

# TOWN OF LISBON

## CONTRACT #1 WATER SYSTEM IMPROVEMENTS

USDA WEP, ARPA 1361010, DWSRF 1361010, DWGT-82

### CONTROL BUILDING, WELL SITE, CHEMICAL BUILDING ADDITION & MANGANESE TREATMENT

BISHOP ROAD & VALLEY VIEW DRIVE  
LISBON, NEW HAMPSHIRE

APRIL 2025

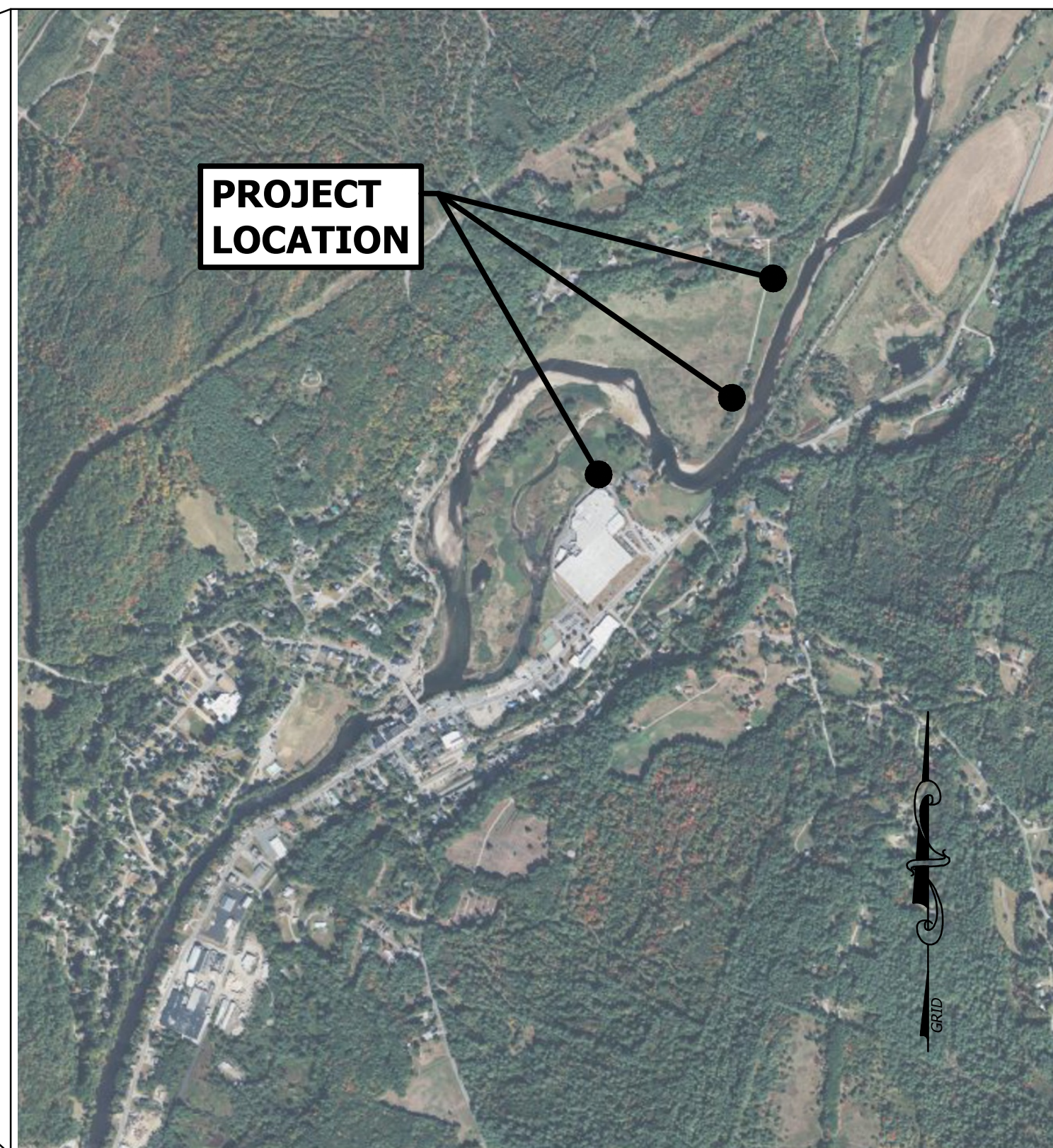
**OWNER:**

LISBON WATER DEPT  
153 SOUTH MAIN ST  
LISBON, NH 03585  
(603) 838-6376

**ENGINEER:**

**horizons**  
*Engineering*

34 SCHOOL STREET  
LITTLETON, NH 03561  
(603) 444-4111



**LOCATION PLAN**

SCALE: 1" = 1000'

**BIDDING PLANS  
NOT FOR CONSTRUCTION**

DATE OF PRINT  
APRIL 17 2025  
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- C2.1 OVERVIEW ABUTTER MAP/ LOT, GENERAL NOTES & LEGEND
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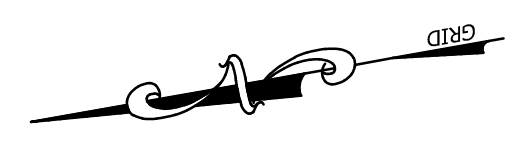


MATCH LINE - SEE BELOW



MATCH LINE - SEE ABOVE

MATCH LINE - SEE SHEET C2.3

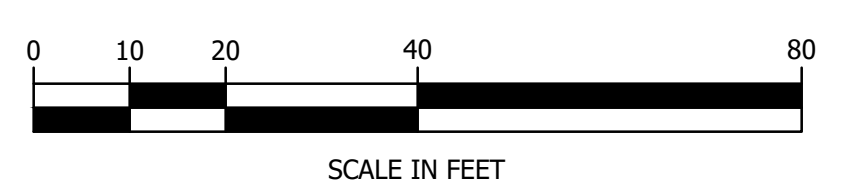


**LEGEND**

- APPROX PROPERTY LINE
- MAJOR CONTOUR
- MINOR CONTOUR
- OHE OVERHEAD UTILITY LINE
- TREE LINE
- 100'YR-FP 100 YEAR FLOOD PLAIN
- SPB-50 50 FT SHORELAND BUFFER
- SPB-150 150 FT SHORELAND BUFFER
- SPB-250 250 FT SHORELAND BUFFER
- ⊙ WELL
- ⊕ MONITORING WELL
- ⊖ WATER SHUTOFF
- ⊕ UTILITY POLE
- ⊕ GUY WIRE
- ⊕ SIGN
- ⊕ MAIL BOX
- ⊕ DECIDUOUS TREE
- ⊕ CONIFER TREE

**PLAN REFERENCES:**

1. THE HORIZONTAL DATUM IS ON THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD83 (2011). THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. THIS PLAN IS BASED ON A FIELD SURVEY COMPLETED IN NOVEMBER OF 2023 WITH CARLSON BRX7 DUAL FREQUENCY SURVEY GRADE GPS RECEIVERS.
3. THE PROPERTY BOUNDARIES ARE APPROXIMATE PER THE TOWN OF LISBON TAX RECORDS A THE TIME THIS PLAN WAS PREPARED.

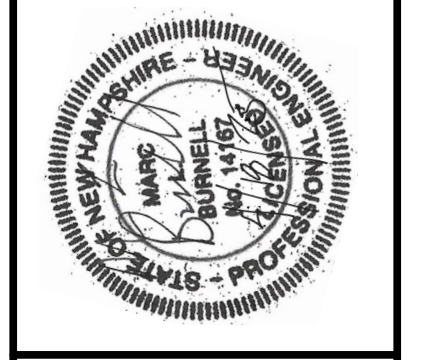


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PROJECT #:	21215	REVISION DESCRIPTION	NO.	DATE	ENG DWG
DATE:	APRIL 2025				
MAP-LOT (OR ARCHIVE)	*				
SURVEYED BY:	HEI-DIG/ANWS				
ENGINEERED BY:	MLB				
DRAWN BY:	LJM				
CHECKED BY:	CFC				



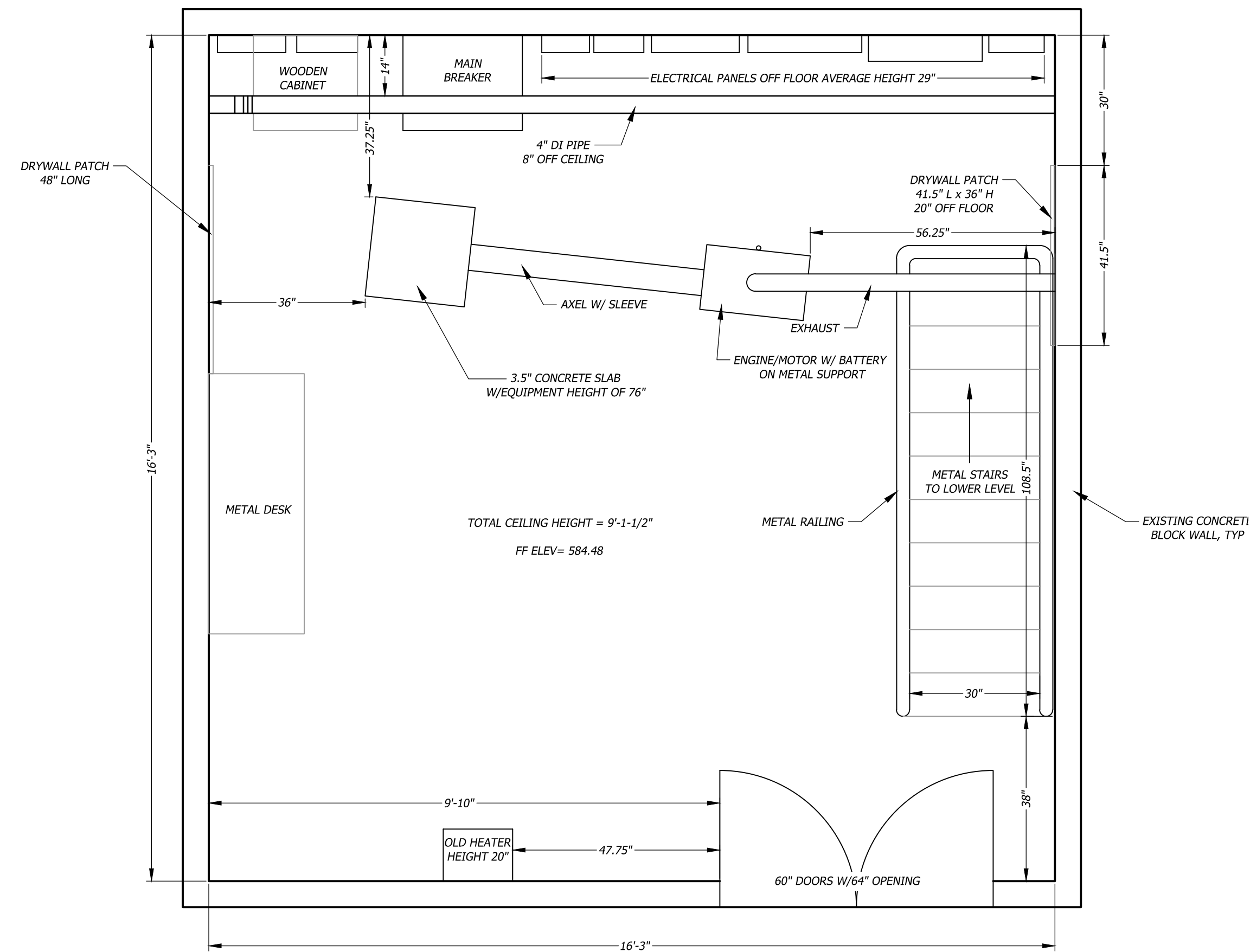
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**TOWN OF LISBON**  
CONTRACT #1 WATER SYSTEM IMPROVEMENTS  
USDA VIBER AREA 13610.0, DWG SPB 13610.0, DWG C-82  
CHEMICAL BUILDING ADDITION & MANGANESE TREATMENT  
BISHOP ROAD & VALLEYVIEW DRIVE, LISBON, NEW HAMPSHIRE

**EXISTING CONDITIONS PLAN**

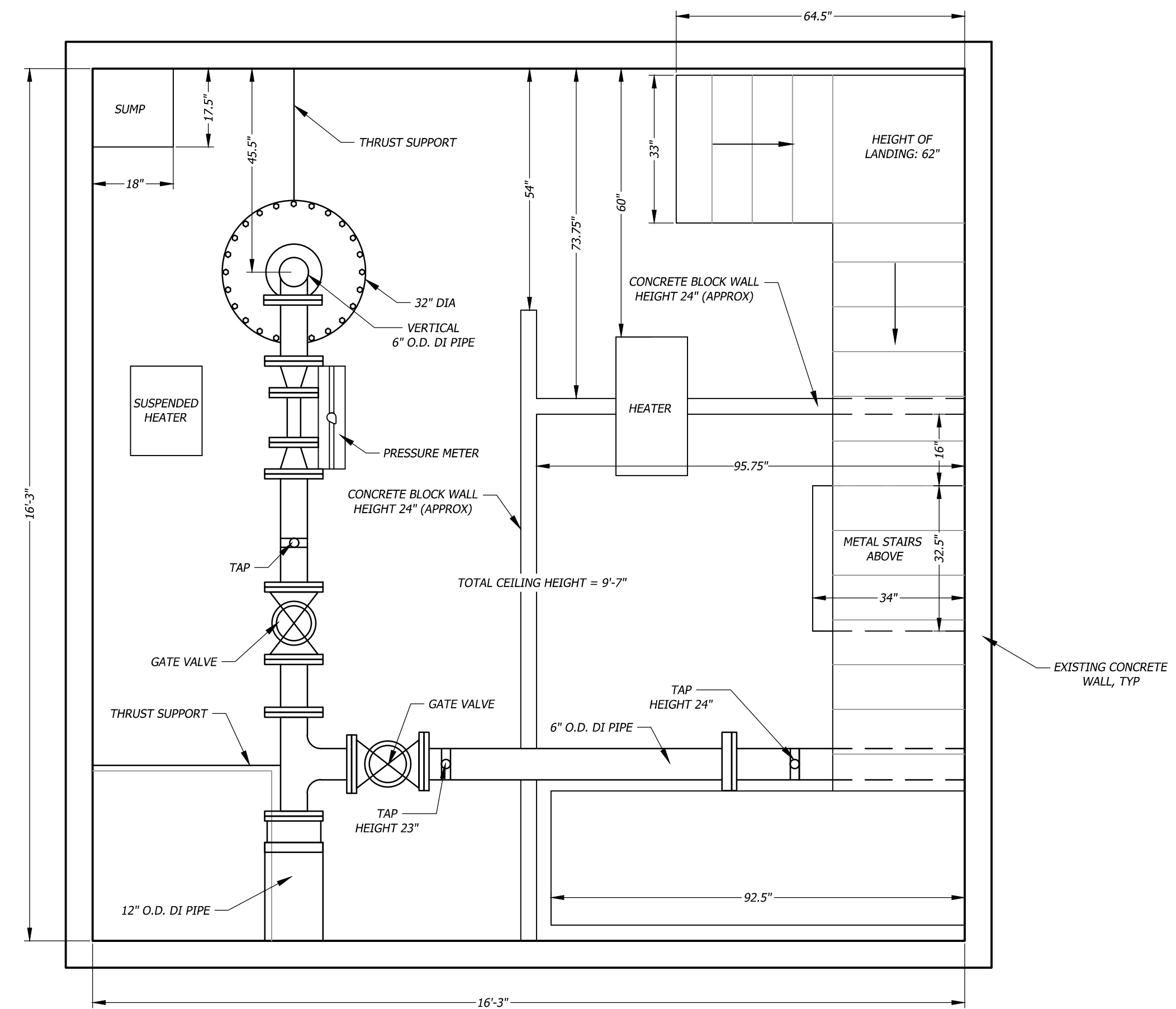
**SHEET C2.2**





**EXISTING BUILDING - UPPER LEVEL**

SCALE: 1/2" = 1'-0"



**EXISTING BUILDING - LOWER LEVEL**

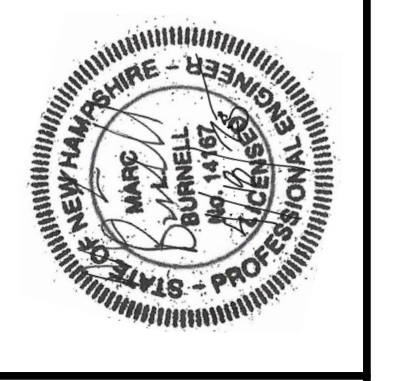
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BISHOP ROAD & VALLEYVIEW DRIVE, LISBON, NEW HAMPSHIRE

**EXISTING BUILDING PLAN**

**SHEET C2.4**

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**GENERAL NOTES**

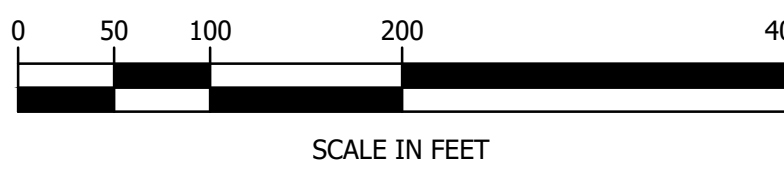
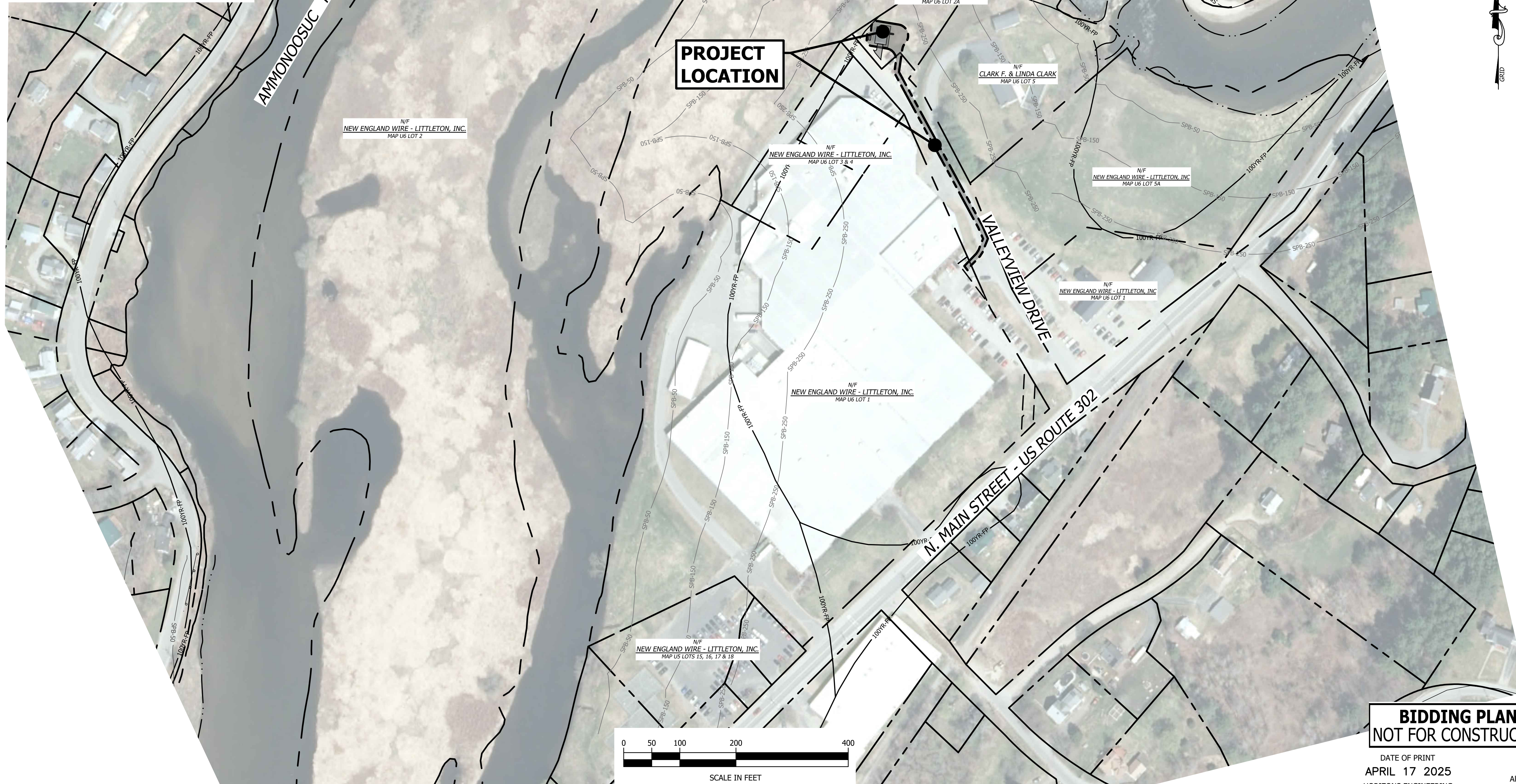
- NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.
- ALL WORK SHALL BE PERFORMED WITHIN THE PROPERTY OF, AND EASEMENTS SECURED BY, THE OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DATA COLLECTION AND PREPARATION OF RECORD DRAWINGS.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONTROLLING EROSION IN ALL AREAS DISTURBED BY HIS ACTIONS. COSTS FOR REQUIRED EROSION CONTROL, REGARDLESS OF WHETHER OR NOT SUCH MEASURES ARE SHOWN ON THE ENGINEERING DRAWINGS, SHALL BE BORNE BY HIM.
- UTILITY LOCATIONS ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF EXISTING UTILITIES AND SHALL REPAIR ANY DAMAGE AS QUICKLY AS POSSIBLE AT HIS OWN EXPENSE. ALL UTILITIES ENCOUNTERED SHALL BE LOCATED BY DEPTH AND TIES AND SHOWN BY THE CONTRACTOR ON HIS "AS BUILT" DRAWINGS. HAND EXCAVATION SHALL BE DONE WHEREVER UNDERGROUND UTILITIES ARE SHOWN OR ANTICIPATED. THE CONTRACTOR SHALL CONTACT DIG SAFE AND THE APPROPRIATE AUTHORITIES PRIOR TO ANY CONSTRUCTION IN ORDER TO VERIFY EXISTING CONDITIONS AND UTILITY LOCATIONS.
- THE HORIZONTAL DATUM IS ON THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM NAD83 (2011). THE VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- THIS PLAN IS BASED ON A FIELD SURVEY COMPLETED IN MARCH OF 2022 WITH TOPCON HIPER V DUAL FREQUENCY SURVEY GRADE GPS RECEIVERS.
- THE PROPERTY BOUNDARIES ARE APPROXIMATE PER THE TOWN OF LISBON TAX RECORDS A THE TIME THIS PLAN WAS PREPARED.

**SUBJECT PARCEL INFORMATION MAP U6 LOT 2A**

- PARCEL IS IN DISTRICT C
- BUILDING SETBACKS ARE 25 FEET (MINIMUM) FROM ROAD RIGHT OF WAY AND 15 FEET ALONG SIDE BOUNDARIES AND 25 FEET FROM BOUNDARY LINES. REQUIRED LOT SIZE IS 20,000 SF MINIMUM WITH 125 FT OF FRONTAGE.
- SUBJECT PARCEL IS PARTIALLY LOCATED WITHIN THE 100-YEAR FLOOD -AE ZONE BASE ELEVATION 579.0.
- ALL WORKMANSHIP AND MATERIALS INCORPORATED INTO THE CONSTRUCTION OF IMPROVEMENTS SPECIFIED ON THIS SITE PLAN SHALL CONFORM TO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION), AS PUBLISHED AND AMENDED BY THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

**LEGEND**

- APPROX PROPERTY LINE
- - - MAJOR CONTOUR
- MINOR CONTOUR
- OVERHEAD UTILITY LINE
- TREE LINE
- 100YR-FP
- SPB-50
- SPB-150
- SPB-250
- WELL
- ⊕ MONITORING WELL
- ⊖ WATER SHUTOFF
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DRAWN BY:	LJM			
CHECKED BY:	CFC			

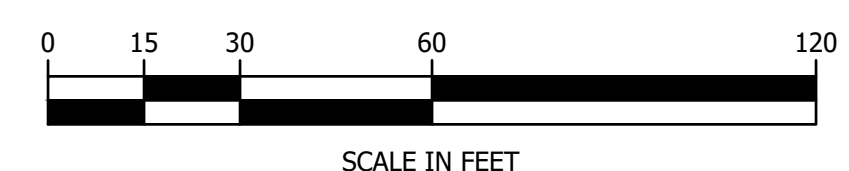


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CONTROL BUILDING, WELLSITE,  
CHEMICAL BUILDING ADDITION & MANGANESE TREATMENT  
BISHOP ROAD & VALLEYVIEW DRIVE, LISBON, NEW HAMPSHIRE  
OVERVIEW, ABUTTER MAP/LOT INFORMATION,  
GENERAL NOTES & LEGEND

SHEET C4.1

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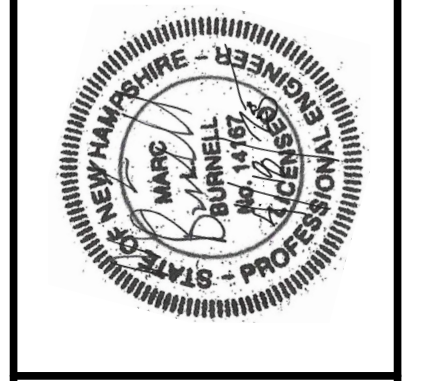


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**EXISTING CONDITIONS PLAN**

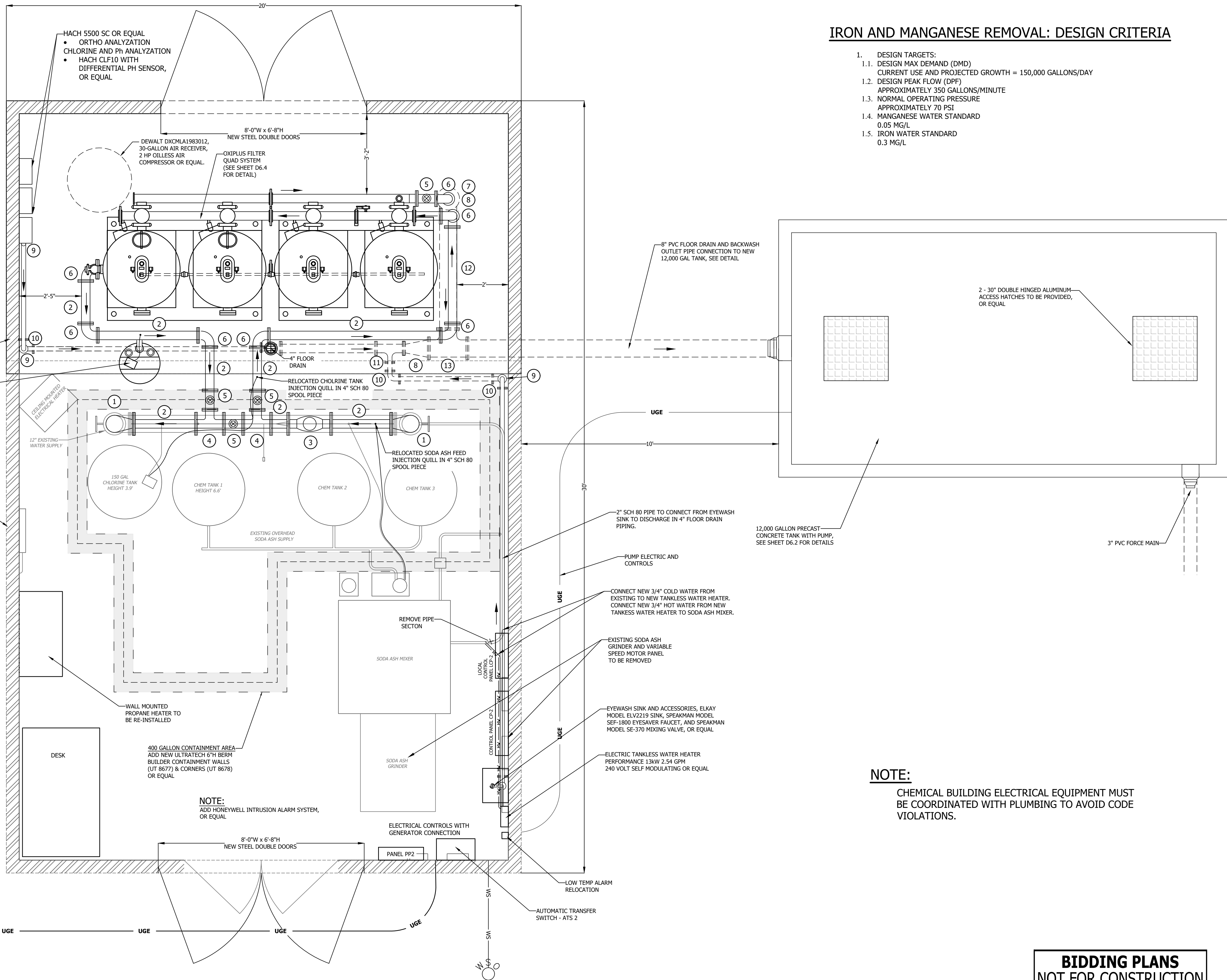
**SHEET C4.2**

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VALVE & PIPING SCHEDULE	
ITEM	DESCRIPTION
1	12" X 4" FLANGED REDUCING ELBOW
2	4" SCH80 SPOOL PIECE WITH MAINTENANCE COUPLING
3	4" ULTRASONIC FLOWMETER
4	4" FLANGED TEE
5	4" FLANGED GATE VALVE
6	4" ELBOW
7	8" PIPE THROUGH FLOOR
8	8" x 4" FLANGED CONCENTRIC REDUCER
9	2" PIPE THROUGH FLOOR
10	2" FLANGED ELBOW
11	4" x 2" FLANGED REDUCING TEE
12	8" SCH 80 SPOOL PIECE WITH MAINTENANCE COUPLING
13	8" FLANGED TEE



**IRON AND MANGANESE REMOVAL: DESIGN CRITERIA**

- DESIGN TARGETS:
  - DESIGN MAX DEMAND (DMD)  
CURRENT USE AND PROJECTED GROWTH = 150,000 GALLONS/DAY
  - DESIGN PEAK FLOW (DPF)  
APPROXIMATELY 350 GALLONS/MINUTE
  - NORMAL OPERATING PRESSURE  
APPROXIMATELY 70 PSI
  - MANGANESE WATER STANDARD  
0.05 MG/L
  - IRON WATER STANDARD  
0.3 MG/L

**NOTE:**  
CHEMICAL BUILDING ELECTRICAL EQUIPMENT MUST BE COORDINATED WITH PLUMBING TO AVOID CODE VIOLATIONS.

**PROPOSED CHEMICAL FEED BUILDING LAYOUT**  
SCALE: 1/2" = 1'-0"

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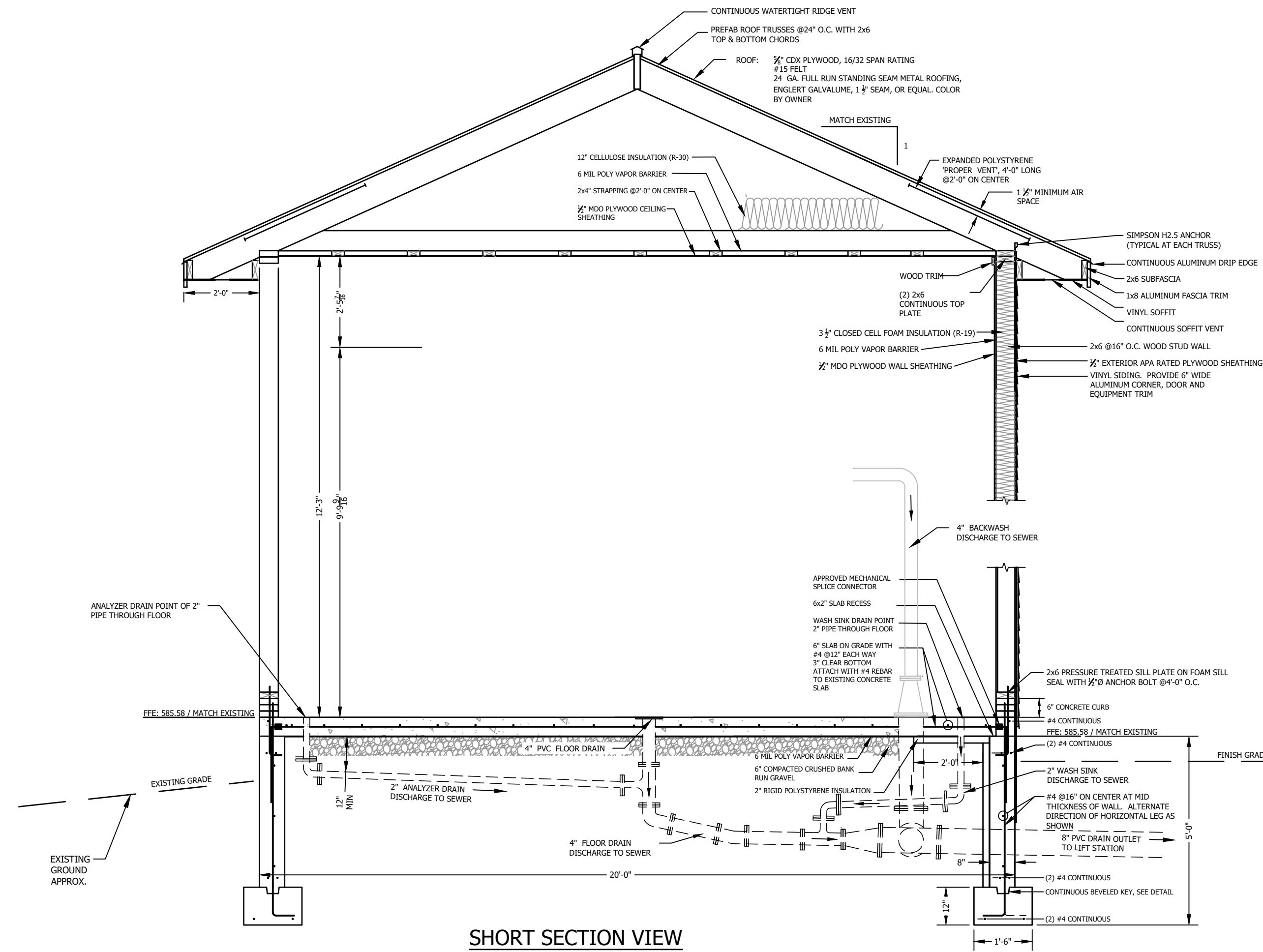
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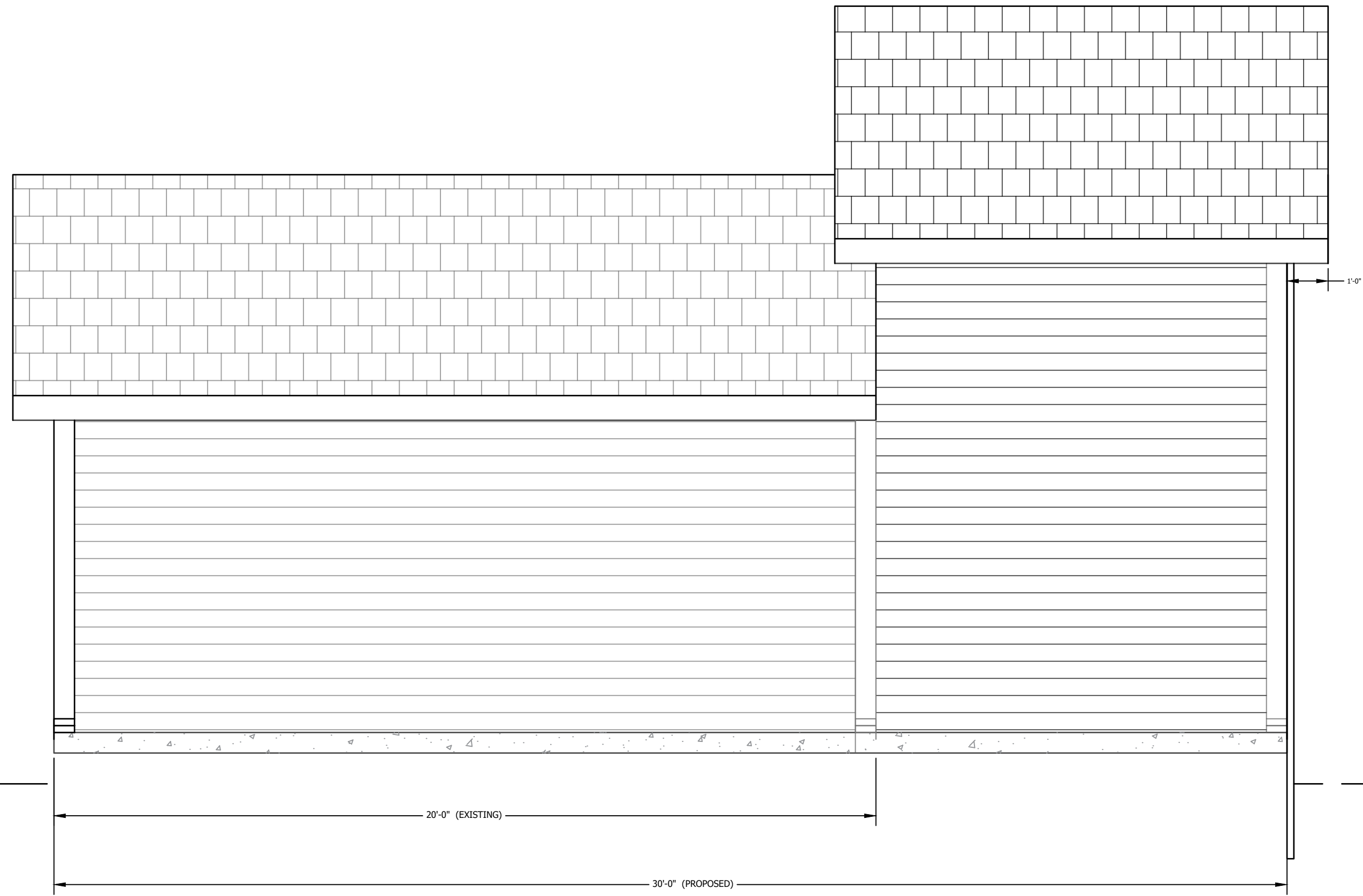
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CHEMICAL BUILDING, WELLSITE;  
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BISHOP ROAD & VALLEYVIEW DRIVE, LISBON, NEW HAMPSHIRE

**PROPOSED CHEMICAL FEED BUILDING LAYOUT PLAN**  
SHEET C5.2



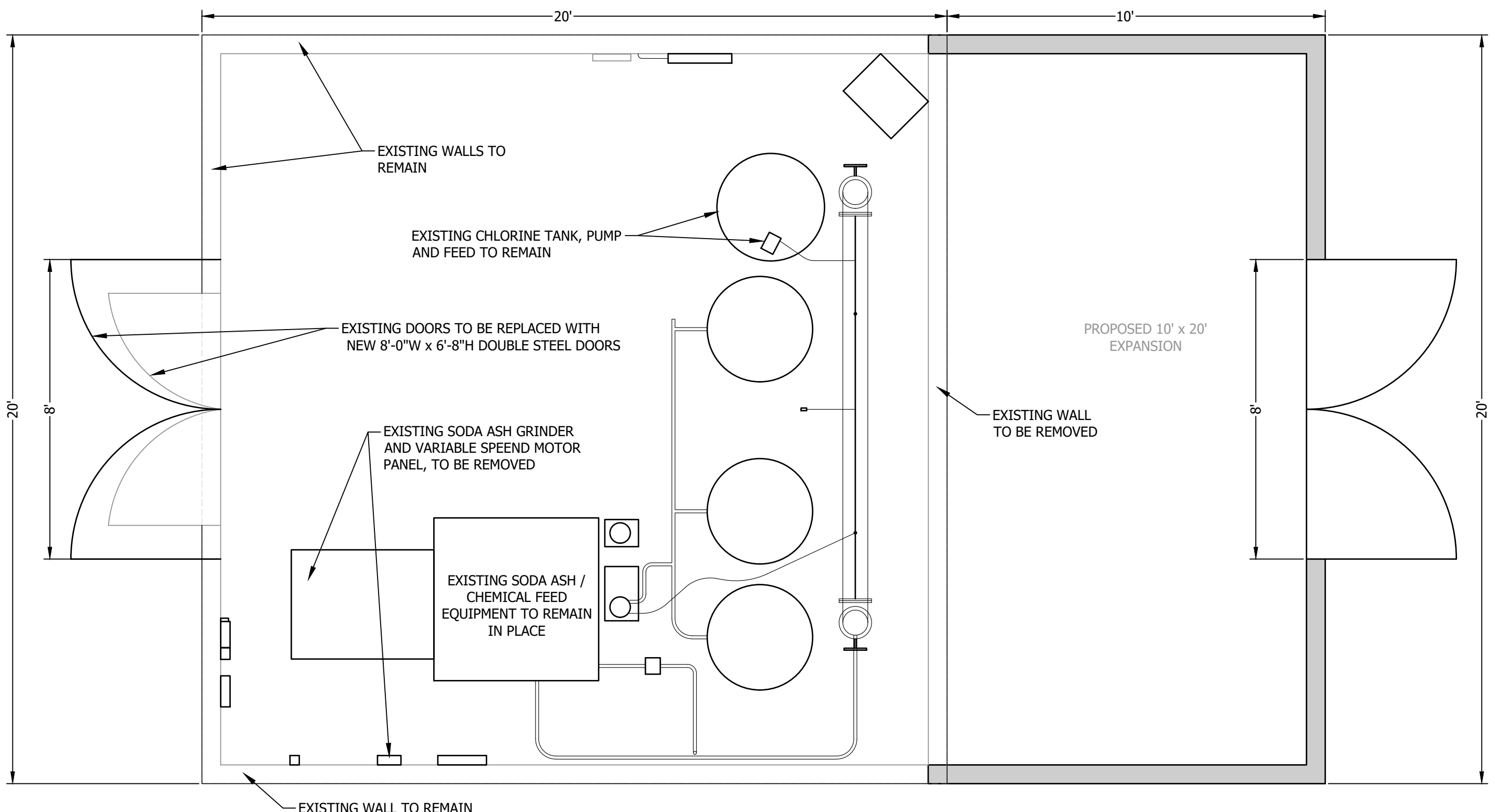
SHORT SECTION VIEW



LONG SECTION VIEW

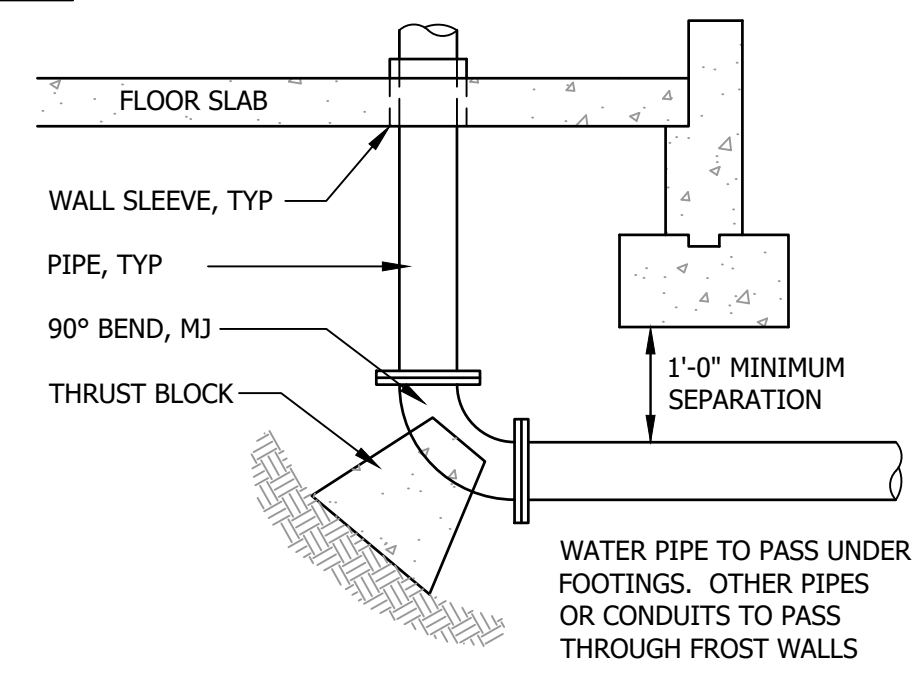
PROPOSED BUILDING SECTION VIEW

SCALE: 1" = 30'



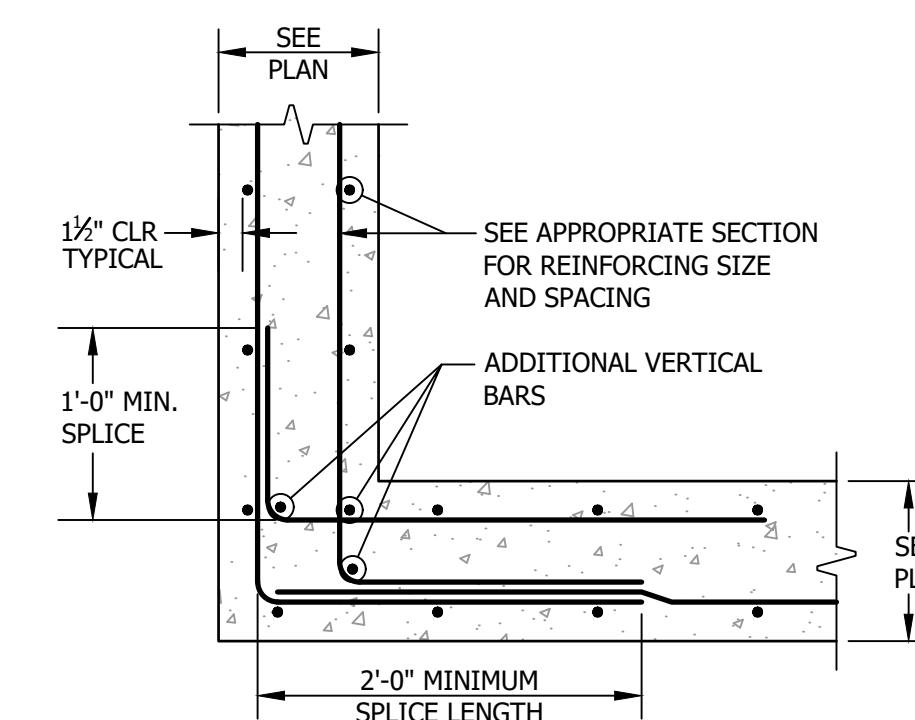
CHEMICAL FEED BUILDING - DEMOLITION PLAN

NOT TO SCALE



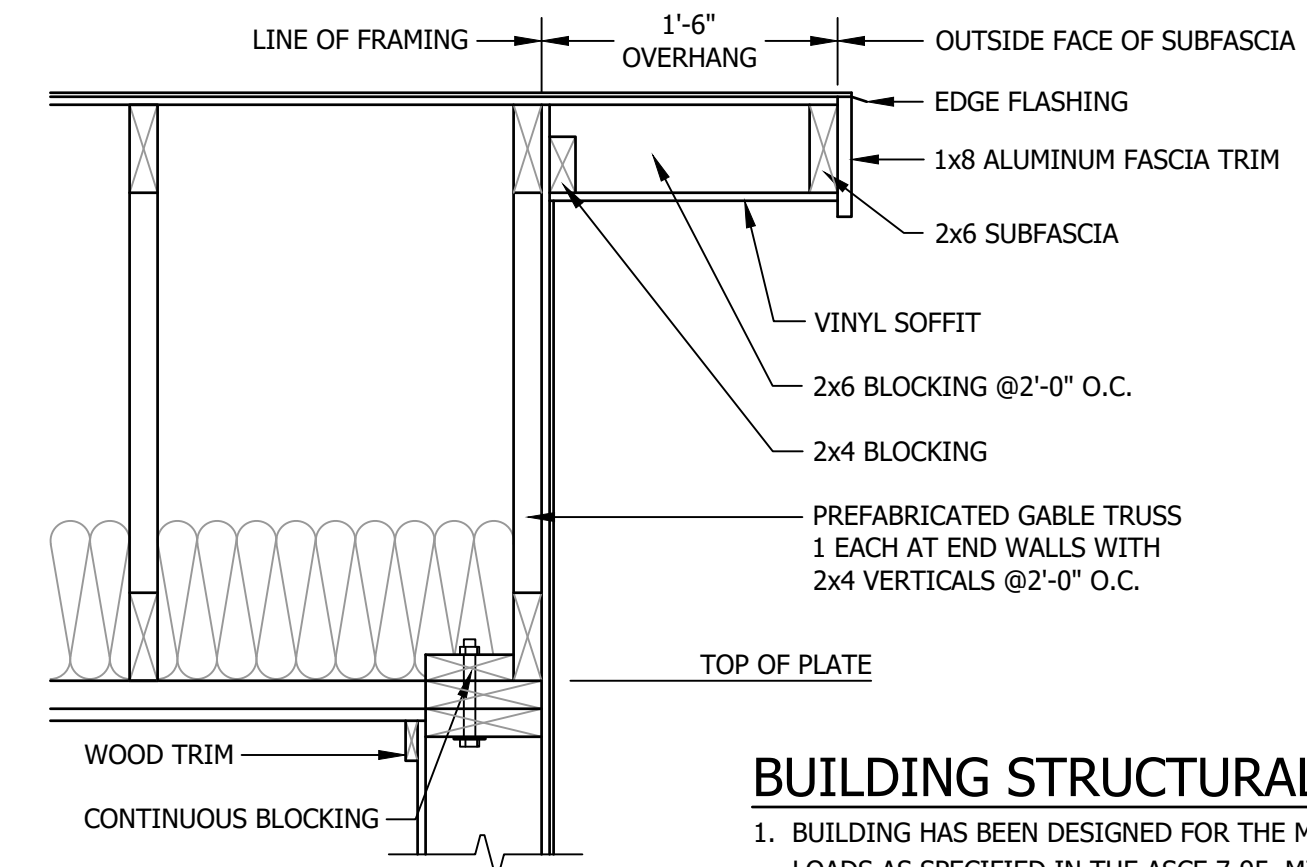
FLOOR PIPE PENETRATION DETAIL

NOT TO SCALE



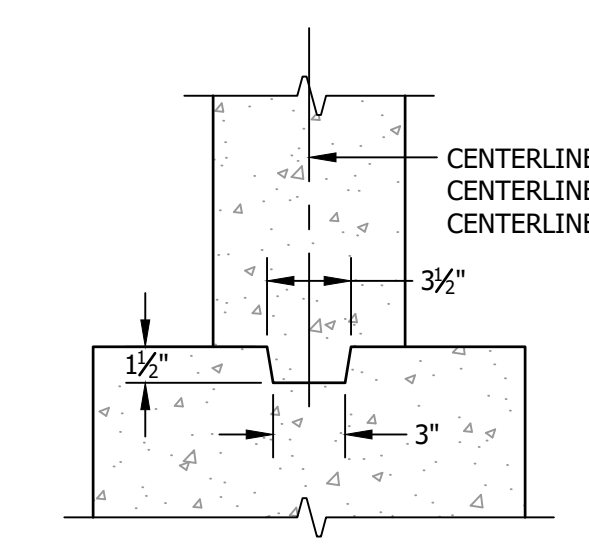
TYPICAL FOUNDATION WALL CORNER REINFORCING

NOT TO SCALE



TYPICAL END GABLE TRUSS DETAIL

NOT TO SCALE



FORMED KEY DETAIL

NOT TO SCALE

BUILDING STRUCTURAL NOTES

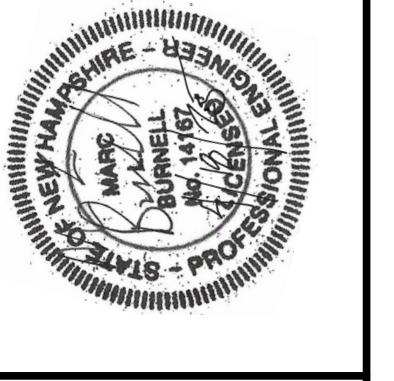
- BUILDING HAS BEEN DESIGNED FOR THE MINIMUM EARTHQUAKE LOADS AS SPECIFIED IN THE ASCE 7-95, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES. EARTHQUAKE DESIGN LOADS: CATEGORY IV, Aa = 0.11, Av = 0.11, SEISMIC PERF. CATEGORY D, BEARING WALL SYSTEM: Cv = 0.24, R = 6.5, Cd = 4
- EXTERIOR PLYWOOD TO BE NAILED TO STUDS WITH MINIMUM 8d NAILS @6" ON CENTER AT PANEL EDGES AND 12" ON CENTER AT INTERIOR OF PANEL. PROVIDE BLOCKING AT ALL PANEL EDGES AND FASTEN PLYWOOD TO BLOCKING AS DESCRIBED ABOVE.
- PROVIDE SIMPSON STRAP TIE HOLD DOWNS, STHDB, AT EACH BUILDING CORNER, AND THE DOOR JAMB ADJACENT TO LONGER WALL SECTION (5 TOTAL). STRAP TIES TO BE POSITIONED WITH 1 1/2" CLEAR FROM EDGE OF CONCRETE FOUNDATION TO EDGE OF STRAP TIE. INSTALLATION PER MANUFACTURER RECOMMENDATIONS.

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PROPOSED BUILDING SECTION & DEMOLITION PLAN

SHEET C5.3

## STANDARD TRENCH NOTES - WATER

- ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE SHALL BE REPLACED WITH BEDDING MATERIAL. SEE ALSO NOTE 4.**
- BEDDING:** SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM ORGANIC MATTER, CLAY, AND/OR LOAM MEETING ASTM C33 STONE SIZE NO. 67.
 

100% PASSING	1 INCH SCREEN
90-100% PASSING	¾ INCH SCREEN
20-55% PASSING	½ INCH SCREEN
0-10% PASSING	#4 SIEVE
0-5% PASSING	#8 SIEVE
- SAND BLANKET:** CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 100% PASSES A ½ INCH SIEVE AND NOT MORE THAN 15% PASSES A #200 SIEVE.
- SUITABLE MATERIAL:** IN ROADS, ROAD SHOULDERS, WALKWAYS, AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED FROM THE TRENCH DURING THE COURSE OF CONSTRUCTION, AFTER EXCLUDING DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL NOT APPROVED BY THE ENGINEER.
 

TRENCH BACKFILL IN CROSS-COUNTRY LOCATIONS SHALL BE SUITABLE MATERIAL AS DESCRIBED ABOVE, EXCEPT THAT TOP SOIL, LOAM, MUCK, OR PEAT MAY BE USED PROVIDED THAT THE COMPLETED CONSTRUCTION WILL BE STABLE AND ACCESS TO THE PIPE FOR MAINTENANCE AND RECONSTRUCTION IS PRESERVED. BACKFILL SHALL BE MOUND TO A HEIGHT OF SIX INCHES ABOVE THE ORIGINAL GROUND SURFACE
- BASE COURSE FOR TRENCH REPAIR** SHALL MEET THE REQUIREMENTS OF SECTION 300 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.
- SHEETING:** ALL TRENCH SUPPORTS SHALL CONFORM TO OSHA STANDARDS. CONTRACTOR IS RESPONSIBLE FOR OSHA COMPLIANCE AND WORKER SAFETY THROUGHOUT CONSTRUCTION.
- TRENCH DIMENSIONS:** W = MAXIMUM ALLOWABLE TRENCH WIDTH MEASURED 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER (D) OR LESS, W SHALL BE NO MORE THAN 36 INCHES; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS THE PIPE OUTSIDE DIAMETER. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE. THE MAXIMUM ALLOWABLE TRENCH PAVEMENT PAYMENT WIDTH SHALL BE 8 FEET CENTERED OVER PIPE.
 

NOTE: MINIMUM BEDDING DEPTH AND MAXIMUM PAYMENT LIMIT FOR LEDGE EXCAVATION = ¼D (12" MINIMUM)
- WATER/SEWER SEPARATION:** WATER MAINS SHALL BE SEPARATED FROM SANITARY SEWER BY A MINIMUM OF 10 FEET HORIZONTALLY AND A MINIMUM OF 18 INCHES VERTICALLY, WITH THE WATER MAIN ABOVE THE SEWER.
- PIPE COVER:** COVER OVER WATER SHALL BE 6 FEET MINIMUM IN ALL LOCATIONS.

- BLOCKS MUST BE POURED AGAINST UNDISTURBED SOIL
- THE PIPE JOINT AND BOLTS MUST BE ACCESSIBLE.
- CONCRETE SHOULD BE CURED FOR AT LEAST 5 DAYS AND SHOULD HAVE A COMPRESSION STRENGTH OF 3,000 LBS. AT 28 DAYS.
- BLOCKS MUST BE POSITIONED TO COUNTERACT THE DIRECTION OF THE RESULTANT THRUST FORCE.

RESTRAINED JOINTS MAY BE USED FOR RESISTING THRUST FORCES WHERE THERE IS A SHORTAGE OF SPACE OR WHERE THE SOIL BEHIND A FITTING WILL NOT PROVIDE ADEQUATE SUPPORT. THIS RESTRAINING METHOD INVOLVES PLACEMENT OF THESE SPECIAL JOINTS AT APPROPRIATE FITTINGS AND FOR A PREDETERMINED NUMBER OF PIPE LENGTHS ON EACH SIDE, (MINIMUM 15 FEET).

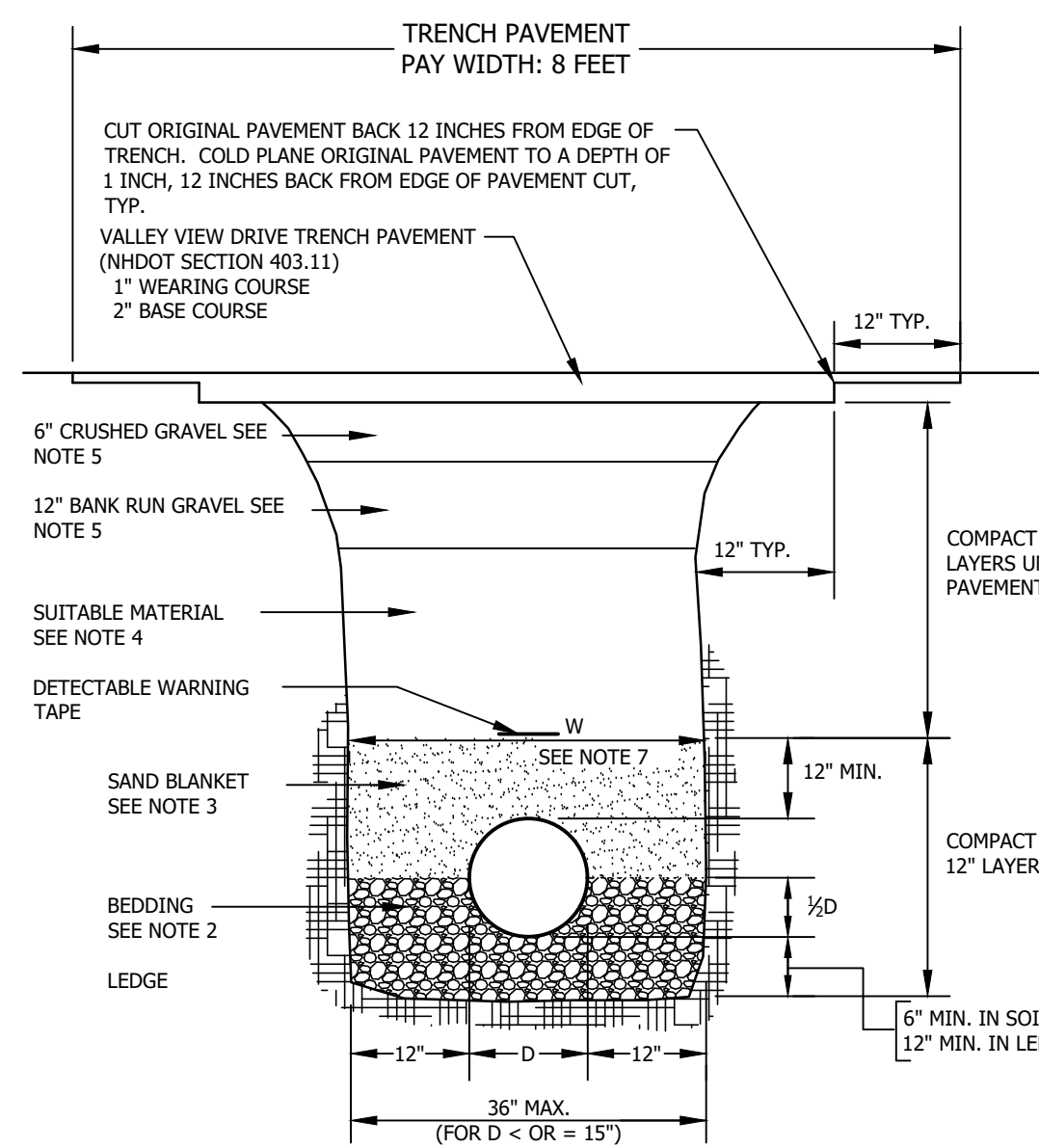
NOMINAL PIPE DIA. (INCHES)	TOTAL THRUST (POUNDS)				
	DEAD END	90° BEND	45° BEND	22½° BEND	11¼° BEND
4	1,810	2,559	1,385	706	355
6	3,739	5,288	2,862	1,459	733
8	6,433	9,097	4,923	2,510	1,261
10	9,677	13,685	7,406	3,776	1,897
12	13,685	19,353	10,474	5,340	2,683
14	18,385	26,001	14,072	7,174	3,604
16	23,779	33,628	18,199	9,278	4,661
18	29,865	42,235	22,858	11,653	5,855
20	36,644	51,822	28,046	14,298	7,183
24	52,279	73,934	40,013	20,398	10,249

NOTE: TO DETERMINE THRUST AT PRESSURES OTHER THAN 100 PSI, MULTIPLY THE THRUST OBTAINED IN THE TABLE BY THE RATIO OF THE PRESSURE TO 100. FOR EXAMPLE, THE THRUST ON A 12 INCH, 90° BEND AT 125 PSI IS:

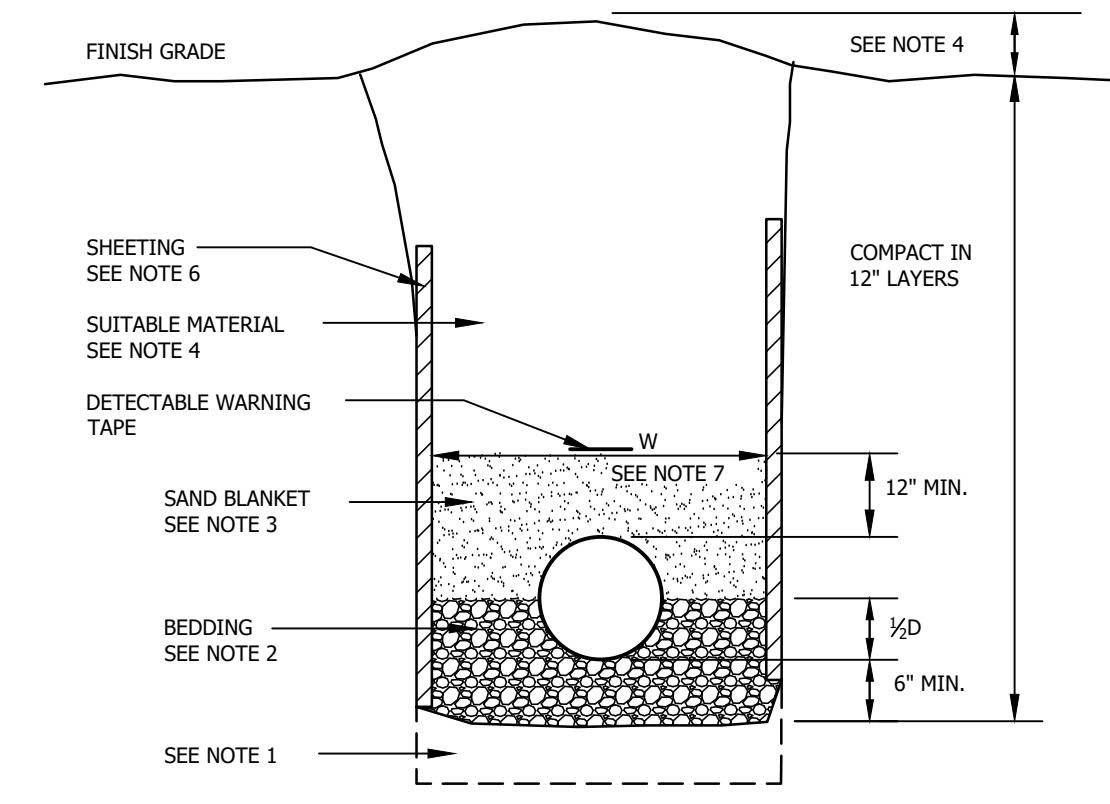
$$19,353 \times \frac{125}{100} = 24,191 \text{ POUNDS}$$

TO DETERMINE THE SIZE OF A CONCRETE THRUST BLOCK, DIVIDE THE TOTAL FORCE BY THE BEARING VALUE OF THE SOIL. THE QUOTIENT WILL BE THE SIZE OF THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET. APPROXIMATE VALUES FOR VARIOUS TYPES OF SOIL ARE LISTED BELOW.

SOIL	BEARING LOAD (LBS./SQ. FT.)
MUCK	0
SOFT CLAY	1,000
SILT	1,500
SANDY SILT	3,000
SAND	4,000
SANDY CLAY	6,000



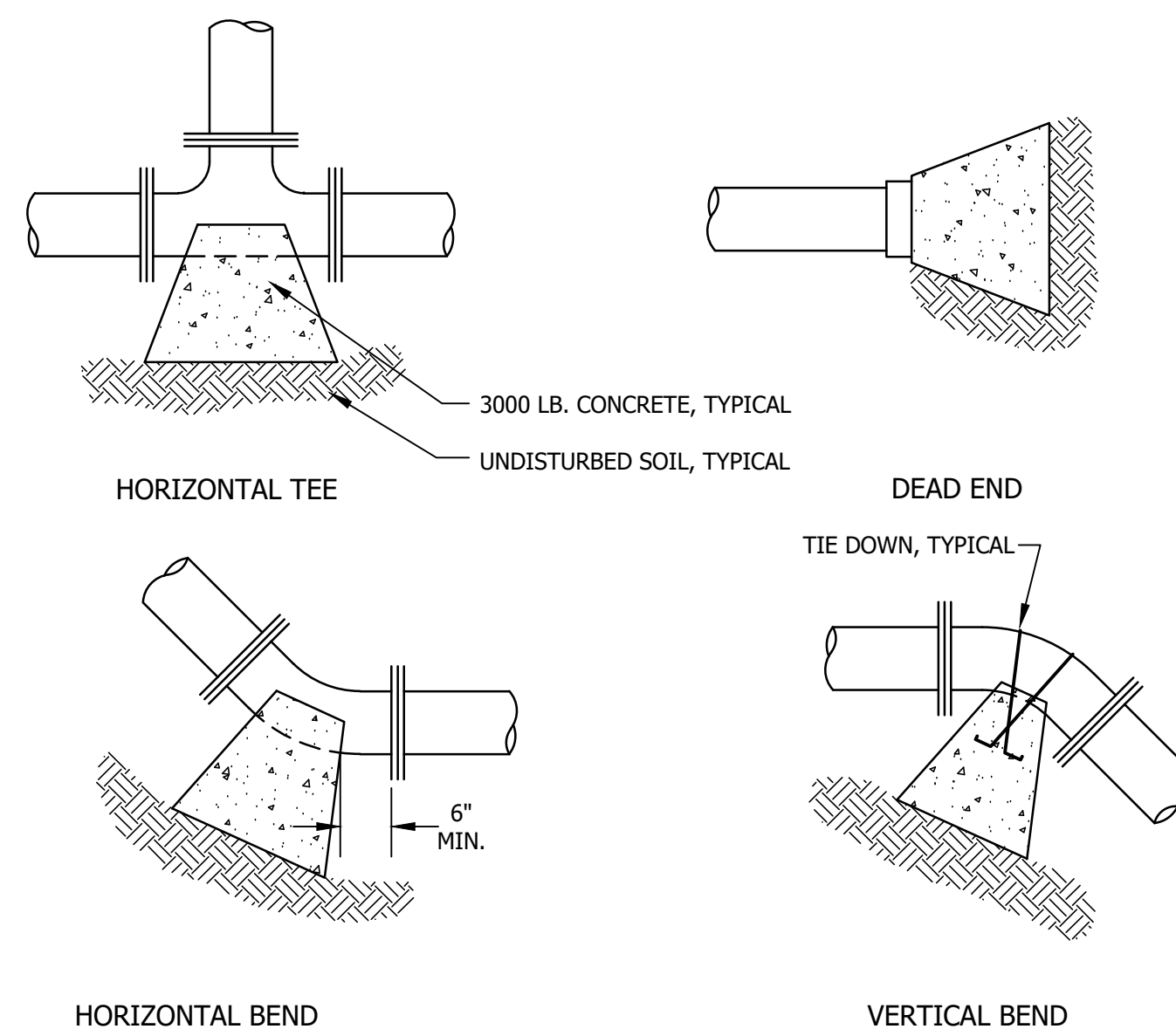
LEDGE/SUB PAVEMENT CONSTRUCTION



EARTH CONSTRUCTION WITH OR WITHOUT SHEETING

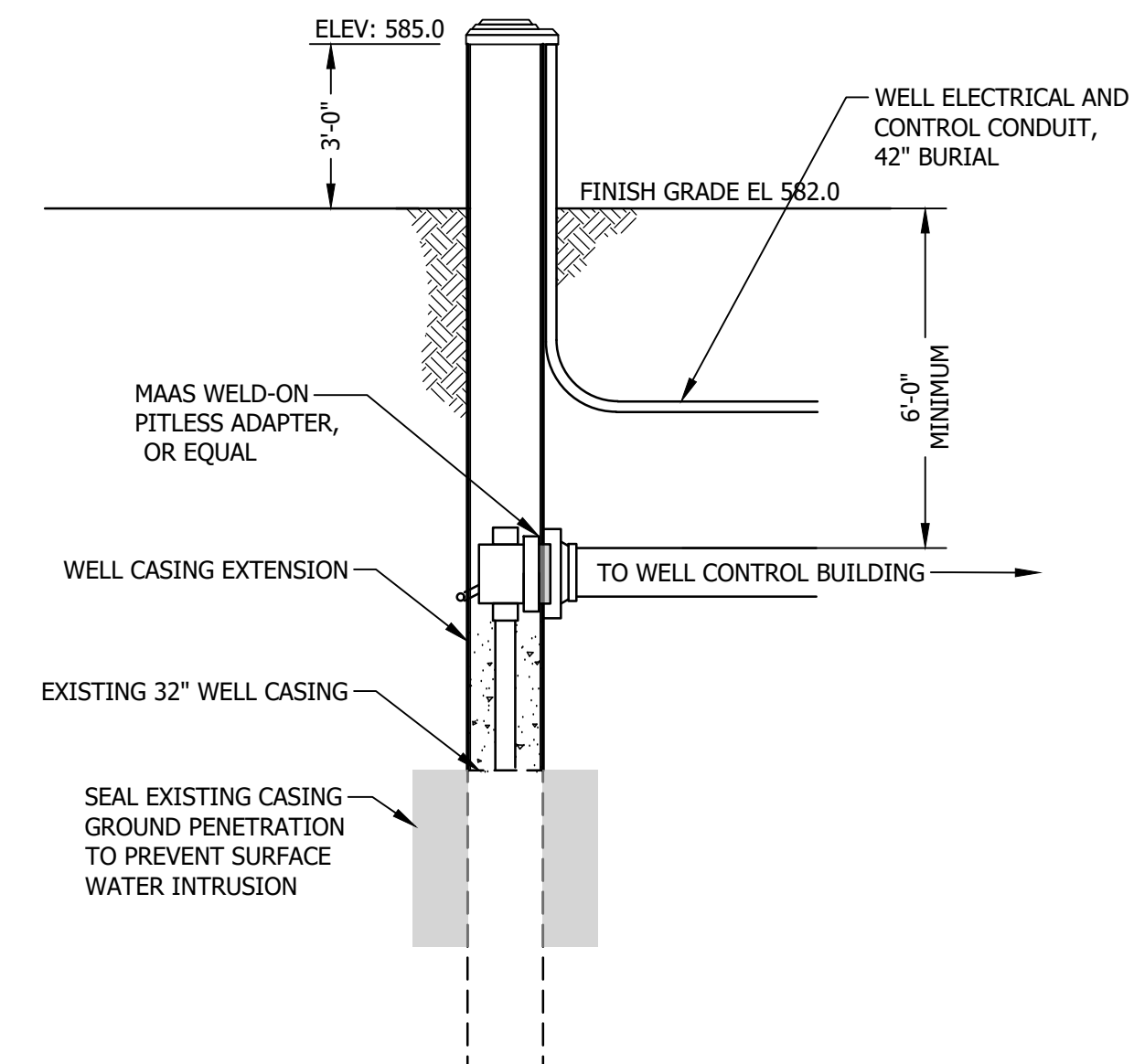
## STANDARD TRENCH SECTIONS

NOT TO SCALE



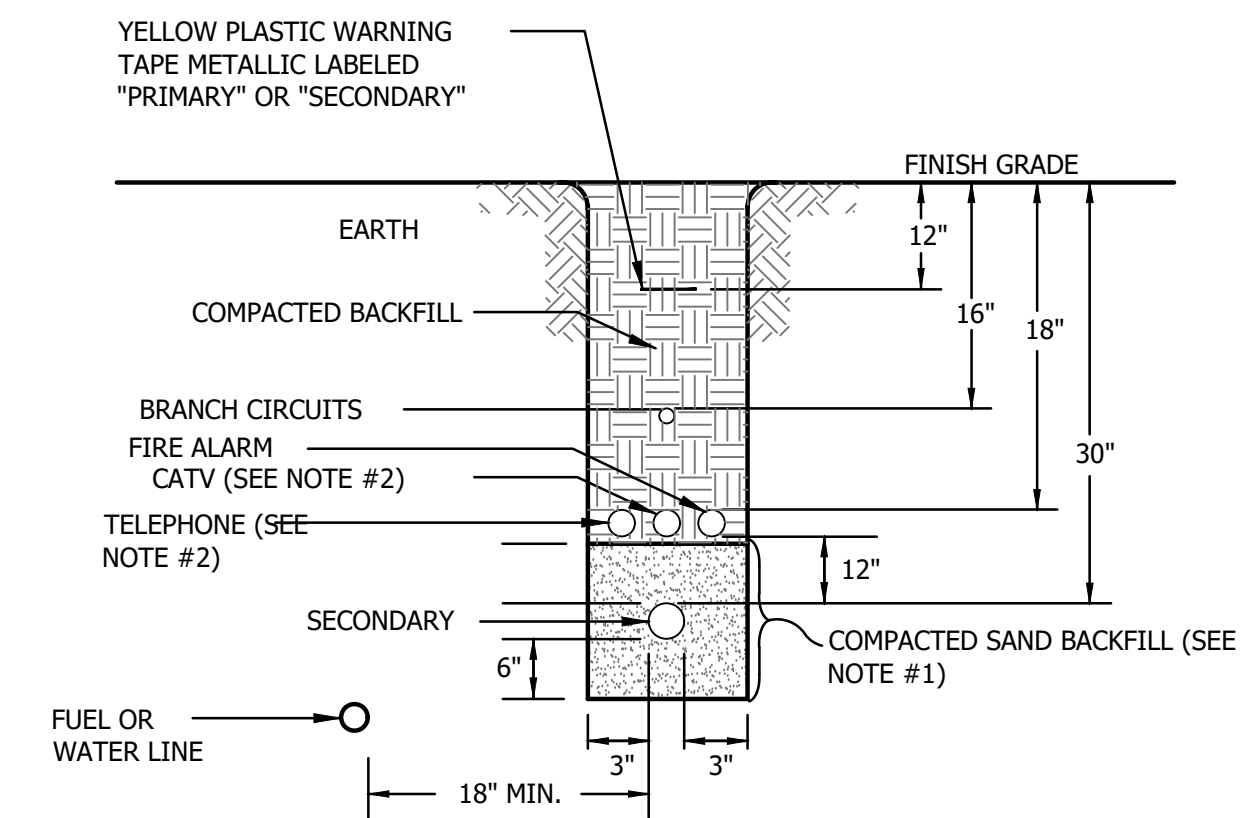
THRUST BLOCK NOTES & DETAILS

NOT TO SCALE



WELL CASING EXTENSION DETAIL

NO SCALE



TYPICAL CONDUIT TRENCH DETAIL SECTION

NO SCALE

### NOTES TYPICAL CONDUIT TRENCH:

- SELECT SAND BACKFILL SHALL CONSIST OF FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6 INCH LAYERS.
- TELEPHONE, CATV AND FIRE ALARM CONDUITS MAY RUN IN THE SAME TRENCH AS ELECTRICAL SERVICE CONDUITS AND/OR BRANCH CIRCUIT CONDUITS PROVIDING A MINIMUM OF 12 INCH HORIZONTAL SEPARATION IS MAINTAINED. IF RUN IN THE SAME TRENCH AS PRIMARY CONDUITS A MINIMUM OF 12 INCHES BOTH HORIZONTAL AND VERTICAL SEPARATION SHALL BE MAINTAINED. SEE NOTE #1 ABOVE.
- ALL CONDUIT BENDS OF 45 DEGREE OR MORE SHALL BE GALVANIZED RIGID STEEL. THE FIRST 10 FOOT SECTION OF CONDUIT BOTH HORIZONTAL AND VERTICAL AT UTILITY POLES, TRANSFORMER PADS AND AT BUILDING CONDUIT ENTRANCES, SHALL BE GALVANIZED RIGID STEEL. PROVIDE 3/8" NYLON PULL ROPE IN ALL EMPTY CONDUITS.
- ALL NONMETALLIC CONDUIT AND FITTINGS SHALL BE ELECTRICAL GRADE, SCHEDULE 80 PVC AND SHALL CONFORM TO THE APPLICABLE SECTIONS OF NEMA TC2-1990 AND BE UL LISTED. ONLY GRAY COLORED CONDUIT WILL BE ACCEPTED. ANY PVC CONDUIT NOT HAVING THE PROPER NEMA OR UL MARKINGS WILL NOT BE ACCEPTED. ALL STEEL CONDUITS SHALL CONFORM TO ASTM A120 AND BE RIGID GALVANIZED STEEL. ALL PVC CONDUITS MUST BE CEMENTED. STEEL FITTINGS SHALL BE SEALED WITH COMPOUND.
- ALL CONDUIT SYSTEMS, SHOWN ON THIS DETAIL, MAY NOT BE PRESENT ON THIS PROJECT. THIS IS A TYPICAL CONDUIT TRENCH DETAIL, EACH INDIVIDUAL PROJECT MAY HAVE MORE OR LESS CONDUIT SYSTEMS.

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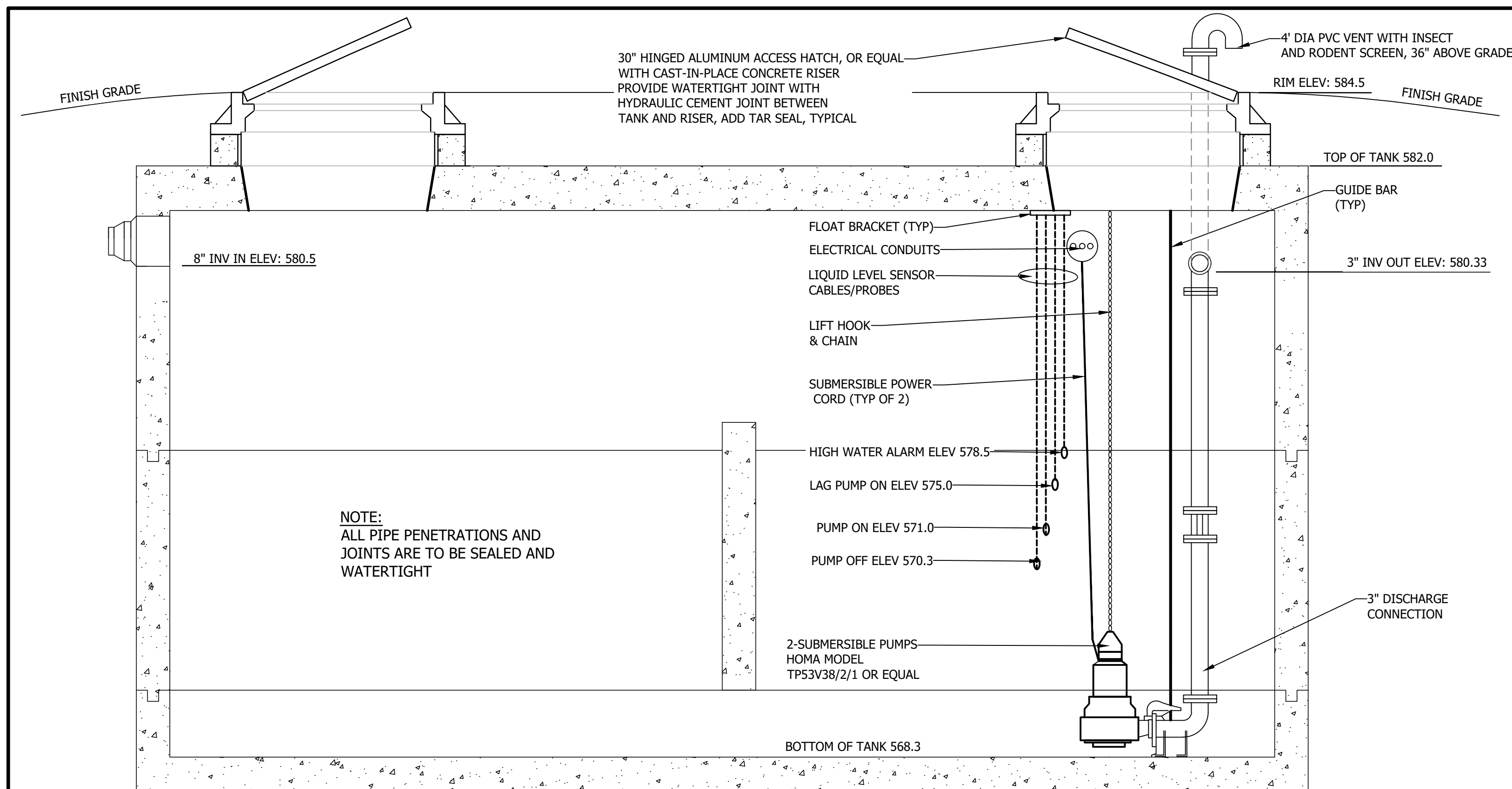


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TOWN OF LISBON  
CONTRACT #1 WATER SYSTEM IMPROVEMENTS  
USDA WATER AREA 134.010, DMS SHEET 134.010, OBJECT 53  
CONTROL BUILDING, WELLSITE, CHEMICAL BUILDING ADDITION  
& MANGANESE TREATMENT  
BISHOP ROAD & VALLEY VIEW DRIVE, LISBON, NEW HAMPSHIRE

STANDARD WATER SYSTEM NOTES AND DETAILS

SHEET D6.1



**MANGANESE BACKWASH LIFT STATION BASIS OF DESIGN:**

DESIGN FLOW: 4 MANGANESE FILTERS BACKWASH APPROXIMATELY ONCE A WEEK IN SUCCESSION AT 884 GALLONS EACH. TOTAL FLOW: 3,536 GALLONS/WEEK.

SINCE THIS LIFT STATION WILL SEE NOTHING OUTSIDE OF BACKWASH FROM THE MANGANESE FILTERS, THERE IS NO PEAKING FACTOR ESTABLISHED. THE LIFT STATION WILL HAVE A REDUNDANT PUMPING SYSTEM AS REQUIRED BY ENV-WQ 700. THE PUMPING SYSTEM WILL MAINTAIN A VELOCITY OF AT LEAST 2.5 FEET PER SECOND. A FLOWRATE OF 80 GPM WAS CHOSEN.

MINIMUM VELOCITY CHECK:  
 $V = Q/A$  WHERE  
 $Q = 80GPM / (7.48GAL/CF * 60SEC/MIN) = 0.18 CFS$   
 $A = 3.14 * ((3/12)^2) / 4 = 0.049 SF$   
 $V = 0.18CFS / 0.0225F = 3.7 FPS$

ELEVATION HEAD: 12 FT  
 FRICTION HEAD OF 3 INCH PIPE AT 80 GPM: 9.9 FT  
 TOTAL DYNAMIC HEAD: 12+9.9 = 21.9 FT  
 PUMP DESIGN POINT: 21.9FT@80GPM

PUMP RUN TIME: 571-570.3 = 0.7 X 9 X 16 = 100.8  
 100.8 SF X 7.48 GAL/CF = 754 GAL  
 754GAL/80 = 9.4 MIN RUN TIME  
 8-9.4<10 .. OK

PUMP MODEL: HOMA TP53V38/2/1 OR EQUAL  
 POWER: 3-PHASE POWER

TANK VOLUME CRITERIA:  
 THE MANGANESE BACKWASH ACCOUNTS FOR 3,536 GALLONS APPROXIMATELY ONCE A WEEK. A 12,000 GALLON WET WELL IS PROPOSED. PUMP ON, PUMP OFF ELEVATIONS ARE SHOWN ON THIS SHEET. THE TANK SUPPLIED SHALL BE ABLE TO HANDLE APPROXIMATELY 3 FULL BACKWASH CYCLES.

BOTTOM OF TANK: 568.3'  
 PUMP OFF: 570.3'  
 LAG PUMP ON: 575.0'  
 HIGH WATER ALARM: 578.5  
 8" INV. IN: 580.5  
 MINIMUM VOLUME BETWEEN PUMP OFF AND PUMP ON: VOLUME = 9.2 MIN X 80 GPM/4 = 184 GAL  
 753 GAL > 184 GAL .. OK

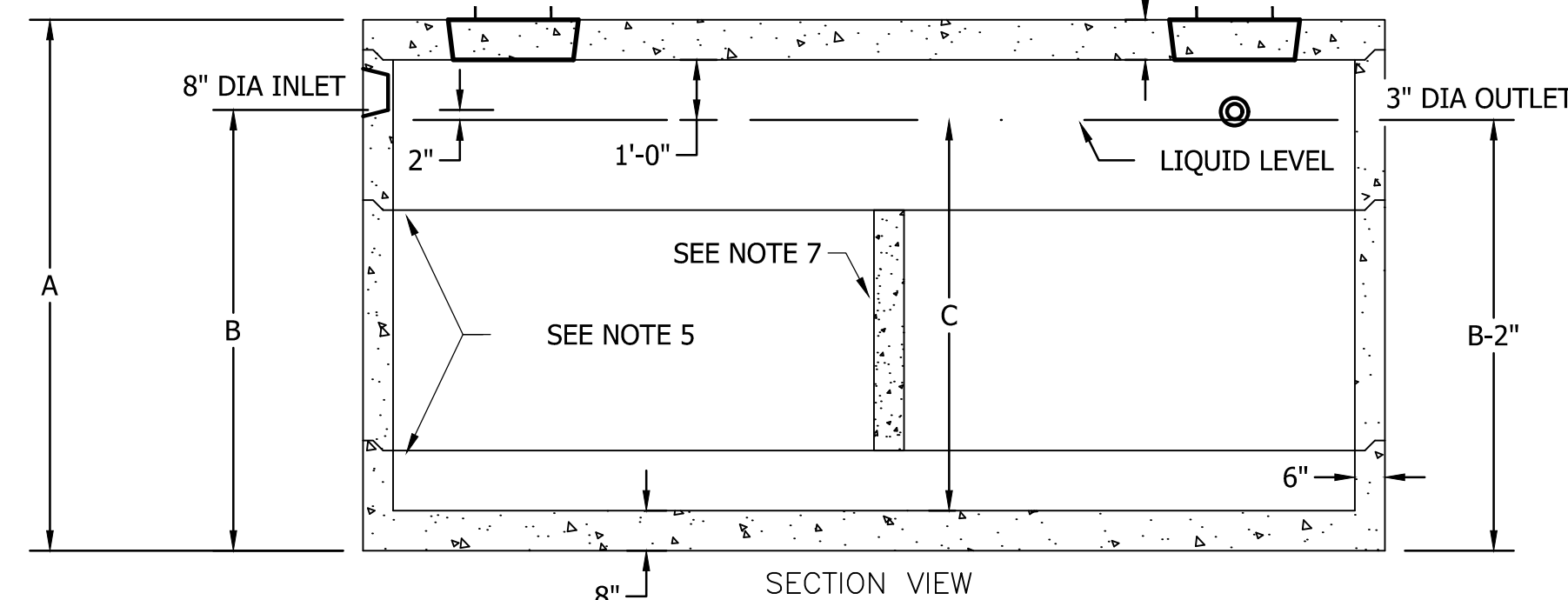
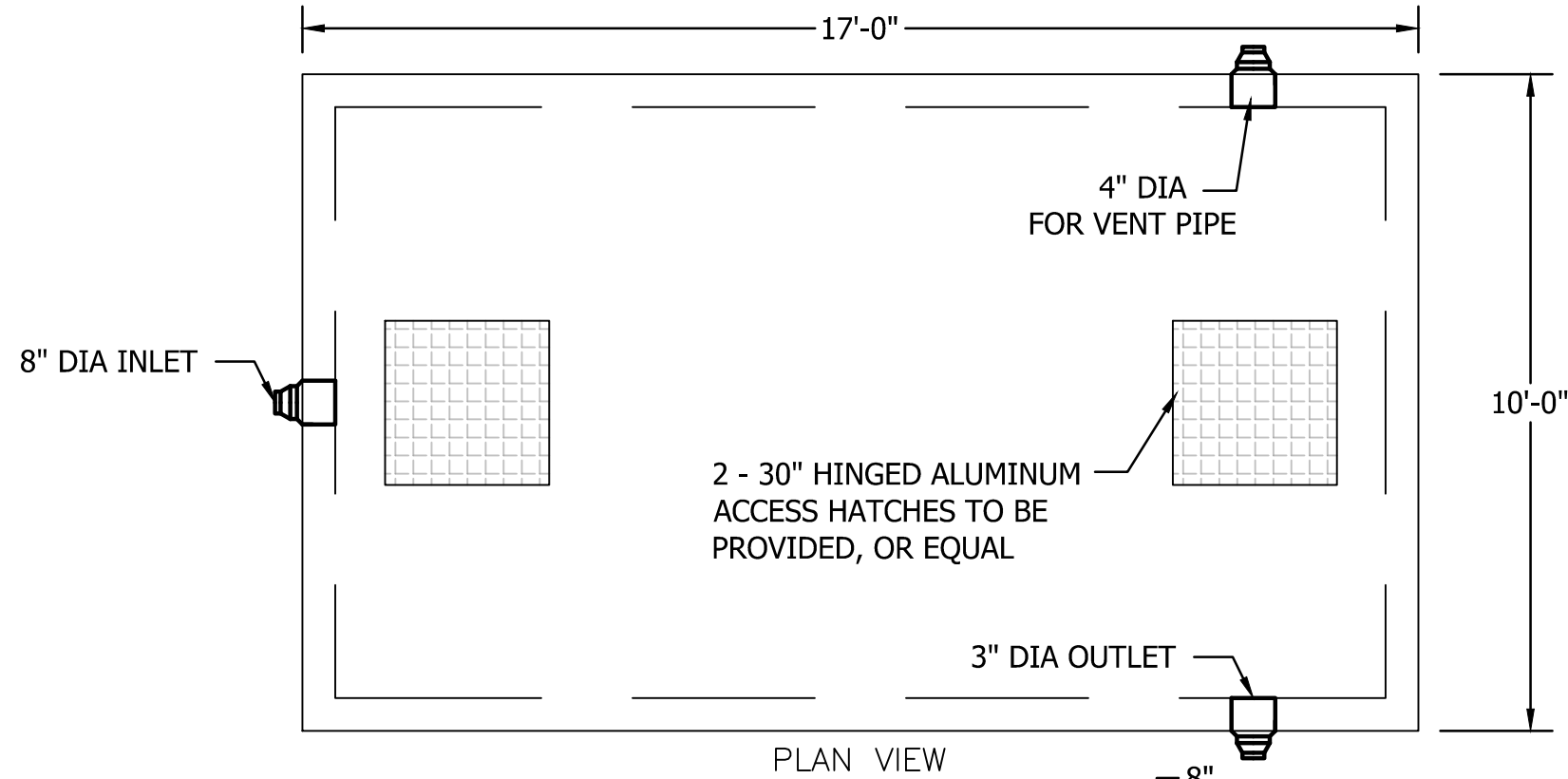
CONTROL PANELS:  
 SIMPLEX MUNICIPAL WASTEWATER PUMP CONTROL PANELS TO BE INSTALLED WITHIN THE CHEMICAL BUILDING.

CONTROL PANEL IS TO CONTROL 3-PHASE SUBMERSIBLE PUMPS IN A LEAD PUMP - LAG PUMP CONFIGURATION, ALTERNATING ON EACH PUMP START CYCLE ON A RISING WET WELL LEVEL, WITH THE LEAD PUMP OPERATING, THE LAG PUMP WILL COME ON UNTIL THE WET WELL LEVEL DROPS TO THE PUMP OFF LEVEL.

WET WELL LEVEL CONTROLS TO BE MECHANICALLY ACTIVATED FLOAT SWITCHES, KWIKSWITCH (PART #1055393) FLOAT SYSTEM, OR EQUAL.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, CUT SHEETS, CONTROL DIAGRAMS, AND PUMP CURVE FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

POWER:  
 3-PHASE POWER IS AVAILABLE  
 A PROPANE POWERED BACKUP GENERATOR SHALL BE CONSTRUCTED AS PART OF THIS PROJECT.



- NOTES:
- CONCRETE, 5,000 PSI MINIMUM AFTER 28 DAYS.
  - DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITL 5 REGS, FOR SEPTIC TANKS.
  - ALL REINFORCEMENT PER ASTM C1227.
  - DESIGNED FOR AASHTO HS-20 LOADING, COVER 1-5 FEET.
  - TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.
  - TEES AND BAFFLES SOLD SEPARATELY.
  - SPANNERS USED IN CENTER SECTIONS FOR TANKS GREATER THAN 7000 GALLONS.

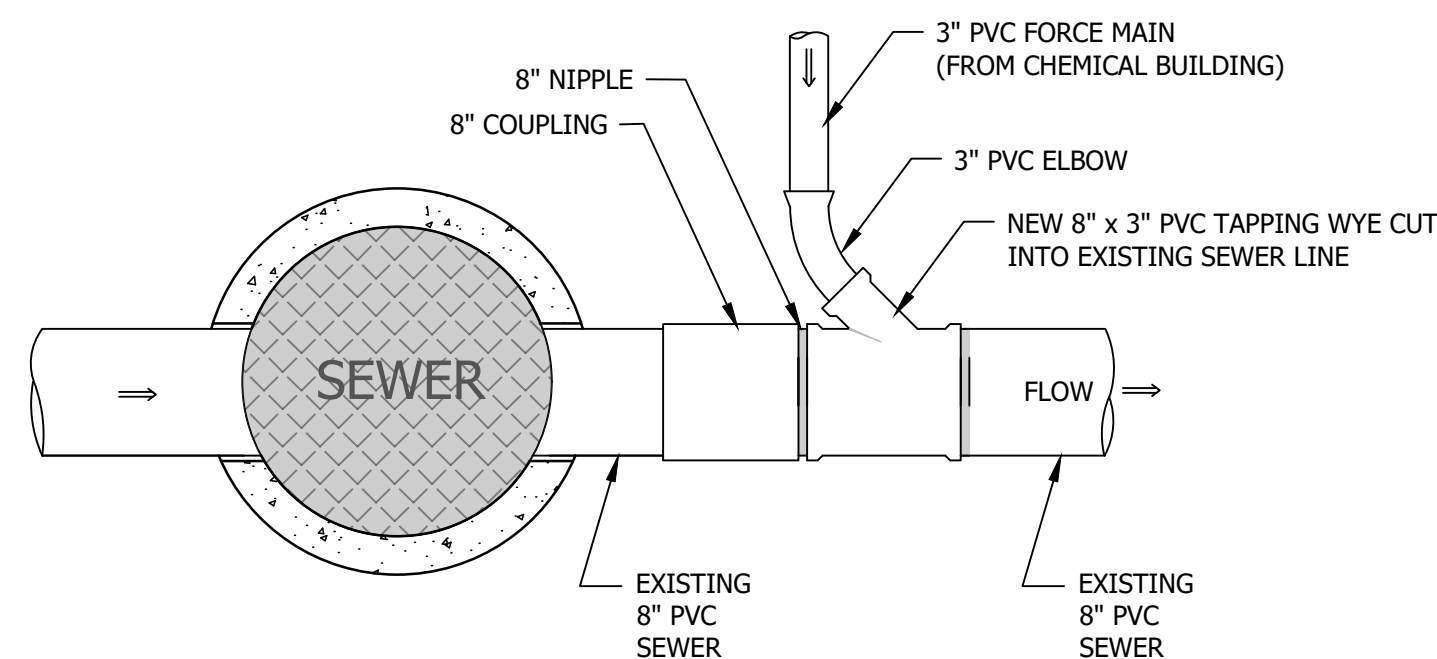
ITEM	SIZE	WEIGHT
8" TOP		16,312#
21" BOTTOM		20,517#
30" RISER		9,425#
30" RIS + SPAN		11,116#
34" RISER		10,682#
34" RIS + SPAN		12,600#
38" RISER		11,940#
38" RIS + SPAN		14,080#
42" RISER		13,195#
42" RIS + SPAN		15,562#
48" RISER		15,080#
48" RIS + SPAN		17,786#

GALLONS	A (HEIGHT)	B (INLET)	C (LIQUID)	TOTAL WEIGHT	RISER 1 SIZE	RISER 2 SIZE	RISER 3 SIZE	ITEM NO.
8,000	118"	100"	90"	67,810	42"	48" W/SPAN	0	10X17-80
8,500	124"	106"	96"	69,695	48"	48" W/SPAN	0	10X17-85
9,000	130"	112"	102"	72,932	30"	30" W/SPAN	42" W/SPAN	10X17-90
9,500	136"	118"	108"	75,156	30"	30" W/SPAN	48" W/SPAN	10X17-95
10,000	140"	122"	112"	76,640	30"	34" W/SPAN	48" W/SPAN	10X17-100
10,500	146"	128"	118"	78,635	34"	42" W/SPAN	42" W/SPAN	10X17-105
11,000	152"	134"	124"	80,859	34"	42" W/SPAN	48" W/SPAN	10X17-110
11,500	158"	140"	130"	83,083	34"	48" W/SPAN	48" W/SPAN	10X17-115
12,000	162"	144"	134"	84,341	38"	48" W/SPAN	48" W/SPAN	10X17-120

**SEWER NOTES**

- GENERAL**  
CONSTRUCTION OF ALL COMPONENTS OF THE SANITARY SEWER SYSTEM SHALL CONFORM TO THE MOST CURRENT VERSION OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES ENV-WQ 700 AND TECHNICAL SPECIFICATIONS ENTITLED "TOWN OF LISBON CONTRACT #1 WATER SYSTEM IMPROVEMENTS, DATED OCTOBER 2024, LATEST REVISED APRIL 2025.
- TYPES OF SEWERS**  
A. THERE SHALL BE NO CONNECTION BETWEEN SANITARY SEWERS AND STORM SEWERS.  
B. RUNOFF FROM ROOFS, STREETS, AND OTHER AREAS AND GROUNDWATER FROM FOUNDATION DRAINS, SUMP PUMPS, OR OTHER SUBSURFACE DRAINS SHALL BE EXCLUDED FROM SANITARY SEWERS.
- SEWER SIZE AND COVER**  
A. MINIMUM PIPE SIZE FOR GRAVITY SEWER MAINS SHALL BE 8 INCHES.  
B. MINIMUM PIPE SIZE FOR GRAVITY SEWER SERVICES SHALL BE 4 INCHES.  
C. MINIMUM PIPE SIZE FOR FORCE MAIN SEWER SERVICES SHALL BE 2 INCHES.  
D. SANITARY SEWERS SHALL HAVE 6 FEET MINIMUM COVER IN ALL ROADWAY LOCATIONS AND 4 FEET MINIMUM COVER IN ALL CROSS-COUNTRY LOCATIONS.
- PIPE AND FITTING MATERIALS:**  
A. DUCTILE IRON PIPE  
DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION:  
(1) AWWA C151 FOR DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL OR SAND LINED MOLDS, FOR WATER OR OTHER LIQUIDS;  
(2) AWWA C150 FOR THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A 536 IRON CASTINGS; AND  
(3) JOINTS SHALL BE MECHANICAL TYPE, PUSH-ON TYPE, OR BALL-AND-SOCKET TYPE;  
B. PVC (POLY VINYL CHLORIDE) PIPE  
PVC PIPE AND FITTINGS SHALL BE APPROVED FOR SEWAGE SERVICE AND CONFORM TO THE FOLLOWING:  
(1) PVC PIPE USED FOR GRAVITY SEWERS SHALL BE TYPE SDR 35 CONFORMING TO ASTM D3034;  
(2) PVC PIPE USED FOR FORCE MAINS SHALL BE TYPE SDR 26 CONFORMING TO ASTM D2241 OR ASTM D1785;  
(3) JOINTS SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE HAVING OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212.  
C. MANHOLES  
A. PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478.  
B. MANHOLES SHALL BE DESIGNED FOR H-20 LOADING.  
C. HORIZONTAL JOINTS BETWEEN BARREL SECTIONS SHALL BE OF AN OVERLAPPING TYPE WHICH SHALL DEPEND UPON A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT FOR WATER TIGHTNESS.  
D. PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:  
(1) ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND

- PROTECTION OF WATER SUPPLIES**  
A. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE WATER SUPPLY SYSTEM AND A SEWER OR SEWER APPURTENANCE WHICH WOULD PERMIT THE PASSAGE OF SEWAGE OR POLLUTED WATER INTO THE POTABLE SUPPLY. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SEWER OR SEWER MANHOLE.  
B. NO SEWER SHALL BE LOCATED WITHIN THE WELL PROTECTIVE RADII ESTABLISHED IN ENV-WS 300 FOR ANY PUBLIC WATER SUPPLY WELLS OR WITHIN 100 FEET OF ANY PRIVATE WATER SUPPLY WELL.  
C. SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.  
D. A DEVIATION FROM THE SEPARATION REQUIREMENTS OF (B) OR (C) ABOVE SHALL BE ALLOWED WHERE NECESSARY TO AVOID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENTS SPECIFIED IN ENV-WQ 704.06.  
E. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:  
(1) VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER; AND  
(2) SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.



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**12,000 GALLON SEPTIC TANK**

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DWG:

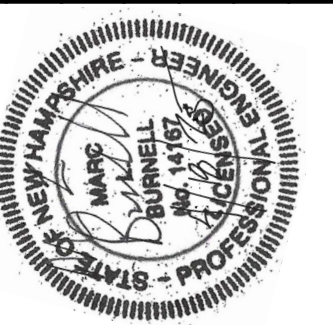
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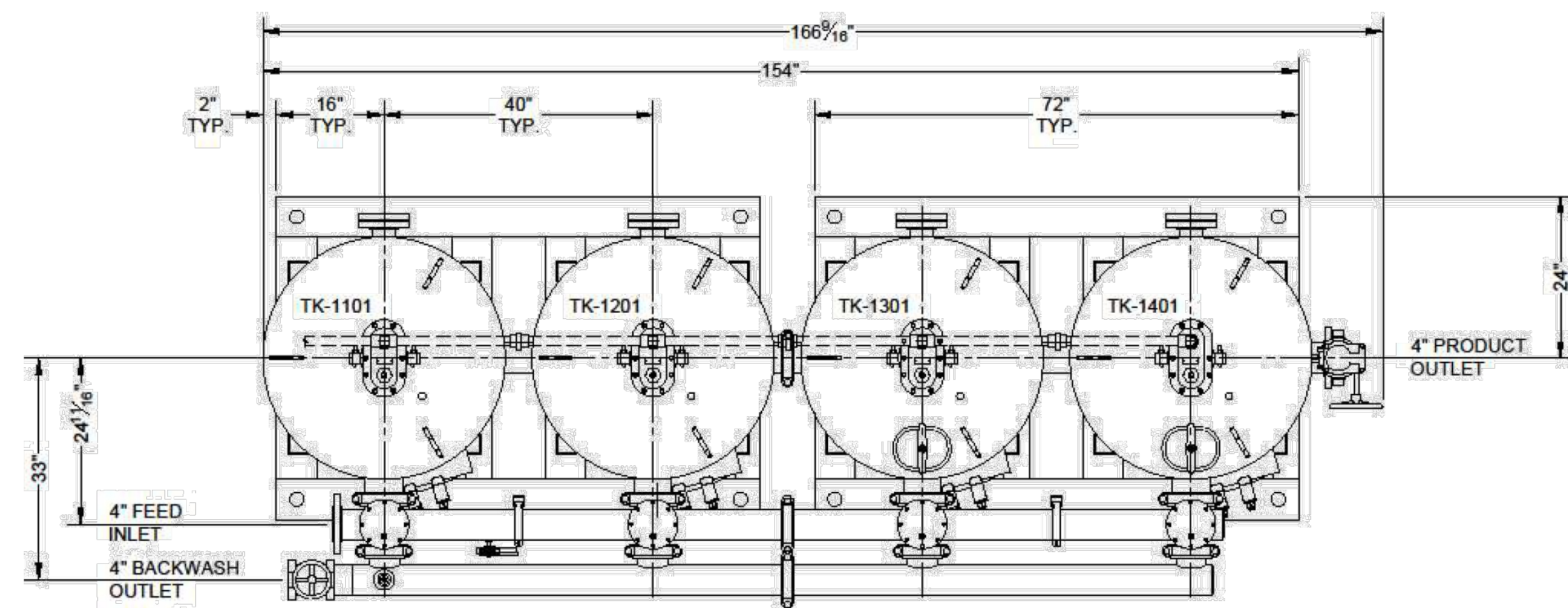


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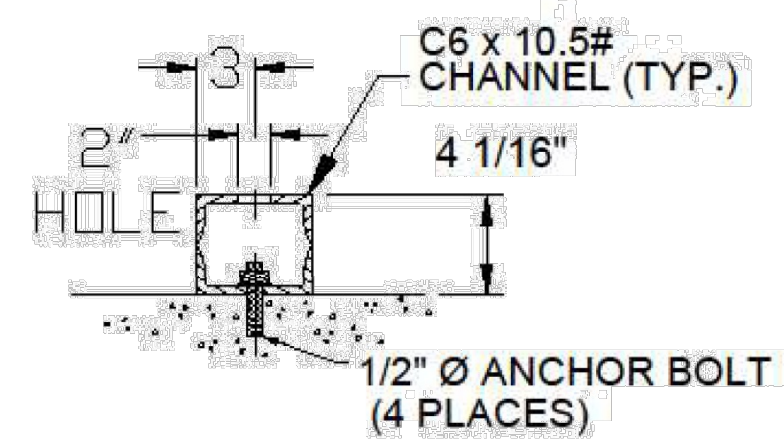
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CONTRACT #1 WATER SYSTEM IMPROVEMENTS  
USDA VEB AREA 136.010, DWS SHE 136.010, DWG 63  
CONTROL BUILDING, WELLSITE, CHEMICAL BUILDING ADDITION  
& MANGANESE TREATMENT  
BISHOP ROAD & VALLEY VIEW DRIVE, LISBON, NEW HAMPSHIRE

STANDARD SANITARY SEWER DETAILS & NOTES  
SHEET D6.2

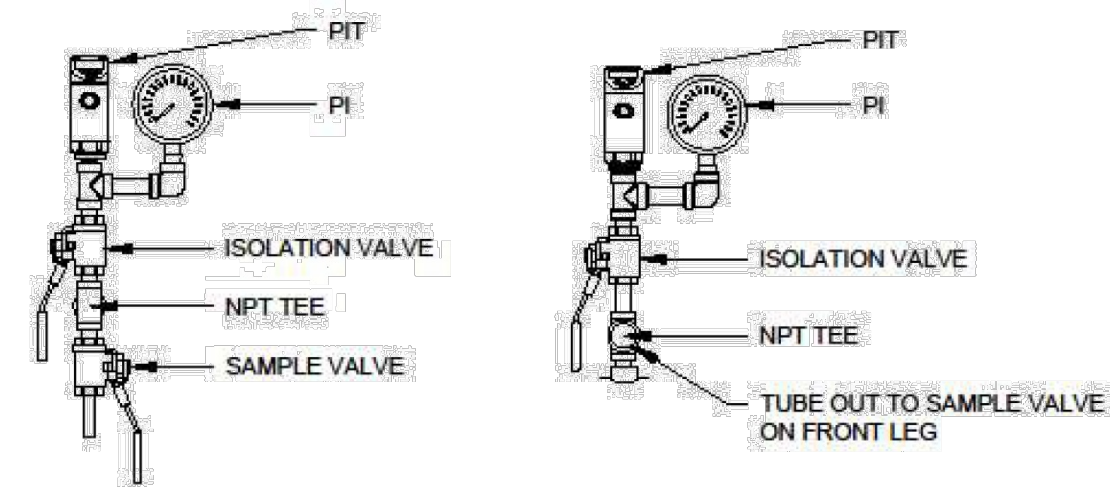




PLAN



SECTION A-A

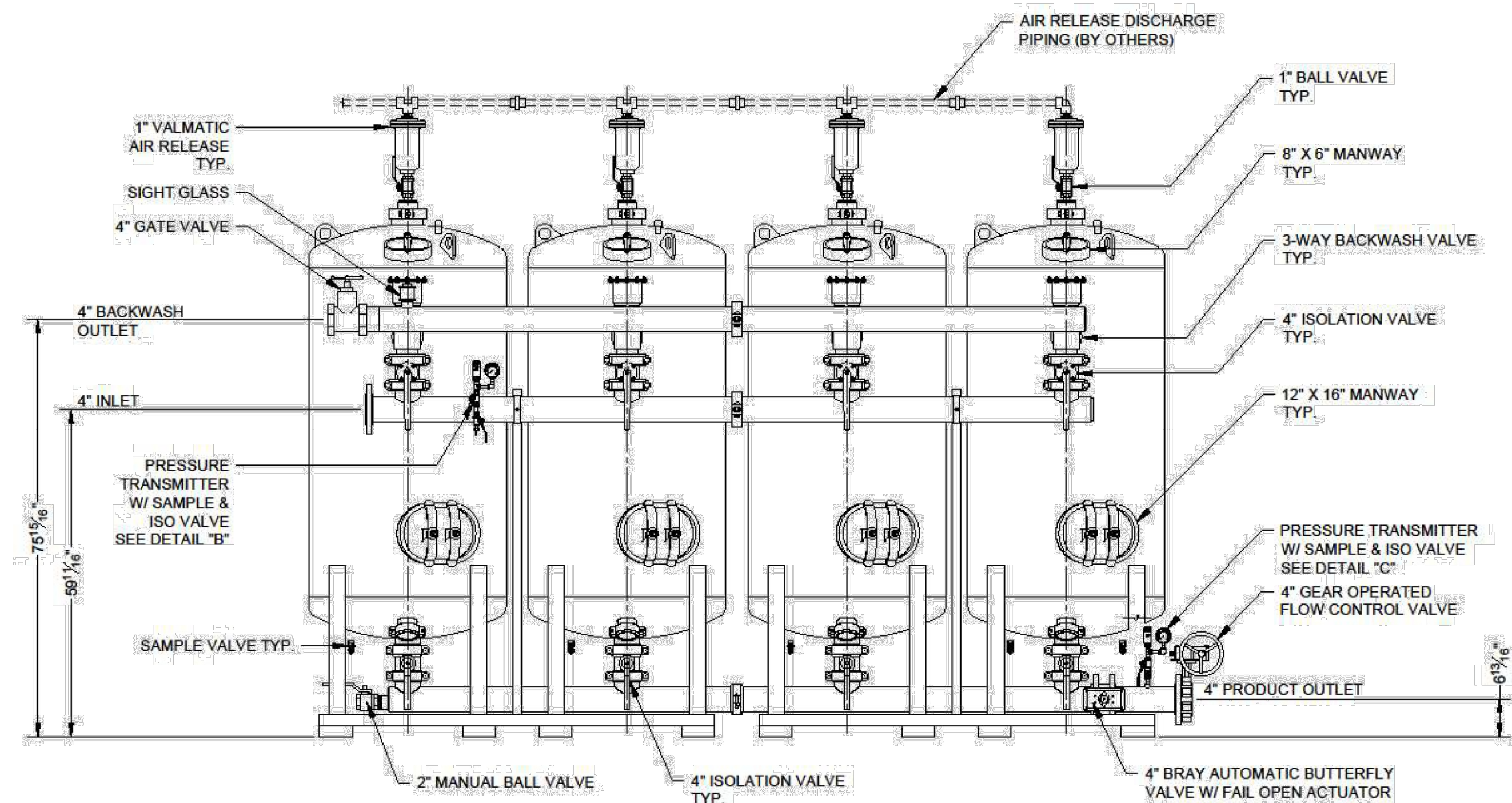


DETAIL "B"

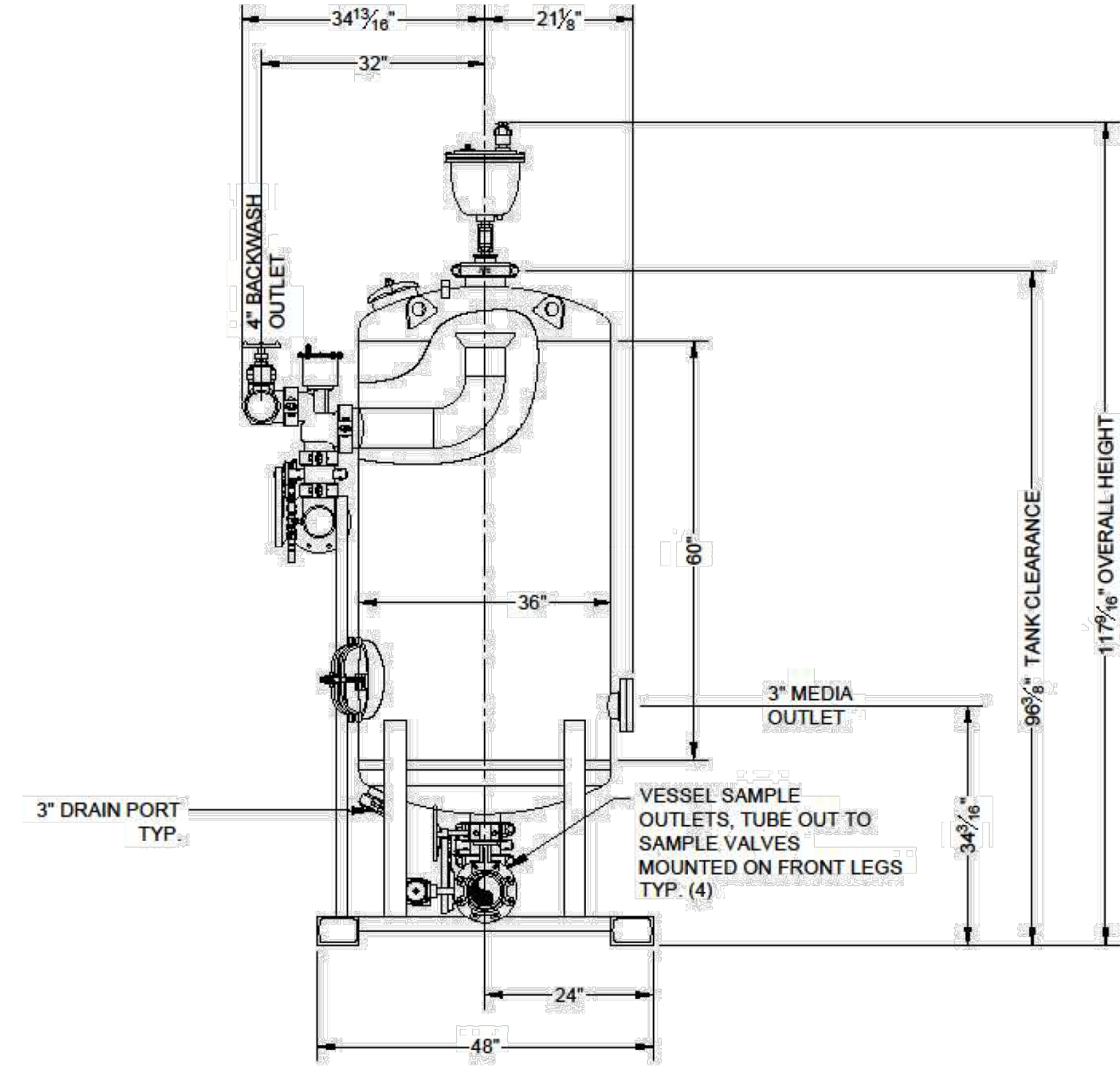
DETAIL "C"

- GENERAL NOTES:
- VESSEL MATL: SA36 BUTT WELD VESSEL CIRC SEAMS.
  - EXTERIOR COLOR STANDARD BLUE, RAL 5010.
  - 304SS UNDRERDRAIN LATERALS AND HUB.
  - SAMPLE VALVE ON INLET AND OUTLET PIPE HEADER, & OUTLET OF EACH TANK.
  - 100 PSIG NON CODE, HYDRO TEST 130 PSI, 1 HOUR.
  - 36"X30"X12" CONTROL PANEL (NOT SHOWN) SHIPPED LOOSE FOR ON SITE INSTALLATION.
  - DESIGN DATA:

Flow rates per Train	xxxxxx	
	GPM	GPM/FT <sup>2</sup>
Design Flow rate	xxx	xxx
Backwash Flow rate	xxx	xxx
Approx. Weight (lbs)		
A. Equipment	xxxxx	
B. Media	xxxxx	
C. Operating	xxxxx	
Media Requirements (per vessel in Ft <sup>2</sup> )		
A. 1/2" x 1/4" Gravel	4.5	
B. 1/4" x 1/8" Gravel	2.5	
C. 1/8" x 1/16" Gravel	2.5	
D. xxxxxxxx	xxxxx	



FRONT ELEVATION



RIGHT ELEVATION

REV	DESCRIPTION	DATE	BY

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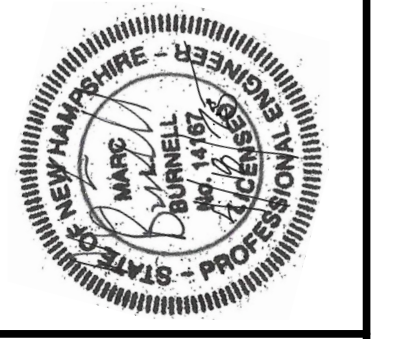
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OXIPLUS QUAD FILTER SYSTEM DETAILS

SHEET D6.4

ELECTRICAL ABBREVIATIONS LIST:	
(NOT ALL ABBREVIATIONS MAY BE USED)	
A	AMPERE(S)
A.C.	ALTERNATING CURRENT
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AL	ALUMINUM
ALT	ALTERNATE
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BW	BUSWAY
C	CONDUIT (SEE RACEWAYS AND CONDUCTORS)
CB	CIRCUIT BREAKER
CC	CONTROL CABINET
CATV	CABLE ACCESS TELEVISION
CKT	CIRCUIT
CLG	CEILING
COND	CONDUCTOR
CONN	CONNECT
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
D.C.	DIRECT CURRENT
DM	DIMMER CONTROL
DISC	DISCONNECT
DN	DOWN
DP	DOUBLE POLE
DT	DOUBLE THROW
E.C.	ELECTRICAL CONTRACTOR
E.HTR	ELECTRIC HEATER
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EOL	END LINE RESISTOR
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
F	FUSE
F.P.C.	FIRE PROTECTION CONTRACTOR
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
FL	FLOOR
FLUOR	FLUORESCENT
FS	FUSIBLE SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
G.C.	GENERAL CONTRACTOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GRD	GROUND
H.D.	HOT DIPPED
H.I.D.	HIGH INTENSITY DISCHARGE
H.P.S.	HIGH PRESSURE SODIUM
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
HZ	FREQUENCY IN CYCLES PER SECOND
IC	INTERCOM
IMC	INTERMEDIATE METALLIC CONDUIT
INC	INCANDESCENT
ISO	ISOLATED NEUTRAL
JB	JUNCTION BOX
K	KEY OPERATED
KOMIL	THOUSAND CIRCULAR MIL(S)
KVA	KILOVOLT AMPERE(S)
KVAR	KILOVAR(S)
KW	KILOWATT(S)
L.P.S.	LOW PRESSURE SODIUM
LP	LIGHTING PANEL
LV	LOW VOLTAGE
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MGST	MAGNETIC STARTER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTH	MOUNTING HEIGHT
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
N.I.C.	NOT IN CONTRACT
NC	NORMALLY CLOSED
NF	NONFUSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	OVER COUNTER
OL	OVERLOAD ELEMENT
P	PILOT INDICATOR
PF	POWER FACTOR
PLG.C	PLUMBING CONTRACTOR
PNL	PANEL
PP	POWER PANEL
PRI	PRIMARY
PS	PULL SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
R	RELAY
RC	REMOTE CONTROL
RECP	RECEPTACLE
RGS	RIGID METAL CONDUIT
S.S.	SOLID STATE
SEC	SECONDARY
SMR	SURFACE METAL RACEWAY
SP	SINGLE POLE
SPK	SPEAKER
SST	SOLID STATE TRIP
ST	SINGLE THROW
SW	SWITCH
SWBD	SWITCHBOARD
T EL	TELEPHONE
TB	TERMINAL BOX
TEMP	TEMPORARY
TV	TELEVISION
TYP	TYPICAL
UC	UNDER CABINET
UG	UNDERGROUND
UH	UNIT HEATER
UNG	UNGROUND
UPS	UNINTERRUPTED POWER SYSTEM
USB	UNIVERSAL SERIAL BUS
V	VOLT(S)
VA	VOLTAMP(S)
VAR	REACTIVE VOLT AMPERES
VP	VAPORPROOF
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

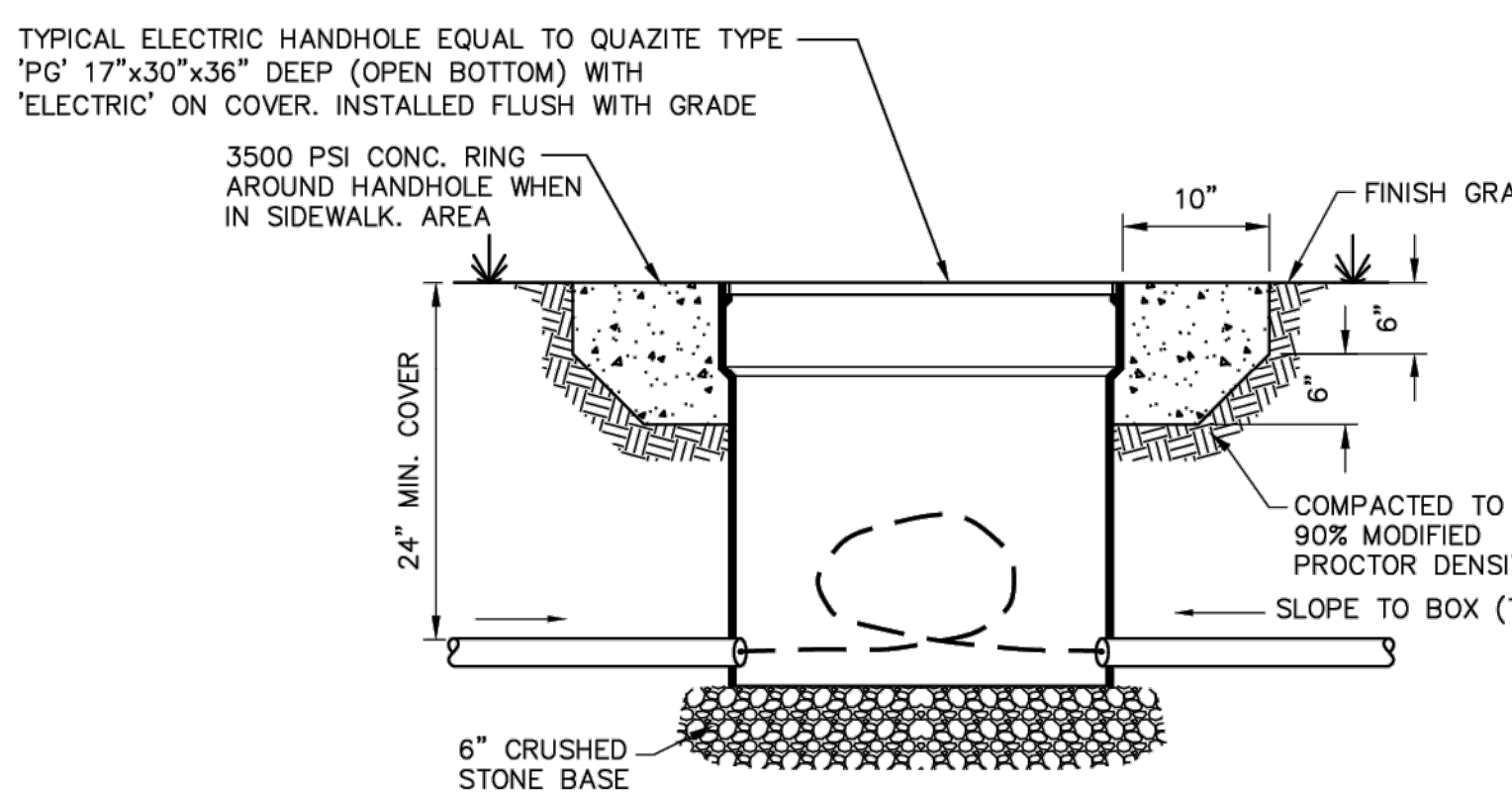
**NOT ALL SYMBOLS MAY BE USED**

MOUNTING ABBREVIATIONS LEGEND:	
SUBSCRIPT	DESCRIPTION
OC	OVER COUNTER OUTLET: INSTALL BOTTOM OF OUTLET BOX 1-1/2" ABOVE HIGHEST ELEMENT OF COUNTER (I.E., BACKSPASH OR COUNTER TOP IF NO BACK SPLASH).
CR	CASEWORK RECESSED OUTLET: MOUNT BOX IN CASEWORK VERTICAL SURFACE.
EQ	EQUIPMENT OUTLET: FINAL TERMINATION METHOD AND EXACT LOCATION SHALL BE DETERMINED FROM EQUIPMENT MANUFACTURER'S APPROVED SHOP DRAWINGS.
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
MTH	MOUNTING HEIGHT

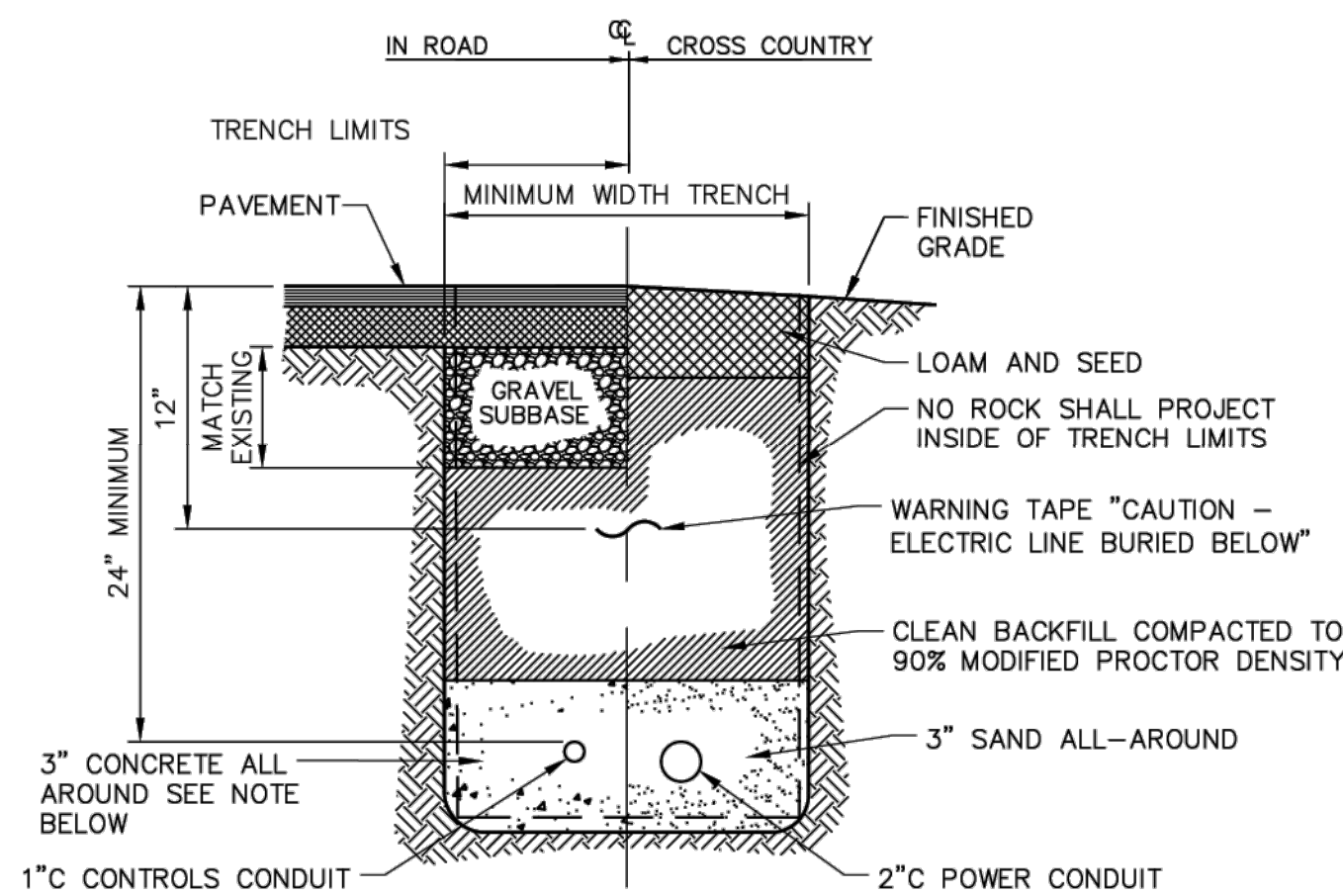
RACEWAYS AND CONDUCTORS LEGEND:	
SYMBOL	DESCRIPTION
LV	LOW VOLTAGE WIRING
(Symbol)	CIRCUIT IN CONDUIT RUN IN-SLAB OR UNDERGROUND
(Symbol)	CIRCUIT IN CONDUIT CONCEALED IN WALLS OR ABOVE CEILING WHERE POSSIBLE.
CKT	HOMERUN TO PANELBOARD OR AS NOTED
(Symbol)	CONDUIT TURNING UP
(Symbol)	CONDUIT TURNING DOWN

RECEPTACLE OUTLETS LEGEND:	
SYMBOL	NUMBER BY THE SIDE OF SYMBOL DENOTES CIRCUIT NUMBER. DEVICE MOUNTING HEIGHTS ARE DENOTED BELOW UNLESS OTHERWISE NOTED ON PLANS. COORDINATE EXACT LOCATIONS AND ALL MOUNTING HEIGHTS W/ ARCHITECTURAL PLANS/SECTIONS.
(Symbol)	DUPLEX CONVENIENCE OUTLET. MOUNT AT +18" AFF.
(Symbol)	DUPLEX CONVENIENCE OUTLET. MOUNT AT +18" AFF. 'X' DENOTES REUSE LOCATION.
(Symbol)	DOUBLE DUPLEX OUTLET (QUADPLEX RECEPTACLE). MOUNT AT +18" AFF.
(Symbol)	DUPLEX OUTLET. INSTALLED ABOVE CEILING AT LOCATION SHOWN.
(Symbol)	SINGLE DEDICATED OUTLET. MOUNT @ 18" AFF.
(Symbol)	SPECIAL OUTLET AS NOTED ON DRAWINGS. MOUNT AT +18" AFF. 'R' DENOTES RANGE. 'D' DENOTES DRYER.
(Symbol)	WIREMOLD 3000. DUPLEX RECEPTACLES SPACED 24" ON CENTER.
(Symbol)	WALL MOUNT AT 36" AFF.
(Symbol)	GROUND FAULT CIRCUIT INTERRUPTER
(Symbol)	OR GFI
(Symbol)	OVER-COUNTER
(Symbol)	WEATHERPROOF

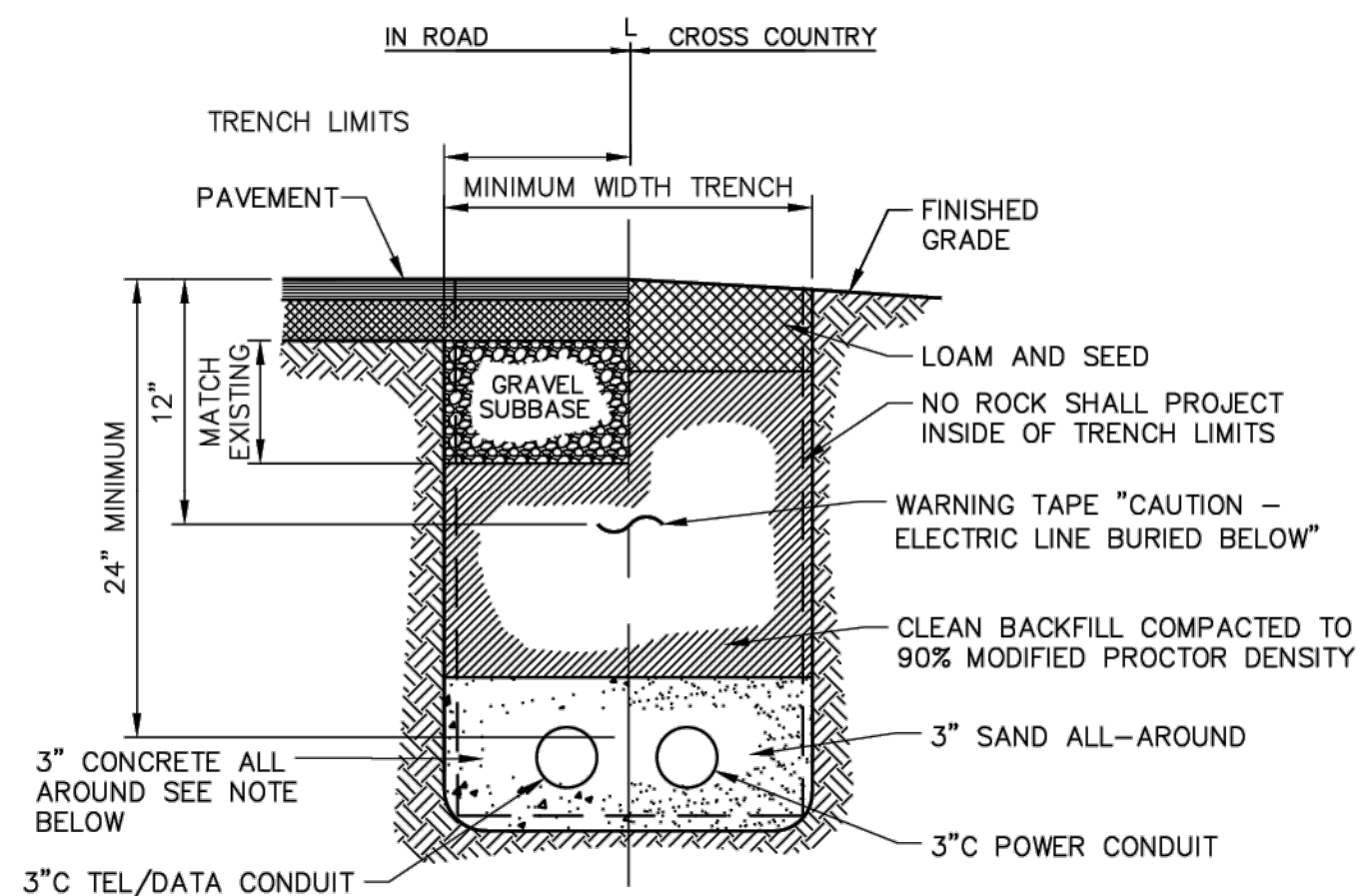
POWER APPURTANCES LEGEND:	
SYMBOL	REFER TO PLANS FOR EXACT QUANTITIES AND LOCATIONS.
(Symbol)	FLUSH MOUNTED PANELBOARD AND CABINET. MOUNT AT 6"-6" MAX. AFF TO TOP.
(Symbol)	SURFACE MOUNTED PANELBOARD AND CABINET. MOUNT AT 6"-6" MAX. AFF TO TOP.
(Symbol)	ELECTRICAL PULL BOX, SIZED AS REQUIRED OR AS SHOWN ON DRAWINGS.
(Symbol)	JUNCTION BOX (JB) (IN ACCESSIBLE LOCATION).
(Symbol)	JUNCTION BOX (JB) (IN ACCESSIBLE LOCATION) W/ FLEXIBLE CONDUIT TO EQUIPMENT AS SHOWN. - JUNCTION BOX SUBSCRIPTS: 'C' CONTROL, 'D' DATA, 'DT' DATA/TELEPHONE, 'F' FIRE ALARM, 'P' POWER, 'T' TELEPHONE.
(Symbol)	MOTOR. HORSEPOWER AS SHOWN ON DRAWINGS.
(Symbol)	H.P. RATED MANUAL MOTOR STARTER (WEATHERPROOF WHERE OUTSIDE). SINGLE OR 2 POLE AS REQUIRED
(Symbol)	FUSED DISCONNECT SWITCH. SIZE AND FUSES PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF (WP) WHEN LOCATED OUTSIDE. 30A/3P MINIMUM.
(Symbol)	MOTOR CONTROLLER.



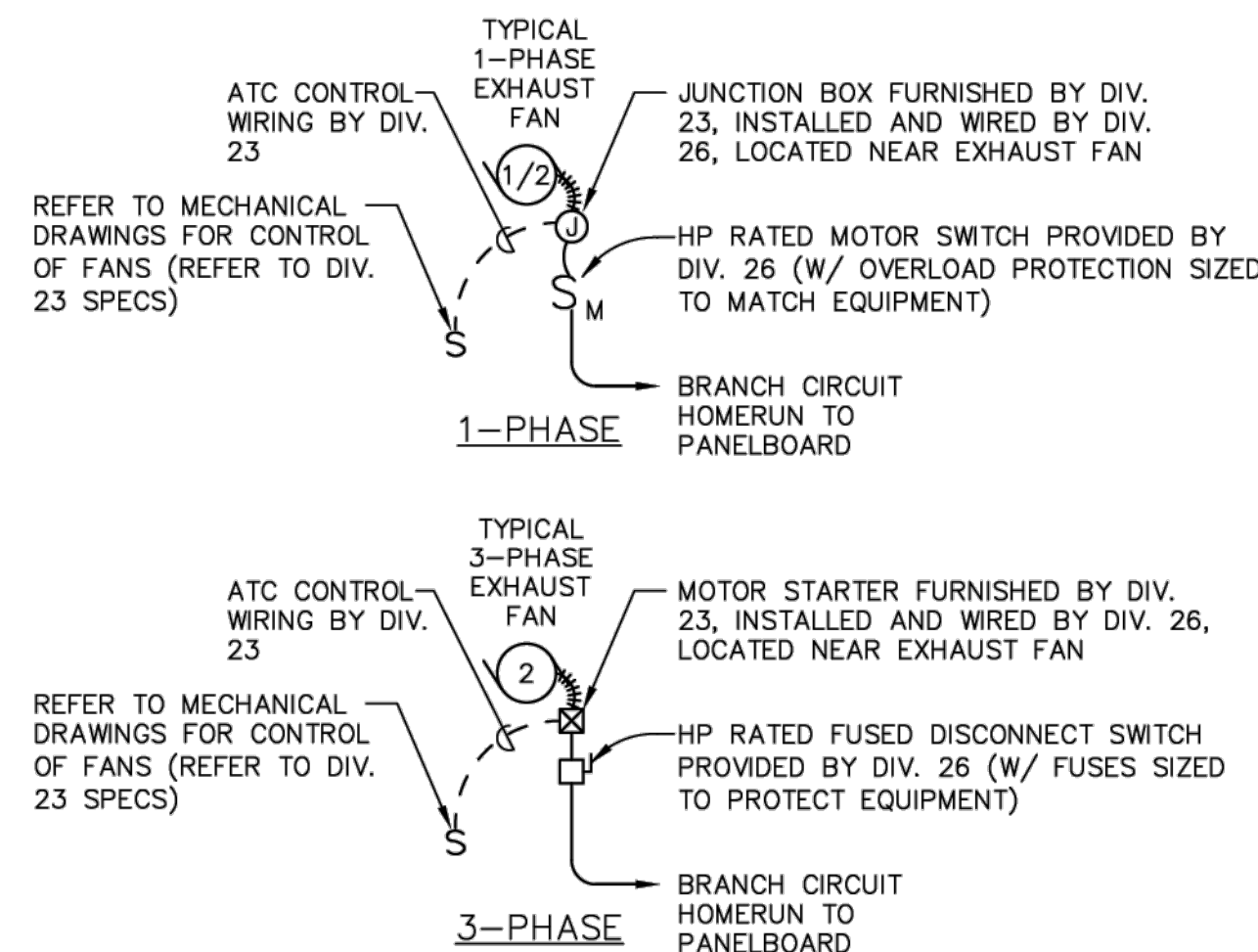
**TYPICAL SECTION @ HANDHOLE**  
NOT TO SCALE



**1 TYPICAL POWER AND CONTROLS TRENCH SECTION**  
E401 NOT TO SCALE



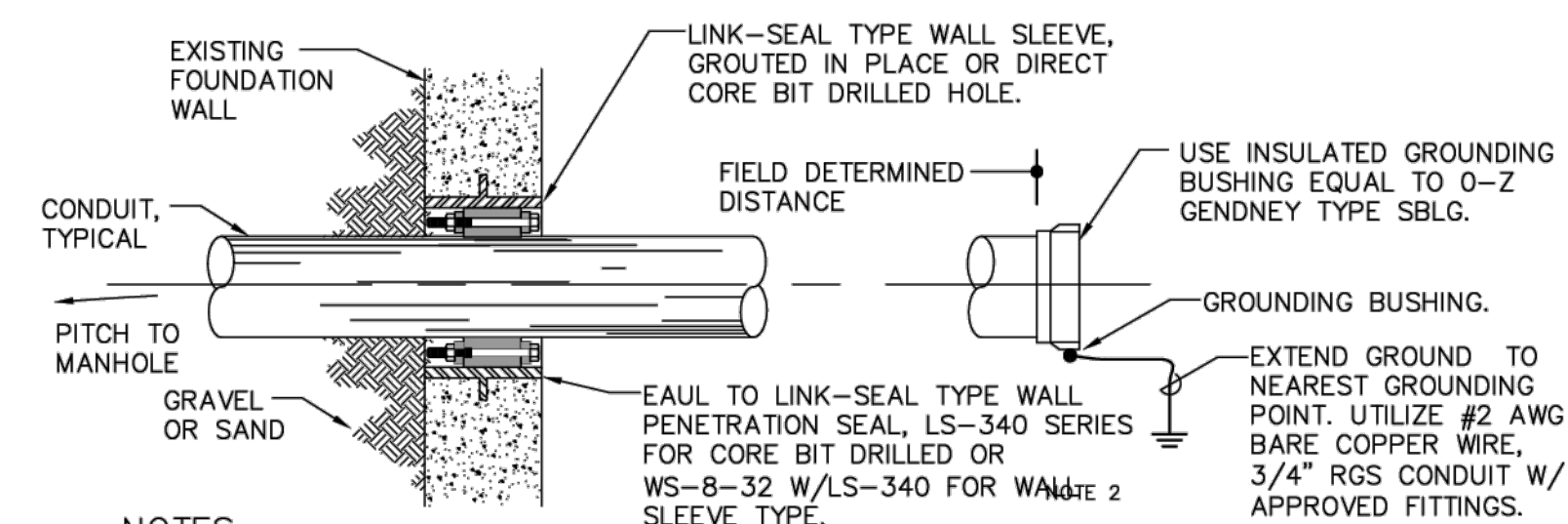
**2 TYPICAL POWER TRENCH SECTION**  
E401 NOT TO SCALE



**TYPICAL MOTOR WIRING DIAGRAMS**  
NOT TO SCALE

**GENERAL NOTES:**

- ALL ELECTRICAL WORK AND MATERIALS SHALL BE INSTALLED ACCORDING TO THE LATEST STATE ADOPTED NATIONAL ELECTRICAL CODE (NEC) AND ITS AMENDMENTS, NFPA AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
- THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTIONS.
- ALL POWER WIRING SHALL BE IN CONDUIT OR MC CABLE (REFER TO SPECIFICATIONS). ALL RACEWAYS SHALL BE EMT (ELECTRICAL METALLIC TUBING) FOR INTERIOR AND PVC FOR UNDERGROUND. THE USE OF EXISTING CONCEALED CONDUITS FOUND TO BE IN GOOD ELECTRICAL CONDITION MAY BE USED. ALL CONDUCTORS SHALL BE COPPER GROUND (TYPICAL) WITH NUMBER OF CONDUCTORS AS REQUIRED. REFER TO PANEL SCHEDULES, TYPICAL. ALL CONDUCTORS SHALL BE COPPER, WIRE SIZE NO. 8 AWG AND SMALLER BE TYPE THHN/THWN INSULATION. SIZES LARGER THEN NO. 8 SHALL HAVE TYPE "THHN/THWN" INSULATION UNLESS OTHERWISE NOTES.
- LIMIT 20A, 120V BRANCH CIRCUITS TO A MAXIMUM 1920VA LOAD AND 15A, 120V BRANCH CIRCUIT TO A MAXIMUM 1440VA LOAD.
- ALL WIRING SHALL BE CONCEALED IN WALLS AND ABOVE CEILING IN FINISHED AREAS AND WHEREVER POSSIBLE. WIRING IN UTILITY AREAS (ELECTRICAL SPACE) MAY BE RUN EXPOSED AS APPROVED BY THE ARCHITECT. EXPOSED WIRING SHALL BE IN CONDUIT, BE PARALLEL TO BUILDING STRUCTURAL ELEMENTS AND PRESENT A NEAT AND COMPLETE INSTALLATION.
- CONDUITS, RACEWAYS AND CABLES SHALL BE PROPERLY AND SECURELY ATTACHED TO BUILDING STRUCTURAL COMPONENTS AS REQUIRED BY NEC ALL FASTENERS AND HARDWARE SHALL BE APPROVED FOR THE INSTALLATION AND THE CONDITIONS ENCOUNTERED.
- EACH OUTLET OR JUNCTION IN ANY OF THE WIRING SYSTEMS SHALL BE MADE IN AN APPROVED, METALLIC JUNCTION BOX. SUCH BOX SHALL BE SUITABLE FOR THE SIZE AND NUMBER OF CONDUCTORS AND DEVICES TO BE INSTALLED, AS WELL AS THE CONDITION ENCOUNTERED. ALL SPLICES SHALL BE MADE WITH APPROVED, ELECTRICAL CONNECTORS.
- VERIFY ALL STRUCTURAL, ARCHITECTURAL AND ELECTRICAL CONDITIONS (DUCT CLEARANCES, COUNTER HEIGHTS, DOOR SWINGS, ETC.) PRIOR TO ROUGH IN FOR ELECTRICAL WIRING EQUIPMENT.
- PRIOR TO ROUGH-IN OF ANY NEW PANEL BOARDS (IN NEW LOCATION) AND RECEPTACLES, THESE LOCATIONS AND MOUNTING HEIGHTS SHALL BE CLEARLY MARKED AND IDENTIFIED WITH SPRAY PAINT. ONCE COMPLETED, THE ARCHITECT/OWNER SHALL BE NOTIFIED THAT ALL LOCATIONS HAVE BEEN MARKED AND ARE READY FOR THEIR APPROVAL.
- ALL ELECTRICAL WORK SHALL BE CAREFULLY COORDINATED WITH THE WORK OF OTHER TRADES AND ON-SITE CONDITIONS. WHERE CUTTING, DRILLING OR ALTERATION TO THE WORK OF OTHERS IS NECESSARY, FOR THE PROPER INSTALLATION OF ELECTRICAL EQUIPMENT, SUCH WORK SHALL BE PLANNED IN ADVANCE WITH THE GENERAL CONTRACTOR AND SHALL BE CAREFULLY DONE. ANY DAMAGE TO THE BUILDINGS OR EQUIPMENT SHALL BE REPAIRED BY PROPERLY TRAINED PERSONNEL, TO THE SATISFACTION OF THE ARCHITECT, AT NO ADDITIONAL COST TO THE OWNER.
- DURING ROUGH IN AND FINISHED STAGES OF CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT AND KEEP CLEAN ALL ELECTRICAL EQUIPMENT, PANELS, FIXTURES AND DEVICES.
- THE CONTRACTOR SHALL PROVIDE ALL INFORMATION ABOUT EQUIPMENT WHICH IS BEING FURNISHED TO THE GENERAL CONTRACTOR FOR COORDINATION PURPOSES. THE CONTRACTOR SHALL PROVIDE ALL INSTALLATION DETAILS AND SUPPORT COMPONENTS TO THE GENERAL CONTRACTOR SO THAT THESE MAY BE BUILT INTO THE CONSTRUCTION IN A TIMELY MANNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF THE FINAL LOCATIONS OF ELECTRICAL, HVAC AND OWNER'S EQUIPMENT AND POWER CONNECTION DETAILS SO THAT THE ASSOCIATED ELECTRICAL WORK WILL BE PROPERLY COORDINATED AND INSTALLED.
- WHERE WIRING CAN NOT BE ROUTED CONCEALED UTILIZE WIREMOLD SURFACE RACEWAY (SEE SPECIFICATIONS - WITH ALL NECESSARY FITTINGS/HARDWARE AND ATTACHMENT) WITH STRANDED TYPE TYPE THHN/THWN CONDUCTOR. ALL COMPONENTS SHALL BE PAINTED AS DIRECTED BY THE ARCHITECT. COORDINATE MOUNTING WITH ARCHITECT.
- THE INTERIOR ELECTRICAL SYSTEM SHALL BE COMPLETELY AND EFFECTIVELY GROUNDING AS REQUIRED BY NEC. ALL METALLIC RACEWAYS SHALL BE ELECTRICALLY AND ELECTRICALLY SECURE AT ALL JOINTS AND AT ALL BOXES, CABINETS, FITTINGS, AND EQUIPMENT.
- COMPLETE ALL PANEL BOARD CIRCUITS DIRECTORY CARDS TO REFLECT AS-BUILT CONDITIONS.
- ALL RACEWAYS SHALL BE PROVIDED WITH EQUIPMENT GROUND CONDUCTOR. EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL ELECTRICAL RACEWAYS AND SHALL BE SPECIFIED IN ACCORDANCE WITH NEC 250-95 AND SHALL BE CONTINUOUS.
- FURNISH, INSTALL, TEST, CALIBRATE, AND OTHERWISE MAKE OPERATIONAL ALL DEVICES AND EQUIPMENT SHOWN ON THESE DRAWINGS.
- THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS TO OBTAIN A COMPLETE AND SATISFACTORY INSTALLATION. AN ATTEMPT HAS BEEN MADE TO SEPARATE AND DEFINE THE CONTRACTOR'S WORK. THESE DRAWINGS ARE DIAGRAMMATIC, BUT SHALL BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION OF THE FACILITY AND THE WORK OF OTHER TRADES WILL PERMIT. THESE DRAWINGS UTILIZE SYMBOLS AND SCHEMATIC DIAGRAMS TO INDICATE VARIOUS ITEMS OF WORK. THEREFORE, NO INTERPRETATION WILL BE MADE FROM THE LIMITATION OF SYMBOLS AND DIAGRAMS THAT ANY ELEMENTS NECESSARY FOR THE COMPLETE INSTALLATION ARE EXCLUDED. THE ARCHITECT SHOULD BE NOTIFIED OF ANY DISCREPANCIES, OMISSIONS, CONFLICTS, OR INTERFERENCE WHICH MAY OCCUR BETWEEN VARIOUS DRAWINGS AND SPECIFICATIONS. IF SUCH NOTIFICATION IS NOT RECEIVED, THE INSTALLING CONTRACTOR(S) SHALL BE RESPONSIBLE FOR THEIR INTERPRETATIONS.



- NOTES:**
- LINK-SEAL TYPE SEALING FITTING SHALL BE USED FOR ALL WALL PENETRATIONS. IF CORE BIT DRILLED SYSTEM IS USED AND CORE DRILL IS SMOOTH AND SUITABLE THE MODULE SEALING SYSTEM MAY BE USED. USE WALL SLEEVES IF ENTRY IS SIMILAR TO DETAIL 'CE'.
  - SLOPE DUCTS TOWARDS MH.
  - ALL CONDUIT PENETRATIONS SHALL BE PERPENDICULAR THROUGH FOUNDATION FOR PROPER SEAL.

**CONDUIT SLEEVE THROUGH WALL DETAIL**  
NOT TO SCALE

**BIDDING PLANS**  
NOT FOR CONSTRUCTION



REVISIONS	REVISION DESCRIPTION	DATE	NUMBER	BY

**CLIENT NAME**  
TOWN OF LISBON  
46 SCHOOL STREET  
LISBON, NH 03585  
(603) 838-6376

**PROJECT NAME**  
WATER SYSTEM  
IMPROVEMENTS  
PROJECT

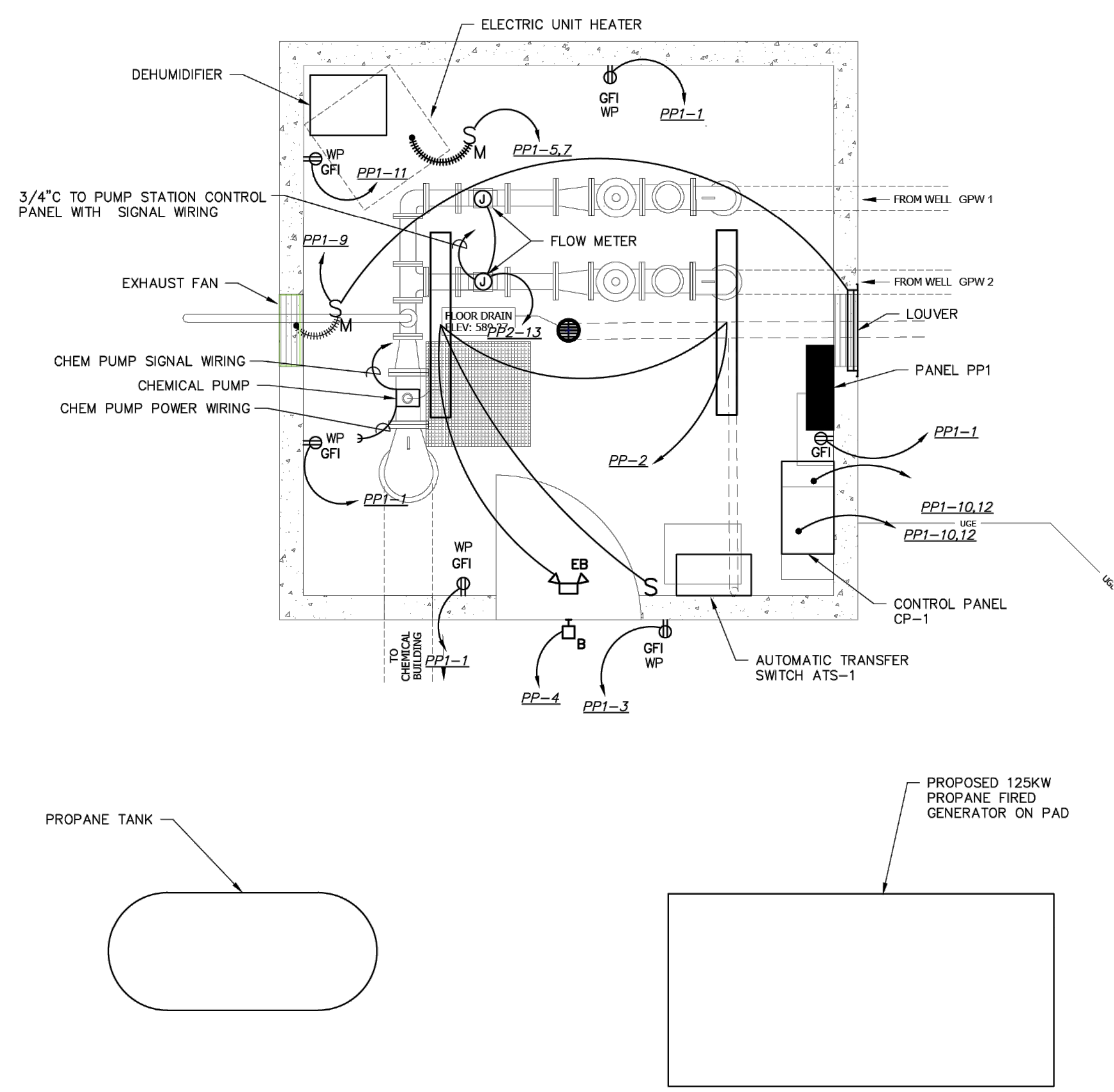
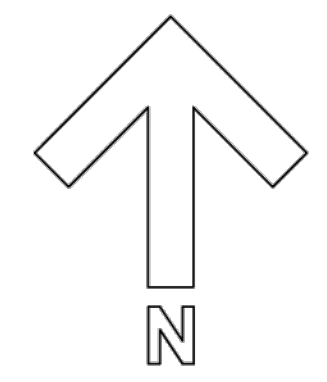
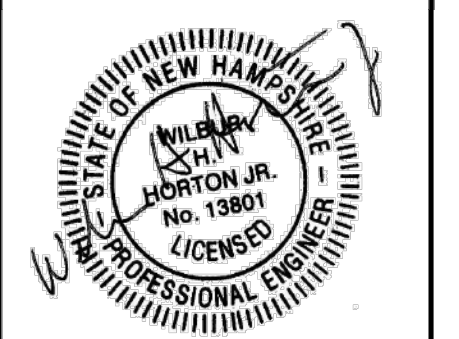
**PROJECT ADDRESS**  
BISHOP ROAD &  
VALLEYVIEW DRIVE  
LISBON, NH

**SHEET TITLE**  
ELECTRICAL  
LEGEND  
AND  
GENERAL  
NOTES

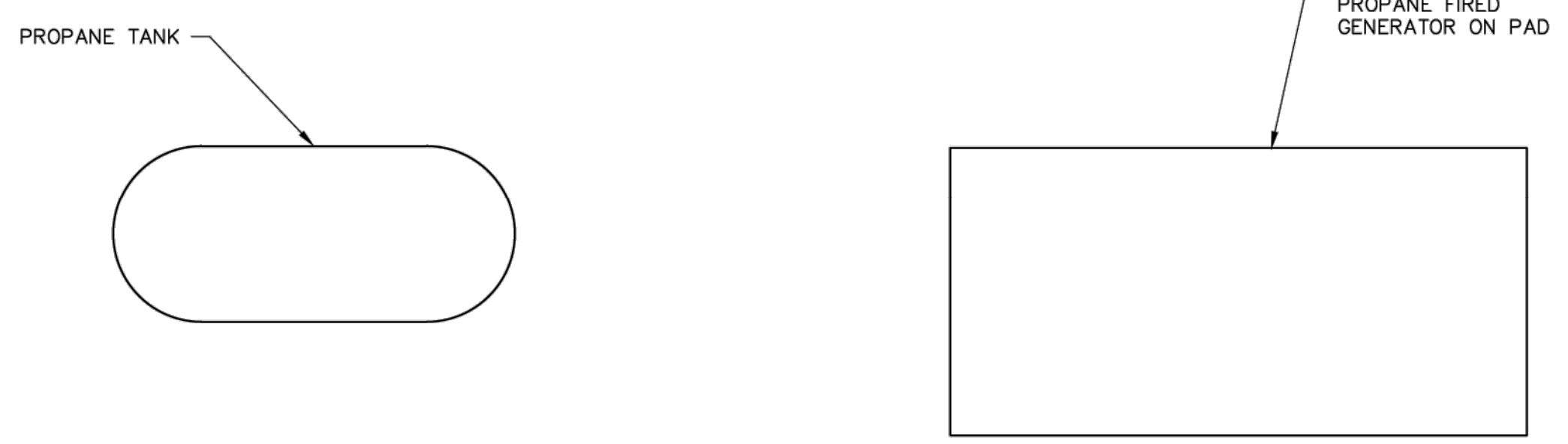
**D&K PROJECT #** 530379  
**PROJ. ENG.** CFA  
**DRAWN BY** EJD  
**CHECKED BY** WHH

**DATE** JANUARY 2025  
**SHEET NUMBER**

**E1**  
SHEET: 25 of XX



**COORDINATION NOTE:**  
1. EC TO COORDINATE FINAL CONDUIT AND FEEDER SIZES BASED ON SELECTED CONTROLLER AND PUMP SELECTION.



**1 CONTROL BUILDING POWER PLAN**  
SCALE: 1/2" = 1'-0"  
0 1' 2' 4'

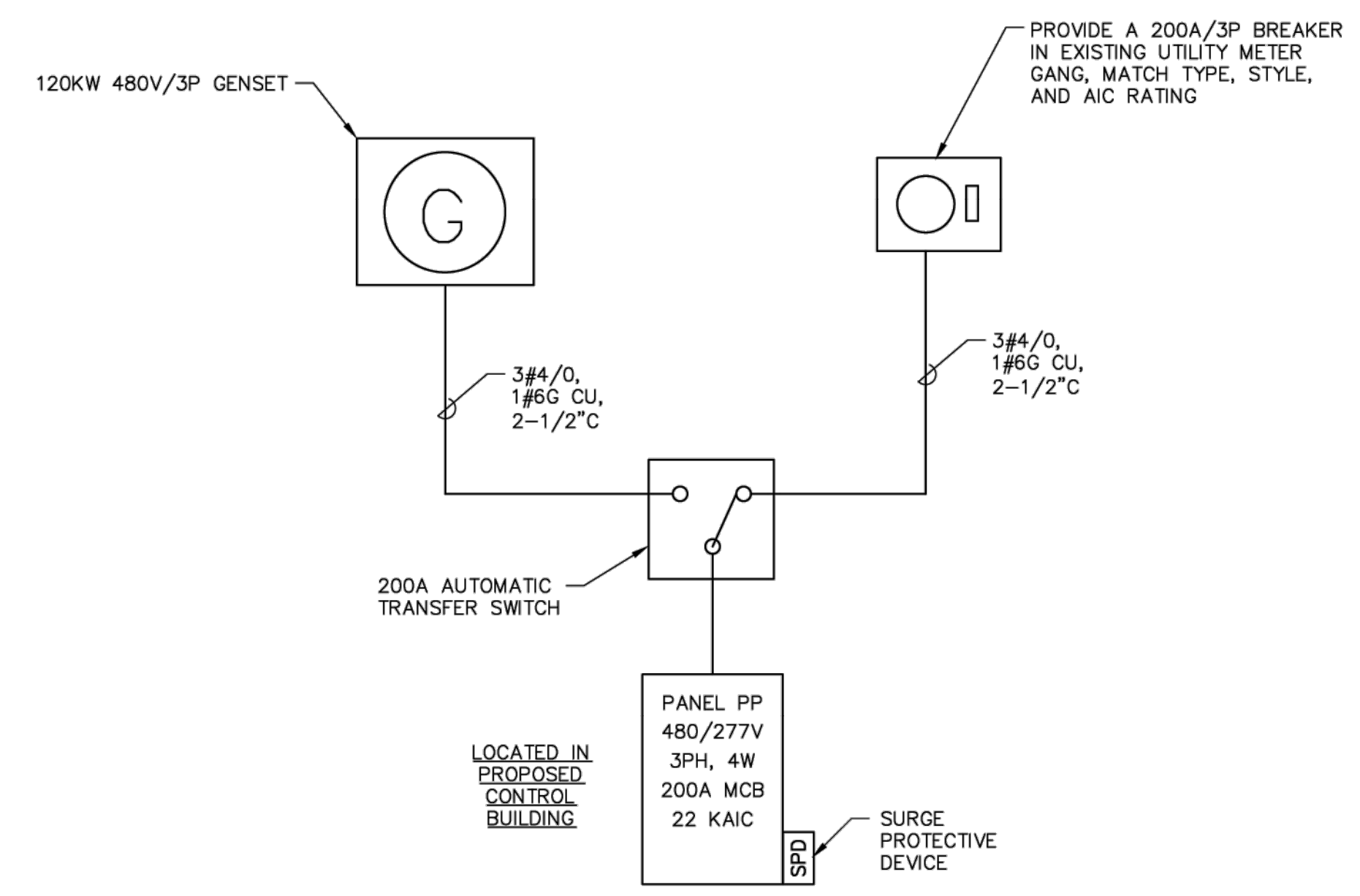
**LIGHTING FIXTURE SCHEDULE**

MARK	MANUFACTURER	CATALOG NUMBER	TYPE	COLOR	MOUNTING	VOLTAGE	LAMPS	REMARKS	TOTAL WATTS
A	LITHONIA LIGHTING	CSVTL485000LMMVOLT40K80CRI	6X48 IND.	WHITE	SURFACE	120	4946 LUMENS, 4000K		42
B	LITHONIA LIGHTING	WDGE2LEDP140K80CRIVFMVOLTDBXLPE	WALL PACK	BLACK	ABOVE DOOR	120	1200 LUMENS, 4000K	PROVIDE WITH PHOTOCCELL	12
EB	LITHONIA LIGHTING	EL2LM12	EMERGENCY	WHITE	WALL @8'	120			0.33

WIRING		DESCRIPTION			VA OR W			BREAKER			CKT.			BUS			BREAKER			VA OR W			DESCRIPTION			WIRING	
WIRE	COND				ØA	ØB	ØC	POLE	A	NO	NO	CONN	NO	POLE	A	ØA	ØB	ØC		COND	WIRE						
2#12, 1#12G	3/4"		INTERIOR RECEPT		720			1	20	1	2		2	1	20	546				3/4"	2#12, 1#12G						
2#12, 1#12G	3/4"		EXTERIOR RECEPT		360			1	20	3			4	1	20	24				3/4"	2#12, 1#12G						
2#4, 1#10G	1-1/2"		ELECTRIC UNIT HEATER			5000		2	60	5			8	3	100	14266				2"	3#2, 1#8G						
2#12, 1#12G	3/4"		EXHAUST FAN		500			1	20	9			10	1	20	14266											
2#12, 1#12G	3/4"		DEMUMIDIFIER		1500			1	20	11			12	1	20	14266											
2#12, 1#12G	3/4"		INSTRUMENTS (CA, FM-1)		42			1	20	13			14	3	100	14266					2"	3#2, 1#8G					
			SPARE					1	20	15			16	1	20	14266											
			SPARE					1	20	17			18	1	20												
			SPACE							19			20														
			SPACE							21			22														
			SPACE							23			24														
TOTAL 1					5762	860	6500				TOTAL 2						29078	28556	28532								
TOTAL 2					29078	28556	28532																				
TOTAL 1+2					34840	29416	35032																				
CONN. LOAD TOTAL					99288																						
AMPERES					119																						

SEE PROCESS DRAWINGS FOR CONTROL WIRING REQUIREMENTS.

<b>PANEL No. PP1</b>	LOCATION: CONTROL BUILDING
BUS: 200 Ampere	MOUNTING: SURFACE
PANEL RATING: 22 KAIC	DRAWING No. E2
SUPPLY VOLTAGE: 480Y/277V, 3Ø	
SERVICE: 4-WIRE WITH GROUND BUS	
MAIN BREAKER: 200A/3P	MAIN LUGS: N/A
FEEDER ENTRANCE: BOTTOM	ENCLOSURE TYPE: NEMA 3R
FEEDER SIZE: SEE ONE-LINE	ACCESSORIES: WITH HINGED COVER AND DOOR IN DOOR CONSTRUCTION
SOURCE: UTILITY METER	
PANEL TYPE: BOLT-ON	



**CONTROL BUILDING ONE-LINE DIAGRAM**  
NO SCALE

**BIDDING PLANS**  
**NOT FOR CONSTRUCTION**

NUMBER	DATE	REVISION DESCRIPTION

CLIENT NAME  
TOWN OF LISBON  
46 SCHOOL STREET  
LISBON, NH 03585  
(603) 838-6376

PROJECT NAME  
WATER SYSTEM  
IMPROVEMENTS  
PROJECT

PROJECT ADDRESS  
BISHOP ROAD &  
VALLEYVIEW DRIVE  
LISBON, NH

SHEET TITLE  
ELECTRICAL  
ONE-LINE  
DIAGRAM  
POWER  
PLAN  
AND  
SCHEDULES

D&K PROJECT # 530379

PROJ. ENG. CFA  
DRAWN BY EJD  
CHECKED BY WHH

DATE: JANUARY 2025

SHEET NUMBER

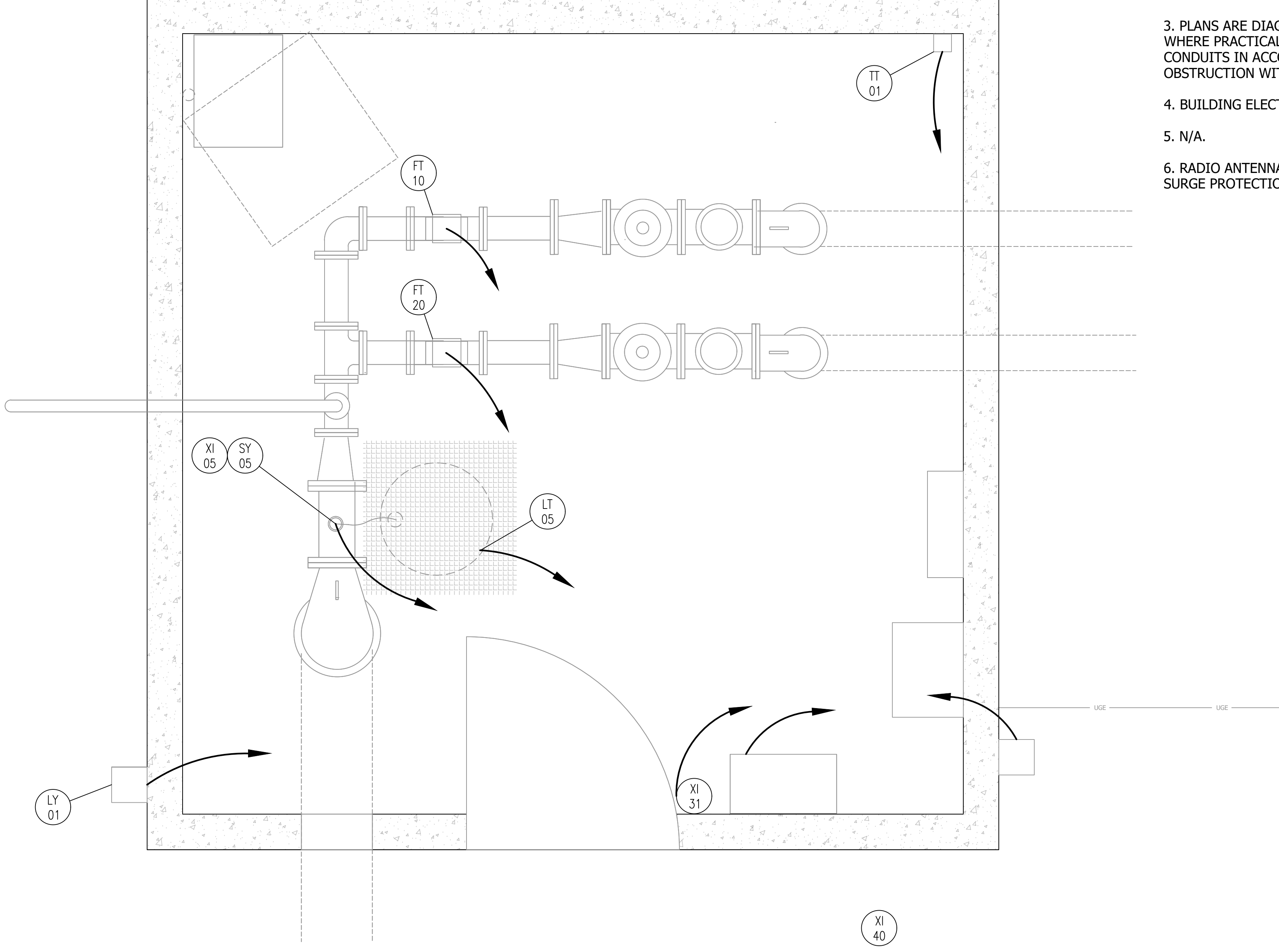
**E2**

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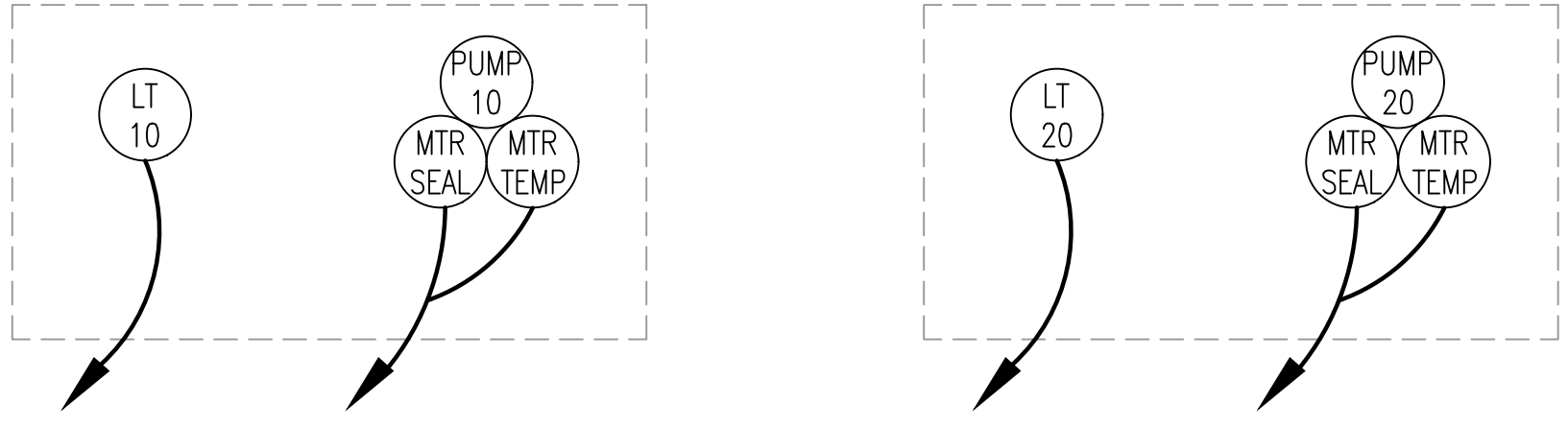


**GENERAL NOTES:**

1. THE CONTRACTOR SHALL DESIGN FABRICATE AND INSTALL THE PLC/VFD PANEL PER PANEL SPECIFICATIONS. CONTRACTOR SHALL SIZE , FURNISHED AND INSTALLED CABLE / CONDUIT FOR ALL INSTRUMENTATION AND FIELD DEVICES AND ROUTE TO THE PLC/VFD PANEL. REFER TO I/O LIST AND NOTES #2 THROUGH #6 FOR ADDITION REQUIREMENTS.
2. CONTRACTOR TO PROVIDE EQUIPMENT MAIN CONDUIT AND INSTRUMENT BRANCH CONDUITS. ALL CABLE, CONDUITS, ELECTRICAL EQUIPMENT, AND RACEWAYS SHALL BE PROPERLY INSTALLED IN ACCORDANCE TO THE NATIONAL ELECTRICAL CODE AND MFR'S DOCUMENTATION. PROVIDE ALL MATERIAL, SUPPORTS, GUA BOXES TO FACILITATE INSTRUMENTATION WIRING. PROPER WIRING METHODS AND TECHNIQUES ARE REQUIRED. FURNISH AND INSTALL CONDUIT SEAL ON ALL CONDUITS TO THE WET WELLS AND WHERE REQUIRED BY NEC.
3. PLANS ARE DIAGRAMMATIC. CONTRACTOR SHALL FIELD DETERMINE OPTIMUM ROUTING OF CONDUITS TO FIELD DEVICES. WHERE PRACTICAL, HOME RUNS OF SAME CONTROL TYPE WITH SAME DESTINATION SHALL BE COMBINED INTO COMMON CONDUITS IN ACCORDANCE WITH NEC. CONDUIT AND INSTRUMENT TUBING SHALL NOT CREATE A TRIP HAZARD OR OBSTRUCTION WITH OPERATION OR MAINTENANCE.
4. BUILDING ELECTRICAL EQUIPMENT MUST BE COORDINATED WITH PLUMBING TO AVOID CODE VIOLATIONS.
5. N/A.
6. RADIO ANTENNA SHALL BE ON INSTALLED ON THE BUILDING EXTERIOR AND EXTEND PASS ROOF LINE. PROVIDE LIGHTING / SURGE PROTECTION.



WET WELL #1 AND #2 ARE LOCATED APPROXIMATELY 900 FEET FROM THE PUMP CONTROL BUILDING. REFER TO CIVIL PLANS FOR ACTUAL LOCATION. CONTRACTOR SHALL SIZE ALL CABLE AND CONDUIT FOR DISTANCE AND VOLTAGE DROP. FURNISH AND INSTALL JUNCTION BOX AT WELL FOR TIE-IN CONNECTIONS FOR LEVEL TRANSMITTER (LT) AND PUMP MOTOR SEAL AND TEMP ALARM WIRING.



**WET WELL #1 AND #2 (REF ONLY)**  
NTS

**PROPOSED CONTROL BUILDING LAYOUT**  
SCALE: 1" = 1'-0"



**BIDDING PLANS**  
**NOT FOR CONSTRUCTION**

DATE OF PRINT  
APRIL 17 2025  
HORIZONS ENGINEERING

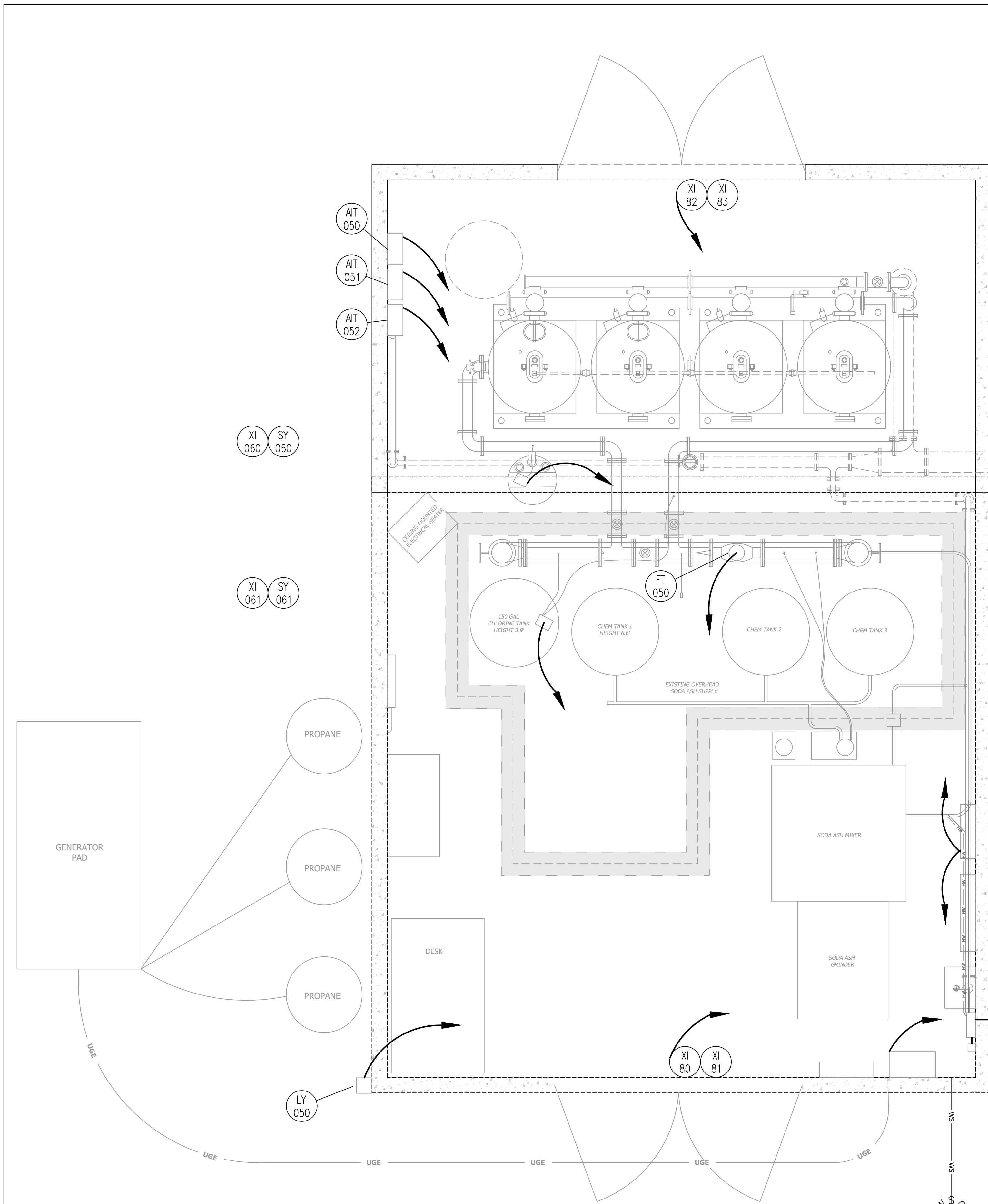
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PROJECT #:	21215	NO.	DATE	REVISION DESCRIPTION	ENG	DWG
DATE:	APRIL 2025					
MAP-LOT (OR ARCHIVE)	*					
SURVEYED BY:	HEI- DJG/AWS					
ENGINEERED BY:	MLB					
DRAWN BY:	LJM					
CHECKED BY:	CFC					

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Civil and Structural Engineering  
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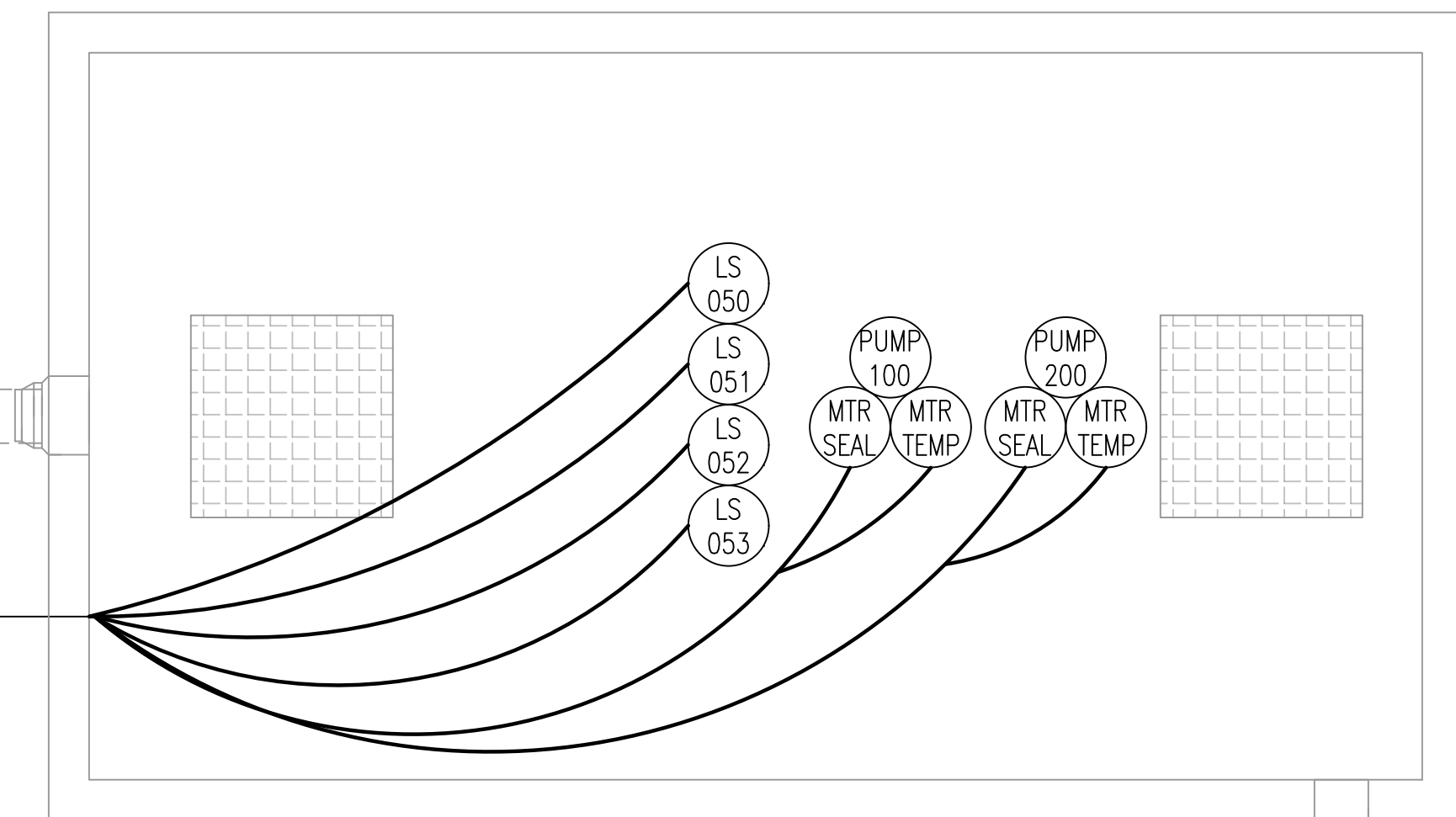
**TOWN OF LISBON**  
CONTRACT #1 WATER SYSTEM IMPROVEMENTS  
USDA/VER AREA 1361010, DWG SFE 1361010, DWG1-82  
CONTROL BUILDING, WELLSITE;  
CHEMICAL BUILDING ADDITION & MANGANESE TREATMENT  
BISHOP ROAD & VALLEYVIEW DRIVE, LISBON, NEW HAMPSHIRE

**CONTROL BUILDING INSTRUMENT PROCESS PLAN**



**PROPOSED CHEMICAL FEED BUILDING LAYOUT**

SCALE: 1/2" = 1'-0"



**NOTE:**

- THE CONTRACTOR SHALL DESIGN FABRICATE AND INSTALL THE PLC/VFD PANEL PER PANEL SPECIFICATIONS. CONTRACTOR SHALL SIZE, FURNISH AND INSTALL CABLE / CONDUIT FOR ALL INSTRUMENTATION AND FIELD DEVICES AND ROUTE TO THE PLC/VFD PANEL. REFER TO I/O LIST AND NOTES #2 THROUGH #6 FOR ADDITION REQUIREMENTS.
- CONTRACTOR TO PROVIDE EQUIPMENT MAIN CONDUIT AND INSTRUMENT BRANCH CONDUITS. ALL CABLE, CONDUITS, ELECTRICAL EQUIPMENT, AND RACEWAYS SHALL BE PROPERLY INSTALLED IN ACCORDANCE TO THE NATIONAL ELECTRICAL CODE AND MFR'S DOCUMENTATION. PROVIDE ALL MATERIAL, SUPPORTS, GUA BOXES TO FACILITATE INSTRUMENTATION WIRING. PROPER WIRING METHODS AND TECHNIQUES ARE REQUIRED. FURNISH AND INSTALL CONDUIT SEAL ON ALL CONDUITS WHERE REQUIRED BY NEC.
- PLANS ARE DIAGRAMMATIC. CONTRACTOR SHALL FIELD DETERMINE OPTIMUM ROUTING OF CONDUITS TO FIELD DEVICES. WHERE PRACTICAL, HOME RUNS OF SAME CONTROL TYPE WITH SAME DESTINATION SHALL BE COMBINED INTO COMMON CONDUITS IN ACCORDANCE WITH NEC. CONDUIT AND INSTRUMENT TUBING SHALL NOT CREATE A TRIP HAZARD OR OBSTRUCTION WITH OPERATION OR MAINTENANCE.
- BUILDING ELECTRICAL EQUIPMENT MUST BE COORDINATED WITH PLUMBING TO AVOID CODE VIOLATIONS.
- N/A
- RADIO ANTENNA SHALL BE ON INSTALLED ON THE BUILDING EXTERIOR AND EXTEND PASS ROOF LINE. PROVIDE LIGHTING / SURGE PROTECTION.
- THE CONTRACTOR SHALL MOUNT THE VENDOR PROVIDED 36" X 30" X 12" CONTROL PANEL ON INTERIOR BUILDING WALL NEAR THE PLC/MOTOR STARTER PANEL. FURNISH AND INSTALL CABLE / CONDUIT FROM CONTROL PANEL TO FILTRATION SKID INSTRUMENTATION. PROVIDE ALL HARDWARE AND MATERIAL REQUIRED TO FACILITATE THE INSTALLATION AND WIRING OF THE PANEL.



613 BALTIMORE DRIVE, STE. 300  
WILKES-BARRE, PA 18702-7903

**BIDDING PLANS**  
**NOT FOR CONSTRUCTION**

DATE OF PRINT  
APRIL 17 2025  
HORIZONS ENGINEERING

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PROJECT #:	NO.	DATE	REVISION DESCRIPTION	ENG	DWG
21215					
DATE:	APRIL 2025				
MAP-LOT (OR ARCHIVE)	*				
SURVEYED BY:	HEI- DJG/AWS				
ENGINEERED BY:	MLB				
DRAWN BY:	LJM				
CHECKED BY:	CFC				

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TOWN OF LISBON  
CONTRACT #1 WATER SYSTEM IMPROVEMENTS  
USDA WIER AREA 1361010, DWG SFE 1361010, DWG T-82  
CHEMICAL BUILDING, WELLSITE,  
CHEMICAL BUILDING ADDITION & MANGANESE TREATMENT  
BISHOP ROAD & VALLEYVIEW DRIVE, LISBON, NEW HAMPSHIRE  
CHEMICAL FEED BUILDING INSTRUMENT PROCESS PLAN