

TOWN OF LISBON

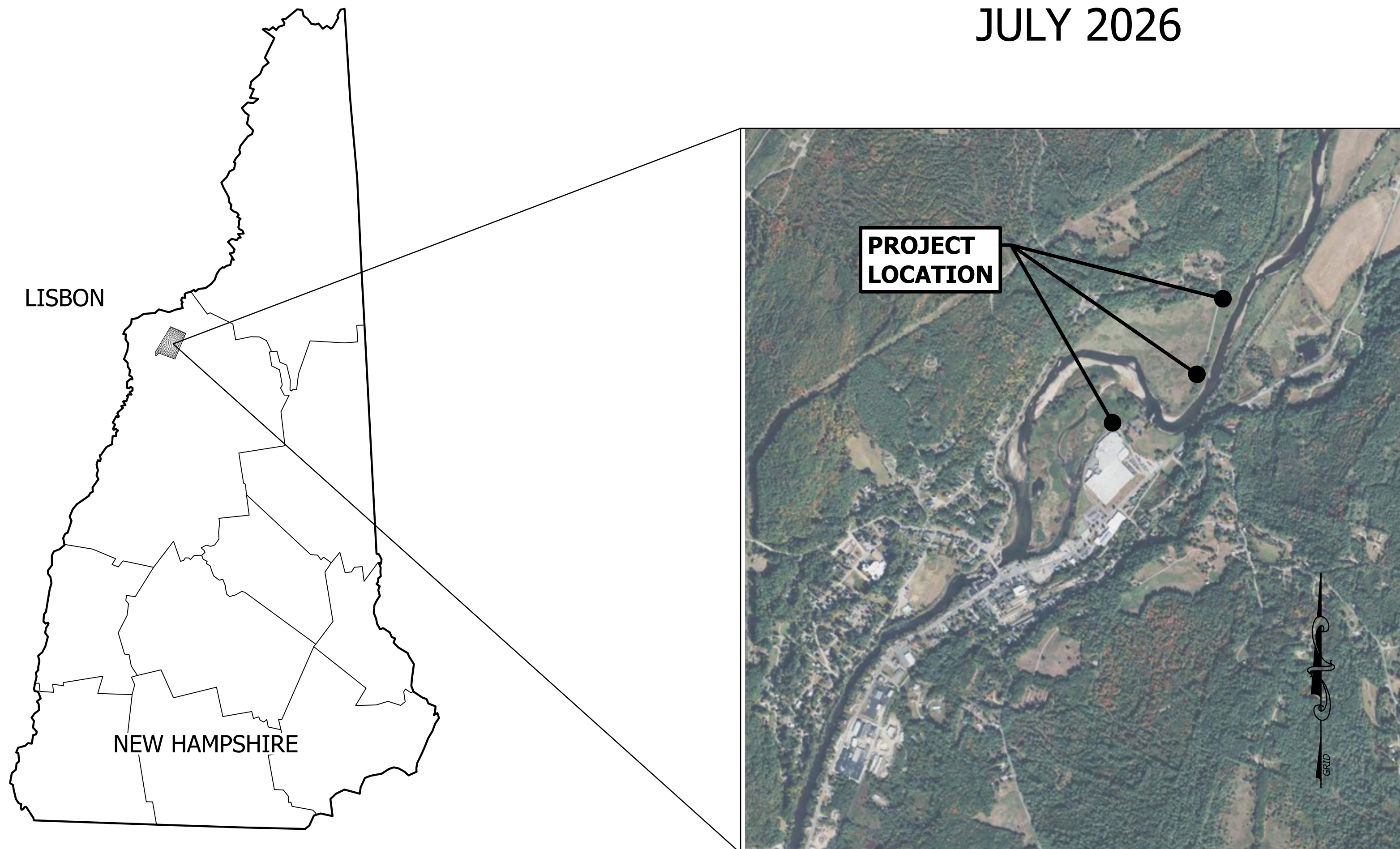
CONTRACT #1 WATER SYSTEM IMPROVEMENTS

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

BISHOP ROAD WELL IMPROVEMENTS

LISBON, NEW HAMPSHIRE

JULY 2026



LOCATION PLAN

SCALE: 1" = 1000'

BIDDING PLANS
NOT FOR CONSTRUCTION

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

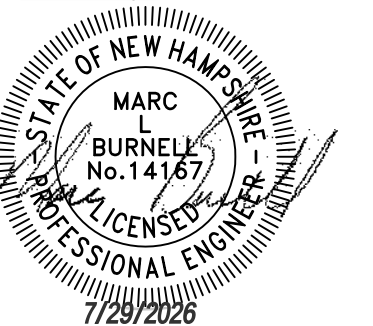
OWNER:

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

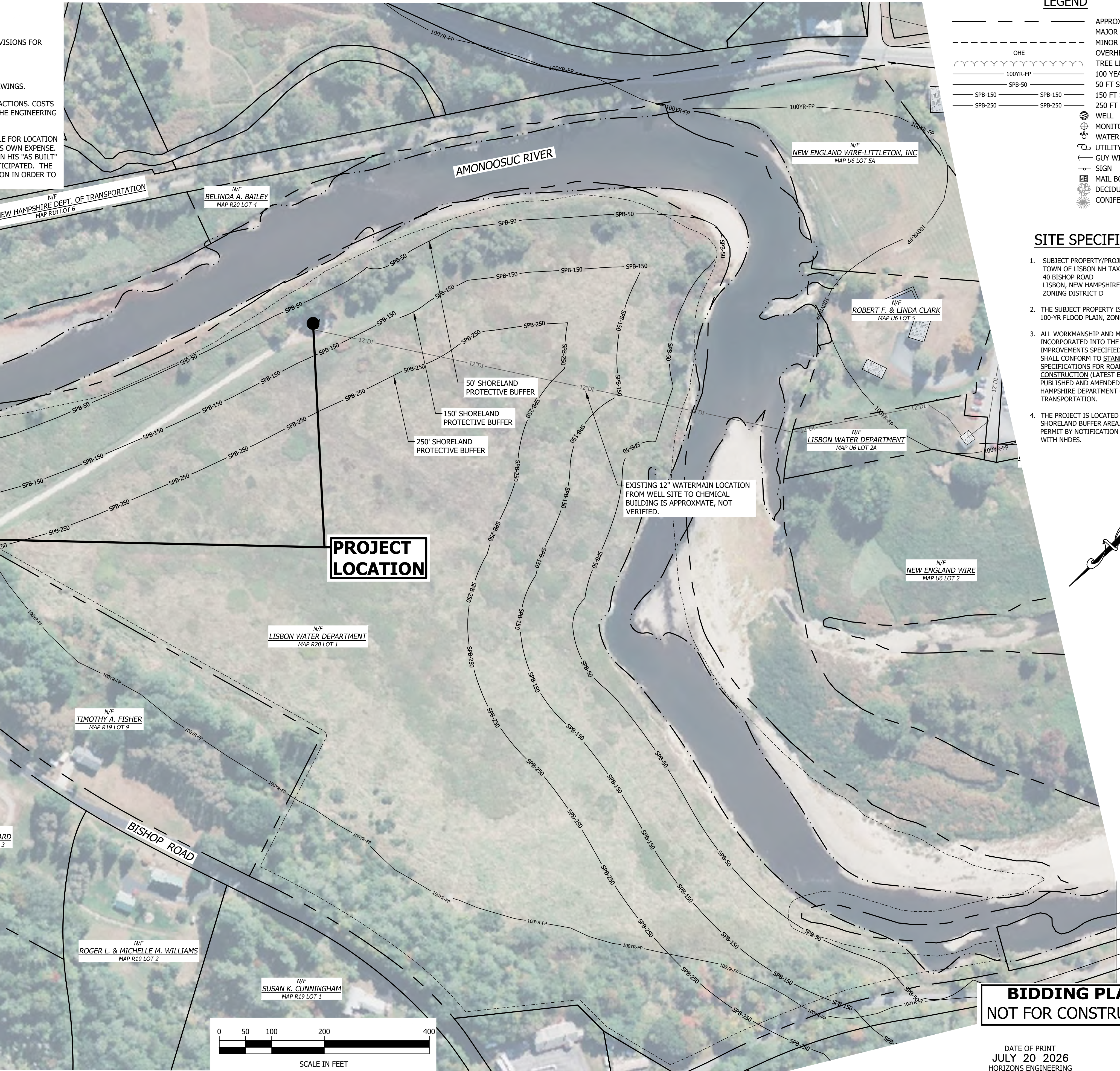


SHEET INDEX:

- C1.0 COVER SHEET
- CONTROL BUILDING AND WELL SITE**
- C2.1 OVERVIEW ABUTTER MAP/ LOT, GENERAL NOTES & LEGEND
- C2.2-C2.3 EXISTING CONDITIONS PLAN
- C2.4 EXISTING BUILDING PLAN
- C3.1-C3.2 SITE IMPROVEMENTS PLAN
- C3.3 CONTROL BUILDING LAYOUT PLAN
- C3.4 CONTROL BUILDING STRUCTURAL PLAN
- CONSTRUCTION DETAILS**
- D1.1 STANDARD WATER SYSTEM NOTES & DETAILS
- D1.2 CONSTRUCTION SEQUENCE, EROSION CONTROL DETAILS & NOTES
- ELECTRICAL DETAILS**
- E1 ELECTRICAL LEGEND AND GENERAL NOTES
- E2 ELECTRICAL ONE-LINE DIAGRAM POWER PLAN AND SCHEDULES
- E3 CONTROL BUILDING INSTRUMENT PROCESS PLAN

1. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE PLANS AND TECHNICAL SPECIFICATIONS.
2. NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.
3. ALL WORK SHALL BE PERFORMED WITHIN THE PROPERTY OF, AND EASEMENTS SECURED BY, THE OWNER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DATA COLLECTION AND PREPARATION OF RECORD DRAWINGS.
5. 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.
6. 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.

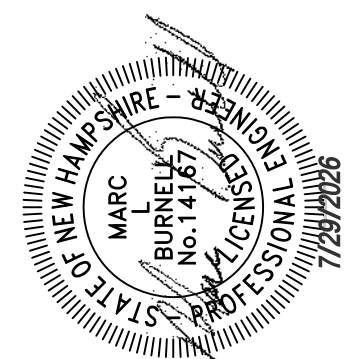
1. EROSION AND SILTATION CONTROL MEASURES SHALL: BE INSTALLED PRIOR TO THE START OF WORK; BE MAINTAINED THROUGHOUT THE PROJECT; AND REMAIN IN PLACE UNTIL ALL DISTURBED SURFACES ARE STABILIZED.
2. EROSION AND SILTATION CONTROLS SHALL BE APPROPRIATE TO THE SIZE AND NATURE OF THE PROJECT AND TO THE PHYSICAL CHARACTERISTICS OF THE SITE, INCLUDING SOIL, SOIL TYPE, VEGETATIVE COVER, PROXIMITY TO WETLAND OR SURFACE WATERS.
3. NO PERSON UNDERTAKING ANY ACTIVITY IN THE PROJECTED SHORELAND SHALL CAUSE OR CONTRIBUTE TO, OR ALLOW THE ACTIVITY TO CAUSE OR CONTRIBUTE TO ANY VIOLATIONS OF THE SURFACE WATER QUALITY STANDARDS ESTABLISHED IN ENV-Ws 1700 OR SUCCESS RULES IN ENV-Wq 1700.
4. ANY FILL USED SHALL BE CLEAN SAND, GRAVEL, ROCK OR OTHER SUITABLE MATERIAL.
5. FOR ANY PROJECT WHERE MECHANIZED EQUIPMENT WILL BE USED, ORANGE CONSTRUCTION FENCE SHALL: BE INSTALLED PRIOR TO THE START OF WORK AT THE LIMITS OF TEMPORARY IMPACT AREA AS SHOWN ON THE PLANS APPROVED AS PART OF A PERMIT OR ACCEPT AS PART OF THE PERMIT BY NOTIFICATION; BE MAINTAINED THROUGH THE PROJECT; AND REMAIN IN PLACE UNTIL ALL MECHANIZED EQUIPMENT HAS BEEN REMOVED FROM THE SITE.
6. MITIGATION REQUIREMENTS MAY CHANGE TO REFLECT RECOMMENDATIONS MADE BY NHB OR OTHER PARTIES SUCH AS NH FISH & GAME.



	APPROX PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	OVERHEAD UTILITY LINE
	TREE LINE
	100 YEAR FLOOD PLAIN
	50 FT SHORELAND BUFFER
	150 FT SHORELAND BUFFER
	250 FT SHORELAND BUFFER
	WELL
	MONITORING WELL
	WATER SHUTOFF
	UTILITY POLE
	GUY WIRE
	SIGN
	MAIL BOX
	DECIDUOUS TREE
	CONIFER TREE

1. SUBJECT PROPERTY/PROJECT IS LOCATED:
TOWN OF LISBON NH TAX MAP R20, LOT 1
40 BISHOP ROAD
LISBON, NEW HAMPSHIRE
ZONING DISTRICT D
2. THE SUBJECT PROPERTY IS WITHIN THE
100-YR FLOOD PLAIN, ZONE AE.
3. 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.
4. THE PROJECT IS LOCATED WITHIN THE
SHORELAND BUFFER AREA, A SHORELAND
PERMIT BY NOTIFICATION HAS BEEN FILED
WITH NHDES.

DWG	ENG	REVISION DESCRIPTION	DATE	NO.
			JULY 2026	21215
			DATE:	PROJECT #:
			MARLOT (OR ARCHIVE)	*
			SURVEYED BY: HEL- DGC/NWS	
			ENGINEERED BY: MLB	
			DRAWN BY: LJM	
			CHECKED BY: CFC	



horizons
Engineering
Civil and Structural Engineering
Land Surveying and Environmental Consulting
MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

TOWN OF LISBON
CONTRACT #1 WATER SUPPLY IMPROVEMENTS
USDA WEP, AREA 136.010, DW SR# 136.010, DWGT-82
BISHOP ROAD WELL IMPROVEMENTS
LISBON, NEW HAMPSHIRE

**OVERVIEW, ABUTTER MAP/LOT INFORMATION,
GENERAL NOTES & LEGEND**

SHEET C2.1

BIDDING PLANS
NOT FOR CONSTRUCTION

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved



EXISTING BUILDING - UPPER LEVEL
SCALE: 1/2" = 1'-0"



EXISTING BUILDING - LOWER LEVEL
SCALE: 1/2" = 1'-0"

BIDDING PLANS
NOT FOR CONSTRUCTION

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

PROJECT #: 21215
DATE: JULY 2026
MAP-LOT (FOR ARCHIVE): *
SURVEYED BY: HEI- DJG/NWS
ENGINEERED BY: MLB
DRAWN BY: LJM
CHECKED BY: CFC



horizons
Engineering
Civil and Structural Engineering
Land Surveying and Environmental Consulting
MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

TOWN OF LISBON
CONTRACT #1 WATER SYSTEM IMPROVEMENTS
USD#147, AREA 135.000, DWG SR# 135.010, DWG-82
BISHOP ROAD WELL IMPROVEMENTS
LISBON, NEW HAMPSHIRE

EXISTING BUILDING PLAN

SHEET C2.4



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 AT THE TIME THIS PLAN WAS PREPARED.



WELL CLEANING:

(NHDES GROUNDWATER DISCHARGE PERMIT REQUIRED) 

PRIOR TO INSTALLATION OF NEW WELL PUMPS IN WELL GPW 1 AND WELL GPW 2 THE WELLS SHALL BE CLEANED. THE FOLLOWING IS A SUGGESTED PROCEDURE TO BE FOLLOWED AND CHEMICALS TO BE USED:

1. REMOVE WELL PUMP. CLEAR THE WELL OF ANY LOOSE ROCKS, SEDIMENT, OR OTHER DEBRIS THAT MAY HAVE FALLEN INTO THE WELL.
2. EXAMINE THE WELL CASING FOR ANY CRACKS, LEAKS OR SIGNS OF DETERIORATION. COMPLETE A VIDEO SURVEY OF THE WELL AND A SPECIFIC CAPACITY TEST PRIOR TO WELL CLEANING WITH TREATMENT FLUIDS.
3. EFFECTIVE CLEANING OF THE WELL IS ACHIEVED BY PUSHING THE TREATMENT FLUIDS INTO THE FORMATION AND ALLOWING THE TREATMENT FLUIDS TO REACT TO THE WELL BLOCKAGE. PROPOSED CLEANING SOLUTION OF NUWELL-120 LIQUID ACID IN COMBINATION WITH NUWELL-310 BIOACID DISPERSANT AND NUWELL-400 NON-IONIC SURFACTANT, OR EQUIVALENT CHEMICAL MANUFACTURER IS TO BE USED. ALL TREATMENT CHEMICALS ARE TO BE NSF CERTIFIED FOR POTABLE WATER WELL USE AND DISPOSED OF PER MANUFACTURERS RECOMMENDATIONS. DETERMINE REQUIRED AMOUNTS OF CHEMICALS PER MANUFACTURERS' RECOMMENDATIONS.
4. PHYSICALLY CLEAN THE INSIDE OF THE WELL BY REMOVAL ANY LOOSE SCALE DEPOSITS. THIS CAN BE ACCOMPLISHED BY BRUSH, JETTINGS OR OTHER METHODS. EVACUATE ALL OF THE LOOSE MATERIAL FROM THE WELL AFTER PHYSICALLY CLEANING THE WELL.
5. A SOLUTION OF 40% OF THE TOTAL TREATMENT VOLUME OF CLEAN, POTABLE WATER SHOULD BE USED TO MIX WITH THE RECOMMENDED TREATMENT CHEMICALS IN THE TANK ON THE SURFACE. THE MIXING TANK SHALL HAVE A CAPACITY OF AT LEAST 20% GREATER THAN THE VOLUME OF THE SOLUTION TO BE MIXED IN THE TANK IN ORDER TO AVOID SPILLING DURING THE MIXING AND TRANSFER OR THE CHEMICALS CAN BE MIXED IN MULTIPLE BATCHES. BLEND THE NUWELL-120 ACID INTO THE WATER, THEN ADD NUWELL-310 BIOACID DISPERSANT AND NUWELL-400 NON-IONIC SURFACTANT, AGAIN AND BLEND THOROUGHLY.
6. PLACE 75% OF THE CLEANING SOLUTION ACROSS THE SCREEN SECTION BY SPOTTING IT WITH A DOUBLE SURGE BLOCK AND SWAPPING THE SOLUTION INTO THE SCREEN. WASH THE CASING WITH THE CLEANING SOLUTION IN THE WELL TO HELP CLEAN THE UPPER NON-WETTED PORTION OF THE CASING.
7. CHECK THE PH AT 30 TO 60 MINUTE INTERVALS ESPECIALLY IN THE BEGINNING TO BE ABLE TO MAINTAIN A MINIMUM PH OF 3.0 IN THE CLEANING SOLUTION IN THE WELL. IF THE PH RISES ABOVE 4, ADD APPROXIMATELY HALF OF THE REMINDER OF THE CLEANING SOLUTION TO THE WELL. AFTER APPROXIMATELY 12 HOURS, PLACE THE REMAINDER OF THE ACID SOLUTION IN THE SCREEN SECTION AND WORK IT INTO THE FORMATION. ALLOW THE SOLUTION TO REMAIN IN THE WELL FOR A MINIMUM PERIOD OF 24 TO 48 HOURS.
8. SWAB THE WELL PERIODICALLY TO MOVE THE CLEANING FLUIDS INTO THE FORMATION TO FACILITATE CLEANING. USE DELIBERATE STROKING TO PUSH VOLUMES OF CLEANER INTO THE AREA OUTSIDE THE SCREEN. OCCASIONALLY CHECK THE PH OF THE TREATMENT SOLUTION AND ADD AN QUANTITY OF ACID WHENEVER NEEDED TO MAINTAIN A PH NEAR 3.
9. AFTER THE CLEANING SOLUTION HAS WORKED IN THE WELL FOR AT LEAST 24-48 HOURS, PUMP THE ACID TO A WASTE HOLDING AREA AND NEUTRALIZE IT PRIOR TO DISPOSAL.
10. IF THE WELL SHOWS SIGNS OF MECHANICAL BLOCKAGE DUE TO SEDIMENT INFILTRATION OR IF THE PRODUCED WATER IS EXHIBITING ELEVATED OCCURRENCE OF VERY FINE SAND, SILTS AND CLAYS. IT IS RECOMMENDED TO REDEVELOP THE WELL USING NUWELL-220 CLAY DISPERSANT.
11. ONCE WELLS HAVE BEEN CLEANED AND REDEVELOPED, INSTALL NEW WELL PUMP AND WELL LEVEL TRANSDUCERS, DISINFECT AND FIELD TEST PRIOR TO OPERATION.

REPLACEMENT PUMPS:

GRUNDFOS 192500C5 475S400-5B 40 HP 60 Hz (OR EQUAL)

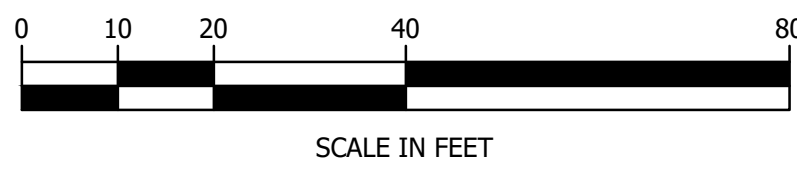
1. WELL GPW 1 & WELL GPW 2 REPLACEMENT PUMPS SHALL HAVE A DESIGN POINT OF 350 GPM AT 310 TOTAL DYNAMIC HEAD
2. BOTH PUMPS SHALL BE SUBMERSIBLE WELL PUMPS WITH VARIABLE FREQUENCY DRIVES AND INCLUDE LEVEL TRANSDUCERS AS PART OF THE INSTALLATION.
3. PRIOR TO OPERATION OF NEW WELL PUMPS, WELL GPW 1 AND WELL GPW 2 SHALL BE CLEANED

EARTH WORK DATA

TOTAL PROPERTY IMPACT AREA: 35,900 S.F.
• EARTH BURROW: 18,725 S.F.
• WATER SYSTEM: 17,175 S.F.

TOTAL FILL VOLUME : 360 Cu Yds
• DEMOLISHED BUILDING: 30 Cu Yds
• RAISED WELL GRADING: 330 Cu Yds

TOTAL CUT USABLE VOLUME: 380 Cu Yds
• EARTH BURROW: 670 Cu Yds
(1 - 1 1/2 FT BELOW EXISTING GRADE)
• 6" TOP SOIL: 290 Cu Yds

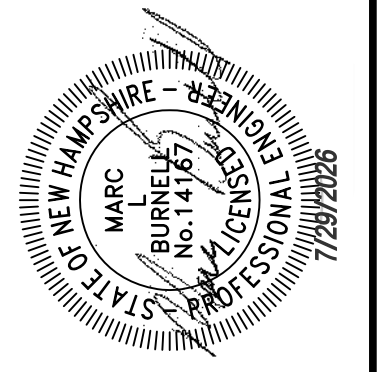


BIDDING PLANS
NOT FOR CONSTRUCTION

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved

DWG	ENG	REVISION DESCRIPTION	DATE	NO.	PROJECT #:	DATE:	MAP-LOT (FOR ARCHIVE)	SURVEYED BY:	ENGINEERED BY:	DRAWN BY:	CHECKED BY:
	NLB	WELL CLEANING (GROUNDWATER DISCHARGE PERMIT REQUIRED)	JUNE 2025	1	21215	JULY 2026	*	HEI- DIG/NWS	NLB	LJM	CFC

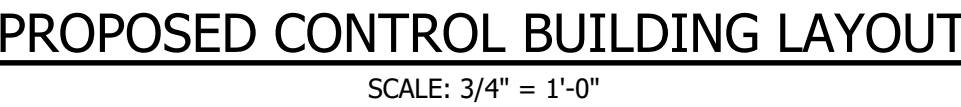


horizons
Engineering
Civil and Structural Engineering
Land Surveying and Environmental Consulting
MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

TOWN OF LISBON
CONTRACT #1 WATER SYSTEM IMPROVEMENTS
USDA/AFIP AREA 135.000 DWG 586 135.000 DWG-82
BISHOP ROAD WELL IMPROVEMENTS
LISBON, NEW HAMPSHIRE

SITE IMPROVEMENTS PLAN

SHEET C3.2

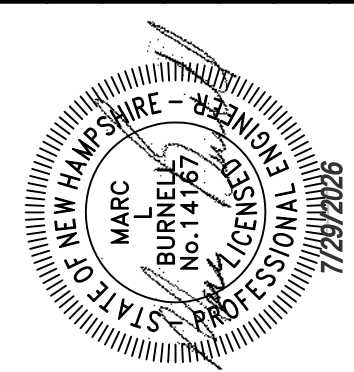


VALVE & PIPING SCHEDULE			
ITEM	DESCRIPTION	ITEM	DESCRIPTION
⑧	6" PIPE THROUGH FLOOR	⑰	6" TAPPED TEE, FLANGED, 2" TAP WITH 1" BUSHING TURNED UP
⑨	6" 90° FLANGED ELBOW	⑱	4" FLANGED TEE
⑩	WELL PRESSURE GAUGE LIQUID FILLED 0-200 PSI	⑲	6" SCH80 SPOOL PIECE WITH MAINTENANCE COUPLING
⑪	6" CHECK VALVE	⑳	12"x 6" 90° FLANGED REDUCING ELBOW
⑫	6"x 4" CONCENTRIC REDUCER	㉑	12" PIPE THROUGH FLOOR
⑬	4" SCH80 SPOOL PIECE WITH MAINTENANCE COUPLING	㉒	DISCHARGE PRESSURE GAUGE LIQUID FILLED 0-200 PSI
⑭	4" BADGER MODMAG M2000 FLOW METER, OR EQUAL	㉓	4" TAPPED TEE, 2" TAP TURNED UP
⑮	4" 90° FLANGED ELBOW	㉔	2" NPT SURGE RELIEF VALVE, ROSS 20WR, OR EQUAL, WITH 2" ISOLATION BALL VALVE. PROVIDE 2 INCH GALVANIZED STEEL DISCHARGE THROUGH WALL WITH ELBOW TURNED DOWN AND STAINLESS STEEL INSECT SCREEN.
⑯	MANIFOLD WITH 1" PRESSURE AIR RELEASE VALVE, CRISPIN PL10 WITH ¼" ORIFICE OR EQUAL, WITH 1" ISOLATION BALL VALVE AND ¾" SAMPLE TAP		

WELL CONTROL BUILDING - DOOR SCHEDULE						
DOOR NUMBER	SIZE (W x H)	TYPE	DOOR MATERIAL	FRAME MATERIAL	LOCK FUNCTION	REMARKS
D-3	6'-0" x 6'-8"	DOUBLE SWING	INSULATED STEEL	HOLLOW METAL	STOREROOM FUNCTION LOCKSET (28-11G04-LL)	PRIMARY PERSONNEL ENTRANCE

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved

[illegible]

horizons
Engineering

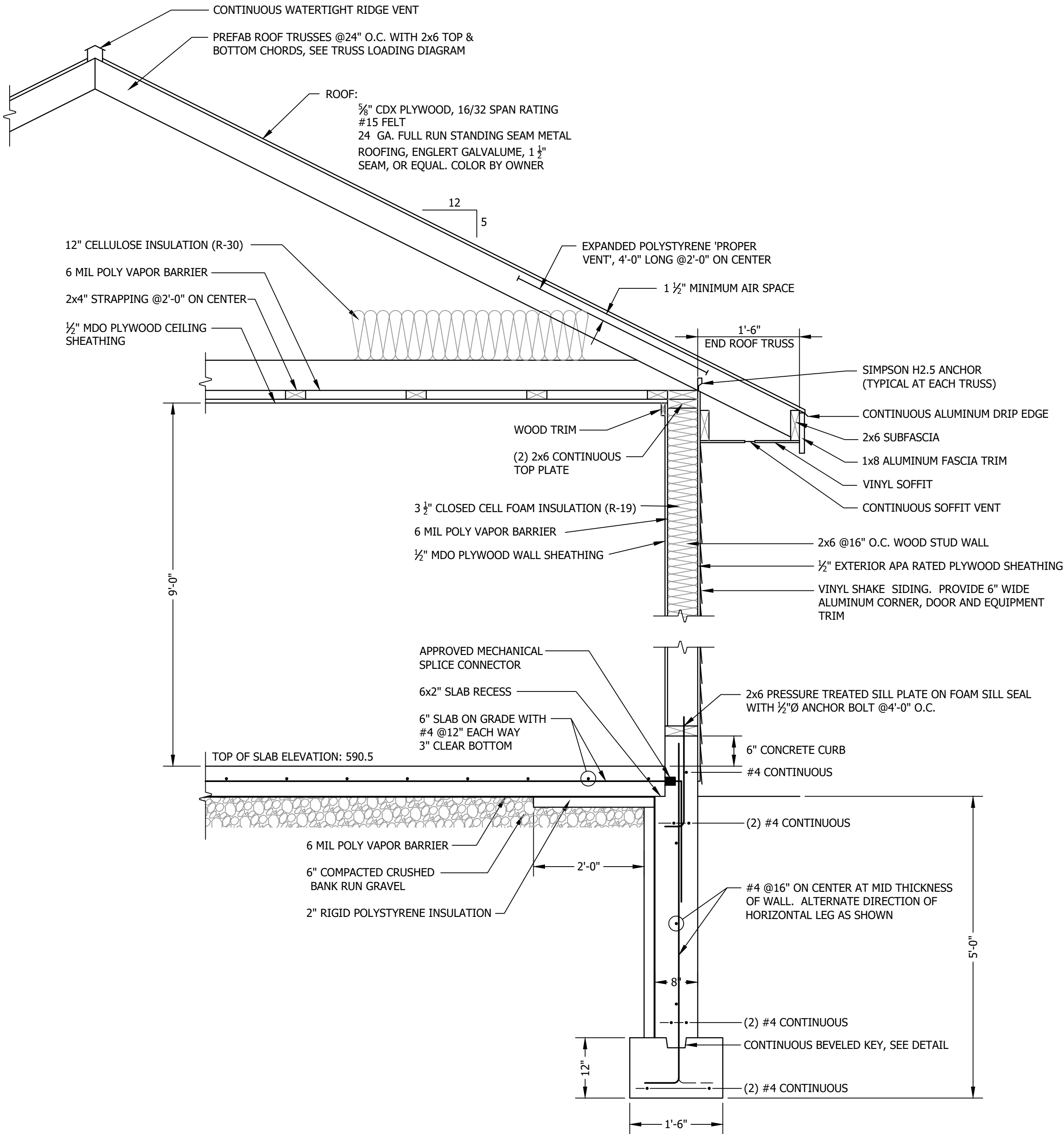
Civil and Structural Engineering
Land Surveying and Environmental Consulting

MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

TOWN OF LISBON
CONTRACT #1 WATER SYSTEM IMPROVEMENTS
USDA WEP, ARPA 1361010, DW SRF 1361010, DWGT-82
BISHOP ROAD WELL IMPROVEMENTS
LISBON, NEW HAMPSHIRE

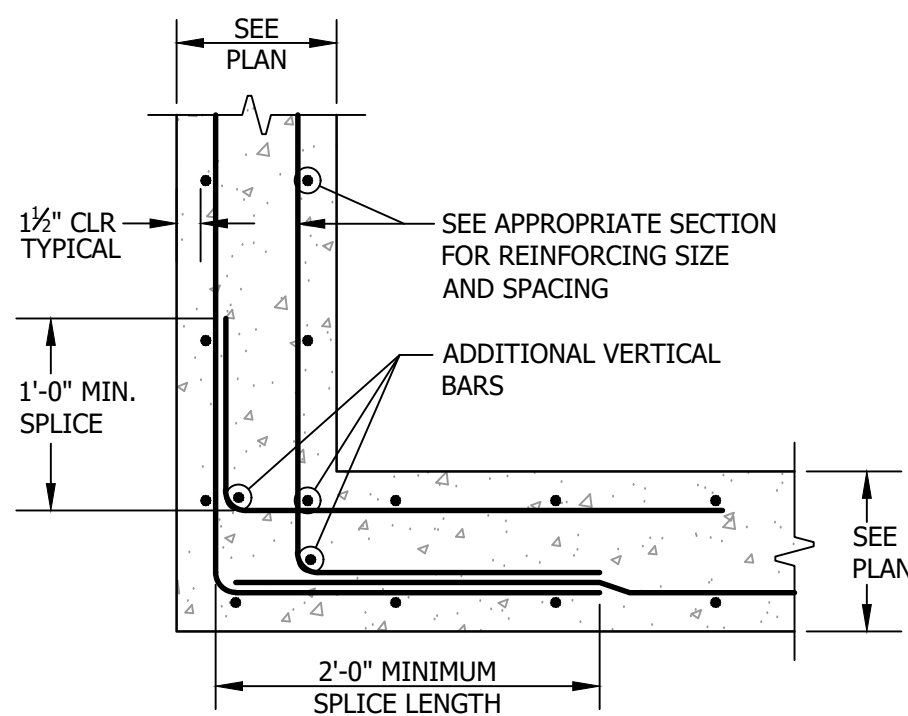
CONTROL BUILDING LAYOUT PLAN

SHEET C3.3



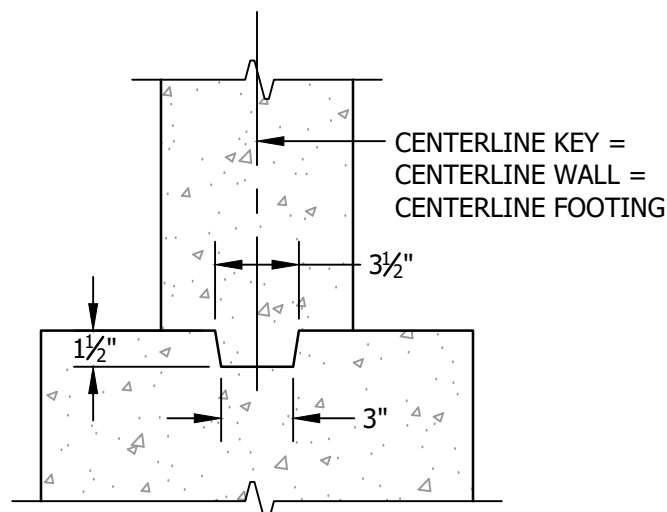
TYPICAL BUILDING SECTION

SCALE: 3/4" = 1'-0"



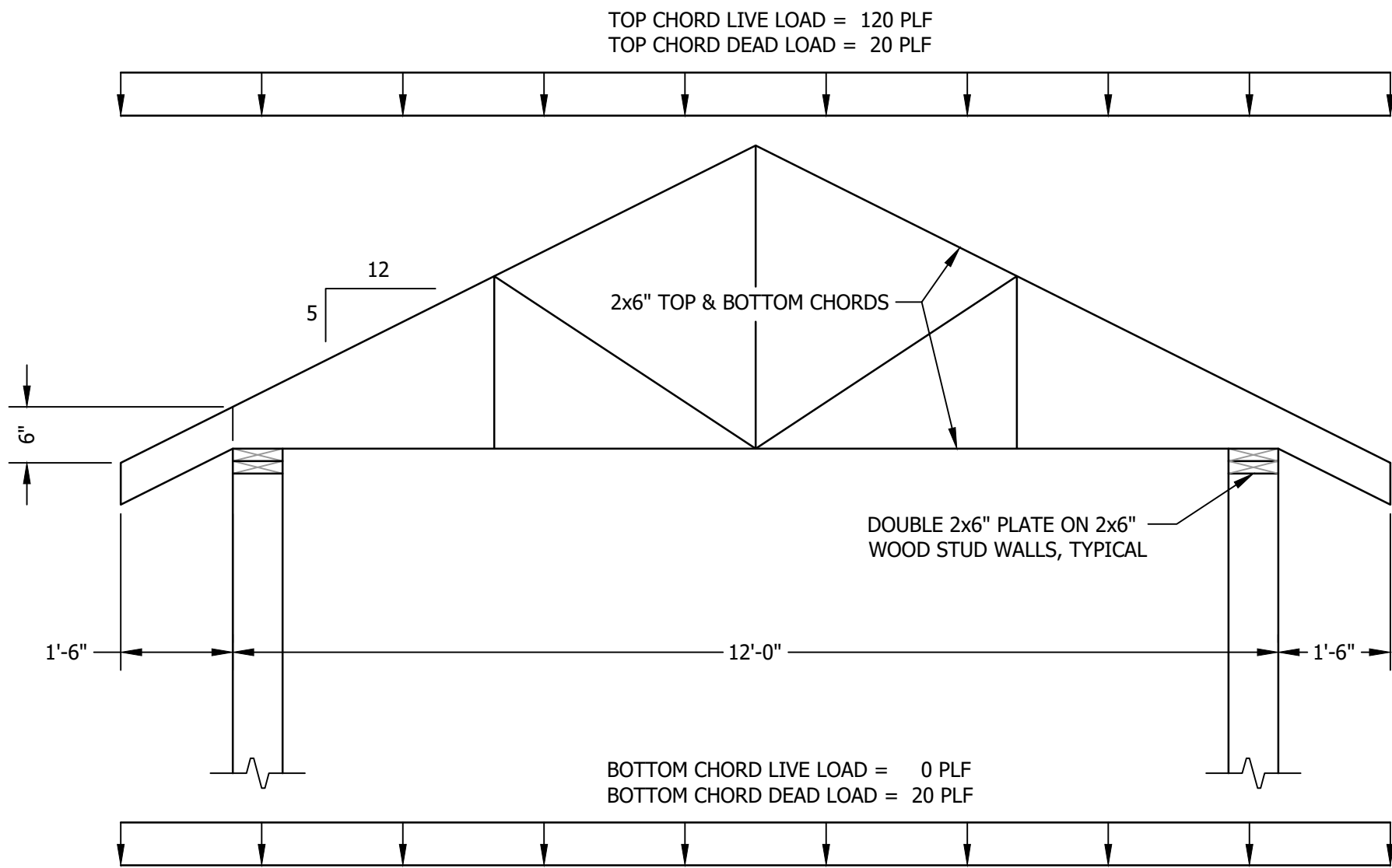
TYPICAL FOUNDATION WALL
CORNER REINFORCING

NOT TO SCALE



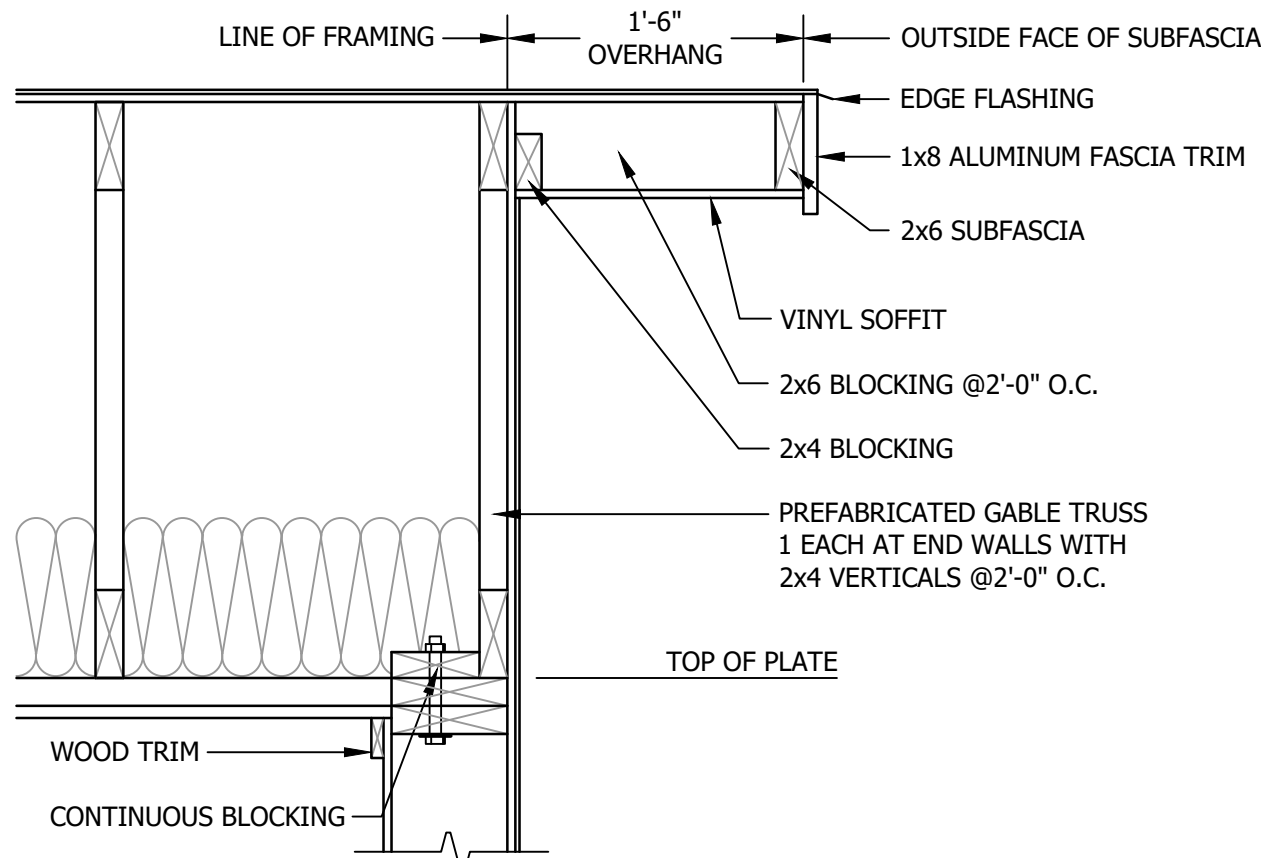
FORMED KEY DETAIL

NOT TO SCALE



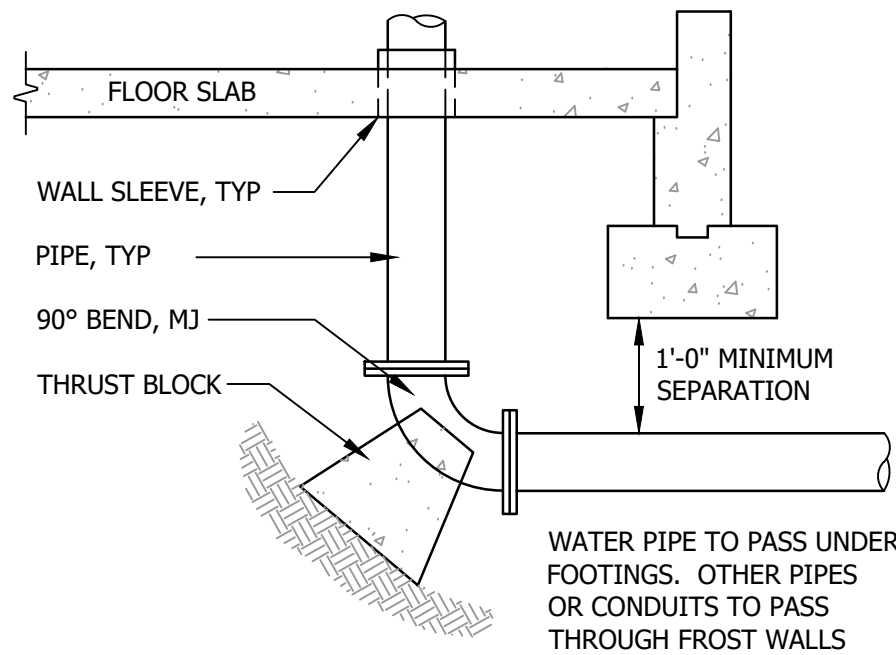
ROOF TRUSS LOADING DIAGRAM

NOT TO SCALE



TYPICAL END GABLE TRUSS DETAIL

NOT TO SCALE



FLOOR PIPE PENETRATION DETAIL

NOT TO SCALE

BUILDING NOTES

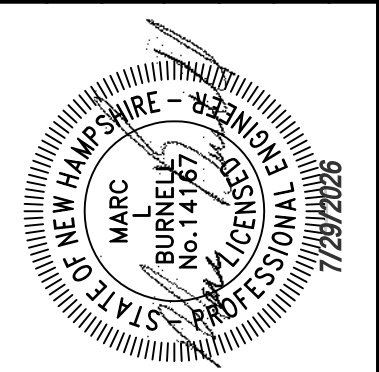
1. THE TYPICAL BUILDING WALL SECTION FROM THE OUTSIDE IN IS AS FOLLOWS:
 - VINLY SHAKE SIDING, "CERTAINTED" NORTHWOOD SHINGLE, 7 INCH STRAIGHT EDGE, PERFECTION SHINGLE, OR EQUAL
 - 1 X 6 PVC CORNER AND DOOR TRIM
 - 5/8" ADVANTECH, INSTALLED PER MANUFACTURERS RECOMMENDATIONS, OR EQUAL
 - 2 X 6 PRESSURE TREATED DOUBLE SILL PLATE BOLTED TO THE CONCRETE
 - 2 X 6 WALL STUDS, 8 FEET HIGH +/-
 - 2 X 6 DOUBLE TOP PLATE
 - SIMPSON H2.5 ANCHORS, TOP PLATE TO RAFTERS, OR EQUAL
 - 3-1/2 INCH CLOSED CELL SPRAY FOAM INSULATION
2. THE TYPICAL BUILDING INTERIOR WALL SECTION IS AS FOLLOWS:
 - 2 X 6 PRESSURE TREATED DOUBLE SILL PLATE BOLTED TO THE CONCRETE
 - 2 X 6 WALL STUDS, 9 FEET HIGH +/-
 - 2 X 6 DOUBLE TOP PLATE
 - 1" X 6" PVC TOE KICK BOARD AROUND INTERIOR WALLS OF BUILDING IN CONTACT WITH CONCRETE
 - 1/2 INCH MDO PLYWOOD
 - INTERIOR PVC TRIM AS NEEDED
3. THE TYPICAL BUILDING CEILING SECTION FROM THE INTERIOR IS AS FOLLOWS:
 - 1/2 INCH MDO PLYWOOD
 - 2" X 4" STRAPPING
 - ROOF TRUSS BOTTOM CHORD
 - 12 INCH THICK CELLULOSE INSULATION
4. THE TYPICAL BUILDING ROOF SECTION FROM THE OUTSIDE IS AS FOLLOWS:
 - STANDING SEAM METAL ROOFING, 24 GAUGE MINIMUM, COLOR BY OWNER
 - ICE AND WATER SHIELD OVER ENTIRE ROOF
 - 5/8 ADVENTECH ROOF SHEATHING, OR EQUAL
 - ROOF TRUSSES
 - RAFTER VENT, ENTIRE LENGTH OF RAFTER WHERE INSULATED
 - 12 INCHES CELLULOSE INSULATION
 - CONTINUOUS DRIP EDGE, EAVES AND RAKES
 - 2 X 6 SUBFASCIA AND BLOCKING
 - 1 X 8 PVC FASCIA TRIM
 - CONTINUOUS SOFFIT VENT
5. PROVIDE ADEQUATELY SIZED GABLE END VENTS TO ALLOW INSTALLATION OF INSULATION AND DEAD SPACE VENTING.

BIDDING PLANS
NOT FOR CONSTRUCTION

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved

PROJECT #:	21215
DATE:	JULY 2026
MAP-LOT (FOR ARCHIVE):	*
SURVEYED BY:	HEI- DJG/NWS
ENGINEERED BY:	MLB
DRAWN BY:	LJM
CHECKED BY:	CFC



horizons
Engineering
Civil and Structural Engineering
Land Surveying and Environmental Consulting
MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

TOWN OF LISBON
CONTRACT #1 WATER SYSTEM IMPROVEMENTS
USDA WER AFR 13610.0, DWS SFE 13610.0, DWG-82
BISHOP ROAD WELL IMPROVEMENTS
LISBON, NEW HAMPSHIRE

CONTROL BUILDING STRUCTURAL PLAN

SHEET C3.4

STANDARD TRENCH NOTES - WATER

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE SHALL BE REPLACED WITH BEDDING MATERIAL. SEE ALSO NOTE 4.

2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM ORGANIC MATTER, CLAY, AND/OR LOAM MEETING ASTM C33 STONE SIZE NO. 67.

100% PASSING

90-100% PASSING

20-55% PASSING

0-10% PASSING

0-5% PASSING

1 INCH SCREEN

¾ INCH SCREEN

½ INCH SCREEN

#4 SIEVE

#8 SIEVE

3. 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.

4. 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 MOUNDED TO A HEIGHT OF SIX INCHES ABOVE THE ORIGINAL GROUND SURFACE

5. 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.

6. SHEETING: ALL TRENCH SUPPORTS SHALL CONFORM TO OSHA STANDARDS. CONTRACTOR IS RESPONSIBLE FOR OSHA COMPLIANCE AND WORKER SAFETY THROUGHOUT CONSTRUCTION.

7. 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.

8. 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.

9. 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)	RESULTANT THRUST AT FITTINGS AT 100 PSI WATER PRESSURE				
	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:

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

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

The diagram illustrates the construction of a trench for a pipe, showing the trench pavement pay width of 8 feet. It details the layers from the top down: cut original pavement back 12 inches from the edge of the trench, cold plane original pavement to a depth of 1 inch, 12 inches back from the edge of pavement cut, typical; valley view drive trench pavement (NHDOT SECTION 403.11) with a 1" wearing course and 2" base course; 6" crushed gravel (see note 5); 12" bank run gravel (see note 5); suitable material (see note 4); detectable warning tape; sand blanket (see note 3); bedding (see note 2); and ledge. The trench width (W) is shown, with a minimum of 12 inches. The depth of the bedding is 12 inches minimum, and the depth of the ledge is 6 inches minimum. The total depth of the trench is 36 inches maximum (for D < OR = 15").

NOTE: MINIMUM BEDDING DEPTH AND MAXIMUM PAYMENT LIMIT FOR LEDGE EXCAVATION = ¼D (12" MINIMUM)

LEDGE/SUB PAVEMENT CONSTRUCTION

The diagram shows a cross-section of a trench with sheeting. It includes labels for finish grade, sheeting (see note 6), suitable material (see note 4), detectable warning tape, sand blanket (see note 3), bedding (see note 2), and ledge (see note 1). The trench width (W) is shown, with a minimum of 12 inches. The depth of the bedding is 12 inches minimum, and the depth of the ledge is 6 inches minimum. The total depth of the trench is 36 inches maximum (for D < OR = 15").

EARTH CONSTRUCTION WITH OR WITHOUT SHEETING

STANDARD TRENCH SECTIONS

NOT TO SCALE

The diagrams illustrate four types of thrust block configurations: horizontal tee, dead end, horizontal bend, and vertical bend. Each configuration shows a pipe joint with a concrete thrust block. The horizontal tee shows a 3000 lb. concrete block typical. The dead end shows a tie down typical. The horizontal bend shows a 6" minimum gap. The vertical bend shows a tie down typical.

THRUST BLOCK NOTES & DETAILS

NOT TO SCALE

The diagram shows a well casing extension detail. It includes labels for elevation 585.0, 3'-0" extension, finish grade elevation 582.0, well electrical and control conduit, 42" burial, 6'-0" minimum depth, MAAS weld-on pitless adapter or equal, well casing extension, existing 32" well casing, seal existing casing ground penetration to prevent surface water intrusion, and to well control building.

WELL CASING EXTENSION DETAIL

NO SCALE

The diagram shows a typical conduit trench detail section. It includes labels for yellow plastic warning tape metallic labeled "PRIMARY" or "SECONDARY", finish grade, earth, compacted backfill, branch circuits, fire alarm, CATV (see note #2), telephone (see note #2), secondary, compacted sand backfill (see note #1), fuel or water line, 18" minimum separation, 3" minimum separation, and 12" minimum separation.

TYPICAL CONDUIT TRENCH DETAIL SECTION

NO SCALE

NOTES TYPICAL CONDUIT TRENCH:

1. 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.
 2. 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.
 3. 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.
 4. 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.
 5. 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.

BIDDING PLANS
NOT FOR CONSTRUCTION

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved

PROJECT #:	21215	DATE:	JULY 2026	MAP LOT (OR ARCHIVE):	*	SURVEYED BY:	HEI- DJG/NWS	ENGINEERED BY:	MLB	DRAWN BY:	LJM	CHECKED BY:	CFC
NO.		DATE		REVISION DESCRIPTION		ENG		DWG					

Professional Engineer Seal for Marc Burnley, State of New Hampshire, No. 14161, Mechanical Engineering.

horizons
Engineering

Civil and Structural Engineering
Land Surveying and Environmental Consulting
MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

TOWN OF LISBON
CONTRACT #1 WATER SYSTEM IMPROVEMENTS
USDA/NEP #85A-156000-DW-SER-133-010-DWG-82
BISHOP ROAD WELL IMPROVEMENTS
LISBON, NEW HAMPSHIRE

STANDARD WATER SYSTEM NOTES AND DETAILS

SHEET D1.1

Z:\proj_2023\231217 Lishon Water System\DWGS Final\Combine - Contract 14331217_CO_142_cover.dwg:DWG, 17:02:29 2/25/17 PML\ashMcClure

last revised: 2018-APR-18

SEEDING RECOMMENDATIONS

- 1. GRADING AND SHAPING**
A. SLOPES SHALL NOT BE STEEPER THAN 2:1; 3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
- 2. SEEDBED PREPARATION**
A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
- B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE AMENDED WITH ORGANIC MATTER AND TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME THOROUGHLY INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
- 3. ESTABLISHING VEGETATION**
A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
- AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ. FT.
-NITROGEN (N), 50 LBS., PER ACRE OR 1.1 LBS. PER 1,000 SQ. FT.
-PHOSPHATE (P₂O₅), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.
-POTASH (K₂O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.

(NOTE: THIS IS THE EQUAL OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10).

- B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.

C. SEEDING GUIDE:

USE	SEEDING MIXTURE (SEE 3D)	SOIL TYPE			
		DROUGHTY	WELL DRAINED	MOD. WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILL-WAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	GOOD	GOOD	GOOD	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR

D. SEEDING RATES:

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.
A TALL FESCUE CREEPING RED FESCUE REDTOP TOTAL:	20	0.45
	20	0.45
	2	0.05
	42	0.95
B TALL FESCUE CREEPING RED FESCUE CROWN VETCH OR FLATPEA TOTAL:	15	0.35
	10	0.25
	15 OR	0.35 OR
	30	0.75
	40 OR 55	0.95 OR 1.35
C TALL FESCUE FLATPEA TOTAL:	20	0.45
	30	0.75
	50	1.20

- E. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO SEPTEMBER 15. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.

F. TEMPORARY SEEDING RATES:

SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.	REMARKS
WINTER RYE	112	2.5	BEST FOR FALL SEEDING. SEED FROM AUGUST TO SEPTEMBER 5TH FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	80	2.0	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15TH FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYEGRASS	40	1.0	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE NOT IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. COVER SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYEGRASS	30	0.7	GOOD COVER WHICH IS LONGER LASTING THAN ANNUAL RYEGRASS. SEED BETWEEN APRIL 1ST AND JUNE 1ST AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. MULCHING WILL ALLOW SEEDING THROUGHOUT THE GROWING SEASON. SEED TO A DEPTH OF APPROXIMATELY 0.5 INCH.

4. MULCH

- A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.

- B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING.

5. MAINTENANCE TO ESTABLISH A STAND

- A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.

- B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ON SITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.

- C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

EROSION CONTROL GENERAL NOTES

A. KEEP SITE MODIFICATION TO A MINIMUM

1. CONSIDER FITTING THE BUILDINGS AND STREETS TO THE NATURAL TOPOGRAPHY. THIS REDUCES THE NEED FOR CUTS AND FILLS. AVOID EXTENSIVE GRADING THAT WOULD ALTER DRAINAGE PATTERNS OR CREATE VERY STEEP SLOPES.
2. EXPOSE AREAS OF BARE SOIL TO EROSION ELEMENTS FOR THE SHORTEST TIME POSSIBLE.
3. SAVE AND PROTECT DESIRABLE EXISTING VEGETATION WHERE POSSIBLE. ERECT BARRIERS TO PREVENT DAMAGE FROM CONSTRUCTION EQUIPMENT.
4. LIMIT THE GRADES OF SLOPES SO VEGETATION CAN BE EASILY ESTABLISHED AND MAINTAINED.
5. AVOID SUBSTANTIAL INCREASE IN RUNOFF LEAVING THE SITE.

B. MINIMIZE POLLUTION OF WATER DURING CONSTRUCTION ACTIVITIES

1. STOCKPILE TOPSOIL REMOVED FROM CONSTRUCTION AREA AND SPREAD OVER ANY DISTURBED AREAS PRIOR TO REVEGETATION. TOPSOIL STOCKPILES MUST BE PROTECTED FROM EROSION.
2. PROTECT BARE SOIL AREAS EXPOSED BY GRADING ACTIVITIES WITH TEMPORARY VEGETATION OR MULCHES.
3. USE SEDIMENT BASINS TO TRAP DEBRIS AND SEDIMENT WHICH WILL PREVENT THESE MATERIALS FROM MOVING OFF SITE.
4. USE DIVERSIONS TO DIRECT WATER AROUND THE CONSTRUCTION AREA AND AWAY FROM EROSION PRONE AREAS TO POINTS OF SAFE DISPOSAL.
5. USE TEMPORARY CULVERTS OR BRIDGES WHEN CROSSING STREAMS WITH EQUIPMENT.
6. PLACE CONSTRUCTION FACILITIES, MATERIALS, AND EQUIPMENT STORAGE AND MAINTENANCE AREAS AWAY FROM DRAINAGE WAYS.

C. PROTECT AREA AFTER CONSTRUCTION.

1. ESTABLISH GRASS OR OTHER SUITABLE VEGETATION ON ALL DISTURBED AREAS. SELECT SPECIES ADAPTED TO THE SITE CONDITIONS AND THE FUTURE USE OF THE AREA. FINAL GRADES SHALL BE SEEDED WITHIN 72 HOURS. STABILIZATION SHALL BE DEFINED AS 85% VEGETATIVE COVER.
2. MAINTAIN VEGETATED AREAS USING PROPER VEGETATIVE 'BEST MANAGEMENT PRACTICES' DURING THE CONSTRUCTION PERIOD.
3. MAINTAIN NEEDED STRUCTURAL 'BEST MANAGEMENT PRACTICES' AND REMOVE SEDIMENT FROM DETENTION PONDS AND SEDIMENT BASINS AS NEEDED.
4. DETERMINE RESPONSIBILITY FOR LONG TERM MAINTENANCE OF PERMANENT 'BEST MANAGEMENT PRACTICES'.
5. IF CONSTRUCTION IS ANTICIPATED DURING WINTER MONTHS, REFER TO 'COLD WEATHER SITE STABILIZATION REQUIREMENTS'.

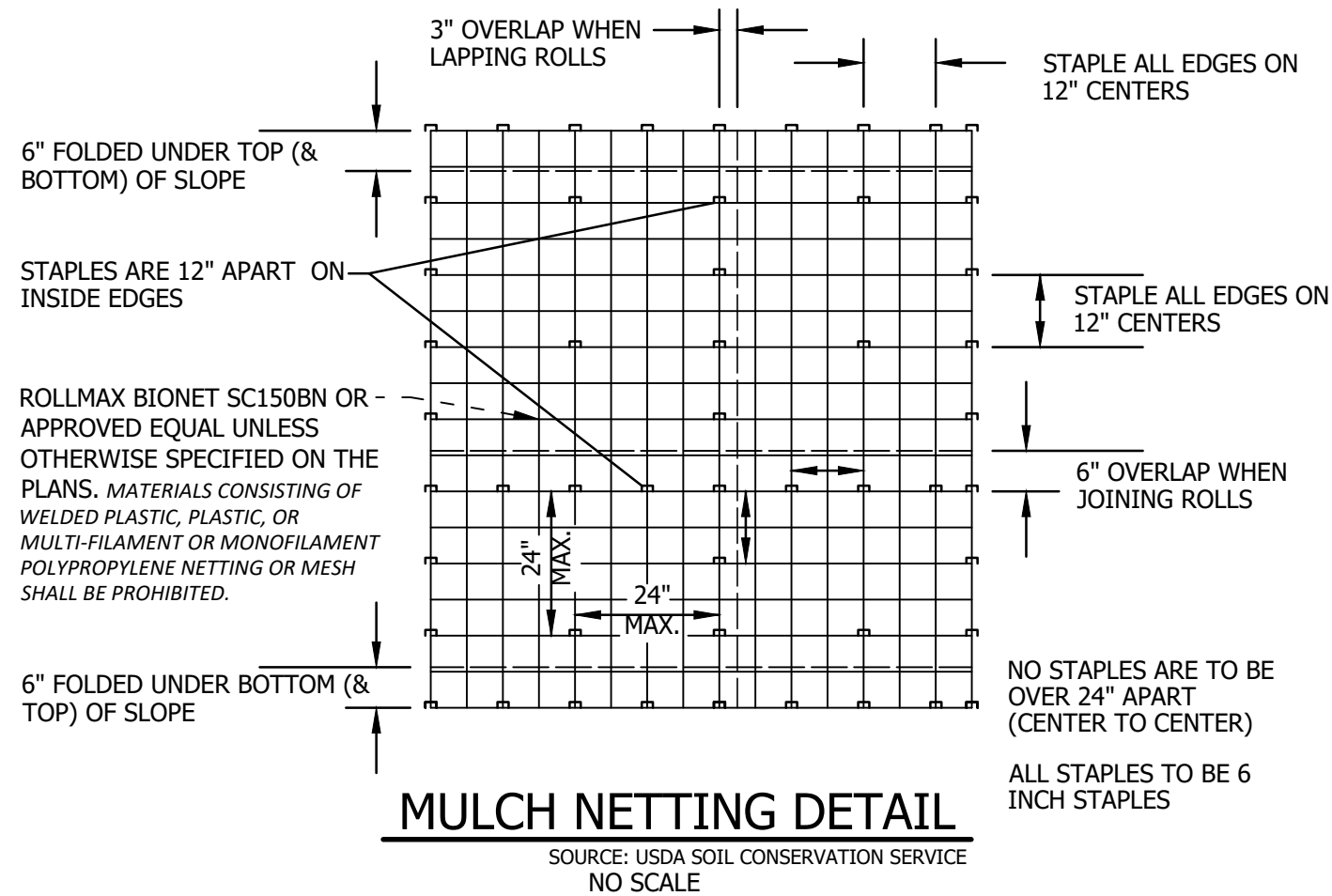
D. INVASIVE SPECIES AND FUGITIVE DUST

1. THE PROJECT SHALL NOT CONTRIBUTE TO THE SPREAD OF INVASIVE SPECIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EVALUATE WORK AREAS FOR THE PRESENCE OF INVASIVE SPECIES, AND IF FOUND SHALL TAKE NECESSARY MEASURES TO PREVENT THEIR SPREAD IN ACCORDANCE WITH RSA 430:51-57 AND AGR 3800. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT THE INTRODUCTION OF INVASIVE SPECIES BY INSPECTING AND CLEANING ALL EQUIPMENT ARRIVING ON SITE.
2. FUGITIVE DUST SHALL BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000.

COLD WEATHER SITE STABILIZATION REQUIREMENTS

TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE FOLLOWING ADDITIONAL STABILIZATION TECHNIQUES SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 1:

1. THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE LIMITED TO 1 ACRE AND SHALL BE PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT. THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY NHDES.
2. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE, SECURED WITH ANCHORED NETTING OR TACKIFIER, OR 2 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H).
3. ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH PROPERLY INSTALLED AND ANCHORED EROSION CONTROL MATTING OR WITH A MINIMUM 4 INCH THICKNESS OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H).
4. INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX, MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H), SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.
5. INSTALLATION OF EROSION CONTROL MATTING SHALL NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.
6. ALL PROPOSED STABILIZATION IN ACCORDANCE WITH NOTES 2 OR 3 ABOVE, SHALL BE COMPLETED WITHIN 1 DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
7. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY THE OWNER'S ENGINEERING CONSULTANT.
8. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION OF THE ROAD OR PARKING AREA HAS STOPPED FOR THE WINTER SEASON SHALL BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM NO. 304-1 OR 304-2.



CONSTRUCTION NOTES FOR SEDIMENT FENCE

1. WOVEN WIRE FENCE, IF REQUIRED, TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP, MID SECTION, AND BOTTOM.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SEDIMENT FENCE, OR 50% OF CAPACITY IS USED.
5. 12" DIAMETER FILTREXX SILTSOXX SHALL BE CONSIDERED AN ACCEPTABLE EQUAL TO SEDIMENT FENCE IF INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

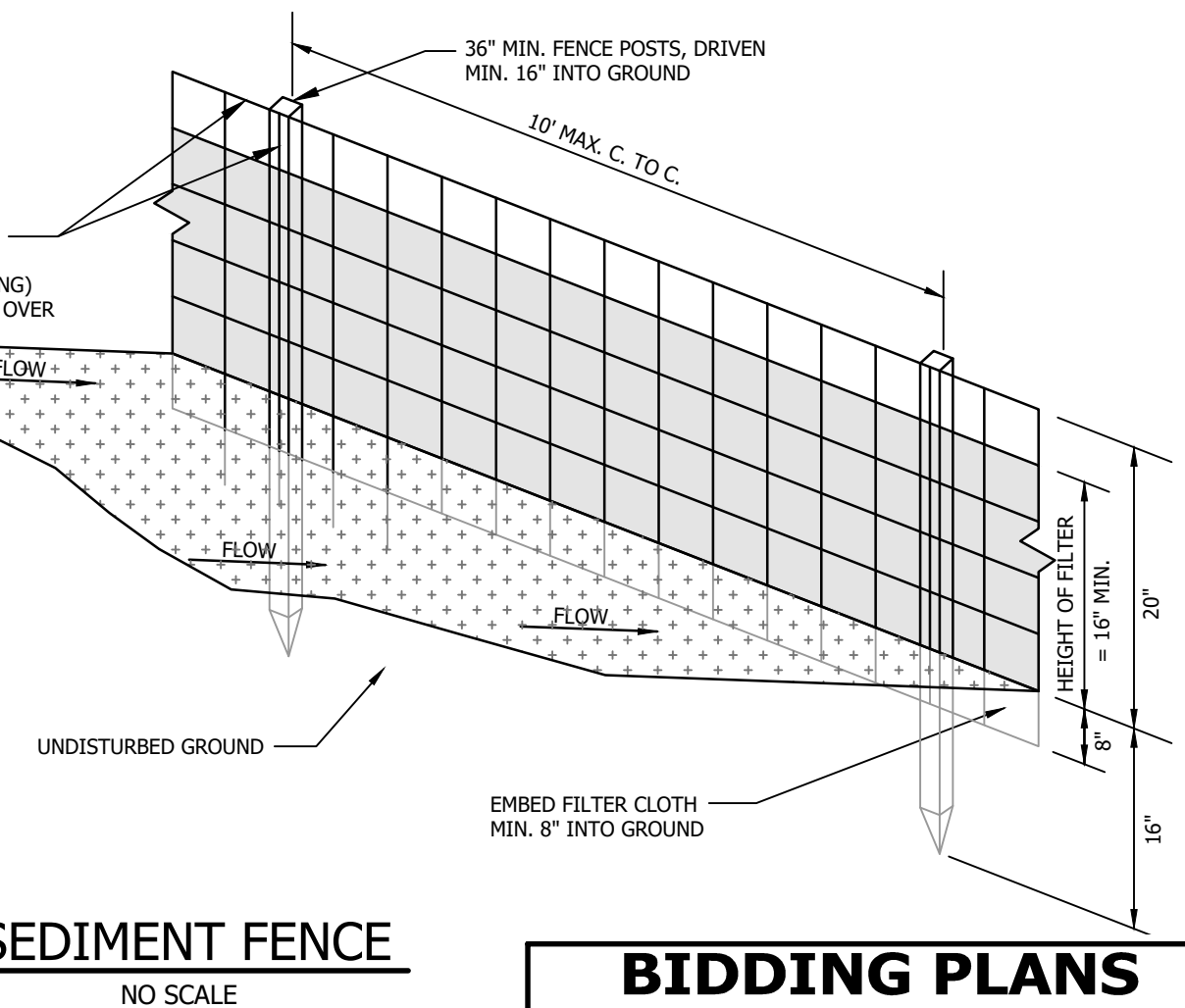
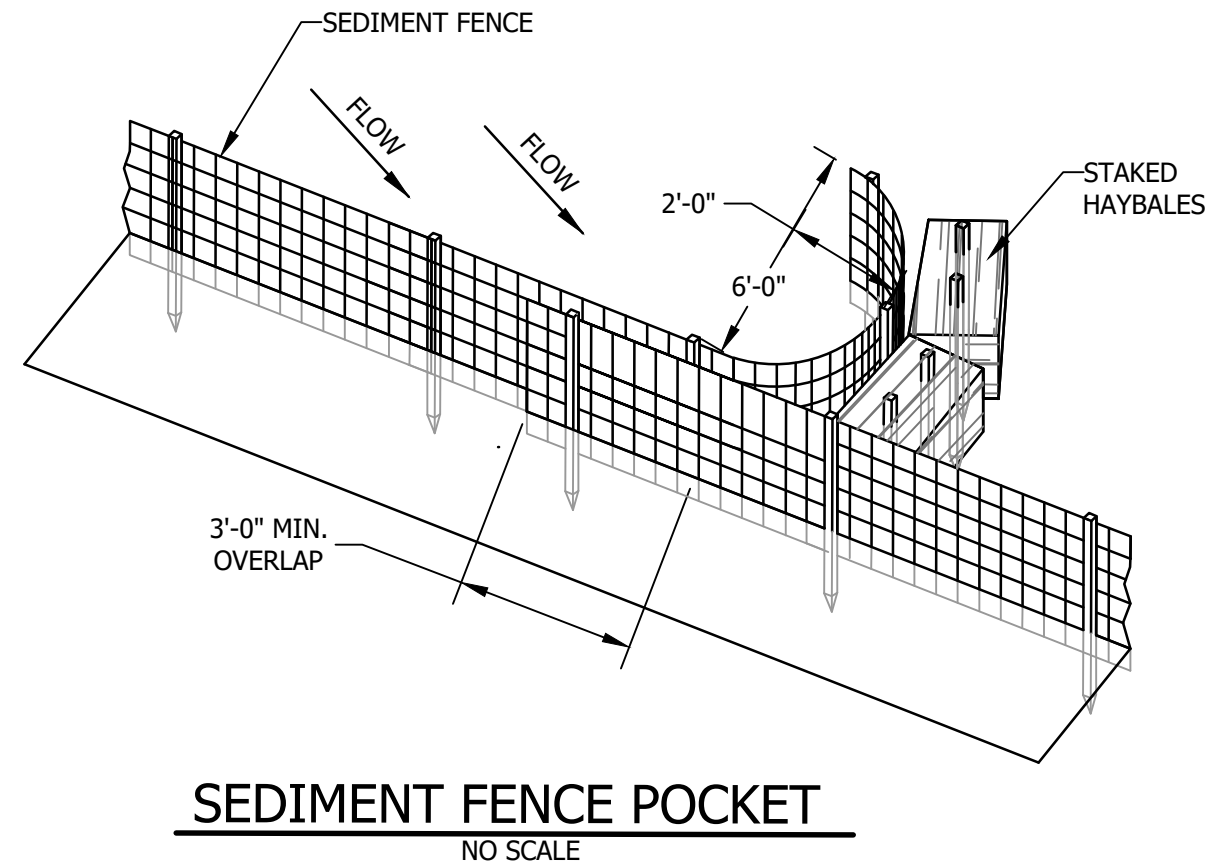
CONSTRUCTION SEQUENCE

1. PREPARE AN EROSION CONTROL PLAN OR A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
2. INSTALL CONSTRUCTION ENTRANCE, SEE DETAIL.
3. CUT AND CLEAR TREES WITHIN THE CLEARING LIMITS.
4. INSTALL SEDIMENT FENCES, ROCK CHECK DAMS, AND OTHER APPROPRIATE EROSION CONTROL MEASURES AT LOCATIONS SHOWN ON THE PLANS AND AS NEEDED.
5. GRUB SITE WITHIN GRADING LIMITS.
6. STRIP AND STOCKPILE TOPSOIL AND INSTALL EROSION CONTROL MEASURES.
7. INSTALL/ADJUST SEDIMENT FENCE, CHECK DAMS, AND HAYBALES, AS REQUIRED.
8. CONSTRUCT PERMANENT STORMWATER CONTROLS AS SOON AS PRACTICAL. DO NOT DIRECT STORMWATER TOWARD TREATMENT BASINS, PONDS, SWALES, DITCHES AND LEVEL SPREADERS UNTIL THEY HAVE BEEN STABILIZED.
9. PROCEED WITH WORK, LIMITING THE DURATION OF DISTURBANCE. THE MAXIMUM OF UNCOVERED DISTURBED EARTH AT ANY ONE TIME IS FIVE ACRES. THE MAXIMUM LENGTH OF TIME THAT DISTURBED EARTH MAY BE LEFT UNSTABILIZED IS 45 DAYS.
10. BEGIN SEEDING AND MULCHING IMMEDIATELY AFTER GRADING. ALL DISTURBED AREAS SHALL BE STABILIZED WITH APPROVED METHODS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

- A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
D) EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

11. INSPECT ALL EROSION CONTROL MEASURES ON A DAILY BASIS AND AFTER EVERY 0.5 INCHES OF PRECIPITATION. MAINTAIN SEDIMENT FENCE, SEDIMENT TRAPS, HAY BALES, ETC., AS NECESSARY.
12. PAVE ROADWAYS AND/OR PARKING AREAS.
13. PLACE TOPSOIL, SEED AND MULCH.
14. COMPLETE ALL REMAINING PERMANENT EROSION CONTROL STRUCTURES.
15. MONITOR THE SITE AND MAINTAIN STRUCTURES AS NEEDED UNTIL FULL VEGETATION IS ESTABLISHED.



**BIDDING PLANS
NOT FOR CONSTRUCTION**

DATE OF PRINT
JULY 20 2026
HORIZONS ENGINEERING

© 2025
horizons
Engineering
All rights reserved

PROJECT #:	21215	DATE:	JULY 2026	NO.		REVISION DESCRIPTION		ENG		DWG	
MAP-LOT (OR ARCHIVE)	*	SURVEYED BY:	HEI- D/G/NWS	ENGINEERED BY:	MLB	DRAWN BY:	LJM	CHECKED BY:	CFC		
horizons Engineering Civil and Structural Engineering Land Surveying and Environmental Consulting MAINE • NEW HAMPSHIRE • VERMONT www.horizonsengineering.com TOWN OF LISBON CONTRACT #1 WATER SYSTEM IMPROVEMENTS USDA PER 1506.05(D) WQ 1506.05(D) ENG-32 BISHOP ROAD WELL IMPROVEMENTS LISBON, NEW HAMPSHIRE											
CONSTRUCTION SEQUENCE, EROSION CONTROL DETAILS & NOTES											
SHEET D1.2											

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
EWG	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
KCMIL	THOUSAND CIRCULAR MIL(S)
kVA	KILOVOLT AMPERE(S)
KVAR	KILOVAR(S)
kW	KILOWATT(S)
L.P.S.	LOW PRESSURE SODIUM
LP	LIGHT 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 CONTACT
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)
V	VOLT(AMP(S)
VAR	REACTIVE VOLT AMPERES
VP	VAPORPROOF
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

MOUNTING ABBREVIATIONS LEGEND:	
SUBSCRIPT	DESCRIPTION
AT OUTLET	
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

SYMBOL	DESCRIPTION
	LOW VOLTAGE WIRING
	CIRCUIT IN CONDUIT RUN IN-SLAB OR UNDERGROUND
	CIRCUIT IN CONDUIT CONCEALED IN WALLS OR ABOVE CEILING WHERE POSSIBLE.
	HOMERUN TO PANELBOARD OR AS NOTED
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN

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.
	DUPLEX CONVENIENCE OUTLET. MOUNT AT +18" AFF.
X	DUPLEX CONVENIENCE OUTLET. MOUNT AT +18" AFF. 'X' DENOTES REUSE LOCATION.
	DOUBLE DUPLEX OUTLET (QUADPLEX RECEPTACLE). MOUNT AT +18" AFF.
X	DUPLEX OUTLET. INSTALLED ABOVE CEILING AT LOCATION SHOWN.
	SINGLE DEDICATED OUTLET. MOUNT @ 18" AFF.
	SPECIAL OUTLET AS NOTED ON DRAWINGS. MOUNT AT +18" AFF. 'R' DENOTES RANGE. 'D' DENOTES DRYER.
24"	WIREMOLD 3000. DUPLEX RECEPTACLES SPACED 24" ON CENTER.
	WALL MOUNT AT 36" AFF.
OR GFI	GROUND FAULT CIRCUIT INTERRUPTER
OC	OVER-COUNTER
WP	WEATHERPROOF

SYMBOL	REFER TO PLANS FOR EXACT QUANTITIES AND LOCATIONS.
	FLUSH MOUNTED PANELBOARD AND CABINET. MOUNT AT 6'-6" MAX. AFF TO TOP.
	SURFACE MOUNTED PANELBOARD AND CABINET. MOUNT AT 6'-6" MAX. AFF TO TOP.
	ELECTRICAL PULL BOX, SIZED AS REQUIRED OR AS SHOWN ON DRAWINGS.
	JUNCTION BOX (JB) (IN ACCESSIBLE LOCATION).
	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.
	MOTOR. HORSEPOWER AS SHOWN ON DRAWINGS.
	H.P. RATED MANUAL MOTOR STARTER (WEATHERPROOF WHERE OUTSIDE). SINGLE OR 2 POLE AS REQUIRED
	FUSED DISCONNECT SWITCH. SIZE AND FUSES PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF (WP) WHEN LOCATED OUTSIDE. 30A/3P MINIMUM.
	MOTOR CONTROLLER.

3500 PSI CONC. RING AROUND HANDHOLE WHEN IN SIDEWALK AREA

24" MIN. COVER

10"

FINISH GRADE

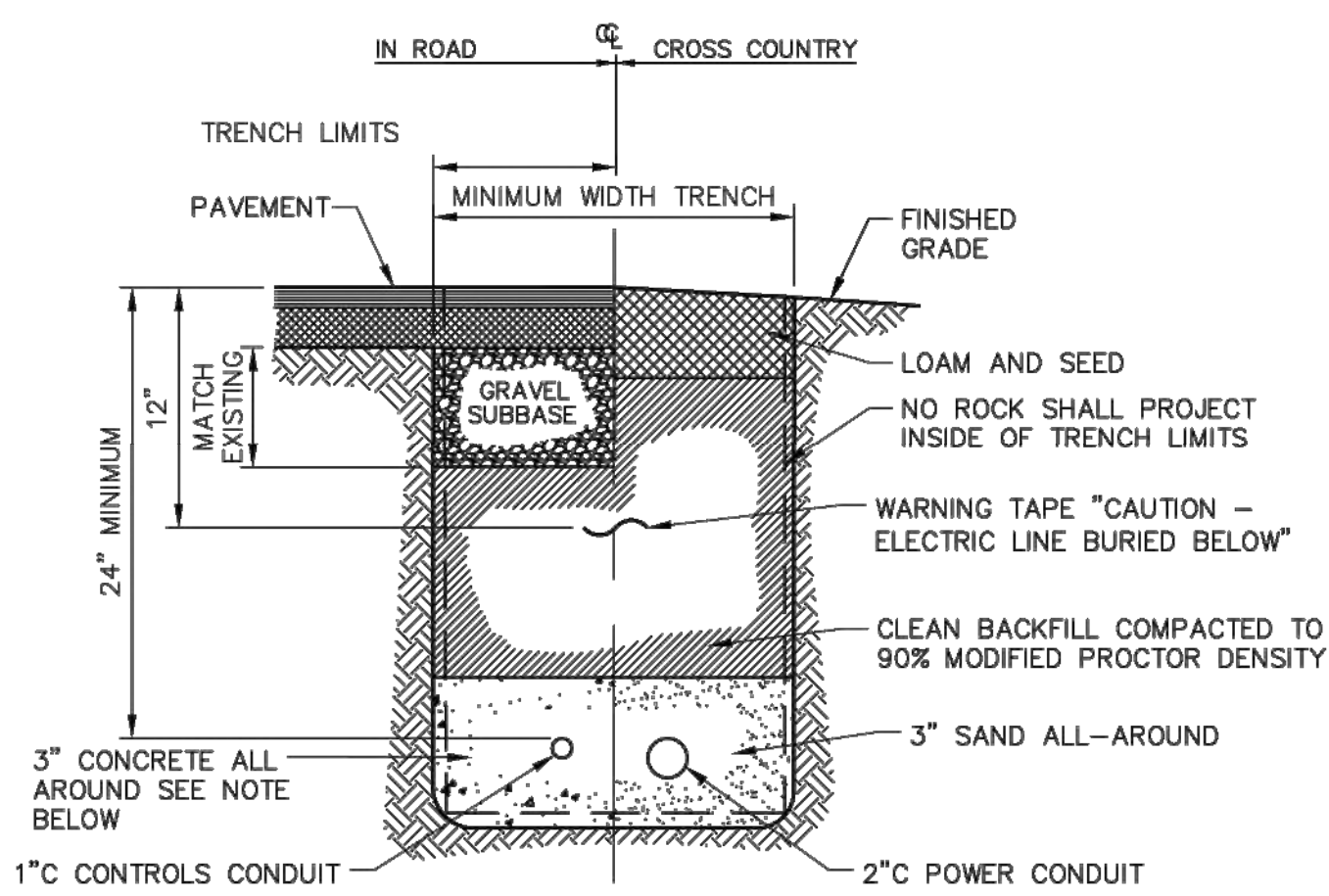
6" CRUSHED STONE BASE

COMPACTED TO 90% MODIFIED PROCTOR DENSITY

SLOPE TO BOX (TYP.)

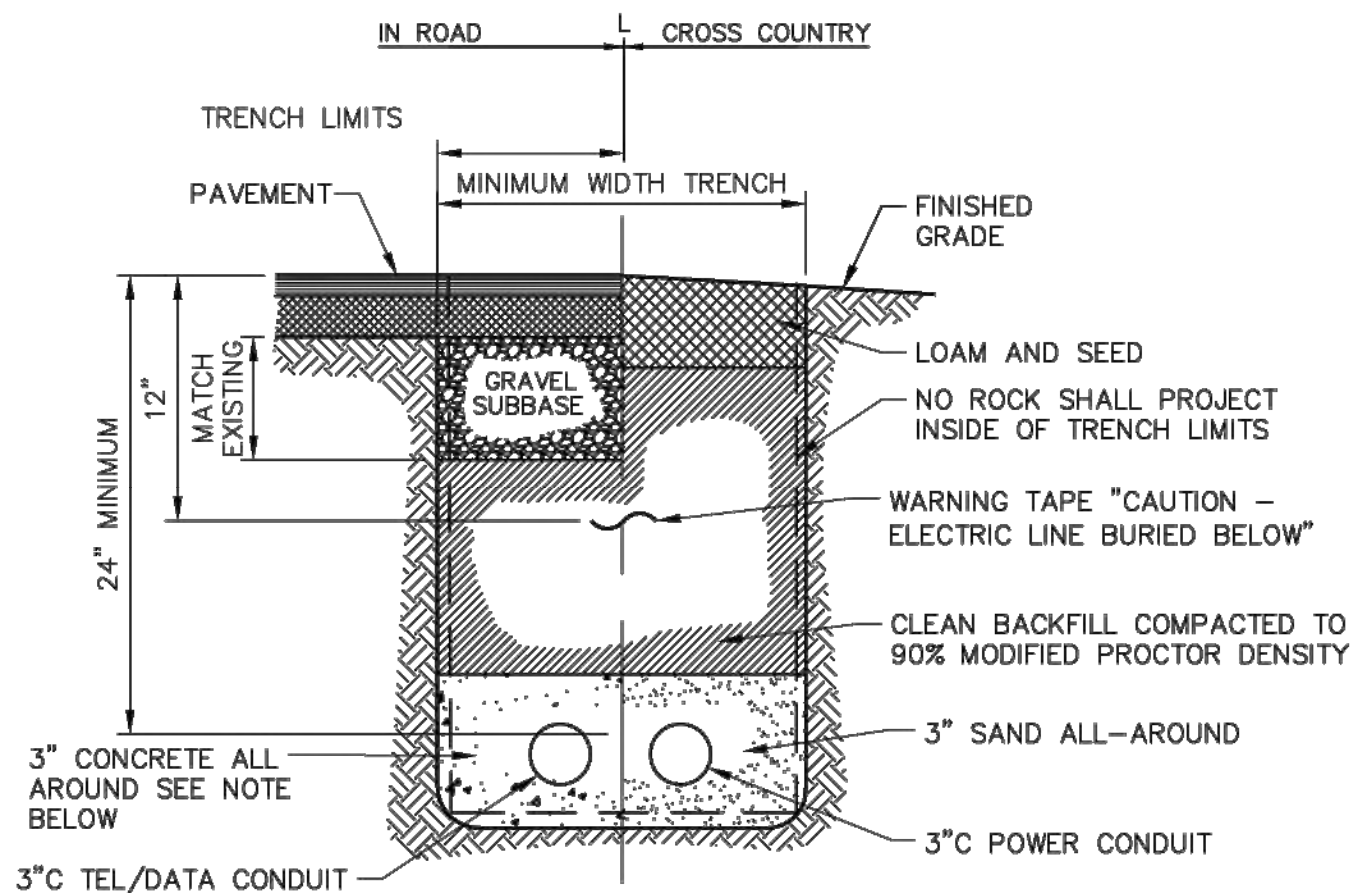
The diagram illustrates a cross-section of a manhole assembly. At the base is a 6-inch layer of crushed stone base. Above this is a concrete box with a dashed oval inside. The box is surrounded by a layer of material compacted to 90% modified Proctor density, which slopes to the box. The top of the box is covered by a 24-inch minimum concrete cover. A 3500 PSI concrete ring is shown around the handhole when it is in the sidewalk area. The finish grade is indicated at the top right, with a 10-inch dimension shown for the top layer of the cover.

NOT TO SCALE



NOTES:
1. PROVIDE 3" CONCRETE ENCASEMENT AROUND PVC CONDUITS AT ALL ROAD AND DRIVEWAY CROSSINGS TO 5' BEYOND EDGE OF PAVEMENT. TYPICAL.

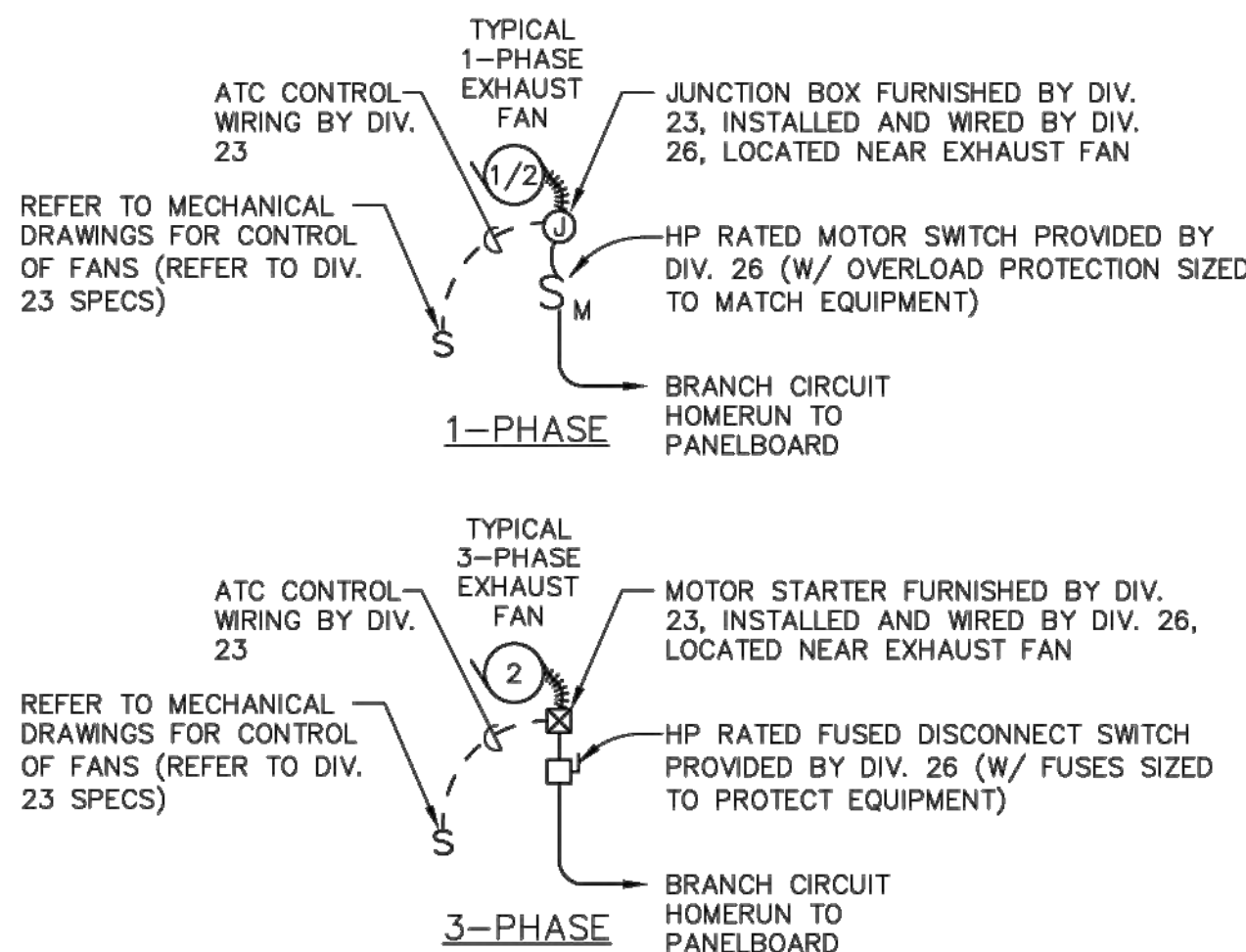
1 TYPICAL POWER AND CONTROLS TRENCH SECTION
E401 NOT TO SCALE



NOTES:

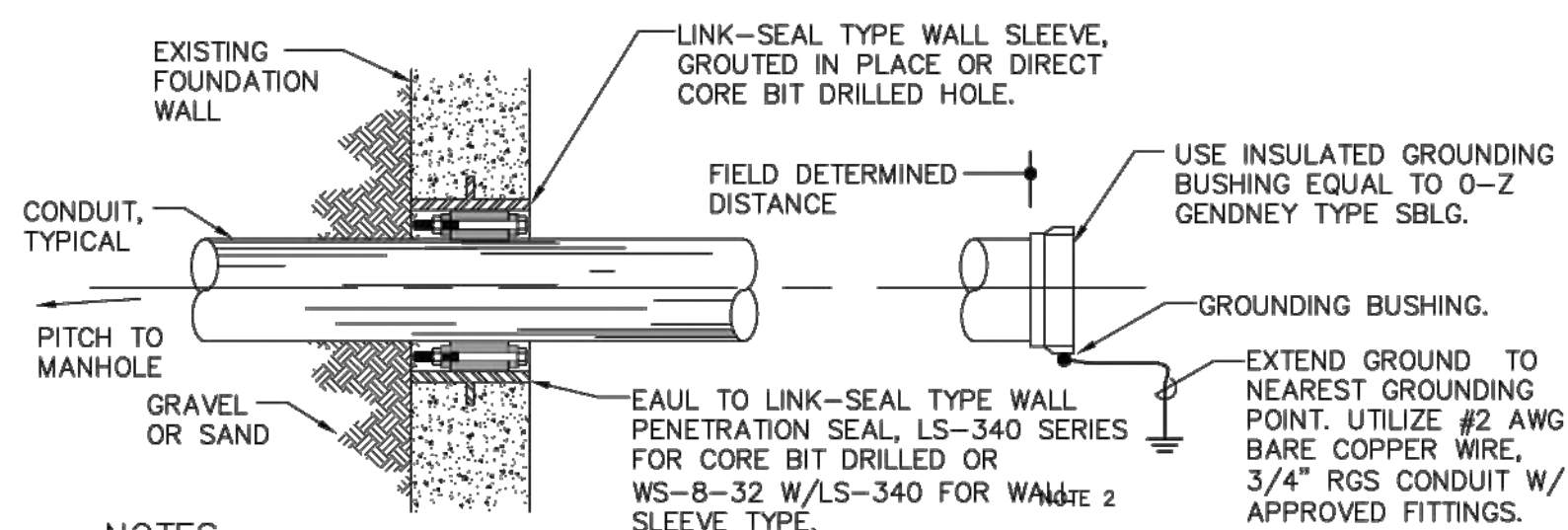
1. PROVIDE 3" CONCRETE ENCASEMENT AROUND PVC CONDUITS AT ALL ROAD AND DRIVEWAY CROSSINGS TO 5' BEYOND EDGE OF PAVEMENT. TYPICAL.

2 TYPICAL POWER TRENCH SECTION
E401 NOT TO SCALE



NOT TO SCALE

1. ALL ELECTRICAL WORK 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.
2. THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTIONS.
3. 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.
4. LIMIT 20A, 120V BRANCH CIRCUITS TO A MAXIMUM 1920VA LOAD AND 15A, 120V BRANCH CIRCUIT TO A MAXIMUM 1440VA LOAD.
5. 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.
6. 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.
7. 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.
8. VERIFY ALL STRUCTURAL, ARCHITECTURAL AND ELECTRICAL CONDITIONS (DUCT CLEARANCES, COUNTER HEIGHTS, DOOR SWINGS, ETC.) PRIOR TO ROUGH IN FOR ELECTRICAL WIRING EQUIPMENT.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. COMPLETE ALL PANEL BOARD CIRCUITS DIRECTORY CARDS TO REFLECT AS-BUILT CONDITIONS.
17. 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.
18. FURNISH, INSTALL, TEST, CALIBRATE, AND OTHERWISE MAKE OPERATIONAL ALL DEVICES AND EQUIPMENT SHOWN ON THESE DRAWINGS.
19. 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.



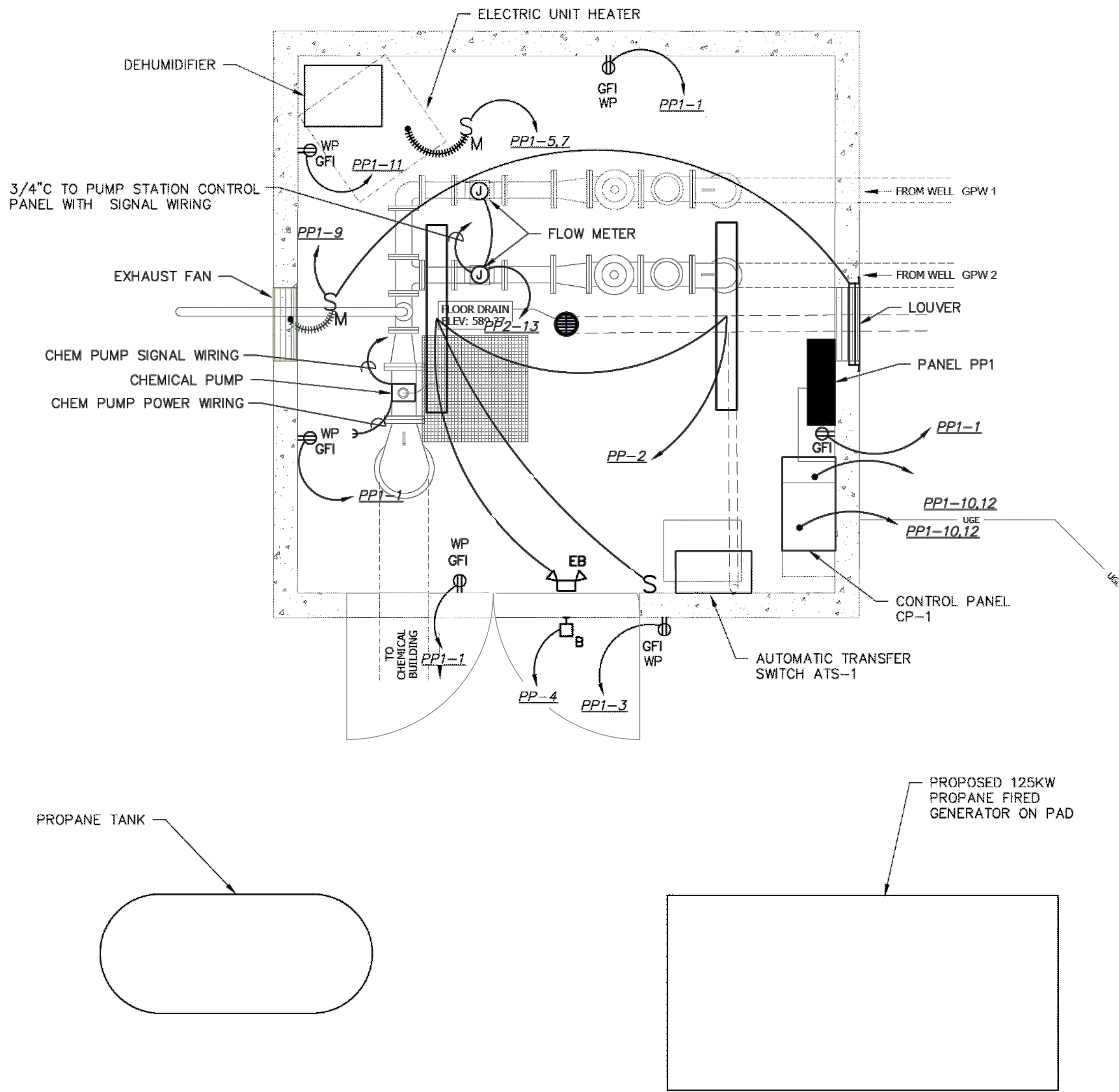
1. LINK-BEAD TYPE SEALING FITTING SHALL BE USED FOR ALL WALL PENETRATIONS. IF CORE BIT DRILL SYSTEM IS USED AND CORE DRILL IS SMOOTH AND SUITABLE THE MODULE SEALING SYSTEM MAY BE USED. USE WALL SLEEVES IF ENTRY IS SIMILAR TO DETAIL 'CE'.
2. SLOPE DUCTS TOWARDS MH.
3. ALL CONDUIT PENETRATIONS SHALL BE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

NOT TO SCALE

BIDDING PLANS
NOT FOR CONSTRUCTION



I:\5\530379L_Horizons Town of Lisbon Electrical Design Services for Chemical Feed and Control Building Drawings\Electrical Set.dwg, 1/28/2025 8:39 PM



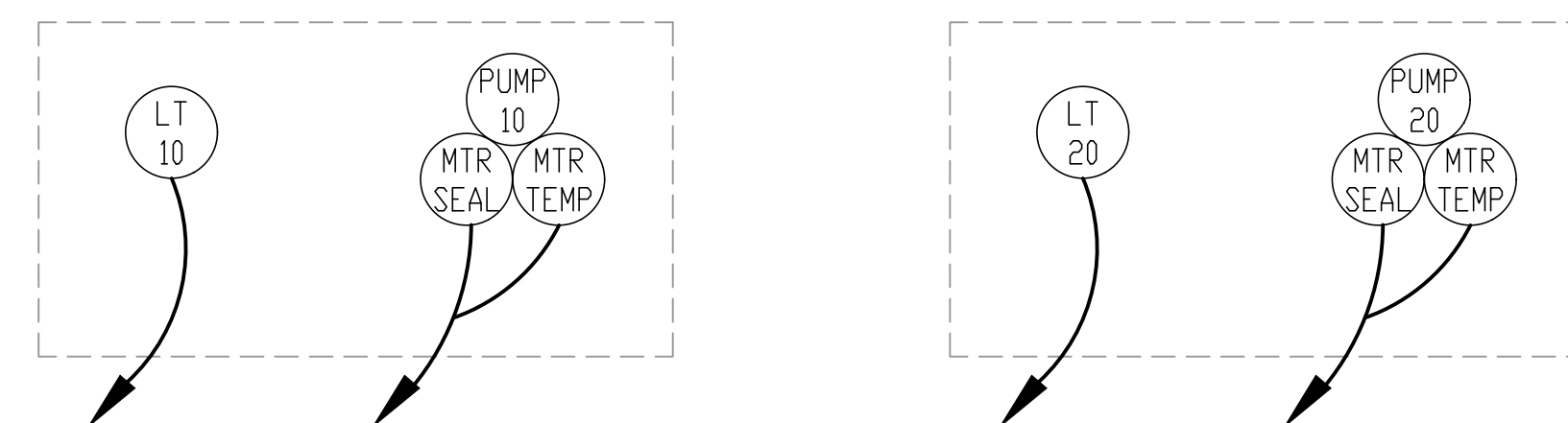
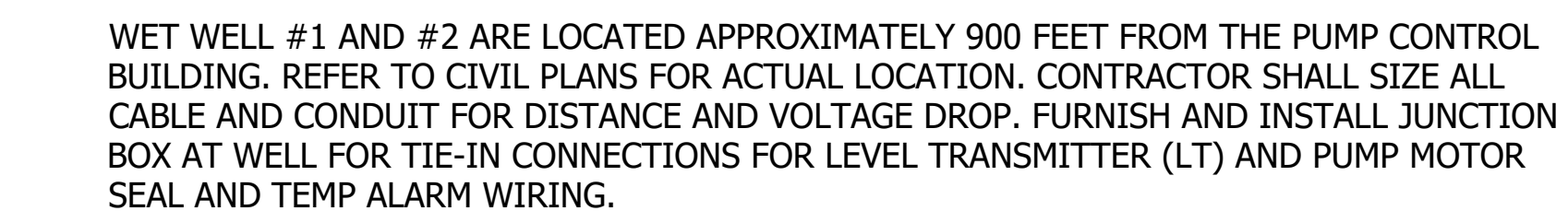
- COORDINATION NOTE:
- EC TO COORDINATE FINAL CONDUIT AND FEEDER SIZES BASED ON SELECTED CONTROLLER AND PUMP SELECTION.

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

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 PHOTOCELL	12
EB	LITHONIA LIGHTING	EL2LM12	EMERGENCY	WHITE	WALL @8'	120			0.33

BUS:		200 Ampere		PANEL No. PP1										LOCATION:		CONTROL BUILDING																	
PANEL RATING:		22 KAIC												MOUNTING:		SURFACE																	
SUPPLY VOLTAGE:		480Y/277V, 3Ø												DRAWING No.:		E2																	
SERVICE:		4-WIRE WITH GROUND BUS																															
WIRING				VA OR W										BREAKER		VA OR W				DESCRIPTION		WIRING											
WIRE		COND		ØA		ØB		ØC		POLE		A		NO		CONN		NO		POLE		A		ØA		ØB		ØC		COND		WIRE	
2#12, 1#12G		3/4"		720						1		20		1		•		2		1		20		546						3/4"		2#12, 1#12G	
2#12, 1#12G		3/4"		360						1		20		3		•		4		1		20				24				3/4"		2#12, 1#12G	
2#4, 1#10G		1-1/2"		5000						2		60		5		•		8		3		100		14266						2"		3#2, 1#8G	
2#12, 1#12G		3/4"		5000						1		20		9		•		10		1		20		14266									
2#12, 1#12G		3/4"						1500		1		20		11		•		12		1		20		14266									
2#12, 1#12G		3/4"		42						1		20		13		•		14		3		100		14266						2"		3#2, 1#8G	
										1		20		15		•		16		1		20		14266									
										1		20		17		•		18		1		20											
														19		•		20															
														21		•		22															
														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:																																	
AMPERES						119																											
										MAIN BREAKER										200A/3P													
										FEEDER ENTRANCE:										BOTTOM													
										FEEDER SIZE:										SEE-ONE-LINE													
										SOURCE:										UTILITY METER													
										PANEL TYPE										BOLT-ON													



WET WELL #1 AND #2 (REF ONLY)

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

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 DIAGMMATIC. 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.

TOWN OF LISBON

CONTRACT #1 WATER SYSTEM IMPROVEMENTS
 USDA WEP, AREA 1361010, DW 3861010, DWGT 482
 BISHOP ROAD WELL IMPROVEMENTS
 LISBON, NEW HAMPSHIRE

CONTROL BUILDING INSTRUMENT PROCESS PLAN



Civil and Structural Engineering
Land Surveying and Environmental Consulting
 MAINE • NEW HAMPSHIRE • VERMONT
www.horizonsengineering.com

PROJECT #:	NO.	DATE	REVISION DESCRIPTION	ENG	DWG
DATE:	JULY 2026				
MAP-LOT (OR ARCH)	*				
SURVEYED BY:	HEI- DIG/NWS				
ENGINEERED BY:	MLB				
DRAWN BY:	LJM				
CHECKED BY:	CFC				