

CONCRETE NOTES:

1. 2018 NORTH CAROLINA STATE BUILDING CODE (BASED ON 2015 INTERNATIONAL BUILDING CODE) REFERENCED STANDARDS AND CODES:
 - A. ACI 318-14
 - B. ACI 301-10
 - C. ASCE 7-10
2. CONCRETE MIX SHALL CONFORM TO ASTM C94, "READY-MIXED CONCRETE." CONCRETE SHALL HAVE NORMAL WEIGHT COARSE AGGREGATES AND A 28 DAY MINIMUM COMPRESSIVE STRENGTH OF $f_c = 4,000$ PSI WITH A DENSITY OF 145 PCF. THE MAXIMUM WATER-CEMENT RATIO SHALL BE 0.45. UNLESS PROOF OF SATISFACTORY PAST PERFORMANCE IS PROVIDED.
3. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150, "PORTLAND CEMENT."
4. DURING HOT AND COLD WEATHER SUPPLY AND CONSTRUCTION OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 305R AND 306R, RESPECTIVELY. AS A GUIDE WHEN CONCRETE TEMPERATURES APPROACH 80 DEGREES F, OR 40 DEGREES F, THE ACI REQUIREMENTS MAY ALREADY BE IN EFFECT.
5. NORMAL WEIGHT AGGREGATES SHALL CONFORM TO ASTM C33, "CONCRETE AGGREGATES." MINIMUM SIZE OF COARSE AGGREGATE SHALL BE 3/4". THE MAXIMUM SIZE OF COARSE AGGREGATE SHALL COMPLY WITH ACI 318 MAX AGGREGATE SIZE REQUIREMENTS. IN NO CASE SHALL MAXIMUM AGGREGATE SIZE BE LARGER THAN 1/2"
6. ALL CONCRETE SHALL BE AIR-ENTRAINED AND CONFORM TO ASTM C260, "AIR-ENTRAINING ADMIXTURES FOR CONCRETE." THE TOTAL AIR CONTENT FOR AIR-ENTRAINED CONCRETE SHALL BE AS FOLLOWS AND WITH A TOLERANCE OF $\pm 1.5\%$.

NOMINAL MAX AGGREGATE SIZE	AIR CONTENT % BY VOLUME
a. 3/8"	7.5
b. 1/2"	7.0
c. 3/4"	6.0
d. 1"	6.0
e. 1 1/2"	5.5
7. PROPORTION AND DESIGN MIXES TO RESULT IN CONCRETE SLUMP AT POINT OF PLACEMENT AS FOLLOWS:
 - A. RAMPS, SLABS, AND SLOPING SURFACES: NOT MORE THAN 3"
 - B. FOUNDATION SYSTEMS: NOT LESS THAN 1" AND NOT MORE THAN 3"
 - C. CONCRETE CONTAINING HIGH-RANGE WATER-REDUCING ADMIXTURE (SUPER PLASTICIZER); NOT MORE THAN 8" AFTER ADDING ADMIXTURE TO SITE VERIFIED SLUMP CONCRETE NOTED ABOVE
8. NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE.
9. CHAMFER ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH 3/4"x45° CHAMFER UNLESS NOTED OTHERWISE.
10. FORM ACCURACY TOLERANCES SHALL BE $\pm 1/4"$ IN PLAN AND ELEVATION EXCEPT THAT ELEVATIONS OF TOPS OF SLABS AND PIERS SHALL BE ACCURATE TO $\pm 1/8"$. ALL EMBEDDED METAL (ANCHOR RODS, INSERTS, ETC.) SHALL BE SET TRUE TO $\pm 1/8"$ OF POSITION SHOWN ON THE CONTRACT DRAWINGS.
11. FINISHES SHALL BE AS FOLLOWS:
 - A. CONCRETE SHALL RECEIVE A TROWELED FINISH.
 - B. SLABS: SCREED TO PROPER ELEVATION WITH INITIAL FLOATING AS SOON AS WORKABLE. AT TIME OF INITIAL SET, BROOM FINISH.
12. OWNER REPRESENTATIVE'S APPROVAL IS REQUIRED BEFORE ANY SURFACE FILLING OR REPAIRS ARE TO BE DONE. VOIDS OR HOLES OVER 3/4"Ø ARE CONSIDERED DEFECTIVE AND SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AS DIRECTED BY THE ENGINEER OF RECORD.
13. CONCRETE REINFORCEMENT SHALL CONFORM TO THE FOLLOWING:
 - A. ALL BARS UNLESS NOTED OTHERWISE: DEFORMED BARS: ASTM A615, GRADE 60
 - B. WELDED WIRE FABRIC: ASTM A185 FLAT SHEETS
 - C. WELDED DEFORMED WIRE REINFORCEMENT SHALL CONFORM TO ASTM 497.
14. REINFORCING BARS SHALL NOT BE TACK WELDED, WELDED, HEATED OR CUT.
15. ALL REBAR SHALL BE CLEAN AND FREE OF RUST, OIL, DIRT AND OTHER DEBONDING AGENTS.
16. SHIFT OR SLIGHTLY BEND REINFORCING STEEL BARS TO CLEAR EMBEDMENTS.
17. ALL REBAR SPLICES SHALL BE CLASS B. LAP SPLICES SHALL BE AS FOLLOWS UNLESS SPECIFICALLY NOTED OTHERWISE. SPLICE LENGTH SHALL BE INCREASE BY 1.3 FOR TOP BARS WHERE MORE THAN 12 INCHES OF CONCRETE IS POURED BELOW THE BAR.

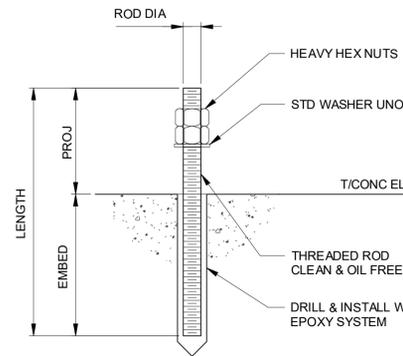
A. #4	22 IN
B. #5	32 IN
C. #6	43 IN
D. #7	69 IN
E. #8	86 IN
F. #9	104 IN
G. #10	125 IN
H. #11	146 IN
18. CONCRETE MINIMUM COVER TO REINFORCING STEEL SHALL BE:
 - A. 3" CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH
 - B. FORMED SURFACES EXPOSED TO EARTH OR WEATHER:
 - a. 1 1/2" #5 AND SMALLER
 - b. 2" #6 AND LARGER
 - C. FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER:
 - a. 3/4" SLABS, WALLS, AND JOISTS 3/4"
 - b. 1 1/2" BEAMS, GIRDERS, AND COLUMNS 1 1/2"
19. ALL CONCRETE REINFORCING SHALL BE DETAILED, FABRICATED, LABELED, SUPPORTED AND SPACED IN FORMS, AND SECURED IN PLACE IN ACCORDANCE WITH THE PROCEDURES AND REQUIREMENTS OUTLINED IN ACI 318 AND ACI 315R, "GUIDE TO PRESENTING REINFORCING STEEL DESIGN DETAILS."
20. FORMS SHALL BE MAINTAINED WET PRIOR TO CONCRETE PLACEMENT.
21. CONCRETE SHALL BE CURED WITH A CURING COMPOUND FOR SURFACES NOT TO RECEIVE COATINGS.
22. CERTIFYING MATERIALS THAT WILL BE USED IN THE CONCRETE WILL PRODUCE THE QUALITY OF CONCRETE REQUIRED.
23. PRIOR TO PLACING CONCRETE, THE CONTRACTOR SHALL REFER TO PIPING, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS TO DETERMINE THE LOCATION OF BLOCK OUTS, OPENINGS, DRAINS, SLEEVES, OUTLET BOXES, CONDUIT, ANCHORS, EMBEDDED ITEMS, ETC. THE VARIOUS TRADES ARE RESPONSIBLE FOR PLACING THEIR ITEMS. SEE BELOW DRAWINGS FOR LOCATIONS OF PENETRATIONS

FOUNDATION NOTES:

1. IF UNSUITABLE MATERIAL IS ENCOUNTERED WHERE NEW FOUNDATIONS ARE TO BE INSTALLED, REMOVE ALL UNSUITABLE MATERIAL AND PLACE SPECIFIED COMPACTED MATERIAL TO THE UNDERSIDE OF THE STRUCTURAL FILL INDICATED ON THE CONTRACT DRAWINGS. REMOVAL OF UNSUITABLE MATERIAL, PLACING AND COMPACTING OF STRUCTURAL FILL, AND TESTING OF COMPACTED STRUCTURAL FILL SHALL BE PERFORMED BY THE GENERAL CONTRACTOR UNDER THE OBSERVATION OF A PROFESSIONAL GEOTECHNICAL ENGINEER.
2. FOUNDATIONS SHALL BE FORMED ON PROPERLY COMPACTED STRUCTURAL FILL WITH A NET ALLOWABLE SOIL BEARING CAPACITY OF 2,000 PSF.
3. COMPACTED STRUCTURAL FILL SHALL BE PLACED IN MAXIMUM 6" THICK HORIZONTAL, LOOSE LIFTS. FILL SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY PER ASTM D698.
4. FOOTINGS SHALL NOT BE PLACED INTO OR AGAINST SUBGRADE CONTAINING FREE WATER, FROST, ICE, OR LOOSE MATERIAL.
5. ALL LOOSENEED SOIL AT THE BASE OF EXCAVATIONS SHALL BE REMOVED BY HAND.
6. IF UNDERMINING OCCURS OR UNUSUAL SOIL CONDITIONS ARE FOUND, THE OWNER SHALL BE NOTIFIED IMMEDIATELY. DIRECTION AS TO THE PROPER WAY TO REMEDIATE THE CONDITION MUST BE PROVIDED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION PROCEEDING.
7. THE CONTRACTOR SHALL OBTAIN THE OWNER'S PERMISSION BEFORE ENCASING OR BACKFILLING AROUND ANY EXISTING UNDERGROUND STRUCTURE, PIPING, ELECTRICAL, OR OTHER UNDERGROUND WORK.
8. THE CONTRACTOR SHALL DEWATER EXCAVATIONS AS NECESSARY PRIOR TO PLACING CONCRETE.
9. SLABS ON GRADE SHALL BE PLACED ON A 6" LAYER OF #57 STONE. REINFORCEMENT FOR SLABS ON GRADE SHALL BE SUPPORTED BY SAND CHAIRS.
10. IF PLACEMENT OF CONCRETE CANNOT BE CONDUCTED ON THE SAME DAY AS FOUNDATION EXCAVATION, A 3" LEAN CONCRETE MUD MAT SHALL BE PLACED ON EXPOSED BEARING SOILS.
11. PADS FOR STEPS TO BE POURED AFTER GENERATOR HAS BEEN SET.

ANCHOR ROD NOTES:

1. EXCEPT AS OTHERWISE SPECIFICALLY NOTED, ALL MATERIALS FURNISHED AND WORK PERFORMED IN CONNECTION WITH MISCELLANEOUS METALS WORK SHALL BE IN CONFORMITY WITH THE AISC "STEEL CONSTRUCTION MANUAL."
2. ANCHOR RODS SHALL BE AS INDICATED ON THE DRAWINGS. ANCHOR RODS SHALL BE FURNISHED WITH TWO HEAVY HEX TOP NUTS.
3. CONFIRM ANCHOR ROD LAYOUTS AND PROJECTIONS USING EQUIPMENT SHOP DRAWINGS AND STRUCTURAL STEEL SHOP DRAWINGS AS APPLICABLE.
4. POST INSTALLED ANCHOR RODS NOTES:
 - A. POST INSTALLED ANCHOR RODS AND REBAR SHALL BE INSTALLED WITH HILTI HIT-HY 200R V3 ADHESIVE SYSTEM, UNLESS NOTED OTHERWISE.
 - B. POST INSTALLED ANCHOR RODS SHALL BE GALVANIZED HAS-V ANCHOR RODS MANUFACTURED BY HILTI, UNLESS NOTED OTHERWISE. NO SUBSTITUTIONS FOR ANCHOR RODS ARE ALLOWED.
 - C. EMBEDMENT DEPTHS INDICATED FOR ADHESIVE ANCHORS ARE BASED ON THE HILTI HIT-HY 200 V3 SYSTEM.
 - D. POST INSTALLED ANCHORS SHALL BE INSTALLED PER THE MANUFACTURERS INSTRUCTIONS AND THOSE INSTRUCTIONS SHALL OVERRIDE ANY INDICATED CONFIGURATION ON THESE DRAWINGS, ESPECIALLY WITH REGARD TO EMBEDMENT DEPTH.



TYPICAL ADHESIVE ANCHOR DETAIL

3" = 1'-0"

NO.	1A		 GREENVILLE UTILITIES Greenville, North Carolina									
REVISIONS	BOVIET SUBSTATION PRELIMINARY DESIGN RMC 3/23/2026	PRELIMINARY	BOVIET SUBSTATION 115 TO 15 kV GEN No. 1 & 2 FOUNDATION DETAILS									
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