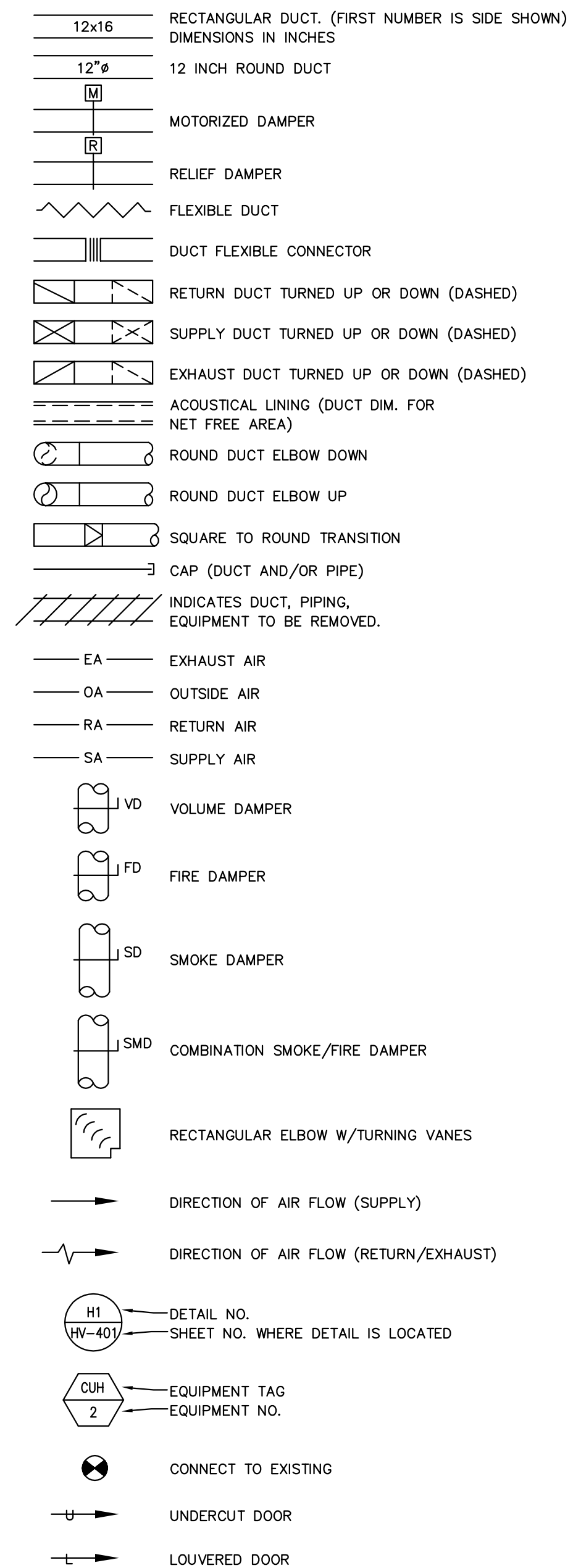
BID SET

\\woodardcurran.net\shares\Projects\227872\_PortsMechanical\227872-01\_Lafayette\_Road\_Pump Station\Drawings\Mechanical\227872-00-M-104.dwg, Jan 31, 2017 - 1:43pm

### PIPING SYMBOLS



### AIR DISTRIBUTION SYMBOLS



### ABBREVIATIONS

AAV	AUTOMATIC AIR VENT	EXIST.	EXISTING	RA	RETURN AIR
ACU	AIR CONDITIONING UNIT	FBO	FURNISHED BY OWNER	RF	RETURN FAN
AD	ACCESS DOOR	FC	FLEXIBLE CONNECTION	RG	RETURN GRILLE
AFF	ABOVE FINISHED FLOOR	FCV	FLOW CHECK VALVE	RH	RELIEF HOOD
AHU	AIR HANDLING UNIT	FCU	FAN COIL UNIT	RHC	REHEAT COIL
AP	ACCESS PANEL	FCO	FLOOR CLEANOUT	RM	ROOM
AS	AIR SEPARATOR	FD	FIRE DAMPER	RPZ	REDUCED PRESSURE ZONE BFP
ATC	AUTOMATIC TEMPERATURE CONTROL	FG	FIBERGLASS	RR	RETURN REGISTER
AV	AIR VENT	FT	FINNED TUBE RADIATION	RV	RELIEF VALVE
B	BOILER	FS	FLOW SWITCH	S	SANITARY
BB	BASEBOARD	GC	GENERAL CONTRACTOR	SA	SUPPLY AIR
BDD	BACKDRAFT DAMPER	GPM	GALLONS PER MINUTE	SCV	SELF CONTAINED VALVE
BG	BLAST GATE	HB	HOSE BIBB	SD	SMOKE DETECTOR
BFP	BACKFLOW PREVENTER	HC	HEATING COIL	SF	SUPPLY FAN
BLDG	BUILDING	HP	HEAT PUMP	SG	SUPPLY GRILLE
BOD	BOTTOM OF DUCT	HRU	HEAT RECOVERY UNIT	SR	SUPPLY REGISTER
BOP	BOTTOM OF PIPE	HTR	HEATER	SS	STAINLESS STEEL
BTU	BRITISH THERMAL UNIT	H & V	HEATING AND VENTILATION	TG	TRANSFER GRILLE
C	CONDENSATE	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	TDV	TRIPLE DUTY VALVE
CAS	COMBUSTION AIR SYSTEM	HW	HOT WATER	TMV	TEMPERATURE MIXING VALVE
CC	COOLING COIL	HX	HEAT EXCHANGER	TOD	TOP OF DUCT
CD	CONDENSATE DRAIN	IH	INTAKE HOOD	TOP	TOP OF PIPE
CFE	CAPPED FOR FUTURE	IN. W.G.	INCHES WATER GAUGE	TTS	TIGHT TO STEEL
CFM	CUBIC FEET PER MINUTE	IV	INTAKE VENT	TV	TURNING VANE(S)
CGD	COMBUSTION GAS DETECTION	L	LOUVER	TYP	TYPICAL
CLG	CEILING	LD	LINED DUCT	UH	UNIT HEATER
CO	CLEANOUT	LSD	LINEAR SLOT DIFFUSER	UIC	UP IN CHASE
CONT	CONTINUATION	M	MOTOR OPERATED DAMPER (MOD)	UIW	UP IN WALL
COORD	COORDINATE	MAU	MAKE UP AIR UNIT	UV	UNIT VENTILATOR
CTE	CONNECT TO EXISTING	MAX	MAXIMUM	V	VENT
CU	CONDENSING UNIT	MBH	1000 BTU/HR.	VAV	VARIABLE AIR VOLUME
CUH	CABINET UNIT HEATER	ME	MECHANICAL ENGINEER	VB	VACUUM BREAKER
CV	CONTROL VALVE	MFRG	MANUFACTURER	VTR	VENT THRU ROOF
CW	COLD WATER	MIN	MINIMUM	VD	VOLUME DAMPER
DC	DUCT COIL	MPV	MULTI-PURPOSE VALVE	VCFE	VALVED AND CAPPED FOR FUTURE
DDC	DIRECT DIGITAL CONTROL	MTD	MOUNTED	VFD	VARIABLE FREQUENCY DRIVE
DIA	DIAMETER	MUA	MAKE UP AIR	VS	VARIABLE SPEED
DN	DOWN	NPW	NON-POTABLE WATER	W	WASTE
DWG	DRAWING	NTS	NOT TO SCALE	W/	WITH
DWH	DOMESTIC WATER HEATER	OA	OUTSIDE AIR	WCO	WALL CLEANOUT
EA	EXHAUST AIR	OED	OPEN ENDED DUCT	WH	WALL HYDRANT
EF	EXHAUST FAN	OBD	OPPOSED BLADE DAMPER	WMS	WIRE MESH SCREEN
ER	EXHAUST REGISTER	OSV	OIL SAFETY VALVE		
ERV	ENERGY RECOVERY UNIT	P	PUMP		
ET	EXPANSION TANK	PL	PLUMBING		
ETR	EXISTING TO REMAIN	PRV	PRESSURE REDUCING VALVE		
		R	RELIEF VENT		

### PIPING DESIGNATIONS

C	CONDENSATE	HPS	HIGH PRESSURE STEAM
CD	CONDENSATE DRAIN	HWR	HOT WATER RETURN
CHWR	CHILLED WATER RETURN	HWS	HOT WATER SUPPLY
CHWS	CHILLED WATER SUPPLY	LPS	LOW PRESSURE STEAM
CWR	CONDENSER WATER RETURN	MPS	MEDIUM PRESSURE STEAM
CWS	CONDENSER WATER SUPPLY	RG	REFRIGERANT GAS
CW	COLD WATER	RL	REFRIGERANT LIQUID
DCW	DOMESTIC COLD WATER	S	SANITARY
DHW	DOMESTIC HOT WATER	V	VENT
F.O.R.	FUEL OIL RETURN		
F.O.S.	FUEL OIL SUPPLY		

**NOTE:**  
SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET ARE GENERAL AND MAY NOT HAVE BEEN USED ON THIS PROJECT.

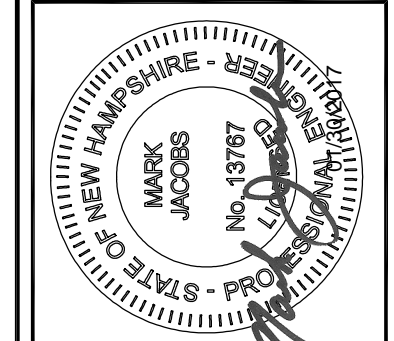
#### GENERAL DRAWING NOTES:

- ALL NEW WORK INCLUDING EQUIPMENT, PIPING, DUCTWORK, CONDUIT, ENCLOSURES, LIGHTING, COATINGS, AND APPURTENANCES SHALL MEET THE REQUIREMENTS OF THE ENVIRONMENTAL AND NFPA 820 CLASSIFICATIONS LISTED IN THE LOCATION SCHEDULE ON SHEET G-001.
- CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST WITHIN THE CONSTRUCTION AREA.
- ALL ITEMS REMOVED SHALL BECOME THE PROPERTY OF THE OWNER AND SHALL BE DISPOSED OF AS PER THE OWNERS INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
- THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE OWNER AND/OR ENGINEER FOR EXPEDITING AND RESOLUTION.
- PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING AND DUCTWORK. DO NOT LEAVE PIPING AND/OR DUCTWORK OPEN ENDED.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF ALL WORK. ALL OFFSETS IN PIPING AND DUCTS TO AVOID OBSTRUCTIONS SHALL BE PROVIDED AT NO COST TO THE OWNER.
- PROVIDE ACCESS PANELS FOR ALL CONCEALED DAMPERS, VALVES AND EQUIPMENT.
- IF A SECTION OF DUCT OR PIPE IS NOT LABELED FOR SIZE, THEN THE LARGER SIZE INDICATED ON THE DRAWINGS SHALL PREVAIL.
- DUCT AND PIPE SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.
- ALL PIPING SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS IN A NEAT AND WORKMANLIKE MANNER AND BE SUPPORTED AS REQUIRED BY CODES. PIPING SHALL BE SET UP AND DOWN AND OFFSET AS REQUIRED TO SUIT FIELD CONDITIONS. DIELECTRIC COUPLINGS SHALL BE USED WHERE DISSIMILAR METALS ARE JOINED.
- THE CONTRACTOR SHALL PROVIDE ALL TEMPERATURE CONTROLS INCLUDING WIRING, TUBING AND THERMOSTATS AND ALL MISCELLANEOUS APPURTENANCES TO MEET THE INTENT OF THESE DOCUMENTS. PROTECT EXISTING THERMOSTATS AND INSTALL NEW AT 4.5 FEET AFF.
- ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
- THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW THE EXACT ROUTING OF SYSTEMS OR LOCATION OF COMPONENTS. THE EXACT LOCATIONS, DIMENSIONS AND ALL OTHER DETAILS OF EQUIPMENT ARE THE RESPONSIBILITY OF THIS CONTRACTOR. THIS CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE. PROVIDE ALL DUCT AND PIPE TRANSITIONS REQUIRED FOR CONNECTION TO EQUIPMENT.
- REFER TO SPECIFICATION 40 05 13.03 FOR DUCT AND PIPE SUPPORT REQUIREMENTS.

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REV	DESCRIPTION	DATE

DESIGNED BY: BMT  
DRAWN BY: DMB  
CHECKED BY: MJS  
22872 H-001.DWG

### HVAC LEGEND

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS NOTED
SHEET: 27 OF 67

**H-001**

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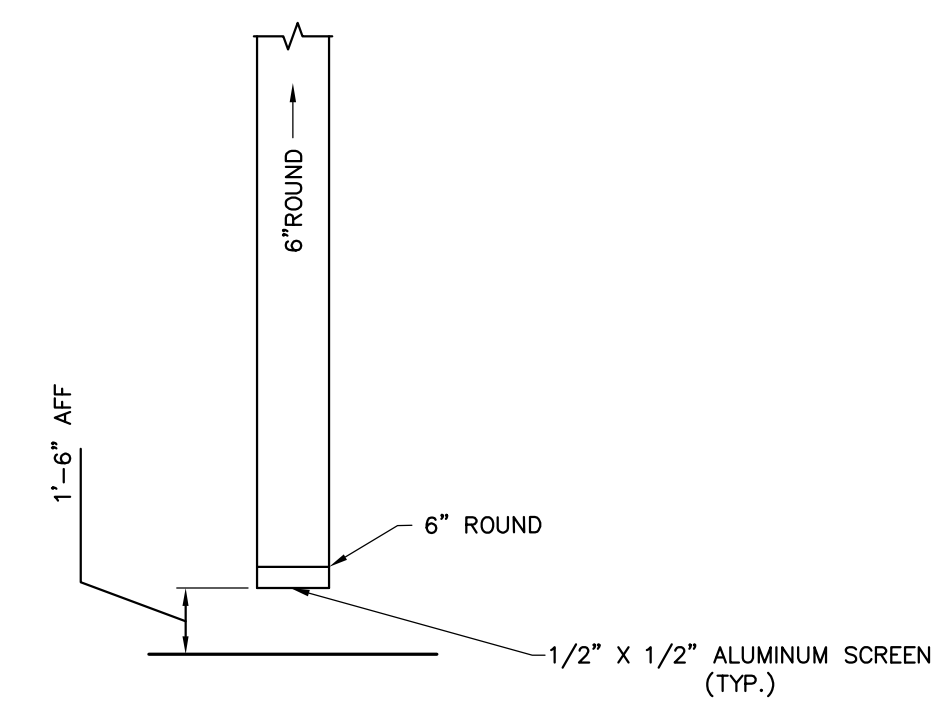


**HVAC GENERAL NOTES**

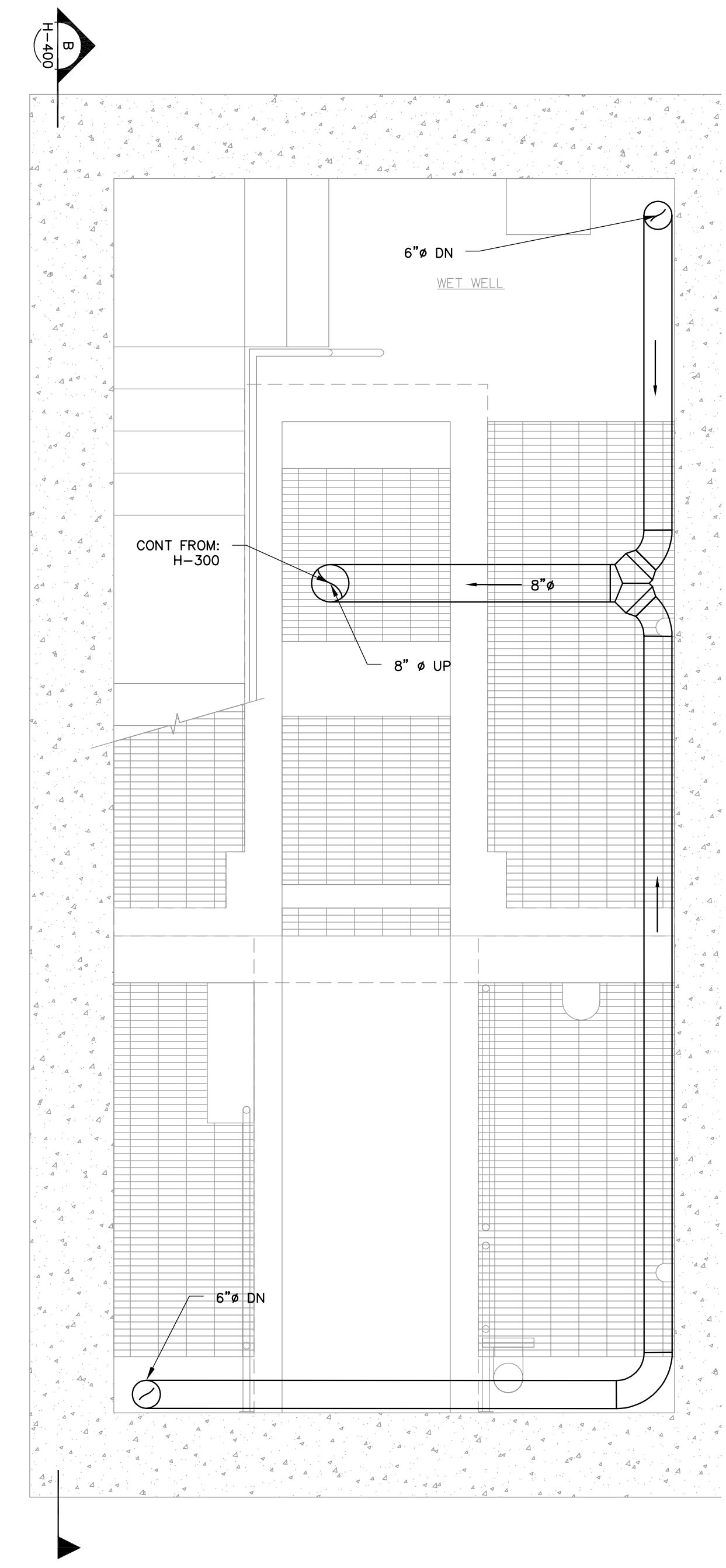
1. ALL WORK SHALL CONFORM TO THE CURRENT NEW HAMPSHIRE CODES.
2. PROVIDE STAINLESS STEEL SUPPLY DUCTWORK IN WETWELL. PROVIDE CONTINUOUS STAINLESS STEEL DUCTWORK FROM EXTERIOR LOUVERS.
3. PROVIDE PVC DUCTWORK FOR WETWELL EXHAUST. PROVIDE CONTINUOUS PVC DUCTWORK TO ODOR CONTROL UNIT.
4. PROVIDE SEALS TO MATCH FIRE RATING ON ALL PENETRATIONS.
5. PROVIDE 304 STAINLESS STEEL DUCT SUPPORTS, INSULATION SHIELDS AND RELATED APPURTENANCES. HARDWARE SHALL BE 316 STAINLESS STEEL.

**HVAC KEYED NOTES**

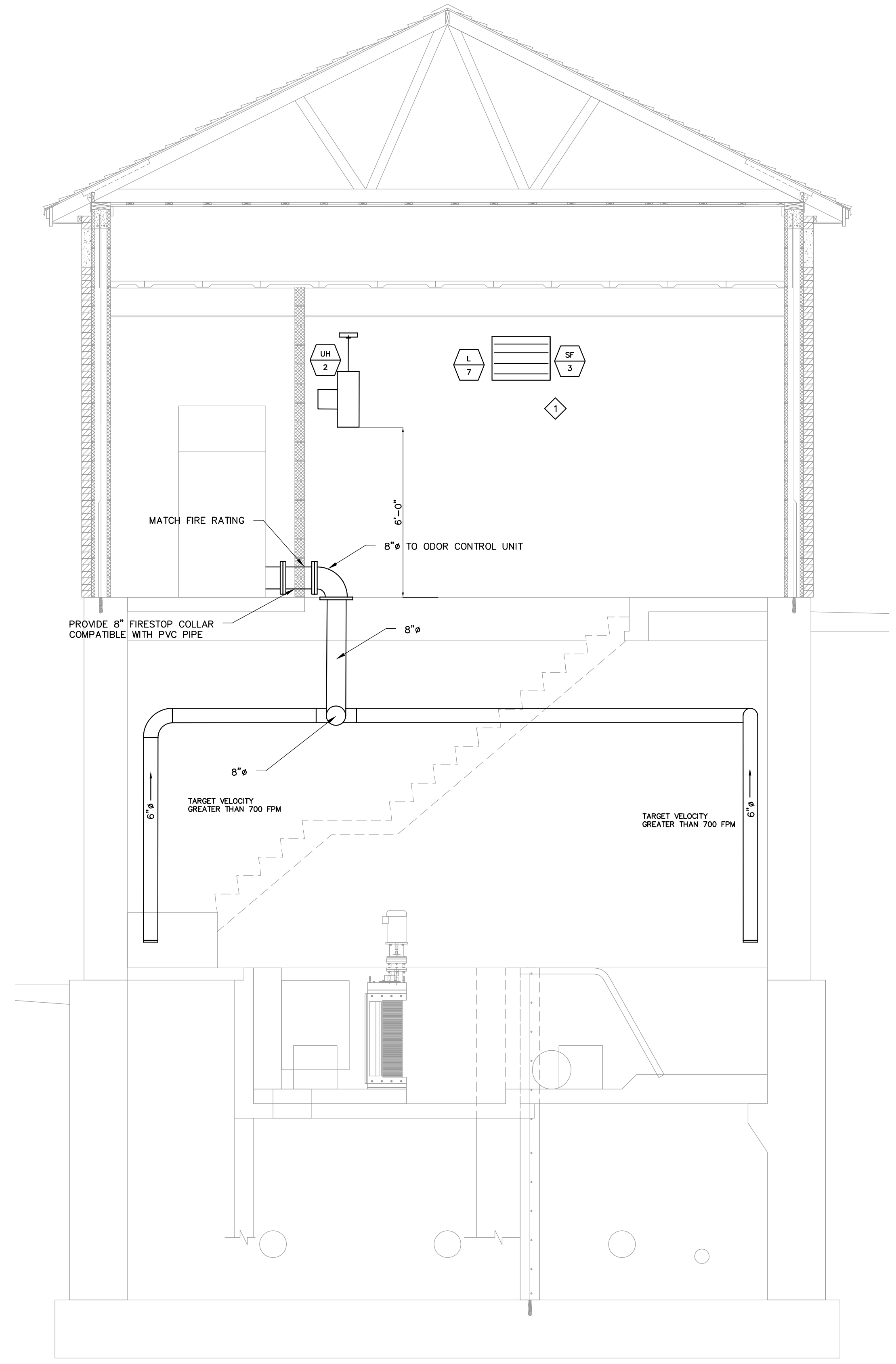
- 1. SUPPLY DUCTED 90 DEGREE TURN ON INTERIOR OF SUPPLY FAN.



**WET WELL DUCTWORK ELEVATION**  
SCALE: NTS



**WET WELL HVAC PLAN**  
SCALE: 1/2" = 1'-0"

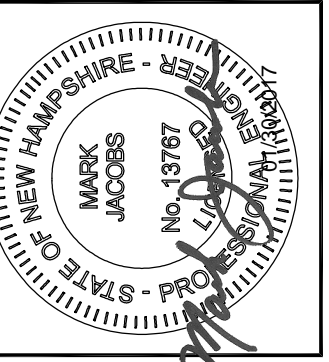


**SECTION B**  
SCALE: 3/8" = 1'-0"  
H-400

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CHECKED BY: MJS  
DATE: 2/29/17 H-102-200.DWG

**WET WELL HVAC PLAN AND SECTIONS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS NOTED
SHEET: 29 OF 67

**H-102**

BID SET

\\woodardcurran.net\shared\Projects\227872\_Perksmouth\_NH - Lafayette\_Road\PS\_Upgrade\wip\_227872.01\_Lafayette\_Rd\_Pump\_Station\Drawings\HVAC\227872\_H-102-200.dwg, Jan. 30, 2017 - 1:43pm

**HVAC GENERAL NOTES**

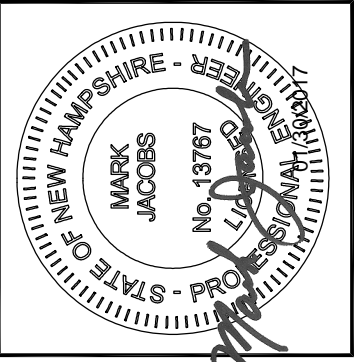
1. DRY WELL DUCTING TO BE FIELD ROUTED AROUND EXISTING STRUCTURES AND GAS PIPING.
2. PROVIDE GALVANIZED STEEL DUCTWORK IN DRYWELL. PROVIDE CONTINUOUS GALVANIZED STEEL DUCTWORK FROM EXTERIOR LOUVERS.
3. PROVIDE 304 STAINLESS STEEL DUCT SUPPORTS, INSULATION SHIELDS AND RELATED APPURTENANCES. HARDWARE SHALL BE 316 STAINLESS STEEL.

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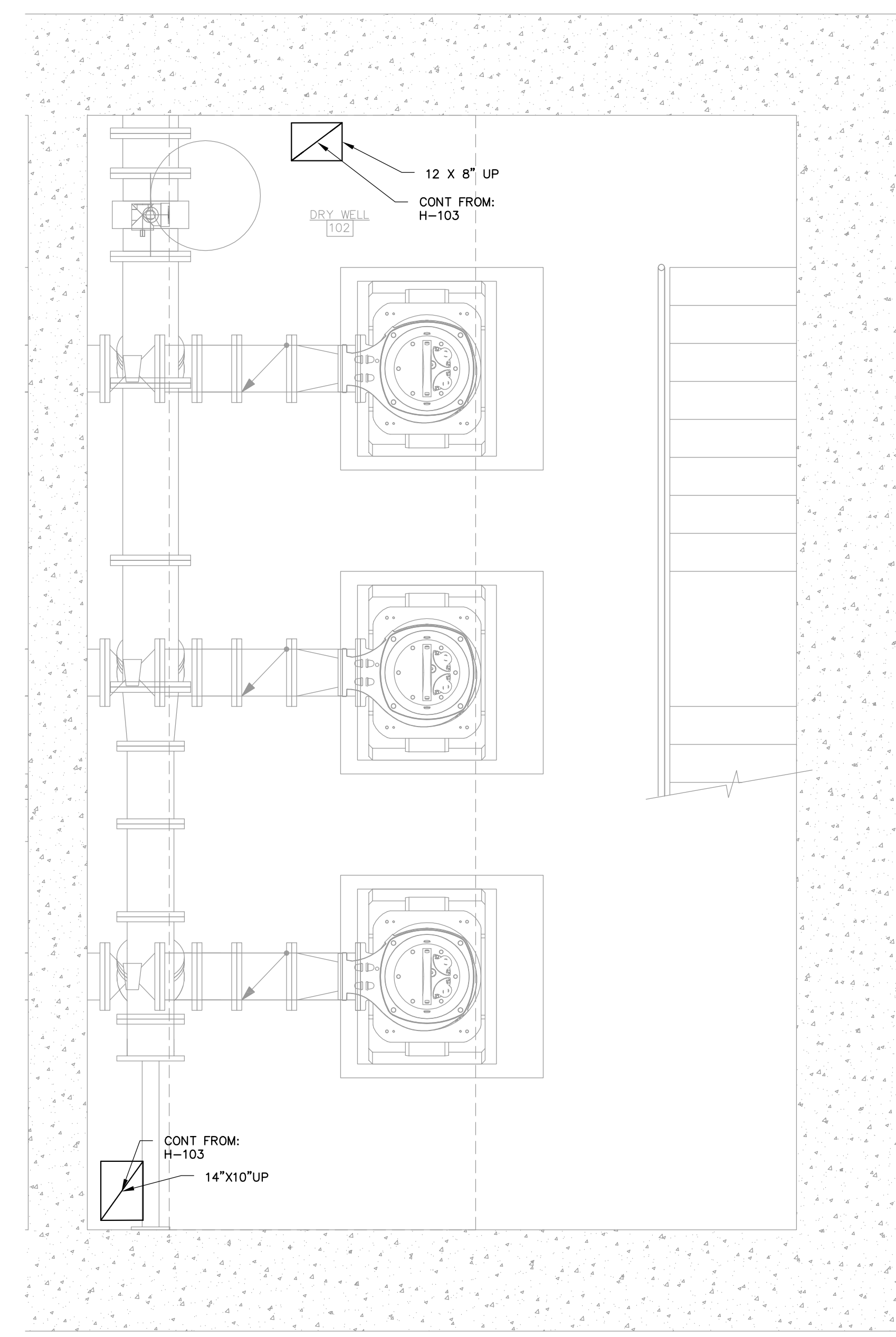
**DRY WELL HVAC PLAN AND SECTIONS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

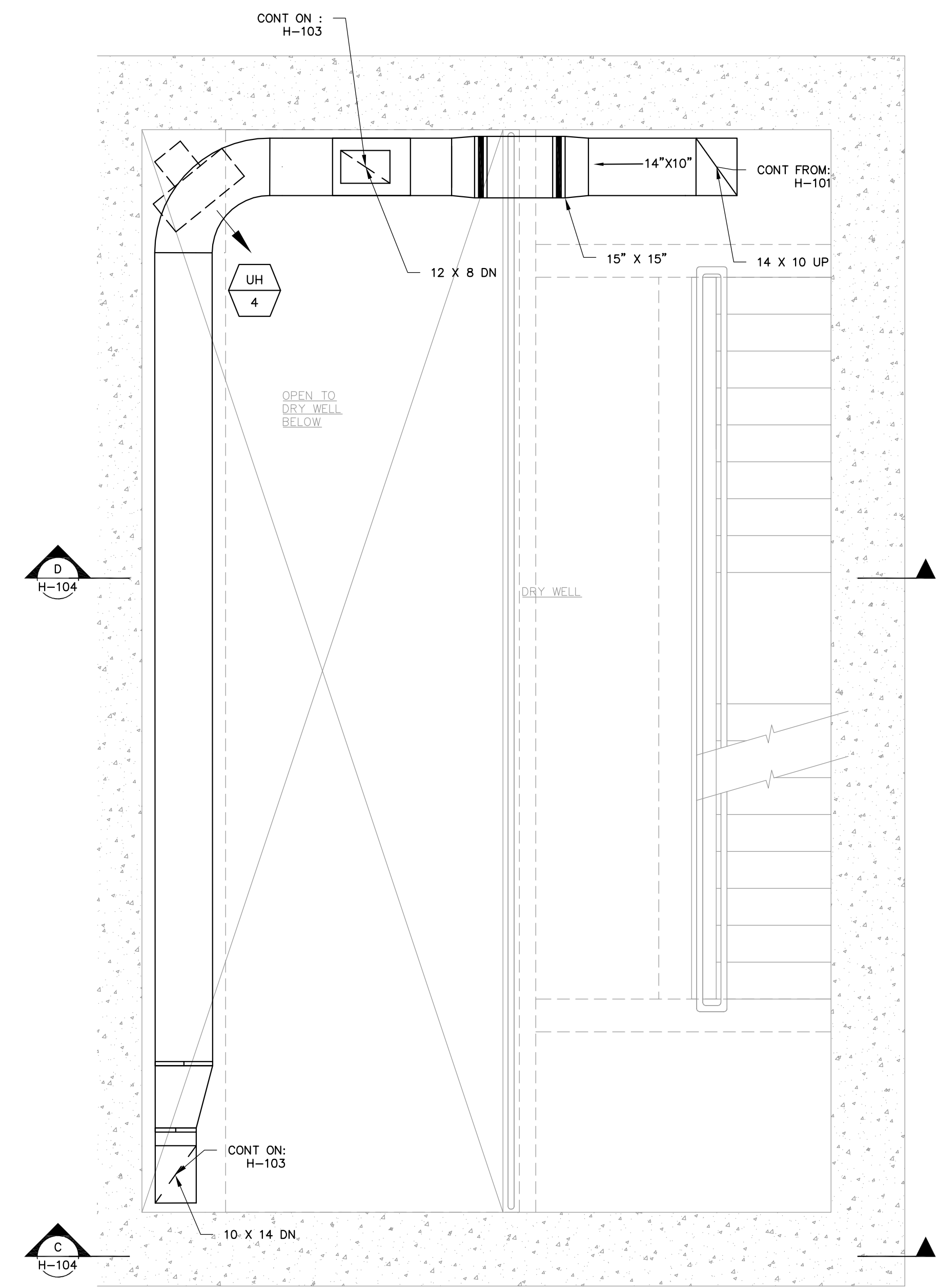
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 30 OF 67

**H-103**



**DRY WELL BASEMENT LEVEL PLAN**  
SCALE: 1/2" = 1'-0"



**DRY WELL INTERMEDIATE LEVEL PLAN**  
SCALE: 1/2" = 1'-0"

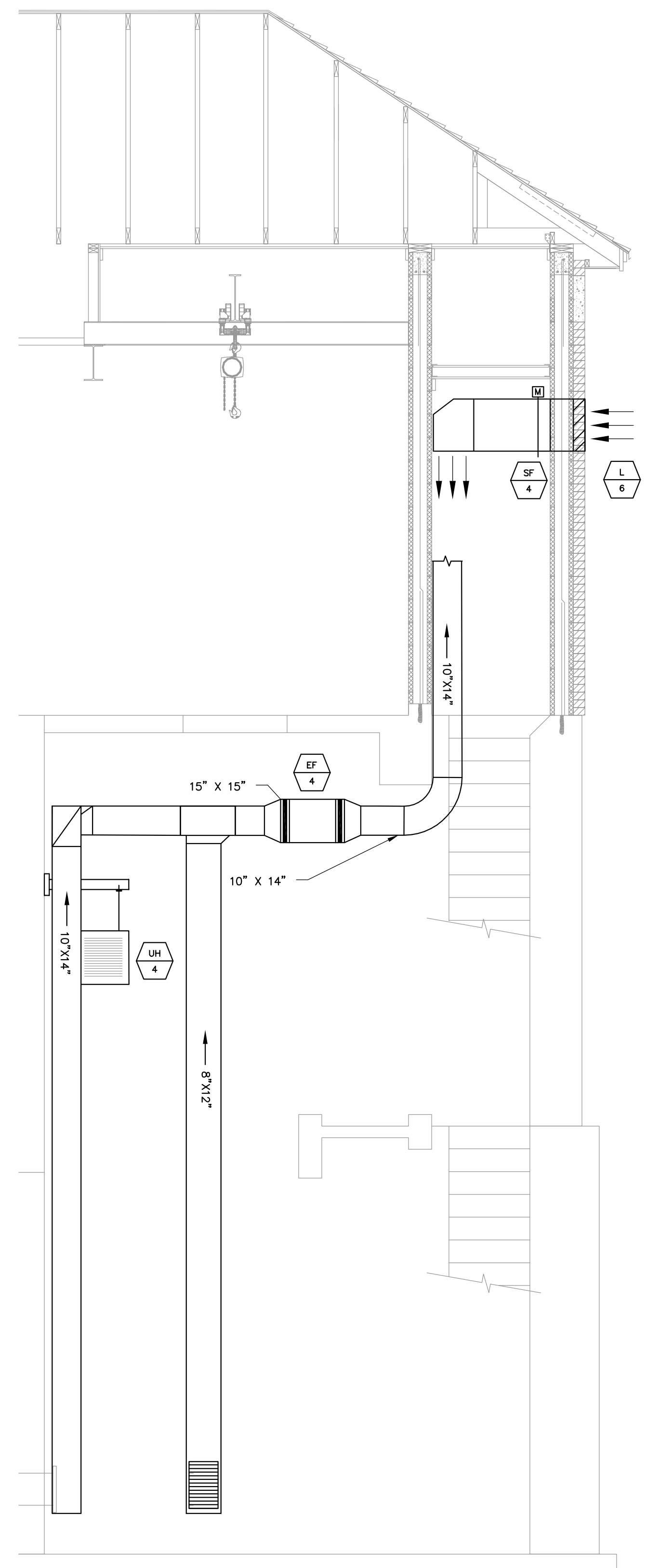
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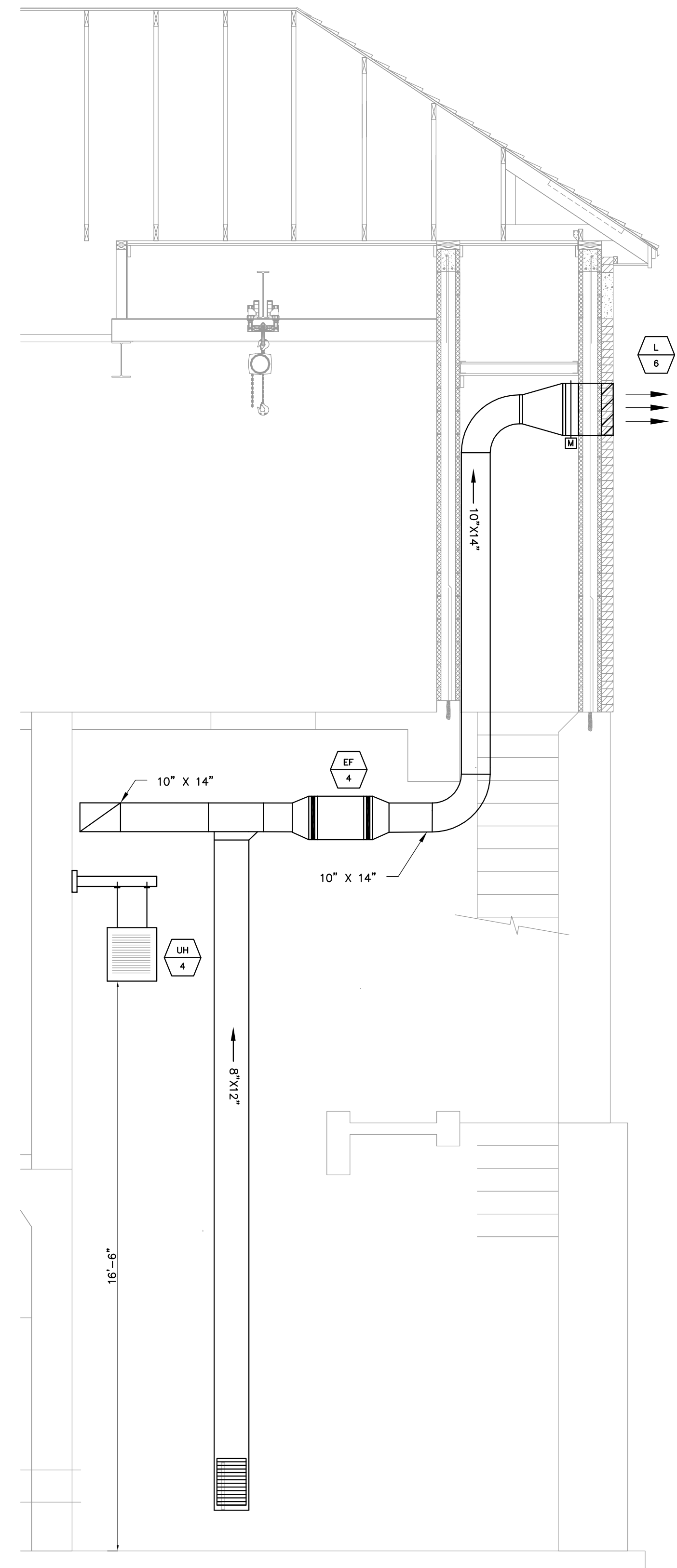
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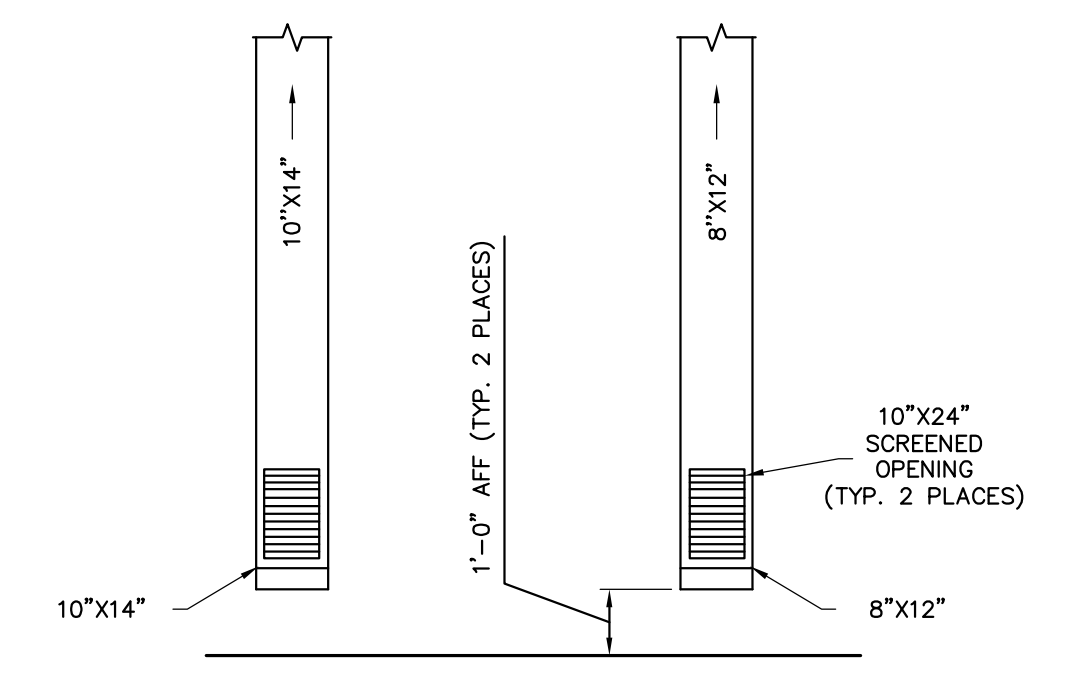
**SECTION C**  
SCALE: 3/8"=1'-0"  
H-103



**SECTION D**  
SCALE: 3/8"=1'-0"  
H-103

**HVAC GENERAL NOTES**

1. ALL WORK SHALL CONFORM TO THE CURRENT NEW HAMPSHIRE CODES.
2. PROVIDE GALVANIZED STEEL DUCTWORK. PROVIDE CONTINUOUS GALVANIZED STEEL DUCTWORK FROM EXTERIOR LOUVERS.
3. PROVIDE SEALS TO MATCH FIRE RATING ON ALL PENETRATIONS.
4. PROVIDE STAINLESS STEEL PIPE SUPPORTS AND STAINLESS STEEL HARDWARE FOR EXTERIOR SYSTEMS.
5. PROVIDE 304 STAINLESS STEEL DUCT SUPPORTS, INSULATION SHIELDS AND RELATED APPURTENANCES. HARDWARE SHALL BE 316 STAINLESS STEEL.



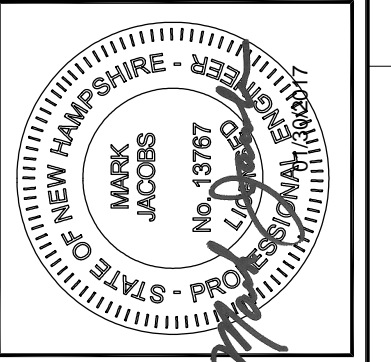
**DRY WELL DUCTWORK ELEVATION**  
SCALE: NTS

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DESIGNED BY: BMT		
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		2/27/17 H-103-200.DWG

**DRY WELL HVAC SECTIONS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 31 OF 67

**H-104**

BID SET

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Fan Schedule														
Tag	Service	CFM	ESP (INWG)	Fan RPM	Sones	Drive Type	Fan Type	Motor RPM	Motor V	Motor Ph	Motor Hz	Motor HP	Manufacturer & Model Number	Notes
SF-2	Electrical Room	300	0.25	1725	4.3	Direct	Propeller Wall Fans	662	277	1	60	1/6	Greenheck SE1-12-432-VG/6	1,4
SF-3	Wet Well	290	0.25	1725	8.5	Direct	Propeller Wall Fans	662	277	1	60	1/4	Greenheck SBS-1H20-4	1,2,4,5,6
SF-4	Dry Well	400	0.25	1725	8.5	Direct	Propeller Wall Fans	662	277	1	60	1/4	Greenheck SBS-1H20-4	1,3,4,5,6
EF-1	Odor Control Room	115	0.25	1725	4.3	Direct	Propeller Wall Fans	800	277	1	60	1/6	Greenheck SE1-8-440-VG/6	1,4
EF-4	Dry Well	425	0.25	1725	7.4	Direct	In-line Fan	800	277	1	60	1/4	Greenheck BSQ-85	1,3,4,5

- Notes:
- 1) Install per manufacturer's recommendations / requirements / clearances.
  - 2) Suitable for Class 1 Div 1 environment, spark resistant construction.
  - 3) Suitable for Class 1 Div 2 environment, spark resistant construction.
  - 4) Hang with vibration isolation.
  - 5) Provide with 1/4 HP EXP Motor.
  - 6) Provide with aluminum propeller.

Electric Unit Heater Schedule						
Tag	Service	Heating Capacity (KW)	V-Ph-Hz	Air Flow Rate (CFM)	Basis of Design or Engineer Approved Equal	Notes
UH-1	Odor Control Room	3	208-1-60	700	Qmark GUX300812	1,4
UH-3	Wet Well	5	480-3-60	530	Qmark GUX5004832	1,2,5
UH-4	Dry Well	7.5	480-3-60	530	Qmark GUX7504832	1,3,5

- Notes:
- 1) Install per manufacturer's recommendations / requirements / clearances.
  - 2) Suitable for Class 1 Div 1 environment, spark resistant, corrosion resistant construction.
  - 3) Suitable for Class 1 Div 2 environment, spark resistant construction.
  - 4) Integral Thermostat.
  - 5) Wall mount Thermostat.

Mini-Split Schedule											
Tag	Service	Air Flow (CFM)	Heating Type	Cooling Type	Cooling Capacity (BTU/h)	Condensing Unit SEER	Condensing Unit Location	Motor V-Ph-HZ	Motor MOP (A)	Refrigerant	Manufacturer & Model Number
AC-1	Electrical Room	2119	Heat Pump	VRF Heat Pump	18,000 - 30,000	15.6	Outside	208-1-60	25	R-410A	Mitsubishi PUZ-HA30NHA2
IDU-1	Electrical Room	770	Heat Pump	VRF Heat Pump	18,000 - 30,000	15.6	Outside	208-1-60	25	R-410A	Mitsubishi PKA-A30KA

- Notes:
- 1) Provide ultra-low temperature option.
  - 2) Provide manufacturer recommended mounting bracket.
  - 3) Provide condensate drain to sink.
  - 4) Provide manufacturer's wall mount remote thermostat and controller. Provide wireless control unit.
  - 5) Verify installation location and required clearances of each condensing unit with the manufacturer prior to installation.
  - 6) AC-1 shall be installed on a concrete equipment pad.

Louver Schedule							
Tag	Service	CFM	Size (in)	Free Area (SQ FT)	Velocity (ft/min)	Manufacturer & Model Number	Notes
L-1	Odor Control Room	115	12 x 24	0.56	205	Ruskin ELF375DXH	1,4,5,7
L-2	Odor Control Room	115	16 x 18	0.76	151	Greenheck ESD-403	1,4,5,6
L-3	Electrical Room	290	18 x 24	1.33	225	Ruskin ELF375DXH	1,4,5,6
L-4	Electrical Room	300	18 x 18	0.83	360	Greenheck ESD-403	1,4,5,6
L-5	Dry Well	400	18 x 24	1.15	348	Greenheck ESD-403	1,3,4,5,7
L-6	Dry Well	410	18 x 18	0.83	512	Greenheck ESD-403	1,3,4,5,7
L-7	Wet Well	290	18 x 24	1.15	340	Greenheck ESD-403	1,2,4,5,7

- Notes:
- 1) Install per manufacturer's recommendations / requirements / clearances.
  - 2) Suitable for Class 1 Div 1 environment, spark resistant construction.
  - 3) Suitable for Class 1 Div 2 environment, spark resistant construction.
  - 4) Provide flange frame, bird screen.
  - 5) Provide wall sleeve, pitched towards outside over flange to drain, match ductwork in material.
  - 6) Provide with standard motorized damper.
  - 7) Provide with spark resistant aluminum motorized damper.

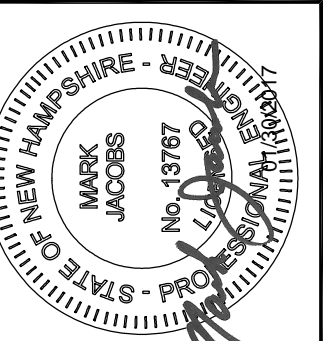
Flow Switch Schedule					
Tag	Service	Electrical Rating	Air Velocity Range (FPM)	Basis of Design or Engineer Approved Equal	Notes
FS-1	Odor Control Room	3 A @ 30 VDC/250 VAC.	197 - 1969	Dwyer AVFS-1	1

- Notes:
- 1) Install per manufacturer's recommendations / requirements / clearances.

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**HVAC SCHEDULES**

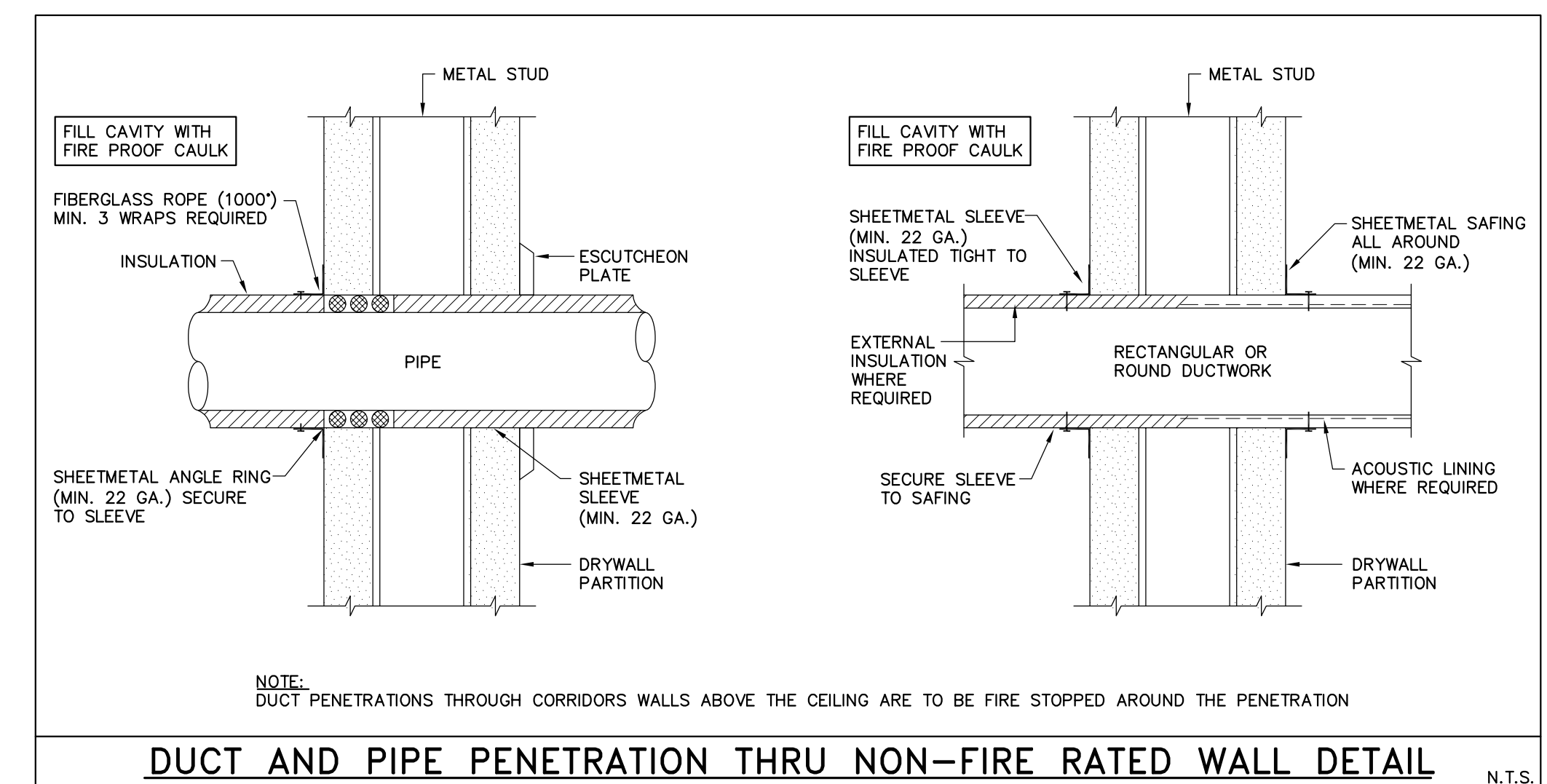
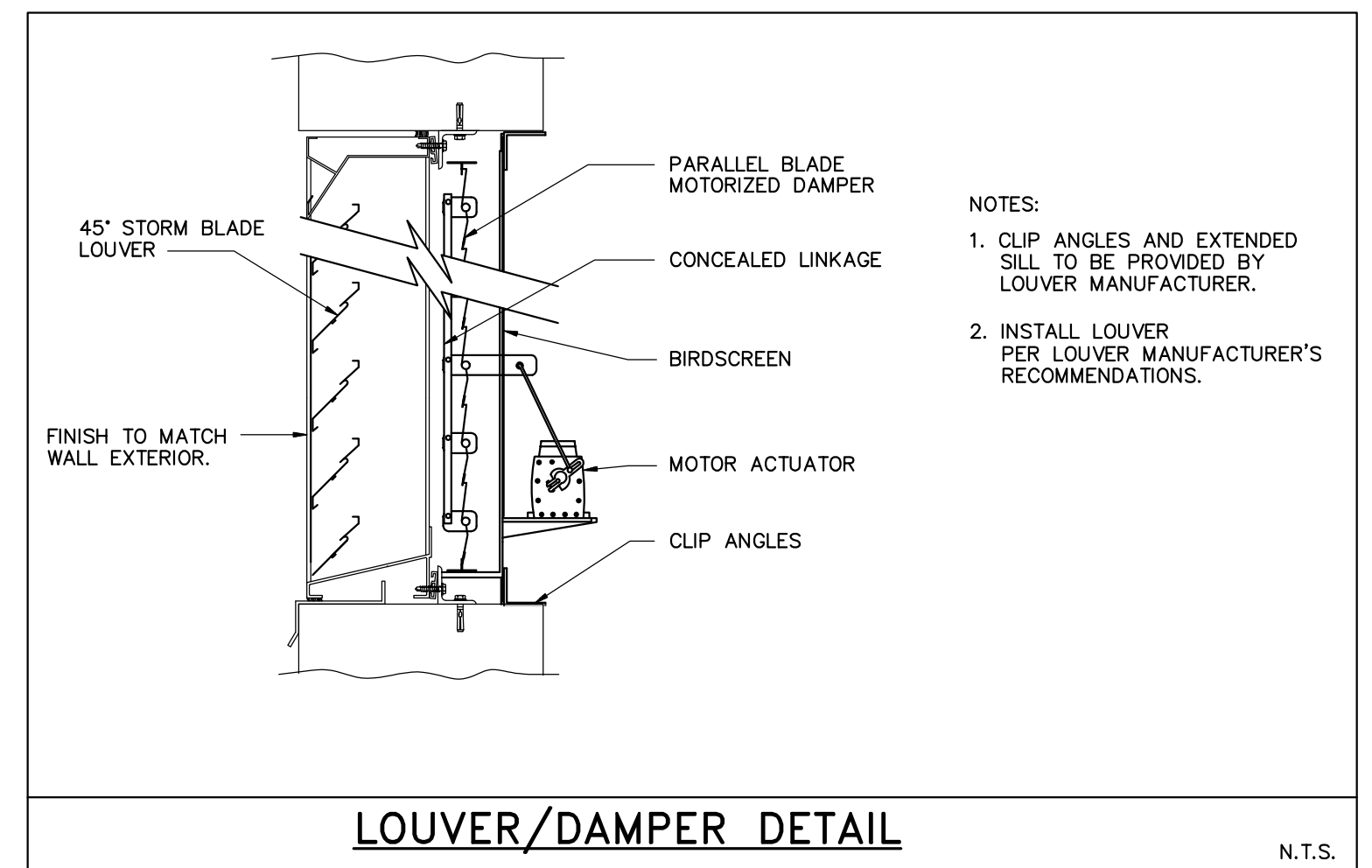
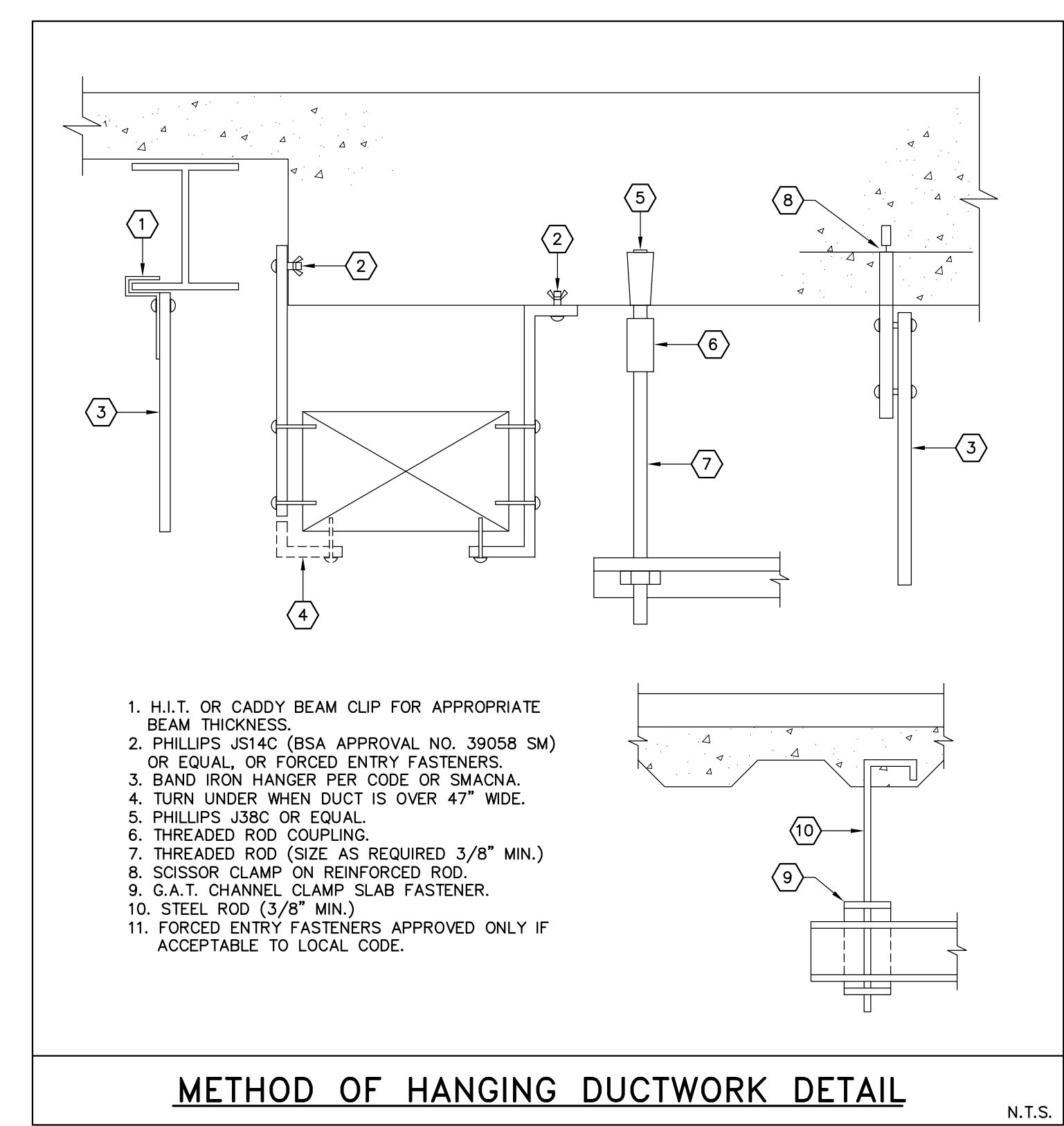
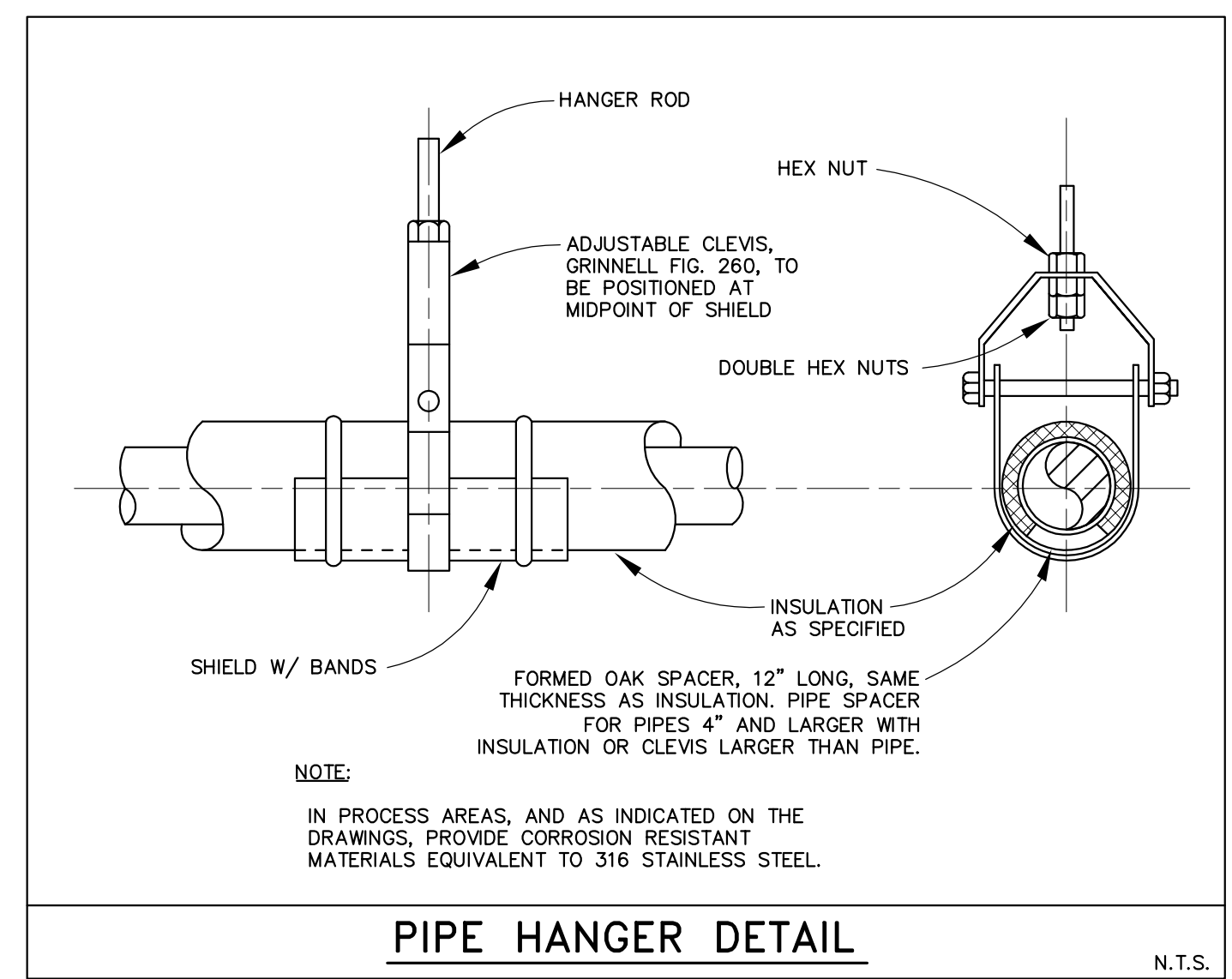
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 32 OF 67

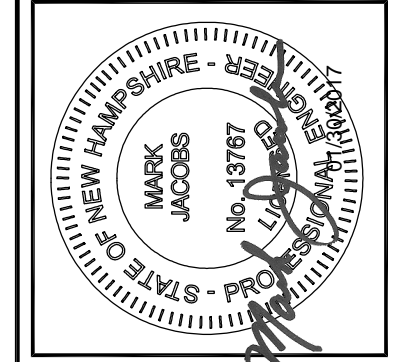
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**HVAC DETAILS 1**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

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SHEET: 33 OF 67

**H-202**

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**GENERAL ABBREVIATIONS**

●	AT	LBV	LOCKABLE BALL VALVE
AD	AREA DRAIN	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AV	ACID VENT	MR	MOP RECEPTOR
AW	ACID WASTE	NO	NUMBER
BFP	BACKFLOW PREVENTOR	OED	OPEN END OR OPEN EQUIPMENT DRAIN
BWV	BACKWATER VALVE	P	PROTECTED WATER
BLDG	BUILDING	PG	PRESSURE GAUGE
⊕	CENTERLINE	PH	POST HYDRANT
CI	CAST IRON	PHW	PROTECTED HOT WATER
CO	CLEANOUT	PL	PLUMBING
CONT	CONTINUOUS, CONTINUE	PRV	PRESSURE REDUCING VALVE
CU FT	CUBIC FEET	PSI	POUNDS PER SQUARE INCH
CV	CHECK VALVE	P&T	PRESSURE & TEMPERATURE
CD	COLD WATER	PW	PLANT WATER
DCVA	DOUBLE CHECK VALVE ASSEMBLY	RD	ROOF DRAIN
DHW	DOMESTIC HOT WATER HEATER	RWH	RECIRC. HOT WATER
DI	DUCTILE IRON	RL	RAINLEADER
DN	DOWN	RM	ROOM
DWG	DRAWING	RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
E	EMERGENCY WATER	S	SOIL PIPE
ECO	EXTERIOR CLEANOUT	SH	SHOWER
EL	ELEVATION	SHT	SHEET
ES	EMERGENCY SHOWER	SP	SPRINKLER
EWU	EYE WASH UNIT	SQ	SQUARE
FAS	FLOW ALARM SWITCH	SS	STAINLESS STEEL
FCO	FLUSH FLOOR CLEANOUT	SSK	SERVICE SINK
FD	FLOOR DRAIN	TP	TRAP PRIMER
FE	FIRE EXTINGUISHER	TW	TEPID WATER
FHV&C	FIRE HOSE VALVE AND CABINET	THK	THICK(NESS)
FS	FLOW SWITCH	TYP	TYPICAL
FV	FIRE VALVE	V	VENT
F/BS	FACE/BODY SPRAY	VAC	VACUUM
G	GAS	VB	VACUUM BREAKER
GPM	GALLONS PER MINUTE	VE	VACUUM EXHAUST
HB	HOSE BIBB	VTR	VENT THROUGH ROOF
HEV	HOSE END VALVE	W	WASTE
HW	HOT WATER	W/	WITH
INV	INVERT	WCO	WALL CLEANOUT
IOS	INSTALLED BY OTHER SECTION	WHA	WATER HAMMER ARRESTOR
IPS	IRON PIPE SIZE	WF	WASH FOUNTAIN
LAV	LAVATORY	WH	WALL HYDRANT
		WHS	WASH HOSE STATION
		W&V	WASTE & VENT

**NOTE.**  
SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET ARE GENERAL AND MAY NOT HAVE BEEN USED ON THIS PROJECT.

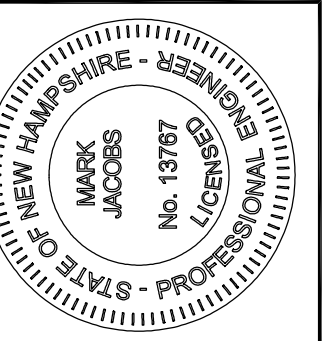
**PLUMBING LEGEND AND ABBREVIATIONS**

	HOSE BIB OR WALL FAUCET
	WALL HYDRANT
	CHECK VALVE
	BALL VALVE
	BALANCING VALVE
	OS&Y VALVE
	STRAINER
	CONTROL VALVE
	RELIEF VALVE
	CIRCULATOR PUMP
	UNION
	CAMLOCK FITTING
	PROPOSED GAS PIPING
	EXISTING COLD WATER
	EXISTING HOT WATER
	PROPOSED COLD WATER
	PROPOSED HOT WATER
	PROPOSED HOT WATER RE-CIRCULATION
	PROPOSED TEMPERED WATER
	PIPE TURNED UP
	PIPE TURNED DOWN
	PIPE BREAK (PIPE CONTINUES THOUGH NOT SHOWN)
	EXISTING SANITARY PIPING
	EXISTING VENT PIPING
	PROPOSED SANITARY PIPING
	PROPOSED STORMWATER
	PROPOSED VENT PIPING
	PROPOSED CONDENSATE DRAIN LINE
	EXISTING FLOOR DRAIN
	PROPOSED FLOOR DRAIN
	EXISTING CLEANOUT
	PROPOSED CLEANOUT
	BACK FLOW PREVENTOR
	REDUCER
	PRESSURE / TEMP. GAUGE
	TRAP PRIMER
	WATER HAMMER ARRESTOR OF PDI SIZE REQUIRED
	WALL CLEANOUT
	CONNECT TO EXISTING

**PLUMBING GENERAL NOTES:**

- CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DEBRIS WITHIN THE CONSTRUCTION AREA.
- NO PIPING, EQUIPMENT, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE OWNER AND/OR ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED. IF ANY AREAS NOT WITHIN THE SCOPE OF WORK ARE AFFECTED BY ANT SHUTDOWN, REMOVAL OR DISCONNECTION, ONE WEEK ADVANCE NOTICE MUST BE GIVEN TO THE OWNER INDICATING WHICH AREAS WILL BE AFFECTED, WHEN THE PROPOSED SHUTDOWN WILL OCCUR, AND FOR HOW LONG A PERIOD OF TIME.
- ALL ITEMS REMOVED SHALL BECOME THE PROPERTY OF THE OWNER AND SHALL BE DISPOSED OF AS PER OWNER'S INSTRUCTIONS. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE BY THE OWNER SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
- THE CONTRACTOR SHALL SUCCESSFULLY PRESSURE TEST ALL REROUTED PIPING SYSTEMS. WATER PIPES SHALL BE TESTED TO 125% OF THE DESIGN PRESSURE FOR A PERIOD OF FOUR HOURS (125 PSIG MINIMUM). REPAIR AND RETEST AS REQUIRED UNTIL SYSTEMS PROVE TIGHT.
- PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF PLUMBING WORK. ALL OFFSETS IN PIPING TO AVOID OBSTRUCTIONS SHALL BE PROVIDED AT NO COST TO THE OWNER.
- PROVIDE ACCESS PANELS FOR ALL CONCEALED VALVES AND EQUIPMENT.
- PROVIDE DRIP TRAPS AT GAS RISERS.
- IF A SECTION OF PIPE IS NOT LABELED FOR SIZE, THEN THE LARGER SIZE INDICATED ON THE DRAWINGS SHALL PREVAIL.
- PIPES SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.
- PITCH ALL WATER LINES TO DRAIN AND PROVIDE DRAINS AT LOW POINTS.
- ALL PIPING SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS AND SUPPORTED AS REQUIRED BY CODES. PIPING SHALL BE SET UP AND DOWN AND OFFSET AS REQUIRED TO SUIT FIELD CONDITIONS. DIELECTRIC COUPLINGS SHALL BE USED WHERE DISSIMILAR METALS ARE JOINED.
- ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH LAWS AND REGULATIONS GOVERNING THE WORK OF THIS NATURE.
- THE PLUMBING PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW THE EXACT ROUTING OF SYSTEMS OR LOCATION OF COMPONENTS. THE EXACT LOCATIONS, DIMENSIONS AND ALL OTHER DETAILS OF EQUIPMENT ARE THE RESPONSIBILITY OF THIS CONTRACTOR. THIS CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE. PROVIDE ALL PIPE TRANSITIONS REQUIRED FOR CONNECTION TO EQUIPMENT.
- REFER TO SPECIFICATION 40 05 13.03 FOR PIPE SUPPORT REQUIREMENTS.

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**PLUMBING LEGEND,  
GENERAL NOTES,  
ABBREVIATIONS,  
AND SCHEDULES**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 35 OF 67

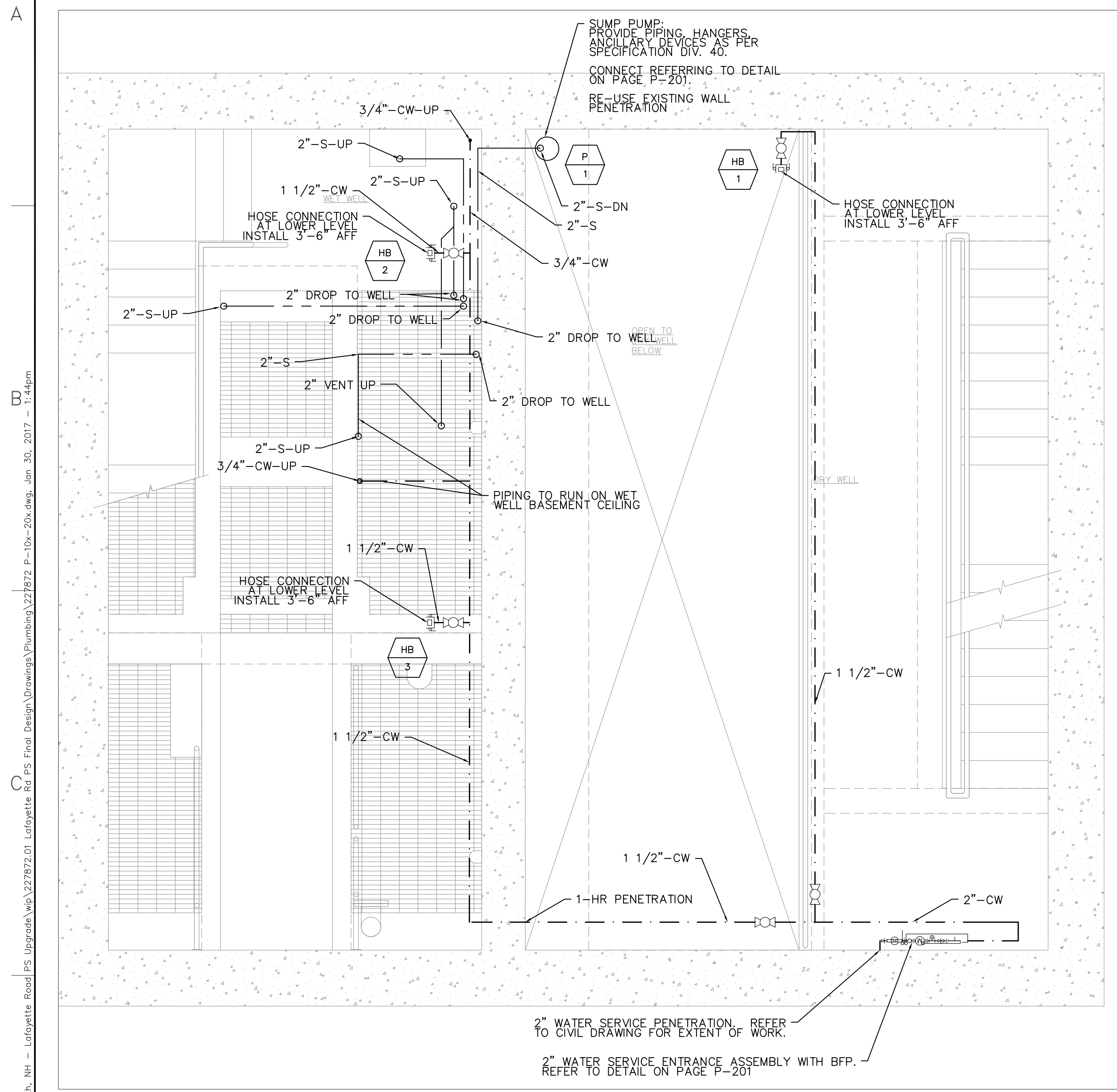
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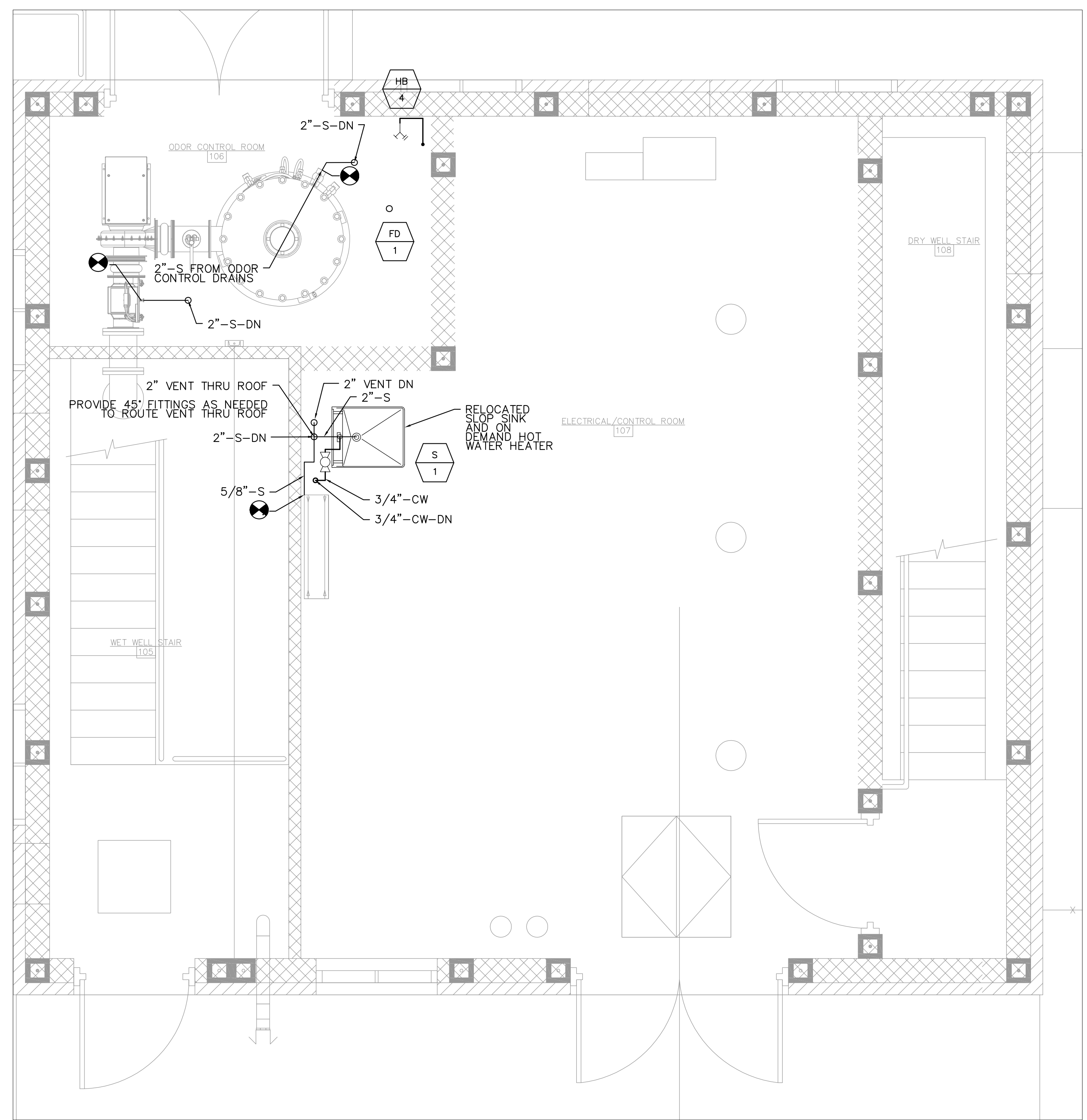
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**PLUMBING GENERAL NOTES**

1. ALL WORK SHALL CONFORM TO CURRENT NEW HAMPSHIRE CODES.
2. USE EXISTING INDIRECT DRAIN FOR BACK FLOW PREVENTER.
3. PROVIDE TRAP PRIMERS FOR ALL DRAINS AND TRAPS PER NEW HAMPSHIRE CODE.
4. NOT ALL VENTS SHOWN. VENT PER NEW HAMPSHIRE CODE.



**PLUMBING PLAN  
MID LEVEL**  
SCALE: 1/2" = 1'-0"



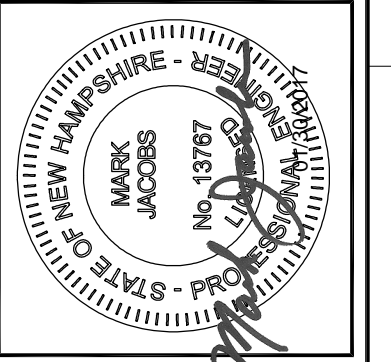
**PLUMBING PLAN  
GROUND LEVEL**  
SCALE: 1/2" = 1'-0"

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**PUMPING STATION  
PLUMBING PLAN**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

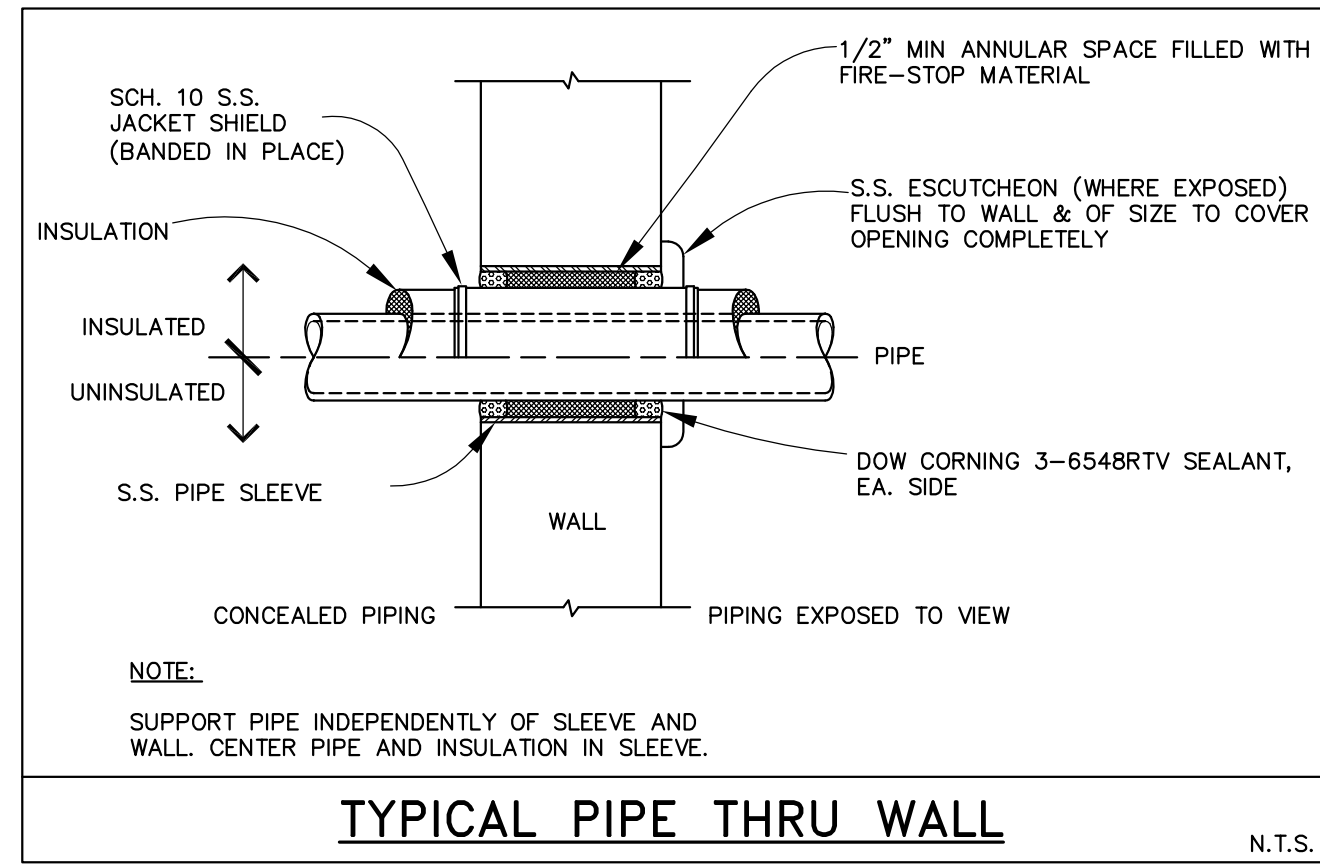
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

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SCALE: AS SHOWN  
SHEET: 36 OF 67

**P-101**

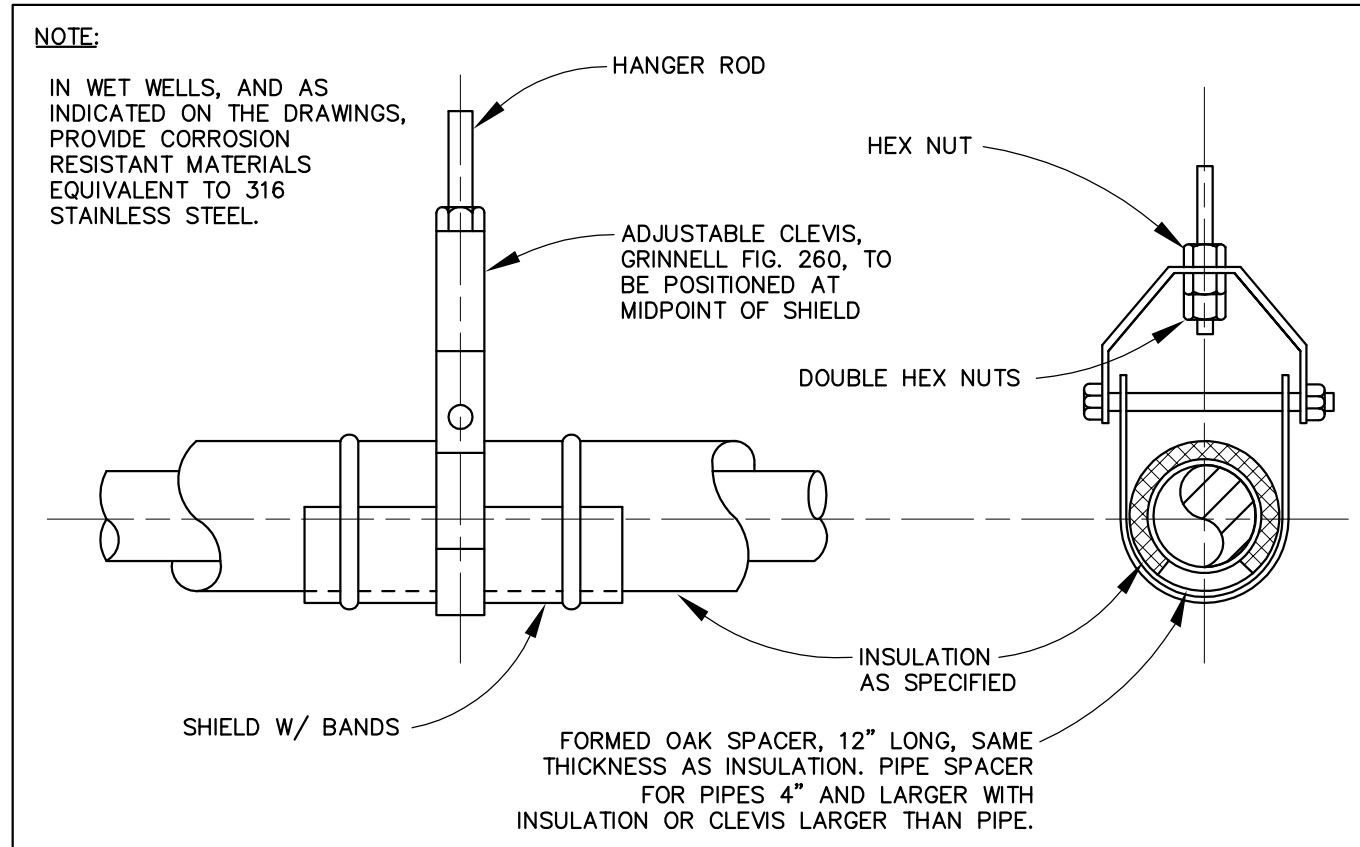
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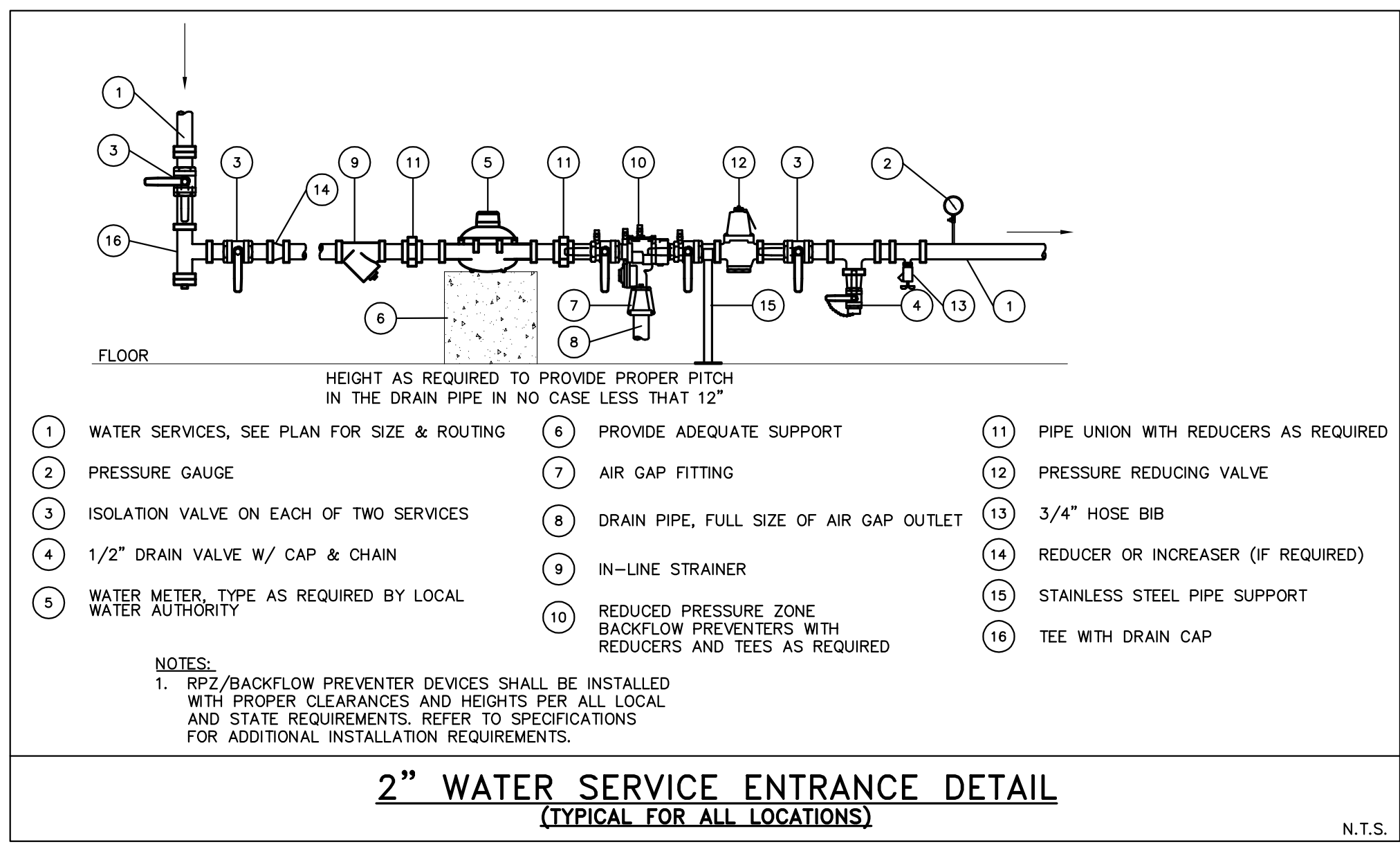
**TYPICAL PIPE THRU WALL**

N.T.S.



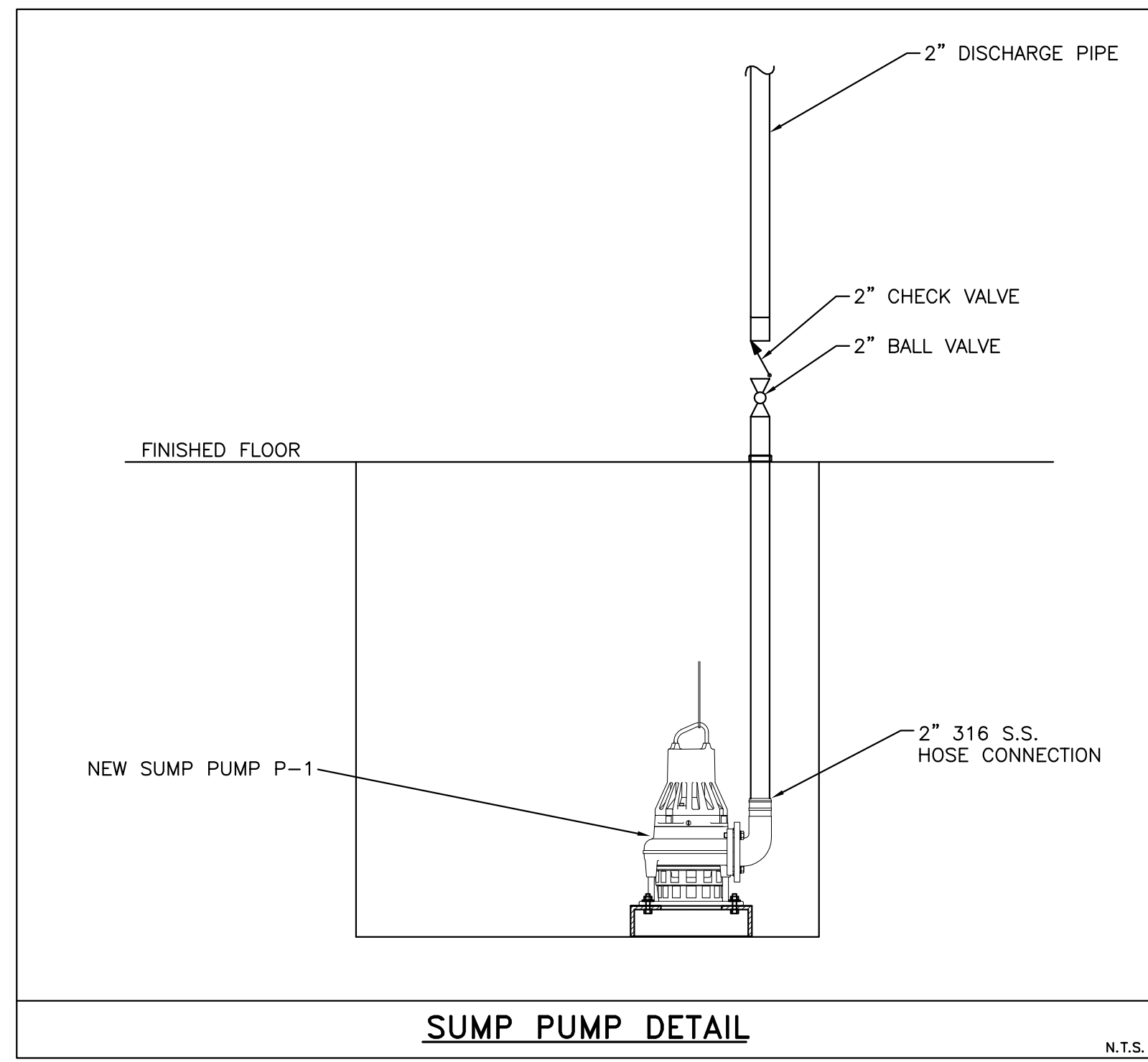
**PIPE HANGER DETAIL**

N.T.S.



**2\"/>**

N.T.S.



**SUMP PUMP DETAIL**

N.T.S.

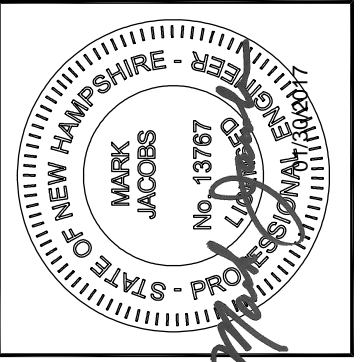
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**PLUMBING DETAILS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

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SHEET: 37 OF 67

**P-201**

BID SET

Pump Schedule											
Tag	Type	GPM	Total Head (ft)	Design Pressure (psig)	Motor						Manufacturer & Model Number
					Amps	HP	RPM	V	Ph	HZ	
P-1	Sump	79	86.5	-	15.5	0.25	3450	115	1	60	Zoeller X160

Plumbing Fixture Schedule						
Tag	Item	Sanitary Connection	Vent Connection	Potable water connection	Basis of Design or Approved Equal	Notes
S-1	Existing Sink	2"	2"	3/4"	Americian Standard	1,2
HB-1	Type B - Aluminum Camlock	NA	NA	1-1/2"	Camlock B150-AL	1,2
HB-2	Type B - Aluminum Camlock	NA	NA	1-1/2"	Camlock B150-AL	1,2
HB-3	Type B - Aluminum Camlock	NA	NA	1-1/2"	Camlock B150-AL	1,2
HB-4	Hose Bibb	NA	NA	3/4"	Nibco C56-VB	1,2
FD-1	Floor Drain	2"	NA	NA	Zurn - Z415	1,2
P-1	Sump Pump	See Plan	NA	NA	Zoeller X160	1,2,3

**Notes:**

- 1) Install per manufacturer's recommendeds, instructions, clearances.
- 2) Provide lead free equipment and appertences.
- 3) 79 GPM @ 20 ft. 1/2 HP, See drawings for location.

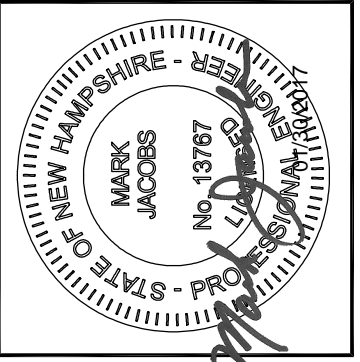
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**PLUMBING SCHEDULES**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
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### GENERAL

HOME RUN, ARROWS INDICATE NUMBER OF CIRCUITS, GROSS LINES INDICATE NUMBER OF WIRES, OTHER THAN TWO (2) PLUS BOND, WIRE SIZE NOT SHOWN INDICATES #12AWG MIN. INDICATES CIRCUIT NUMBER

PANEL DESIGNATION

WIRING IN RACEWAY

OHU - WIRING IN RACEWAY

WIRING IN RACEWAY CONCEALED UNDERGROUND OR UNDERSLAB, MINIMUM 3/4" C

3/C #nn W/GND  
EquipNo-P

CONDUIT AND CABLE ID TAG

CONDUIT TURNING UP

CONDUIT TURNING DOWN

CONDUIT STUB

EY CONDUIT SEAL

FLEXIBLE NON-METALLIC CONDUIT

PANELBOARD

CONTROL PANEL

ATC - AUTOMATIC TEMPERATURE CONTROL PANEL

ISBP - INTRINSIC SAFETY BARRIER PANEL

POWER COMPANY METER

LOCAL SELECTOR SWITCH  
H/O/A - HAND/OFF/AUTO  
H/O/R - HAND/OFF/REMOTE  
L/O/R - LOCAL/OFF/REMOTE

PUSHBUTTON STATION

JUNCTION BOX

MOTORIZED DAMPER

THERMOSTAT

RELAY

DOOR BELL/BUZZER AND TRANSFORMER - MTD CL UP 7'-0" AFF

EQUIPMENT TAGS

KEYED NOTE TAG

REVISION TRIANGLE

BRACKET

### POWER

NON-FUSED SAFETY SWITCH

FUSED SAFETY SWITCH

NON-FUSED DISCONNECT/MAGNETIC MOTOR STARTER

MANUAL MOTOR SWITCH (MOTOR RATED SWITCH), TOGGLE OPERATED, SINGLE PHASE, 1 OR 2 POLE AS REQUIRED

CB 100A - ENCLOSED CIRCUIT BREAKER W/AMPERE RATING

M - ELECTRIC MOTOR, NUMBER INDICATES HORSEPOWER RATING, "F" INDICATES FRACTIONAL LESS THAN 1/20HP OR 100W

T - TRANSFORMER

P - POWER POLE

DUPLX RECEPTACLE, NEMA 5-20R - MTD CL UP 24" OR AS NOTED, "WP" WEATHER PROOF, "G" PROTECTED BY GFCI RECEPTACLE OR BREAKER UPSTREAM, "H" MOUNTED 0'-6" BELOW CEILING, "TV" MOUNT 7'-6" UP

DOUBLE DUPLX RECEPTACLE, NEMA 5-20R - MTD CL UP 24" OR AS NOTED

SINGLE RECEPTACLE, NEMA 5-20R - MTD CL UP 24" OR AS NOTED

GFCI DUPLX RECEPTACLE, NEMA 5-20R - MOUNTED CL UP 48" OR 6" ABOVE COUNTER

DOUBLE DUPLX GFCI RECEPTACLE, NEMA 5-20R - MOUNTED CL UP 48" OR 6" ABOVE COUNTER

FLUSH FLOOR OUTLET, DUPLX RECEPTACLE, NEMA 5-20R

MULTI SERVICE FLUSH FLOOR BOX WITH DUPLX RECEPTACLE AND PROVISIONS FOR DATA

POWER RECEPTACLE, NEMA CONFIGURATION AS NOTED OR AS REQUIRED FOR EQUIPMENT SERVED.

FLUSH CEILING MTD DEVICE BOXES, ONE W/ DUPLX RCPT FOR PROJECTOR POWER AND ONE FOR DATA TO SERVE OH PROJECTOR. RUN ONE 1 1/2" C TO JBOX LOCATED AT FRONT OF ROOM FOR PROJECTOR CABLE PATHWAY. VERIFY FINAL LOCATION W/ OWNER PRIOR TO ROUGH IN.

MULTI-OUTLET POWER STRIP, MOUNT 0'-6" ABOVE COUNTERTOP, RECEPTACLE SPACING AS NOTED.

### MISCELLANEOUS

DETAIL #

SECTION CALL OUT

SHEET #

DETAIL TITLE

DETAIL CALL OUT

### LIGHTING

2x4 FLUORESCENT FIXTURE

ASSOCIATED CONTROL DEVICE

FIXTURE TYPE (SEE LIGHT FIXTURE SCHEDULE)

1x4 FLUORESCENT FIXTURE

2x2 FLUORESCENT FIXTURE

FIXTURE WIRED TO UNSWITCHED NORMAL CIRCUIT

FIXTURE WIRED TO UNSWITCHED EMERGENCY CIRCUIT

FIXTURE WIRED TO SWITCHED EMERGENCY CIRCUIT

DOWN LIGHT

FLUORESCENT STRIP

WALL MOUNTED FIXTURES

POLE MOUNTED SITE LIGHTING FIXTURE

FIXTURE TYPE (SEE LIGHT FIXTURE SCHEDULE)

FLOOD LIGHT

EXIT SIGN, CEILING MOUNTED. ARROW INDICATES EGRESS DIRECTION, SHADING INDICATES SIGN FACE. NUMERAL INDICATES BATTERY UNIT CONNECTED

EXIT SIGN, WALL MOUNTED 7'-6" AFF OR 0'-6" ABOVE DOOR. SHADING INDICATES SIGN FACE. NUMERAL INDICATES BATTERY UNIT CONNECTED TO.

DUAL HEAD EMERGENCY LIGHT BATTERY PACK WITH NUMBER OF HEADS AS INDICATED - WALL MOUNTED MTD 7'-6" AFF. NUMERAL INDICATES BATTERY ID NUMBER.

TANDEM EMERGENCY LIGHT BATTERY PACK & EXIT SIGN - WALL MOUNTED MTD 7'-6" AFF OR 0'-6" ABOVE DOOR. NUMERAL INDICATES BATTERY ID NUMBER.

REMOTE EMERGENCY LIGHTING HEAD - WALL MOUNTED MTD 7'-6" AFF. NUMERAL INDICATES BATTERY UNIT CONNECTED TO.

SINGLE POLE TOGGLE SWITCH - MTD CL UP 4'-0" AFF

S2 - DOUBLE POLE TOGGLE SWITCH - MTD CL UP 4'-0" AFF

S3 - 3-WAY TOGGLE SWITCH - MTD CL UP 4'-0" AFF

S4 - 4-WAY TOGGLE SWITCH - MTD CL UP 4'-0" AFF

SM - WALL MOUNTED OCCUPANCY SENSOR - MTD CL UP 4'-0" AFF

Sp - TOGGLE SWITCH WITH PILOT LIGHT - MTD CL UP 4'-0" AFF

Sd - DIMMER SWITCH - MTD CL UP 4'-0" AFF

Sv - LOW VOLTAGE SWITCH - MTD CL UP 4'-0" AFF

o - OCCUPANCY SENSOR

o - INDICATES CONTROLLED FIXTURE

PC - PHOTOCCELL

LC - LIGHTING CONTACTOR

MS - MOTION SENSOR

AL - ALARM LIGHT

### FIRE ALARM DIAGRAM SYMBOLS

FACP - FIRE ALARM CONTROL PANEL

FAA - FIRE ALARM ANNUNCIATOR

FCPS - FIELD CHARGER POWER SUPPLY

M - FIRE ALARM MASTER BOX

K - KNOX BOX

F - FIRE ALARM MANUAL PULL STATION - WALL MTD CL UP 4'-0"

H/L - FIRE ALARM AUDIBLE/VISIBLE NOTIFICATION APPLIANCE CANDELA (CD) POWER PER NFPA 72 OR AS NOTED - WALL MTD BOTTOM UP 80" AFF. "H" HORN, "V" VOICE.

L - FIRE ALARM VISUAL NOTIFICATION APPLIANCE CANDELA (CD) POWER PER NFPA 72 OR AS NOTED - WALL MTD BOTTOM UP 80" AFF

⊗ - CEILING MOUNTED SMOKE DETECTOR

⊗ - CEILING MOUNTED HEAT DETECTOR

⊗ - DUCT SMOKE DETECTOR

S=SUPPLY, R=RETURN

FS - SPRINKLER SYSTEM FLOW SWITCH

TS - SPRINKLER SYSTEM TAMPER SWITCH

PS - SPRINKLER SYSTEM PRESSURE SWITCH

DH - FIRE ALARM SYSTEM MAGNETIC DOOR HOLDER

Z - MONITOR MODULE

C - CONTROL MODULE

R - RELAY MODULE

### COMMUNICATIONS

TEL - TELEPHONE BACKBOARD

PROVISIONS FOR TELEPHONE OUTLET. TWO-GANG WALL BOX WITH ONE 1" C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE

W - INDICATES WALL MOUNTED AT 60" AFF

P - INDICATES PAYPHONE MOUNTED AT 4'-0" AFF

X - INDICATES NUMBER OF JACKS, SINGLE BOX

PROVISIONS FOR DATA OUTLET. TWO-GANG WALL BOX WITH ONE 1" C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE. SUBSCRIPTS AS NOTED ABOVE.

PROVISIONS FOR TELEPHONE & DATA OUTLET. TWO-GANG WALL BOX WITH ONE 1" C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE. SUBSCRIPTS AS NOTED ABOVE.

PROVISIONS FOR SCADA SYSTEM OUTLET. TWO-GANG WALL BOX WITH ONE 1" C STUB TO ABOVE ACCESSIBLE CEILING - MTD CL UP SAME AS ASSOCIATED RECEPTACLE

CEILING MOUNTED TELEPHONE SYSTEM OUTLET

CEILING MOUNTED DATA SYSTEM OUTLET

CEILING MOUNTED VOICE & DATA OUTLET

FLUSH TELEPHONE FLOOR OUTLET

FLUSH DATA FLOOR OUTLET

FLUSH VOICE & DATA FLOOR OUTLET

TELEVISION COAXIAL OUTLET. MOUNTED UP SAME AS ASSOCIATED RECEPTACLE

### SECURITY

SEC - SECURITY PANEL

DS - DOOR INTRUSION SWITCH

DE - ELECTRIC DOOR STRIKE

CR - CARD READER

KP - KEY PAD

MOTION DETECTOR

CAM - SECURITY CAMERA

PTZ = PAN/TILT/ZOOM

### INTERCOM & PAGING SYSTEM

S - CEILING MOUNTED SPEAKER

PA - PAGING SYSTEM CONTROL PANEL

HS - PAGING SYSTEM HANDSET

### INSTRUMENTATION

LS - FIELD MOUNTED INSTRUMENT

XX - INSTRUMENT IDENTIFICATION TYPE

XX - INSTRUMENT LOOP #

FS - VENDOR SUPPLIED INSTRUMENT

INSTRUMENT IDENTIFIER:

AE - ANALYSIS ELEMENT

AIT - ANALYSIS INDICATING TRANSMITTER

AT - ANALYSIS TRANSMITTER

DPS - DIFFERENTIAL PRESSURE SWITCH

FCV - FLOW CONTROL VALVE

FE - FLOW ELEMENT

FIT - FLOW INDICATING TRANSMITTER

FT - FLOW TRANSMITTER

FS - FLOW SWITCH

LE - LEVEL ELEMENT

LIT - LEVEL INDICATING TRANSMITTER

LT - LEVEL TRANSMITTER

LSH - LEVEL SWITCH HIGH

LSL - LEVEL SWITCH LOW

MOV - MOTOR OPERATED VALVE

PE - PRESSURE ELEMENT

PIT - PRESSURE INDICATING TRANSMITTER

PT - PRESSURE TRANSMITTER

PS - PRESSURE SWITCH

SV - SOLENOID VALVE

TE - TEMPERATURE ELEMENT

TIT - TEMPERATURE INDICATING TRANSMITTER

TT - TEMPERATURE TRANSMITTER

ZS - PROXIMITY SWITCH

### GROUNDING

BARE COPPER GROUND CABLE. (SIZE 4/0 UNLESS OTHERWISE NOTED)

3/4" x 10'-0" LONG GROUND ROD. (10'-0" MINIMUM LENGTH)

EQUIPMENT BOLTED CONNECTION OR APPROVED EQUAL.

CADWELDED EXOTHERMIC CONNECTION

GROUND

### ONE-LINE DIAGRAM SYMBOLS

52 GCB1 - HV VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER ELECTRICALLY OPERATED

CB 800A E.O. - HV VOLTAGE DRAWOUT TYPE POWER CIRCUIT BREAKER WITH MANUAL CONTROL SWITCH

AF - LOW VOLTAGE CIRCUIT BREAKER

AT - AMP TRIP

EO - ELECTRICALLY OPERATED

ST - SHUNT TRIP

GF - GROUND FAULT

EO - ELECTRICALLY OPERATED

DISCONNECT, ISOLATION OR SAFETY SWITCH

FUSED DISCONNECT SWITCH

MAGNETIC MOTOR STARTER. NUMERAL INDICATES NEMA SIZE FVNR UNLESS OTHERWISE NOTED.

FVR - FULL VOLTAGE REVERSING

RVAT - REDUCING VOLTAGE AUTO TRANSFORMER

2S - TWO SPEED

YD - WYE DELTA REDUCED VOLTAGE STARTER

VFD 11 - VFD = VARIABLE FREQUENCY DRIVE

SS - SOLID STATE STARTER

DC - DC VARIABLE DRIVE

NUMERAL INDICATES AMP RATING

POWER TRANSFORMER

OA - LIQUID TYPE SELF COOLED

AA - DRY TYPE SELF COOLED

FA - FAN COOLED

CONNECTION

480/120 - POTENTIAL TRANSFORMER RATIO NUMBER REQUIRED

600/5 - CURRENT TRANSFORMER RATIO PHASE

5 - MOTOR, NUMERAL INDICATES HORSEPOWER

X - GENERAL LOAD, NUMERAL INDICATES LOAD IN KVA

GENERATOR

ATS - AUTOMATIC TRANSFER SWITCH

MTS - MANUAL TRANSFER SWITCH

METER

A - AMMETER

V - VOLTMETER

W - WATTMETER

KWH - KILOWATT HOUR

KVAR - KILOVAR METER

VAR - VAR METER

HZ - FREQUENCY METER

PF - POWER FACTOR METER

LINE OR LOAD REACTOR

NUMERAL INDICATES % IMPEDENCE

DPM - DIGITAL POWER MONITOR

AS - METER TRANSFER SWITCH

AS - AMMETER SWITCH

VS - VOLTMETER SWITCH

SPD - SURGE PROTECTION DEVICE

ENDN = ETHERNET TO DEVICENET LINKING DEVICE

DPS = DEVICENET POWER SUPPLY

ENPS = ETHERNET POWER SUPPLY

MEDIUM VOLTAGE CABLE TERMINATION

DRAWOUT DEVICE

LA - LIGHTNING ARRESTOR

K - KEY INTERLOCK

### CONTROL DIAGRAM SYMBOLS

NOTE: ALL CONTROL SYMBOLS ARE DRAWN ASSUMING DE-ENERGIZED CIRCUITS, EMPTY TANKS, UNPRESSURIZED LINES, ETC.

OPEN ON INCREASE

CLOSE ON INCREASE

PRESSURE SWITCH

LEVEL SWITCH

FLOW SWITCH

TEMPERATURE SWITCH

NORMALLY CLOSED

NORMALLY OPEN

PUSH BUTTON

INSTANTANEOUS CONTACT

TIMED CLOSE CONTACT

TIMED OPEN CONTACT

LIMIT SWITCH

SELECTOR SWITCH: QUANTITY OF ARROWS INDICATES NUMBER OF POSITIONS, XOO INDICATES UPPER CONTACT CLOSED IN LEFT POSITION AND OPEN IN CENTER AND RIGHT POSITIONS

INTERNAL WIRING

FIELD WIRING

RELAY COIL

### ABBREVIATIONS

A,AMP - AMPERES

AC - ALTERNATING CURRENT

AFG - ABOVE FINISHED FLOOR

AFH - ABOVE FINISHED GRADE

AHJ - AUTHORITY HAVING JURISDICTION

AIC - AMPERE INTERRUPT CAPACITY

AWG - AMERICAN WIRE GAUGE

BFG - BELOW FINISHED GRADE

CATV - CABLE TELEVISION

CB - CIRCUIT BREAKER

CCTV - CLOSED CIRCUIT TELEVISION

CL - CENTER LINE

CKT - CIRCUIT

CP - CONTROL PANEL

CPT - CONTROL POWER TRANSFORMER

CT - CURRENT TRANSFORMER

CU - COPPER

E.C. - ELECTRICAL CONTRACTOR

EMT - ELECTRIC METALLIC TUBING

FAA - FIRE ALARM ANNUNCIATOR

FACP - FIRE ALARM CONTROL PANEL

FBO - FURNISHED BY OTHERS

FWE - FURNISHED WITH EQUIPMENT

G.C. - GENERAL CONTRACTOR

GEN - GENERATOR

GFCI - GROUND FAULT CIRCUIT INTERRUPTER

GND - GROUND

HP - HORSEPOWER

HZ - FREQUENCY IN CYCLES/SECOND

IG - ISOLATED GROUND

IMT - INTERMEDIATE METALLIC CONDUIT

JBOX - JUNCTION BOX

K - KILO

KCMIL - 1000 CIRCULAR MILS

KVA - KILOVOLT AMPERE

KVAR - KILOVOLT AMPERE REACTIVE

KW - KILOWATT

KWH - KILOWATT HOUR

MCC - MOTOR CONTROL CENTER

MCB - MAIN CIRCUIT BREAKER

DPS - MANUFACTURER

MFG - MANUFACTURER

MH - MANHOLE

MLO - MAIN LUGS ONLY

MTD - MOUNTED

MTR - MOTOR

MV - MEDIUM VOLTAGE

NC - NORMALLY CLOSED

NEC - NATIONAL ELECTRIC CODE

NEUT - NEUTRAL

NO - NORMALLY OPEN

OL - OVERLOAD ELEMENT

PF - POWER FACTOR

PH - PHASE

PRI - PRIMARY

PT - POTENTIAL TRANSFORMER

PVC - POLYVINYL CHLORIDE

RGS - RIGID STEEL CONDUIT

RTO - RESISTANCE TEMPERATURE DETECTOR

SEC - SECONDARY

SS - STAINLESS STEEL

SV - SOLENOID VALVE

TEMP - TEMPERATURE

TVSS - TRANSIENT VOLTAGE SURGE SUPPRESSOR

TYP - TYPICAL

UE - UNDERGROUND ELECTRIC

UG - UNDERGROUND

UPS - UNINTERRUPTED POWER SUPPLY

V - VOLTS

VA - VOLT-AMPERES

VAR - VOLT-AMPERE REACTIVE

W - WATT

WM - WATT METER

WP - WEATHER PROOF

XFMR - TRANSFORMER

XP - EXPLOSION PROOF

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COMMITMENT & INTEGRITY DRIVE RESULTS

REGISTERED PROFESSIONAL ENGINEER  
STATE OF NEW HAMPSHIRE - PROFESSIONAL LICENSE  
ANDREW J. FITZPATRICK  
No. 14289

REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
CHECKED BY: SEH  
DRAWN BY: NTHB  
22787200-E-001.DWG

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 39 OF 67

E-001

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BID SET



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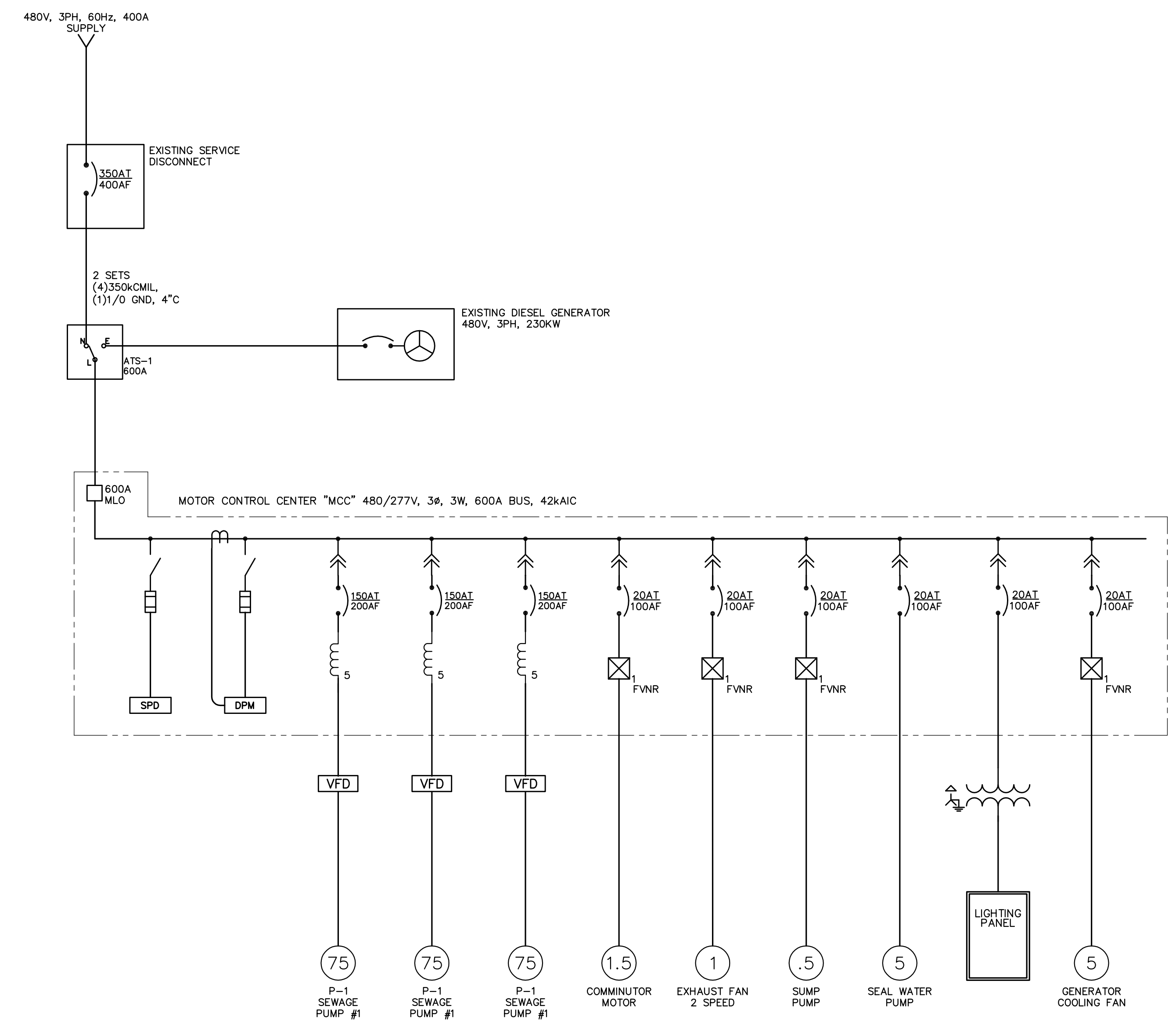
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\\woodardcurran.net\shares\Projects\227872\Projects\227872\Portsmouth, NH - Lafayette Road - Lafayette Road PS Upgrade\wpb\227872.01 Lafayette Road PS Final Design\Drawings\Electrical\22787200-E-002.dwg, Jan 31, 2017 - 9:36am



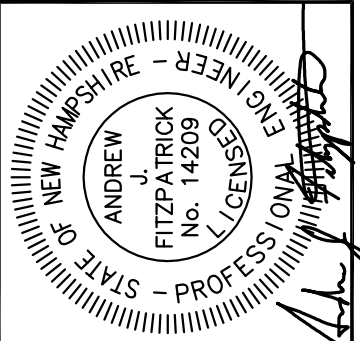
**DEMOLITION NOTES:**

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING EQUIPMENT TO REMAIN. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES EXISTING EQUIPMENT TO BE REMOVED, UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL ITEMS INDICATED FOR REMOVAL SHALL BE REMOVED WITH ALL ASSOCIATED HARDWARE AND ACCESSORIES COMPLETE BACK TO SOURCE, INCLUDING, BUT NOT LIMITED TO CONDUIT, BOXES, WIRING, CABLES, HANGERS, SUPPORTS, ETC.
2. REFERENCE PUMP STATION DEMOLITION PLAN ON SHEET E-003 FOR FURTHER DEMOLITION REQUIREMENTS.
3. THE INTENT OF THE DEMOLITION PLANS IS TO DOCUMENT EXISTING CONDITIONS. HOWEVER, ALL ELECTRICAL EQUIPMENT AND DUCTBANKS MAY NOT NECESSARILY BE INDICATED ON THE DRAWINGS. FIELD VERIFY AND ADJUST WORK TO SUIT ALL CONDITIONS FOUND.
4. IN ALL LOCATIONS WHERE EQUIPMENT AND WIRING IS TO REMAIN, BUT CANNOT BE DISCONNECTED WITHOUT DAMAGING, PROVIDE NEW EQUIPMENT AND HARDWARE AS REQUIRED, ENSURING PROPER FACILITY.
5. IN ALL SURROUNDING AREAS THAT ARE NOT BEING RENOVATED UNDER THIS CONTRACT, VERIFY THAT ELECTRICAL POWER, LIGHTING, AND SYSTEMS HAVE NOT BEEN AFFECTED BY THE ALTERATIONS. IN LOCATIONS WHERE SYSTEMS ARE AFFECTED, PROVIDE ALL WORK AS REQUIRED TO MAINTAIN PROPER OPERATIONS OF THESE SYSTEMS.
6. THE CONTRACTOR SHALL ARRANGE TO EXECUTE ALL WORK AT SUCH TIMES AND IN SUCH LOCATIONS TO PROVIDE UNINTERRUPTED SERVICES FOR THE BUILDING, OR ANY OF ITS SECTIONS. IF NECESSARY, TEMPORARY WORK SHALL BE INSTALLED TO PROVIDE FOR THIS CONDITION. THE INTENT IS FOR ALL NEW EQUIPMENT TO BE INSTALLED AND READY TO BE ENERGIZED PRIOR TO REMOVAL OF EXISTING EQUIPMENT TO MINIMIZE DOWNTIME TO THE GREATEST EXTENT POSSIBLE. AUTHORIZATION FOR INTERRUPTING SERVICES SHALL BE OBTAINED IN WRITING FROM THE OWNER.

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REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
DRAWN BY: NTHB  
CHECKED BY: SEH  
22787200-E-002.DWG

**ELECTRICAL DEMOLITION ONE-LINE**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 40 OF 67

**E-002**

BID SET

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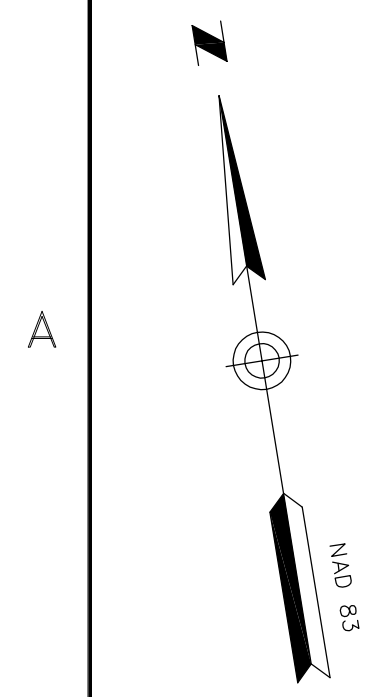
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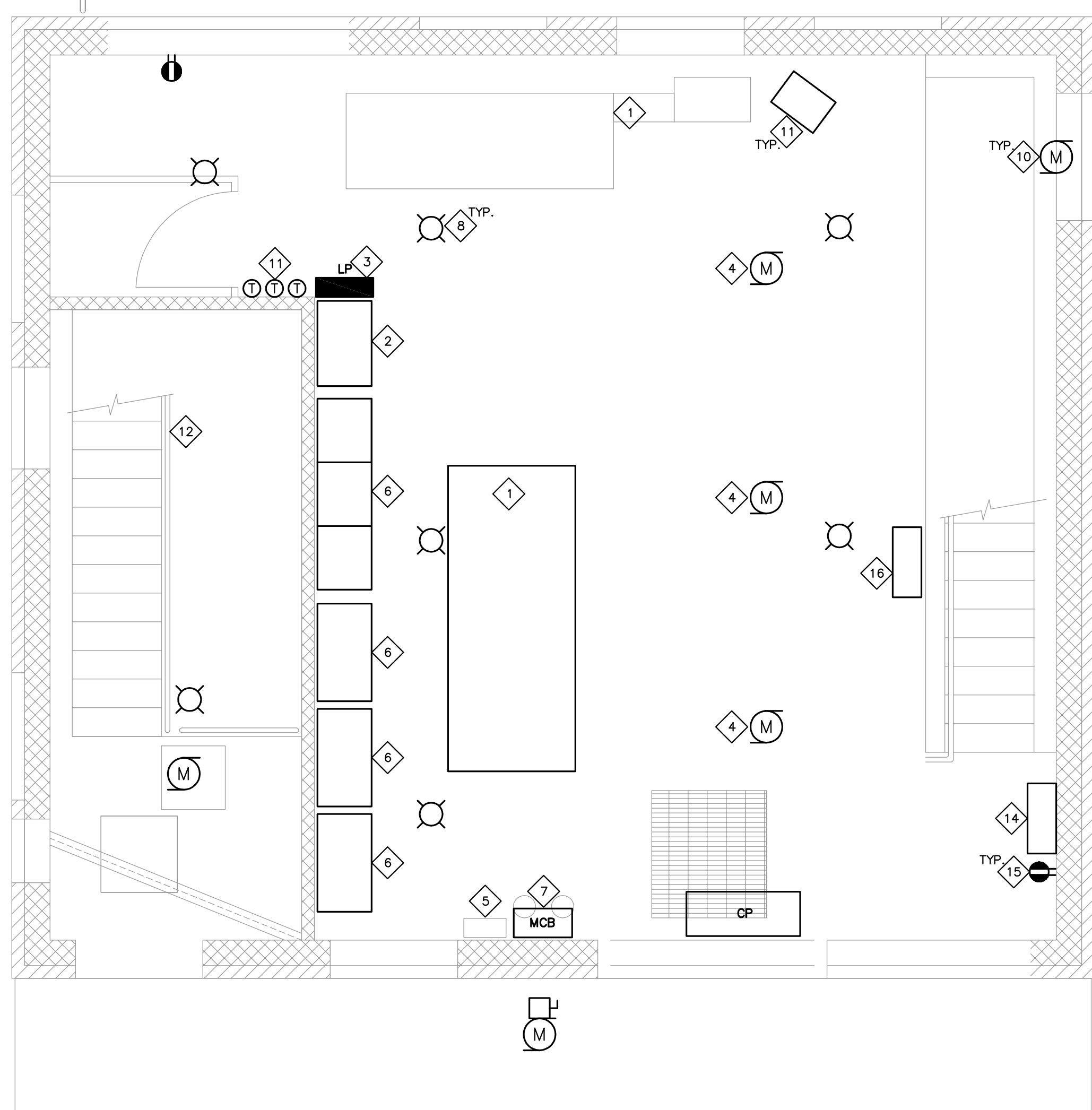


**DEMOLITION NOTES:**

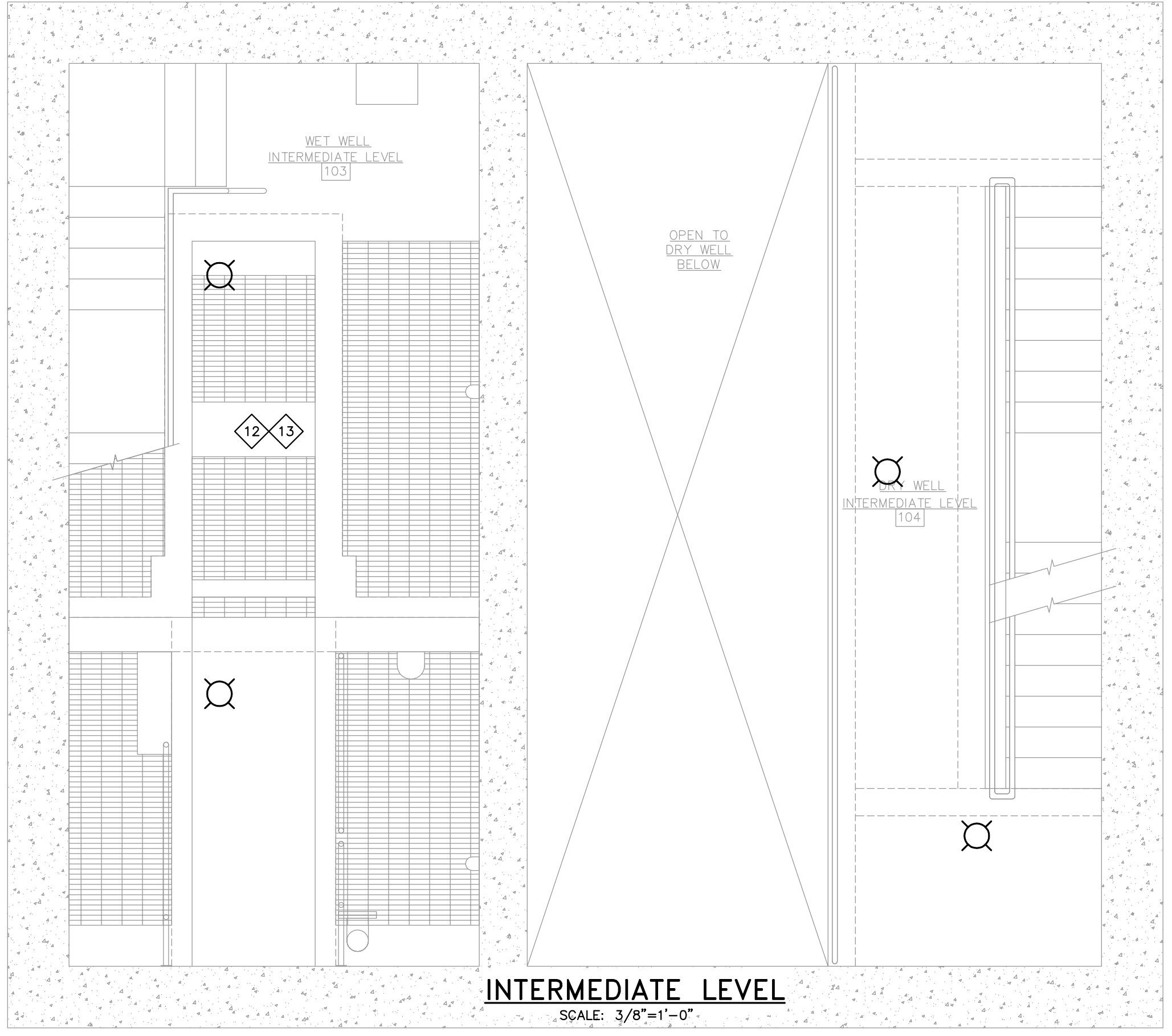
1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING EQUIPMENT TO REMAIN. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK OR EXISTING EQUIPMENT TO BE REMOVED, UNLESS SPECIFICALLY INDICATED OTHERWISE. ALL ITEMS INDICATED FOR REMOVAL SHALL BE REMOVED WITH ALL ASSOCIATED HARDWARE AND ACCESSORIES COMPLETE BACK TO SOURCE, INCLUDING, BUT NOT LIMITED TO CONDUIT, BOXES, WIRING, CABLES, HANGERS, SUPPORTS, ETC.
2. REFERENCE "DEMOLITION NOTES" ON SHEET E-002 FOR GENERAL DEMOLITION DETAILS AND REQUIREMENTS.
3. GENERAL INTENT IS TO DEMOLISH ALL ELECTRICAL EQUIPMENT, DEVICES, AND SUPPORTING DEVICES. NOT ALL EQUIPMENT IS DEPICTED.
4. REFERENCE DEMOLITION ONE-LINE DIAGRAM ON SHEET E-002 AND PUMP ROOM STAIRWELL DEMOLITION PLAN FOR FURTHER DEMOLITION REQUIREMENTS.
5. DEMOLISH ALL ELECTRICAL ASSOCIATED WITH EXISTING HVAC SYSTEM, NOT ALL EQUIPMENT IS DEPICTED IN DEMOLITION PLAN.

**KEYED NOTES:**

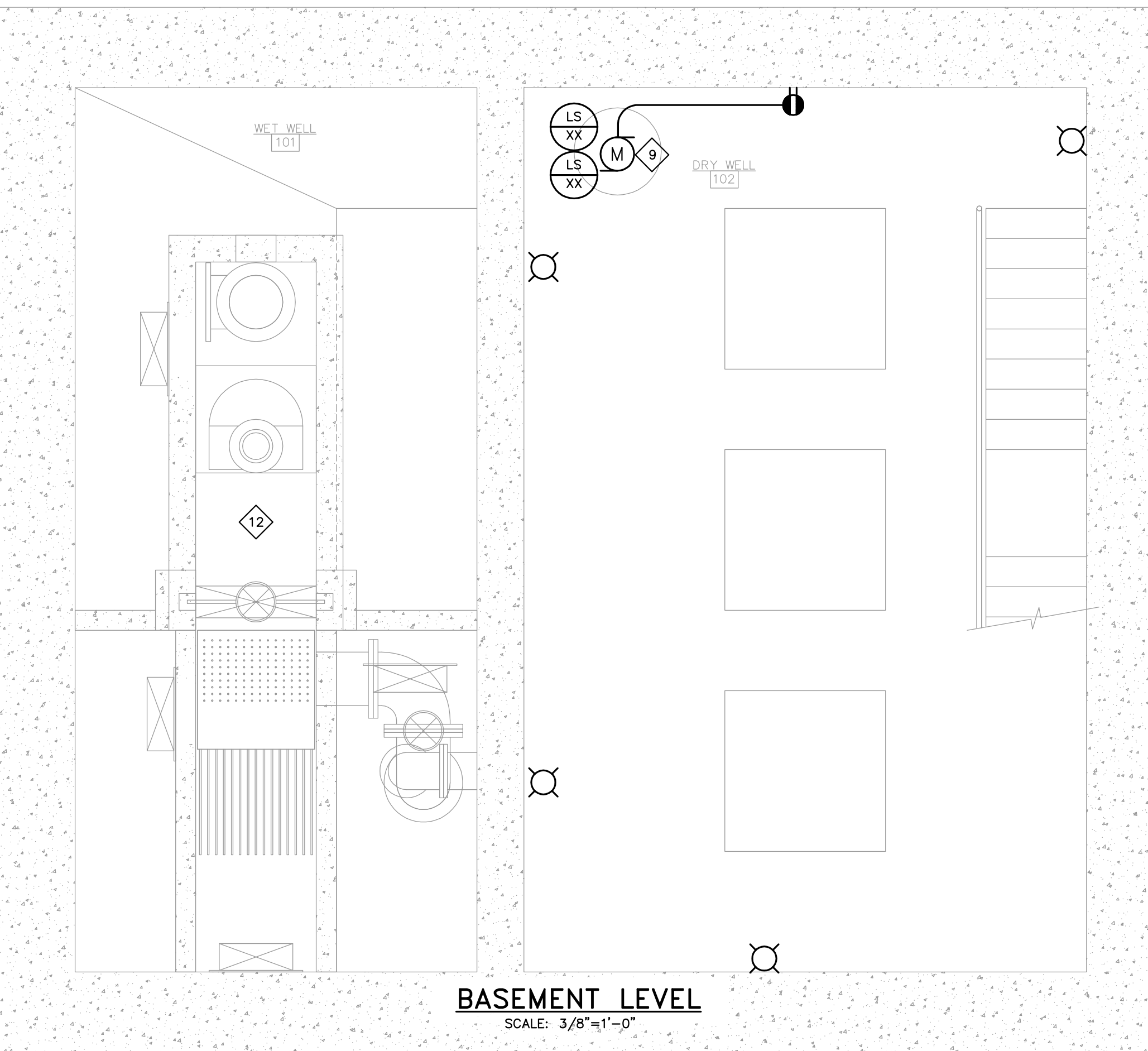
1. EC TO DEMOLISH ALL ELECTRICAL ASSOCIATED WITH THE GENERATOR, INCLUDING ALL ANCILLARY COMPONENTS. GC TO DEMOLISH GENERATOR SET, INCLUDING ALL ASSOCIATED PIPING, DUCTWORK, AND APPURTENANCES.
2. DEMOLISH AUTOMATIC TRANSFER SWITCH (ATS) AND ALL ASSOCIATED ELECTRICAL.
3. DEMOLISH 120/208V PANELBOARD AND ALL ASSOCIATED ELECTRICAL.
4. DEMOLISH ALL ELECTRICAL ASSOCIATED WITH RAW SEWAGE PUMPS; INCLUDING, BUT NOT LIMITED TO VFDs, CONDUIT, CABLE, FITTINGS, ETC. (TYP. FOR 3)
5. REMOVE AND STORE CHART RECORDER FOR REINSTALLATION, REFERENCE SHEET E-201.
6. DEMOLISH MCC, INCLUDING ALL ASSOCIATED ELECTRICAL AND CONNECTED LOADS.
7. DEMOLISH MAIN CIRCUIT BREAKER (MCB) AND ALL ASSOCIATED ELECTRICAL.
8. DEMOLISH ALL EXISTING LIGHTING AND ALL ASSOCIATED ELECTRICAL, INCLUDING, BUT NOT LIMITED TO SWITCHES, CABLE, CONDUIT AND SUPPORTS. (NOT ALL EXISTING LIGHTING IS DEPICTED)
9. DEMOLISH SUMP PUMP, RECEPTACLE, LEVEL SWITCHES/ELEMENTS, AND ALL ASSOCIATED ELECTRICAL.
10. DEMOLISH ALL ELECTRICAL AND CONTROL ASSOCIATED WITH SUPPLY AND EXHAUST FANS, AND MOTORIZED DAMPERS. NOT ALL EQUIPMENT IS DEPICTED.
11. DEMOLISH ALL ELECTRICAL ASSOCIATED WITH UNIT HEATERS. (TYP., NOT ALL ARE DEPICTED)
12. DEMOLISH ALL ELECTRICAL WITHIN WET WELL INCLUDING, BUT NOT LIMITED TO LIGHTING, HVAC, GRINDER AND OTHER PROCESS EQUIPMENT. NOT ALL EQUIPMENT IS DEPICTED.
13. DEMOLISH WET WELL LEVEL INSTRUMENTATION AND ALL ASSOCIATED ELECTRICAL.
14. DEMOLISH TEOG PANEL AND ALL ASSOCIATED EQUIPMENT. DEMOLISH ALL EXISTING RECEPTACLES, SWITCHES, ETC. AND ALL ASSOCIATED CONDUIT AND WIRING. NOT ALL RECEPTACLES ARE NECESSARILY DEPICTED. (TYP.)
15. DEMOLISH MOTOR MONITORING PANEL AND ALL RELATED POWER AND INSTRUMENTATION.



**GRADE LEVEL**  
SCALE: 3/8"=1'-0"



**INTERMEDIATE LEVEL**  
SCALE: 3/8"=1'-0"



**BASEMENT LEVEL**  
SCALE: 3/8"=1'-0"

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STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

ANDREW J. FITZPATRICK  
No. 14289  
LICENSED

REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
DRAWN BY: NTHB  
CHECKED BY: SEH  
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**ELECTRICAL DEMOLITION PLANS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 41 OF 67

**E-003**

BID SET

**ELECTRICAL SITE DEMOLITION GENERAL NOTES:**

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING EQUIPMENT TO REMAIN. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES EXISTING EQUIPMENT TO BE DEMOLISHED, UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. REFERENCE DEMOLITION NOTES ON SHEET E-002 FOR GENERAL DEMOLITION DETAILS AND REQUIREMENTS.
3. REFERENCE DEMOLITION ONE-LINE DIAGRAM ON SHEET E-002, ELECTRICAL DEMOLITION PLAN ON SHEET E-003 FOR FURTHER PUMP STATION DEMOLITION REQUIREMENTS.
4. REFERENCE CIVIL SITE PLANS FOR COORDINATION WITH OTHER UTILITIES.

**KEYED DEMOLITION NOTES:**

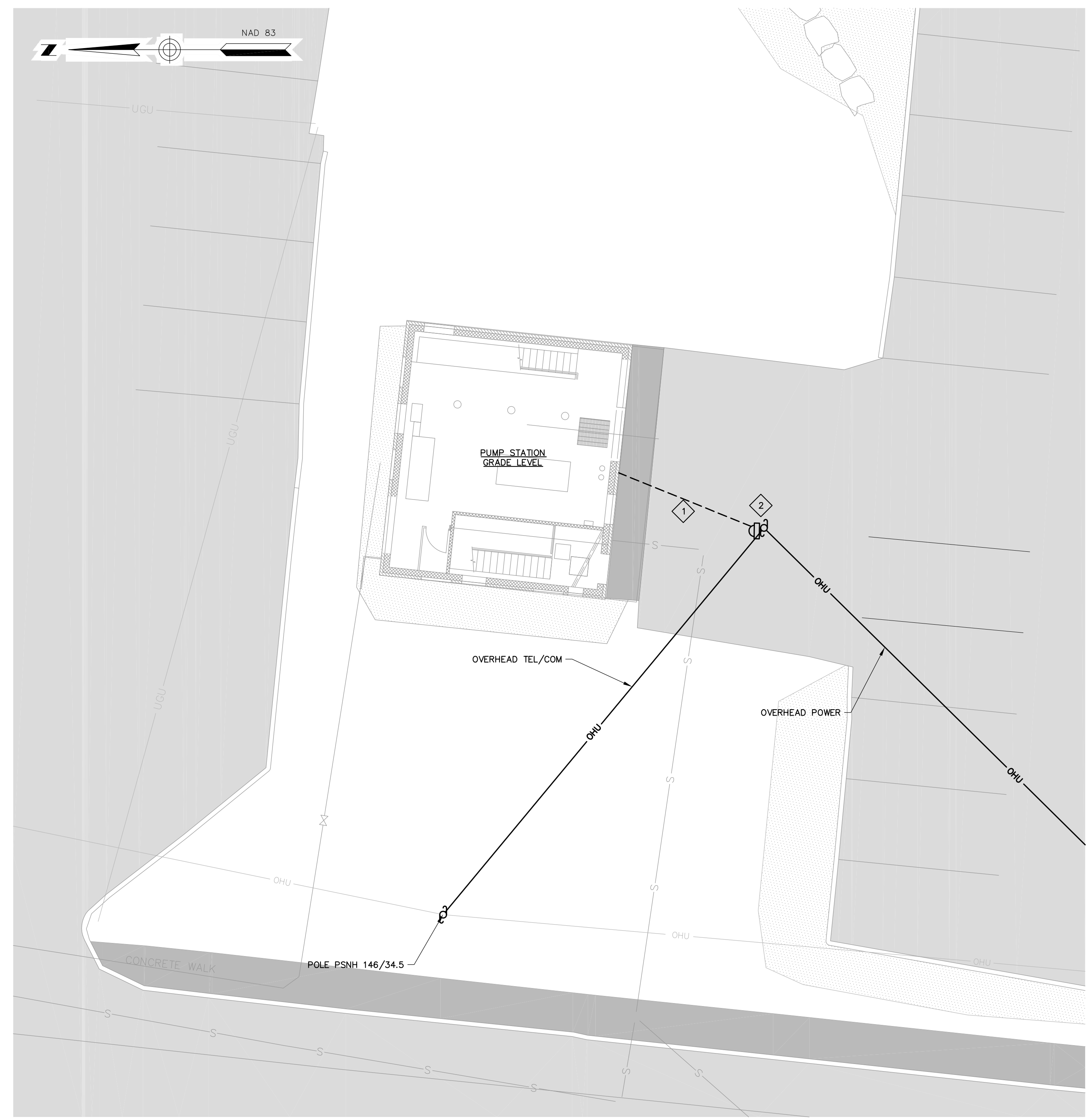
1. DEMOLISH ALL SERVICE CONDUIT AND CABLE BACK TO POLE.
2. COORDINATE DEMOLITION OF EXISTING SERVICE INCLUDING UTILITY POLE, TRANSFORMERS, GUY WIRES, AND ALL ASSOCIATED HARDWARE, WITH EVERSOURCE.
3. 1/0 BARE COPPER GROUND BURIED MINIMUM 30" BELOW GRADE (TYP.)

**GENERAL NOTES:**

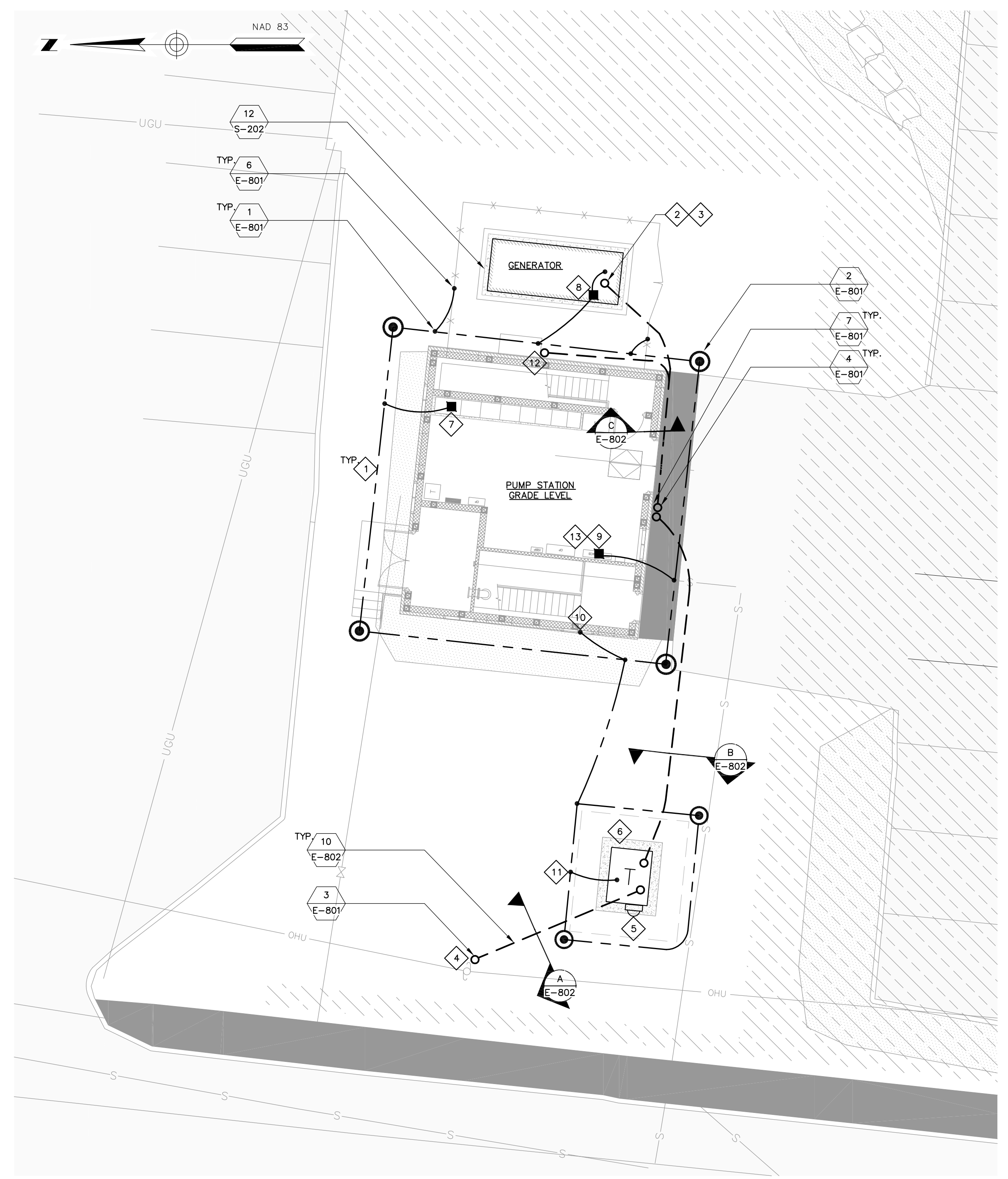
1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. REFERENCE CIVIL SITE PLANS FOR COORDINATION WITH OTHER UTILITIES.
3. ALL EQUIPMENT AND LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE COORDINATED IN THE FIELD PRIOR TO INSTALLATION.
4. CERTAIN AREAS WITHIN THE PUMP STATION ARE CONSIDERED CLASS 1 DIVISION 1, OR CLASS 1 DIVISION 2 HAZARDOUS LOCATIONS. REFERENCE SHEET E-101, E-201, AND E-301 FOR DETAILS. CONDUITS EXTENDING INTO THE BUILDING FROM THE EXTERIOR SHALL NOT PENETRATE INTO THESE SPACES AND SHALL TRANSITION DIRECTLY INTO THE ELECTRICAL ROOM.
5. BOND EACH END OF BARE COPPER GROUND IN DUCT BANK TO NEAREST GROUNDING ELECTRODE CONDUCTOR. (NOT SHOWN)

**KEYED NOTES:**

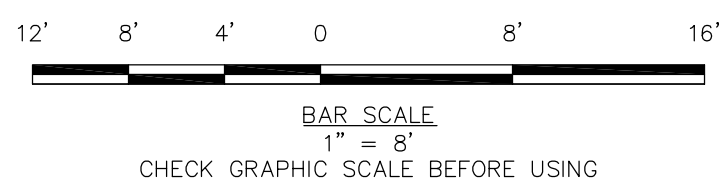
1. 1/0 BARE COPPER GROUND BURIED MINIMUM 30" BELOW GRADE (TYP.)
2. PROVIDE (2)#10, (1)#10GND, 1" C FOR GENERAL BLOCK HEATER AND (2)#10, (1)#10GND, 1" C GENERATOR CONTROL/BATTERY CHARGER POWER, EACH TO PANEL P1. REFERENCE RISER DIAGRAM ON SHEET E-501 FOR GENERATOR CONTROL WIRING REQUIREMENTS.
3. COORDINATE GENERATOR CONDUIT STUB UP LOCATION(S) AND REQUIREMENTS WITH GENERATOR SHOP DRAWINGS.
4. COORDINATE FINAL SERVICE REQUIREMENTS AND RISER POLE LOCATION WITH EVERSOURCE PRIOR TO INSTALLATION. (TYP.)
5. COORDINATE FINAL UTILITY METER LOCATION AND REQUIREMENTS WITH EVERSOURCE.
6. PROVIDE CONCRETE TRANSFORMER PAD IN ACCORDANCE WITH EVERSOURCE REQUIREMENTS. FIELD COORDINATE FINAL CONDUIT STUB UP LOCATIONS PRIOR TO INSTALLATION.
7. BOND TO MCC-1 GROUND BUS.
8. BOND TO REBAR IN GENERATOR PAD AND GENERATOR CHASSIS.
9. BOND TO MCB GROUND BUS.
10. BOND GROUND RING TO BUILDING STEEL. LOCATION TO DETERMINED IN THE FIELD.
11. PROVIDE GROUNDING IN ACCORDANCE WITH EVERSOURCE REQUIREMENTS.
12. COORDINATE STUB-UP LOCATION WITH FINAL AC-1 POSITIONING.
13. BOND TO WATER PIPING, LOCATION TO BE DETERMINED IN THE FIELD.



**ELECTRICAL SITE DEMOLITION PLAN**  
SCALE: 1" = 8'



**PROPOSED ELECTRICAL SITE PLAN**  
SCALE: 1" = 8'



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**WOODARD & CURRAN**  
CONSULTING ENGINEERS

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER  
ANDREW J. FITZPATRICK  
No. 14209

REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
DRAWN BY: NTHB  
CHECKED BY: SEH  
22787200-E-004.DWG

**ELECTRICAL SITE PLANS**

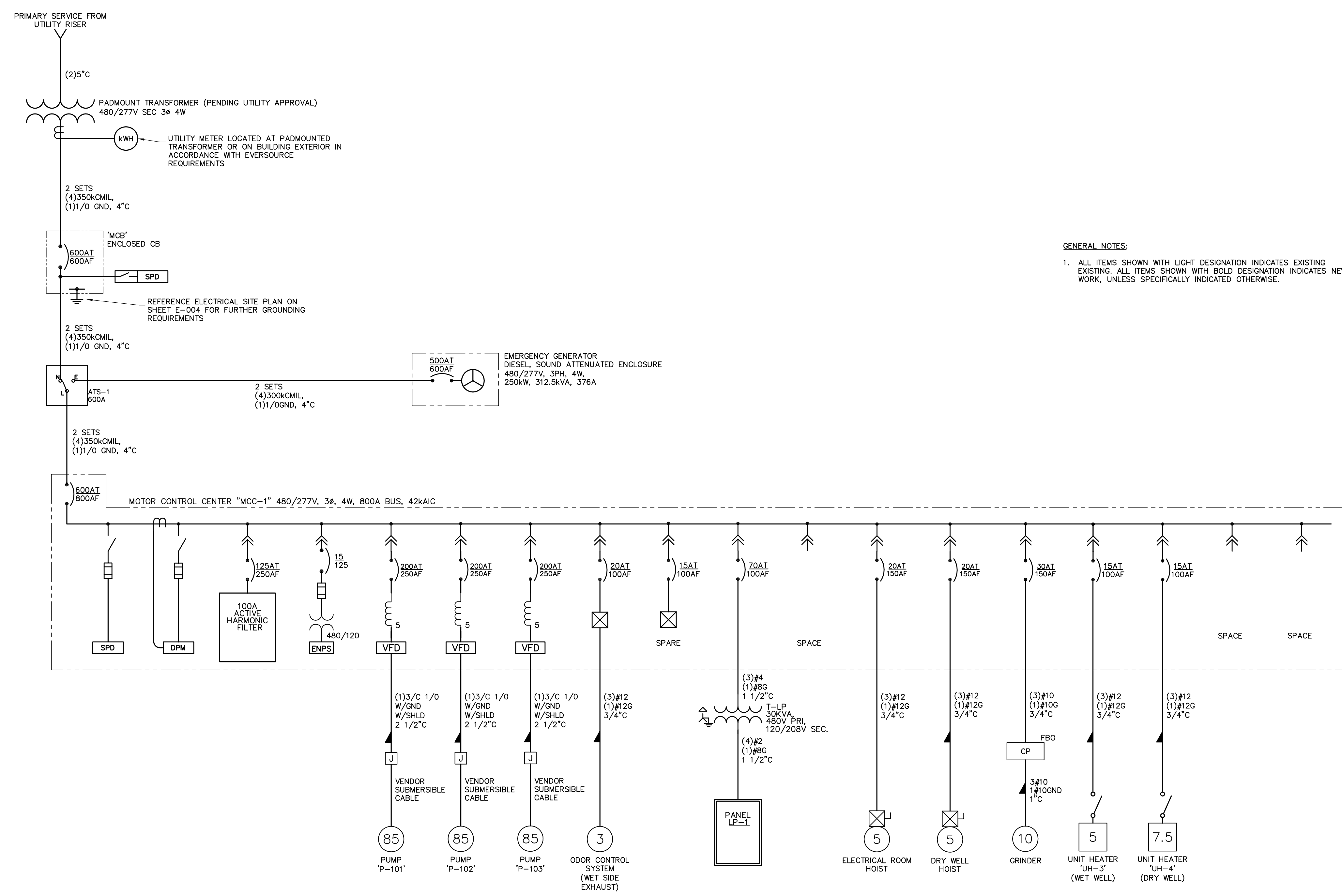
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 42 OF 67

**E-004**

BID SET



**GENERAL NOTES:**  
 1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS SPECIFICALLY INDICATED OTHERWISE.

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STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER  
 ANDREW J. FITZPATRICK  
 No. 14290

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**ELECTRICAL ONE-LINE**

CITY OF PORTSMOUTH  
 DEPARTMENT OF PUBLIC WORKS  
 NEW HAMPSHIRE

LAFAYETTE ROAD  
 PUMP STATION  
 UPGRADES

JOB NO.: 227872.00  
 DATE: FEBRUARY 2017  
 SCALE: AS SHOWN  
 SHEET: 43 OF 67

**E-010**

BID SET

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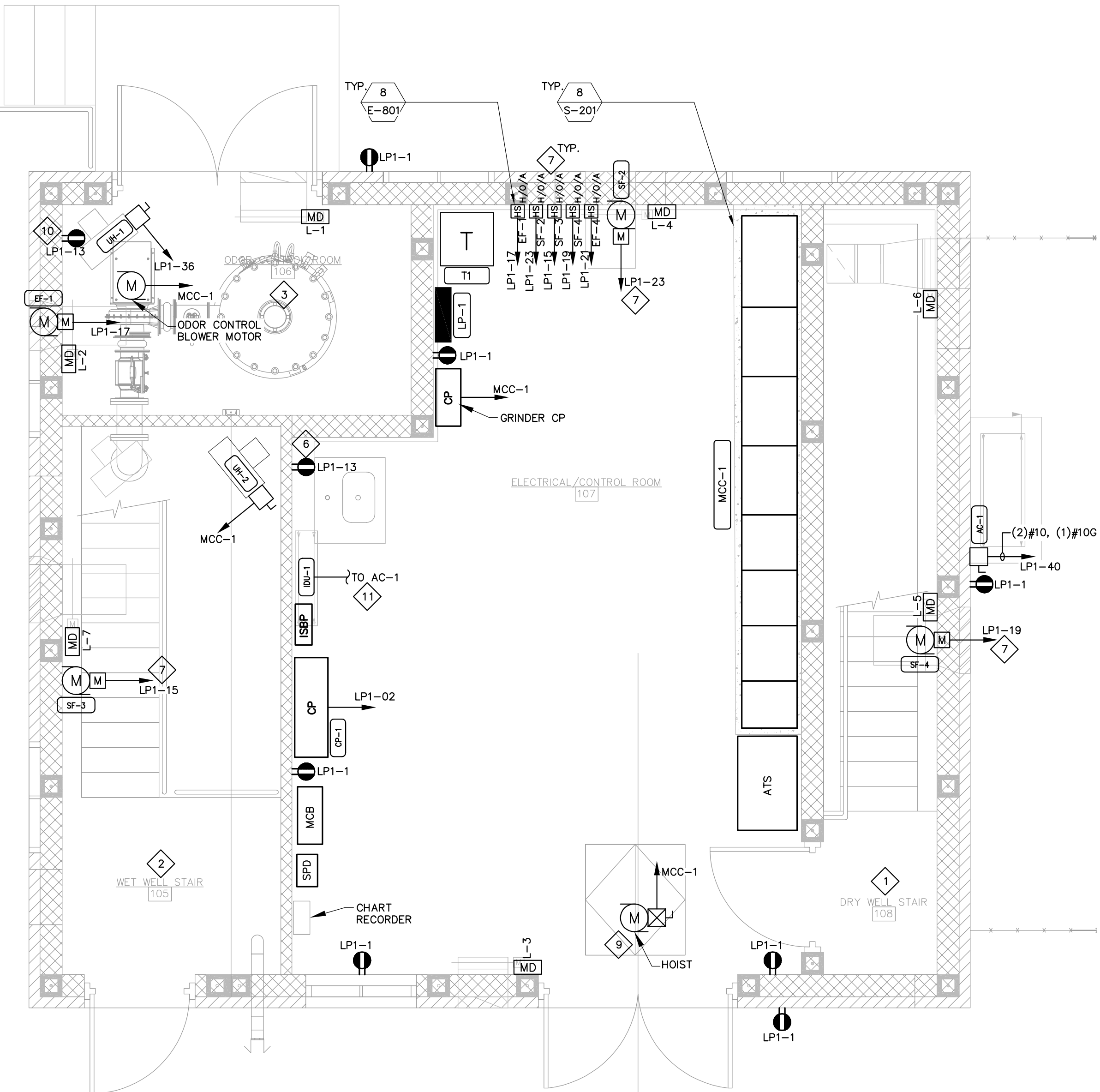
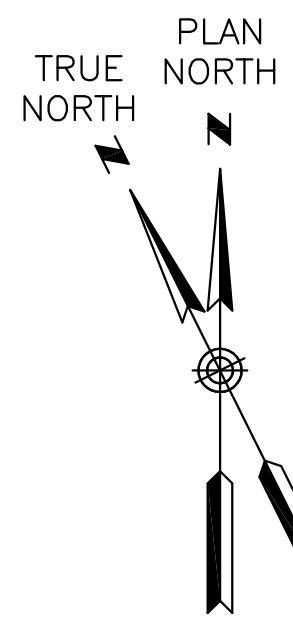
GENERAL NOTES:

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. ALL EQUIPMENT AND LOCATIONS ARE SHOWN DIAGMATICALLY AND SHALL BE COORDINATED IN THE FIELD PRIOR TO INSTALLATION.
3. REFERENCE SHEETS E-102 AND E-103 FOR CONTROL AND LIGHTING POWER REQUIREMENTS.
4. REFERENCE ONE-LINE ON SHEET E-010 FOR POWER CONDUIT AND CABLE REQUIREMENTS FOR EQUIPMENT CONNECTED TO MCC-1.
5. REFERENCE WIRING DIAGRAMS FOR PROCESS AND HVAC MOTOR WIRING DETAILS.

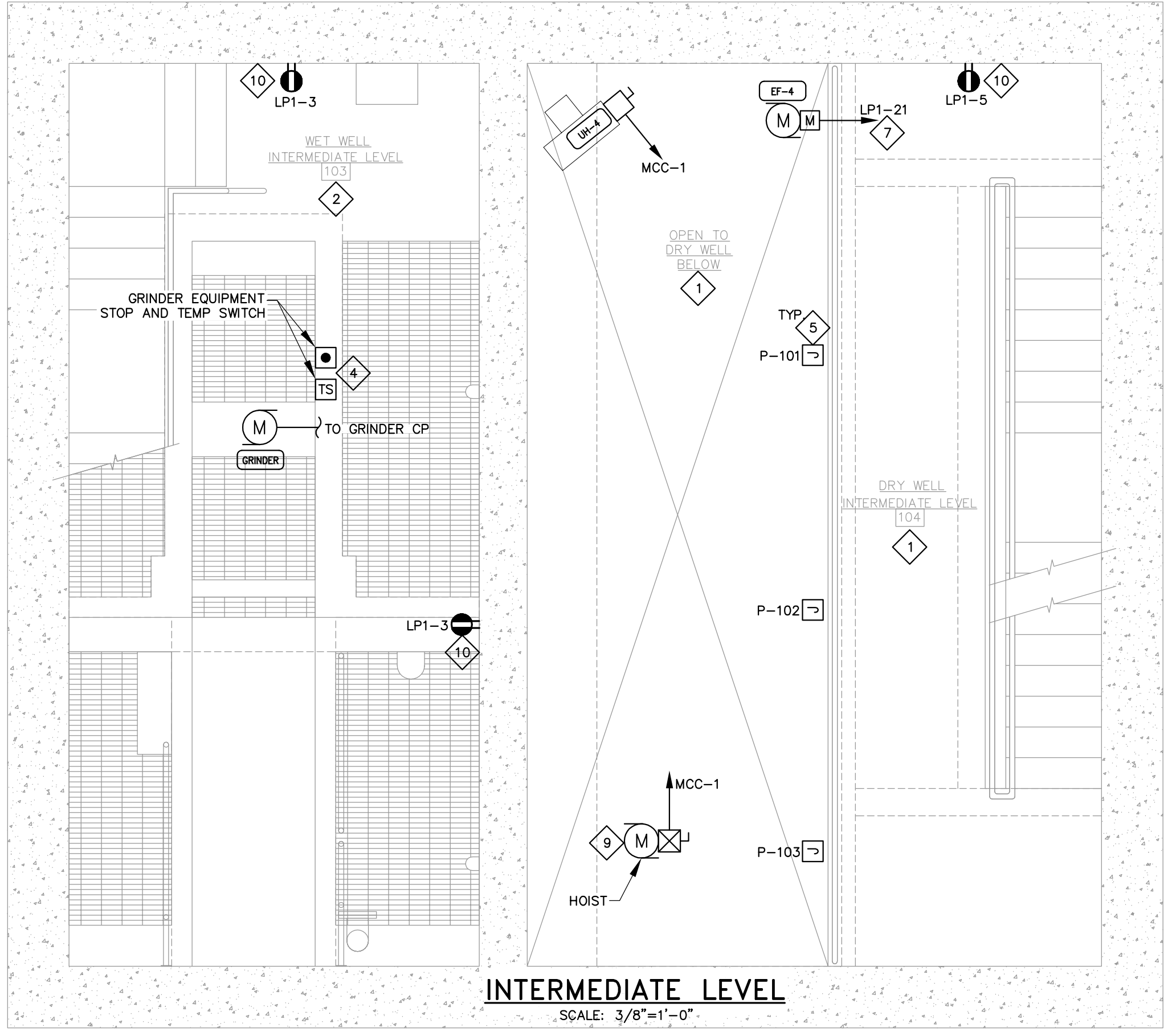
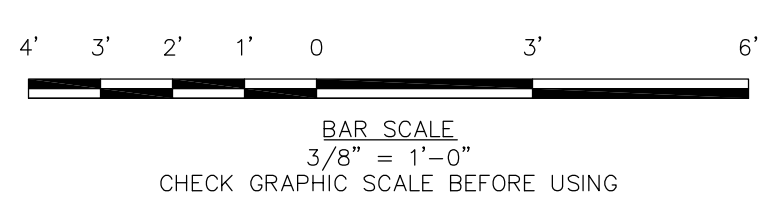
KEYED NOTES:

1. DRY WELL AND ASSOCIATED STAIRWAY IS A CLASS 1, DIVISION 2 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500.
2. WET WELL AND ASSOCIATED STAIRWAY IS A CLASS 1, DIVISION 1 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500.
3. AREA WITHIN 3'-0" OF ODOR CONTROL EQUIPMENT IS CONSIDERED A CLASS 1, DIVISION 2 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500. COORDINATE ALL WORK WITH MECHANICAL.
4. COORDINATE GRINDER EQUIPMENT STOP PUSHBUTTON LOCATION AND TEMPERATURE SWITCH LOCATION WITH OWNER AND ENGINEER IN THE FIELD.
5. PROVIDE JUNCTION BOX ON DRY WELL INTERMEDIATE LEVEL FOR TERMINATION OF VENDOR SUBMERSIBLE PUMP CABLES. ALL EQUIPMENT SHALL BE XP. PROVIDE STRAIN RELIEF FOR ALL PUMP CABLES AND INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. JUNCTION BOXES SHALL NOT IMPEDE HANDRAIL AND SHALL MAINTAIN MINIMUM 3" CLEARANCE AROUND THE UPPER RAIL.

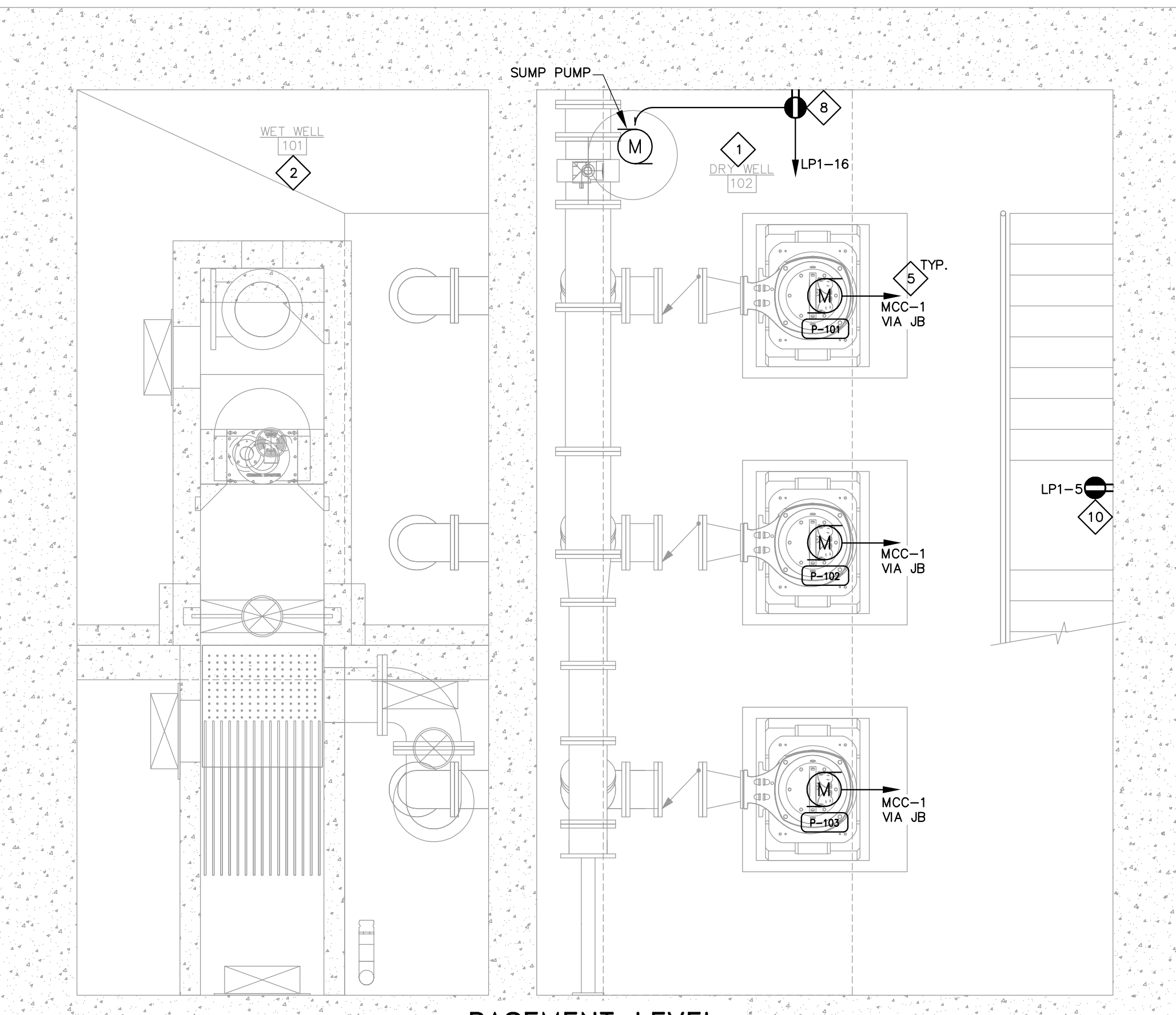
6. LOCATE RECEPTACLE TO ACCOMMODATE RELOCATED HOT WATER HEATER.
7. COORDINATE FINAL EXHAUST/ SUPPLY FAN H/O/A RELAY ENCLOSURE LOCATION(S) WITH OWNER AND ENGINEER IN THE FIELD. PROVIDE INTERLOCKS WITH LOUVERS AND CONTROL WIRING PER THE ASSOCIATED WIRING DIAGRAMS. (TYP.)
8. PROVIDE NEMA 7 RECEPTACLE AND PLUG FOR SUMP PUMP. COORDINATE FINAL INSTALLATION LOCATION TO ACCOMMODATE SUMP PUMP OPERATION AND DISCONNECTION. HOME-RUN SHALL BE WITH (2)#10, (1)#10G.
9. COORDINATE HOIST INSTALLATION REQUIREMENTS WITH FINAL SELECTED EQUIPMENT.
10. COORDINATE NEMA 7/ EXPLOSIONPROOF RECEPTACLE NEMA/ MANUFACTURER CONFIGURATION WITH OWNER'S PREFERENCE. FURNISH ASSOCIATED PLUG FOR EACH RECEPTACLE SHOWN. (TYP. FOR ALL RECEPTACLES IN THE DRY WELL AND WET WELL.)
11. PROVIDE CONDUIT AND CABLE BETWEEN IDU-1 AND AC-1 IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.



**GRADE LEVEL**  
SCALE: 3/8"=1'-0"



**INTERMEDIATE LEVEL**  
SCALE: 3/8"=1'-0"

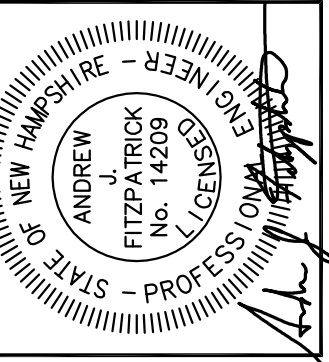


**BASEMENT LEVEL**  
SCALE: 3/8"=1'-0"

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DRAWN BY: NTHB  
22787200-E-101.DWG

**ELECTRICAL POWER PLANS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 44 OF 67

**E-101**

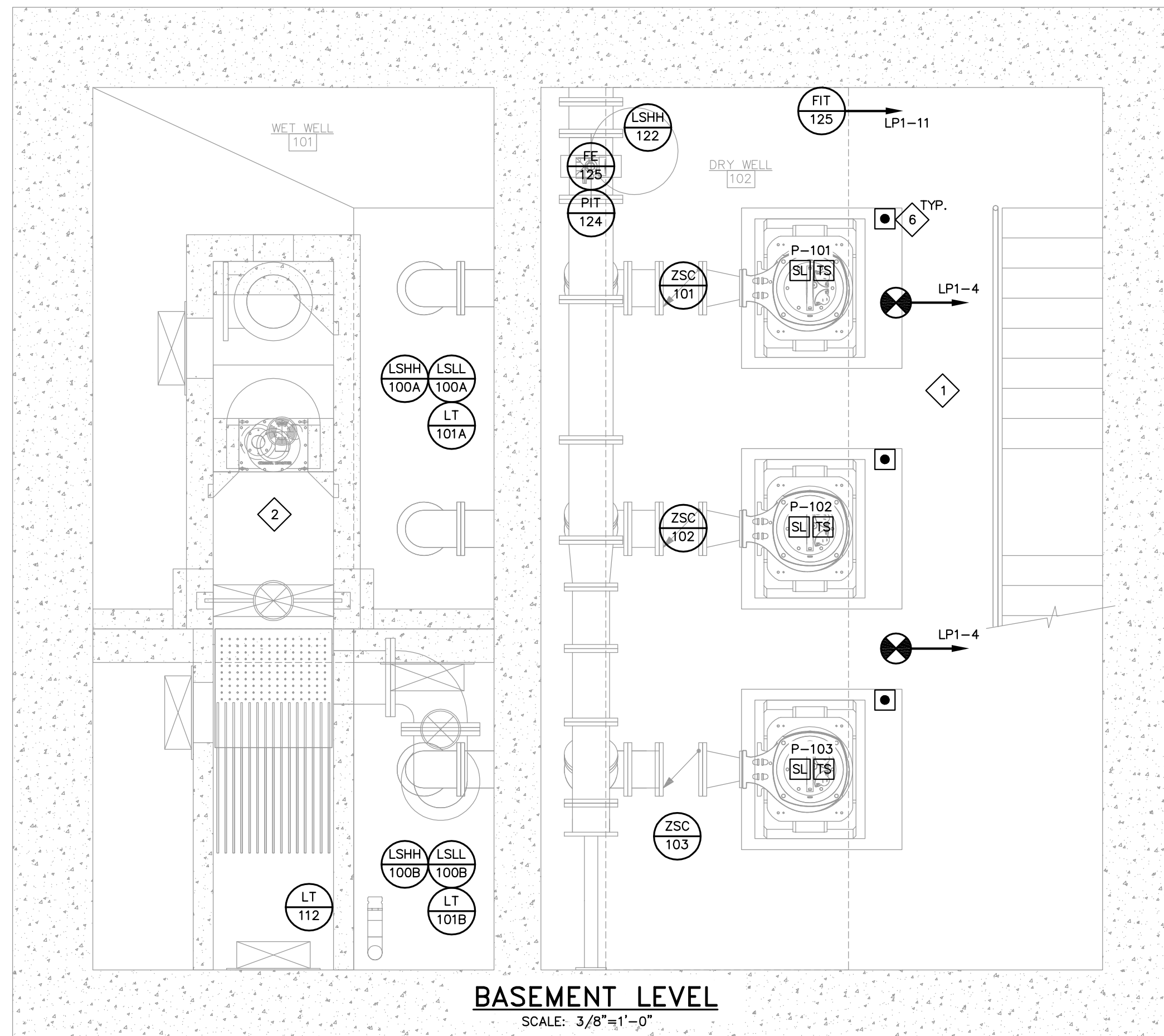
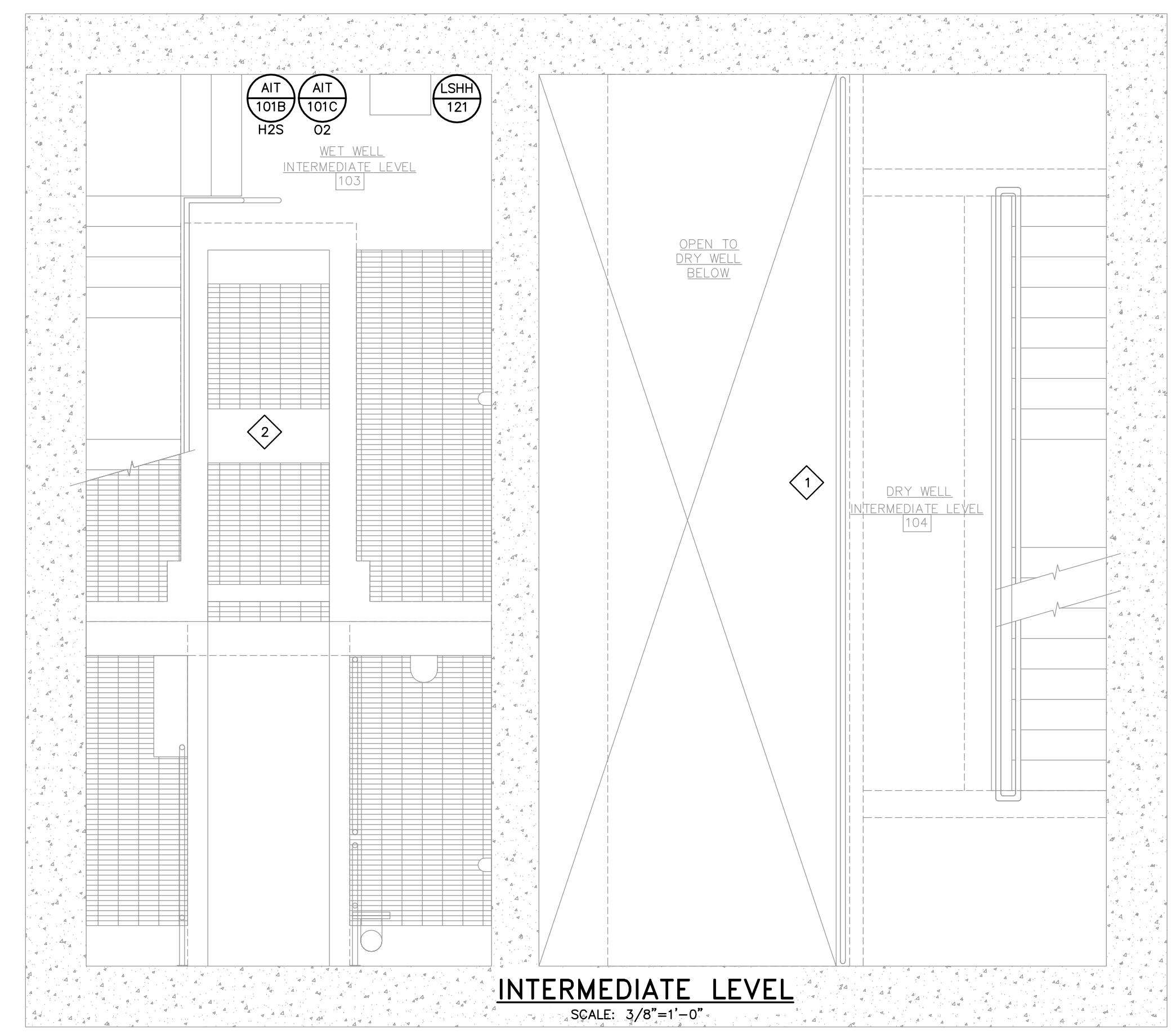
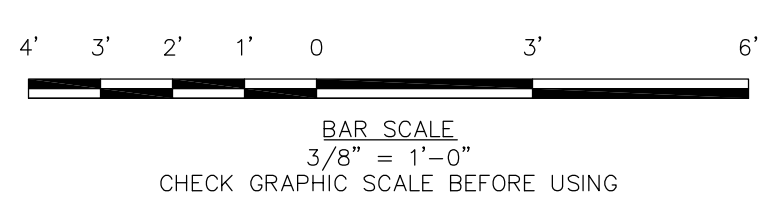
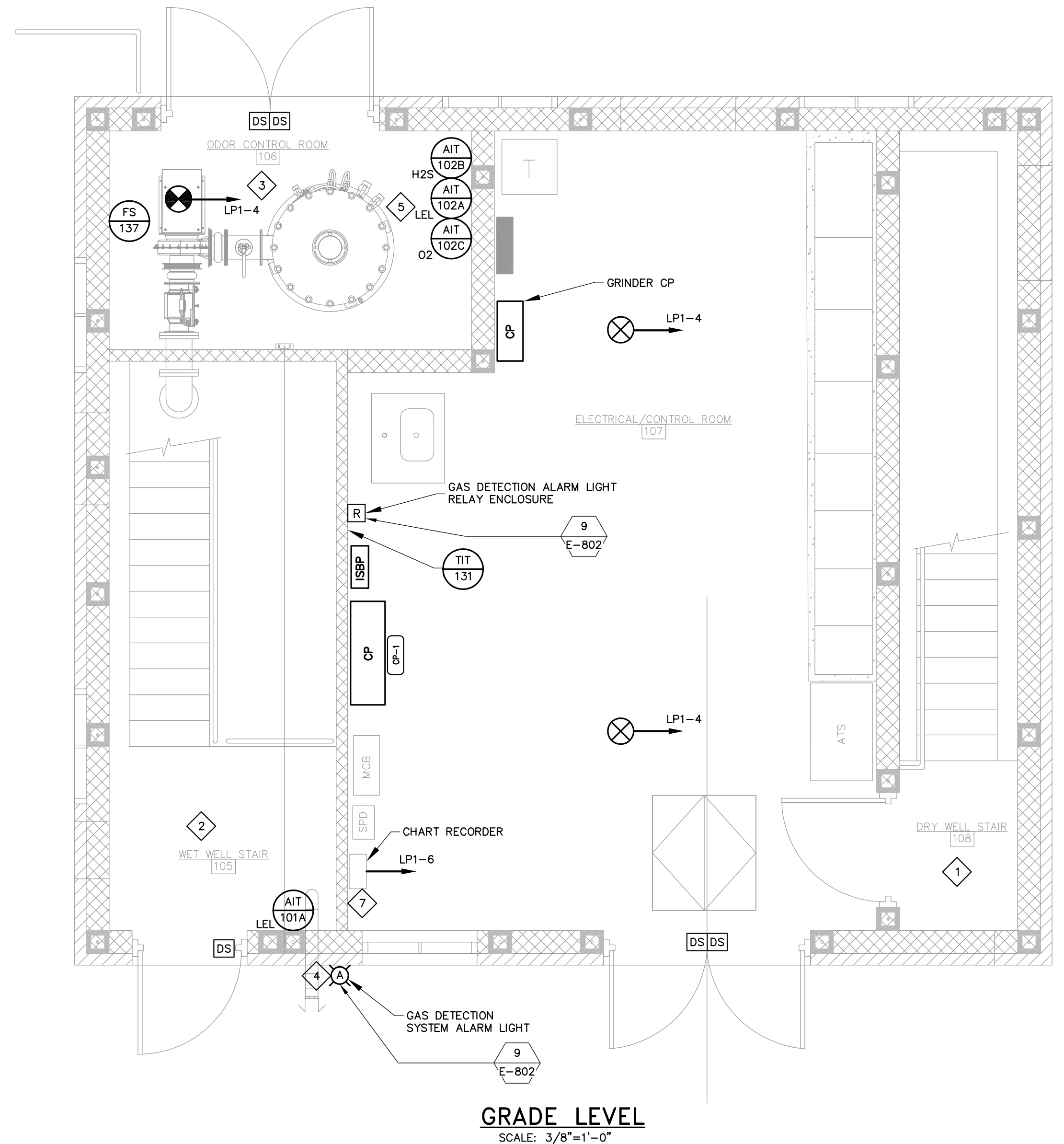
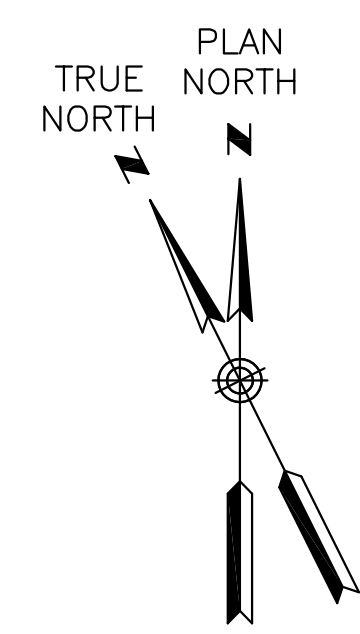
BID SET

**GENERAL NOTES:**

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. ALL EQUIPMENT AND LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE COORDINATED IN THE FIELD PRIOR TO INSTALLATION.
3. REFERENCE RISER DIAGRAM ON SHEET E-501 FOR INSTRUMENTATION AND CONTROL WIRING REQUIREMENTS.

**KEYED NOTES:**

1. DRY WELL AND ASSOCIATED STAIRWAY IS A CLASS 1, DIVISION 2 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500.
2. WET WELL AND ASSOCIATED STAIRWAY IS A CLASS 1, DIVISION 1 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500.
3. AREA WITHIN 3'-0" OF ODOR CONTROL EQUIPMENT IS CONSIDERED A CLASS 1, DIVISION 2 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500. COORDINATE ALL WORK WITH MECHANICAL.
4. MAINTAIN 3'-0" CLEARANCE FROM WET WELL ENTRANCE. COORDINATE INTERLOCK WITH ASSOCIATED GAS DETECTION EQUIPMENT DRY CONTACT OUTPUTS.
5. COORDINATE MOUNTING LOCATION OF GAS MONITORING INSTRUMENTATION WITH ODOR CONTROL SYSTEM. INSTALL IN A READILY ACCESSIBLE LOCATION.
6. MOUNT EQUIPMENT STOP PUSHBUTTONS IN A READILY ACCESSIBLE LOCATION ADJACENT TO EACH ASSOCIATED PUMP. ENSURE ACCESS TO PUMP FOR MAINTENANCE WILL NOT BE IMPEDED. (TYP. FOR THREE)
7. RELOCATE CHART RECORDER AS SHOWN, COORDINATE FINAL LOCATION WITH OWNER AND ENGINEER IN THE FIELD.



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REGISTERED PROFESSIONAL ENGINEER  
STATE OF NEW HAMPSHIRE - PROJECT NO. 14289  
ANDREW J. FITZPATRICK  
No. 14289  
LICENSE NO. 14289

REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
DRAWN BY: NTHB  
CHECKED BY: SEH  
DATE: 2/28/2017

**INSTRUMENTATION AND CONTROLS PLANS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 45 OF 67

**E-201**

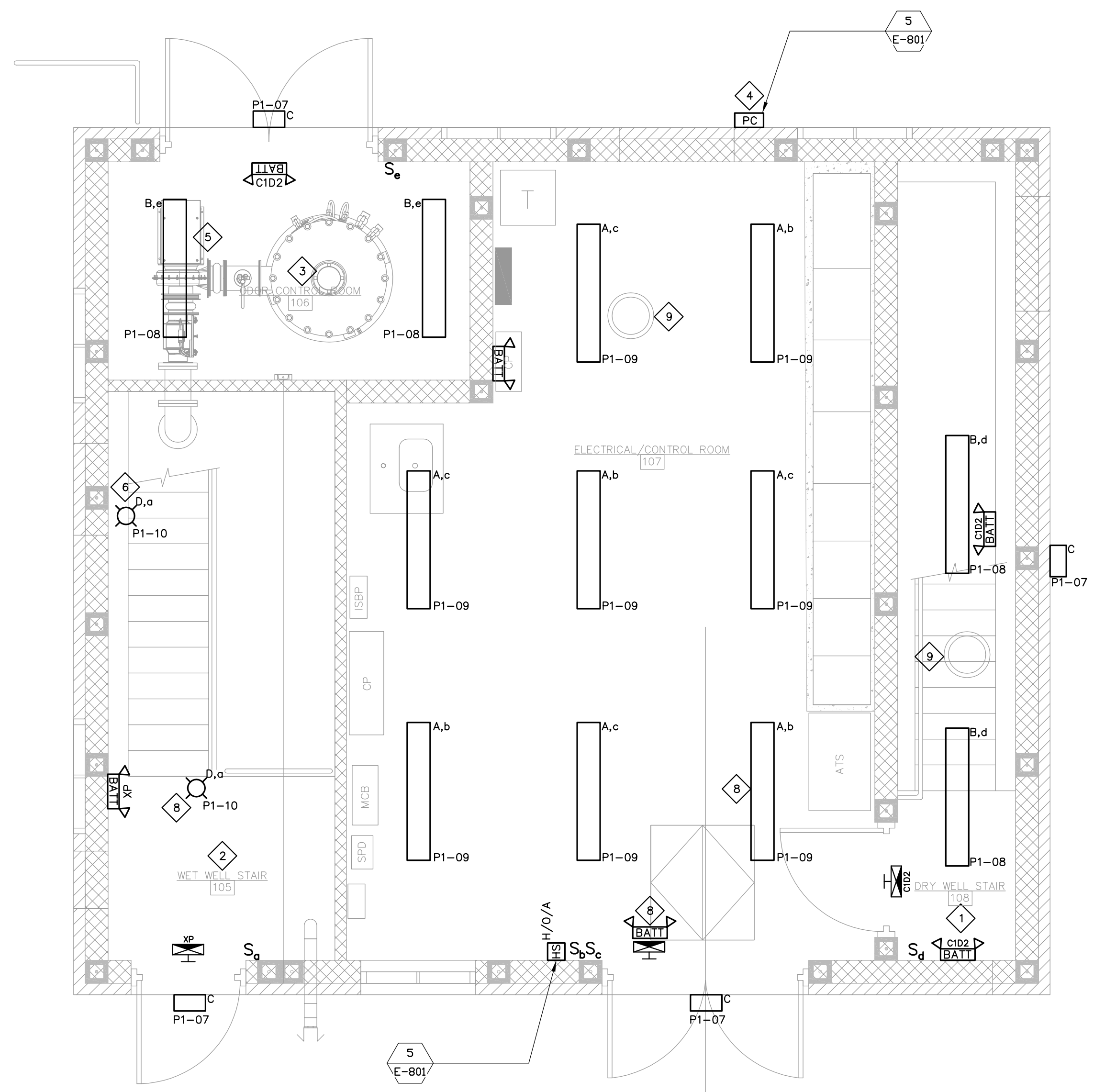
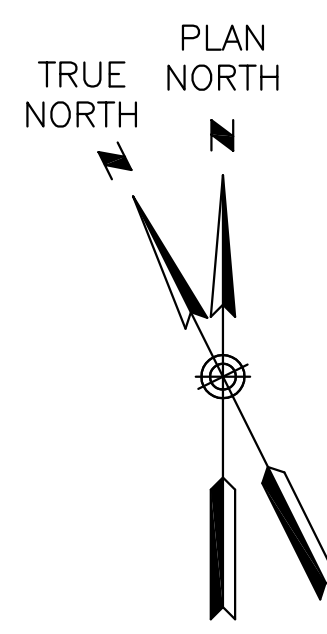
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**GENERAL NOTES:**

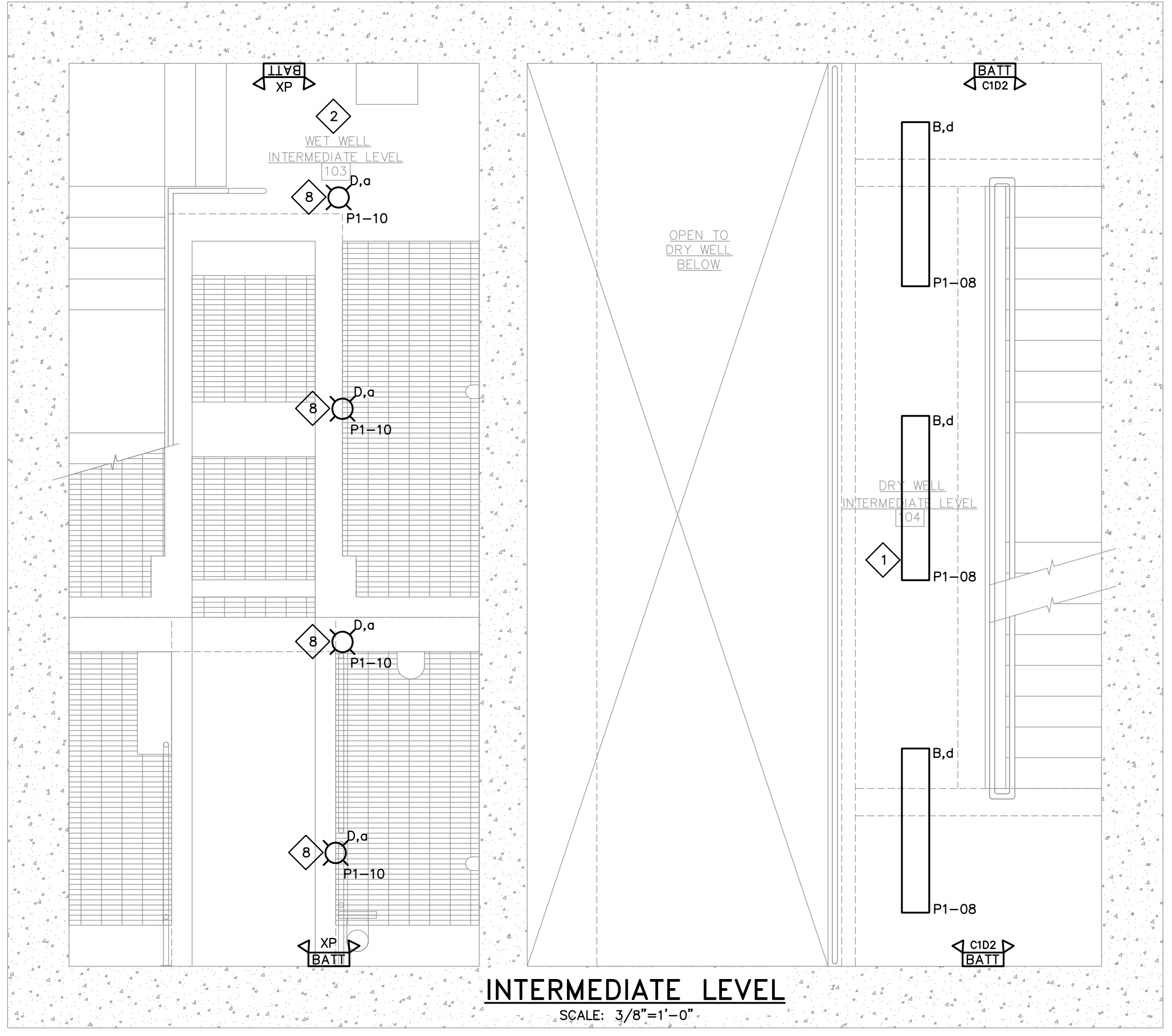
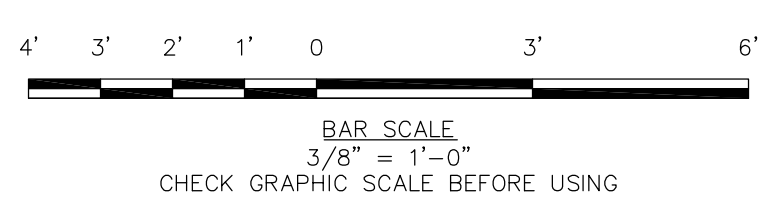
1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING EXISTING. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. ALL EQUIPMENT AND LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE COORDINATED IN THE FIELD PRIOR TO INSTALLATION.
3. CONNECT ALL EMERGENCY FIXTURES TO UN-SWITCHED SIDE OF CLOSEST LIGHTING CIRCUIT.

**KEYED NOTES:**

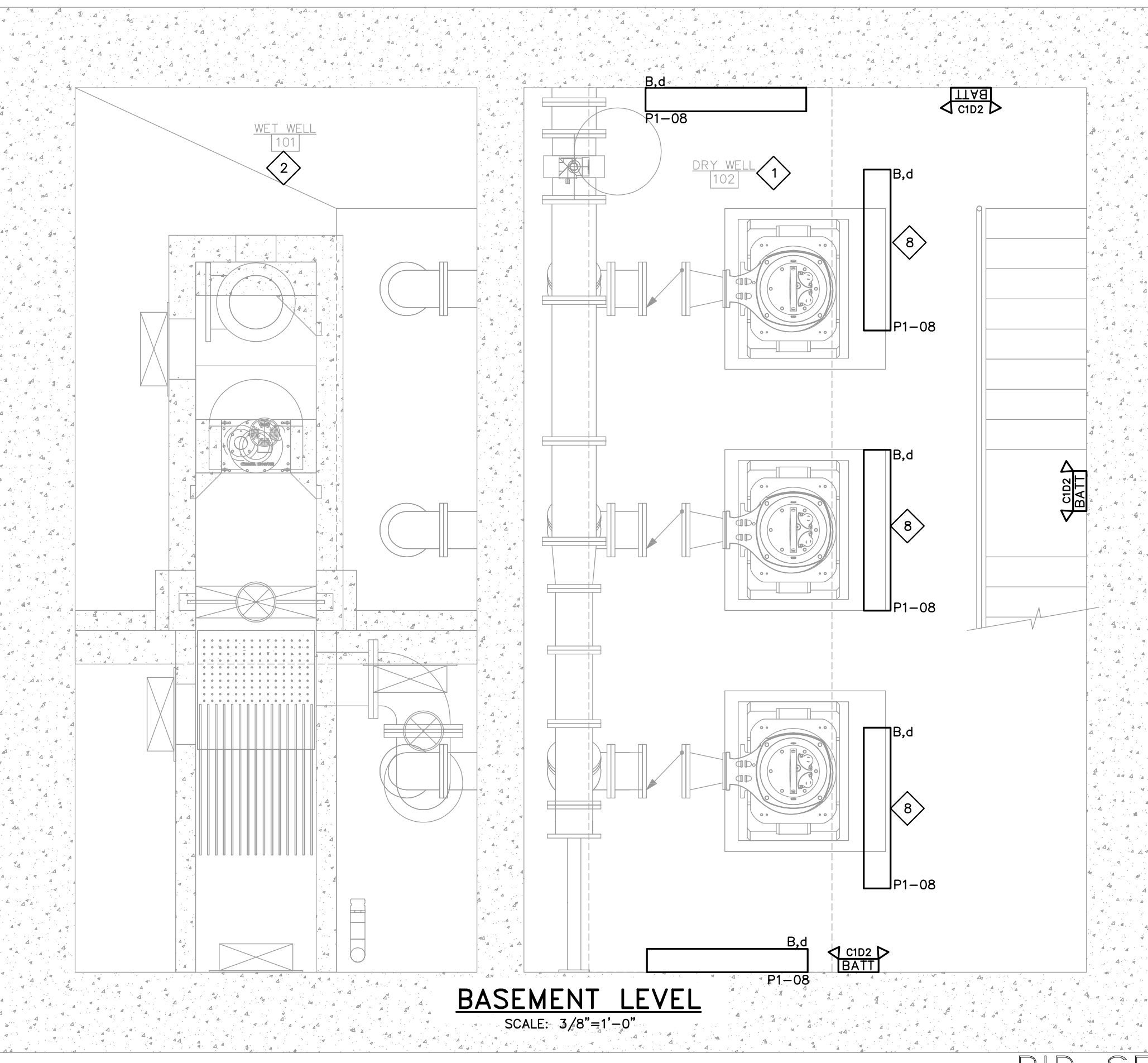
1. DRY WELL AND ASSOCIATED STAIRWAY IS A CLASS 1, DIVISION 2 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500.
2. WET WELL AND ASSOCIATED STAIRWAY IS A CLASS 1, DIVISION 1 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500.
3. AREA WITHIN 3'-0" OF ODOR CONTROL EQUIPMENT IS CONSIDERED A CLASS 1, DIVISION 2 HAZARDOUS LOCATION. ALL ELECTRICAL INSTALLED IN THIS AREA SHALL ADHERE TO NEC ARTICLE 500. COORDINATE ALL WORK WITH MECHANICAL.
4. PHOTOCELL TO BE MOUNTED HIGH ON NORTH SIDE OF BUILDING.
5. FIELD COORDINATE FINAL ODOR CONTROL ROOM LIGHT FIXTURE LOCATIONS WITH ODOR CONTROL SYSTEM INSTALLATION.
6. WALL MOUNT FIXTURE ABOVE STAIRWAY IN ACCESSIBLE LOCATION.
7. COORDINATE EXIT SIGN AND EMERGENCY LIGHT FIXTURE MOUNTING LOCATION WITH MONORAIL.
8. COORDINATE FIXTURE LOCATIONS WITH MONORAIL POSITIONING.
9. COORDINATE FINAL FIXTURE POSITIONING WITH SOLAR LIGHTING TUBE.



**GRADE LEVEL**  
SCALE: 3/8"=1'-0"



**INTERMEDIATE LEVEL**  
SCALE: 3/8"=1'-0"



**BASEMENT LEVEL**  
SCALE: 3/8"=1'-0"

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2/28/2017 - C-301.DWG

**LIGHTING PLANS**

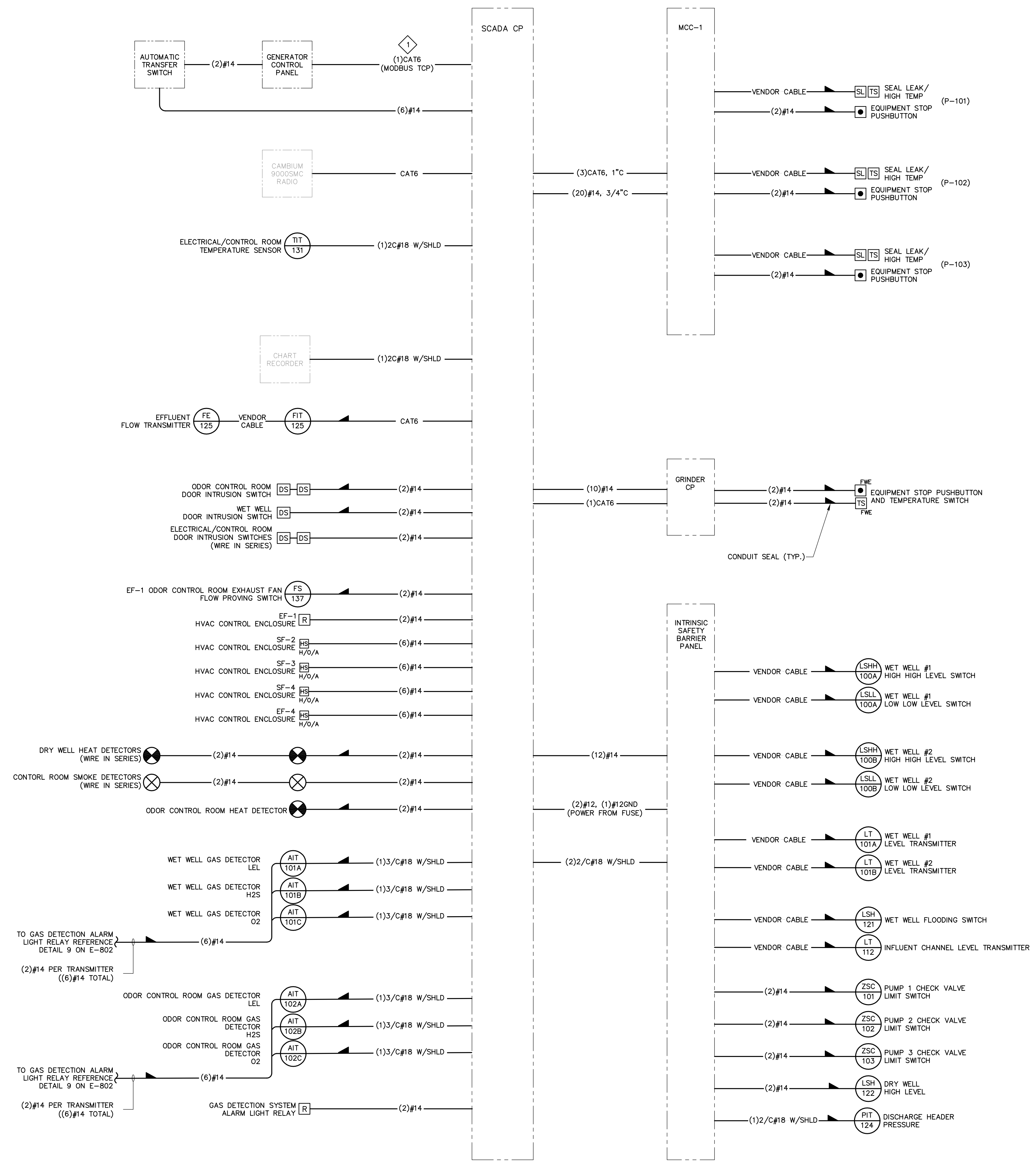
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 46 OF 67

**E-301**

BID SET



- GENERAL NOTES:**
- CONDUIT SIZES NOT IDENTIFIED SHALL BE MINIMUM 3/4", UNLESS OTHERWISE NOTED.
  - WIRING FOR THE FOLLOWING CATEGORIES SHALL BE INSTALLED IN SEPARATE RACEWAYS. DO NOT COMBINE CATEGORIES IN A SINGLE CONDUIT.
    - 120V POWER WIRING
    - DIGITAL/DISCRETE CONTROL WIRING (120VAC & 24VDC)
    - ANALOG SIGNAL WIRING (4-20mADC)
    - COMMUNICATIONS
  - LOCATION OF PROCESS EQUIPMENT, MOTORS, VALVES, INSTRUMENTS, ETC. SHOWN ON THE DRAWINGS ARE APPROXIMATE. REFER TO PROCESS DRAWINGS FOR EXACT LOCATIONS. FINAL LOCATIONS TO BE DETERMINED IN FIELD TO MATCH EQUIPMENT SUPPLIED BY CONTRACTOR.
  - EQUIPMENT SHOWN IN BOLD DESIGNATION SHALL BE CONSIDERED NEW. EQUIPMENT SHOWN IN LIGHT DESIGNATION SHALL BE CONSIDERED EXISTING TO BE RE-WIRED.
  - REFERENCE SHEET E-201 FOR INSTRUMENTATION AND CONTROL EQUIPMENT LOCATIONS.
  - REFERENCE SHEETS E-701, E-702, AND E-703 FOR FURTHER WIRING AND INTERLOCK REQUIREMENTS.
  - COORDINATE INTEGRAL VENDOR FURNISHED INSTRUMENTATION AND CONTROL CABLE LENGTHS WITH PROPOSED ROUTING IN THE FIELD. PROVIDE WIRING TO MATCH VENDOR CABLE IN LOCATIONS THAT REQUIRE ADDITIONAL LENGTH TO FULLY EXTEND TO CP-001.

- KEYED NOTE:**
- COORDINATE FINAL GENERAL CONTROL CABLE AND CONNECTION REQUIREMENTS WITH APPROVED EQUIPMENT.

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STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

ANDREW J. FITZPATRICK  
No. 14289  
LICENSE

REV	DESCRIPTION	DATE

CHECKED BY: SEH  
DRAWN BY: NTHB  
22787200-E-501.DWG

**INSTRUMENTATION AND CONTROLS RISER DIAGRAM**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS SHOWN
SHEET: 47 OF 67

**E-501**

BID SET

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DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS			KVA	CKT #	POLE	BRKR	DIRECTORY			
					A	B	C								
RCPTS - CTRL RM, EXTERIOR	20	1	1	1.08	1.58		0.50	2	1	20	CP-1				
RCPTS - WET WELL	20	1	3	0.36		0.46	0.10	4	1	15	SMOKE/HEAT DETECTORS				
RCPTS - DRY WELL	20	1	5	0.90			0.95	0.05	6	1	20	CHART RECORDER			
LTG - EXTERIOR	20	1	7	0.06	0.98		0.92	8	1	20	LTG - DRY WELL				
LTG - CTRL RM, ODOR CTRL RM	20	1	9	0.92		1.63	0.71	10	1	20	LTG - WET WELL				
RT-125	15	1	11	0.00			0.50	12	1	20	GENERATOR CP, BATT CHARGER				
RCPT - WATER HEATER	20	1	13	0.00	0.10		0.10	14	1	15	GAS DETECTION ALARM LIGHT				
WET WELL SUPPLY FAN SF-3	15	1	15	0.53		1.73		1.20	16	1	25	SUMP PUMP			
ODOR CTRL RM SUPPLY FAN EF-1	15	1	17	0.53			0.53	0.00	18	1	20	SPARE			
DRY WELL SUPPLY FAN SF-4	15	1	19	0.53	0.53		0.00	20	1	20	SPARE				
DRY WELL EXHAUST FAN EF-4	15	1	21	0.53		0.53	0.00	22	1	20	SPARE				
ELEC RM SUPPLY FAN SF-2	15	1	23	0.53			0.53	0.00	24	1	20	SPARE			
SPARE	20	1	25	0.00	0.00		0.00	0.00	26	1	20	SPARE			
SPARE	20	1	27	0.00	0.00		0.00	0.00	28	1	20	SPARE			
SPARE	20	1	29	0.00		0.00	0.00	0.00	30	1	20	SPARE			
SPARE	20	1	31	0.00	0.00		0.00	0.00	32						
SPARE	20	1	33	0.00		0.00	0.00	0.00	34	2	20	SPARE			
SPARE	20	1	35	0.00			1.50	1.50	36						
SPARE	20	1	37	0.00	1.50			1.50	38	2	20	UH-1			
GENERATOR BLOCK HEATER	30	2	39	2.00		4.10		2.10	40						
			41	2.00			4.10	2.10	42	2	25	AC-1			
SUBTOTAL				4.69	8.45	8.11	SUBTOTAL								
VOLTAGE:				120/208				TOTAL KVA				21.25			
MAIN BREAKER:				100				TOTAL AMPS				59			
BUSES:				150				PANEL NAME:				LP-1			
PH & WIRES:				3PH 4W				LOCATION:				PUMP STATION GRADE LEVEL			
NOTES:								MOUNTING:				SURFACE			
								AIC RATING:				22 KAIC			

**PANEL SCHEDULE**  
SCALE: NO SCALE

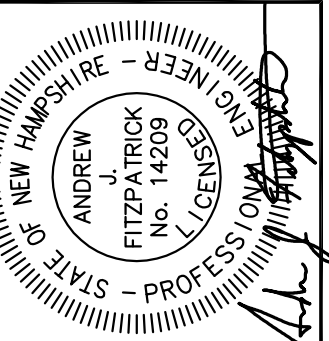
LIGHT FIXTURE SCHEDULE									
ALL FIXTURES SHALL BE FURNISHED COMPLETE WITH ALL HARDWARE, LAMPS, HANGERS, FITTINGS, ETC., FOR A COMPLETE AND PROPER INSTALLATION.									
TYPE	MANUFACTURER	CATALOG NUMBER	LAMP TYPE	LAMP WATT	LAMP NO.	VOLTAGE	MTG.	REMARKS/RECOMMENDATIONS	
A	4' LED ENCLOSED AND GASKETED FIXTURE								
	COLUMBIA OR EQUAL	LXEM4-40VL-DFA-EU	LED	47	LED	120	SURFACE/CHAIN 09'-0"	CHAIN HANG OR SURFACE MOUNT FIXTURE TO CEILING. COORDINATE FINAL MOUNTING OF LIGHT FIXTURES WITH DUCT WORK, PIPING, AND OTHER POTENTIAL CONFLICTS IN THE FIELD.	
B	4' LED CLASS 1 DIVISION 2 FIXTURE								
	COLUMBIA OR EQUAL	HEM4-40ML-DFA-EU	LED	46.10	LED	120	SURFACE/CHAIN 09'-0"	SURFACE MOUNT FIXTURE TO CEILING OR WALL. COORDINATE FINAL MOUNTING OF LIGHT FIXTURES WITH DUCT WORK, PIPING, AND OTHER POTENTIAL CONFLICTS IN THE FIELD.	
C	EXTERIOR LED WALL PACK								
	LUMINAIRE LED OR EQUAL	AEL36-15W-120-277-3000K-DP-BKH	LED	15	LED	120	WALL	MOUNT FIXTURE 8'-0" AFF.	
D	EXPLOSION-PROOF LUMINAIRE								
	HUBBELL INDUSTRIAL	LUMINAIRE: HLEML-45 30 X3-G-AN	LED	45W	LED	120	PENDANT MOUNTED 09'-0"	MOUNT FIXTURE IN POSITION SIMILAR TO EXISTING. FIELD COORDINATE FINAL MOUNTING LOCATIONS.	
	EXIT SIGN								
	DUAL-LITE OR EQUAL	LN4X-RWEI	LED	3.8	LED	120	WALL	MOUNT FIXTURE 8'-0" AFF.	
	CLASS 1 DIVISION 2 HAZARDOUS LOCATION EXIT SIGN								
	COOPER CROUSE-HINDS OR EQUAL	COH-UX70RSDHAZ	LED	3.8	LED	120	WALL	MOUNT FIXTURE 8'-0" AFF.	
	CLASS 1 DIVISION 1 / EXPLOSION-PROOF EXIT SIGN								
	DUAL-LITE OR EQUAL	EBB3-20-10B W/ VEX4400 EXIT ACCESSORY	LED	20W	2	120	WALL	COORDINATE FINAL MOUNTING STYLE IN FIELD WITH INSTALLATION METHOD	
	EMERGENCY LIGHT								
	DUAL-LITE OR EQUAL	EV2I	LED	2W	2	120	WALL	MOUNT FIXTURE 8'-0" AFF. PROVIDE WITH NUMBER OF HEADS AS INDICATED ON THE DRAWINGS. PROVIDE SELF DIAGNOSTIC ELECTRONICS.	
	CLASS 1 DIVISION 2 HAZARDOUS LOCATION EMERGENCY LIGHT								
	DUAL-LITE OR EQUAL	DYN6I-C1D2	LED	6W	2	120	WALL	MOUNT FIXTURE 8'-0" AFF. PROVIDE WITH NUMBER OF HEADS AS INDICATED ON THE DRAWINGS. PROVIDE SELF DIAGNOSTIC ELECTRONICS.	
	CLASS 1 DIVISION 1 / EXPLOSION-PROOF EMERGENCY LIGHT								
	DUAL-LITE OR EQUAL	EBB3-20-10B	HALOGEN	20W	1	120	WALL	MOUNT REMOTE TEST STATION IN AN ACCESSIBLE LOCATION IN VIEW OF THE ASSOCIATED FIXTURE	
	ALARM LIGHT, RED, STEADY-ON BEACON								
	EDWARDS SIGNALING OR EQUAL	48XBRMR240	LED	13W	1	120	WALL	MOUNT FIXTURE 9'-0" ABOVE GRADE.	

**LIGHT FIXTURE SCHEDULE**  
SCALE: NO SCALE

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DESIGNED BY: SEH  
DRAWN BY: NTHB  
CHECKED BY: SEH  
2/27/2017 - E-601.DWG

**SCHEDULES**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS SHOWN  
SHEET: 48 OF 67

**E-601**

BID SET

A

B

C

D

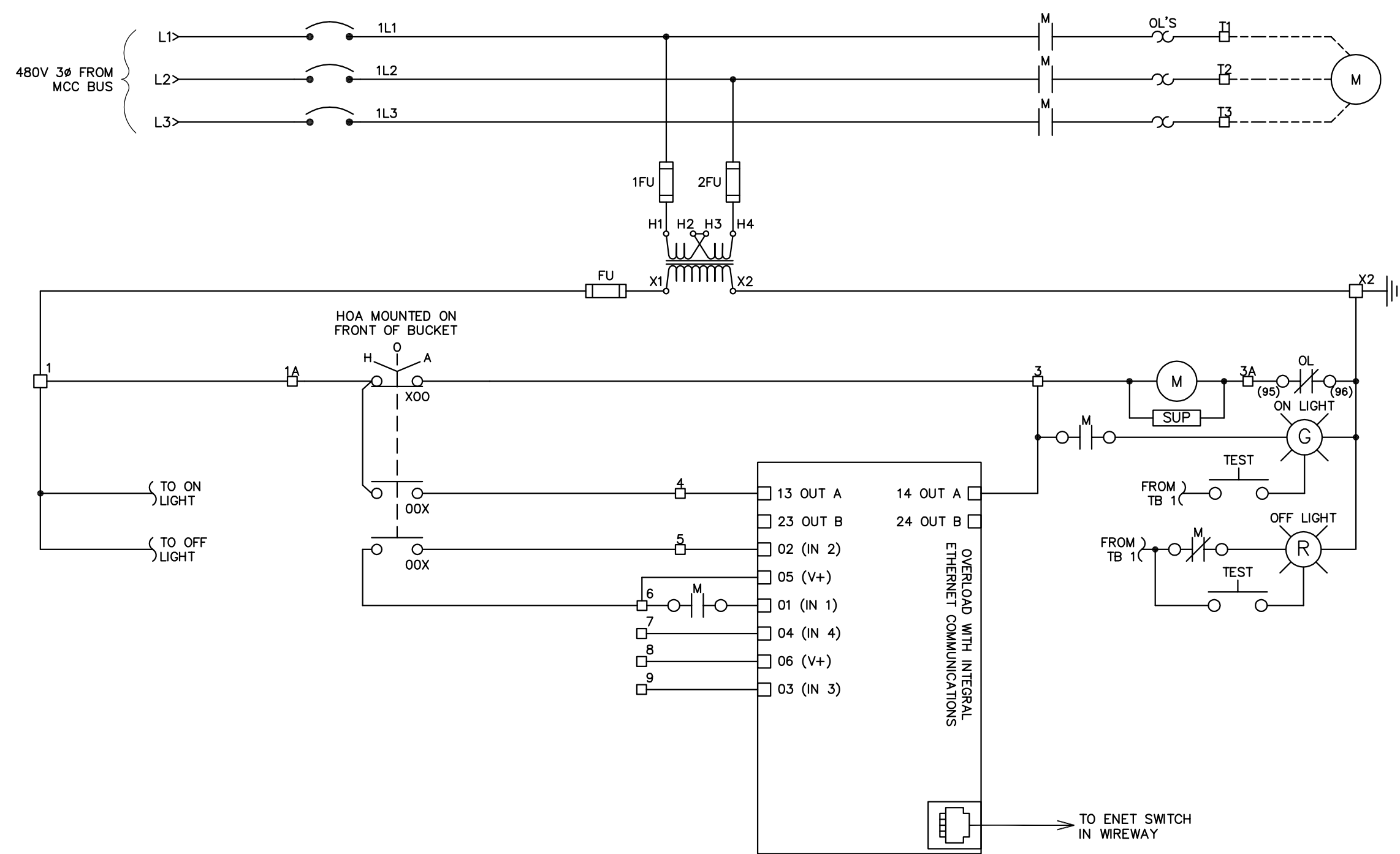
A

B

C

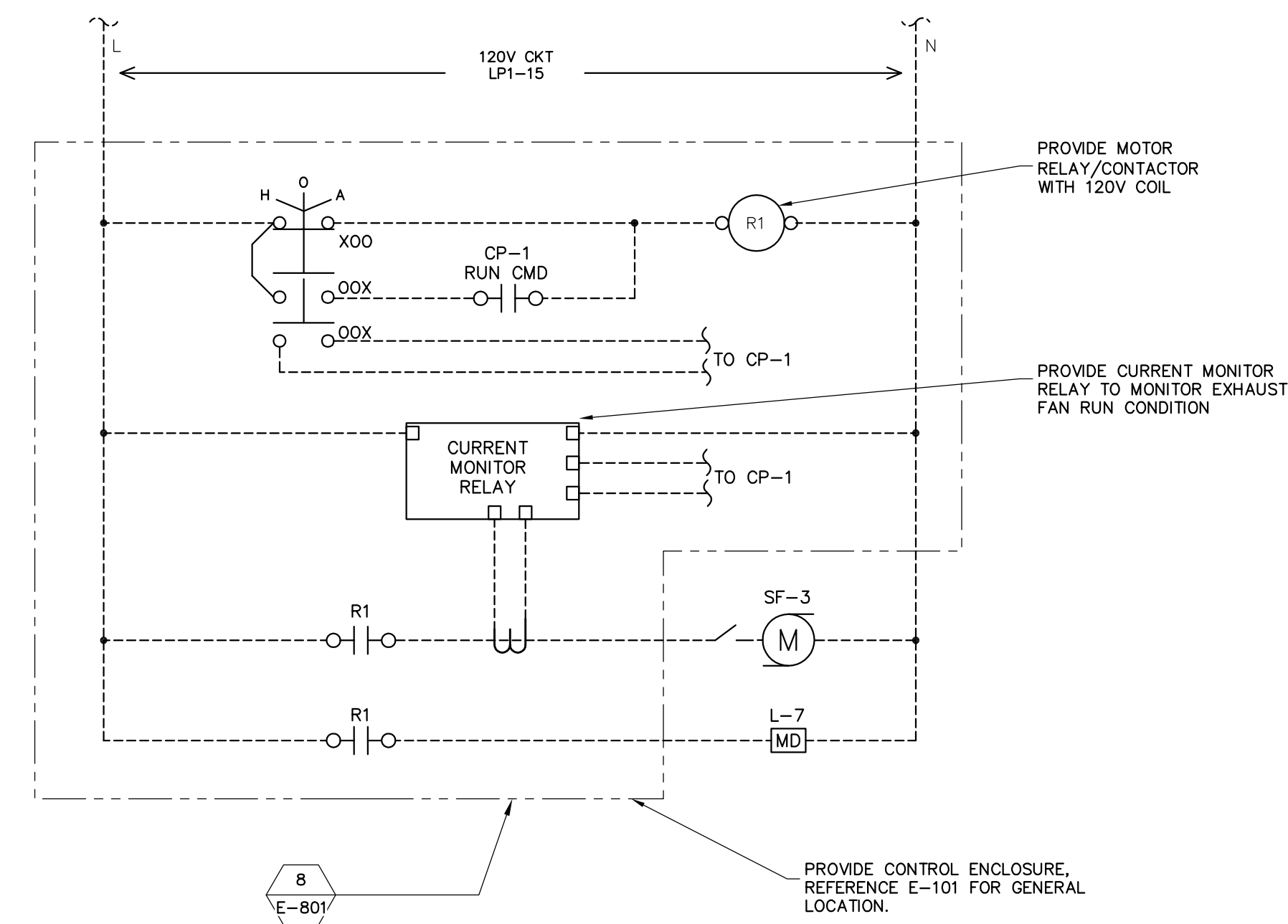
D





**ODOR CONTROL SYSTEM (WET WELL EXHAUST)  
MOTOR STARTER WIRING DIAGRAM**

**NOTE:**  
SF-3 AND ASSOCIATED MOTORIZED DAMPERS ARE LOCATED IN A CLASS 1 DIVISION 1 ENVIRONMENT. ALL ELECTRICAL SHALL BE INSTALLED ACCORDINGLY WITH SEALED CONDUITS AND NEMA 7 ENCLOSURES, FITTINGS, ETC.

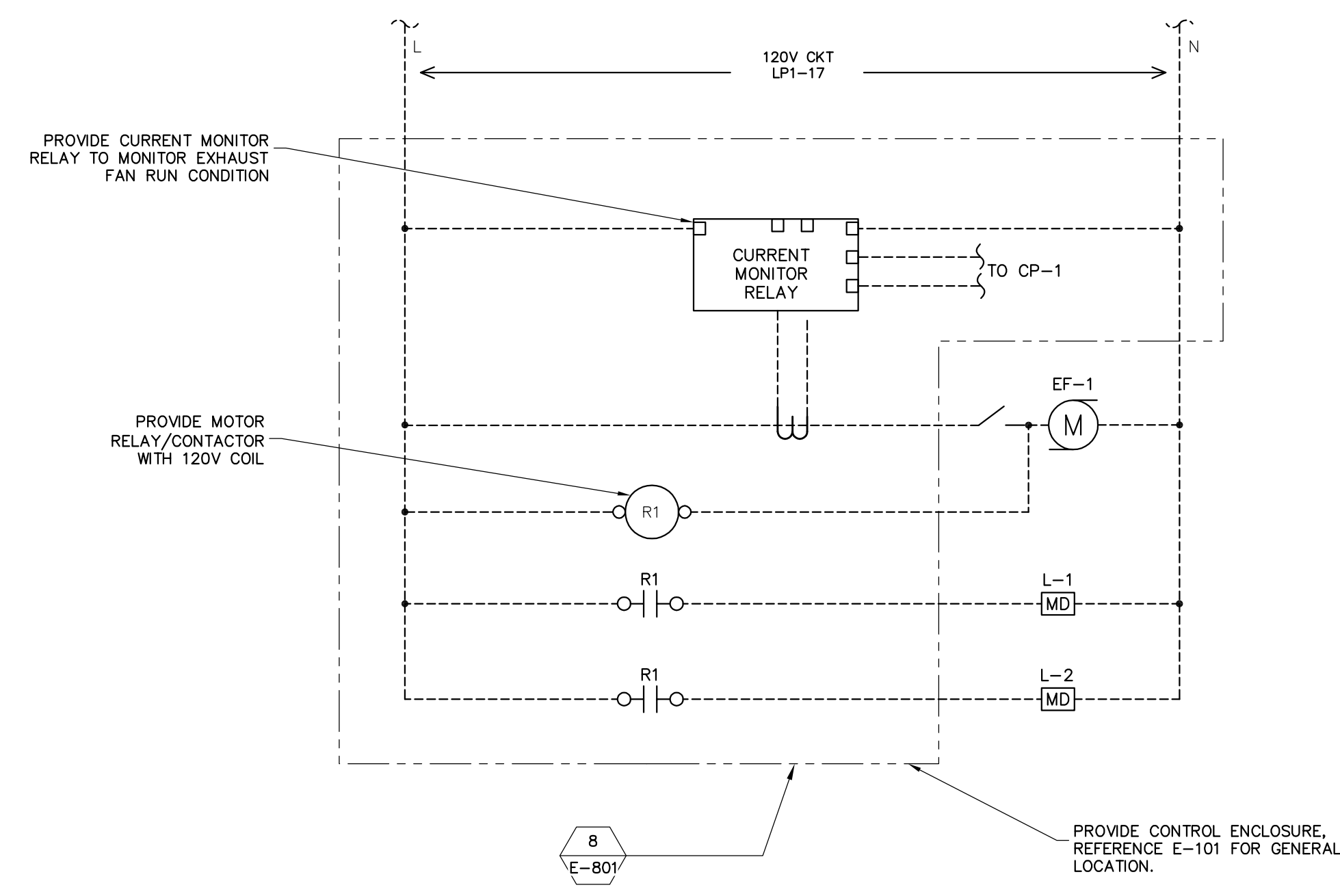


**WET WELL SUPPLY FAN SF-3  
MOTOR STARTER WIRING DIAGRAM**

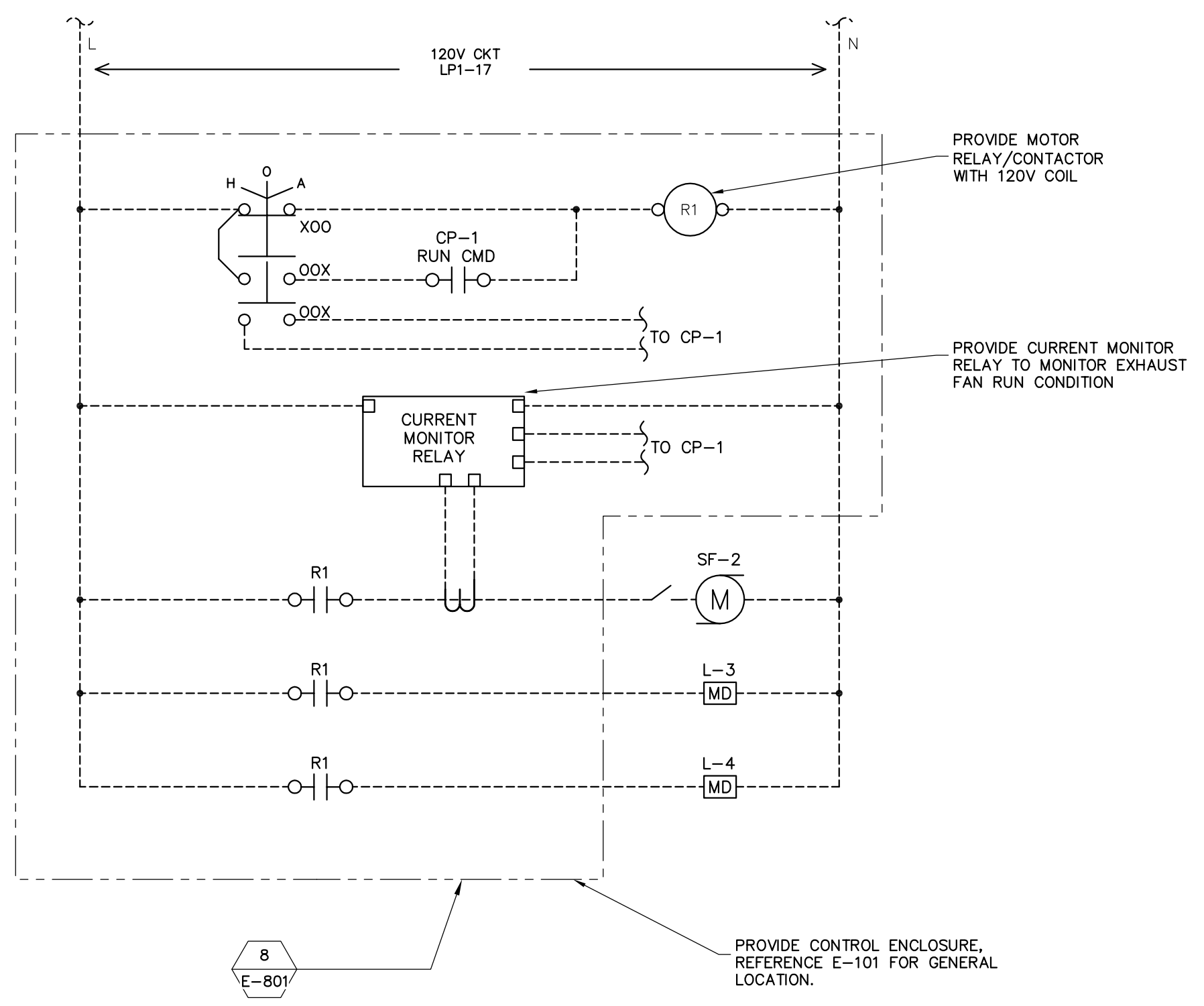
**WIRING DIAGRAM LEGEND (TYP. FOR ALL SHEETS):**

- VFD/MOTOR STARTER TERMINAL BLOCK
- ▣ PLC PANEL TERMINAL BLOCK
- INTERNAL WIRING
- - - - - FIELD WIRING

**NOTE:**  
EF-1 AND ASSOCIATED MOTORIZED DAMPERS ARE LOCATED IN A CLASS 1 DIVISION 2 ENVIRONMENT. ALL ELECTRICAL SHALL BE INSTALLED ACCORDINGLY WITH SEALED CONDUITS AND NEMA 7 ENCLOSURES, FITTINGS, ETC.

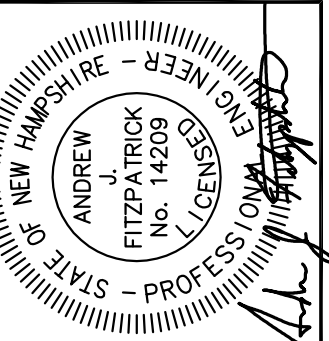


**ODOR CONTROL ROOM EXHAUST FAN EF-1  
MOTOR STARTER WIRING DIAGRAM**



**CONTROL ROOM SUPPLY FAN SF-2  
MOTOR STARTER WIRING DIAGRAM**

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REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
CHECKED BY: SEH  
DRAWN BY: NTHB  
12/27/2017  
E-702/DM

**WIRING DIAGRAMS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

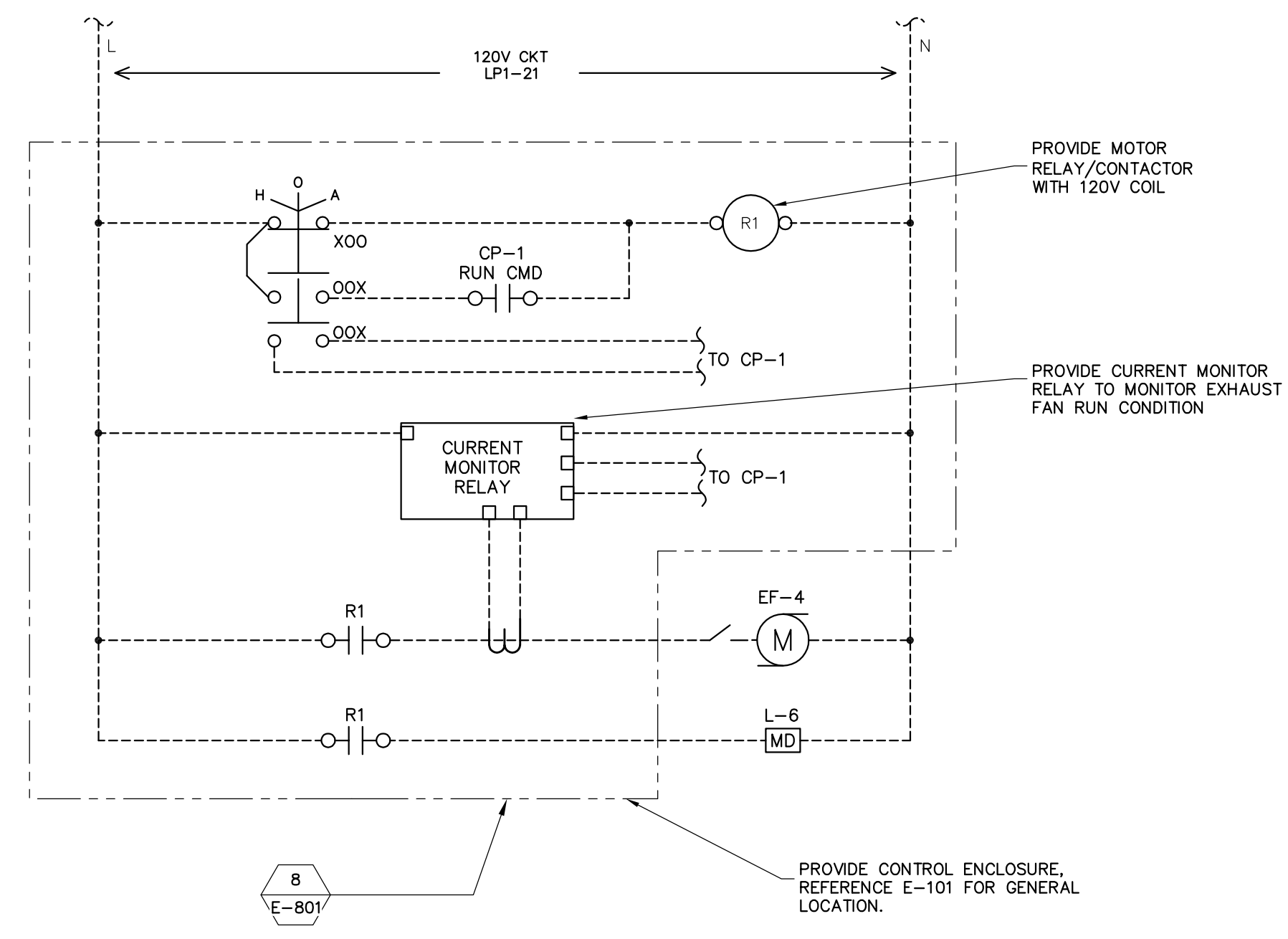
JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 50 OF 67

**E-702**

BID SET

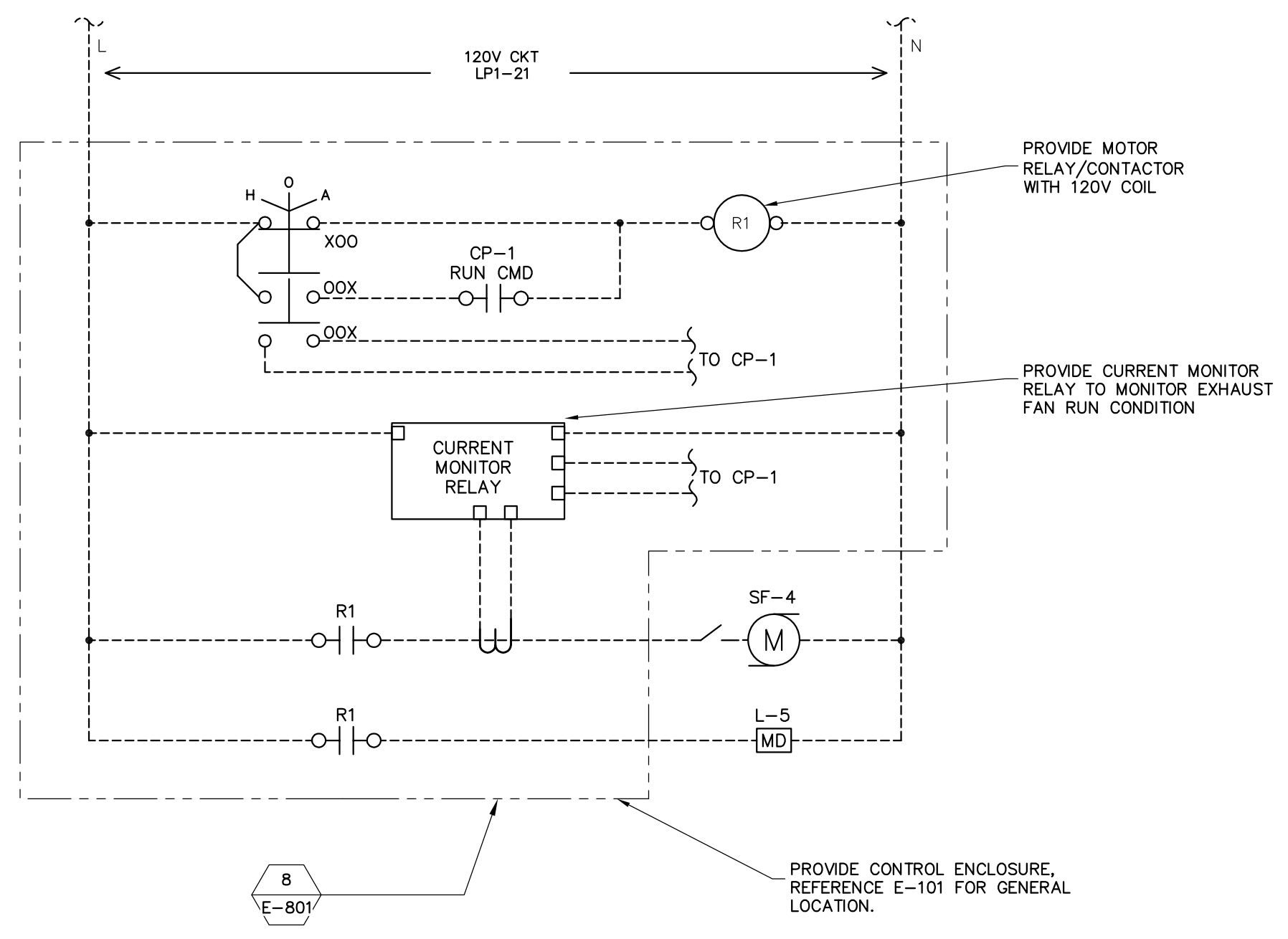
\\woodardcurran.net\shares\Projects\227872\Projects\227872\_01\_Lafayette\_Road\_P\_S\_Upgrade\wp\227872\_01\_Lafayette\_Road\_P\_S\_Final\_Design\Drawings\Electrical\22787200-E-702.dwg, Jan 31, 2017 - 9:42am

NOTE:  
EF-4 AND ASSOCIATED MOTORIZED DAMPERS  
ARE LOCATED IN A CLASS 1 DIVISION 2  
ENVIRONMENT. ALL ELECTRICAL SHALL BE  
INSTALLED ACCORDINGLY WITH SEALED  
CONDUITS AND NEMA 7 ENCLOSURES,  
FITTINGS, ETC.



**DRY WELL EXHAUST FAN EF-4  
MOTOR STARTER WIRING DIAGRAM**

NOTE:  
SF-4 AND ASSOCIATED MOTORIZED DAMPERS  
ARE LOCATED IN A CLASS 1 DIVISION 2  
ENVIRONMENT. ALL ELECTRICAL SHALL BE  
INSTALLED ACCORDINGLY WITH SEALED  
CONDUITS AND NEMA 7 ENCLOSURES,  
FITTINGS, ETC.



**DRY WELL SUPPLY FAN SF-4  
MOTOR STARTER WIRING DIAGRAM**

WIRING DIAGRAM LEGEND (TYP. FOR ALL SHEETS):

□	VFD/MOTOR STARTER TERMINAL BLOCK
⊠	PLC PANEL TERMINAL BLOCK
—	INTERNAL WIRING
---	FIELD WIRING

\\woodardcurran.net\shares\Projects\227872\Portsmouth, NH - Lafayette Road - PS Upgrade\wpb\227872.01 Lafayette Road PS Upgrade.dwg, Jan 31, 2017 - 9:33am  
 C:\PS Upgrade\wpb\227872.01 Lafayette Road PS Upgrade.dwg, Jan 31, 2017 - 9:33am  
 D:\woodardcurran.net\shares\Projects\227872\Portsmouth, NH - Lafayette Road - PS Upgrade\wpb\227872.01 Lafayette Road PS Upgrade.dwg, Jan 31, 2017 - 9:33am

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STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

ANDREW J. FITZPATRICK  
No. 14289

REV	DESCRIPTION	DATE

DESIGNED BY: NTHB  
DRAWN BY: NTHB

CHECKED BY: SEH  
DATE: 2/27/2017

**WIRING DIAGRAMS**

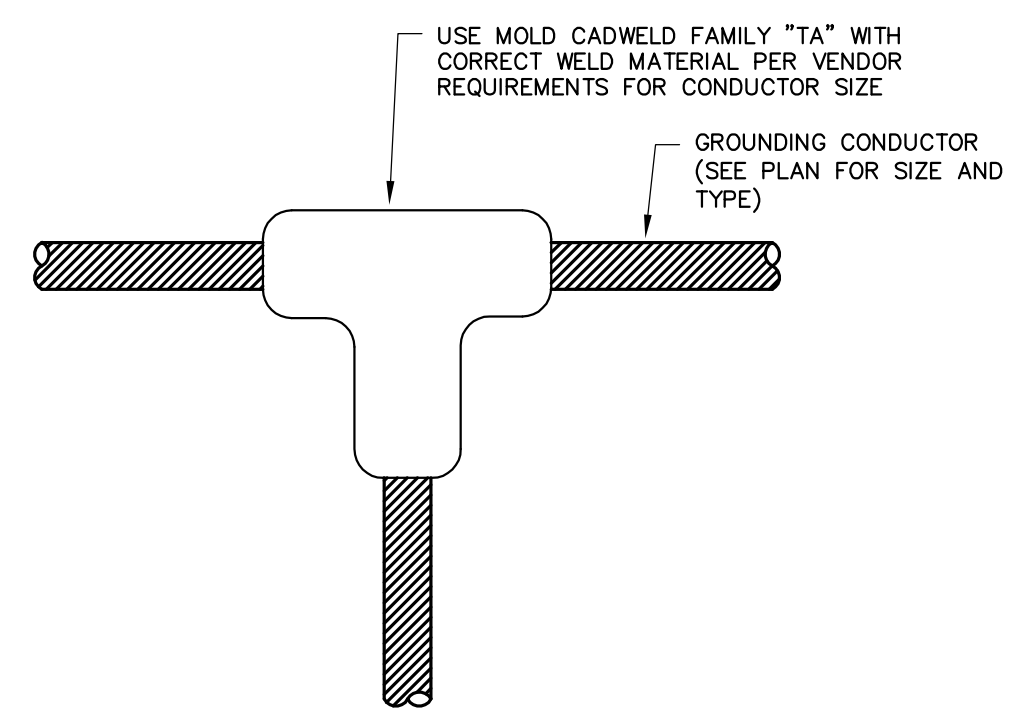
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 51 OF 67

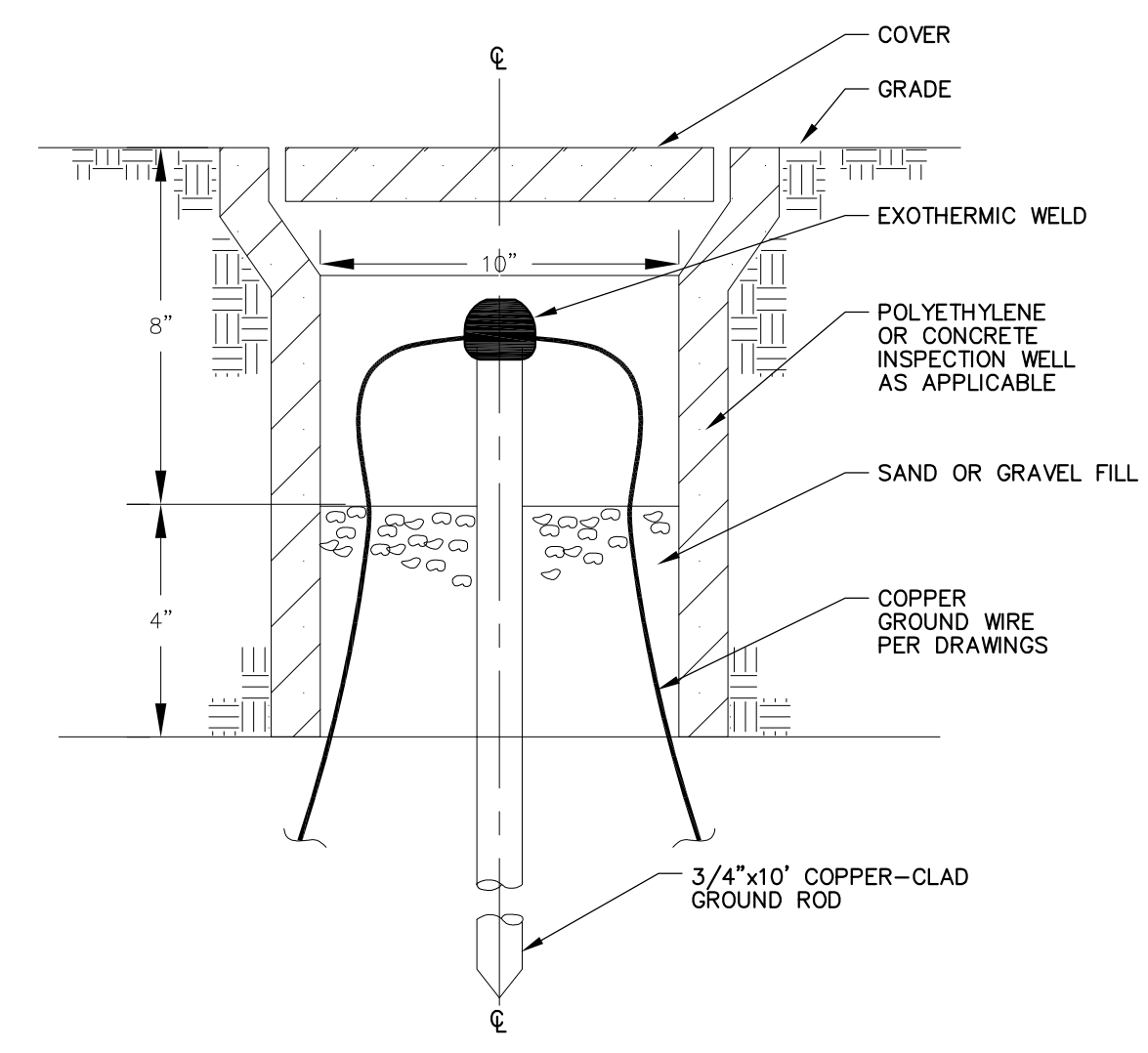
**E-703**

BID SET

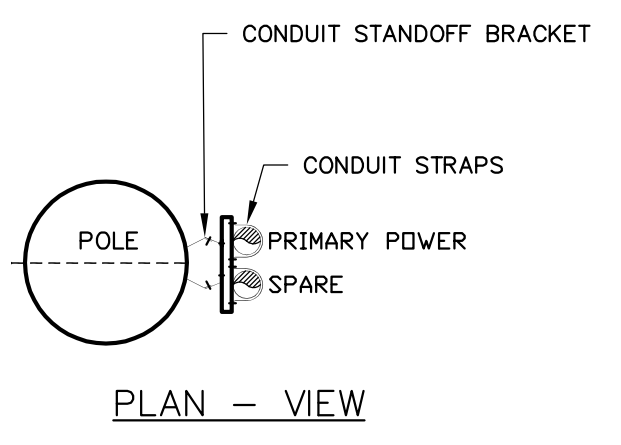


**1 TEE THERMOWELD CONNECTION**  
E-004 SCALE: N.T.S.

- NOTES:**
1. WELLS SHALL BE FLUSH TYPE PRECAST CONCRETE, OR POLYMER CONCRETE PER AREA OF INSTALLATION. PROVIDE BOLTED DOWN COVERS WITH DESCRIPTION "GROUND ROD". PROVIDE STEEL COVERS FOR WELLS IN TRAFFIC AREAS.
  2. TOP OF GROUND TEST WELLS SHALL BE INSTALLED EVEN WITH FINISHED GRADE.

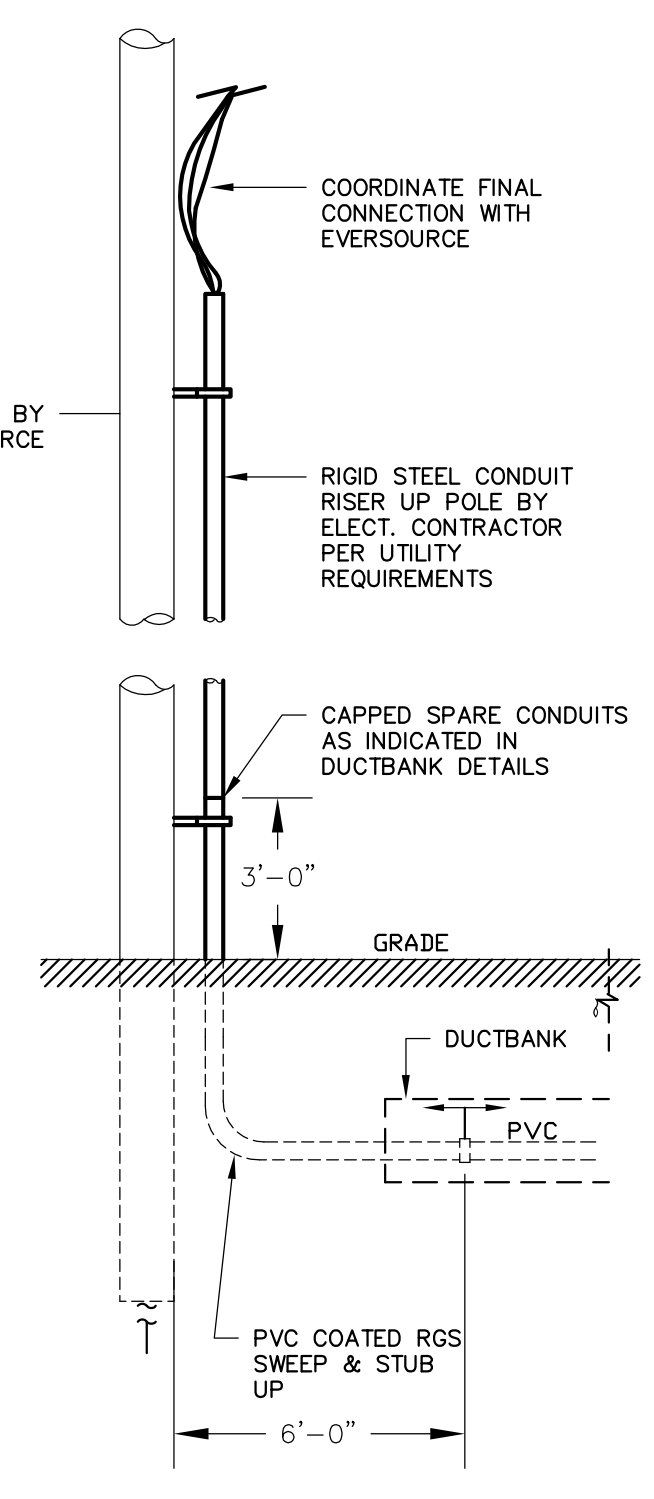


**2 TYPICAL GROUNDING WELL DETAIL**  
E-004 SCALE: N.T.S.

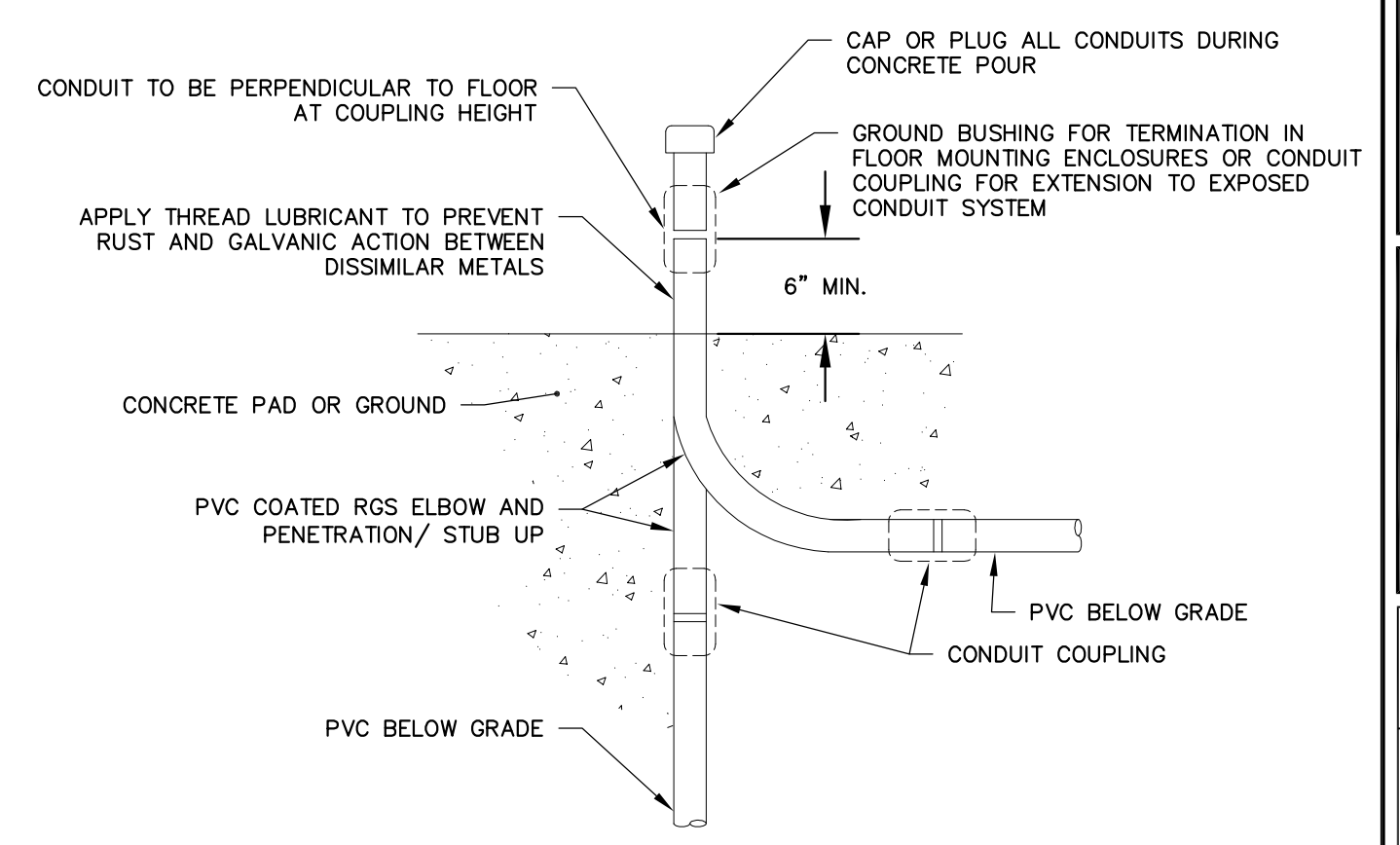


- NOTES:**
1. ALL BENDS SHALL BE LONG SWEEP RIGID STEEL CONDUIT ELBOWS WHERE BEND RADIUS IS LESS THAN 15'.
  2. DETAIL IS SHOWN DIAGRAMMATIC ONLY. FINAL QUANTITY AND SIZE OF CONDUITS SHALL BE AS INDICATED ON THE DRAWINGS.

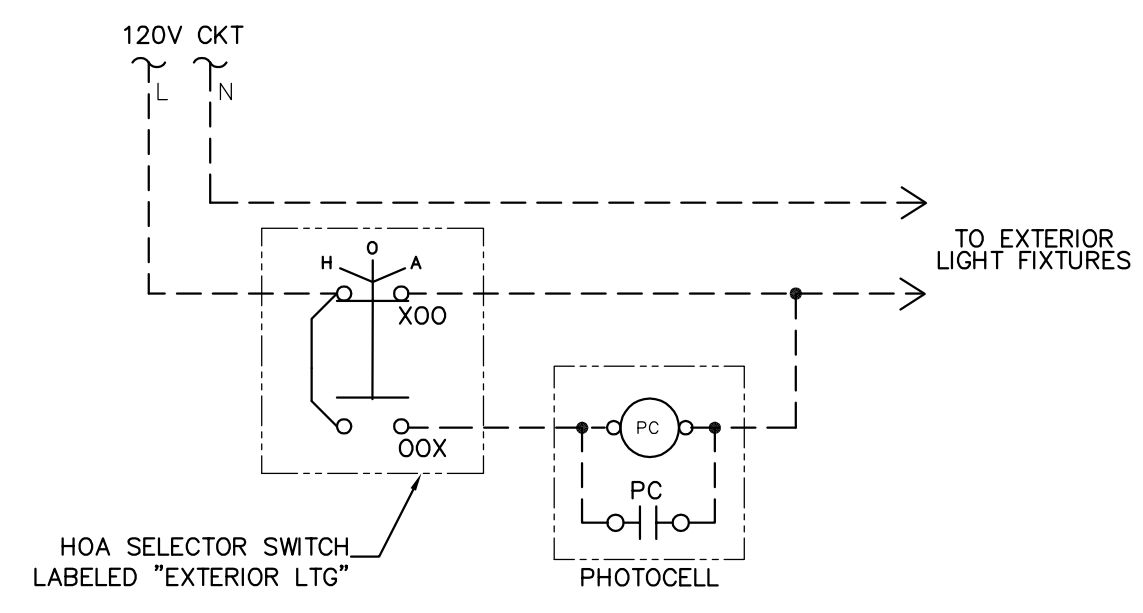
**3 RISER POLE DETAIL**  
E-004 SCALE: N.T.S.



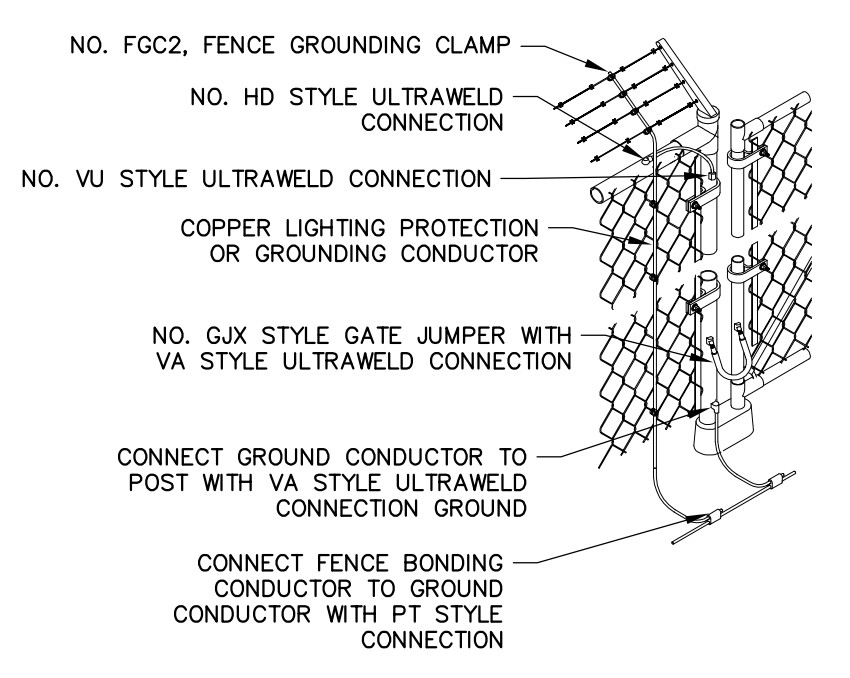
- NOTES:**  
APPLICABLE FOR ALL IN-SLAB AREAS UNLESS NOTED OTHERWISE.



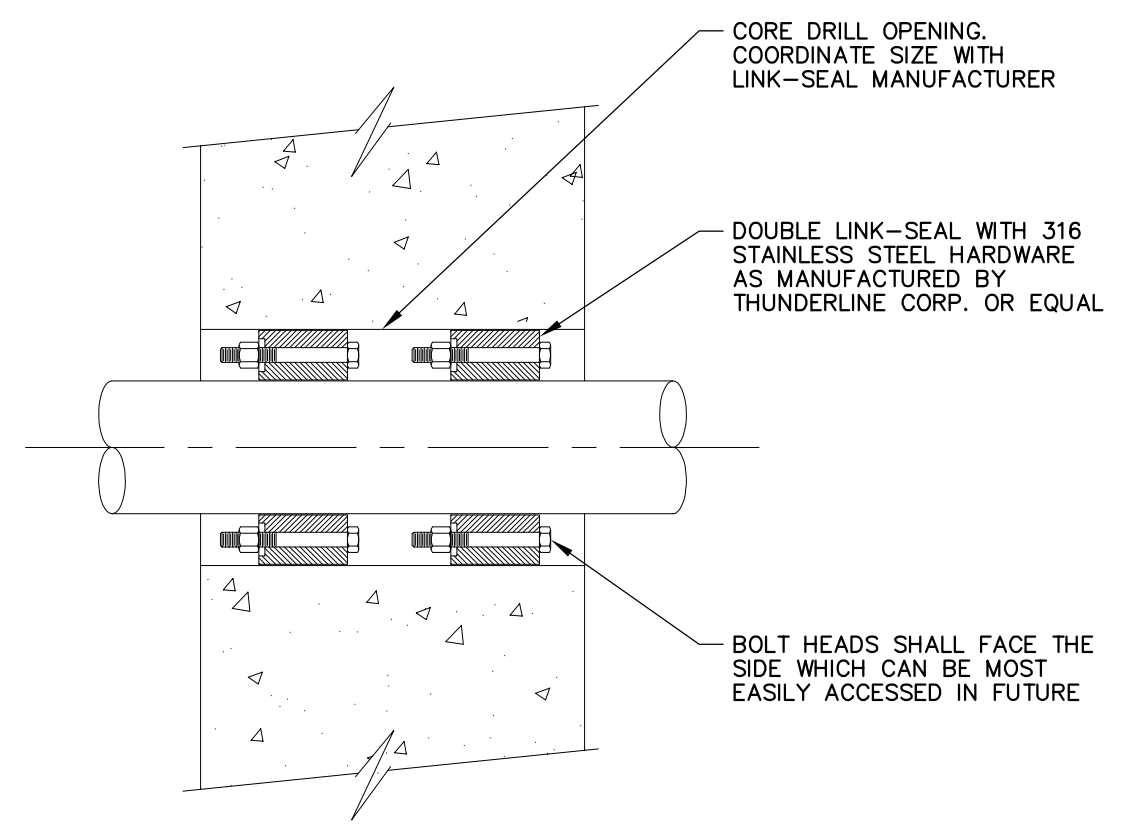
**4 TYPICAL CONDUIT STUB-UP DETAIL**  
E-004 SCALE: N.T.S.



**5 EXTERIOR LIGHTING CONTROL WIRING DIAGRAM**  
E-301 SCALE: N.T.S.

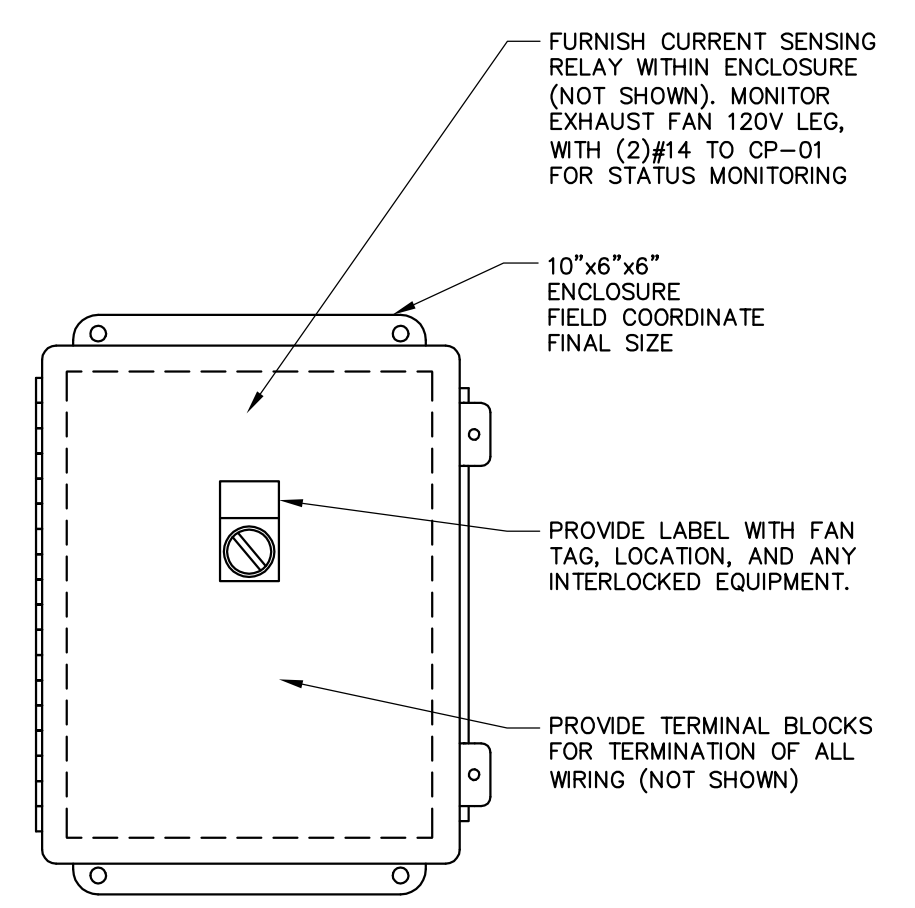


**6 TYPICAL FENCE & GATE BONDING DETAIL**  
E-004 SCALE: N.T.S.



**7 CONDUIT PENETRATION DETAIL**  
E-004 SCALE: N.T.S.

- NOTE:**  
1. REFERENCE ASSOCIATED WIRING DIAGRAMS ON SHEETS E-702 AND E-703 FOR FURTHER DETAILS.



**8 HVAC CONTROL ENCLOSURE DETAIL**  
E-101, E-702, E-703 SCALE: NO SCALE

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REGISTERED PROFESSIONAL ENGINEER  
STATE OF NEW HAMPSHIRE - 3323  
ANDREW J. FITZPATRICK  
No. 14289

REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
DRAWN BY: NTHB  
CHECKED BY: SEH  
2/27/2017 - E-801.dwg

**ELECTRICAL DETAILS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

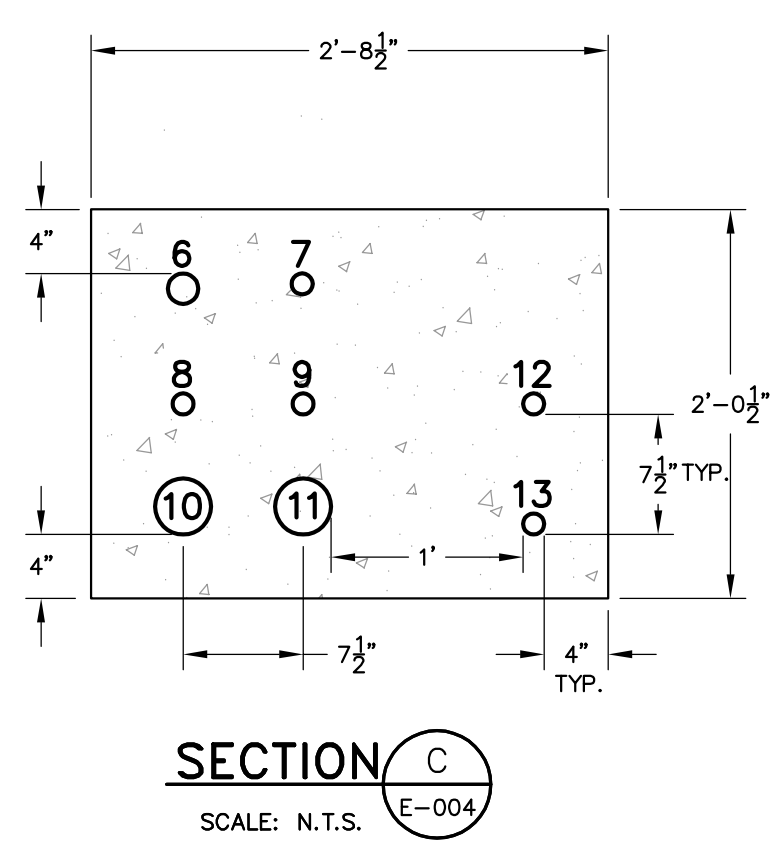
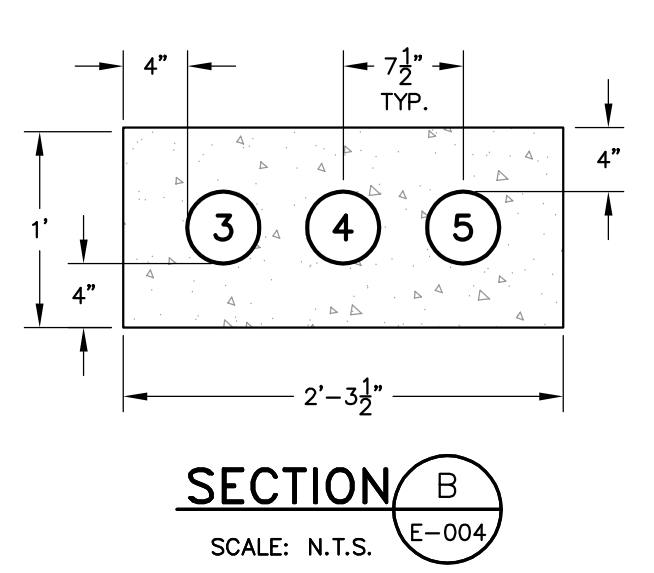
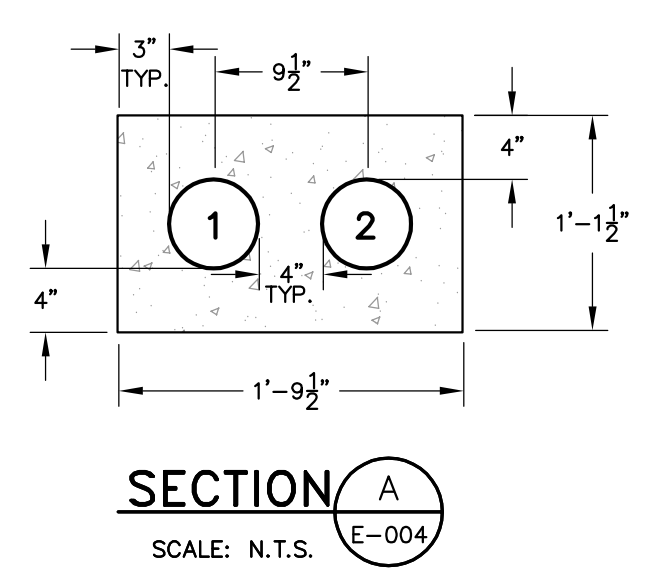
LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: AS SHOWN
SHEET: 52 OF 67

**E-801**

BID SET

**GENERAL NOTES:**  
1. REFERENCE DUCTBANK SCHEDULE THIS SHEET FOR CONDUIT DESIGNATIONS.

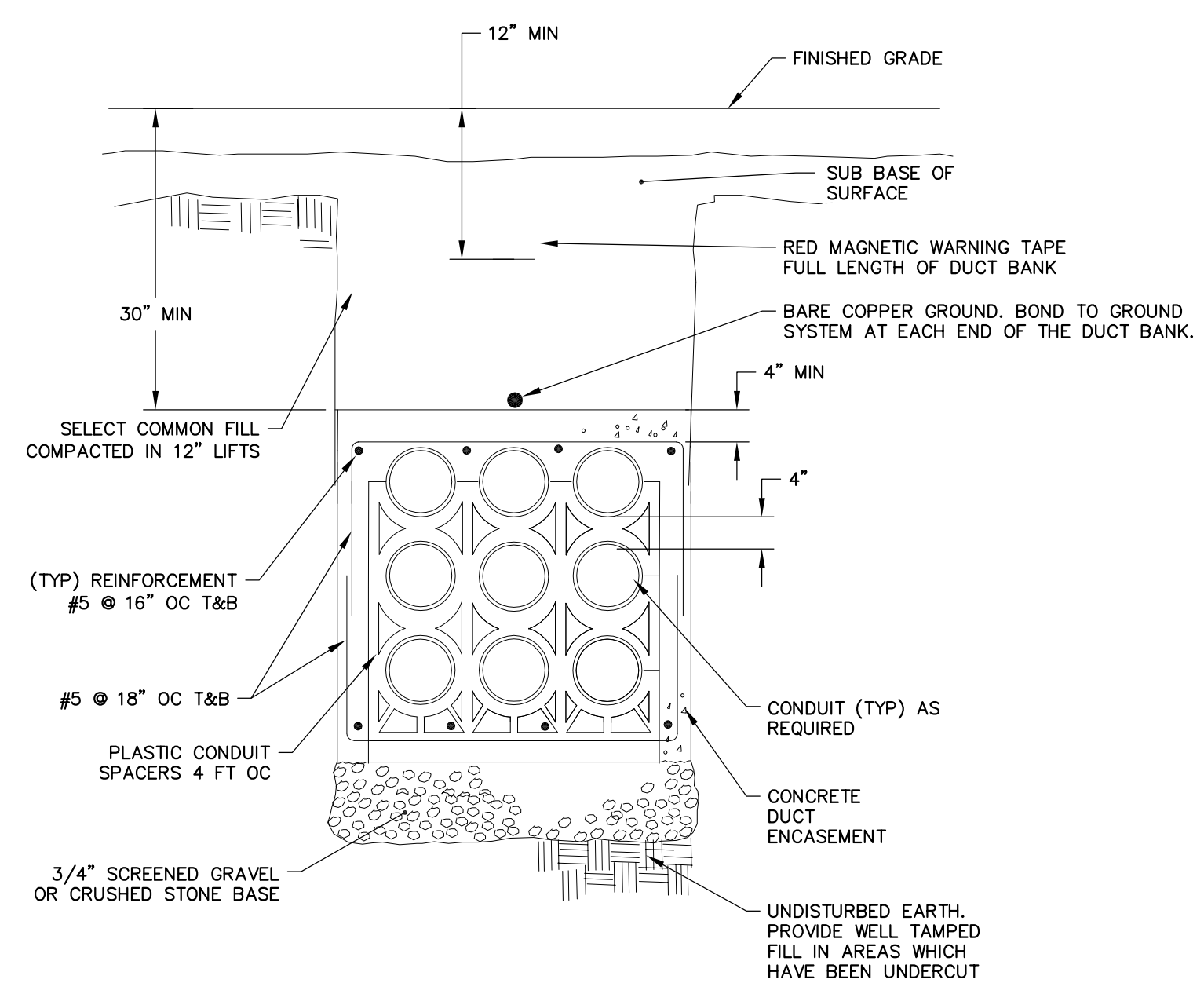


**DUCTBANK SECTIONS**

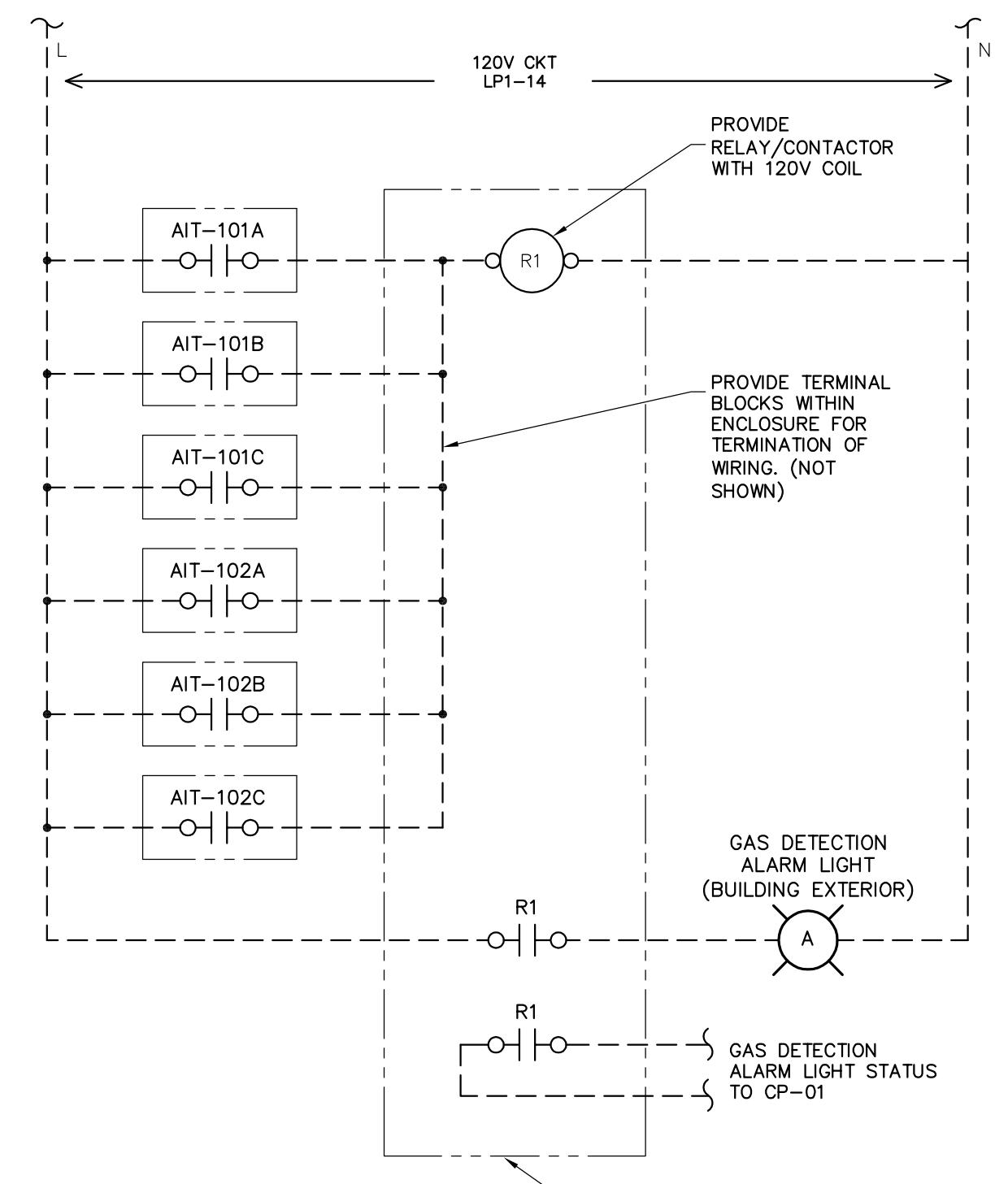
DUCTBANK SCHEDULE				
CONDUIT ID	SIZE	FROM	TO	FUNCTION
1	5"	UTILITY RISER	PADMOUNT TRANSFORMER	POWER
2	5"	UTILITY RISER	PADMOUNT TRANSFORMER	POWER
3	4"	PADMOUNT TRANSFORMER	MCB	POWER
4	4"	PADMOUNT TRANSFORMER	MCB	POWER
5	4"	PADMOUNT TRANSFORMER	MCB	SPARE
6	1 1/2"	PANEL P1 & IDU-1	AC-1	AC-1 POWER, IDU-1 POWER
7	1"	IDU-1	GENERATOR	SPARE
8	1"	PANEL P1	GENERATOR BATTERY CHARGER	POWER
9	1"	PANEL P1	GENERATOR BLOCK HEATER	POWER
10	3"	ATS	GENERATOR	POWER
11	3"	ATS	GENERATOR	POWER
12	1"	SCADA CONTROL PANEL & ATS	GENERATOR CP	CONTROL (STATUS & 2-WIRE START)
13	1"	ATS	GENERATOR CP	SPARE

**DUCTBANK SCHEDULE**

- SITE DUCTBANK NOTES:**
- REFERENCE DUCTBANK SECTION DETAILS (THIS SHEET) FOR DUCTBANK REQUIREMENTS.
  - PROVIDE MINIMUM 1"-0" SPACING WITHIN DUCTBANK BETWEEN POWER AND COMMUNICATIONS CONDUITS.
  - QUANTITY OF DUCTS SHOWN IN DETAIL ARE SHOWN DIAGRAMMATICALLY ONLY TO IDENTIFY GENERAL CONSTRUCTION AND SPACING REQUIREMENTS. QUANTITY AND SIZE OF CONDUITS SHALL BE AS IDENTIFIED IN THE DUCTBANK SCHEDULE.
  - MINIMUM DEPTH OF 30" TO TOP OF DUCT BANK FROM GRADE.



**REINFORCED CONCRETE ENCASED UNDERGROUND DUCT BANK**  
SCALE: N.T.S. E-004



**NOTE:**  
GAS DETECTION AITs ARE LOCATED IN A CLASS 1 DIVISION 1 AND CLASS 1 DIVISION 2 ENVIRONMENT FOR THE WET WELL AND ODOR CONTROL ROOM, RESPECTIVELY. ALL ELECTRICAL SHALL BE INSTALLED ACCORDINGLY WITH SEALED CONDUITS AND NEMA 7 ENCLOSURES, FITTINGS, ETC.

**GAS DETECTION SYSTEM ALARM LIGHT CONNECTION DETAIL**  
SCALE: N.T.S. E-201

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REV	DESCRIPTION	DATE

DESIGNED BY: SEH  
CHECKED BY: SEH  
DRAWN BY: NTHB  
2/27/2017 E-802.dwg

**ELECTRICAL DETAILS, DUCTBANK SCHEDULES AND SECTIONS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: AS NOTED  
SHEET: 53 OF 67

**E-802**

BID SET

ELECTRICAL SYMBOLS

PANEL NOTES

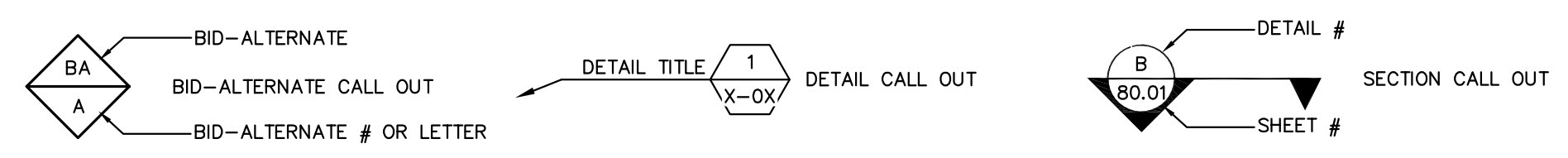
FIELD NOTES

	LIMIT SWITCH NORMALLY CLOSED		TRANSFORMER
	LIMIT SWITCH HELD CLOSED		
	LIMIT SWITCH NORMALLY OPEN		CURRENT TRANSFORMER
	LIMIT SWITCH HELD OPEN		
	FLOAT SWITCH NORMALLY OPEN		THERMOCOUPLE
	PRESSURE SWITCH NORMALLY OPEN		
	RTD SENSOR		MOTOR
	TEMPERATURE SWITCH NORMALLY OPEN		
	TIME SWITCH (DROP OUT) NORMALLY OPEN		MUSHROOM PUSH BUTTON NORMALLY OPEN
	TIME SWITCH (PULL IN) NORMALLY OPEN		
	FLOW SWITCH NORMALLY OPEN		REVISION REFERENCE
	PUSH BUTTON NORMALLY CLOSED		
	PUSH BUTTON NORMALLY OPEN		ITEM REFERENCE
	NOTE REFERENCE		
	TERMINAL NUMBER		BREAK
	SELECTOR SWITCH 2 POSITION		
	SELECTOR SWITCH 3 POSITION		PANEL WIRING
	SELECTOR SWITCH 4 POSITION		
	SHIELDED CABLE		WIRES CROSSING
	WIRES CONNECTING		
	3 PHASE HEATER (DELTA)		3 PHASE HEATER (WYE)
	3 PHASE HEATER (WYE)		
	3-POLE CIRCUIT BREAKER		MOTOR PROTECTOR
	MOTOR PROTECTOR		
	3-POLE CONTACTOR		3-POLE DISCONNECT
	3-POLE DISCONNECT		
	120 VAC RECEPTACLE		TRANSFORMER
	TRANSFORMER		

- INCLUDE A DRAWING POCKET INSIDE THE PANEL LARGE ENOUGH TO STORE A COMPLETE SET OF SYSTEM DIAGRAMS, AND DRAWINGS.
- ANALOG CABLES: 2 CONDUCTOR WITH SHIELD. BELDEN #8760 OR EQUAL.
- LEAVE FREE SPACE ABOVE PLC FOR VENTILATION.
- IDENTIFY ALL WIRES AS SPECIFIED BY THE NATIONAL ELECTRICAL CODE HANDBOOK AND THE FOLLOWING:
 

POWER DISTRIBUTION WIRES.....BLACK
NEUTRAL WIRES.....WHITE
AC CONTROL CIRCUIT WIRES.....RED
DC CONTROL CIRCUIT WIRES.....BLUE
DC COMMON WIRES.....WHITE W/BLEU STRIPE
GROUND WIRES.....GREEN W/YELLOW STRIPE
WIRES THAT MAY REMAIN ENERGIZED WHEN THE MAIN DISCONNECT IS IN THE OFF POSITION.....ORANGE
- SIZE ALL WIRE IN ACCORDANCE WITH NEC CODES. SINGLE CONDUCTORS: STRANDED COPPER WITH THWN INSULATION, RATED FOR 600 VAC, AND UL LISTED AS MTW, UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZE: #14AWG. #16 AWG MAY BE USED ONLY FOR THE INDIVIDUAL WIRES CONNECTING DIRECTLY TO AN I/O TERMINAL ON THE PLC SWING ARM. THE HOT AND NEUTRAL CONDUCTOR SUPPLYING EACH SWING ARM SHALL REMAIN #14 AWG. GROUND CONDUCTOR SIZE: AS INDICATED ON THE DRAWINGS. WHERE NOT INDICATED, THEY SHALL BE #14 AWG OR LARGER.
- BOND PLC CHASSIS, PANEL DOORS, SIDE PANELS, BACK PANELS AND GROUND BUS TOGETHER WITH WIRES SIZED AS SHOWN ON THE DRAWING.
- TAG ALL WIRES AT EVERY TERMINATION POINT. SHORT WIRE LENGTHS, (LESS THAN 8") WHERE THE ENTIRE CONDUCTOR IS VISIBLE MAY BE TAGGED AT JUST ONE END. WIRE LABELS FOR WIRES SMALLER THAN NO. 4, SHALL BE VINYL, SELF ADHESIVE, WRAPAROUND, WITH MACHINE PRINTED NUMBERS AND LETTERS. WIRE SIZES NO. 4 AND LARGER AND MULTI CONDUCTOR CABLES SHALL BE MARKED WITH ONE-PIECE, NYLON LOCKING MACHINE PRINTED MARKER TIES EQUAL TO PANDUIT PLM SERIES. WIRE TAG NUMBER SHALL BE AS INDICATED ON THE DRAWINGS
- DO NOT ROUTE ANY COMMUNICATION CABLES IN WIREWAYS WITH 120 VAC WIRING. ROUTE ALL THESE CABLES AWAY FROM 120 VAC WIRING. WHERE 120 VAC CONDUCTORS MUST BE CROSSED, DO SO AT RIGHT ANGLES AND PROVIDE AT LEAST 1" SEPARATION.
- CONNECT NO MORE THAN TWO WIRES TO ANY ONE TERMINAL. PROVIDE TERMINAL BLOCKS WITH A SAFETY COVER OR BE FINGER SAFE TO PROTECT PERSONNEL FROM SHOCK. MOUNT ALL TERMINAL BLOCKS ON DIN RAILS. SUPPLY ALL HARDWARE NEEDED TO PROVIDE A COMPLETE TERMINAL STRIP ASSEMBLY, INCLUDING BUT NOT LIMITED TO: MISCELLANEOUS SEPARATORS, TOP JUMPER BARS, SIDE JUMPER BARS, MACHINE PRINTED TERMINAL BLOCK TAGS, FASTENERS, BRACKETS FOR RAISING 35MM RAIL, ETC
- RAISE ALL TERMINAL STRIPS SET BETWEEN WIREWAYS TO FACILITATE WIRING. INSTALL END BARRIERS FOR EACH STYLE OF TERMINAL. INSTALL END STOPS ON EACH SECTION OF TERMINALS OR RELAYS. USE MACHINE PRINTED TAGS TO MARK TERMINAL STRIPS. WHEREVER POSSIBLE, MAKE ALL TERMINAL BLOCK CONNECTIONS FOR THE PANEL WIRING ON THE TOP OR RIGHT SIDE OF THE TERMINAL STRIP AND LEAVE THE BOTTOM OR LEFT SIDE FREE FOR FIELD TERMINATIONS, UNLESS NOTED OTHERWISE.
- PROVIDE ENGRAVED PLASTIC NAMEPLATES. EITHER PAINT FILLED ENGRAVINGS OR 2 COLOR LAMINATIONS ARE ACCEPTABLE.
- ALL OPERATOR CONTROL DEVICES (BUTTONS, SWITCHES, METERS, DISPLAYS, ETC.) SHALL HAVE NAMEPLATES.
- PROVIDE A SET OF AS-BUILT DRAWINGS WITH THE PANEL. THESE SHALL BE COMPLETE, ALLOWING ENGINEER TO PRODUCE A SET OF "RECORD" DRAWINGS SHOWING ALL WIRE NUMBERS WITHIN THE PANEL AND THE DEVICE TERMINAL NUMBERS TO WHICH THEY CONNECT. REQUIRED INFORMATION SHALL INCLUDE BUT NOT BE LIMITED TO:
  - ALL WIRE TAG NUMBERS.
  - TERMINAL CONNECTION POINTS FOR POWER AND NEUTRAL FEEDS.
  - ANY DEVIATIONS FROM THE EQUIPMENT LOCATIONS SHOWN ON THE DRAWINGS. PRIOR APPROVAL SHOULD BE OBTAINED BEFORE MAKING SUCH CHANGES.
- SAVE ALL MATERIAL DATA SHEETS AND LITERATURE. WHERE PRODUCT DATA IS PROVIDED ON THE PACKAGE, MAKE A CLEAR COPY OF THE DATA AND INCLUDE WITH OTHER DATA SHEETS. INCLUDE ALL THIS MATERIAL WITH THE PANEL DURING DELIVERY.
- EQUIPMENT LOCATIONS SHALL BE AS SHOWN ON THE DRAWINGS. THE PANEL BUILDER SHALL NOTIFY ENGINEER OF ANY PHYSICAL CONFLICTS OR OTHER PROBLEMS THAT COULD CAUSE PROBLEMS WITH THE INSTALLATION OR OPERATION OF THE PANEL BEFORE ASSEMBLING THE PANEL. RESOLUTION OF SUCH CONFLICTS SHALL BE APPROVED BY ENGINEER PRIOR TO PANEL ASSEMBLY.
- PROVIDE ALL EQUIPMENT AS SHOWN ON THE BILL OF MATERIALS INCLUDED IN THIS DRAWING PACKAGE. SUBMIT ANY DEVIATION FROM THE BILL OF MATERIALS FOR APPROVAL IN WRITING PRIOR TO FABRICATION.

MISCELLANEOUS SYMBOLS



- TAKE CARE WHEN CONDUIT ENTRY PENETRATIONS ARE MADE INTO ENCLOSURE TO PREVENT SCATTERING OF DRILL CHIPS & KNOCK-OUT SLUGS. DE-BUR PENETRATIONS AND REMOVE DEBRIS. SEAL ALL CONDUIT ENTRIES INTO ENCLOSURE FROM LIQUIDS & CONTAMINANTS. AVOID CONDUIT ENTRIES OVER CRITICAL COMPONENTS, SUCH AS PLCs AND DRIVES.
- ANALOG CABLES: 2 CONDUCTOR WITH SHIELD. BELDEN #8760 OR EQUAL.
- IDENTIFY ALL WIRES AS SPECIFIED BY THE NATIONAL ELECTRICAL CODE HANDBOOK AND THE FOLLOWING:
 

460 VAC	120/208 VAC
(L1).....BROWN	(L1).....BLACK
(L2).....ORANGE	(L2).....RED
(L3).....YELLOW	(L3).....BLUE
(NEUT).....GREY	(NEUT).....WHITE
24 VDC	INTRINSICALLY SAFE
(ALL).....BLUE	(ALL).....LIGHT BLUE
- SIZE ALL WIRES IN ACCORDANCE WITH NEC CODES. SINGLE CONDUCTORS SHALL BE STRANDED COPPER WITH THWN INSULATION, RATED FOR 600 VAC, AND UL LISTED AS MTW, UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZE SHALL BE #14 AWG. GROUND CONDUCTOR SIZE SHALL BE AS INDICATED ON THE DRAWINGS. WHERE NOT INDICATED, IT SHALL BE #14 AWG OR LARGER.
- LOCATE CONDUIT ENTRIES INTO ENCLOSURES TO ASSURE ADEQUATE WIRE BENDING SPACE. ROUTE WIRING SO THAT DOOR MOUNTED EQUIPMENT WILL NOT INTERFERE WITH IT WHEN THE DOOR IS CLOSED.
- LOCATE INTRINSICALLY SAFE WIRING CONDUIT ENTRIES INTO ENCLOSURE AS CLOSE AS POSSIBLE TO THE WIREWAY PROVIDED FOR INTRINSICALLY SAFE FIELD WIRING SO THAT ALL INTRINSIC WIRING IS ISOLATED (AT LEAST 2") FROM ALL OTHER FIELD AND PANEL WIRING AND SECURED. ROUTE INTRINSICALLY SAFE FIELD WIRING THROUGH THE WIREWAY PROVIDED EXCLUSIVELY FOR INTRINSICALLY SAFE WIRING. ALL WIRING SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 504. OTHER APPLICABLE ARTICLES INCLUDE 501 & 515.
- ENGINEER HAS IDENTIFIED AS MANY OF THE PLC INPUTS AND OUTPUTS AS POSSIBLE THAT WILL BE NEEDED TO MAKE THE CONTROL PROGRAM OPERATE AS REQUIRED. ADDITIONAL I/O MAY BE IDENTIFIED WHEN THE CONTROL PROGRAM IS WRITTEN AND REQUIRE WIRING. THESE SHALL BE CONSIDERED PART OF THESE SHOP DRAWINGS. THE INSTALLING CONTRACTOR SHALL INSTALL 10% SPARE CONDUCTORS TERMINATED ON TERMINAL BLOCKS ON BOTH ENDS TO MEET ADDITIONAL I/O REQUIREMENTS.
- TAG ALL WIRES AT EVERY TERMINATION POINT. SHORT WIRE LENGTHS, (LESS THAN 8") WHERE THE ENTIRE CONDUCTOR IS VISIBLE MAY BE TAGGED AT JUST ONE END. WIRE LABELS FOR WIRES SMALLER THAN NO. 4, SHALL BE VINYL, SELF ADHESIVE, WRAPAROUND, WITH MACHINE PRINTED NUMBERS AND LETTERS. WIRE SIZES NO. 4 AND LARGER AND MULTI CONDUCTOR CABLES SHALL BE MARKED WITH ONE-PIECE, NYLON LOCKING MACHINE PRINTED MARKER TIES EQUAL TO PANDUIT PLM SERIES. WIRE TAG NUMBER SHALL BE AS INDICATED ON THE DRAWINGS.
- DO NOT ROUTE ANY COMMUNICATION CABLES IN WIREWAYS WITH 120 VAC WIRING. ROUTE ALL THESE CABLES AWAY FROM 120 VAC WIRING. WHERE 120 VAC CONDUCTORS MUST BE CROSSED, DO SO AT RIGHT ANGLES AND PROVIDE AT LEAST 1" SEPARATION.
- DO NOT CONNECT MORE THAN TWO WIRES TO ANY ONE TERMINAL.

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John H. Grant  
No. 13718  
LICENSED PROFESSIONAL ENGINEER  
STATE OF NEW HAMPSHIRE

REV	DESCRIPTION	DATE

DESIGNED BY: JHG  
DRAWN BY: SCK  
CHECKED BY: JHG  
I-100-10

SCADA PANEL INSTALLATION LEGEND & NOTES

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

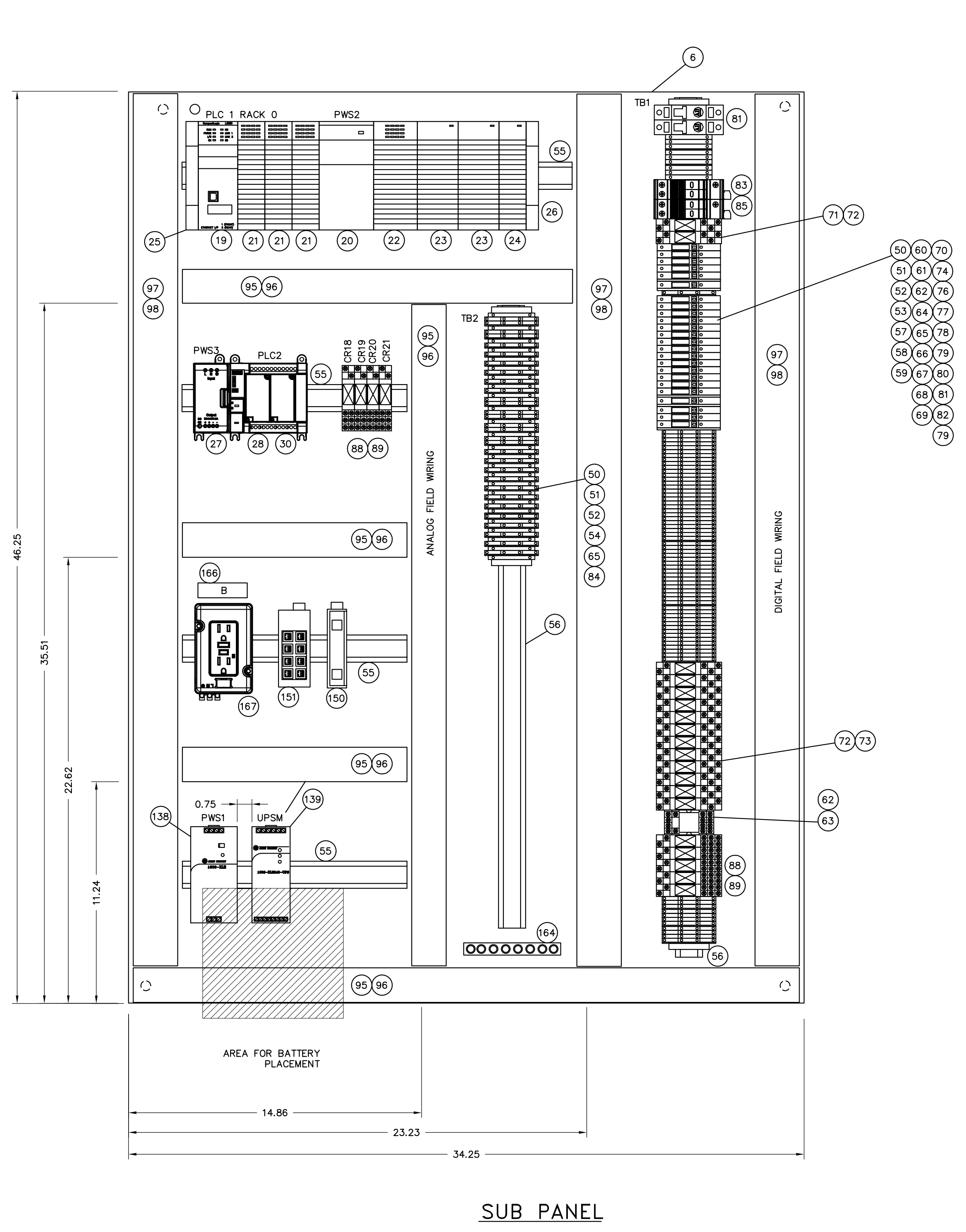
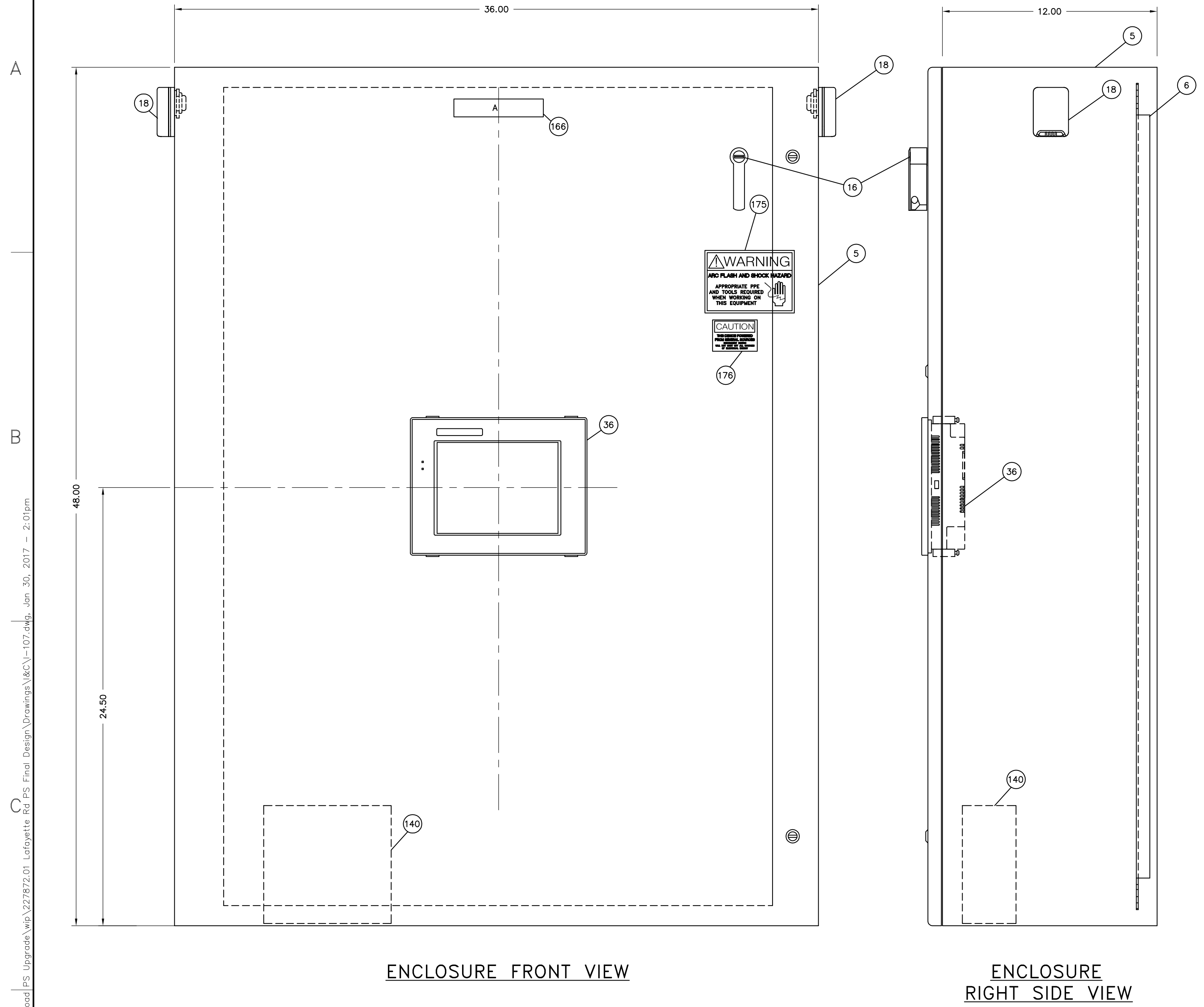
JOB NO.: 227872-00
DATE: FEBRUARY 2017
SCALE: NTS
SHEET: 54 OF 67

\\woodardcurran.net\shares\Projects\227872 Portsmouth, NH - Lafayette Road\PS Upgrade\wp\227872\_01 Lafayette\_Rd\_PS\_Final\_Design\_Drawings\kck\100.dwg, Jan\_30, 2017 - 2:01pm





NAMEPLATE SCHEDULE			
ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 1"	SCADA PANEL	NAMEPLATE TO BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
B	2.50" x .75"	GFCI RECEPTACLE FOR PROGRAMMING ONLY	NAMEPLATE TO BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .125



ENCLOSURE FRONT VIEW

ENCLOSURE RIGHT SIDE VIEW

SUB PANEL

**INSTALLING CONTRACTOR NOTES:**

- 1) CONTRACTOR SHALL USE CAUTION WHEN LANDING CONDUITS IN THE BOTTOM OF ENCLOSURE TO AVOID INTERFERING WITH BATTERY PLACEMENT (ITEM 140).
- 2) CONTRACTOR SHALL INSTALL ENCLOSURE SO THAT BOTTOM OF CABINET IS APPROXIMATELY 36" FROM FLOOR LEVEL TO FACILITATE USE OF OPERATOR INTERFACE (ITEM 36).

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DRAWN BY: SCK	IN CHARGE: JHG

SCADA PANEL EQUIPMENT LAYOUT

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: NTS  
SHEET: 56 OF 67

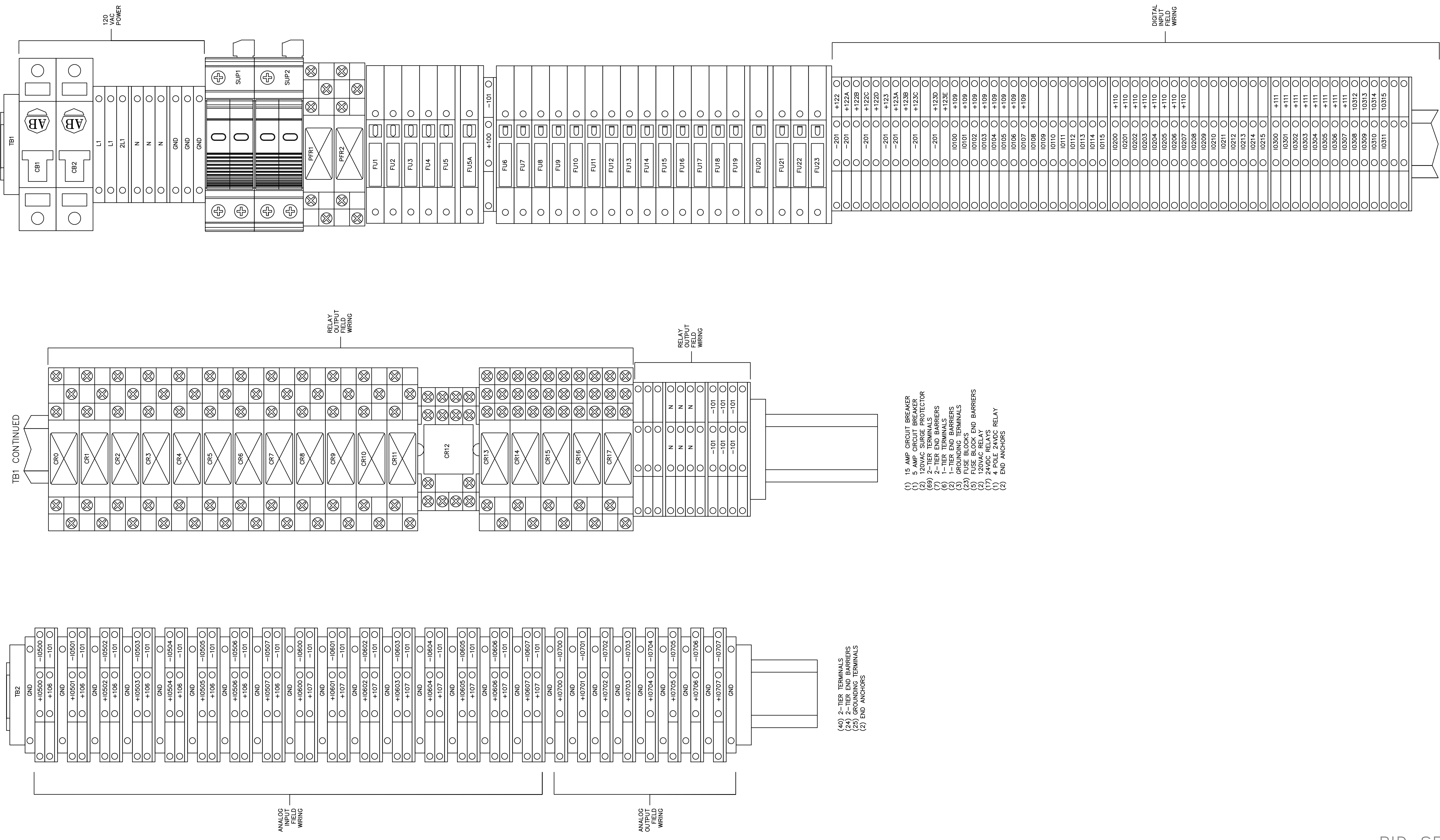
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A

B

C

D



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Grant No. 13718  
STATE OF NEW HAMPSHIRE

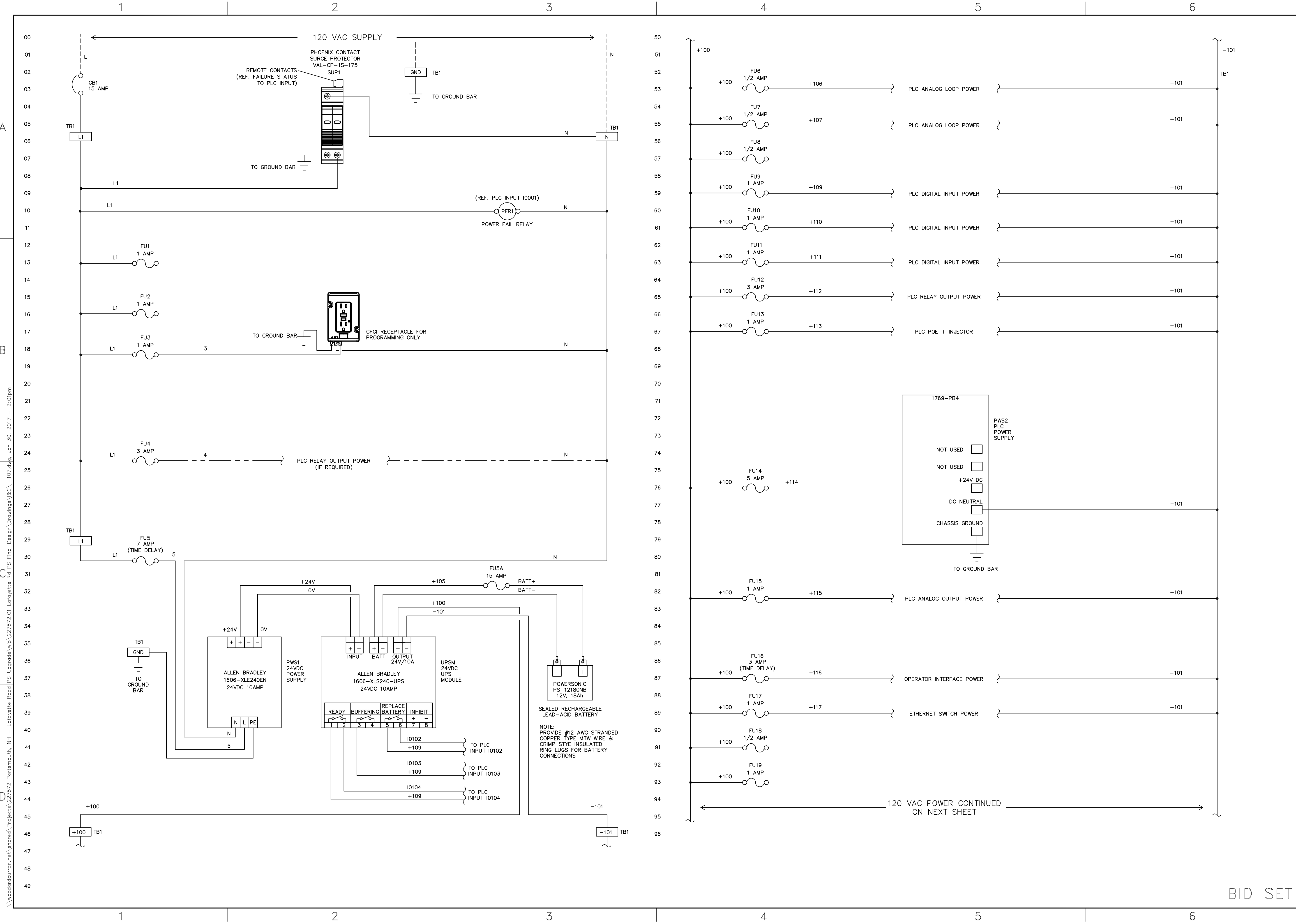
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DESIGNED BY: JHG	CHECKED BY: JHG	
DRAWN BY: SCK		1-107.DWG

**SCADA PANEL TERMINAL BLOCK LAYOUT**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: NTS
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John Grant  
No. 13718  
STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

**SCADA PANEL POWER DISTRIBUTION**  
(SHEET 1 OF 2)

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

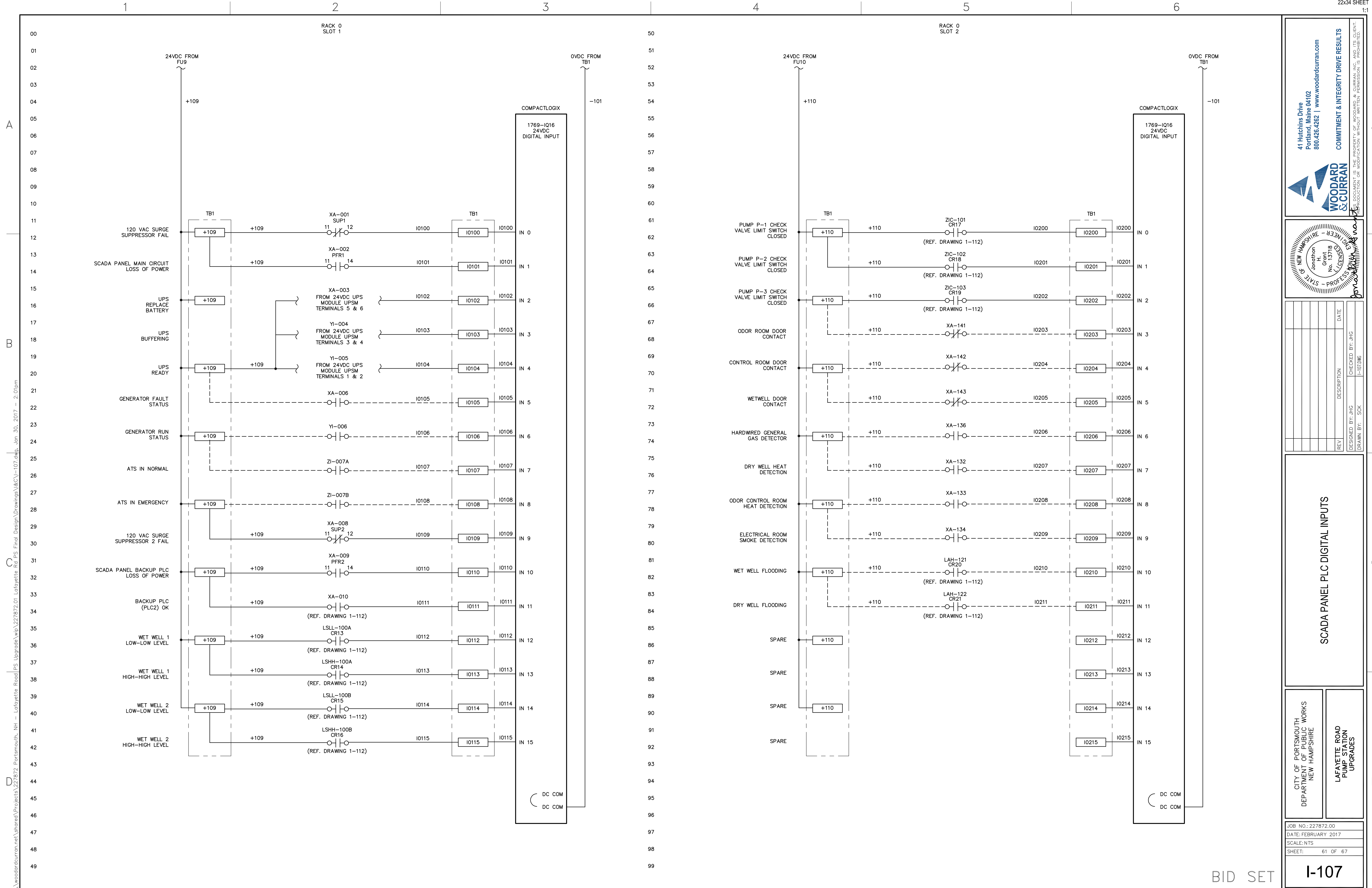
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DATE: FEBRUARY 2017  
SCALE: NTS  
SHEET: 58 OF 67

BID SET

I-104







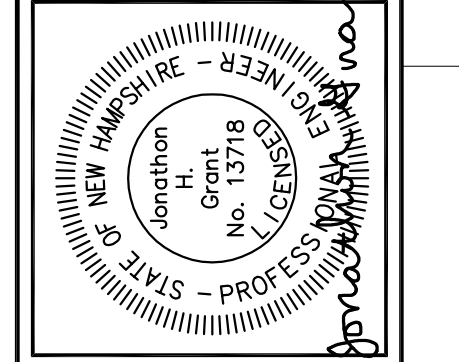
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1	DESIGNED BY: JHG	
2	CHECKED BY: JHG	
3	DRAWN BY: SCK	1-10-17

**SCADA PANEL PLC DIGITAL INPUTS**

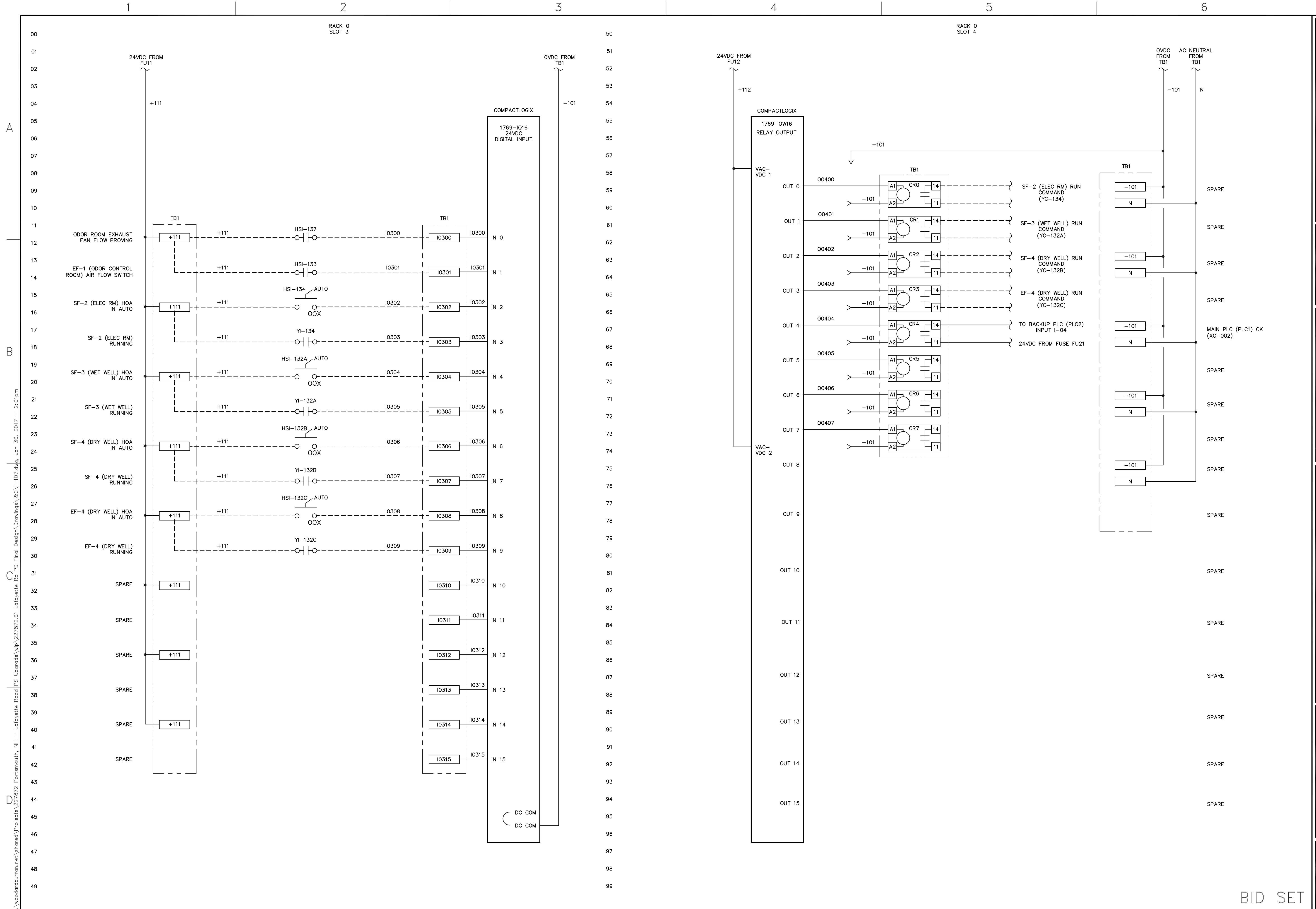
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NEW HAMPSHIRE

LAFAYETTE ROAD  
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UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: NTS  
SHEET: 61 OF 67

**I-107**

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John H. Grant  
No. 13718  
LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

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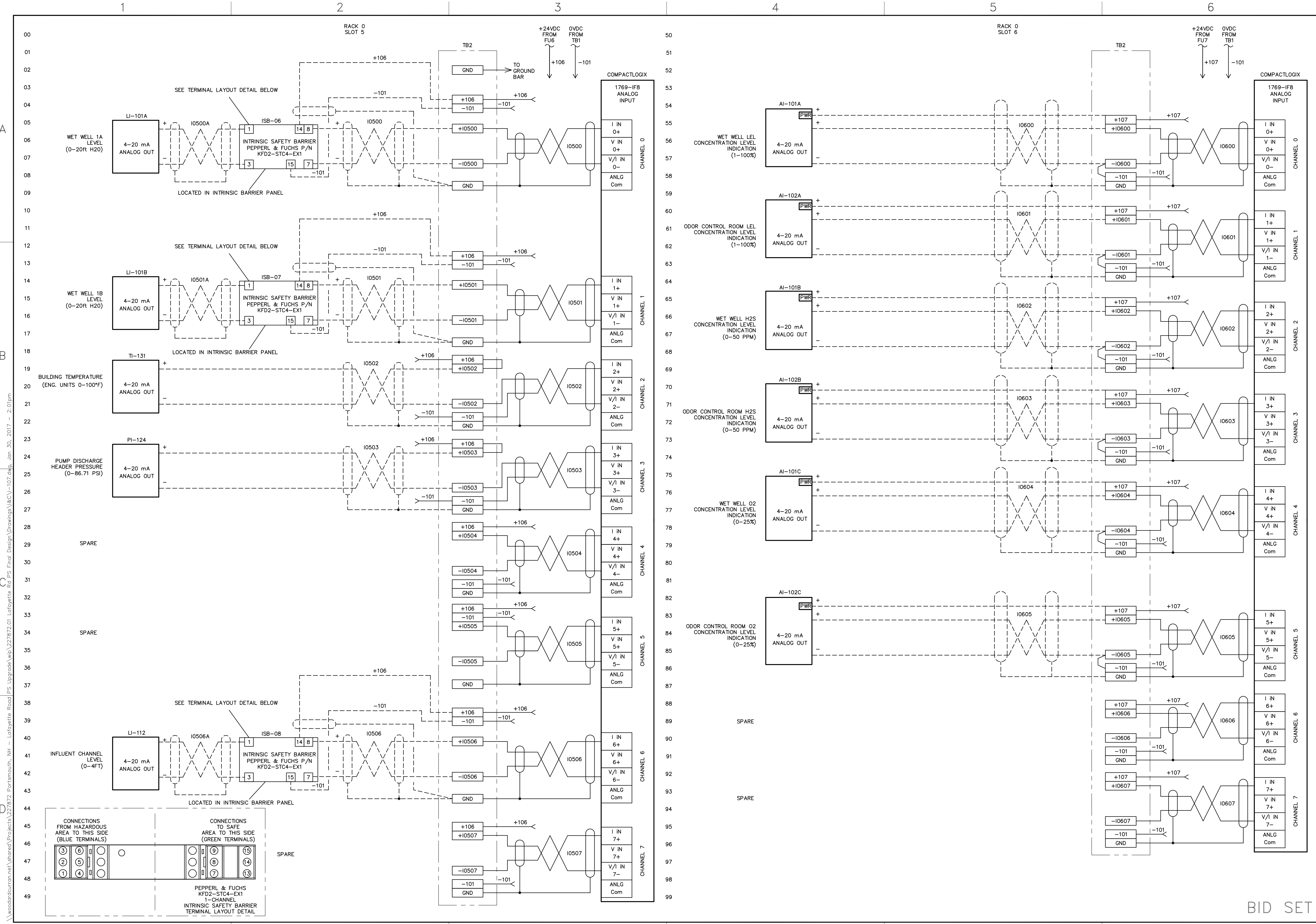
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DRAWN BY: SCK  
CHECKED BY: JHG  
I-107.DWG

**SCADA PANEL PLC BASE I/O DIGITAL INPUTS AND RELAY OUTPUTS**

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NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

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DATE: FEBRUARY 2017  
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SHEET: 62 OF 67



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**SCADA PANEL PLC ANALOG INPUTS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
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UPGRADES

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**I-109**

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DATE: 1-10-17

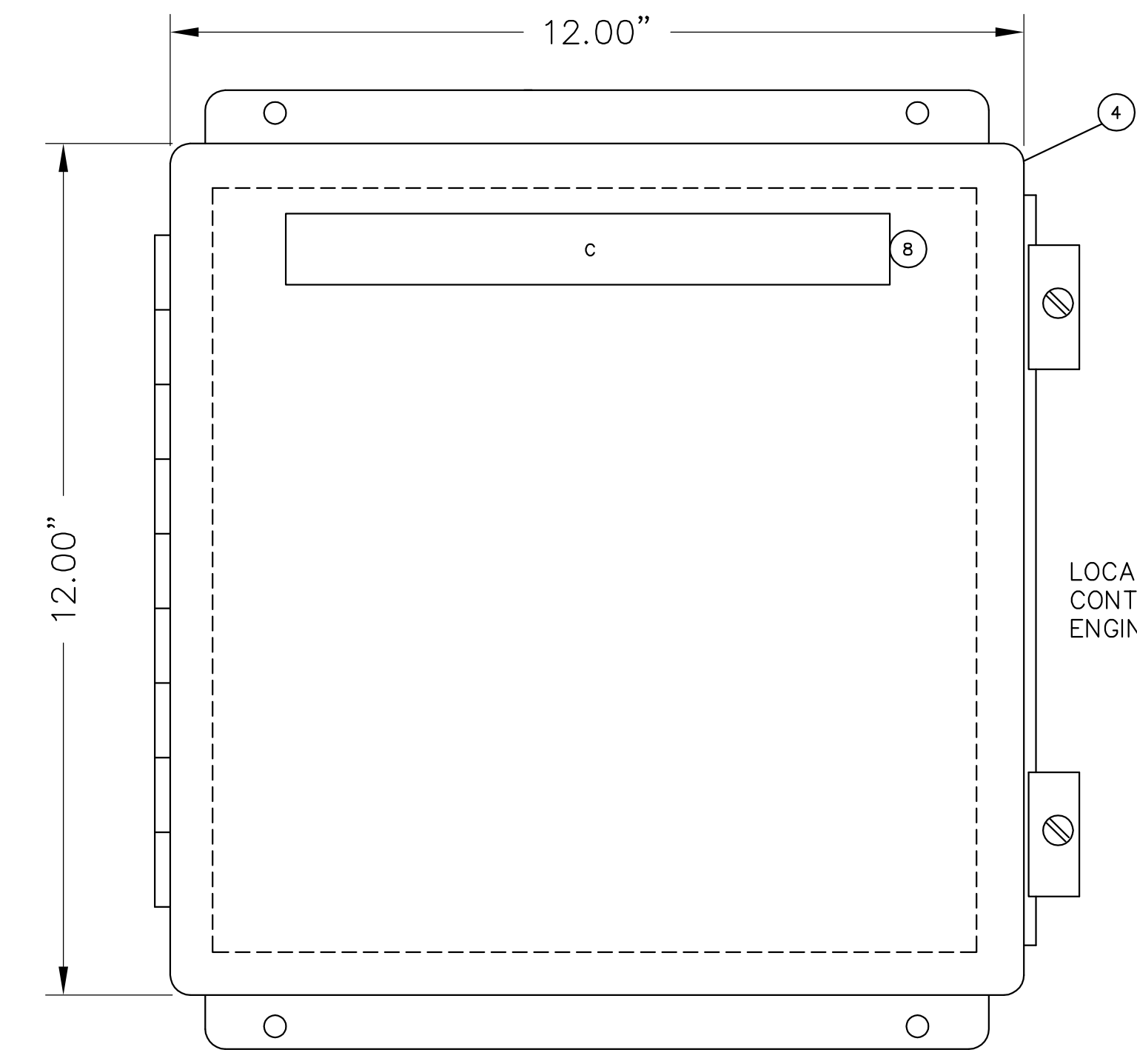




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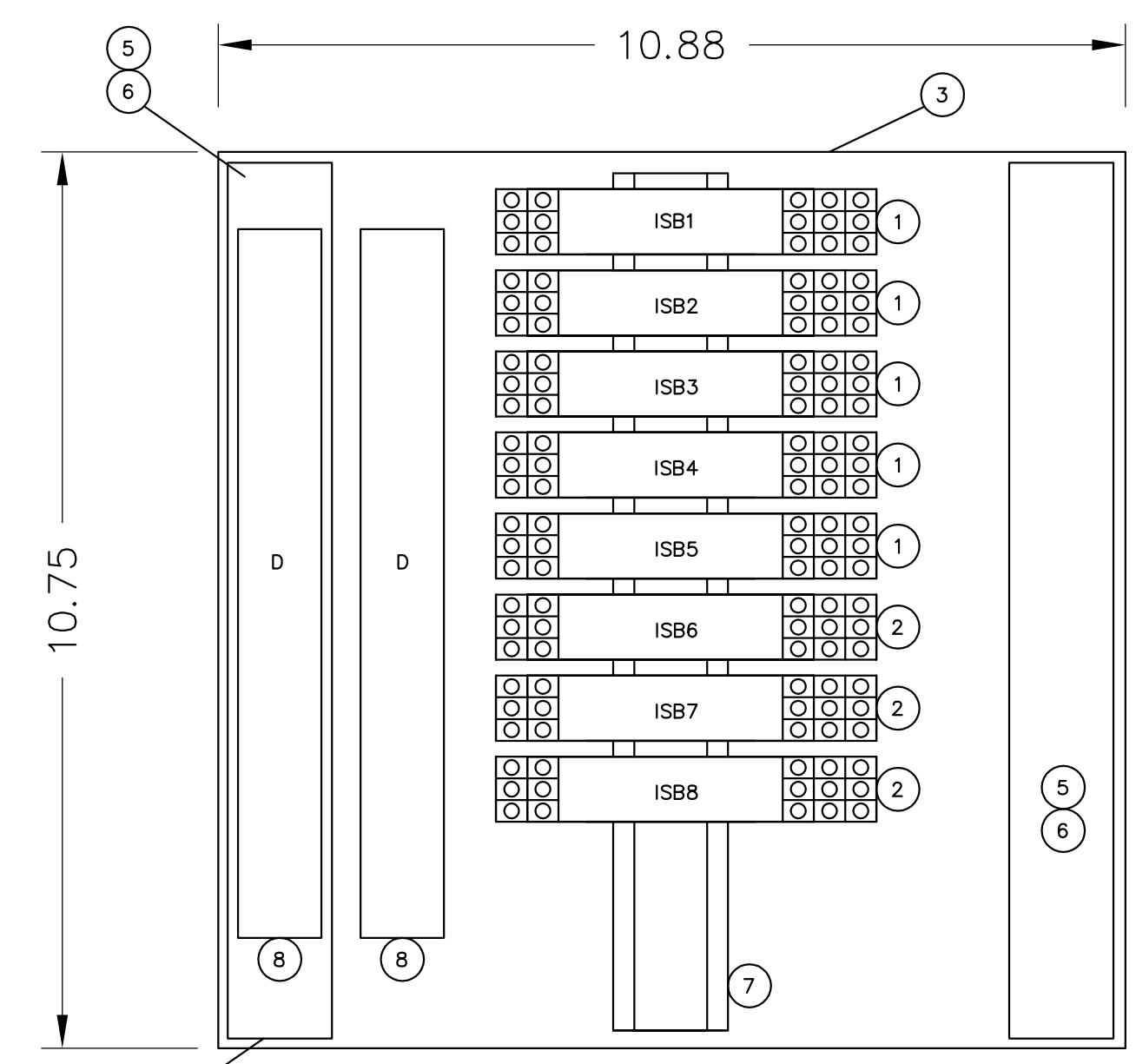
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1	5	PEPPERL & FUCHS	KFD2-SR2-EX2.W	SWITCH ISOLATOR WITH RELAY OUTPUT	INTRINSIC BARRIER ISB1-1SB5
2	3	PEPPERL & FUCHS	KFD2-STC4-EX1	ANALOG ISOLATOR	INTRINSIC BARRIER ISB6-1SB8
3	1	HOFFMAN	A12P12	BACK PANEL, 10.75" x 10.88"	
4	1	HOFFMAN	A-1212CHNF	ENCLOSURE, NEMA 4, 12.00" x 12.00" x 6.00"	
5	6FT	PANDUIT	F1X4LG6	WIRING DUCT, 1"W x 4"H	
6	6FT	PANDUIT	C1LG6	WIRING DUCT COVER, 1"W	
7	1	ALLEN BRADLEY	199-DR1	DIN RAIL, STANDARD	
8	3	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE THIS SHEET
9					
10					
11					

NAMEPLATE SCHEDULE			
ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
C	8.50" x 1"	INTRINSIC BARRIER PANEL	NAMEPLATE TO BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375. QUANTITY: 1
D	8.50" x 1"	INTRINSICALLY SAFE WIRING	NAMEPLATE TO BE YELLOW WITH BLACK LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375. QUANTITY: 2



LOCATION SHALL BE VERIFIED BY CONTRACTOR AND APPROVED BY ENGINEER.

ENCLOSURE



SUB PANEL

WIREWAY FOR INTRINSICALLY SAFE FIELD WIRING. (SEE "FIELD NOTE" #6 ON "LEGEND & NOTES" SHEET).

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STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER

Jonathan Grant  
No. 13718  
LICENSED

REV	DESCRIPTION	DATE

DESIGNED BY: JHG  
DRAWN BY: SCK  
CHECKED BY: JHG  
DATE: 1-10-17

SCADA PANEL INTRINSIC BARRIER PANEL  
EQUIPMENT LAYOUT

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

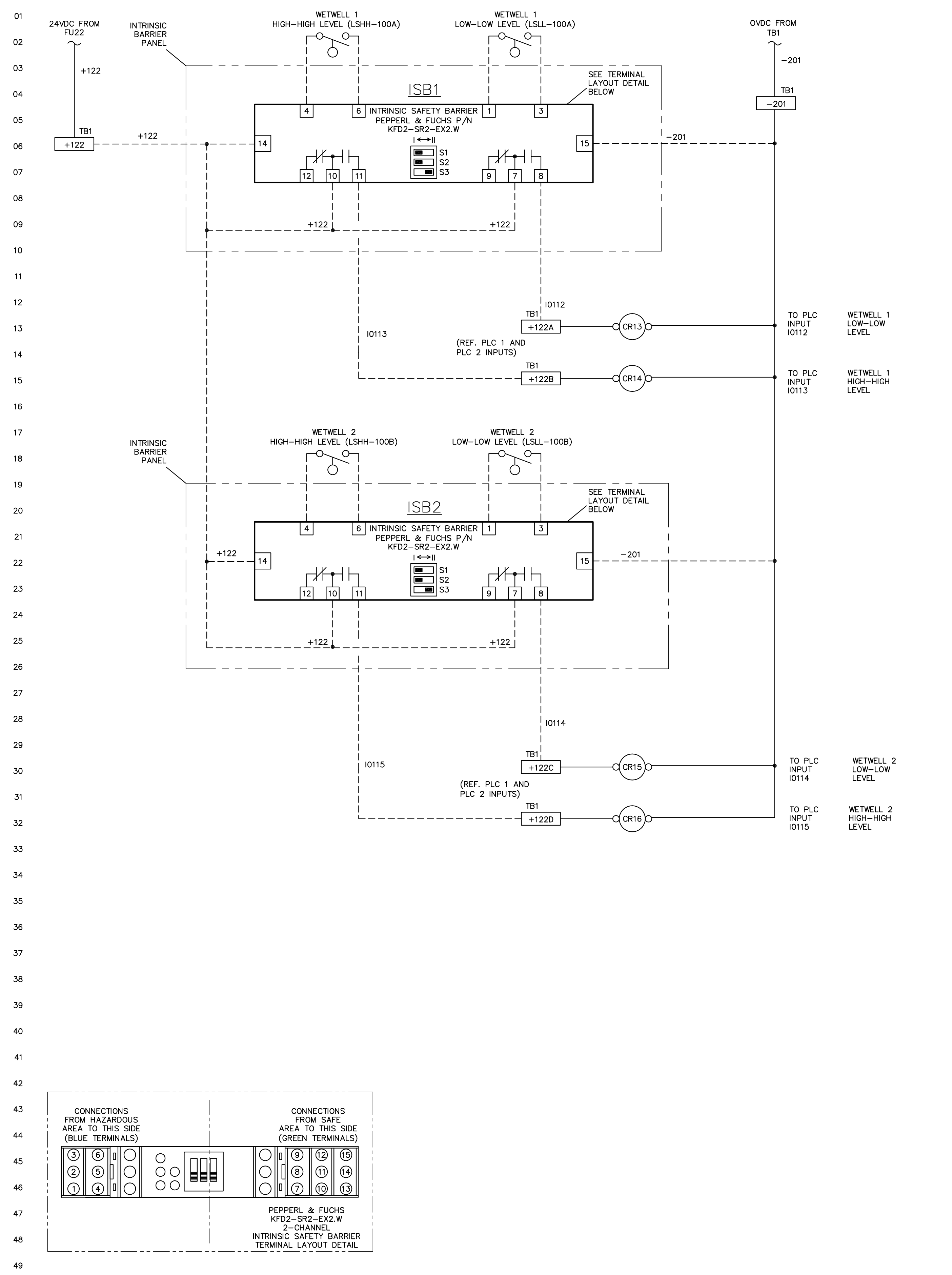
JOB NO.: 227872.00
DATE: FEBRUARY 2017
SCALE: NTS
SHEET: 65 OF 67

I-111

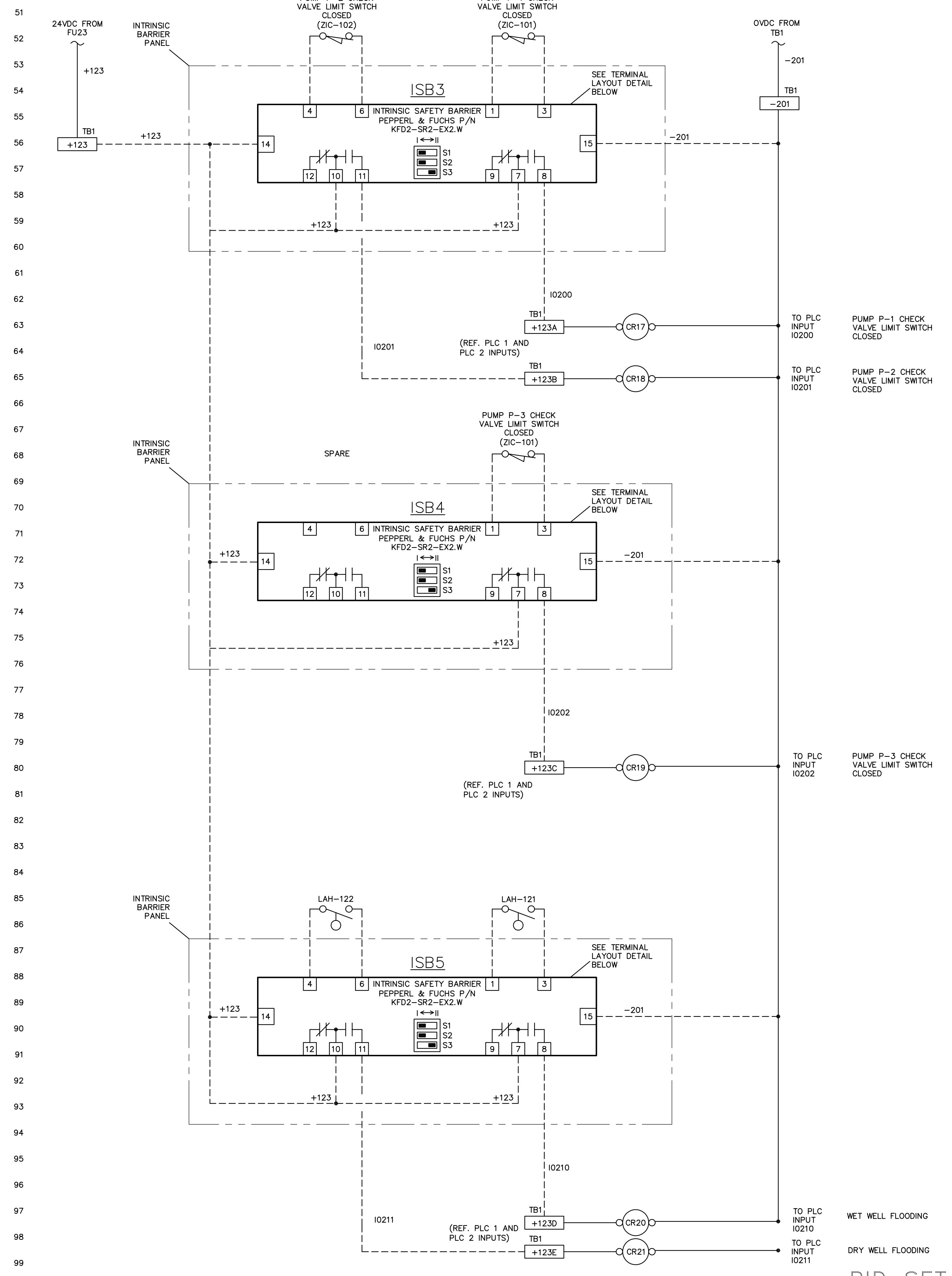
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### INTRINSIC BARRIER PANEL- DIGITAL CIRCUITS



### INTRINSIC BARRIER PANEL- DIGITAL CIRCUITS

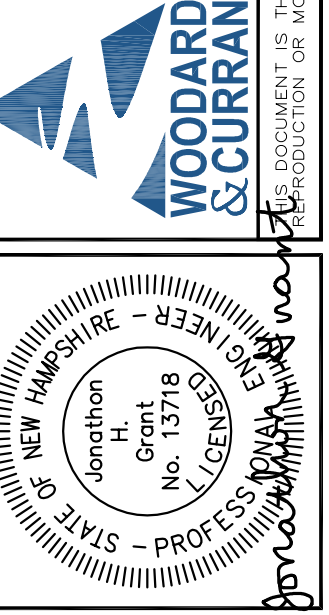


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DRAWN BY: SCK  
I-107.DWG

### SCADA PANEL INTRINSIC BARRIER PANEL WIRING DETAILS

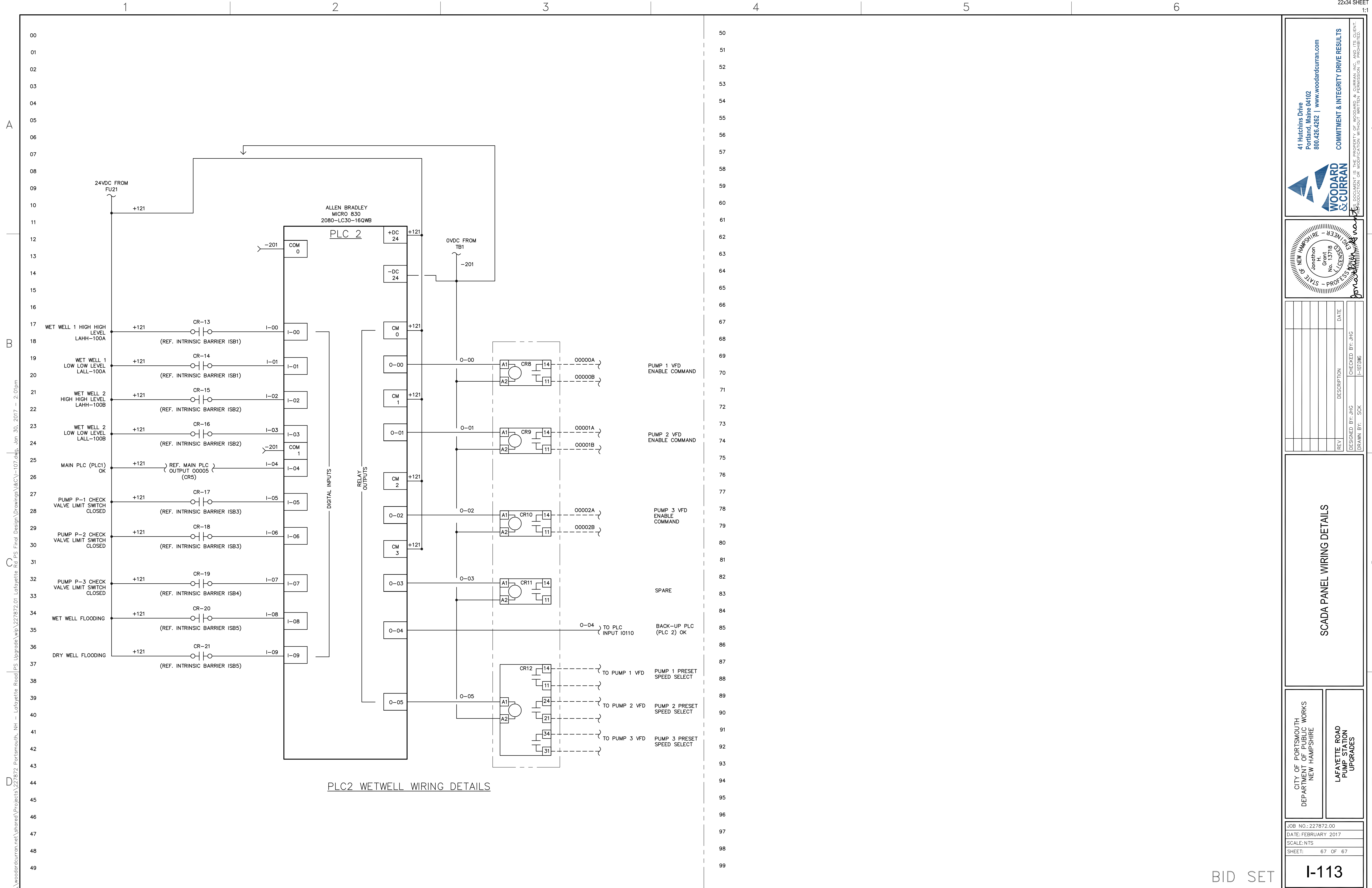
CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: NTS  
SHEET: 66 OF 67

**I-112**

BID SET



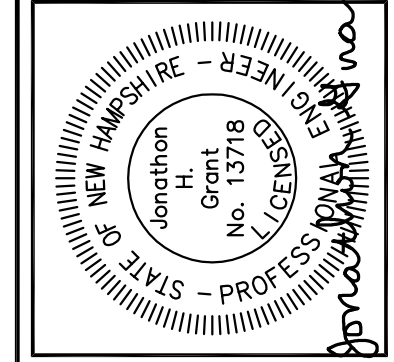
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DRAWN BY: SCK  
CHECKED BY: JHG  
I-107/IMG

**SCADA PANEL WIRING DETAILS**

CITY OF PORTSMOUTH  
DEPARTMENT OF PUBLIC WORKS  
NEW HAMPSHIRE

LAFAYETTE ROAD  
PUMP STATION  
UPGRADES

JOB NO.: 227872.00  
DATE: FEBRUARY 2017  
SCALE: NTS  
SHEET: 67 OF 67