HENDERSON COUNTY TOWER

SITE ADDRESS (E-911 VERIFIED)

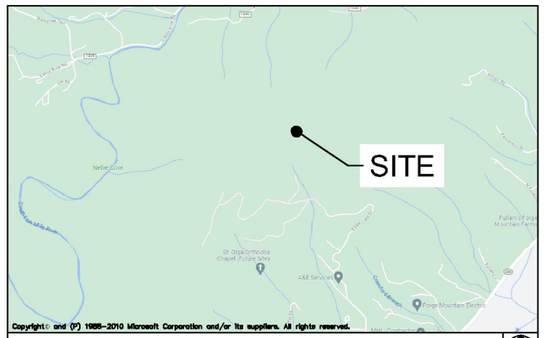
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY
LATITUDE: 35° 21' 53.52" N
LONGITUDE: 82° 37' 12.10" W
TAX/PIN #: 9620-16-6829

SHEET NO.	SHEET TITLE
T1	COVER SHEET
T2	APPENDIX B - BUILDING CODE SUMMARY
--	SITE SURVEY (SHEET 1 OF 1)
N1	GENERAL NOTES
C0	OVERALL AERIAL PLAN
C1	OVERALL PARCEL PLAN
C2	EXISTING SITE PLAN
C3	DEMO PLAN
C4	SITE PLAN
C5	EQUIPMENT PAD LAYOUT
C6	CONCRETE PAD FOUNDATION DETAILS
C7	FENCE DETAILS
C8	WAVEGUIDE BRIDGE DETAILS
C9	ANTENNA AND TOWER ELEVATION DETAILS
C9.1	TOWER EQUIPMENT SCHEDULE
C9.2	ANTENNA SPECS
C9.3	ANTENNA SPECS
C10	GRADING & EROSION CONTROL PLAN
C10.1	GRADING & EROSION CONTROL PLAN
E1	ELECTRICAL NOTES
E2	OVERALL UTILITY SERVICE ROUTING PLAN
E2.1	UTILITY SERVICE ROUTING PLAN
E3	ELECTRICAL DETAILS
E3.1	METER RACK DETAILS
E4	GROUNDING NOTES
E5	GROUNDING PLAN
E6	GROUNDING SINGLE LINE DIAGRAM
E7	GROUNDING DETAILS
E8	GROUNDING DETAILS

SHEET INDEX

HENDERSON COUNTY SHERIFF'S OFFICE
100 N GROVE ST
HENDERSONVILLE, NC 28792
PHONE: (828) 697-4596
ATTN.: CUSTOMER SERVICE

MILLS RIVER VOLUNTEER FIRE
121 SCHOOL HOUSE RD
MILLS RIVER, NC 28759
PHONE: (828) 891-7959
ATTN.: CUSTOMER SERVICE



VICINITY MAP

DRIVING DIRECTIONS

JURISDICTION:
HENDERSON COUNTY

STATE:
NORTH CAROLINA

TOWER TYPE:
MONOPOLE TOWER

TOWER HEIGHT:
150'

NUMBER OF CARRIERS:
1 EXISTING, 1 PROPOSED

USE:
EXISTING TELECOMMUNICATIONS TOWER AND UNMANNED EQUIPMENT

FLOOD INFO
SITE IS LOCATED WITHIN FEMA FLOOD MAP AREA 370096200J DATED 10/02/2008 WITHIN FLOOD ZONE X.

PROJECT SUMMARY

DEVELOPER
HENDERSON COUNTY
2529 ASHEVILLE HIGHWAY
HENDERSONVILLE, NC 28791
PHONE: (828) 697-4728
FAX: (828) 698-6164
ATTN: JIMMY BRISSIE, DIRECTOR

POWER COMPANY
DUKE ENERGY PROGRESS
PHONE: (800) 653-5307
ATTN.: CUSTOMER SERVICE

PROPERTY OWNER
FULLAM FAMILY LIMITED PARTNERSHIP
40 FULLAM LN
MILLS RIVER, NC 28759
PHONE: N/A
ATTN.: CUSTOMER SERVICE

CONSULTANT
KIMLEY-HORN AND ASSOCIATES, INC.
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GEORGIA 30009
PHONE: (678) 894-3618
ATTN.: CHRISTOPHER STRANGE

CONTACTS

HENDERSON COUNTY PLANNING DEPARTMENT
213 1ST AVE E
HENDERSONVILE, NC 28792
PHONE: (828) 697-4819
ATTN.: CUSTOMER SERVICE

PERMIT INFORMATION

PROJECT INFORMATION:

SITE NAME:
HENDERSON COUNTY TOWER
SITE No.: 639642
PROJECT #: 20202154476
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

PLANS PREPARED BY:

Kimley»Horn
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GA 30009
PHONE: 770-619-4280
WWW.KIMLEY-HORN.COM
NC License F-0102

REV: DATE: ISSUED FOR: BY:

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0	01/10/24	CONSTRUCTION	DRC

LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSE

PRELIMINARY
NOT FOR CONSTRUCTION

KHA PROJECT NUMBER:
017848000

DRAWN BY:	CHECKED BY:
XQD	DMF

SHEET TITLE:
COVER SHEET

SHEET NUMBER:
T1

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2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: HENDERSON COUNTY TOWER
Address: 469 S FORGE CREST DR, MILLS RIVER, NC Zip Code 28759
Owner/Authorized Agent: DAVID COUSINS Phone # (770) 545 - 6105 E-Mail david.cousins@kimley-horn.com
Owned By: ☐ City/County ☒ Private ☐ State
Code Enforcement Jurisdiction: ☐ City_____ ☒ County HENDERSON ☐ State

CONTACT: DAVID R. COUSINS, P.E. (#047704)

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural				(___)	
Civil	KIMLEY-HORN & ASSOC.	DAVID R. COUSINS	047704	(678) 274-5032	david.cousins@kimley-horn.com
Electrical	KIMLEY-HORN & ASSOC.	DAVID R. COUSINS	047704	(678) 274-5032	david.cousins@kimley-horn.com
Fire Alarm				(___)	
Plumbing				(___)	
Mechanical				(___)	
Sprinkler-Standpipe				(___)	
Structural				(___)	
Retaining Walls >5' High				(___)	
Other				(___)	

("Other" should include firms and individuals such as truss, precast, pre-engineered, interior designers, etc.)

2018 NC BUILDING CODE: ☒ New Building ☐ Addition ☐ Renovation
☐ 1st Time Interior Completion
☐ Shell/Core - Contact the local inspection jurisdiction for possible additional procedures and requirements
☐ Phased Construction - Shell/Core- Contact the local inspection jurisdiction for possible additional procedures and requirements

2018 NC EXISTING BUILDING CODE: EXISTING: ☐ Prescriptive ☐ Repair ☐ Chapter 14
Alteration: ☐ Level I ☐ Level II ☐ Level III
☐ Historic Property ☐ Change of Use

CONSTRUCTED: (date) _____ **CURRENT OCCUPANCY(S)** (Ch. 3): TELECOMMUNICATIONS SITE
RENOVATED: (date) _____ **PROPOSED OCCUPANCY(S)** (Ch. 3): TELECOMMUNICATIONS SITE

RISK CATEGORY (Table 1604.5): **Current:** ☐ I ☐ II ☐ III ☐ IV
Proposed: ☐ I ☐ II ☐ III ☐ IV

BASIC BUILDING DATA
Construction Type: ☐ I-A ☐ II-A ☐ III-A ☐ IV ☐ V-A
(check all that apply) ☐ I-B ☐ II-B ☐ III-B ☐ V-B
Sprinklers: ☐ No ☐ Partial ☐ Yes ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D
Standpipes: ☐ No ☐ Yes Class ☐ I ☐ II ☐ III ☐ Wet ☐ Dry
Fire District: ☐ No ☐ Yes **Flood Hazard Area:** ☐ No ☐ Yes
Special Inspections Required: ☐ No ☐ Yes (Contact the local inspection jurisdiction for additional procedures and requirements.)

N/A

Gross Building Area Table

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	SUB-TOTAL
3rd Floor			
2nd Floor			
Mezzanine			
1st Floor			
Basement			
TOTAL			

ALLOWABLE AREA

Primary Occupancy Classification(s): Select one Select one Select one Select one Select one Select one
Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☐
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 Condition ☐ 1 ☐ 2
☐ I-2 Condition ☐ 1 ☐ 2
☐ I-3 Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
☐ I-4
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ☐ S-1 Moderate ☐ S-2 Low ☐ High-piled
☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage
Utility and Miscellaneous ☐

Accessory Occupancy Classification(s): _____
Incidental Uses (Table 509): _____
Special Uses (Chapter 4 – List Code Sections): _____
Special Provisions: (Chapter 5 – List Code Sections): _____
Mixed Occupancy: ☐ No ☐ Yes Separation: ____ Hr. Exception: _____

☐ Non-Separated Use (508.3) - The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

☐ Separated Use (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

_____ + _____ + ... = _____ ≤ 1.00

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA	(C) AREA FOR FRONTAGE INCREASE[1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED[2,3]

[1] Frontage area increases from Section 506.2 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = _____ (F)
b. Total Building Perimeter = _____ (P)
c. Ratio (F/P) = _____ (F/P)
d. W = Minimum width of public way = _____ (W)
e. Percent of frontage increase $I_f = 100[F/P - 0.25] \times W/30 =$ _____ (%)

[2] Unlimited area applicable under conditions of Section 507.

[3] Maximum Building Area = total number of stories in the building x D (maximum3 stories) (506.2).

[4] The maximum area of open parking garages must comply with Table 406.5.4. The maximum area of air traffic control towers must comply with Table 412.3.1.

[5] Frontage increase is based on the unsprinklered area value in Table 506.2.

N/A

ALLOWABLE HEIGHT

	ALLOWABLE	SHOWN ON PLANS	CODE REFERENCE
Building Height in Feet (Table 504.3)			
Building Height in Stories (Table 504.4)			

[1] Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (W/_____* REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	SHEET # FOR RATED PENETRATION	SHEET # FOR RATED JOINTS
Structural Frame, including columns, girders, trusses							
Bearing Walls							
Exterior							
North							
East							
West							
South							
Interior							
Nonbearing Walls and Partitions							
Exterior walls							
North							
East							
West							
South							
Interior walls and partitions							
Floor Construction Including supporting beams and joists							
Floor Ceiling Assembly							
Columns Supporting Floors							
Roof Construction, including supporting beams and joists							
Roof Ceiling Assembly							
Columns Supporting Roof							
Shaft Enclosures - Exit							
Shaft Enclosures - Other							
Corridor Separation							
Occupancy/Fire Barrier Separation							
Party/Fire Wall Separation							
Smoke Barrier Separation							
Smoke Partition							
Tenant/Dwelling Unit/ Sleeping Unit Separation							
Incidental Use Separation							

* Indicate section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL SHOWN ON PLANS (%)

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: ☐ No ☐ Yes
Exit Signs: ☐ No ☐ Yes
Fire Alarm: ☐ No ☐ Yes
Smoke Detection Systems: ☐ No ☐ Yes ☐ Partial _____
Carbon Monoxide Detection: ☐ No ☐ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: _____

☐ Fire and/or smoke rated wall locations (Chapter 7)
☐ Assumed and real property line locations (if not on the site plan)
☐ Exterior wall opening area with respect to distance to assumed property lines (705.8)
☐ Occupancy Use for each area as it relates to occupant load calculation (Table 1004.1.2)
☐ Occupant loads for each area
☐ Exit access travel distances (1017)
☐ Common path of travel distances (Tables 1006.2.1 & 1006.3.2(1))
☐ Dead end lengths (1020.4)
☐ Clear exit widths for each exit door
☐ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
☐ Actual occupant load for each exit door
☐ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
☐ Location of doors with panic hardware (1010.1.10)
☐ Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
☐ Location of doors with electromagnetic egress locks (1010.1.9.9)
☐ Location of doors equipped with hold-open devices
☐ Location of emergency escape windows (1030)
☐ The square footage of each fire area (202)
☐ The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
☐ Note any code exceptions or table notes that may have been utilized regarding the items above

N/A

ACCESSIBLE DWELLING UNITS
(SECTION 1107)

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED

ACCESSIBLE PARKING
(SECTION 1106)

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF PARKING SPACES PROVIDED	# OF ACCESSIBLE SPACES PROVIDED REGULAR WITH 5' ACCESS AISLE	VAN SPACES WITH 132" ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	TOTAL # ACCESSIBLE PROVIDED
TOTAL						

N/A

PLUMBING FIXTURE REQUIREMENTS
(TABLE 2902.1)

USE		WATERCLOSETS MALE	WATERCLOSETS FEMALE	WATERCLOSETS UNISEX	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	LAVATORIES UNISEX	SHOWERS /TUBS	DRINKING FOUNTAINS REGULAR	DRINKING FOUNTAINS ACCESSIBLE
SPACE	EXIST'G										
	NEW										
	REQ'D										

SPECIAL APPROVALS

Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, etc., describe below)

_____

_____

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code: ☐ No ☐ Yes (The remainder of this section is not applicable)

Exempt Building: ☐ No ☐ Yes (Provide code or statutory reference): _____

Climate Zone: ☐ 3A ☐ 4A ☐ 5A

Method of Compliance: Energy Code ☐ Performance ☐ Prescriptive
ASHRAE 90.1 ☐ Performance ☐ Prescriptive
(If "Other" specify source here)_____

THERMAL ENVELOPE (Prescriptive method only)

Roof/ceiling Assembly (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____
Skylights in each assembly: _____
U-Value of skylight: _____
total square footage of skylights in each assembly: _____

Exterior Walls (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____
Openings (windows or doors with glazing)
U-Value of assembly: _____
Solar heat gain coefficient: _____
projection factor: _____
Door R-Values: _____

Walls below grade (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____

Floors over unconditioned space (each assembly)
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____

Floors slab on grade
Description of assembly: _____
U-Value of total assembly: _____
R-Value of insulation: _____
Horizontal/vertical requirement: _____
slab heated: _____

**NOTE: SCOPE OF WORK INCLUDES INSTALLATION OF CAST IN PLACE CONCRETE PADS.
NO NEW BUILDING BEING CONSTRUCTED.**

N/A

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
STRUCTURAL DESIGN
(PROVIDE ON THE STRUCTURAL SHEETS IF APPLICABLE)

DESIGN LOADS:

Importance Factors: Snow (I_S) _____ Seismic (I_E) _____

Live Loads: Roof _____ psf
Mezzanine _____ psf
Floor _____ psf

Ground Snow Load: _____ psf

Wind Load: Basic Wind Speed _____ mph (ASCE-7)
Exposure Category _____

SEISMIC DESIGN CATEGORY: ☐ A ☐ B ☐ C ☐ D
Provide the following Seismic Design Parameters:
Risk Category (Table 1604.5) ☐ I ☐ II ☐ III ☐ IV
Spectral Response Acceleration S_S_____ %g S_1_____ %g
Site Classification (ASCE 7) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F
Data Source: ☐ Field Test ☐ Presumptive ☐ Historical Data
Basic structural system ☐ Bearing Wall ☐ Dual w/Special Moment Frame
☐ Building Frame ☐ Dual w/Intermediate R/C or Special Steel
☐ Moment Frame ☐ Inverted Pendulum
Analysis Procedure: ☐ Simplified ☐ Equivalent Lateral Force ☐ Dynamic
Architectural, Mechanical, Components anchored? ☐ Yes ☐ No

LATERAL DESIGN CONTROL: Earthquake ☐ Wind ☐

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) _____ psf
Presumptive Bearing capacity _____ psf
Pile size, type, and capacity _____

N/A

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
MECHANICAL DESIGN
(PROVIDE ON THE MECHANICAL SHEETS IF APPLICABLE)

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone
winter dry bulb: _____
summer dry bulb: _____

Interior design conditions
winter dry bulb: _____
summer dry bulb: _____
relative humidity: _____

Building heating load: _____

Building cooling load: _____

Mechanical Spacing Conditioning System
Unitary
description of unit: _____
heating efficiency: _____
cooling efficiency: _____
size category of unit: _____
Boiler
Size category. If oversized, state reason.: _____
Chiller
Size category. If oversized, state reason.: _____

List equipment efficiencies: _____

N/A

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
ELECTRICAL DESIGN
(PROVIDE ON THE ELECTRICAL SHEETS IF APPLICABLE)

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance: Energy Code ☐ Performance ☒ Prescriptive
ASHRAE 90.1 ☐ Performance ☐ Prescriptive

Lighting schedule (each fixture type)
lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballasts in fixture
total wattage per fixture
total interior wattage specified vs. allowed (whole building or space by space)
total exterior wattage specified vs. allowed

Additional Efficiency Package Options
(When using the 2018 NCECC; not required for ASHRAE 90.1)
☐ C406.2 More Efficient HVAC Equipment Performance
☐ C406.3 Reduced Lighting Power Density
☐ C406.4 Enhanced Digital Lighting Controls
☒ C406.5 On-Site Renewable Energy
☐ C406.6 Dedicated Outdoor Air System
☐ C406.7 Reduced Energy Use in Service Water Heating

N/A

HENDERSON COUNTY

PROJECT INFORMATION:

SITE NAME:
HENDERSON COUNTY TOWER
SITE No.: 639642
PROJECT #: 20202154476
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

PLANS PREPARED BY:

Kimley»Horn
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GA 30009
PHONE: 770-619-4280
WWW.KIMLEY-HORN.COM
NC License F-0102

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY:	CHECKED BY:
XQD	DMF

SHEET TITLE:
APPENDIX B - BUILDING CODE SUMMARY

SHEET NUMBER:
T2

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1.00 GENERAL NOTES

1.01 ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE, LOCAL AND NATIONAL CODES, ORDINANCES AND OR REGULATIONS APPLICABLE TO THIS PROJECT.

1.02 THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND SHALL CHECK ALL DIMENSIONS. ALL DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE PROJECT MANAGER AND/OR ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH WORK. WHERE THERE IS A CONFLICT BETWEEN DRAWING AND VERIZON SPECIFICATIONS, THE VERIZON PROJECT ENGINEER SHOULD BE CONTACTED FOR CLARIFICATION.

1.03 ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. WHERE ACTUAL CONDITIONS CONFLICT WITH THE DRAWINGS, THEY SHALL BE REPORTED TO THE PROJECT MANAGER AND/OR ENGINEER SO THAT PROPER REVISIONS MAY BE MADE. MODIFICATION OF DETAILS OF CONSTRUCTION SHALL NOT BE MADE WITHOUT WRITTEN APPROVAL OF THE PROJECT MANAGER AND/OR ENGINEER.

1.04 CONTRACTOR SHALL REVIEW AND BE FAMILIAR WITH SITE CONDITIONS AS SHOWN ON THE ATTACHED SITE PLAN AND/OR SURVEY DRAWINGS.

1.05 WAVEGUIDE BRIDGE AND EQUIPMENT CABINETS ARE SHOWN FOR REFERENCE ONLY. REFER TO SEPARATE DRAWINGS FOR SPECIFIC INFORMATION.

1.06 ALL FINISHED GRADES SHALL SLOPE MINIMUM 1/4 IN./FT. AWAY FROM EQUIPMENT IN ALL DIRECTIONS. CONTRACTOR SHALL SLOPE SWALES AS REQUIRED ALONG EXISTING TERRAIN TO DRAIN AWAY FROM COMPOUND AND ACCESS DRIVE.

1.07 THE EXISTING TOWER AND TOWER FOUNDATIONS WERE DESIGNED BY OTHERS. TOWER INFORMATION PROVIDED ON THESE PLANS ARE PROVIDED FOR REFERENCE PURPOSES ONLY. NOTIFY ENGINEER OR PROJECT MANAGER OF ANY CONFLICTS OR DISCREPANCIES. CONTRACTOR TO OBTAIN COPY OF STRUCTURAL ANALYSIS, IF AVAILABLE, FROM VERIZON PROJECT MANAGER TO CONFIRM COAX ROUTING AND ANTENNA MOUNT INFORMATION.

1.08 THE CONTRACTOR SHALL PROVIDE ADEQUATE EXCAVATION SLOPING, SHORING, BRACING, AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE, AND LOCAL SAFETY ORDINANCES.

1.09 UPON COMPLETION OF CONSTRUCTION, CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES TO THE EXISTING ACCESS ROAD AND COMPOUND GRAVEL AREAS. ANY NEW FILL MATERIALS SHALL BE COMPACTED.

1.10 THE CONTRACTOR IS HEREBY NOTIFIED THAT PRIOR TO COMMENCING CONSTRUCTION, HE IS RESPONSIBLE FOR CONTACTING THE UTILITY COMPANIES INVOLVED AND SHALL REQUEST A VERIFICATION AT THE CONSTRUCTION SITE OF THE LOCATIONS OF THEIR UNDERGROUND UTILITIES AND WHERE THEY MAY POSSIBLY CONFLICT WITH THE PLACEMENT OF IMPROVEMENTS AS SHOWN ON THESE PLANS. THE CONTRACTOR OR ANY SUBCONTRACTOR FOR THIS CONTRACT WILL BE REQUIRED TO NOTIFY "NORTH CAROLINA 811" 48 HOURS IN ADVANCE OF PERFORMING ANY WORK BY CALLING THE TOLL FREE NUMBER (800) 632-4949 (OR 811). ANY UTILITIES DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR, AT NO EXPENSE TO THE OWNER.

1.11 CONTRACTOR SHALL TAKE EXTREME CAUTION WHEN CONSTRUCTING WAVEGUIDE FOOTINGS SO AS TO NOT DAMAGE THE EXISTING TOWER GROUNDING RING. IF THE EXISTING RING BECOMES DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND/OR REPLACEMENT OF THE TOWER GROUNDING RING AS DEEMED APPROPRIATE BY VERIZON.

1.12 CONTRACTOR TO PROVIDE DUMPSTER AND PORTABLE TOILET FACILITY DURING CONSTRUCTION.

2.00 EQUIPMENT FOUNDATION NOTES

2.01 FOUNDATIONS ARE DESIGNED FOR A PRESUMPTIVE ALLOWABLE SOIL BEARING CAPACITY OF 2,000 PSF. CONTRACTOR SHALL VERIFY SOIL CONDITIONS AND BEARING CAPACITY PRIOR TO CONSTRUCTION.

2.02 EXCAVATE A MINIMUM 18" BELOW PROPOSED EQUIPMENT FOUNDATIONS OF EXPANSIVE, ORGANIC, UNCONSOLIDATED OR OTHERWISE UNACCEPTABLE MATERIAL AND REPLACE WITH WELL-COMPACTED MATERIAL ACCEPTABLE TO VERIZON.

2.03 CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, PROTECTING, AND RELOCATING AS REQUIRED ALL SERVICE AND UTILITY LINES IN VICINITY OF THE WORK SITE. ALL EXCAVATIONS NEAR THESE LINES TO BE CARRIED OUT WITH EXTREME CAUTION. COORDINATE ALL RELOCATIONS WITH THE PROPERTY OWNER.

2.04 CONTRACTOR TO CUT/FILL EXISTING COMPOUND SUBSOIL TO PROVIDE AN AREA AS LEVEL AS POSSIBLE FOR THE EQUIPMENT FOUNDATIONS. ALL FILL AREAS ARE TO BE FILLED WITH SUITABLE MATERIALS. FILL MATERIALS ARE TO BE PLACED, COMPACTED, AND TESTED IN MAXIMUM LAYERS OF 8". COMPACTION OF ALL FILL MATERIAL SHALL ACHIEVE 95 PERCENT OF MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D 698. ALL TESTS MUST MEET THE MINIMUM SPECIFIED SOIL BEARING CAPACITY. COMPACTION TESTING IS BY THE GEOTECHNICAL TESTING COMPANY DESIGNATED FOR THE PROJECT. SCHEDULING AND COORDINATION IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. REPORTS OF ALL TESTING ARE TO BE PROMPTLY DELIVERED OR FAXED TO THE VERIZON WIRELESS PROJECT MANAGER.

2.05 CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REVISION TO ACI-318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

2.06 CONCRETE SHALL HAVE A SLUMP BETWEEN 3" AND 6".

2.07 FIBERS FOR CONCRETE SHALL BE FIBERMESH 650, 100 PERCENT VIRGIN POLYPROPYLENE FIBRILLATED FIBERS, e3 PATENTED TECHNOLOGY PATENTED TECHNOLOGY, CONTAINING NO REPROCESSED OLEFIN MATERIALS. THE FIBERS SHALL CONFORM TO ASTM C1116 TYPE III AND MANUFACTURED SPECIFICALLY FOR THE SECONDARY REINFORCEMENT OF CONCRETE.

2.08 THE FIBERS SHALL BE MANUFACTURED IN AN ISO 9001:2008 CERTIFIED MANUFACTURING FACILITY. UNLESS OTHERWISE STATED, FIBERMESH 650 MACRO-SYNTHETIC FIBERS SHALL BE ADDED TO THE CONCRETE AT THE BATCHING PLANT AT THE RECOMMENDED APPLICATION RATE OF 3 LBS/YD^3 AND MIXED FOR A SUFFICIENT TIME (MINIMUM 5 MINUTES AT FULL MIXING SPEED) TO ENSURE UNIFORM DISTRIBUTION OF THE FIBERS THROUGHOUT THE CONCRETE. FIBROUS CONCRETE REINFORCEMENT SHALL BE MANUFACTURED BY FIBERMESH, 4019 INDUSTRY DRIVE, CHATTANOOGA, TN 37416 USA, TEL: 800 621-1273, WEBSITE: WWW.FIBERMESH.COM

2.09 AT THE REQUEST OF THE VERIZON WIRELESS PROJECT MANAGER, TEST CYLINDERS SHALL BE MOLDED AND LABORATORY CURED IN ACCORDANCE WITH ASTM C31. THREE CYLINDERS SHALL BE TAKEN FOR EACH DAY'S CONCRETE PLACEMENT. CYLINDERS SHALL BE TESTED IN ACCORDANCE WITH THE LATEST REVISION TO ASTM C39.

2.10 CHAMFER ALL EXPOSED EXTERNAL CORNERS OF CONCRETE WITH ¾" x 45° CHAMFER, UNLESS OTHERWISE NOTED.

2.11 CONCRETE FORMWORK IS TO BE STRIPPED WITHIN 48 HOURS. VIBRATION OF THE CONCRETE MUST ASSURE THAT HONEYCOMBING WILL BE AT A MINIMUM. MECHANICAL VIBRATION OF ALL CONCRETE IS REQUIRED UNLESS OTHERWISE DIRECTED BY VERIZON WIRELESS' PROJECT MANAGER. ABOVE GRADE CONCRETE IS TO BE RUBBED AND PATCHED TO ASSURE SMOOTH FINISH AT TIME OF FORMS REMOVAL. CONTRACTOR SHALL PROVIDE A BROOM FINISH ON THE TOP SURFACE OF THE EQUIPMENT FOUNDATION UNLESS OTHERWISE DIRECTED BY VERIZON WIRELESS' PROJECT MANAGER.

2.12 TOPS OF CONCRETE FOUNDATION MUST BE WITHIN 0.02' OF ELEVATION REQUIRED.

2.13 TOP OF FOUNDATION FINISH TO BE LEVEL ±⅛" IN 10'.

2.14 TOP OF FOUNDATION TO HAVE MEDIUM BROOM FINISH.

2.15 CONTRACTOR SHALL REFER TO DRAWINGS OF OTHER TRADES AND VENDOR DRAWINGS FOR EMBEDDED ITEMS AND RECESSES NOT SHOWN ON THE STRUCTURAL DRAWINGS. CONTRACTOR SHALL VERIFY PLACEMENT OF EQUIPMENT AND LOCATION OF CONDUIT FOR MANUFACTURER'S AND VENDORS SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL OPENINGS AND SLEEVES FOR PROPER DISTRIBUTION OF ALL UTILITIES.

HENDERSON COUNTY

PROJECT INFORMATION:

SITE NAME:
HENDERSON COUNTY TOWER
SITE No.: 639642
PROJECT #: 20202154476
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

PLANS PREPARED BY:

Kimley»Horn
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GA 30009
PHONE: 770-619-4280
WWW.KIMLEY-HORN.COM
NC License F-0102

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LICENSER:

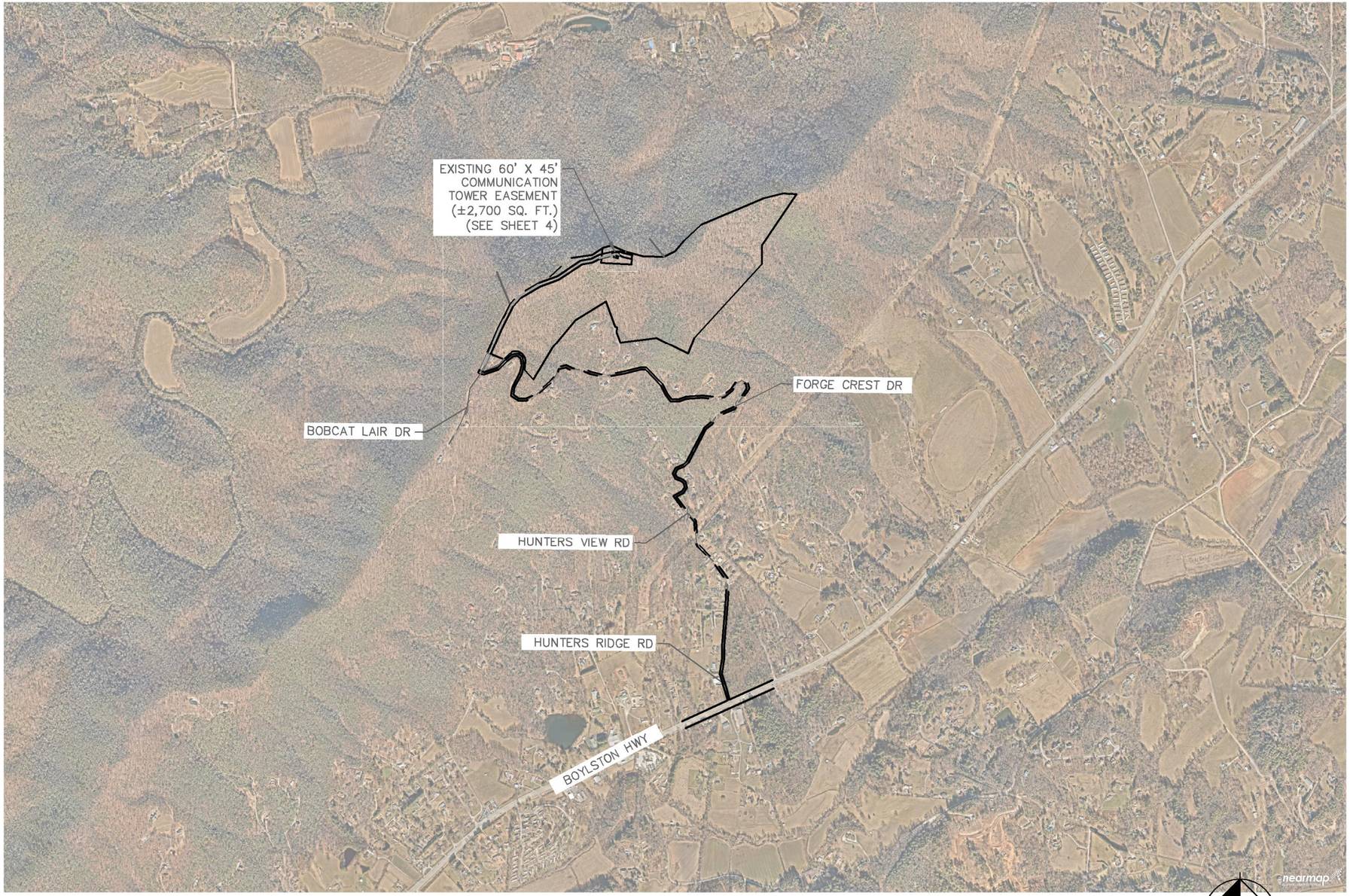
NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
GENERAL NOTES

SHEET NUMBER:
N1



1 / C0 OVERALL AERIAL PLAN

SCALE: 1" = 1,500'

NORTH

0 750 1500 3000

GRAPHIC SCALE: 1" = 1500'

HENDERSON COUNTY

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DRAWN BY:	CHECKED BY:
XQD	DMF

SHEET TITLE:
OVERALL AERIAL PLAN

SHEET NUMBER:
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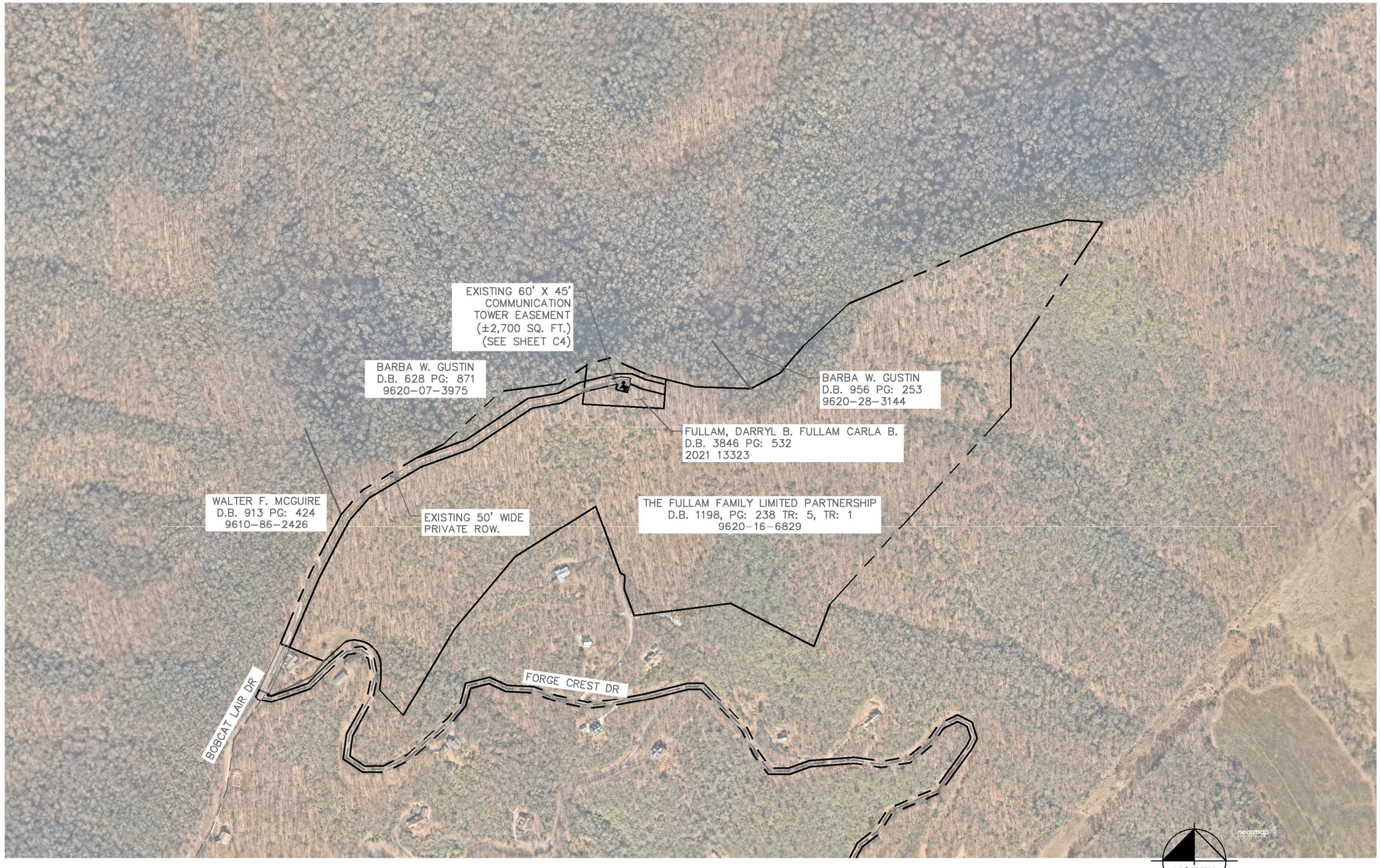

1/C1 OVERALL PARCEL PLAN

SCALE: 1" = 500'

0 250 500 1000

GRAPHIC SCALE: 1" = 500'

PROJECT INFORMATION:

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE: OVERALL PARCEL PLAN

SHEET NUMBER: C1

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1 / C2 EXISTING SITE PLAN

SCALE: 1" = 50'

0 25 50 100

GRAPHIC SCALE: 1" = 50'

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HENDERSON COUNTY

PROJECT INFORMATION:

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LICENSER:

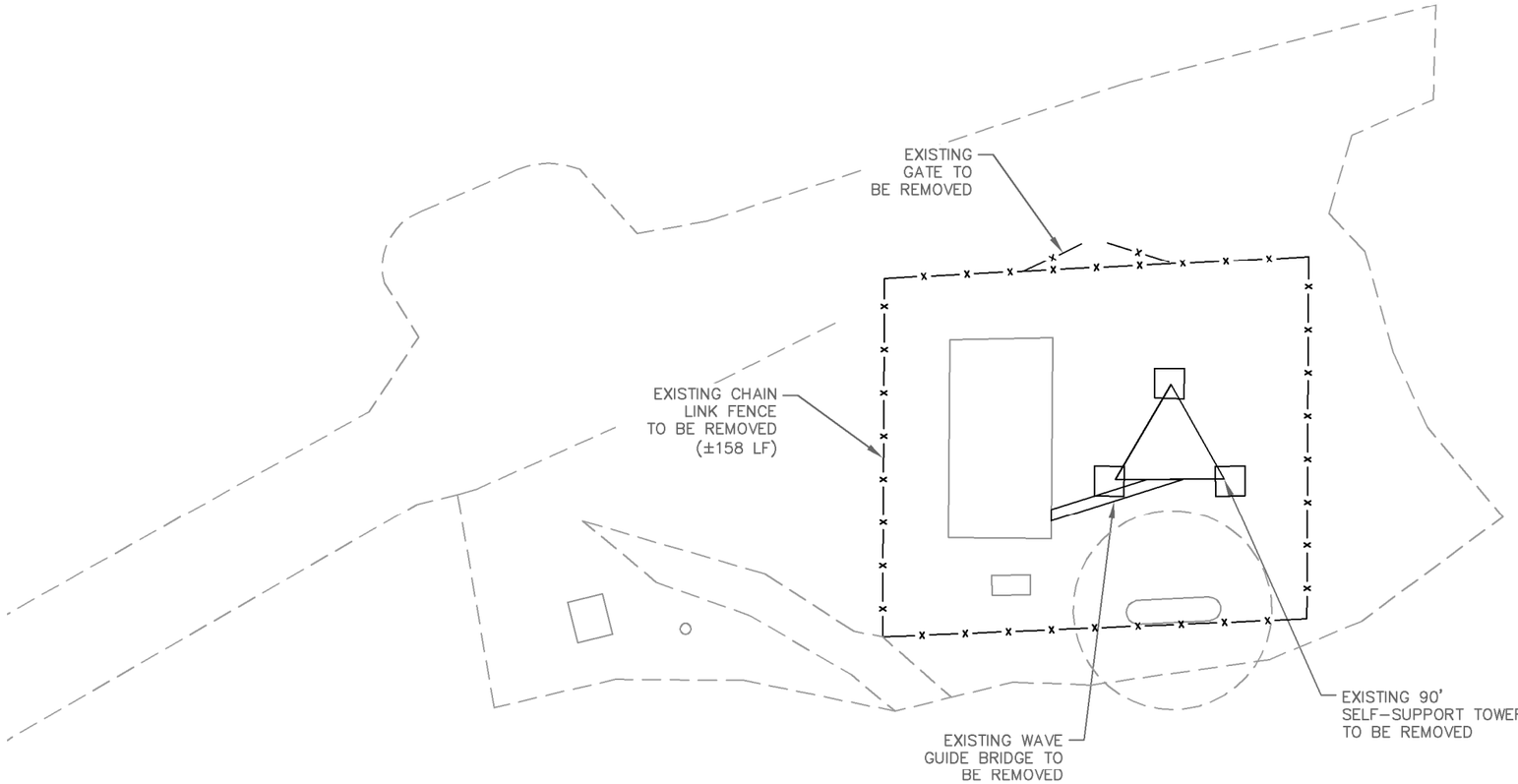
NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY:	CHECKED BY:
XQD	DMF

SHEET TITLE:
EXISTING SITE PLAN

SHEET NUMBER:
C2



1 / C3 DEMO PLAN

SCALE: 1" = 15'

NORTH

0 7.5 15 30

GRAPHIC SCALE: 1" = 15'

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LICENSER:

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KHA PROJECT NUMBER:
017848000

DRAWN BY:	CHECKED BY:
XQD	DMF

SHEET TITLE:
DEMO PLAN

SHEET NUMBER:
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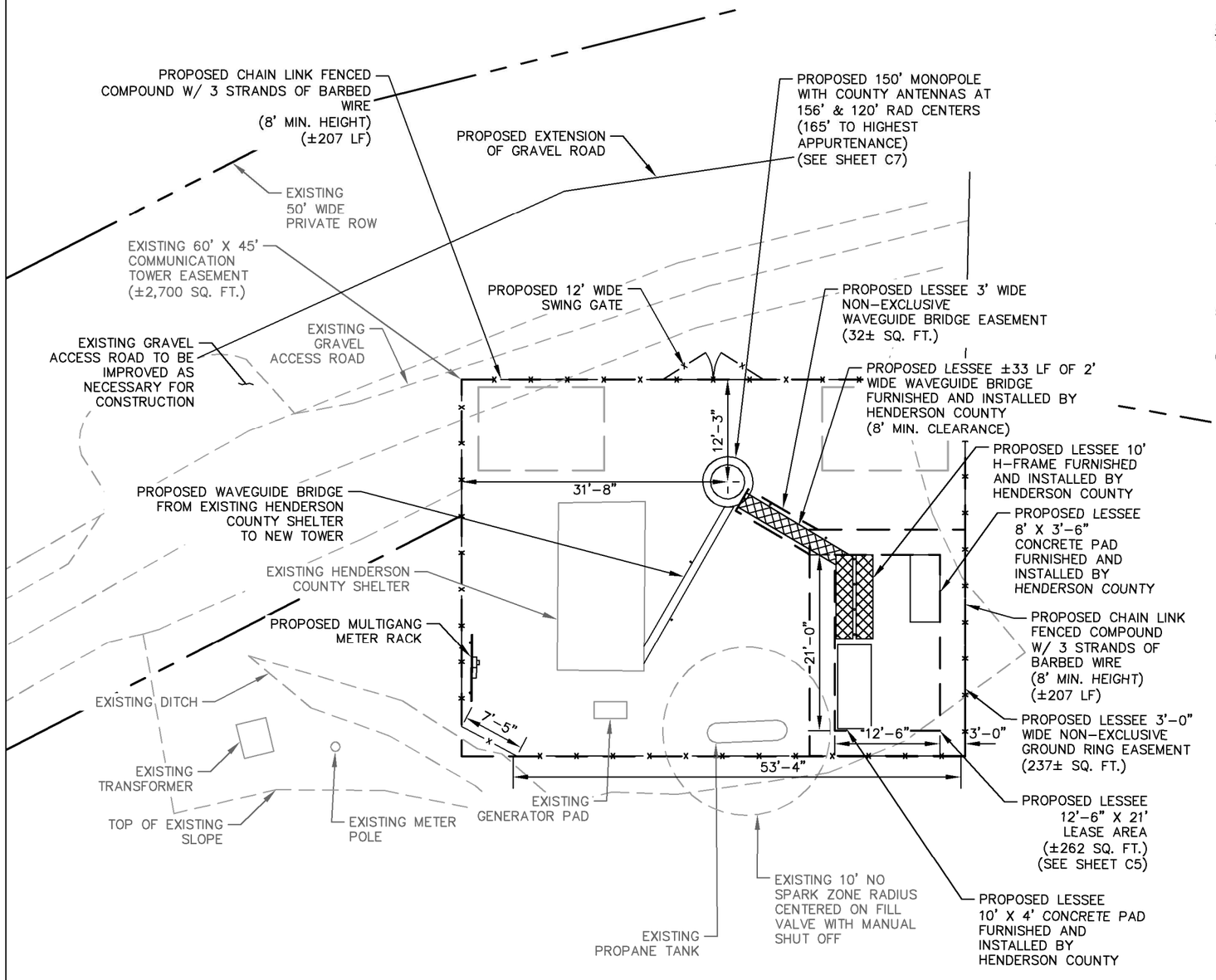

1 / C4 SITE PLAN

SCALE: 1" = 15'

SITE NOTES:

1. HENDERSON COUNTY STAFF SHALL COORDINATE WITH THE PROPERTY OWNER TO OBTAIN THE PROPER EASEMENT AGREEMENTS TO CONSTRUCT AND MAINTAIN EQUIPMENT IN AND AROUND THE TOWER COMPOUND.
2. PROPOSED COMPOUND LAYOUT BASED ON SURVEY PROVIDED BY HILL AND ASSOCIATES SURVEYORS, P.A. DATED 08/17/21.
3. CONTRACTOR TO CONFIRM WITH HENDERSON COUNTY CONSTRUCTION MANAGER THAT THE EQUIPMENT SHOWN HAS BEEN ORDERED/SCHEDULED FOR DELIVERY TO THIS SITE.
4. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND MODIFYING SCOPE OF WORK TO ACCOMMODATE ANY CHANGES IN THE EXACT EQUIPMENT PROCURED BY HENDERSON COUNTY. COORDINATE ANY CHANGES WITH HENDERSON COUNTY CONSTRUCTION MANAGER.
5. ROUTE COAX/FIBER UP TOWER PER STRUCTURAL ANALYSIS BY TOWER OWNER.
6. TOWER DIMENSIONS SHOWN ON THIS PLAN ARE FOR TOWER CENTER LOCATION. CONTRACTOR TO OBTAIN COPY OF TOWER ERECTION DRAWINGS FROM HENDERSON COUNTY CONSTRUCTION MANAGER PRIOR TO DRILLING TOWER FOUNDATIONS. CASSIONS AND TOWER SHOWN ON THIS PLAN ARE ILLUSTRATIVE, SEE DESIGN DRAWING BY OTHERS. DO NOT SCALE.

NOTE:

1. CONTRACTOR TO REUSE CHAINLINK FENCE AS FEASIBLE

NORTH

0 7.5 15 30

GRAPHIC SCALE: 1" = 15'

PROJECT INFORMATION:

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY:	CHECKED BY:
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SHEET TITLE: SITE PLAN

SHEET NUMBER: C4

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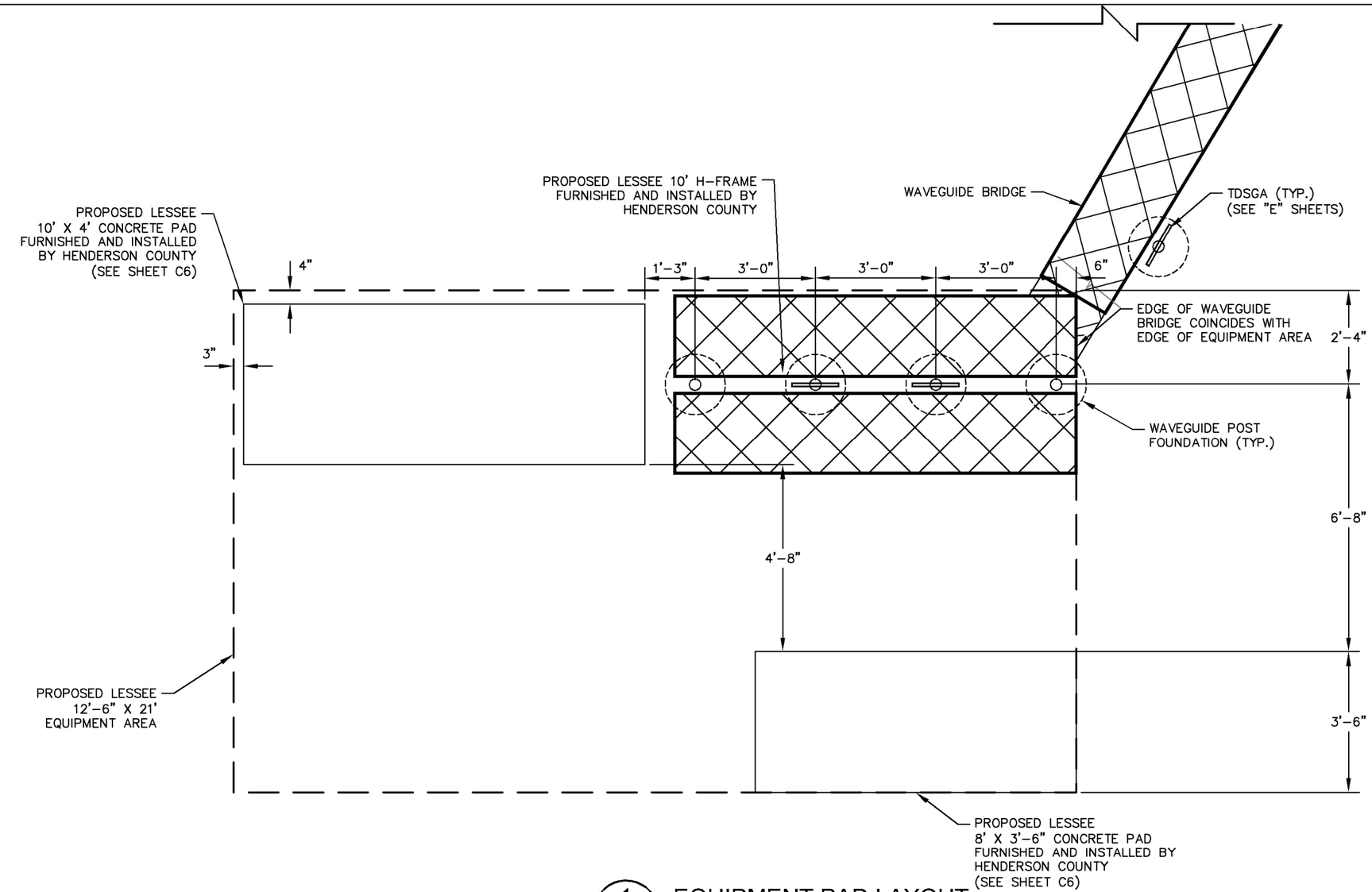

1 / C5 EQUIPMENT PAD LAYOUT

SCALE: 1" = 3'

EQUIPMENT PAD/ROUTING NOTES:

1. REFER TO THE SITE PLAN FOR EQUIPMENT PAD LOCATION AND ORIENTATION.
2. RUN 2" FLEX TELCO CONDUIT FROM BOTTOM OF TELCO BOX TO SIDE OF RF CABINET WITH CHASE NIPPLE THROUGH FACTORY KNOCKOUT.
3. RUN (2) 2" FLEX POWER CONDUIT AND (1) 1" ALARM CONDUIT FROM BOTTOM OF ILC TO SIDE OF RF CABINET WITH CHASE NIPPLES THROUGH FACTORY KNOCKOUTS.
4. RUN 2" FLEX FIBER CONDUIT FROM BOTTOM OF OVP TO SIDE OF RF CABINET WITH CHASE NIPPLE THROUGH FACTORY KNOCKOUT.
5. RUN (1) 1½" FLEX POWER CONDUIT FOR EVERY (6) RRU CIRCUITS FROM BOTTOM OF OVP TO SIDE OF RF CABINET WITH CHASE NIPPLE THROUGH FACTORY KNOCKOUT.
6. SUPPORT FLEX CONDUIT ON HORIZONTAL H-FRAME RAILS OR ON VERTICAL SITE STRUT SNT10 RAILS ADDED TO H-FRAME FOR CONDUIT/CABLE MANAGEMENT.
7. RUN HYBRID CABLE FOR TOWER MOUNTED RRU'S OVERHEAD ON TRAPEZE SUSPENDED FROM WAVE GUIDE BRIDGE. SWEEP DOWN ONTO H-FRAME RAILS, THEN LOOP UNDER OVP AND CONNECT TO BOTTOM OF OVP. ATTACH GROUND KITS TO HYBRID CABLE BEFORE LOOPING UNDER OVP, AND BOND TO TDSGA GROUND BAR AT BASE OF H-FRAME.
8. RUN COAX CABLE FOR GROUND MOUNTED RRU'S (IF USED) OVERHEAD ON TRAPEZE SUSPENDED FROM WAVE GUIDE BRIDGE. TERMINATE COAX ON ICE BRIDGE AND TRANSITION TO JUMPERS JUST BEFORE REACHING H-FRAME. ATTACH GROUND KITS TO COAX CABLE ON TOWER SIDE OF LAST ICE BRIDGE POST AND BOND TO TDSGA GROUND BAR NEAR TOP OF POST.
9. GPS ANTENNA TO BE MOUNTED TO STANDARD HEIGHT POST WITH EXTENDED MOUNTING PIPE, USING COMMSCOPE GPS-U MOUNTING KIT. MOUNT AS NEAR AS PRACTICAL TO RBA84 CABINET.
10. BOLT CABINETS AND GENERATOR TO SLAB USING FASTENERS SPECIFIED BY EQUIPMENT MANUFACTURER IN FACTORY PROVIDED MOUNTING HOLES.

NORTH

0 1.5 3 6

GRAPHIC SCALE: 1" = 3'

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE: EQUIPMENT PAD LAYOUT

SHEET NUMBER: C5

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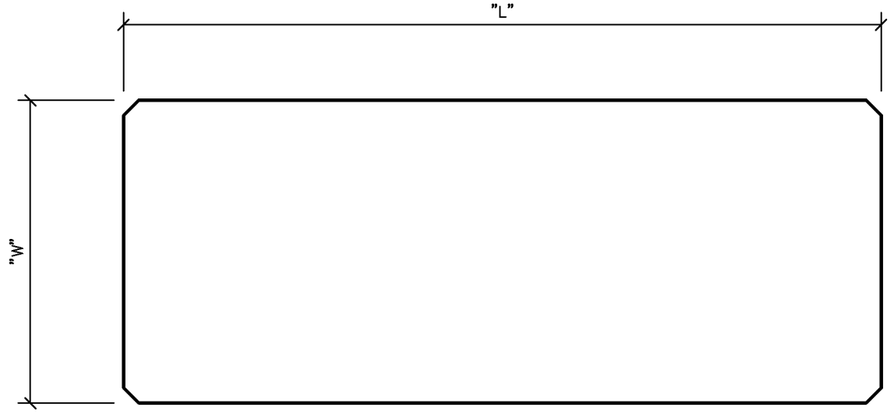
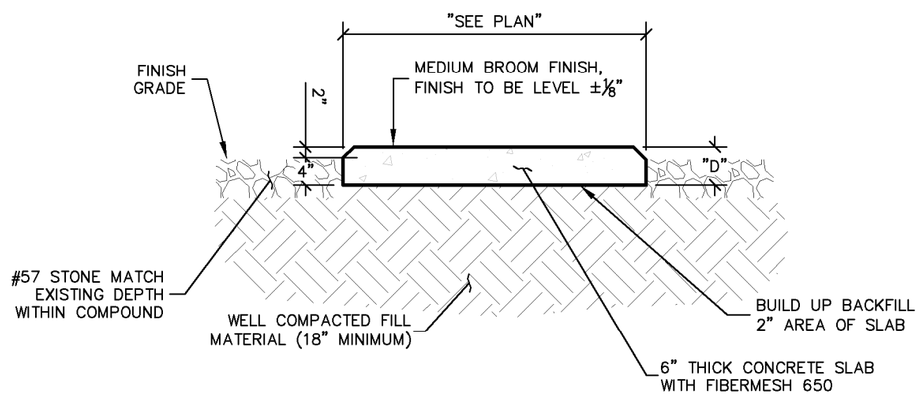
CONCRETE PAD SCHEDULE				
PAD TYPE	"L"	"W"	"D"	REINFORCEMENT
EQUIPMENT PAD	10'-0"	4'-0"	6"	SEE DETAIL 2/C6
GENERATOR PAD	8'-0"	3'-6"	6"	SEE DETAIL 2/C6



1 C6 CONCRETE PAD PLAN

NOT TO SCALE



2 C6 CONCRETE PAD FOUNDATION SECTION

NOT TO SCALE

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469 S FORGE CREST DR
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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
CONCRETE PAD FOUNDATION DETAILS

SHEET NUMBER:
C6

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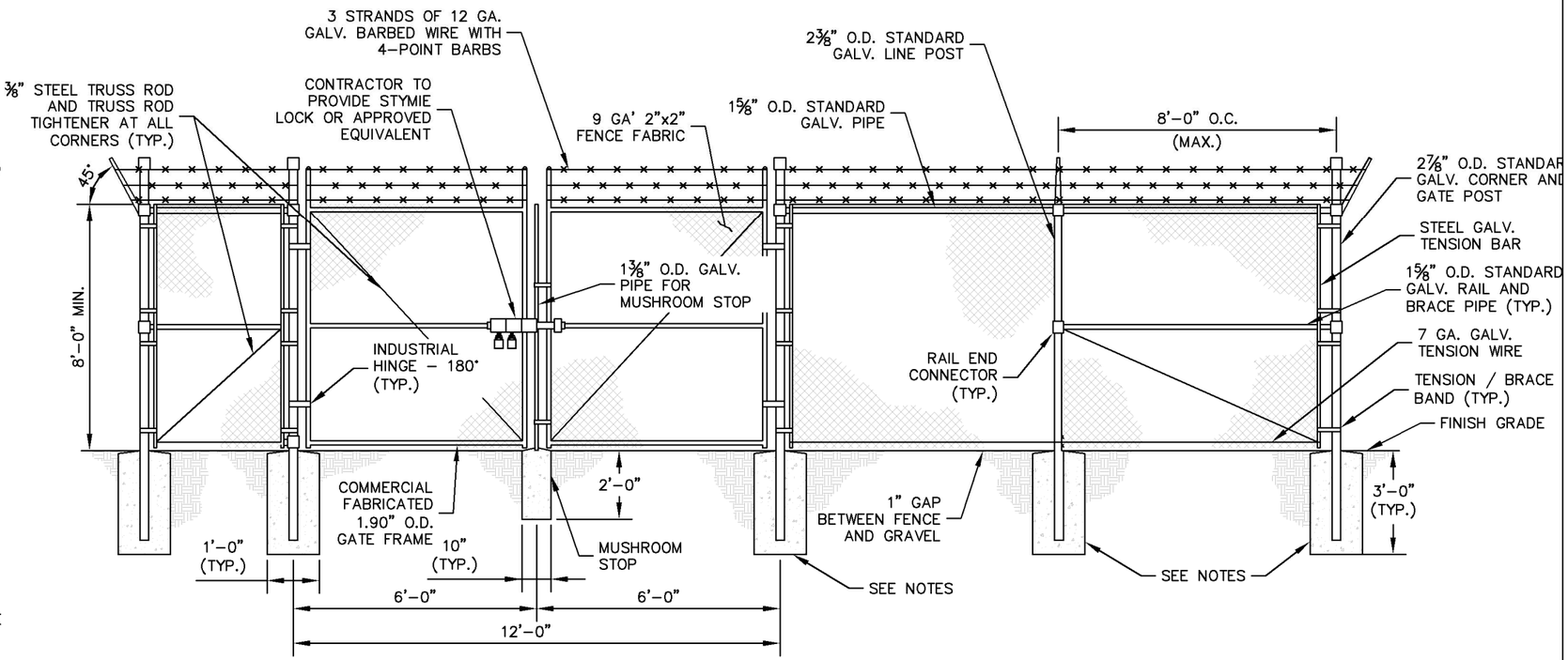
FENCE NOTES:

1. USE 3,000–PSI CONCRETE, FULLY CONSOLIDATED AROUND THE POST.
2. WHERE THE POST IS SET IN ROCK OR CONCRETE, CORE A HOLE 12" DEEP AND 1" LARGER IN DIAMETER THAN THE POST. SET THE POST AND GROUT IN PLACE USING NON–SHRINK GROUT.
3. ALL POSTS MUST BE PLUMB AND ALIGNED WITH ONE ANOTHER IN BOTH HORIZONTAL AND VERTICAL PLANES.
4. CORNERS AND GATEPOSTS FOR CHAIN LINK FENCES SHALL EXTEND ABOVE THE TOP STRAND OF BARBED WIRE TO PROVIDE TENSIONING FOR THE BARBED WIRE.
5. PROVIDE MIDRAILS AND BRACING AT ALL CORNER POSTS WHERE THE FENCE CHANGES DIRECTION BY MORE THAN 30 DEGREES.
6. THE GRADE OF THE SITE AND INSTALLATION OF THE FENCE SHALL PROVIDE FOR NO MORE THAN A 1" GAP BETWEEN THE BOTTOM OF THE FENCE MATERIAL AND FINISH GRADE.
7. CONTRACTOR SHALL PROVIDE HOLD OPEN DEVICES FOR ALL GATES AT THE SPECIFIED OPEN POSITIONS, DRIVEN PIPE TYPE RECEIVERS ARE NOT AUTHORIZED.
8. CONTRACTOR SHALL ALSO PROVIDE A MUSHROOM TYPE RECEIVER AT THE CLOSE POSITION.



1 C7 CHAIN LINK FENCE AND GATE ELEVATION

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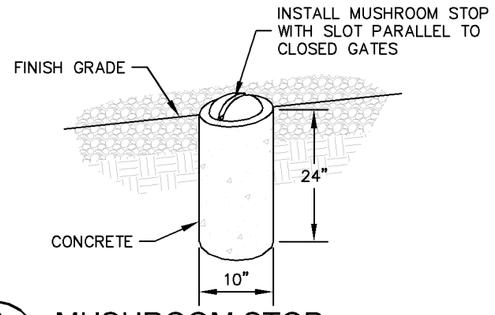
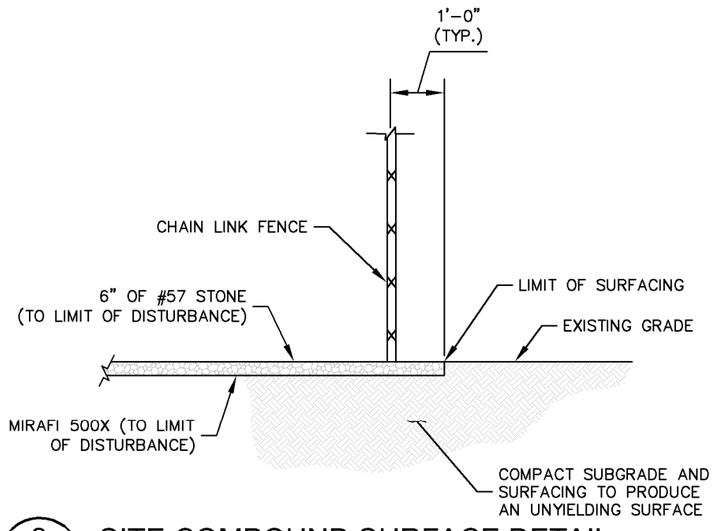


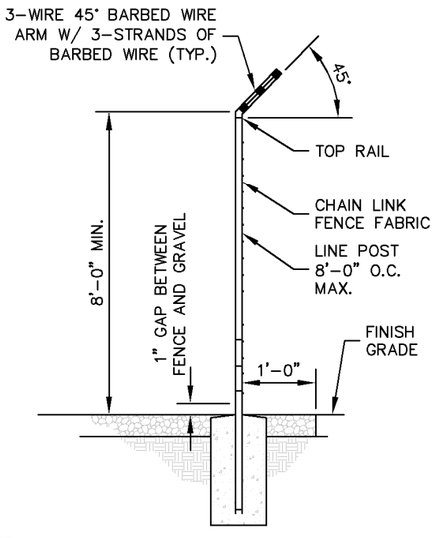
2 C7 MUSHROOM STOP

NOT TO SCALE



3 C7 SITE COMPOUND SURFACE DETAIL

NOT TO SCALE



4 C7 SECTION AT FENCE

NOT TO SCALE

HENDERSON COUNTY

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE: FENCE DETAILS

SHEET NUMBER: C7

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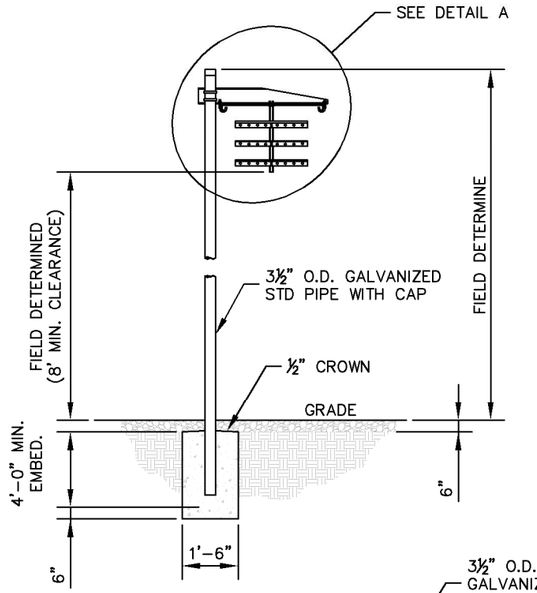
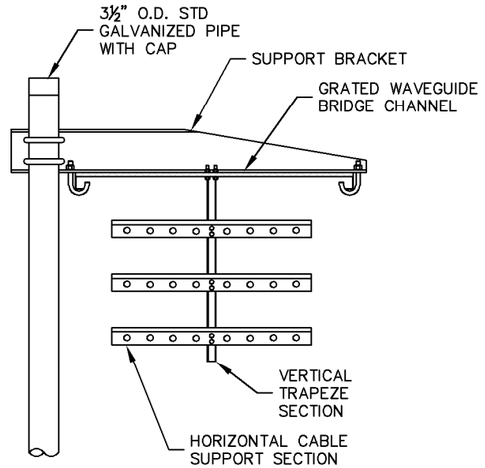




DETAIL A

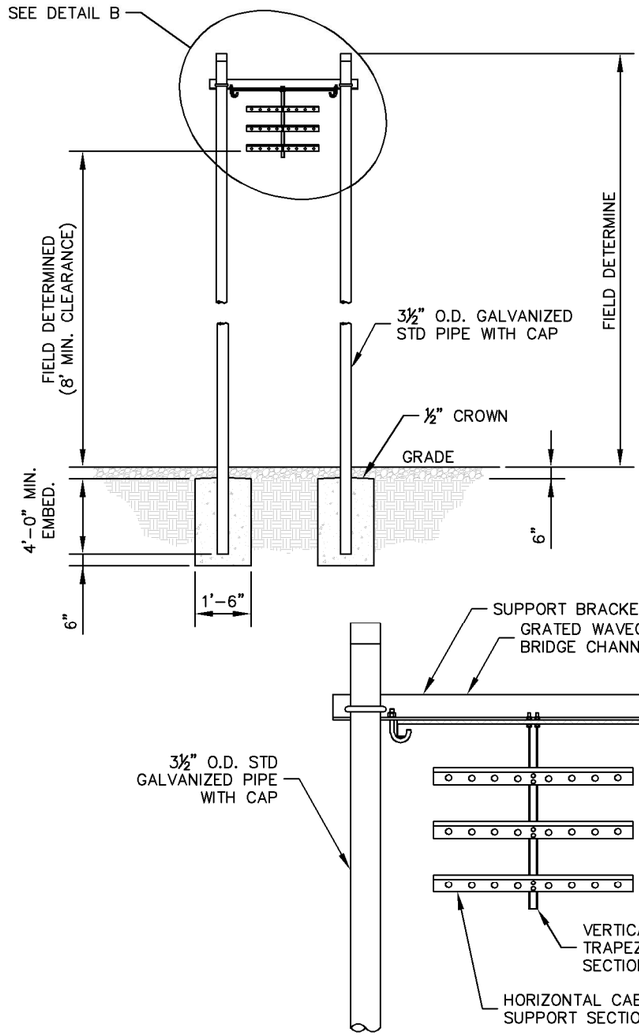
ANDREW 1 POST WAVEGUIDE BRIDGE KIT (PART #: WB-K210-B15, OR APPROVED EQUIVALENT)

NOTE:

1. ALL MATERIALS FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.

1 C8 WAVEGUIDE BRIDGE DETAIL

NOT TO SCALE



DETAIL B

ANDREW 2 POST WAVEGUIDE BRIDGE KIT (PART #: WB-K410-B15, OR APPROVED EQUIVALENT)

NOTE:

1. ALL MATERIALS FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.

2 C8 WAVEGUIDE BRIDGE DETAIL (ALT DESIGN - 2 PIPE COLUMNS)

NOT TO SCALE

PROJECT INFORMATION:

SITE NAME:
HENDERSON COUNTY TOWER
SITE No.: 639642
PROJECT #: 20202154476
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

PLANS PREPARED BY:

Kimley»Horn
11720 AMBER PARK DRIVE, SUITE 600
ALPHARETTA, GA 30009
PHONE: 770-619-4280
WWW.KIMLEY-HORN.COM
NC License F-0102

REV: | DATE: | ISSUED FOR: | BY:

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0	01/10/24	CONSTRUCTION	DRC

LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE: WAVEGUIDE BRIDGE DETAILS

SHEET NUMBER: C8

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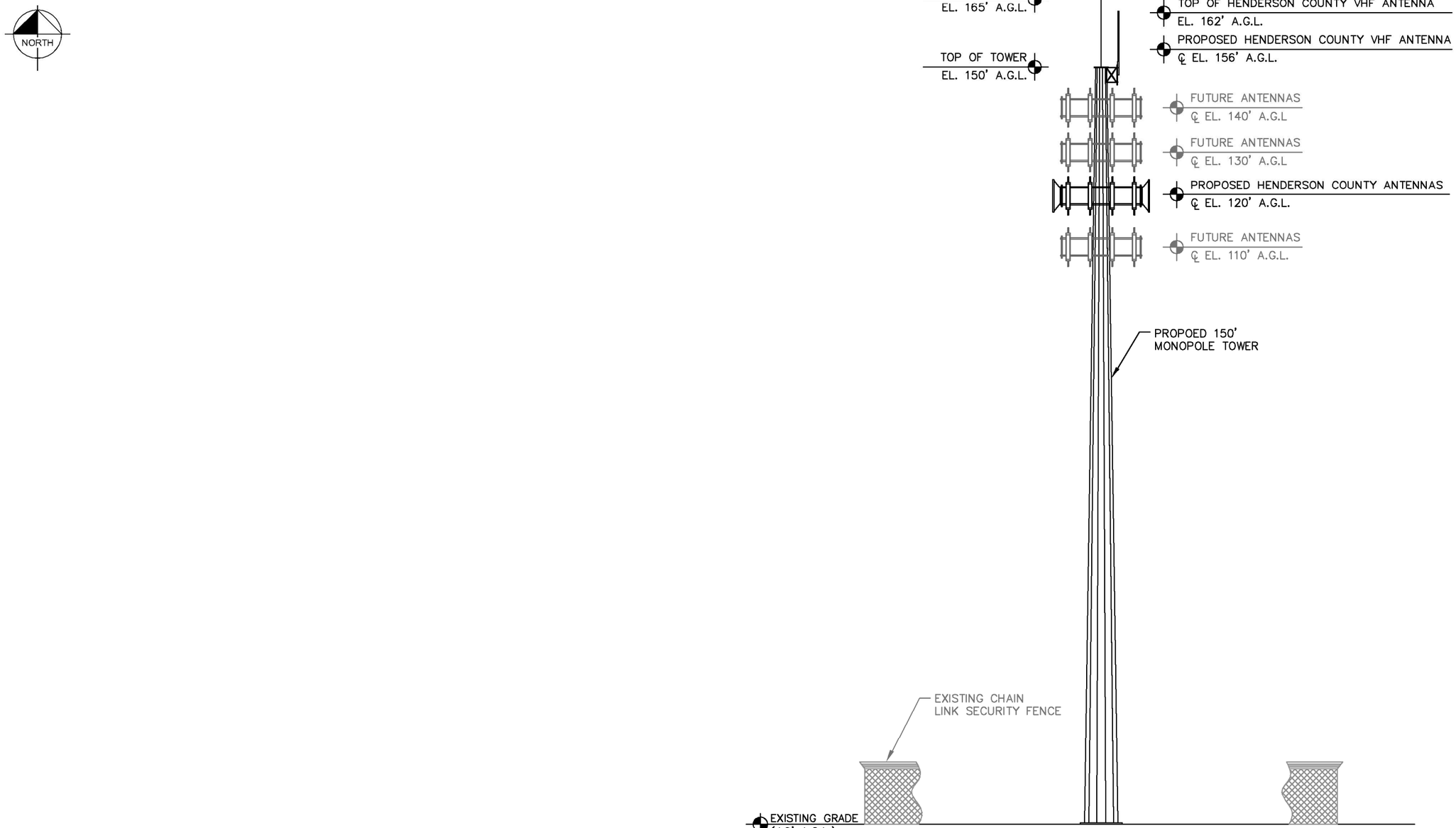

2/C9 MONOPOLE TOWER ELEVATION

NOT TO SCALE

NOTES:

1. ALL EXISTING ATTACHMENTS TO TOWER BASED ON STRUCTURAL ANALYSIS BY OTHERS (SEE GENERAL NOTE 1.07, SHEET N1).
2. THE TOWER ELEVATION SHOWN ABOVE IS FOR REFERENCE ONLY.
3. COAX/FIBER CABLE LENGTHS ARE APPROXIMATE. CONTRACTOR TO VERIFY CORRECT LENGTH IN FIELD AT TIME OF CONSTRUCTION.
4. FOR CLARITY, EXISTING STRUCTURES NOT SHOWN.
5. PROPOSED ANTENNAS WILL BE LIGHT GRAY IN COLOR.

NOTES:

1. ALL INFORMATION ON THIS PAGE IS PROVIDED BY HENDERSON COUNTY AND/OR OTHERS AND IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR SHALL CONTACT THE HENDERSON COUNTY CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION FOR ALL DETAILED ANTENNA, AND COAX CABLE INFORMATION.
2. REFER TO STRUCTURAL ANALYSIS BY TOWER OWNER FOR ANALYSIS OF PROPOSED TOWER.
3. IT IS UNDERSTOOD THAT KIMLEY-HORN MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, FINDINGS, DESIGNS, RECOMMENDATIONS, SPECIFICATIONS, OPINION, OR PROFESSIONAL ADVICE RELATING TO THE STRUCTURAL ADEQUACY OF THE PROPOSED TOWER OR ATTACHMENT OF ANTENNAS OR OTHER APPURTENANCES.

PROJECT INFORMATION:

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HENDERSON COUNTY TOWER
SITE No.: 639642
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469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

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0	01/10/24	CONSTRUCTION	DRC

LICENSER:

FOR ILLUSTRATIVE PURPOSES ONLY- NO SIGNATURE REQUIRED

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
ANTENNA AND TOWER ELEVATION DETAILS

SHEET NUMBER:
C9

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EQUIPMENT REPLACEMENT SUMMARY SCHEDULE		
EQUIPMENT	QUANTITY	DESCRIPTION
EXISTING EQUIPMENT		
ANTENNAS	2	4' MW DISH ANTENNA
	2	VHF TRANSMIT ANTENNA
FEEDLINES	4	ANDREW 7/8" HELIAX
	–	–
OTHER EQUIPMENT	–	–
	–	–
EQUIPMENT TO BE RELOCATED		
ANTENNAS	2	4' MW DISH ANTENNA
FEEDLINES	–	–
OTHER EQUIPMENT	–	–
EQUIPMENT TO BE INSTALLED		
ANTENNAS	1	DB-224
	4	DB-222
	2	HPD4-4.7
	1	HPD6-11
FEEDLINES	10	ANDREW 7/8" HELIAX
OTHER EQUIPMENT	4	3' SIDE ARMS FOR DB-222 ANTENNAS
	–	–
	–	–
	–	–
FINAL CONFIGURATION		
ANTENNAS	2	4' MW DISH ANTENNA
	1	DB-224
	4	DB-222
	2	HPD4-4.7
	1	HPD6-11
	–	–
FEEDLINES	10	ANDREW 7/8" HELIAX
	–	–
OTHER EQUIPMENT	4	3' SIDE ARMS FOR DB-222 ANTENNAS
	–	–
	–	–

1 / C9.1 SCOPE OF WORK SUMMARY

NOT TO SCALE

1. THE PROPOSED DB-224 ANTENNA IS TO BE INSTALLED AT 156' AGL. THE DB-222 ANTENNAS ARE TO BE INSTALLED AT 120' AGL. ALL DB-222 MUST BE MOUNTED ON 3-FOOT SIDE ARMS AWAY FROM THE TOWER.
2. ALL ANTENNAS SHOULD BE PROVIDED WITH ANDREW 7/8" HELIAX WITH APPROPRIATE HOISTING GRIPS AND "N" STYLE CONNECTORS.
3. RELOCATED ANTENNAS SHOULD BE PROVIDED NEW COAX AND CONNECTORS (SPECIFICATIONS TO BE PROVIDED BY HENDERSON COUNTY. CONTRACTOR TO COORDINATE WITH HENDERSON COUNTY PM)

PROJECT INFORMATION:

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469 S FORGE CREST DR
MILLS RIVER, NC 28759
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LICENSER:

FOR ILLUSTRATIVE PURPOSES ONLY- NO SIGNATURE REQUIRED

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
TOWER EQUIPMENT SCHEDULE

SHEET NUMBER:
C9.1

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1.8 m | 6 ft High Performance Parabolic Reflector Antenna, Single-polarized, 10.7-11.7GHz

HP6-11

The HP High Performance Series by RadioWaves offers a full line of high performance parabolic antennas engineered to provide ETSI class 2/3 radiation pattern performance as well as excellent gain. RadioWaves field-proven pre-assembled antennas and robust pole-mounts ensure "set and forget" installation with minimal post-installation maintenance. The included radome ensures robust and reliable performance under the most challenging conditions. If it's rugged, it must be RadioWaves!

FEATURES AND BENEFITS
O High Performance ETSI Class 2/3* Parabolic Antennas – Excellent performance for a wide range of applications
O Fully Preassembled at the Factory – Simplifies installation on site and guarantees "factory-tested" quality

*ETSI Class depends on frequency band

SPECIFICATIONS

General

Antenna Type	High Performance Parabolic Reflector Antenna
Size, nominal	6 ft | 1.8 m
Polarization	Single

Standard RF Connector Type	CPR90G
Standard RF Connector Suffix	RS (append suffix to model number)

Electrical

Operating Frequency Band	10.7 - 11.7 GHz
Half Power Beamwidth, Horizontal	1.1 degrees
Half Power Beamwidth, Vertical	1.1 degrees
Cross-Polarization Discrimination	30 dB
Front to Back Ratio (F/B)	68 dB

Gain, Low Frequency	43.1 dBi
Gain, Mid Frequency	43.4 dBi
Gain, High Frequency	43.8 dBi
VSWR	1.37:1
Return Loss	-16.1 dB

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Mechanical

Fine Azimuth Adjustment	+/- 10 degrees
Fine Elevation Adjustment	+/- 10 degrees
Mounting Pipe Diameter, Min	4.5 inch | 11.4 cm
Mounting Pipe Diameter, Max	4.5 inch | 11.4 cm
Net Weight	251 lbs | 113 kg
Wind Velocity Operational	90 mph | 145 km/h
Wind Velocity Survival Rating	125 mph | 201 km/h

Mechanical Configuration	HP6
Axial Force (FA)	1680 lbs | 7473 N
Side Force (FS)	832 lbs | 3700 N
Twisting Moment (MT)	2100 ft-lbs | 2847 Nm
Operating Temperature Range	-40 to +60 C
Max Pressure, PSIG, (if waveguide interface)	5

Regulatory Compliance

FCC	Part 101 Cat. A
Industry Canada Compliance	SRSP310.7 B

ETSI	302217 R1 C2
RoHS-compliant	Yes

Shipping Information

Package Type	Wood Crate
Gross Weight	401 lbs | 181.8 kg

Dimensions, L x W x H	77 x 35 x 80in | 195 x 89 x 203 cm
Shipping Volume	124.77 cu ft | 3.53 cu m

*Additional OEM interfaces and adapters may be available. Contact RadioWaves for a complete and current list of available adapters.

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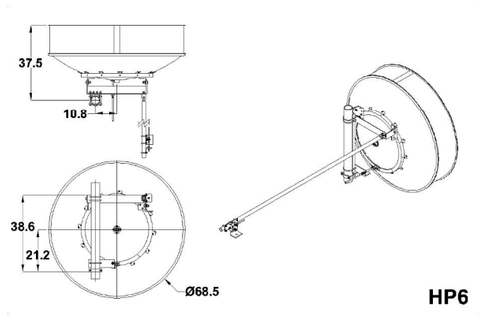
TECHNICAL DRAWINGS



HP6

+1 (978) 459-8800 | sales@radiowaves.com | radiowaves.com

1.2 m | 4 ft High Performance Parabolic Reflector Antenna, Dual-polarized, 4.4-5GHz

HPD4-4.7

The HP High Performance Series by RadioWaves offers a full line of high performance parabolic antennas engineered to provide ETSI class 2/3 radiation pattern performance as well as excellent gain. RadioWaves field-proven pre-assembled antennas and robust pole-mounts ensure "set and forget" installation with minimal post-installation maintenance. The included radome ensures robust and reliable performance under the most challenging conditions. If it's rugged, it must be RadioWaves!

FEATURES AND BENEFITS
O High Performance ETSI Class 2/3* Parabolic Antennas – Excellent performance for a wide range of applications
O Fully Preassembled at the Factory – Simplifies installation on site and guarantees "factory-tested" quality

*ETSI Class depends on frequency band

SPECIFICATIONS

General

Antenna Type	High Performance Parabolic Reflector Antenna
Size, nominal	4 ft | 1.2 m
Polarization	Dual

Standard RF Connector Type	N-Female
Standard RF Connector Suffix	NS (append suffix to model number)

Electrical

Operating Frequency Band	4.4 - 5 GHz
Half Power Beamwidth, Horizontal	3.6 degrees
Half Power Beamwidth, Vertical	3.6 degrees
Cross-Polarization Discrimination	30 dB
Front to Back Ratio (F/B)	54 dB

Gain, Low Frequency	31.8 dBi
Gain, Mid Frequency	32.4 dBi
Gain, High Frequency	32.9 dBi
VSWR	1.5:1
Return Loss	-14 dB

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Mechanical

Fine Azimuth Adjustment	+/- 10 degrees
Fine Elevation Adjustment	+/- 25 degrees
Mounting Pipe Diameter, Min	4.5 inch | 11.4 cm
Mounting Pipe Diameter, Max	4.5 inch | 11.4 cm
Net Weight	85 lbs | 38.3 kg
Wind Velocity Operational	90 mph | 145 km/h
Wind Velocity Survival Rating	125 mph | 201 km/h

Mechanical Configuration	HP4-LoFreq
Axial Force (FA)	737 lbs | 3278 N
Side Force (FS)	365 lbs | 1623 N
Twisting Moment (MT)	784 ft-lbs | 1063 Nm
Operating Temperature Range	-40 to +60 C
Max Pressure, PSIG, (if waveguide interface)	5

Regulatory Compliance

FCC	undeclared
Industry Canada Compliance	undeclared

ETSI	undeclared
RoHS-compliant	Yes

Shipping Information

Package Type	Wood Crate
Gross Weight	196 lbs | 88.9 kg

Dimensions, L x W x H	59 x 35 x 60in | 180 x 89 x 152 cm
Shipping Volume	71.7 cu ft | 2.03 cu m

*Additional OEM interfaces and adapters may be available. Contact RadioWaves for a complete and current list of available adapters.

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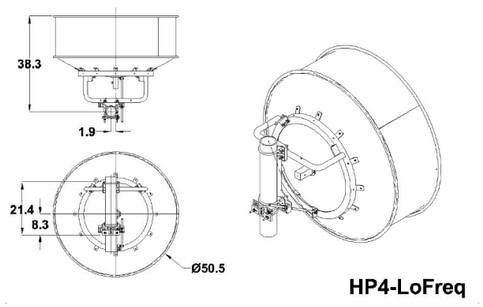
TECHNICAL DRAWINGS



HP4-LoFreq

+1 (978) 459-8800 | sales@radiowaves.com | radiowaves.com

1 / C9.2 ANTENNA SPECS

NOT TO SCALE

HENDERSON COUNTY

PROJECT INFORMATION:

SITE NAME:
HENDERSON COUNTY TOWER
SITE No.: 639642
PROJECT #: 20202154476
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

PLANS PREPARED BY:

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11720 AMBER PARK DRIVE, SUITE 600
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LICENSER:

FOR ILLUSTRATIVE PURPOSES ONLY- NO SIGNATURE REQUIRED

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE: ANTENNA SPECS

SHEET NUMBER: C9.2

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DB222-A

1-port omni exposed dipole antenna, 150–158 MHz, 360° HPBW, fixed electrical tilt

- Broad response
- Weather resistant

General Specifications

Antenna Type	Omni
Band	Single band
Color	Silver
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radiator Material	Aluminum
RF Connector Interface	N Male
RF Connector Location	Bottom
RF Connector Quantity, low band	1
RF Connector Quantity, total	1

Dimensions

Length	3,225.8 mm | 127 in
Net Weight, without mounting kit	7.2 kg | 15.873 lb

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	150 – 158 MHz
Polarization	Vertical

Electrical Specifications

Frequency Band, MHz	**150–158**
Gain, dBi	5.1
Beamwidth, Horizontal, degrees	360
Beamwidth, Vertical, degrees	36

COMMSCOPE®

DB222-A

Beam Tilt, degrees	0
VSWR | Return loss, dB	1.5 | 14.0
Input Power per Port, maximum, watts	500

Mechanical Specifications

Wind Loading @ Velocity, maximum	284.7 N @ 100 mph (64.0 lbf @ 100 mph)
Wind Speed, maximum	201 km/h | 124.896 mph

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

Included Products

DB365-OS	–	Pipe Mounting Kit that consists of two clamps for mounting antennas to round members 1.25 - 3.5 in (35 - 89 mm) OD round members.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

COMMSCOPE®

DB365-OS

Pipe Mounting Kit that consists of two clamps for mounting antennas to round members 1.25 - 3.5 in (35 - 89 mm) OD round members.

Product Classification

Product Type	Pipe mount kit

General Specifications

Application	Outdoor
Color	Silver

Dimensions

Compatible Diameter, maximum	88.9 mm | 3.5 in
Compatible Diameter, minimum	33 mm | 1.299 in
Weight, net	3.2 kg | 7.055 lb

Material Specifications

Material Type	Galvanized steel

Packaging and Weights

Included	Brackets | Hardware
Packaging quantity	2
Weight, gross	3.6 kg | 7.937 lb

Regulatory Compliance/Certifications

Agency	Classification
CE	Compliant with the relevant CE product directives
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.commscope.com/ProductCompliance
ROHS	Compliant

COMMSCOPE®

DB224-A

1-port omni exposed dipole antenna, 150–160 MHz, 360° HPBW, fixed electrical tilt

- Broad response
- Two-piece mast for ease of shipping

General Specifications

Antenna Type	Omni
Band	Single band
Color	Silver
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radiator Material	Aluminum
RF Connector Interface	N Male
RF Connector Location	Bottom
RF Connector Quantity, low band	1
RF Connector Quantity, total	1

Dimensions

Length	6477 mm | 255 in
Net Weight, without mounting kit	15.9 kg | 35.053 lb

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	150 – 160 MHz
Polarization	Vertical

Electrical Specifications

Frequency Band, MHz	**150–160**
Gain, dBi	8.1
Beamwidth, Horizontal, degrees	360
Beamwidth, Vertical, degrees	16

COMMSCOPE®

DB224-A

Beam Tilt, degrees	0
VSWR | Return loss, dB	1.5 | 14.0
Input Power per Port, maximum, watts	500

Mechanical Specifications

Wind Loading @ Velocity, maximum	560.5 N @ 100 mph (126.0 lbf @ 100 mph)
Wind Speed, maximum	130 km/h | 80.778 mph

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

Included Products

DB365-OS	–	Pipe Mounting Kit that consists of two clamps for mounting antennas to round members 1.25 - 3.5 in (35 - 89 mm) OD round members.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

COMMSCOPE®

1 / C9.3 ANTENNA SPECS

NOT TO SCALE

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PROJECT INFORMATION:

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SITE No.: 639642
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469 S FORGE CREST DR
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LICENSER:

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KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE:
ANTENNA SPECS

SHEET NUMBER:
C9.3

NOTE:
CURRENT DESIGN ANTICIPATES APPROXIMATELY XXXXXX± SQ. FT. (0.XX ACRES) OF CLEARING AND GRADING FOR THE PROPOSED PROJECT. IF ADDITIONAL CLEARING IS REQUIRED BEYOND WHAT IS SHOWN IN THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND/OR PROJECT MANAGER. IF DURING THE BID WALK OR CONSTRUCTION IT IS DETERMINED THAT MORE THAN (1) ACRE OF LAND IS TO BE DISTURBED FOR CONSTRUCTION AN EROSION AND SEDIMENTATION CONTROL PLAN MUST BE FILED 30 DAYS PRIOR TO CONSTRUCTION.

GRADING NOTES:

1. THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND MOISTURE CONDITION ALL FILL PER THE PROJECT GEOTECHNICAL ENGINEERS SPECIFICATIONS. FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
2. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS REFLECT FINISHED GRADES.
3. CONTRACTOR SHALL BLEND EARTHWORK SMOOTHLY TO TRANSITION BACK TO EXISTING GRADE.
4. PORTIONS OF THE SITE NOT SPECIFICALLY MENTIONED WITHIN THE GEOTECHNICAL REPORT SHALL BE COMPACTED TO 95 PERCENT OF THE MATERIALS MAXIMUM DRY DENSITY WITHIN 3 PERCENT OF OPTIMUM MOISTURE CONTENT.
5. FILL SHALL BE PLACED IN MAXIMUM 8 INCH LOOSE LIFTS.
6. UNDISTURBED AREAS WITHIN 30' INGRESS/EGRESS EASEMENT NOT NEEDED FOR UTILITY ROUTING TO BE LEFT UNDISTURBED.
7. GROUND WATER SHOULD BE REASONABLY EXPECTED. ANY DE-WATERING OR MOISTURE CONDITIONING IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHOULD BE INCLUDED IN THE CONTRACT PRICE.
8. SEED ALL DISTURBED AREAS NOT TOPPED WITH GRAVEL PER SEEDING SCHEDULE ON DETAIL ON SHEET C9.
9. MAXIMUM CUT SLOPE = 2H:1V UNLESS OTHERWISE NOTED.
10. MAXIMUM FILL SLOPE = 3H:1V UNLESS OTHERWISE NOTED.

LEGEND

EXISTING CONTOURS

PROPOSED CONTOURS

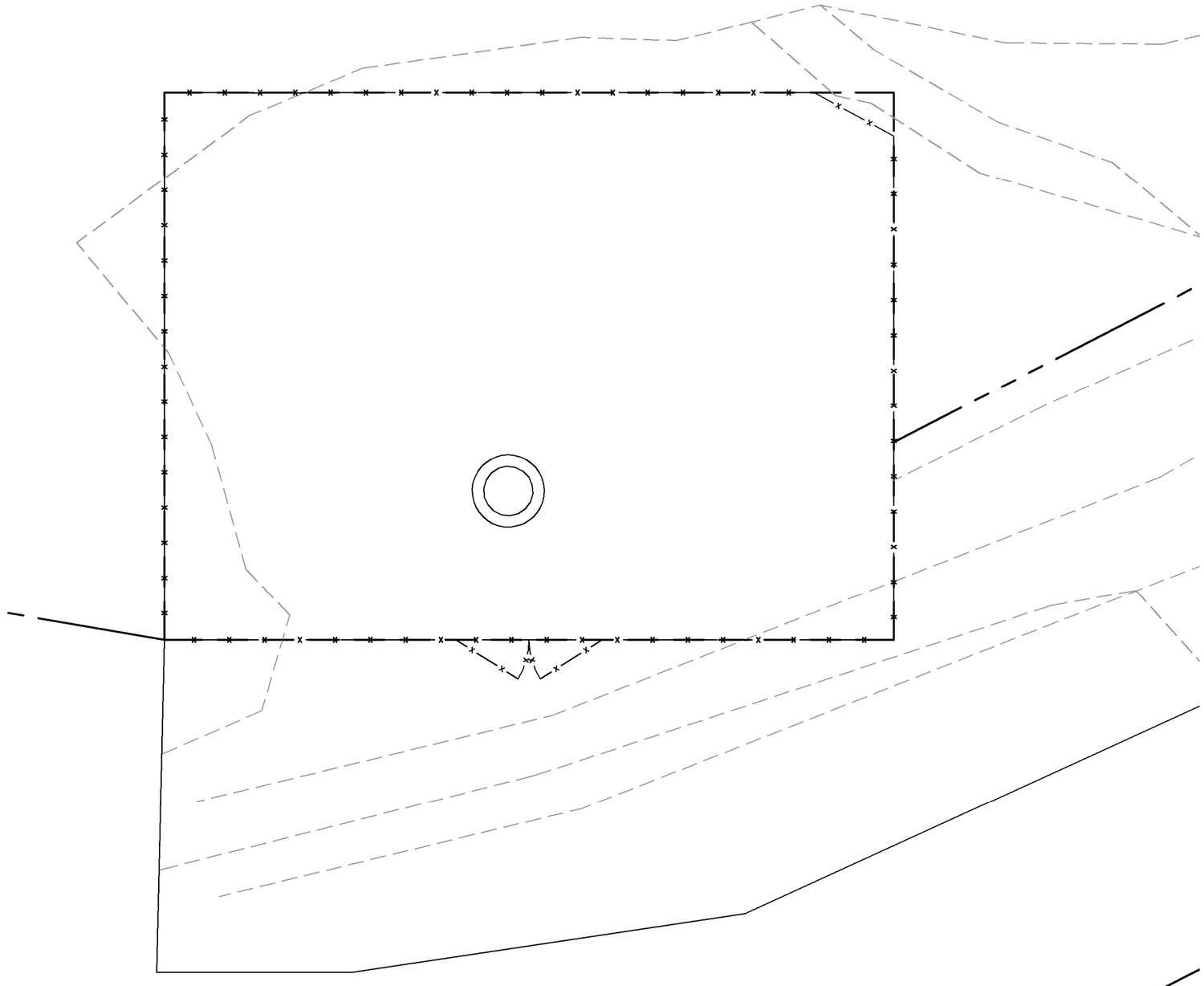
LOD/SILT FENCE — LOD —

TPF — TPF — TPF —

EXISTING SPOT ELEVATION x XXX

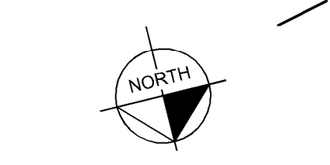
PROPOSED SPOT ELEVATION ● XXX

CUT/ FILL TABLE	
CUT VOLUME:	XX.XX CU YD.
FILL VOLUME:	XX.XX CU. YD.
NET VOLUME:	X.XX YD. (FILL)



1 / C10 GRADING & EROSION CONTROL PLAN

SCALE: 1" = 10'



HENDERSON COUNTY

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE:
GRADING & EROSION CONTROL PLAN

SHEET NUMBER:
C10

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EROSION CONTROL NOTES:

1. EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND SHALL BE ADEQUATE TO MAINTAIN SEDIMENT ON SITE.
2. ALL EXCAVATED SOILS NOT NEEDED ON SITE FOR BACKFILL OPERATIONS SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE TAKEN OFF SITE AND LEGALLY DISPOSED OF.
3. SOIL REMAINING ON SITE SHALL HAVE SILT FENCE TIGHTLY PLACED AROUND THE ENTIRE CIRCUMFERENCE OF THE PILE.
4. PROVIDE EROSION CONTROLS AS NECESSARY TO PREVENT EXISTING SOILS FROM DRAINING OFF SITE OR INTO EXISTING DRAINAGE STRUCTURES.
5. ERECTION OF EROSION CONTROLS SHALL BE IN ACCORDANCE WITH STATE AND LOCAL EROSION CONTROL REGULATIONS.

SEEDING SCHEDULE FOR WINTER / SPRING CONSTRUCTION ACTIVITIES

SEEDING MIXTURE

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

SEEDING DATES

Mountains-- Above 2500 ft: Feb 15 – May 15
Below 2500 ft.: feb. 1 – May 1
Piedmont--Jan. 1 – May 1
Coastal Plain--Dec. 1 – Apr. 15

SOIL AMENDMENTS

Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.

MULCH

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

MAINTENANCE

Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

SEEDING SCHEDULE FOR SUMMER CONSTRUCTION ACTIVITIES

SEEDING MIXTURE

Species	Rate (lb/acre)
Common Bermudagrass	40–80 (1–2 lb/1,000 sq.ft.)

SEEDING DATES

Coastal Plain--Apr. 1 – July
Piedmont--Apr. 15 – June 30

SOIL AMENDMENTS

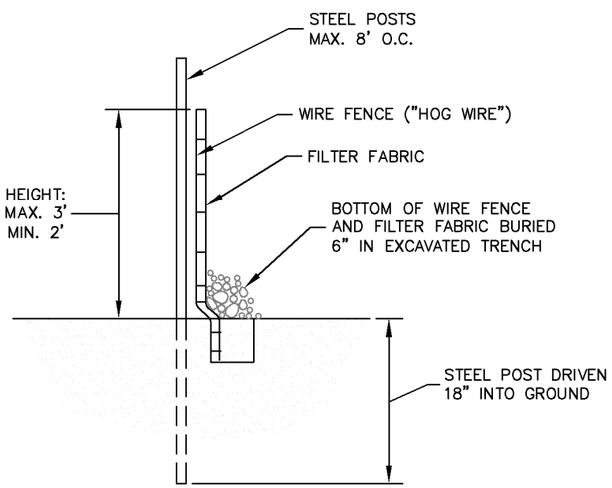
Apply lime and fertilizer according to soil tests, or apply 3,000 lb/acre ground agricultural limestone and 500 lb/acre 10–10–10 fertilizer.

MULCH

Use jute, excelsior matting, or other effective channel lining material to cover the bottom of channels and ditches. The lining should extend above the highest calculated depth of flow. On channel side slopes above this height, and in drainages not requiring temporary lining, apply 4,000 lb/acre grain straw and anchor straw by stapling netting over the top.

MAINTENANCE

A minimum of 3 weeks is required for establishment. Inspect and repair mulch frequently. Refertilize the following Apr. with 50 lb/acre nitrogen.



SECTION

1 C10.1 SEDIMENT FENCE (SILT FENCE)

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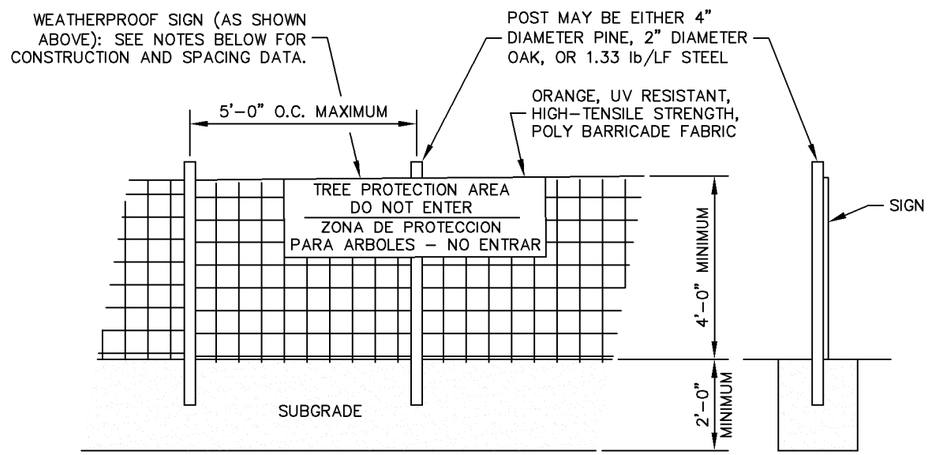

NOTES
INSTALL TREE PROTECTION FENCE AND SIGNAGE PRIOR TO CALLING FOR SITE INSPECTION. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT. ADDITIONAL SIGNS MAY BE REQUIRED BASED ON ACTUAL FIELD CONDITIONS.

2 C10.1 TREE PROTECTION FENCE

NOT TO SCALE

PROJECT INFORMATION:

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PLANS PREPARED BY:

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0	01/10/24	CONSTRUCTION	DRC

LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:

GRADING & EROSION CONTROL PLAN

SHEET NUMBER:

C10.1

ELECTRICAL NOTES

1.00 CODES, STANDARDS, & SPECIFICATIONS

1.01 IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL MATERIALS AND LABOR RELATED DIRECTLY OR INDIRECTLY TO ALL ELECTRICAL WORK DOCUMENTED IN THESE DRAWINGS SHALL BE PROVIDED AND PERFORMED IN CONFORMANCE WITH ALL CURRENT GOVERNING CODES, STANDARDS, AND PROFESSIONAL STANDARD OF CARE TO INCLUDE THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), UNDERWRITERS LABORATORY (UL), NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA), AMERICAN STANDARDS ASSOCIATION (ASA), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), AND THE NATIONAL ELECTRICAL CODE (NEC).

1.02 MATERIALS SHALL BE NEW AND SHALL CONFORM TO ALL APPLICABLE CURRENT GOVERNING STANDARDS ESTABLISHED FOR EACH ITEM BY ASTM, UL, NEMA, ASA, AND NFPA.

1.03 ALL ELECTRICAL WORK SHALL COMPLY WITH ALL APPLICABLE STATE, COUNTY, AND MUNICIPAL CODES AND ORDINANCES, AS WELL AS ALL CURRENT GOVERNING STANDARDS AND PRACTICES AS REQUIRED BY NEC, NEMA, ANSI, NFPA, UBC, UL, IEEE, AND THE LOCAL UTILITY COMPANY.

1.04 ALL ELECTRICAL GROUNDING SHALL COMPLY WITH THE CURRENT EDITION OF THE NEC.

1.05 CONTRACTOR SHALL MAINTAIN UL LISTED FIRE RATINGS AT ALL WALL PENETRATIONS.

1.06 CONTRACTOR SHALL MAINTAIN A MINIMUM CLEARANCE OF 36" IN FRONT OF ALL ELECTRICAL EQUIPMENT AS REQUIRED BY NEC. MINIMUM CLEARANCE SHALL BE OBSERVED FOR BOTH THE FRONT AND THE REAR OF THE METER H-FRAME RACK AND THE EQUIPMENT H-FRAME RACK.

2.00 GENERAL

2.01 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND ASSOCIATED FEES RELATED TO THE PROJECT AND SHALL DELIVER A COPY OF ALL PERMITS TO THE VERIZON REPRESENTATIVE.

2.02 CONTRACTOR SHALL SCHEDULE AND SHOULD ATTEND ALL INSPECTIONS REQUIRED BY THE JURISDICTION HAVING AUTHORITY.

2.03 CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, ACCESSORIES, ETC., FOR A COMPLETE WORKING ELECTRICAL INSTALLATION.

2.04 ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER, AND SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

2.05 CONTRACTOR SHALL PROTECT ADJACENT EQUIPMENT AND FINISHES FROM DAMAGE AND SHALL REPAIR TO ORIGINAL CONDITION ANY ITEMS DAMAGED AS A RESULT OF THE WORK.

2.06 CONTRACTOR SHALL REPAIR ANY LANDSCAPING DISTURBED DURING CONSTRUCTION.

2.07 IF CONDUIT RUNS HAVE MORE THAN THREE (3) CONSECUTIVE 90 DEGREE TURNS, THE CONTRACTOR SHALL INSTALL PULL BOXES AS REQUIRED BY NEC.

2.08 CONTRACTOR SHALL INDICATE THE LOCATION OF ALL CAPPED UNDERGROUND SPARE CONDUIT ON THE RECORD DRAWINGS SUBMITTED TO THE OWNER.

2.09 CONTRACTOR SHALL COORDINATE EXACT ROUTING OF CONDUIT WITH OWNER. ALL CONDUIT SHALL BE ROUTED WITHIN 3 FEET, EITHER SIDE, OF PERIMETER FENCING.

3.00 MATERIALS

3.01 ALL EQUIPMENT AND MATERIALS SHOWN SHALL BE CONSIDERED NEW UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.

3.02 FINAL CONNECTIONS OF EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS, AND INSTRUCTIONS. THE ELECTRICAL CONTRACTOR SHALL PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT SUPPLIED BY VERIZON.

3.03 CONTRACTOR SHALL PROVIDE AN UPDATED PANELBOARD DIRECTORY FOR THE PANEL FROM WHICH THE NEW VERIZON EQUIPMENT CIRCUIT WILL BE CONNECTED. CONTRACTOR SHALL SUBMIT UPDATED DIRECTORY IN A PLASTIC COVER TO THE BUILDING OWNER FOR APPROVAL PRIOR TO INSTALLATION.

3.04 CONTRACTOR SHALL FIELD DETERMINE ACTUAL CONDUIT ROUTING AND SHALL OBTAIN APPROVAL FROM THE TOWER OWNER OF THE PROPOSED ROUTING PRIOR TO CONDUIT INSTALLATION.

3.05 ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION AND ALL TERMINATIONS SHALL BE RATED FOR AT LEAST 75 DEGREES CELSIUS.

3.06 ALL NEUTRAL CONDUCTORS SHALL HAVE WHITE INSULATION. ALL GROUND CONDUCTORS SHALL HAVE GREEN INSULATION. COLOR TAPE IDENTIFICATION OF THESE CONDUCTORS IS NOT PERMITTED.

3.07 CONTRACTOR SHALL SEAL ALL CONDUITS ENTERING AN ENCLOSURE WITH CONDUIT SEALANT THAT IS COMPATIBLE WITH THE INSULATION OF THE CONDUCTORS IN THE CONDUIT.

3.08 CONDUIT RUNS SHALL HAVE A CONTINUOUS DOWNWARD SLOPE AWAY FROM ALL EQUIPMENT TO PREVENT WATER INFILTRATION.

3.09 ALL CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS NOTED OTHERWISE ON THE PLANS. WHEN CONDUIT IS ROUTED UNDER A ROADWAY, SCHEDULE 80 PVC CONDUIT SHALL BE UTILIZED. MANUFACTURED BEND RADII SHALL BE PER NEC.

3.10 CONTRACTOR SHALL PROVIDE TWO (2) 200 POUND TEST POLYETHYLENE PULL CORDS IN ALL CONDUITS AND ALL INNERDUCTS. PULL CORDS SHALL BE SECURED AT EACH END OF CONDUIT RUNS. ALL SPARE CONDUIT ENDS SHALL BE CAPPED WITH MANUFACTURED PVC FITTINGS.

3.11 CONTRACTOR SHALL BOND EACH METALLIC CONDUIT ENTERING A METALLIC ENCLOSURE WITH A #8 MIN AWG INSULATED COPPER BONDING JUMPER PER NEC. CONTRACTOR SHALL BOND ALL ELECTRICAL EQUIPMENT TO THE H-FRAME RACK ON WHICH EQUIPMENT IS MOUNTED WITH #8 MIN AWG INSULATED COPPER BONDING JUMPERS PER NEC.

3.12 CONTRACTOR SHALL IDENTIFY THE END OF ALL SPARE UNDERGROUND CONDUITS AND PROVIDE AND INSTALL 90 DEGREE ELBOWS WITH VERTICAL CONDUIT EXTENSIONS TO EXTEND 3" ABOVE FINISHED CRUSHED AGGREGATE GRADE. CONTRACTOR SHALL TERMINATE CONDUITS WITH MANUFACTURED CONDUIT CAPS THAT THE CONTRACTOR HAS PAINTED ORANGE.

3.13 CONTRACTOR SHALL PROVIDE AND INSTALL AN ENGRAVED PHENOLIC PLATE ON THE FRONT OF THE INTEGRATED LOAD CENTER. THE WORDING ON THE PLATE SHALL READ AS FOLLOWS: "MAXIMUM DRAW OF ALL RECTIFIERS AND EQUIPMENT ON THE LOAD CENTER CANNOT EXCEED 50kW. IF ADDITIONAL POWER IS REQUIRED, THE EXISTING 50kW GENERATOR MUST BE REPLACED."

4.00 PRE-CONSTRUCTION COORDINATION

4.01 CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND NOTE EXISTING CONDITIONS THAT MIGHT AFFECT THEIR WORK. ALL SUCH CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO BID.

4.02 THE CONTRACTOR SHALL PROVIDE A UTILITY LOCATOR AND SHALL VERIFY THE ACTUAL LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

4.03 CONTRACTOR SHALL VERIFY, PRIOR TO ROUGH-IN, THAT SITE CONDITIONS ALLOW FOR THE PLACEMENT OF THE ELECTRICAL EQUIPMENT AS SHOWN ON THE PLANS.

4.04 CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRICAL UTILITY REGARDING THE EXACT LOCATION OF THE TRANSFORMER, ALL METERING REQUIREMENTS, AND CONDUIT ROUTING BETWEEN TRANSFORMER AND METER.

4.05 CONTRACTOR SHALL COORDINATE WITH LOCAL TELCO UTILITY REGARDING THE EXACT LOCATION OF THE TELCO SERVICE ENTRY POINT.

4.06 CONTRACTOR SHALL COORDINATE WITH AUTHORITY HAVING JURISDICTION REGARDING LOCAL FROST LINE REQUIREMENTS FOR RACEWAY MATERIAL SELECTION AND INSTALLATION.

4.07 CONTRACTOR SHALL PERFORM AN ARC FLASH ANALYSIS AT THE INTEGRATED LOAD CENTER AND PROVIDE ARC FLASH LABEL PER NEC.

4.08 ALL CIRCUIT BREAKERS AND EQUIPMENT SHALL HAVE A MINIMUM AIC RATING OF 10,000 AMPS. IF THE RATING OF THE UTILITY TRANSFORMER PROVIDING THE ELECTRICAL SERVICE IS GREATER THAN 75 kVA, THE CONTRACTOR SHALL PERFORM A SHORT CIRCUIT ANALYSIS TO DETERMINE THE REQUIRED AIC RATING FOR THE CIRCUIT BREAKERS AND EQUIPMENT. PRIOR TO PURCHASING EQUIPMENT, THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY AND OBTAIN IN WRITING THE MAXIMUM AVAILABLE FAULT CURRENT (AFC) AT THE UTILITY SERVICE POINT. PROVIDE MAX. AFC SIGNAGE AS REQUIRED PER NEC 110.24. THE CONTRACTOR SHALL ENSURE ALL ELECTRICAL EQUIPMENT, CIRCUIT BREAKERS, DISCONNECTS, FUSES, AND PANELBOARDS HAVE A FAULT CURRENT INTERRUPTING RATING GREATER THAN THE AVAILABLE FAULT CURRENT.

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LICENSER:

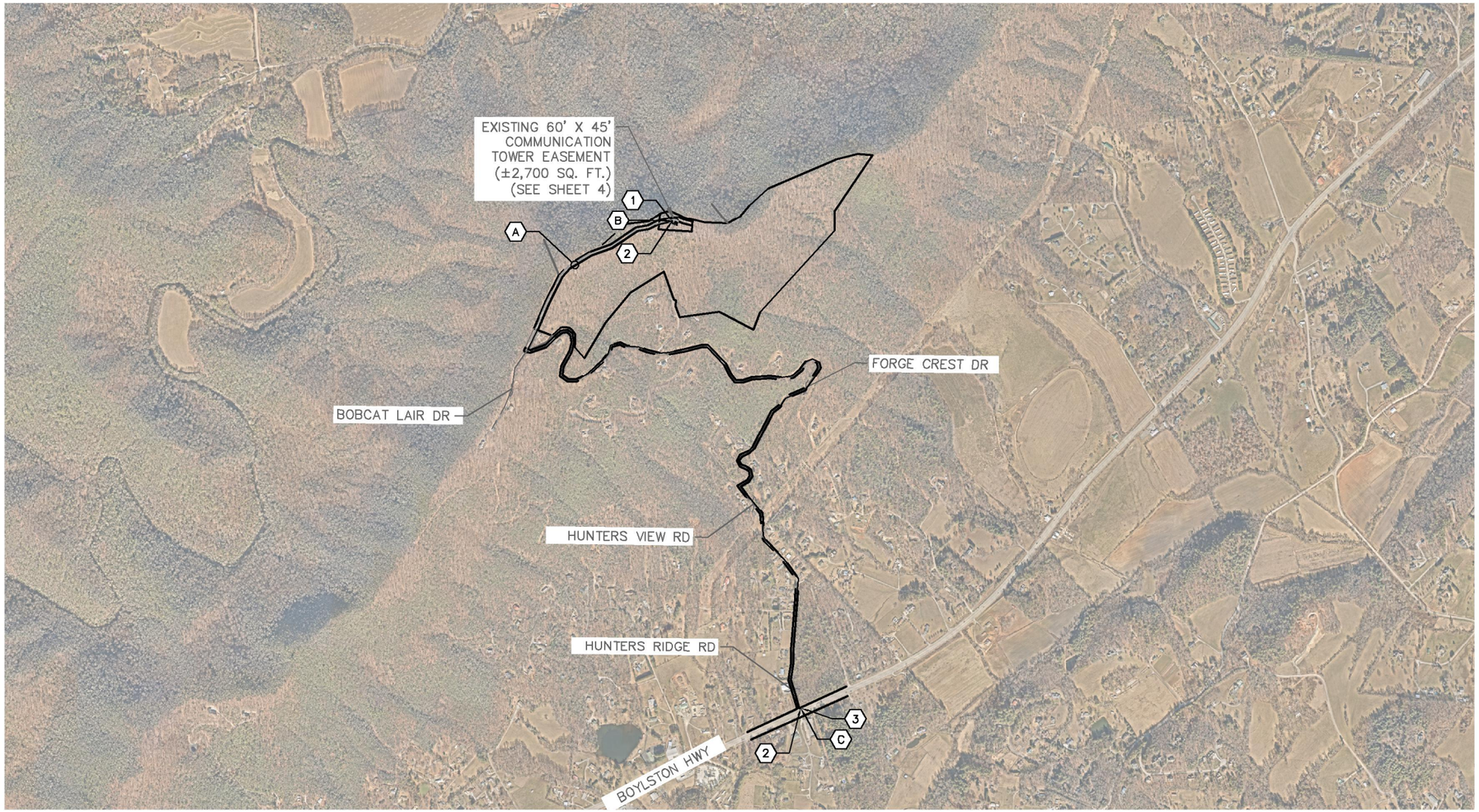
NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE: ELECTRICAL NOTES

SHEET NUMBER: E1



1/E2 OVERALL UTILITY SERVICE ROUTING PLAN

SCALE: 1" = 1,500'

NORTH

0 750 1500 3000

GRAPHIC SCALE: 1" = 1500'

KEY NOTES - ELECTRICAL EQUIPMENT

1. EXISTING LIT–FIBER HANDHOLE/PEDESTAL.
2. TRAFFIC RATED TELCO VAULT LABELED "VZW FIBER". (SPACED EVERY 500', AT MAJOR TRANSITIONS, AND AS NEEDED TO ALLOW DARK FIBER TO BE PULLED)(SEE NOTE 4.05 ON SHEET E1)
3. EXISTING ONE FIBER HANDHOLE (CONTRACTOR TO CONFIRM EXISTENCE AND LOCATION)

KEY NOTES - CONDUIT, CONDUCTORS, & MISC.

A. TWO (2) 2" PVC CONDUIT FOR "VZW FIBER" WITH TWO (2) PULL ROPES. (SEE DETAIL 2/E3); (APPROXIMATELY 12,274± LF); GENERAL CONTRACTOR TO CONFIRM NEED FOR CONDUITS TO RIGHT OF WAY AND HANDHOLE AT RIGHT OF WAY WITH VERIZON CONSTRUCTION MANAGER.

B. 4" PVC BRIDGE FIBER CONDUIT. (IF NO EXISTING LIT FIBER HANDHOLE/PEDESTAL IS PRESENT CONTRACTOR TO PROVIDER A 5' LONG CAPPED STUB BRIDGE CONDUIT).

C. 4" PVC BRIDGE FIBER CONDUIT. (IF NO EXISTING ONE FIBER HANDHOLE IS PRESENT, BRIDGE CONDUIT WILL BE BY OTHERS)

NOTES:

GENERAL CONTRACTOR IS TO CONFIRM WITH VERIZON CONSTRUCTION MANAGER WHETHER INSTALLATION OF THE TWO (2) 2" CONDUITS WILL BE PART OF THE INITIAL CONSTRUCTION.

PROPOSED VERIZON TELCO VAULT WITHIN RIGHT OF WAY LOCATED APPROXIMATELY 35° 20' 56.50"N, 82° 36' 51.30"W BASED ON GOOGLE EARTH IMAGERY.

HENDERSON COUNTY

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE: OVERALL UTILITY SERVICE ROUTING PLAN

SHEET NUMBER: E2

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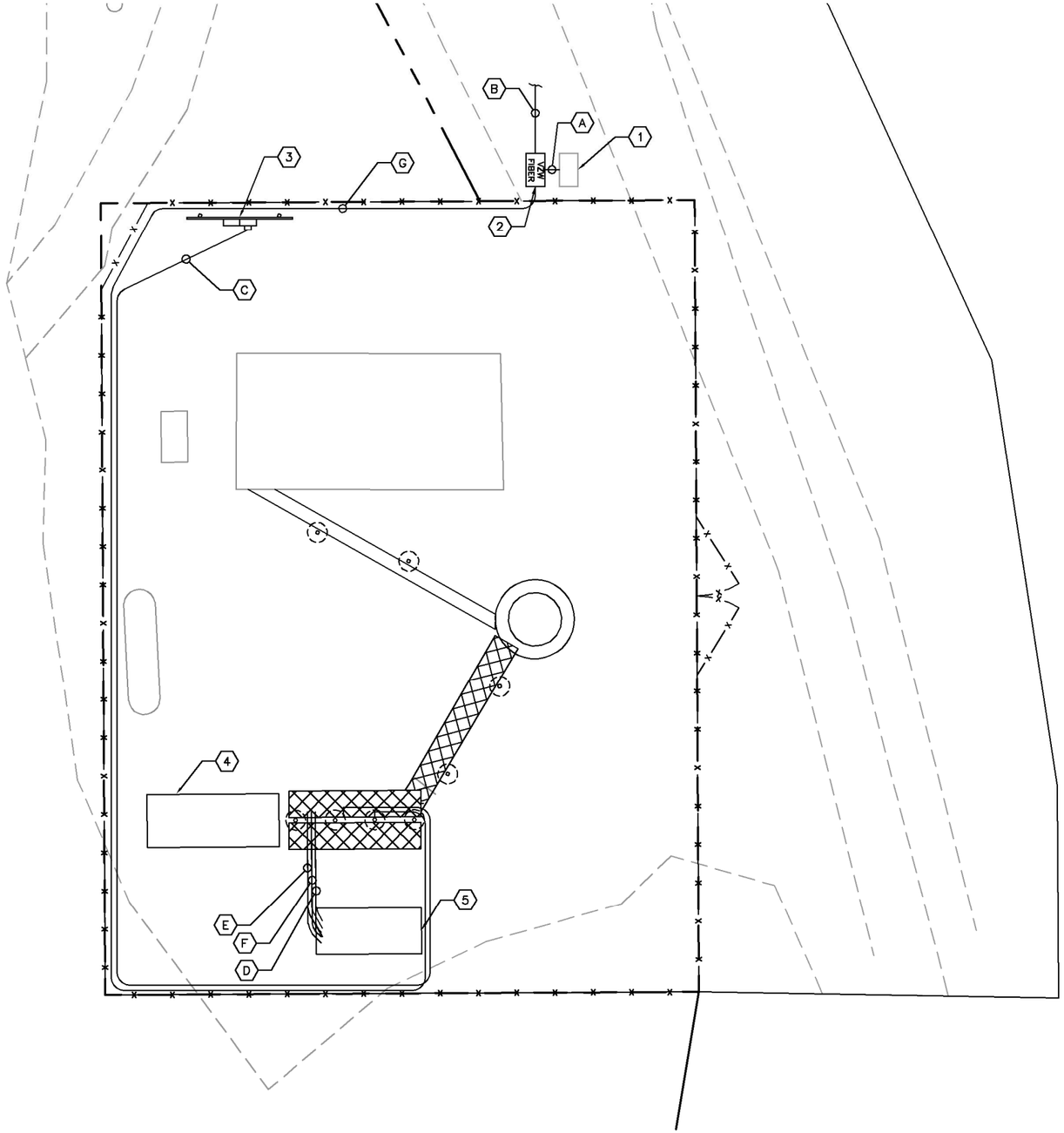

1 E2.1 UTILITY SERVICE ROUTING PLAN

SCALE: 1" = 10'

KEY NOTES - ELECTRICAL EQUIPMENT

1. EXISTING LIT FIBER HANDHOLE/PEDESTAL. (CONTRACTOR TO CONFIRM EXISTENCE AND LOCATION).
2. TRAFFIC RATED TELCO VAULT LABELED "VZW FIBER". (SEE NOTE 4.05 ON SHEET E1)
3. PROPOSED METER RACK (SEE SHEET E3.1)
4. VERIZON CONCRETE EQUIPMENT PAD (SEE SHEET C6).
5. VERIZON CONCRETE GENERATOR PAD (SEE SHEET C6).

KEY NOTES - CONDUIT, CONDUCTORS, & MISC.

- A. 4" PVC BRIDGE FIBER CONDUIT. (IF NO EXISTING LIT FIBER HANDHOLE/PEDESTAL IS PRESENT CONTRACTOR TO PROVIDE A 5' LONG CAPPED STUB BRIDGE CONDUIT).
- B. TWO (2) 2" PVC TELCO CONDUIT, WITH TWO (2) PULL ROPES. CONDUIT TO BE STUBBED UP 36" AND CAPPED AT EQUIPMENT RACK (SEE TRENCH DETAIL 2/E5).
- C. 2" PVC POWER CONDUIT FROM NEW METER RACK TO EQUIPMENT RACK. CONDUIT TO BE STUBBED UP 36" AND CAPPED. (SEE TRENCH DETAIL 2/E5).
- D. 2" PVC CONDUIT FOR ROUTING POWER CONDUCTOR TO THE GENERATOR. CONDUIT TO BE STUBBED UP 18" AND CAPPED. (SEE TRENCH DETAIL 2/E5).
- E. 1" PVC CONDUIT FOR ROUTING GENERATOR CONTROL AND ALARM SIGNAL CABLES TO THE GENERATOR. CONDUIT TO BE STUBBED UP 18" AND CAPPED. (SEE TRENCH DETAIL 2/E5).
- F. 1" PVC CONDUIT FOR ROUTING POWER CONDUCTOR TO THE GENERATOR BATTERY CHARGER AND THE GENERATOR BLOCK HEATER. CONDUIT TO BE STUBBED UP 18" AND CAPPED. (SEE TRENCH DETAIL 2/E5).
- G. TWO (2) 2" PVC CONDUITS FROM RIGHT OF WAY W/TWO (2) PULL ROPES (SEE TRENCH DETAIL 2/E5 AND SHEET E2).

NOTES:

GENERAL CONTRACTOR IS TO CONFIRM WITH VERIZON CONSTRUCTION MANAGER WHETHER INSTALLATION OF THE TWO (2) 2" CONDUITS TO THE RIGHT OF WAY WILL BE PART OF THE INITIAL CONSTRUCTION.

NORTH

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GRAPHIC SCALE: 1" = 10'

HENDERSON COUNTY

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DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE: UTILITY SERVICE ROUTING PLAN

SHEET NUMBER: E2.1

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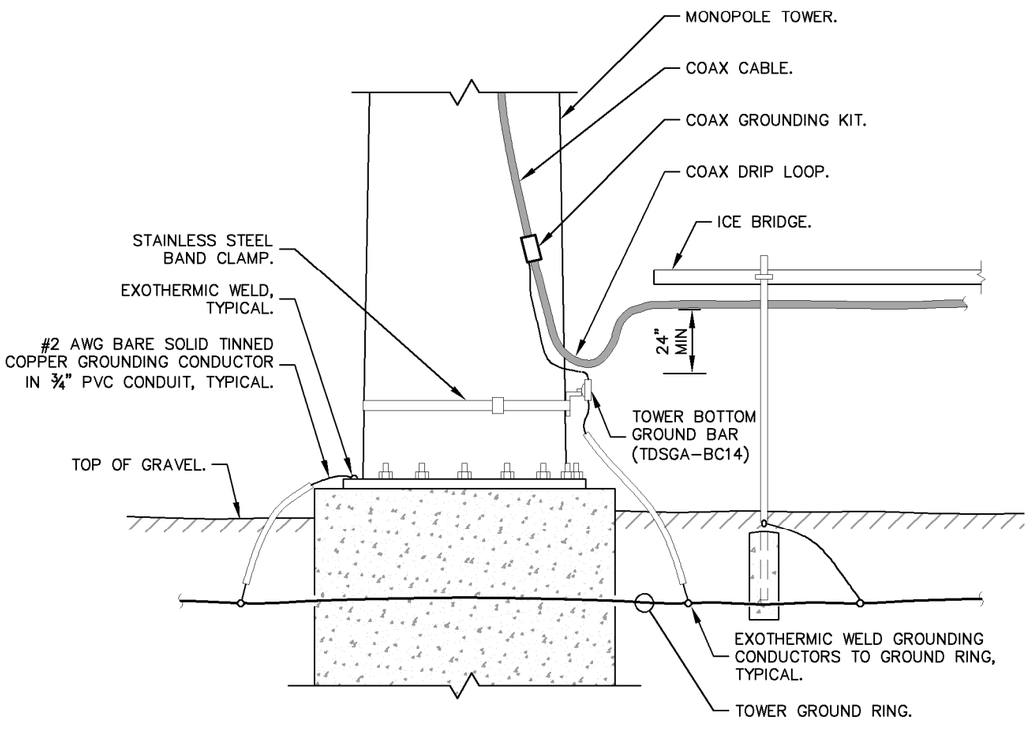

1 E3 DRIP LOOP DETAIL

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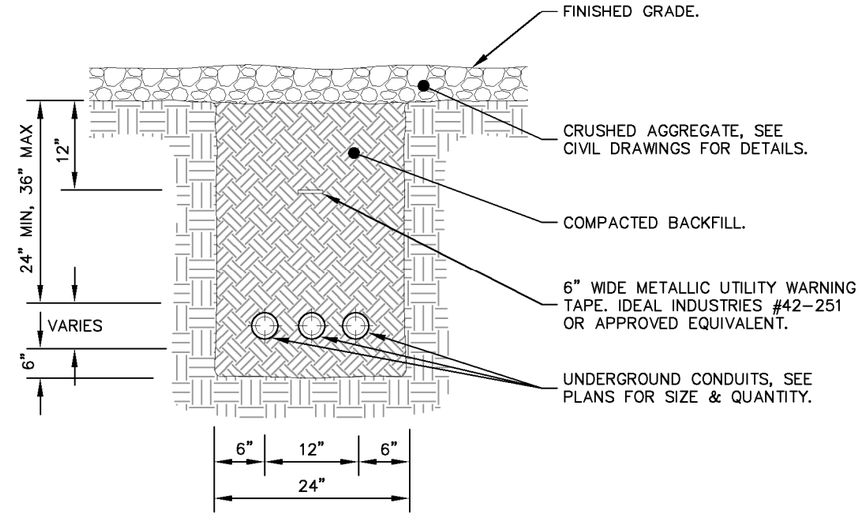

NOTES:
1. IF GROUND SURFACE IS OTHER THAN NEWLY GRAVELED AREA. CONTRACTOR IS TO RESTORE TO ORIGINAL CONDITION.
2. PROVIDE PVC CONDUIT BELOW GRADE EXCEPT AS NOTED BELOW.
3. PROVIDE SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT & ELBOWS AT STUB UP LOCATIONS (I.E. POLES, EQUIPMENT, ETC.)
4. PROVIDE SCHEDULE 80 PVC CONDUIT BELOW PARKING LOTS AND ROADWAYS.

2 E3 TYPICAL TRENCH DETAIL

NOT TO SCALE

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KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE:
ELECTRICAL DETAILS

SHEET NUMBER:
E3

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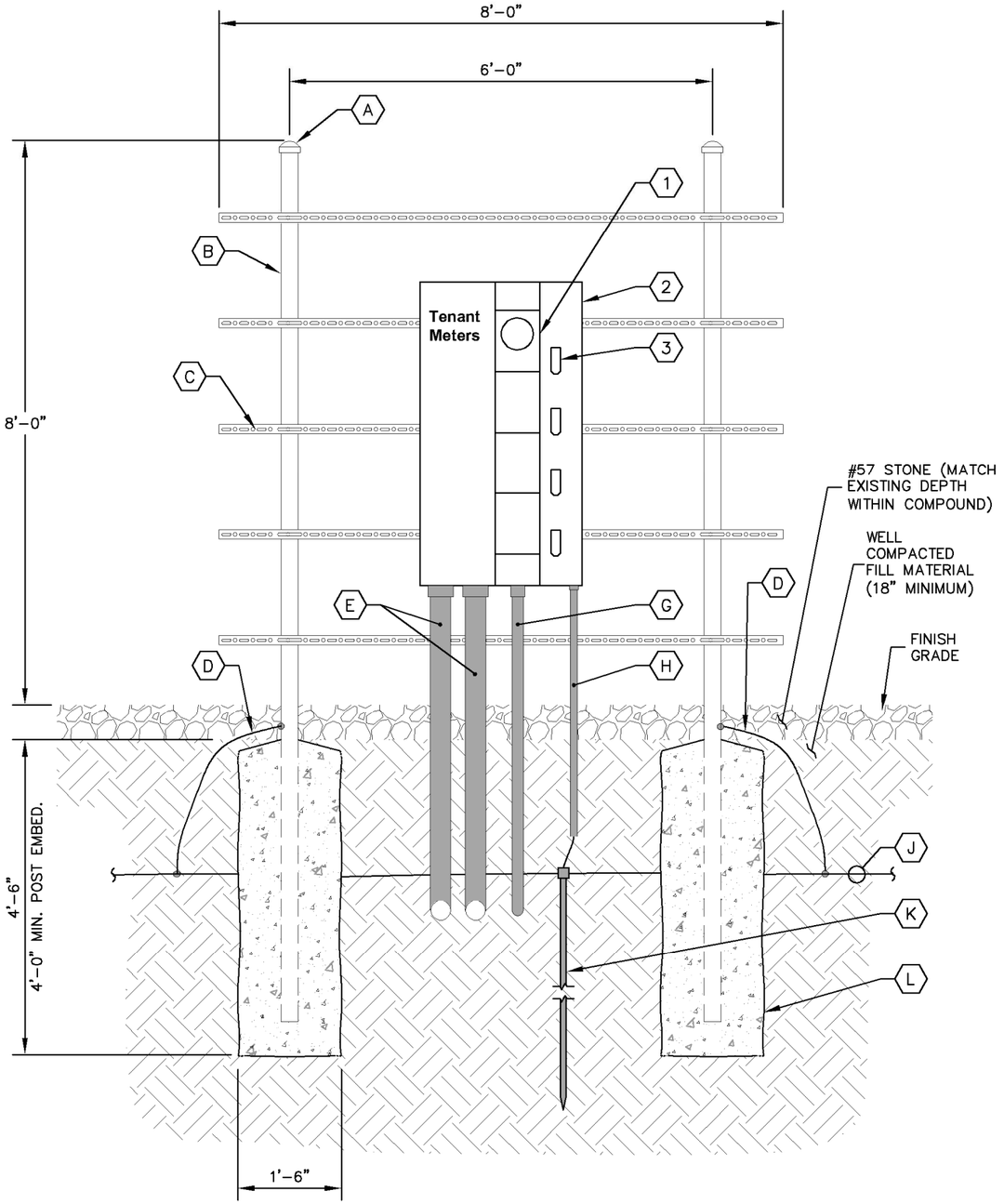

1 E3.1 METER RACK DETAILS

NOT TO SCALE

KEY NOTES - CONDUIT, CONDUCTORS, & MISC

A. GALVANIZED RIGID STEEL CAP, TYPICAL.

B. 3" GALVANIZED RIGID STEEL PIPE, TYPICAL.

C. 1⅝" x 1⅝" GALVANIZED STEEL CHANNEL (UNISTRUT #P1000 OR APPROVED EQUIVALENT) WITH PLASTIC END CAP (UNISTRUT #P2860), TYPICAL.

D. ONE (1) #2 AWG BARE SOLID TINNED COPPER BONDING CONDUCTORS (BC) FROM H-FRAME VERTICAL PIPE TO GROUND RING, EXOTHERMIC WELD BOTH ENDS.

E. 4" PVC CONDUIT FOR INCOMING SERVICE LATERALS FROM LOCAL UTILITY, TYPICAL OF 2.

F. KEYNOTE NOT USED.

G. 2" PVC CONDUIT FOR ROUTING FEEDERS TO NON-FUSED DISCONNECT SWITCH.

H. ¾" PVC CONDUIT WITH ONE (1) - 2/0 BARE STRANDED TINNED COPPER GROUNDING ELECTRODE CONDUCTOR (GEC) FROM GROUNDING LUG TO GROUND ROD, EXOTHERMIC WELD GEC TO GROUND ROD.

J. GROUND RING (SEE "E" SHEETS).

K. GROUND ROD, EXOTHERMIC WELD TO GROUND RING. (SEE "E" SHEETS).

L. CONCRETE FOUNDATION FOR H-FRAME VERTICAL PIPE. CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI. AND INCLUDE FIBERMESH 650-3E.

KEY NOTES - ELECTRICAL EQUIPMENT

1. 200 AMP METER SOCKET IN NEMA 3R ENCLOSURE, TYPICAL OF 4. ONLY TOP SOCKET WILL RECEIVE METER UNDER THIS CONTRACT.

2. 800 AMP, 22KAIC, 4 GANG, SERVICE ENTRANCE RATED METER CENTER IN NEMA 3R ENCLOSURE. BOND TO RACK PER NEC.

3. 200 AMP, 2 POLE (22KAIC) DISCONNECT CIRCUIT BREAKER FOR TOP METER ONLY. CONTRACTOR SHALL MOUNT THE METER CENTER SUCH THAT THE TOP CIRCUIT BREAKER IS NO MORE THAN 6' ABOVE GRADE.

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
METER RACK DETAILS

SHEET NUMBER:
E3.1

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GROUNDING NOTES

1. THE GROUND RING SHALL CONSIST OF #2 AWG BARE SOLID TINNED COPPER (STC) CONDUCTOR, UNLESS NOTED OTHERWISE, BURIED AT 30" BELOW FINISHED GRADE (OR BELOW FROST LINE). LOCATE 24" MINIMUM AND 36" MAXIMUM FROM EQUIPMENT PAD AND FROM TOWER FOUNDATION. ALL CONNECTIONS SHALL BE MADE USING A PARALLEL TYPE EXOTHERMIC WELD, UNLESS NOTED OTHERWISE. WHERE THE GROUND RING DISTURBS EXISTING SITE GROUNDING, CONNECT GROUND RING TO EXISTING SITE CONDUCTORS SO AS TO MAINTAIN THE CONTINUITY OF THE EXISTING GROUND SYSTEM.

2. INSTALL GROUND RODS AS SHOWN AND AS REQUIRED. GROUND RODS TO BE COPPER CLAD STEEL, 5/8" DIAMETER AND 10FT IN LENGTH. SPACING BETWEEN GROUND RODS SHALL BE 10FT MINIMUM AND 15FT MAXIMUM. TOP OF GROUND ROD TO BE 30" MINIMUM BELOW GRADE (OR BELOW FROST LINE). BOND TOP OF GROUND ROD TO GROUND WIRE WITH EXOTHERMIC WELD. DO NOT EXOTHERMICALLY WELD ANYTHING TO GROUND ROD EXCEPT GROUND WIRE WHICH PASSES OVER TOP OF GROUND ROD (CLAMPED CONNECTIONS TO GROUND ROD PER TOWER MANUFACTURERS DETAILS ARE ACCEPTABLE).

3. EQUIPMENT GROUND RING SHALL HAVE A MINIMUM OF 4 GROUND RODS, INSTALLED AT THE CORNERS OF THE GROUND RING PLUS ADDITIONAL RODS AS REQUIRED TO COMPLY WITH THE SPACING REQUIREMENTS.

4. EQUIPMENT GROUND RING AND TOWER GROUND RING SHALL BE BONDED TOGETHER WITH TWO #2 STC GROUND LEADS, TYPICALLY ONE ON EACH SIDE OF ICE BRIDGE.

5. MINIMUM BEND RADIUS FOR #2 AWG GROUND WIRE IS 12", EXCEPT USE 24" FOR EQUIPMENT PAD GROUND RINGS.

6. GROUND ALL EXTERIOR EXPOSED METAL OBJECTS. USE TWO HOLE LUGS FOR CONNECTION TO FLAT METAL SURFACES. USE ONLY STAINLESS STEEL HARDWARE ON ALL MECHANICAL CONNECTIONS. CLEAN ALL SURFACES (AND STRIP PAINTED SURFACES) TO BARE BRIGHT METAL PRIOR TO MAKING GROUND CONNECTIONS. APPLY ANTI-OXIDE COMPOUND TO ALL CONNECTIONS. APPLY ZINC RICH PAINT (COLD GALV.) TO ALL EXOTHERMIC WELDS, AND TO ANY METAL EXPOSED BY CLEANING, STRIPPING, GRINDING, CUTTING OR DRILLING.

7. ALL GROUNDING CONDUCTORS ABOVE GRADE SHALL BE RUN IN 3/4" FLEXIBLE PVC CONDUIT. CONDUIT SHALL BEGIN WITHIN 3/4" OF ABOVE GROUND CONNECTION POINT, SHALL EXTEND 24" BELOW GRADE MINIMUM, AND SHALL BE FILLED WITH SEALANT AT ABOVE GROUND CONNECTION POINT. SECURE CONDUIT EVERY 24" ON VERTICAL RUNS AND EVERY 36" ELSEWHERE WITH NON-METALLIC TIES.

8A. AT GUYED AND SELF SUPPORT TOWERS MOUNT TDSGA-PA14 TOWER BOTTOM GROUND BAR ON DEDICATED POST DIRECTLY BELOW COAX CABLES COMING OFF TOWER. POST TO BE 3.5" OD GALVANIZED SCHEDULE 40 PIPE WITH GALVANIZED PIPE CAP. TOP OF POST TO BE 78" ABOVE GRADE. EMBED POST 30" MINIMUM IN 12" DIAMETER BY 36" DEEP MINIMUM CONCRETE FOOTING WITH TOP OF FOOTING 6" BELOW GRADE. IF TOWER FOUNDATION OBSTRUCTS AUGERED FOOTING, USE POST WITH 10" SQUARE GALVANIZED STEEL FLANGE PLATE WELDED TO BOTTOM AND BOLT FLANGE TO TOP OF CONCRETE TOWER FOOTING.

8B. AT MONOPOLE TOWERS CLAMP TDSGA-BC14 TOWER BOTTOM GROUND BAR DIRECTLY TO TOWER. IF RUNNING COAX INSIDE MONOPOLE, CLAMP ONTO BOTTOM LIP OF EXIT PORT. IF BANDING COAX TO OUTSIDE OF TOWER, CLAMP ONTO STEEL ANGLE WHICH IS BANDED TO TOWER. BOND TDSGA-BC14 TO TOWER GROUND RING WITH TWO #2 STC LEADS LUGGED TO GROUND BAR AND EXOTHERMICALLY WELDED TO GROUND RING.

9. AT EQUIPMENT AREA, INSTALL TDSGA-PA14 EXTERIOR GROUND BAR (THRU-BOLTED STYLE) AT BASE OF (2) INTERIOR H-FRAME POSTS AND AT TOP OF ICE BRIDGE POST WHICH IS NEAREST TO (BUT CLOSER TO TOWER THAN) THE COAX CABLE TERMINATION. MOUNT GROUND BAR TO H-FRAME POSTS AT 6" ABOVE GRAVEL AND TO ICE BRIDGE POST AT 6FT ABOVE GRAVEL.

10. ALL ICE BRIDGE SECTIONS ARE TO BE JUMPERED TOGETHER WITH #2 WIRE, EITHER BARE TINNED COPPER OR GREEN INSULATED STRANDED. ICE BRIDGE SHALL BE GROUNDED AT EACH END WITH #2 STC WIRE LUGGED TO ICE BRIDGE AND EXOTHERMICALLY WELDED TO UPPER PORTION OF NEAREST ICE BRIDGE POST. ICE BRIDGE SECTIONS ABOVE H-FRAME SHALL BE BONDED TO EACH OTHER WITH JUMPERS AT EACH END - THIS ASSEMBLY WILL BE CONSIDERED AS A SINGLE ICE BRIDGE SECTION FOR GROUNDING PURPOSES.

11. BOND EACH ICE BRIDGE POST, H-FRAME POST OR DEDICATED GROUNDING POST TO BURIED GROUNDING SYSTEM WITH #2 STC LEAD EXOTHERMICALLY WELDED TO POST BELOW TOP OF GRAVEL AND EXOTHERMICALLY WELDED TO GROUND RING. EACH POST TO HAVE SEPARATE GROUND LEAD DIRECTLY TO GROUND RING - DO NOT DAISY CHAIN POSTS TOGETHER.

12. BOND EACH RF CABINET TO EQUIPMENT GROUND RING WITH #2 AWG TINNED SOLID BARE COPPER CONDUCTOR LUGGED TO CABINET BODY AND EXOTHERMICALLY WELDED TO GROUND RING. LUG TO CABINET BODY USING LOCATION AT WHICH STUDS ON CABINET CHASSIS HAVE DIRECT GROUND WIRE CONNECTION TO CABINET INTERNAL GROUND BAR. RUN CONDUIT AND CONDUCTOR ACROSS BACK OF CABINET (DO NOT RUN TOWARDS NEAREST CORNER OF CABINET AND THEN BEND GROUND WIRE SHARPLY), ACROSS CONCRETE PAD BELOW CABLE LADDER, THEN DOWN INTO GRAVEL AREA.

13. BOND EACH BATTERY CABINET TO GROUND RING WITH #2 AWG TINNED SOLID BARE COPPER CONDUCTOR LUGGED TO CABINET BODY AND EXOTHERMICALLY WELDED TO GROUND RING. RUN GROUND LEAD IN FLEX CONDUIT ALONG BACK OF RBA72 CABINET, ACROSS CONCRETE PAD BELOW CABLE LADDER, THEN DOWN INTO GRAVEL AREA. CONNECT TWO HOLE LUG TO BACK OF CABINET AT FACTORY PROVIDED GROUNDING STUDS.

14. BOND GENERATOR TO GROUND RING WITH #2 STC AT TWO DIAGONALLY OPPOSITE LOCATIONS BY DRILLING AND BOLTING TWO HOLE LUG TO FINS ON GENERATOR BASE STRUCTURE. GROUND LEADS SHOULD TAKE SHORTEST PATH ACROSS CONCRETE PAD TO GRAVEL AREA, THEN CONTINUE TO GROUND RING.

15. WHERE PROPANE TANK IS INSTALLED TO FUEL GENERATOR, BOND PROPANE TANK TO GROUND RING WITH A SINGLE #2 STC CLAMPED TO FILLER PIPE OF PROPANE TANK AND EXOTHERMICALLY WELDED TO GROUND RING. GROUND LEAD SHOULD RUN TO TANK SUPPORT AND TAKE SHORTEST PATH ACROSS CONCRETE PAD TO GRAVEL AREA, THEN CONTINUE TO GROUND RING. IF PROPANE TANK FUEL LINE IS METALLIC AND CROSSES EQUIPMENT GROUND RING, BOND FUEL LINE TO EQUIPMENT GROUND RING WHERE THE TWO LINES CROSS WITH A SINGLE #2 STC CLAMPED TO FUEL LINE AND EXOTHERMICALLY WELDED TO GROUND RING.

16. BOND GPS ANTENNA AND GPS ANTENNA MOUNT TO TSDGA GROUND BAR AT BOTTOM OF H-FRAME POST WITH #2 GREEN INSULATED STRANDED GROUND WIRE.

17. ANY METAL FENCE POST WITHIN 6FT OF A GROUNDED METAL OBJECT SHALL BE BONDED TO THE EQUIPMENT GROUND RING WITH #2 STC CLAMPED OR EXOTHERMICALLY WELDED TO THE POST AND EXOTHERMICALLY WELDED TO GROUND RING. ANY FENCE WITH METAL LINE POSTS WITHIN 6FT OF THE GROUND RING SHALL HAVE THE LINE POSTS BONDED TO THE GROUND RING WITH #2 STC WITH #2 STC CLAMPED OR EXOTHERMICALLY WELDED TO THE POST AND EXOTHERMICALLY WELDED TO GROUND RING AT 20FT MAXIMUM INTERVALS AS MEASURED ALONG THE LENGTH OF THE FENCE.

18. WHERE GROUND BASED RRU'S, RAYCAP OVP'S OR DIPLEXERS ARE INSTALLED AT THE EQUIPMENT AREA, BOND EACH COMPONENT TO NEAREST TDSGA GROUND BAR BELOW THE COMPONENT WITH #2 GREEN INSULATED STRANDED GROUND WIRE. SINGLE HOLE LUG OR RING TYPE CONNECTOR IS SUITABLE FOR CONNECTION TO GROUNDING STUD ON EACH COMPONENT.

19. NOTIFY VZW CM TO INSPECT GROUND RING BEFORE BACKFILLING. CONTRACTOR SHALL HIRE A 3RD PARTY TO PERFORM AN IEEE81 FALL OF POTENTIAL METHOD GROUND TEST. MAXIMUM ALLOWABLE RESISTANCE TO GROUND IS 5 OHMS. PROVIDE ADDITIONAL GROUND SYSTEM COMPONENTS AS REQUIRED TO ACHIEVE THIS VALUE.

20. REFER TO TOWER GROUNDING DIAGRAM AND NOTES FOR GROUND SYSTEM REQUIREMENTS ON THE TOWER.

21. GROUNDING OF ALL ELECTRICAL EQUIPMENT SHALL BE AS PER NEC MUNICIPAL AND UTILITY COMPANY REQUIREMENTS.

HENDERSON COUNTY

PROJECT INFORMATION:

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HENDERSON COUNTY TOWER
SITE No.: 639642
PROJECT #: 20202154476
469 S FORGE CREST DR
MILLS RIVER, NC 28759
HENDERSON COUNTY

PLANS PREPARED BY:

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
GROUNDING NOTES

SHEET NUMBER:
E4

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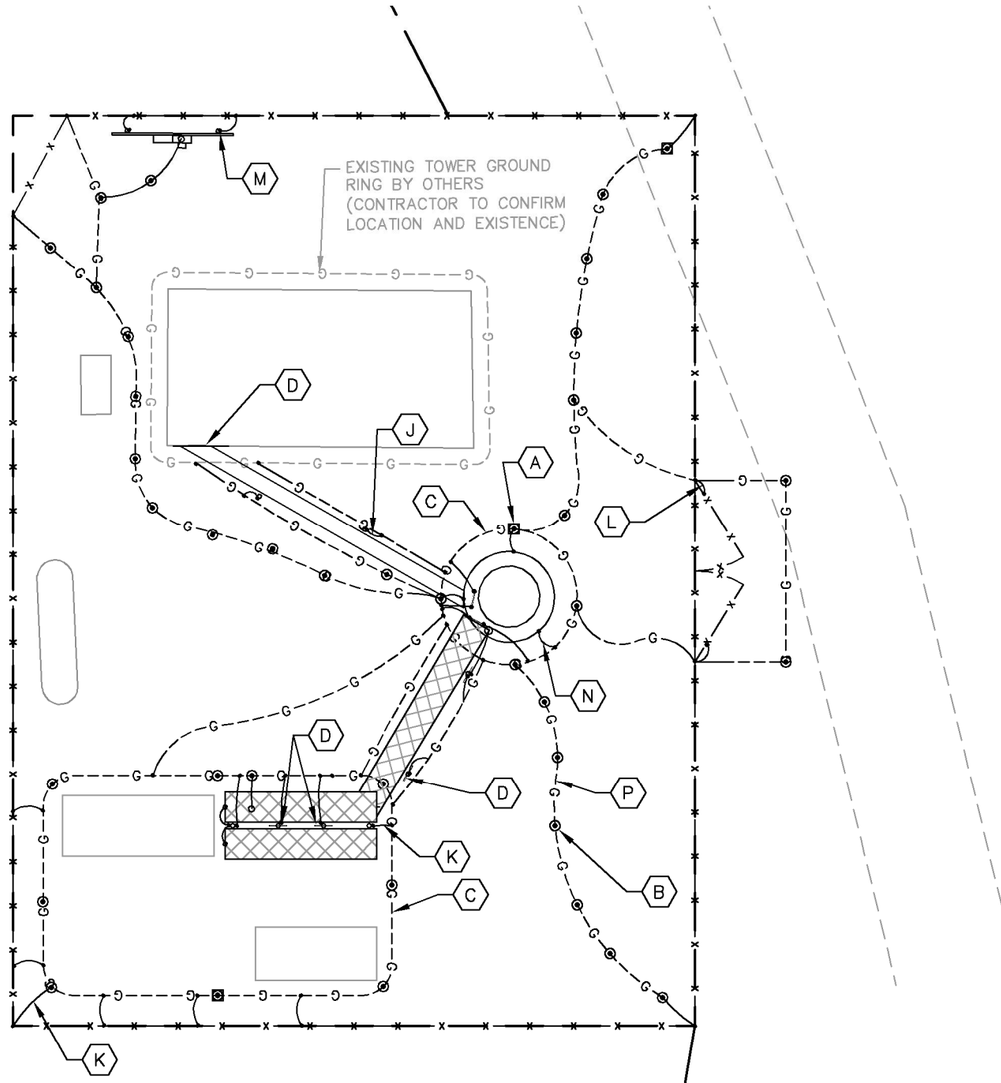

1 / E5 GROUNDING PLAN

SCALE: 1" = 10'

KEY NOTES - GROUNDING EQUIPMENT

(A) GROUND ROD TEST WELL (SEE DETAIL 1/E7).

(B) GROUND ROD, TYPICAL (SEE DETAIL 2/E10 AND NOTES 2 AND 3 ON E4).

(C) TOWER AND EQUIPMENT GROUND RING (SEE NOTES 1, 3, 4, 5, 6 AND 7 ON E4).

(D) TDSGA–PA14 OR TDSGA–BC14 WHERE APPLICABLE (SEE NOTES 10 AND 11 ON E4).

(J) ICE BRIDGE POST BOND TO GROUND RING, TYPICAL (SEE NOTES 12 AND 13 ON E4).

(K) FENCE POST GROUNDING, TYPICAL. (SEE NOTE 22 ON E4).

(L) GATE GROUNDING, TYPICAL. (SEE NOTES 19, 20 & 21 ON E4).

(M) UTILITY H–FRAME GROUNDING, TYPICAL. (SEE SHEET E3 AND NOTE 13 ON E4).

(N) TOWER GROUNDING, TYPICAL. (SEE NOTES 5, 6 & 25 ON E4).

(P) GROUND RADIALS, TYPICAL (SEE NOTE 6 ON E4).

(Q) REFER TO SHEETS E7, E9, E10 & E11 FOR GROUNDING NOTES, DETAILS, AND SPECIFICATIONS.

LEGEND:

----G----G----	GROUND RING
----G-⊙-G----	GROUND ROD EXOTHERMICALLY WELDED TO GROUND RING
●	EXOTHERMIC WELD
⊡	GROUND ROD TEST WELL (SEE DETAIL 1/E10)
~⊙	MECHANICAL CONNECTION

NORTH

0 5 10 20

GRAPHIC SCALE: 1" = 10'

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MILLS RIVER, NC 28759
HENDERSON COUNTY

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY: XQD | CHECKED BY: DMF

SHEET TITLE: GROUNDING PLAN

SHEET NUMBER: E5

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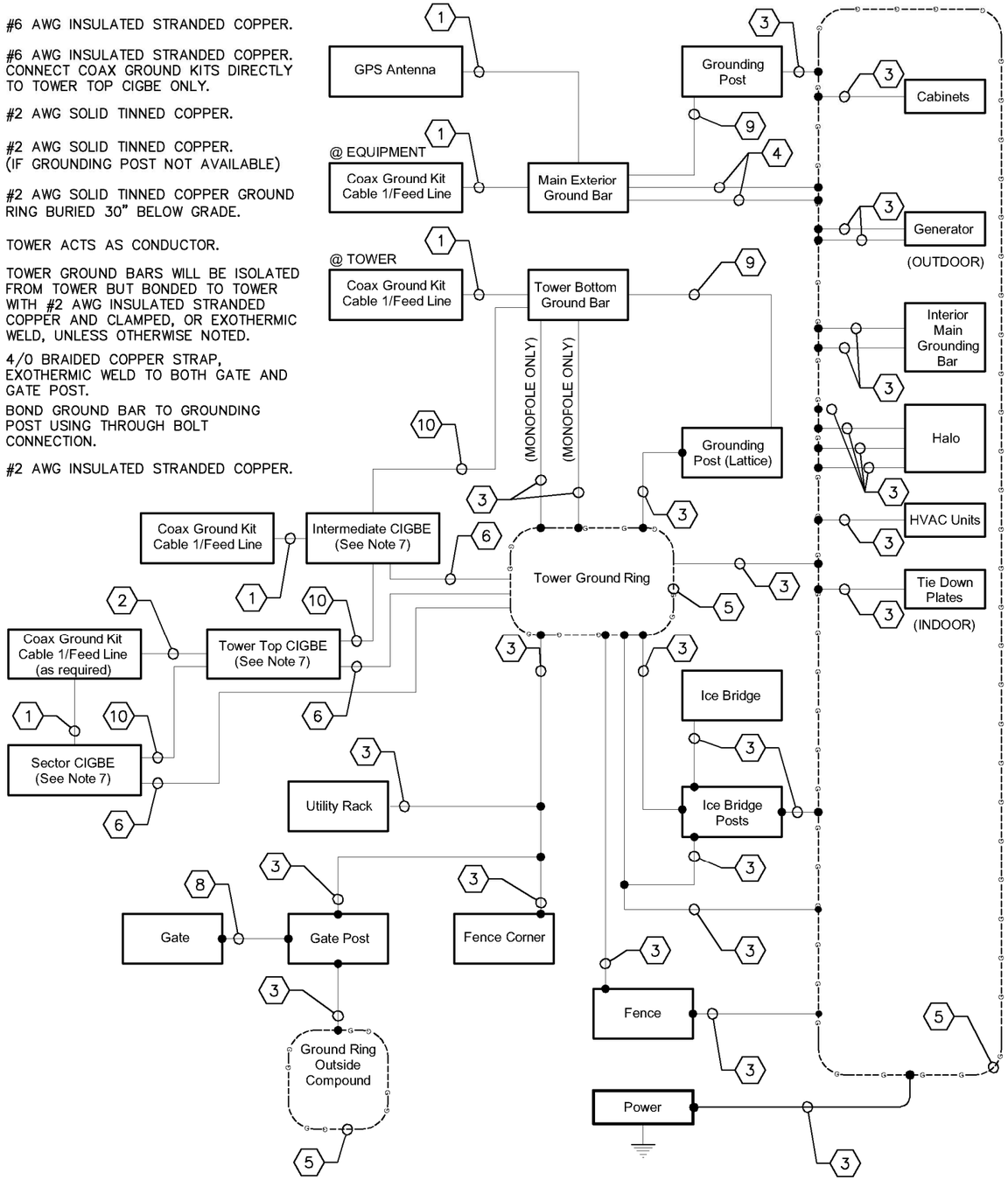
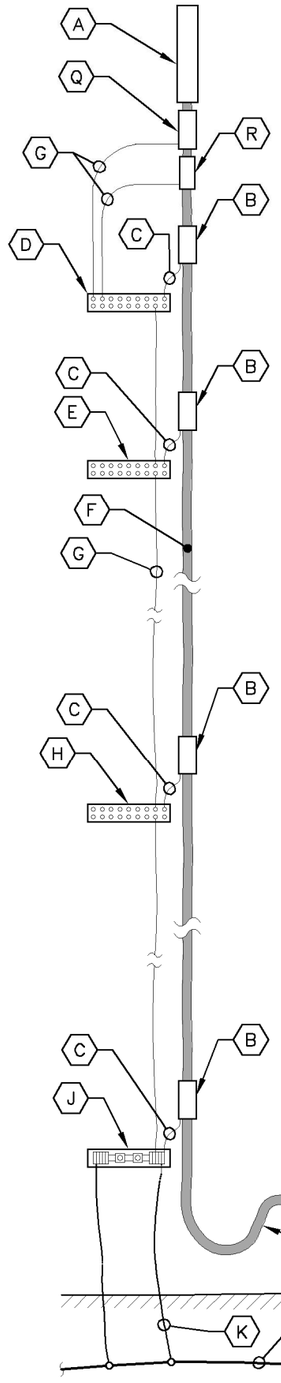
KEY NOTES - ELECTRICAL EQUIPMENT

1. #6 AWG INSULATED STRANDED COPPER.
2. #6 AWG INSULATED STRANDED COPPER. CONNECT COAX GROUND KITS DIRECTLY TO TOWER TOP CIGBE ONLY.
3. #2 AWG SOLID TINNED COPPER.
4. #2 AWG SOLID TINNED COPPER. (IF GROUNDING POST NOT AVAILABLE)
5. #2 AWG SOLID TINNED COPPER GROUND RING BURIED 30" BELOW GRADE.
6. TOWER ACTS AS CONDUCTOR.
7. TOWER GROUND BARS WILL BE ISOLATED FROM TOWER BUT BONDED TO TOWER WITH #2 AWG INSULATED STRANDED COPPER AND CLAMPED, OR EXOTHERMIC WELD, UNLESS OTHERWISE NOTED.
8. 4/0 BRAIDED COPPER STRAP, EXOTHERMIC WELD TO BOTH GATE AND GATE POST.
9. BOND GROUND BAR TO GROUNDING POST USING THROUGH BOLT CONNECTION.
10. #2 AWG INSULATED STRANDED COPPER.

NOTE:
1. HENDERSON COUNTY TO FURNISH AND INSTALL ANY GROUNDING REQUIRING GROUND DISTURBANCE.



1 GROUNDING SINGLE LINE DIAGRAM
NOT TO SCALE



KEY NOTES - CONDUIT, CONDUCTORS, & MISC

A. PROPOSED ANTENNA.

B. COAX OR HYBRID CABLE GROUNDING KIT, TYPICAL. GROUNDING KITS ARE REQUIRED EVERY 75 FT MAXIMUM EXCEPT WHERE COAX IS CONCEALED INSIDE MONOPOLE OR OTHER INACCESSIBLE SPACE.

C. #6 AWG INSULATED GROUNDING CONDUCTOR FROM COAX GROUND KIT TO TOWER GROUND BAR, TYPICAL.

D. SECTOR CIGBE GROUND BAR, PROVIDE ONE PER SECTOR NEXT TO ANTENNAS (OPTIONAL ON GUYED TOWERS) AND ISOLATED FROM TOWER. BOND TO TOWER OR SECTOR FRAME WITH #2 AWG SOLID TINNED COPPER AND APPROVED CLAMP. (SEE NOTE P BELOW)

E. TOWER TOP CIGBE GROUND BAR MOUNTED TO TOWER WHERE COAX CABLES LEAVE VERTICAL WAVE GUIDE SUPPORT OR COMMON CABLE TRAY. TYPICALLY OCCURS ON GUY TOWERS (IN LIEU OF SECTOR CIGBE'S), ROOFTOPS, OR ON WATER TANKS (THRU-BOLTED TO MESSENGER PIPE) IN ORDER TO MAINTAIN 75 FEET MAXIMUM DISTANCE BETWEEN COAX GROUND KITS. ISOLATE CIGBE FROM TOWER AND BOND TO TOWER WITH #2 AWG BARE SOLID TINNED COPPER AND APPROVED CLAMP. (SEE NOTE P BELOW)

F. COAX OR HYBRID CABLE.

G. #2 AWG INSULATED, STRANDED COPPER. (SEE NOTE P BELOW)

H. INTERMEDIATE CIGBE GROUND BAR MOUNTED TO TOWER BELOW AND WITHIN 3 FEET OF COAX GROUND KITS AND ISOLATED FROM TOWER (THRU-BOLTED TO MESSENGER PIPE ON WATER TANKS). BOND TO TOWER WITH #2 AWG BARE SOLID TINNED COPPER AND APPROVED CLAMP. (SEE NOTE P BELOW)

J. TOWER BOTTOM GROUND BAR TDSGA-PA14 ON DEDICATED STEEL POST WHERE POSSIBLE; OTHERWISE TDSGA-BC14 CLAMPED DIRECTLY TO TOWERS STEEL (THRU-BOLTED TO MESSENGER PIPE ON WATER TANKS).

K. #2 AWG BARE STRANDED TINNED COPPER GROUNDING CONDUCTOR WHEN USING TDSGA-BC14. TYPICAL TWO CONNECTIONS TO GROUND RING.

L. #2 AWG SOLID TINNED COPPER TOWER GROUND RING.

M. DRIP LOOP. (SEE DETAIL 1/E6)

N. TO SHELTER/RF CABINETS.

P. IF UNABLE TO CLAMP #2 AWG BARE SOLID TINNED COPPER TO METAL STRUCTURE, THEN RUN #2 AWG INSULATED STRANDED TINNED COPPER FROM CIGBE TO NEXT LOWEST CIGBE.

Q. PROPOSED RRU AND DIPLEXER (IF USED).

R. PROPOSED RAYCAP.

2 COAX-TOWER GROUNDING SCHEMATIC
NOT TO SCALE

HENDERSON COUNTY

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LICENSER:

NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER: 017848000

DRAWN BY:	CHECKED BY:
XQD	DMF

SHEET TITLE:
GROUNDING SINGLE LINE DIAGRAM

SHEET NUMBER:
E6

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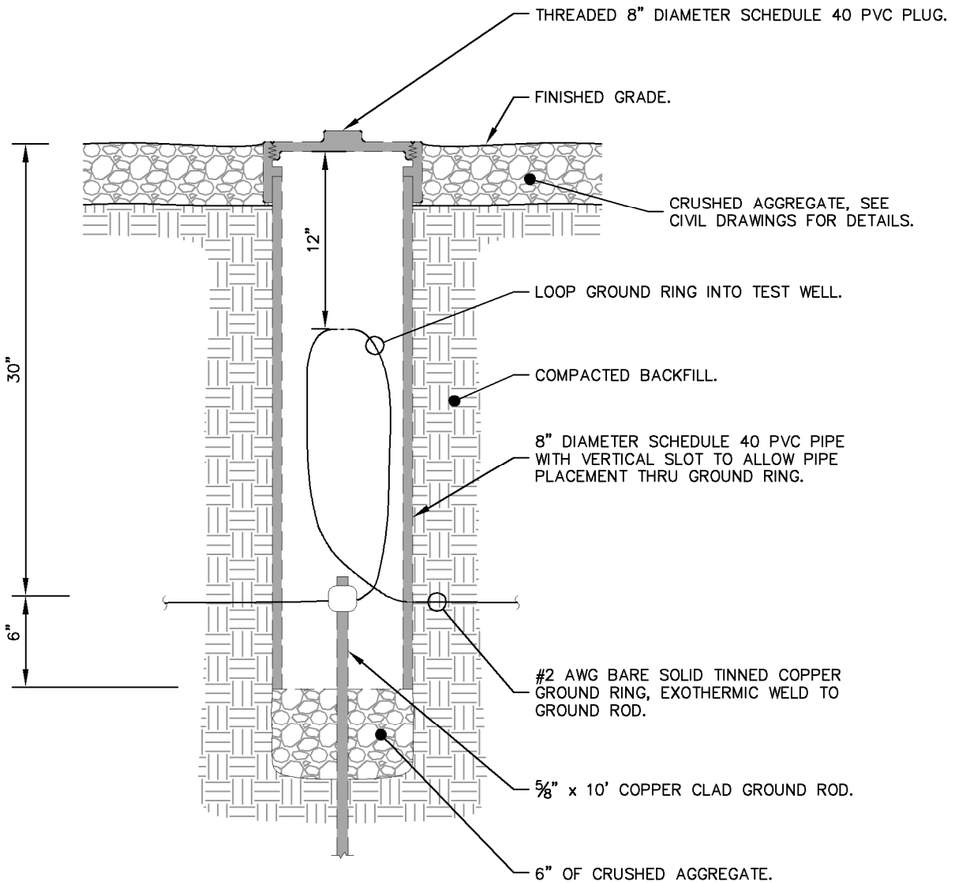

1 E7 GROUND ROD TEST WELL DETAIL

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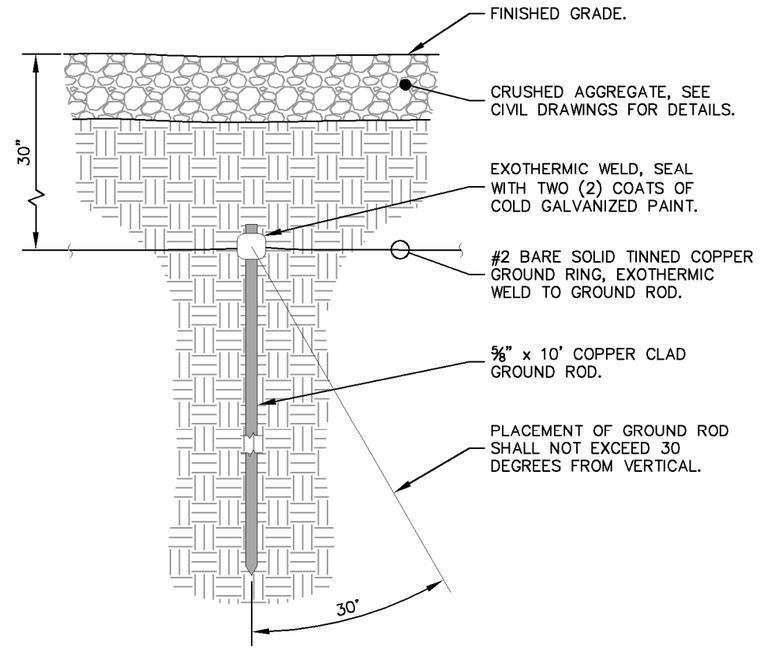

2 E7 GROUND ROD INSTALLATION DETAIL

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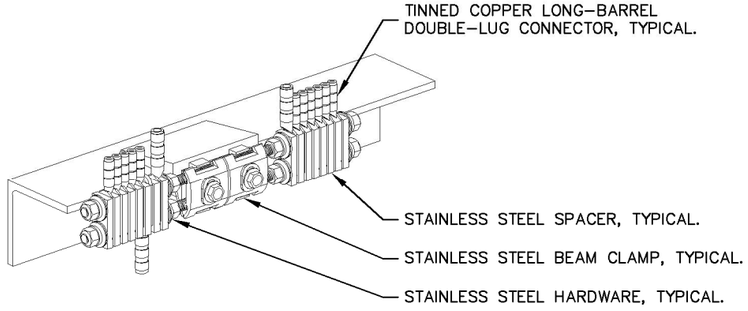
NORTH CAROLINA PROFESSIONAL SEAL 047704 ENGINEER DAVID RAINEY COUSINS

KHA PROJECT NUMBER:
017848000

DRAWN BY: XQD CHECKED BY: DMF

SHEET TITLE:
GROUNDING DETAILS

SHEET NUMBER:
E7



1 E8 BAR NONE GROUNDED BEAM CLAMP (TDSGA-BC14)

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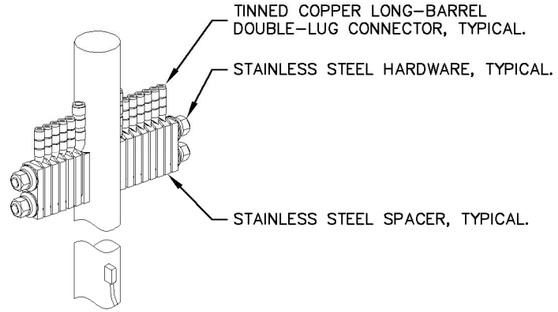

2 E8 BAR NONE POST MOUNTED (TDSGA-PA14)

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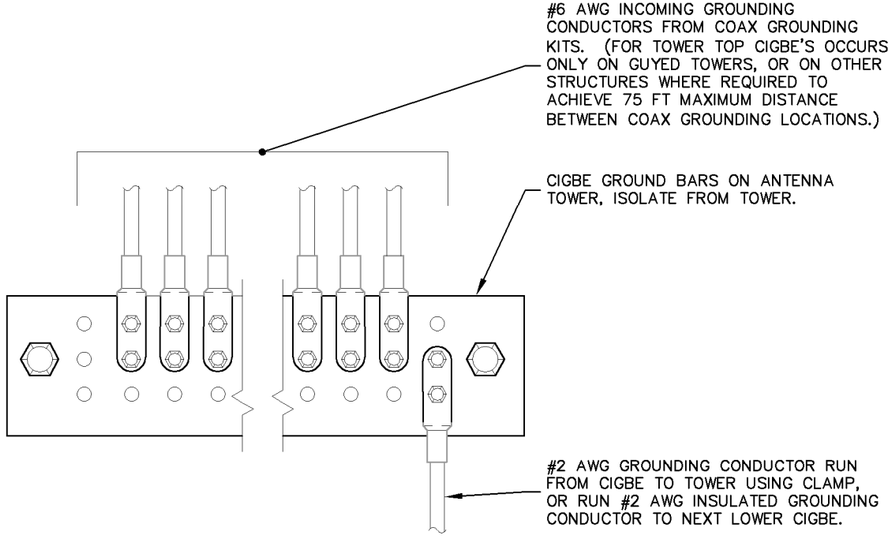

3 E8 ANTENNA GROUND WIRE INSTALLATION DETAIL

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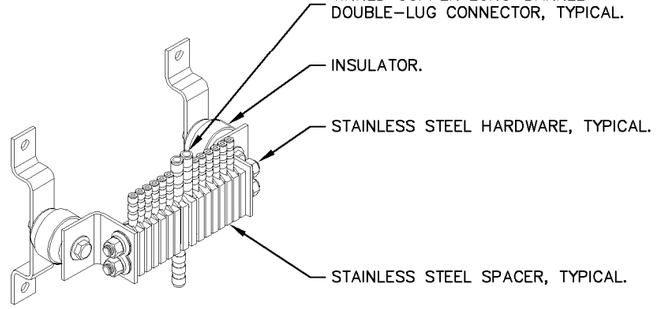

4 E8 BAR NONE INSULATED (TDSGA-WB17)

NOT TO SCALE

NOTES:

1. ALL CIGBE GROUND BARS ON TOWER ARE TO BE ERICO TDSGA. TYPICALLY USE TDSGA–WB17 ISOLATED FROM UNISTRUT BRACKET.

2. IF CIGBE CANNOT BE CONNECTED TO TOWER WITH #2 AWG GROUNDING CONDUCTOR, VIA CLAMP OR EXOTHERMIC WELD, THEN RUN #2 AWG BLACK GROUND LEAD FROM CIGBE DOWN TO NEXT LOWER CIGBE. SECURE GROUND LEAD WITH NON–METALIC TIES AT SAME SPACING AS COAX SUPPORTS.

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SHEET TITLE:
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