

2/19/2026 9:30 AM - BRENTKY - INACTIVE PROJECTS\25337\_IPSWITCH\_ELECTRIC\_FOWLERS\_LANE\_#5\_CONTROL\_HOUSE\06-DRAFTING\WORKING DRAWINGS\CIVIL\191506-C300-0.DWG

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>LEGEND</b>															
2L	DOUBLE ANGLE	NS	NEAR SIDE												
BOP	BOTTOM OF BASE PLATE	NTS	NOT TO SCALE												
BC	BOLT CIRCLE	PLCS	PLACES												
COL	COLUMN	SIM	SIMILAR												
ES	EACH SIDE	SP	SPACED/SPACING												
EQ	EQUAL/EQUALLY	TOC	TOP OF CONCRETE												
FS	FAR SIDE	TOS	TOP OF STEEL												
IWO	IN WAY OF	TYP	TYPICAL												
LLB	LONG LEG BACK-TO-BACK	UNO	UNLESS NOTED OTHERWISE												
LLH	LONG LEG HORIZONTAL														
LLV	LONG LEG VERTICAL														
<b>GOVERNING CODES &amp; DESIGN LOADS</b>															
1. GOVERNING CODES:															
a. MA 10TH EDITION BUILDING CODE CMR 780															
b. INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION															
c. ACI "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", 318-19															
d. AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", 360-16															
2. DESIGN LOADS:															
a. RISK CATEGORY: III															
b. FLOOR LIVE LOAD: N/A															
c. ROOF LIVE LOAD: N/A															
d. SNOW LOAD:															
GROUND SNOW LOAD, Pg: 50 PSF															
FLAT-ROOF SNOW LOAD, Pf: N/A															
SNOW EXPOSURE FACTOR, Ce: N/A															
SNOW LOAD IMPORTANCE FACTOR, Is: 1.1															
THERMAL FACTOR, Ct: N/A															
SLOPE FACTOR(S), Cs: N/A															
DRIFT SURCHARGE LOADS, Pd: N/A															
WIDTH OF SNOW DRIFTS, w: N/A															
e. WIND LOAD:															
ULTIMATE DESIGN WIND SPEED, Vult: 126 MPH															
EXPOSURE CATEGORY: C															
INTERNAL PRESSURE COEFFICIENT, GCpi: 0.00															
f. EARTHQUAKE LOAD:															
IMPORTANCE FACTOR, Ie: 1.25															
MAPPED SPECTRAL ACCEL., S <sub>S</sub> : 0.341															
MAPPED SPECTRAL ACCEL., S <sub>F</sub> : 0.074															
SITE CLASS: E															
DESIGN SPECTRAL ACCEL., S <sub>DS</sub> : 0.488															
DESIGN SPECTRAL ACCEL., S <sub>D1</sub> : 0.201															
SEISMIC DESIGN CATEGORY: D															
SEISMIC FORCE-RESISTING SYSTEM(S): N/A															
DESIGN BASE SHEAR(S): N/A															
SEISMIC RESPONSE COEFFICIENT, Cs: N/A															
RESPONSE MODIFICATION COEFFICIENT(S), R: N/A															
SEISMIC DESIGN IS BASED ON EQUIVALENT LATERAL FORCE PROCEDURE															
g. WIND & ICE:															
MAPPED ICE THICKNESS: 1.50 IN															
IMPORTANCE FACTOR, ICE, II: 1.15															
DESIGN WIND SPEED, V: 50 MPH															
IMPORTANCE FACTOR, WIND, Iwi: 1.0															
3. GEOTECHNICAL INFORMATION:															
a. NET ALLOWABLE BEARING PRESSURE: 2,000 PSF															
b. FROST DEPTH: 4 FT															
c. LIQUEFACTION POTENTIAL: LOW															
4. SPECIAL LOADS:															
c. FAULT CURRENT: N/A															
<b>GENERAL NOTES</b>															
1. THE STRUCTURAL DRAWINGS MUST BE USED IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND THE DRAWINGS OF ALL OTHER DISCIPLINES.															
2. ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVDO88) AND ARE STATED IN FEET.															
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION AND FOR ALL JOBSITE SAFETY.															
4. THE CONTRACTOR SHALL PROVIDE TEMPORARY ERECTION BRACING AND SHORING AS REQUIRED DURING ERECTION OF ALL STRUCTURAL FRAMING AND DURING EXCAVATION, COMPLYING WITH ALL OSHA REGULATIONS.															
5. PROTECT STRUCTURES, UTILITIES, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT, AND OTHER HAZARDS CREATED BY EARTHWORK OPERATIONS. CONDUCT OPERATIONS WITH MINIMUM INTERFERENCE TO PUBLIC OR PRIVATE THOROUGHFARES. COORDINATE INGRESS AND EGRESS WITH ADJACENT PROPERTY OWNERS.															
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, GRADES, BEARINGS, INVERTS, AND OTHER INFORMATION GIVEN ON THE DRAWINGS. PRIOR TO LAYING OUT ALL WORK, REPORT ALL DISCREPANCIES TO THE ENGINEER IN WRITING OR WITH DRAWINGS FOR DETERMINATION OF WHAT ACTIONS, IF ANY, ARE REQUIRED.															
7. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION. NOTIFY THE ENGINEER IF CONFLICTS OCCUR.															
8. SHOULD UNCHARTED OR INCORRECTLY CHARTED UTILITIES OR OBSTRUCTIONS BE ENCOUNTERED DURING EXCAVATION, NOTIFY THE ENGINEER IMMEDIATELY FOR DIRECTIONS. COOPERATE WITH OWNER AND/OR UTILITY OWNER TO KEEP RESPECTIVE SERVICES/FACILITIES/UTILITIES IN OPERATION. IN ACCORDANCE WITH AS-BUILT RECORD REQUIREMENTS, RECORD THE UTILITY LOCATION(S), TYPE(S), SIZE(S), AND DEPTH(S).															
9. THE CONTRACTOR SHALL LIMIT HIS OPERATION ON AND ADJACENT TO THE SITE AS REQUIRED BY THE OWNER.															
10. DO NOT ALLOW ACCUMULATION OF WASTE, DEBRIS, CONSTRUCTION WATER, RUBBISH, ETC. THAT CAN CREATE HAZARDOUS CONDITIONS.															
11. UNCONTROLLED OR UNRESTRICTED ACCESS FOR MATERIALS, DEBRIS, OR EQUIPMENT WILL NOT BE PERMITTED. ACCESS ROUTES SHALL BE SUBJECT TO APPROVAL BY THE OWNER.															
12. PROVIDE ALL PROTECTION BARRICADES, ETC. REQUIRED BY FEDERAL, STATE, AND/OR LOCAL LAWS AND ORDINANCES. MAINTAIN ALL LIGHTS, SIGNALS, AND PROTECTION OF ALL KINDS FOR THE FULL PERIOD OF OPERATION; AND REMOVE THE SAME WHEN DIRECTED.															
13. CONTRACTOR SHALL RESTORE ALL AREAS DAMAGED DURING CONSTRUCTION TO ORIGINAL CONDITION INCLUDING CLEANUP, REGRADING, SEEDING, AND SIDEWALK/PAVEMENT REPLACEMENT.															
14. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE DUST CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION ACTIVITIES.															
15. THE CONTRACTOR MUST PROVIDE CONTINUOUS CONTROL OF SURFACE AND GROUNDWATER SO AS TO MAINTAIN A DRY WORK AREA AND AVOID MOVEMENT OF NEW CONSTRUCTION DUE TO FLOATION.															
16. RIGID INSULATION BOARD MUST BE ASTM C578 TYPE V XPS. BOARDS MUST BE INSTALLED SO THAT JOINTS ARE TIGHT AND THERE ARE NO GAPS. TEMPORARILY SECURE BOARDS AS REQUIRED TO PREVENT MOVEMENT DURING BACKFILLING AND/OR CONCRETE PLACEMENT.															

**CONCRETE NOTES**

- ALL CONCRETE WORK MUST CONFORM TO THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR MUST SUBMIT THE FOLLOWING DOCUMENTATION:
  - CONCRETE MIX DESIGN(S)
  - REINFORCING STEEL MATERIAL CERTIFICATES
  - REINFORCING STEEL SHOP DRAWINGS
  - FIELD TEST RESULTS (AIR, COMPRESSION STRENGTH, ETC.)
- CONCRETE MIXTURES SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:

ELEMENT	MIN. 28-DAY COMPRESSIVE STRENGTH	EXP. CAT. F	EXP. CAT. S	EXP. CAT. W	EXP. CAT. C
FOOTINGS, PEDESTALS, AND WALLS	4,500 PSI	F2	S0	W0	C1
EXTERIOR SLAB-ON-GROUND AND MATS	4,500 PSI	F2	S0	W0	C1

- ALL CONCRETE, EXCEPT FOR INTERIOR SLAB-ON-GROUND, SHALL BE AIR-ENTRAINED.
- INTERIOR SLAB-ON-GROUND SHALL HAVE AN AIR CONTENT LESS THAN 3%
- REINFORCING BARS SHALL BE ASTM A615 GRADE 60 DEFORMED, BILLET STEEL BARS.
- WELDED WIRE REINFORCEMENT SHALL COMPLY WITH ASTM A1064.
- LAP SPLICES SHALL NOT BE USED FOR REINFORCING BARS LARGER THAN #11.
- WELDING OF REINFORCING IS PROHIBITED.
- MINIMUM COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
  - CONCRETE CAST AGAINST EARTH: 3"
  - CONCRETE CAST AGAINST FORMWORK: 2"
  - TOP SURFACE OF WALLS, SLABS, & PEDESTALS: 2"
- ALL LAP SPLICES SHALL BE ACI CLASS B SPLICES UNLESS NOTED OTHERWISE. SPLICES SHALL BE STAGGERED AND LOCATED AWAY FROM THE SECTION OF MAXIMUM TENSILE STRESS
- THE FOLLOWING LAP SPlice TABLES ARE BASED ON NORMAL WEIGHT CONCRETE WITH BARS SPACED 4 BAR DIAMETERS OR MORE APART AND CONCRETE COVER EQUAL TO 2" OR MORE. TOP BARS ARE DEFINED AS HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE PLACED BELOW THE REINFORCEMENT.

4,500 PSI CONCRETE											fy = 60,000 PSI										
BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11		#3	#4	#5	#6	#7	#8	#9	#10	#11		
LAP (IN) - TOP BARS	18	24	30	36	45	60	68	76	88		18	24	30	36	45	60	68	76	88		
LAP (IN) - OTHER BARS	14	18	23	28	40	46	52	59	68		14	18	23	28	40	46	52	59	68		

- PROVIDE 3/4" CHAMFER ON ALL EXPOSED CONCRETE EDGE UNLESS NOTED OTHERWISE.
- ALL COLD JOINTS BETWEEN NEW AND EXISTING CONCRETE SHALL BE BONDED WITH AN EPOXY-RESIN-BASE BONDING AGENT COMPLYING WITH ASTM C881. APPLY PER MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
- FINISH UNFORMED CONCRETE SURFACES AS FOLLOWS:
  - TOPS OF WALLS AND PEDESTALS: FLOAT FINISH
  - EXTERIOR SLAB-ON-GROUND & MATS FOR EQUIPMENT: TROWEL FINISH
  - EXTERIOR WALKING-WORKING SURFACE: BROOM FINISH
  - INTERIOR SLAB-ON-GROUND: TROWEL FINISH

**ANCHOR ROD & EMBEDDED ITEMS NOTES**

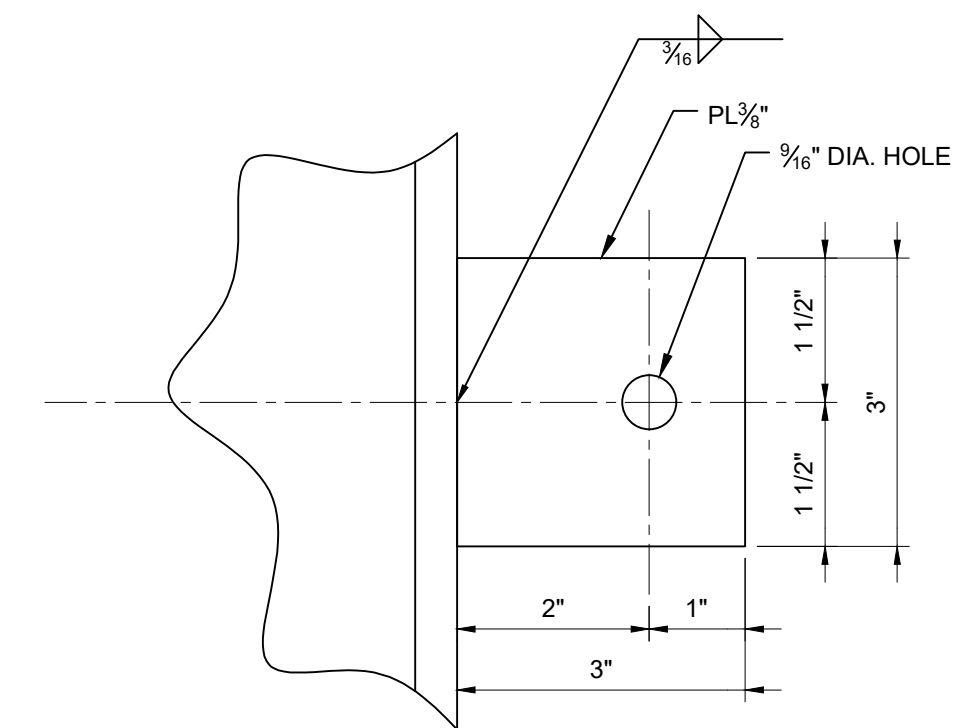
- THE CONTRACTOR MUST SUBMIT THE FOLLOWING DOCUMENTATION FOR REVIEW PRIOR TO STARTING WORK
  - ANCHOR ROD MATERIAL CERTIFICATES
  - ANCHOR ROD SHOP DRAWINGS
  - EMBEDDED ITEM SHOP DRAWINGS
- ANCHOR RODS SHALL BE ASTM F1554 GR. 36 UNLESS NOTED OTHERWISE. IF GR. 55 ANCHORS ARE SPECIFIED OR SUBSTITUTED, THEY SHALL BE FURNISHED WITH THE S1 SUPPLEMENT. NUTS FOR ANCHORS SHALL BE ASTM A563 HEAVY HEX NUTS.
- EMBEDDED PLATES, CHANNELS, AND ANGLES SHALL BE ASTM A36 UNLESS NOTED OTHERWISE.
- HEADED STUD ANCHORS SHALL BE AWS D1.1 TYPE B.
- ANCHOR RODS SHALL BE HOT-DIP GALVANIZED FOR THE TOP 12", MINIMUM. NUTS AND WASHERS FOR ANCHOR RODS SHALL BE HOT-DIP GALVANIZED.
- ALL ANCHOR RODS MUST BE LOCATED BY A LICENSED SURVEYOR PRIOR TO CONCRETE PLACEMENT.
- ALL ANCHOR RODS MUST BE ACCURATELY LOCATED AND SECURELY HELD SO AS NOT TO MOVE DURING CONCRETE PLACEMENT. A RIGID ANCHOR TEMPLATE SHALL BE USED
- APPLICATION OF HEAT FOR STRAIGHTENING AND WELDING OF F1554 GR.55 AND GR.105 ANCHOR RODS IS PROHIBITED.
- THREADS OF ANCHOR RODS SHALL BE PROTECTED AGAINST CONCRETE SPILLAGE, RUST, AND DAMAGE.
- ANCHOR RODS SHALL BE INSTALLED WITHIN THE FOLLOWING TOLERANCES:
  - HORIZONTAL DEVIATION OF INDIVIDUAL ANCHOR: WITHIN 1/16" OF PLAN CENTERLINE
  - HORIZONTAL DEVIATION OF ANCHOR SETS WITHIN A STRUCTURE: 1/16" OF PLAN CENTERLINES
  - ELEVATION OR PROJECTION: +/- 1/8"
  - DEVIATION FROM PLUMB: 1/16"
- CAST-IN ELECTRICAL CONDUITS SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT PER THE TYPICAL DETAIL. COORDINATE CONDUIT QUANTITIES, SIZES, AND LOCATIONS WITH THE ELECTRICAL DRAWINGS.
- POST-INSTALLED ANCHORS SHALL BE INSTALLED PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.

**STRUCTURAL STEEL NOTES**

- ALL STRUCTURAL STEEL WORK MUST CONFORM WITH THE PROJECT SPECIFICATIONS.
- THE STEEL FABRICATOR SHALL HAVE AN ACTIVE AISC CERTIFICATION FOR STEEL BUILDINGS.
- THE FABRICATOR SHALL SUBMIT THE FOLLOWING DOCUMENTATION PRIOR TO START OF FABRICATION:
  - MATERIAL COMPLIANCE CERTIFICATES
  - FABRICATION AND ERECTION (SHOP) DRAWINGS
- THE FABRICATOR IS RESPONSIBLE FOR BOLTS LENGTHS AND QUANTITIES.
- ALL PIECES SHALL BE MARKED WITH WELDED LETTER AND/OR NUMBER DESIGNATIONS PRIOR TO GALVANIZING. MARK NUMBERS SHALL INCLUDE STRUCTURE AND PIECE DESIGNATIONS.
- MATERIALS SHALL COMPLY WITH THE FOLLOWING SPECIFICATIONS:
  - ASTM A36 - PLATES, CHANNELS, AND ANGLES
  - ASTM A53 GR. B - PIPE
  - ASTM A500 GR. C - HOLLOW STRUCTURAL SECTIONS (HSS)
  - ASTM A563 GR. DH - HEAVY HEX NUTS
  - ASTM A572 GR. 50 - PLATES, WHEN INDICATED
  - ASTM A992 - WIDE FLANGE SHAPES AND TEES CUT FROM WIDE FLANGE SHAPES
  - ASTM F436 - HARDENED STEEL WASHERS
  - ASTM F3125 TYPE A325 - HIGH STRENGTH BOLTS
- WELD FILLER MATERIAL SHALL BE E70XX LOW HYDROGEN ELECTRODES MEETING THE REQUIREMENTS OF AWS D1.1.
- STEEL BEAMS AND COLUMNS SHALL BE CUT FROM FULL LENGTH STOCK. UNAUTHORIZED SPLICES WILL BE REJECTED.
- ALL HOLES SHALL BE AISC STANDARD HOLES UNLESS NOTED OTHERWISE. HOLES SHALL BE CYLINDRICAL AND PERPENDICULAR TO THE MEMBER.
- WELDING SHALL COMPLY WITH THE LATEST EDITION OF AWS D1.1. STRUCTURAL WELDING CODE, EXCEPT FOR THE PROVISIONS EXCLUDED BY AISC 360 PARAGRAPH J2.
- ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS, CERTIFIED FOR THE WELD BEING MADE.
- WELDING TO HIGH STRENGTH BOLTS IS PROHIBITED.
- ALL COMPONENTS, INCLUDING FASTENERS, SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123, ASTM A143, ASTM 153, ASTM A384, AND ASTM A385, AS APPLICABLE.
- THE FABRICATOR SHALL DETAIL SEAL WELDS AND DRAIN HOLES FOR GALVANIZING AS REQUIRED BY ASTM AND AS RECOMMENDED BY THE AMERICAN GALVANIZER'S ASSOCIATION (AGA). HOLES IN HSS WALLS AT WELDED TEE-TYPE CONNECTIONS ARE NOT PERMITTED.
- THE CONTRACTOR SHALL FURNISH ALL TEMPORARY GUYING, BRACING, AND/OR SHORING REQUIRED FOR ERECTION AND SUPPORT OF WIND AND CONSTRUCTION LOADS ON THE STRUCTURES. TEMPORARY SUPPORTS SHALL REMAIN IN PLACE UNTIL ALL STRUCTURAL COMPONENTS REQUIRED FOR STABILITY ARE PERMANENTLY IN PLACE.
- ANCHOR RODS SHALL BE TIGHTENED TO THE SNUG-TIGHT CONDITION
- BOLTS SHALL BE INSTALLED TO THE SNUG-TIGHT CONDITION UNLESS NOTED OTHERWISE.
- FOR SNUG-TIGHT CONNECTIONS, PROVIDE ONE WASHER UNDER THE ELEMENT(BOLT OR NUT) BEING TURNED. FOR PRETENSIONED CONNECTIONS, PROVIDE A WASHER UNDER BOTH THE BOLT HEAD AND THE NUT.
- HOLES FOR STRUCTURAL BOLTS MAY BE ENLARGED IN THE FIELD AN ADDITIONAL 1/32" BEYOND THE SPECIFIED HOLE DIAMETER, IF REQUIRED FOR FIT-UP. BASE PLATE HOLES SHALL NOT BE ENLARGED.
- ANY DAMAGE TO THE GALVANIZED COATING SHALL BE REPAIRED ACCORDING TO ASTM A780.
- GROUT FOR BASE PLATES SHALL BE NON-SHRINK NON-METALLIC GROUT WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI. INSTALL PER MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.

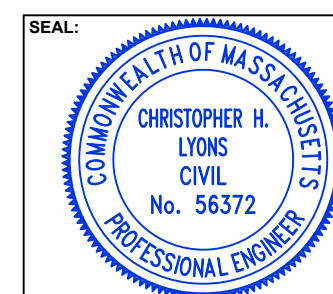
**FOUNDATION EARTHWORK NOTES**

- THE CONTRACTOR SHALL SUBMIT GRADATION DATA FOR ALL BACKFILL MATERIALS FOR REVIEW PRIOR TO STARTING WORK.
- FOUNDATION SUBGRADES SHALL BE OBSERVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO FORM/BAR PLACEMENT. IF SUBGRADE IS DETERMINED TO BE UNSUITABLE, NOTIFY THE ENGINEER PRIOR TO PROCEEDING FOR DETERMINATION OF WHAT ACTIONS, IF ANY, ARE REQUIRED.
- AGGREGATES FOR STRUCTURAL FILL MUST COMPLY WITH THE REQUIREMENTS OF MASSDOT-SSHB, DIVISION III, M1.03.0, GRAVEL BORROW TYPE B WITH LESS THAN 6% PASSING THROUGH #200 SIEVE.
- PLACE STRUCTURAL FILL IN LIFTS NOT TO EXCEED 12" LOOSE THICKNESS.
- COMPACT STRUCTURAL FILL TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.
- CRUSHED STONE MUST BE WASHED, HARD, DURABLE ROCK COMPLYING WITH THE REQUIREMENTS OF MASSDOT-SSHB, DIVISION III, M2.01.4, 3/4" CRUSHED STONE.
- COMPACT CRUSHED STONE WITH 3 TO 5 PASSES OF A VIBRATORY PLATE COMPACTOR HAVING A STATIC WEIGHT OF AT LEAST 500 POUNDS.
- ALL UNCONTROLLED FILLS, ORGANIC MATERIAL, EXISTING STRUCTURES, EXISTING FOUNDATIONS, AND DEBRIS MUST BE COMPLETELY REMOVED FROM BENEATH PROPOSED FOUNDATIONS. THE EXTENT OF REMOVAL MUST EXTEND 1' Laterally OUTWARD FROM THE OUTSIDE EDGE OF THE MAT/FOOTING FOR EVERY 1' OF EXCAVATION DEPTH. OVER-EXCAVATED AREAS SHALL BE BACKFILLED WITH STRUCTURAL FILL.



TYP TYPICAL GROUNDING TAB DETAIL  
SCALE: NTS

**NEW DRAWING**



0	REV:	DESCRIPTION:	ISSUED FOR CONSTRUCTION	02/20/26	DATE:	BTK	DRWN:	CHL	CHKD:	CHL	APRVD:
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**FOWLERS LANE SUBSTATION No.5  
LIGHTSHIFT BESS UPGRADES  
IPSWICH ELECTRIC LIGHT DEPT**  
IPSWICH, MASSACHUSETTS

SCALE: 3/16" = 1'-0"  
SIZE: ANSI D

STRUCTURAL NOTES

DATE:	10/27/25
DRAWN BY:	RLC/BTK
ENGINEER BY:	RLC/IWL
PROJECT #:	25337
DRAWING #:	919506-C300-0