



18-004

TOWN OF CHAPEL HILL
Planning Department

405 Martin Luther King Jr. Blvd.
Chapel Hill, NC 27514-5705

phone (919) 969-5066 fax (919) 969-2014
www.townofchapelhill.org

Community Design Commission
Final Plan Application

This application should be used to submit Final Plan applications to the Community Design Commission including building elevations, site lighting, and alternative buffers. For assistance with this application, please contact the Chapel Hill Planning Department at (919) 969-5066 or at planning@townofchapelhill.org.

Section A: Property Information

Property Address:	(E911) 200 Northern Park Drive
Zoning:	R-2

Type of Application

☒ Building Elevation ☐ Alternative Buffers

Section B: Applicant Information (for contact purposes)

Name:	J. David McCutchen (McCutchen Engineering Associates, PC)				
Address:	898 West Saint John Street				
City:	Spartanburg	State:	SC	Zip Code:	29301
Phone Number:	864-582-0585	Email:	dmccutchen@mcc-ea.com / bweeks@mcc-ea.com		

The undersigned applicant hereby certifies that: a) the property owner authorizes the filing of this application; b) authorizes on-site review by authorized staff; and c) to the best of their knowledge and belief, all information supplied with this application is true and accurate.

Signature:

J. David McCutchen

Date: 8 January 2018

Parcel Identifier Number (PIN): 9880127274

The Community Design Commission meets regularly on the fourth Tuesday of each month. For confirmation of a meeting date and the placement of your request on the agenda, please contact the Planning Department at (919) 969-5066.

Final Plan Application

Please submit 2 sets of all materials, no later than the fourth Tuesday of the month prior to the meeting by 4 p.m. Materials must be collated and folded to fit into a 12" x 15" envelope. The Application Fee shall be submitted with this Application Form.

DETAILED SUMMARY OF REQUIRED INFORMATION

X	1. Application fee (refer to fee schedule)	Amount Paid \$ 395
N/A	2. Digital files – provide digital files of all plans and documents	
X	3. Approved Site Plan The site plan for the development, as approved by the Town Council, or when applicable, the Planning Board, clearly indicating all building footprints, parking areas, sidewalks, and buffers. In particular, the site plan shall clearly indicate the specific buildings that are included in the application for building elevations approval. Finished first floor elevation (height above sea level) information shall also be provided for each building, including any applicable cross section elevation changes.	
X	4. Detailed Exterior Building Elevations – The detailed exterior elevations shall include the following: a) <u>Detailed Building Elevations</u> <ul style="list-style-type: none">• A detailed list including all materials, textures, and colors for each building. If all buildings are the same, a combined list of materials, texture, and colors is acceptable. All windows, doors, light fixtures, and other appurtenant features must indicate type, style, and color.• A straight-on, one-dimensional view of each building façade including front, side, and rear elevations.• Color renderings, sketches, or perspective drawings. <i>The applicant should bring samples of all colors and materials to the Design Commission Meeting.</i> b) <u>Cross-Sections</u> <ul style="list-style-type: none">• Provide simple, typical cross-section(s) indicating how the buildings are placed on the site in relationship to topography, public access, existing vegetation, or other significant site features. c) <u>Floor Plans</u> <ul style="list-style-type: none">• Show the general interior layout of the building (this aids in understanding window locations, etc.) and the relationship of pedestrian circulation and entryways. d) <u>Other</u> <ul style="list-style-type: none">• Indicate the location of all HVAC, chiller, and/or ventilation units. Show how these units will be screened from the view of any relevant public rights-of-way. All detailed building elevation plans must be the <u>final</u> versions. Any subsequent elevation modifications or changes in materials, color, etc., must be resubmitted for approval. If the Design Commission makes decisions based on any renderings, sketches, or artists' drawings presented at the meeting, these graphics will become the property of the Town and will need to be submitted for the formal record	
N/A	5. Lighting Plans a) <u>Site Lighting Plan</u> : A detailed lighting plan for <u>all</u> proposed lighting fixtures on the site (including parking areas, pedestrian paths, building facades, landscape uplighting, etc.). The lighting plan should clearly indicate the locations of <u>all</u> light fixtures. The lighting plan shall also provide isographs with foot-candle and uniform ratios, candlepower of lamps, and types of illumination for all proposed lighting fixtures. The isographs shall be provided for the full extent of the site lighting (to the point where the lighting reaches 0.0 foot-candles), even if this includes off-site areas. The isograph shall be calculated with 100% lighting, and also identify and incorporate a site's topography. b) <u>Cut Sheets</u> : A detailed drawing and description shall be provided for each type of light fixture proposed on the site. The number, height, colors, and materials for each type of fixture shall be clearly indicated. Please note that in accordance with Section 5.11 (Lighting Standards) of the Town's Land Use Management Ordinance, lighting sources shall be shielded or arranged so as not to produce, within any public right-of-way, glare that interferes with the safe use of such right-of-way or constitutes a nuisance to the occupants of adjacent properties.	

For information on illuminating canopies, please refer to the Community Design Commission's "Design Standards for Canopies," which is available from the Chapel Hill Planning Department.

N/A

6. Alternative Buffer

a) Landscaping Plan: A detailed planting plan, including a plant materials table that indicates the number, size, and spacing for each plant type.

b) Other: If a fence or wall is proposed as part of the alternative buffer, a scaled drawing or rendering shall be submitted, along with a list including all materials, textures, and colors. The applicant should bring samples of such materials to the Design Commission meeting.

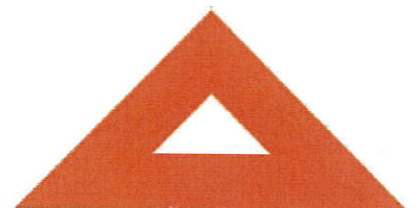


**TOWER ANALYSIS FOR
ANTENNA ADDITIONS
FOR
Sprint**

**Duke Energy Tower 8
1E1968/8
Type 1CW ET Tower**

**SPRINT RA03XC005
Northern Park Drive**

Orange County, NC



McCutchen Engineering Associates, PC

November 10, 2017

Mr. Corey White
Duke Energy Carolinas, LLC
Attn: Digital Infrastructure
400 South Tryon Street (ST29X)
Charlotte, NC 28202

**RE: Tower Analysis, Duke Energy Site # 1E1968 Tower #8
Chapel Hill, NC, Orange County
Type 1CW Tower with 4-25' legs
Sprint Site "RA03XC005"**

Dear Mr. White:

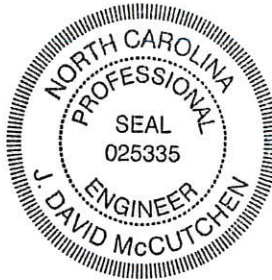
We are pleased to submit our report of the structural investigation and analysis of the ET structure located at the above site. We have concluded that the tower is adequate to support the proposed loading modifications under present conditions.

We appreciate the opportunity to perform this service and look forward to future projects with you. We are available to answer any questions, which may arise from this report. If we can be of any additional assistance, please do not hesitate to contact us at your convenience.

Sincere Regards,
McCutchen Engineering Associates, PC



J. David McCutchen, PE
President



11-10-17



McCutchen Engineering Associates, PC

898 West Saint John St.
Spartanburg, SC 29301

T	864 582 0585
F	864 582 0581
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TABLE OF CONTENTS

1.	Introduction	1
2.	Analysis Criteria	1
3.	Tower Loading Information	1
4.	Available Documentation	2
5.	Assumptions	2
6.	Analysis Results	3
7.	Conclusion	3

Appendices:

- A Selected Computer Output and Calculations
- B Wire Load Information
- C Tower Drawings and other Client Supplied Information

1. Introduction

McCutchen Engineering Associates has conducted a structural analysis of the 1CW ET structure located at Northern Park Drive, Chapel Hill, NC in Orange County. The tower site corresponds to Sprint Site "RA03XC005." The analysis was performed using the commercially available *TOWER* computer analysis program (version 13.01) published by Power Line Systems, Inc.

2. Analysis Criteria

The following codes and standards have been used as a basis for this analysis:

- ASCE 10-97 – Design of Latticed Steel Transmission Structures
- Duke Power Company Structure Design Loading Criteria, 1996
- National Electrical Safety Code (NESC), 2012
- TIA-222-G – Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
- 2012 North Carolina Building Code

3. Tower Loading Information

The tower has been analyzed for the following load cases in accordance with the Duke Power Company Structure Design Loading Criteria:

1. NESC Medium
- 3S. Broken Static
- 3TC. Broken Top Conductor
- 3MC. Broken Middle Conductor
- 3BC. Broken Bottom Conductor
4. RBD Wind & Ice
5. RBD Wind Only

The Duke Electric Transmission group has provided wire load information and this load tree information is included in this report as Appendix B. Wind loading on the tower structure has been calculated using the provisions of NESC Rule 252.2.C. Wind pressures and dead load factors are in accordance with the Duke Structure Design Loading Criteria. For this analysis the shape factor was increased to account for redundants, mounted coax ladder, and coax transmission lines. This increase varies from approximately 38 to 57 percent per section (calculation of this shape factor adjustment is included in Appendix A). Dead loads were increased by 20 to 30 percent per section. The software calculates drag areas for each section.

Existing attachments (**to remain**) to the tower for Sprint consist of:

- (3) RFS APXCSP18-C-A20 antennas, 3 sectors of 1 each, approximate rad center of 101' AGL
- (3) ALU 1900MHz RRHs, 3 sectors of 1 each, approximate centers of 96' AGL
- (3) ALU 800MHz RRHs, 3 sectors of 1 each, approximate centers of 96' AGL

Type 1CW Tower

Duke Energy 1E1968/Tower #8

- (3) RRH mounting pipes
- (3) 1 1/4" ϕ hybriflex cables
- Duke Energy Tower Top Wireless Adapter
- "Aluma-Form" sector mounts, model CAM-T-1, which allows a 12 foot antenna separation

Proposed attachments to the tower for Sprint consist of:

- (3) RFS APXVTM14-ALU-20 antennas, 3 sectors of 1 each, approximate rad center of 101' AGL
- (3) ALU TD-RRH8x20, 3 sectors of 1 each, approximate centers of 93' AGL on braced pipe mast extensions
- (1) 1 1/4" ϕ hybriflex cable

Wind loads on the antennas, mounts, and coax which project above the tower structure have been calculated using the provisions for TIA-222-G and the 2012 North Carolina Building Code for a 90 mph wind speed as specified for Orange County. Wind pressures for load combinations that include ice have been reduced to 30 mph per TIA-222-G guidelines. Ice is considered to increase in thickness with height. For input into the analysis software, these attachment forces were increased by an overload factor (OLF) of 1.30 to account for the differences between ASCE 10-97 and TIA-222-G regarding member capacity determination. Wind force and overload factor calculations are included in Appendix A.

4. Available Documentation

McCutchen Engineering was provided with the following documents:

- Original drawings for Type "1CW" Suspension Tower and extensions (Bethlehem Steel Company)
- Proposed antenna and cable loading (Sprint)
- Duke Energy Tower Top Wireless Adapter details
- Wire load calculations and summary sheets (Duke Electric Transmission)
- Cellular Antenna Mount Assembly Drawing, with weight and wind areas provided by manufacturer (Aluma-Form)

5. Assumptions

- All information on the tower drawings, which could not be verified, is assumed correct. Other assumed provisions include proper alignment and plumbness, correct bolt tightness, no significant damage or deterioration to any component, and the use of steel which meets the specified yield strength of the original design.
- All new transmission lines shall be placed on the existing cable ladder or on the tower face perpendicular to overhead electrical transmission wires.

- Analysis of insulators, clamps, or any other conductor or OHGW attachment is not included herein. We assume these components are adequate for the wire loads used for this analysis.
- None of the carriers have specified any limitations for antenna twist, tilt, roll, or lateral translation for their antennas in service. Therefore, we base no criteria for the adequacy of this tower on any of these factors.

If any of these assumptions are not valid, this analysis should not be considered accurate. McCutchen Engineering should be allowed to review any new information to determine its effect on the results of this analysis.

6. Analysis Results

Complete results of this analysis are presented in the attached computer output. The maximum percentage of capacity used by any member is 57% in a diagonal member due to Load Case 5 – RBD Wind Only. The highest usage percentage for a leg member is 52% and a horizontal member is 33%. The software calculates member capacities based on ASCE-10 provisions.

7. Conclusion

The analysis results indicate that under the proposed loading configuration, the tower is structurally adequate when subject to the assumptions noted herein. No additional structural reinforcement is required.

A PROJECT FOR:



**PROPOSED UNMANNED WIRELESS
COMMUNICATION SITE**

**LINE INDEX NUMBER 1E1968
TOWER #8 / SPRINT RA03XC005
(E911) 200 NORTHERN PARK DRIVE
CHAPEL HILL, N.C. 27516
ORANGE COUNTY**

PROJECT DESCRIPTION :

1. THIS IS AN UNMANNED AND RESTRICTED ACCESS WIRELESS TELECOMMUNICATIONS FACILITY THAT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PERSONAL COMMUNICATIONS SERVICE (PCS). HANDICAP ACCESS IS NOT REQUIRED.
2. NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
3. NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.
4. NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.
5. MAINTENANCE TECHNICIANS (TYPICALLY ONE PERSON) MAY MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

DRAWING INDEX

COVER SHEET

CS COVER SHEET

BUILDING CODE SUMMARY

BCS 0.01 BUILDING CODE SUMMARY
BCS 0.02 BUILDING CODE SUMMARY

CIVIL

C1.01 OVERALL SITE PLAN
C2.01 SITE LAYOUT PLAN
C6.01 EQUIPMENT LAYOUT
C7.01 TOWER ELEVATION, ANTENNA LAYOUT PLANS AND ANTENNA SCHEDULE

ELECTRICAL

E1.01 GENERAL NOTES AND RISER DIAGRAM
E8.01 DETAILS

REFERENCE

69043 ASSEMBLY DIAGRAM (ALUMA-FORM, INC.)



**TOWER 8 / 1E1968
SPRINT RA03XC005**

PROPERTY OWNER :

TOWN OF CHAPEL HILL
405 MARTIN LUTHER KING JR. BLVD.
CHAPEL HILL, N.C. 27514

POWER :

DUKE POWER
CUSTOMER SERVICE
(704) 594-9400

ZONING JURISDICTION :

TOWN OF CHAPEL HILL

INSPECTIONS DEPARTMENT :

CHAPEL HILL BUILDING
AND INSPECTIONS
405 MARTIN LUTHER KING JR. BLVD.
CHAPEL HILL, N.C. 27514
(919) 968-2743

TELCO :

N/A

PARCEL ID NUMBER :

PARCEL ID # 9880127274

ISSUE INFORMATION :

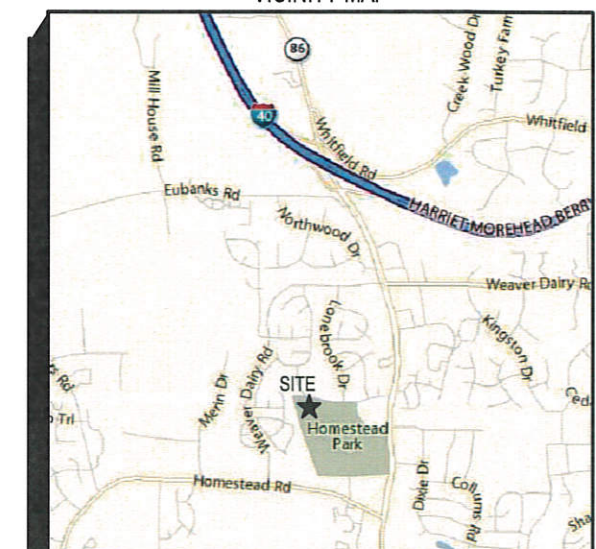
REV. 0 INITIAL ISSUE 12/01/17

TOWER COORDINATES :

LATITUDE: 35° 57' 20.9" N
LONGITUDE: 79° 03' 52.2" W

DIRECTIONS:
FROM CHARLOTTE N.C., TAKE I-85 NORTH TO GREENSBORO TO I-40 EAST. CONTINUE ON I-40/I-85 EAST TO DURHAM TO THE I-40/I-85 SPLIT. CONTINUE EAST ON I-40 TO MARTIN LUTHER KING JR. BLVD. (EXIT 266). TURN RIGHT ONTO MARTIN LUTHER KING JR. BLVD AND CONTINUE SOUTH TO HOMESTEAD ROAD. TURN RIGHT ONTO HOMESTEAD ROAD AND CONTINUE WEST TO NORTHERN PARK DRIVE. TURN RIGHT ONTO NORTHERN PARK DRIVE AND CONTINUE TO REAR TO THE EXISTING TOWER AT THE HOMESTEAD AQUATIC CENTER.

VICINITY MAP



PREPARED BY:



McCutchen Engineering Associates, PC

898 W. Saint John St., Spartanburg, S.C. 29301
Phone: 864 582 0585 | Fax: 864 582 0581
NC License No. C-2626

PROJECT DESCRIPTION :

DUKE ENERGY PROPOSES TO UPGRADE ANTENNAS AND APPURTENANCES AT AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY AT AN EXISTING TOWER SITE FOR THE OPERATION AND MAINTENANCE OF TELECOMMUNICATIONS EQUIPMENT. THE SCOPE OF WORK WILL INCLUDE EQUIPMENT INSTALLATION AS OUTLINED IN THESE CONSTRUCTION DOCUMENTS.



(NOT APPLICABLE)

- ☐ Exterior wall opening area with respect to distance to assumed property lines (705.8)
☐ Existing structures within 30' of the proposed building
☐ Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1)
☐ Occupant loads for each area
☐ Exit access travel distances (1016)
☐ Common path of travel distances (1014.3 & 1028.8)
☐ Dead end lengths (1018.4)
☐ Clear exit widths for each exit door
☐ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1)
☐ 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 (1008.1, 10)
☐ Location of doors with delayed egress locks and the amount of delay (1008.1.9.7)
☐ Location of doors with electromagnetic egress locks (1008.1.9.8)
☐ Location of doors equipped with hold-open devices
☐ Location of emergency escape windows (1029)
☐ The square footage of each fire area (902)
☐ The square footage of each smoke compartment (407.4)
☐ Note any code exceptions or table notes that may have been utilized regarding the items above

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 Units Accessible Provided

ACCESSIBLE PARKING
(SECTION 1106)

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF ACCESSIBLE SPACES PROVIDED	# OF ACCESSIBLE SPACES WITH VAN SPACES WITHIN 13' ACCESSIBLE		TOTAL # ACCESSIBLE PROVIDED
			5' ACCESSIBLE	8' ACCESSIBLE	
TOTAL					

DESIGN LOADS:

Importance Factors: Wind (1-4) _____
Snow (1-2) _____
Seismic (1) _____

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

Ground Snow Load: _____ psf

2012 NC Administrative Code and Policies

SEE TOWER STRUCTURAL
ANALYSIS FOR FURTHER
INFORMATION

(NOT APPLICABLE)

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attributes 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.

Climate Zone: ☐ 3 ☐ 4 ☐ 5

Method of Compliance:

- ☐ Prescriptive (Energy Code)
☐ Performance (Energy Code)
☐ Prescriptive (ASHRAE 90.1)
☐ Performance (ASHRAE 90.1)

THERMAL ENVELOPE

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: _____

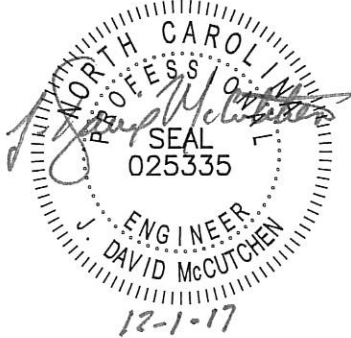
Floors over unconditioned space (each assembly)

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: _____

2012 NC Administrative Code and Policies



JDM
Engineer
WGW
Drawn By
10/27/17
Date
A FOR REVIEW 11/10/17
0 INITIAL ISSUE 12/01/17

Project Number
1701.004

BUILDING CODE
SUMMARY

Sheet Number:
BCS 0.02



PROPOSED UNMANNED WIRELESS COMMUNICATION SITE

LINE INDEX NUMBER 1E1968
TOWER #8 / SPRINT RA03XC005
(E911) 200 NORTHERN PARK DRIVE
CHAPEL HILL, N.C. 27516
ORANGE COUNTY



McCutchen Engineering Associates, PC
898 W. Saint John St., Spartanburg, S.C. 29301
Phone: 864 582 0585 | Fax: 864 582 0581
NC License No. C-2626

SEE TOWER STRUCTURAL ANALYSIS
FOR FURTHER INFORMATION

Basic Wind Speed _____ mph (ASCE-7)
Exposure Category _____
Wind Base Shears (for MWFRS) Vx = _____ Vy = _____

SEISMIC DESIGN CATEGORY:

☐ A ☐ B ☐ C ☐ D

Provide the following Seismic Design Parameters:

Occupancy Category (Table 1604.5) ☐ I ☐ II ☐ III ☐ IV

Spectral Response Acceleration Ss _____ %g

Site Classification (Table 1613.5.2) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

Data Source: ☐ Field Test ☐ Presumptive ☐ Historical Data

Basic structural system (check one)

☐ Building Frame ☐ Dual w/Special Moment Frame

☐ Building Frame ☐ Dual w/Intermediate B/C or Special Steel

☐ Moment Resisting ☐ Inverted Pendulum

Seismic base shear: Vx = _____ Vy = _____

Analysis Procedure: ☐ Simplified ☐ Equivalent Lateral Force

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 _____

SPECIAL INSPECTIONS REQUIRED: ☐ Yes ☐ No

PLUMBING FIXTURE REQUIREMENTS
(TABLE R 2902.1)

SPACE	EXISTING	NEW	REQUIRED	WATERCLOSURES		URINALS		LAVATOIRES		SHOWERS		DRAINING EQUIPMENT	
				MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	TUB	STALL	EGRESSION	ACCESSIBLE

SPECIAL APPROVALS

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

N/A

2012 NC Administrative Code and Policies

(NOT 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

Boiler category: If oversized, state reason: _____

Chiller

Chiller category: If oversized, state reason: _____

List equipment efficiencies: _____

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance:

Energy Code: ☐ Prescriptive ☐ Performance

ASHRAE 90.1: ☐ Prescriptive ☐ Performance

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 Prescriptive Compliance

☐ 506.2.1 More Efficient Mechanical Equipment

☐ 506.2.2 Reduced Lighting Power Density

☐ 506.2.3 Energy Recovery Ventilation Systems

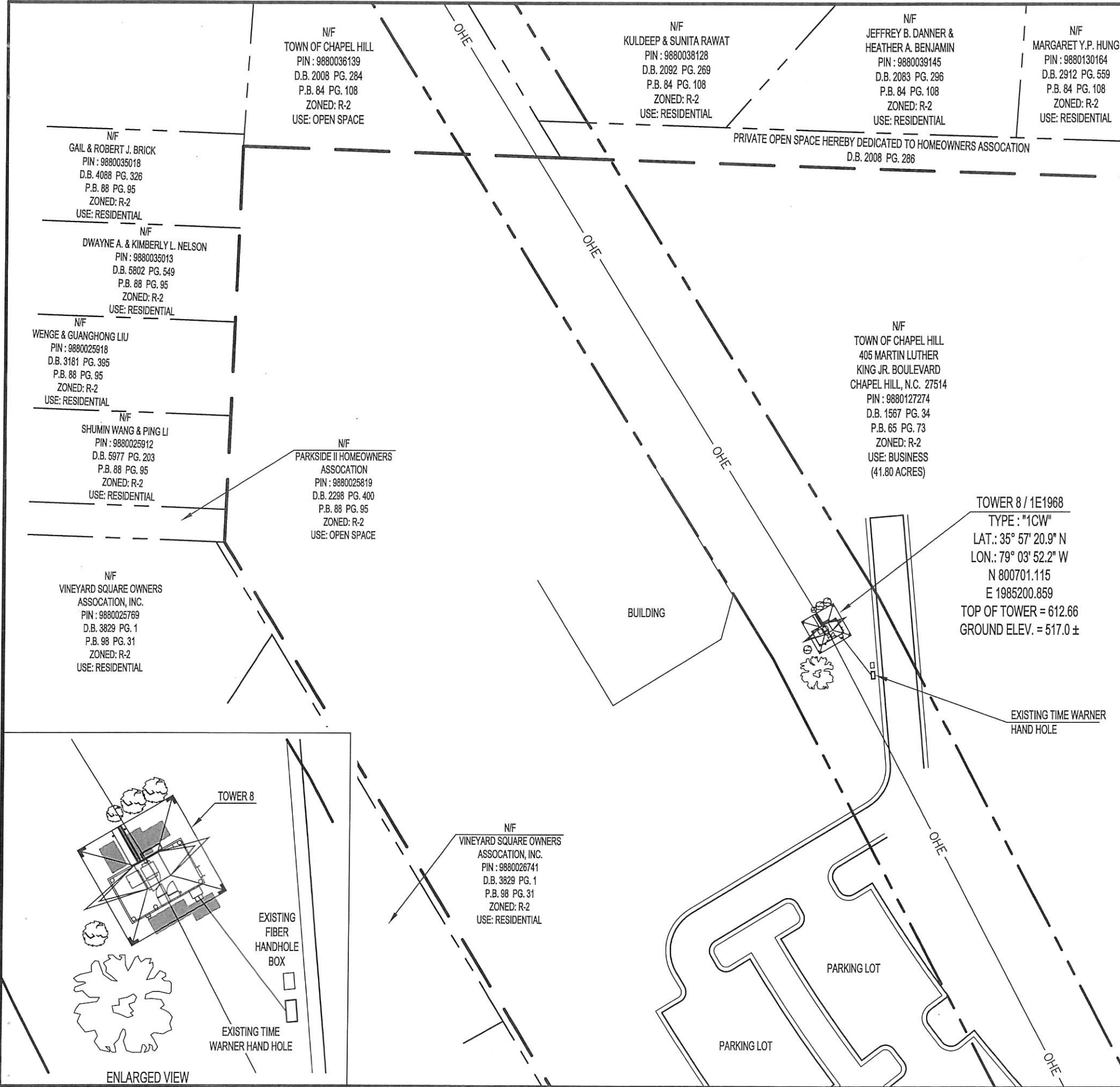
☐ 506.2.4 Higher Efficiency Service Water Heating

☐ 506.2.5 On-Site Supply of Renewable Energy

☐ 506.2.6 Automatic Daylighting Control Systems

2012 NC Administrative Code and Policies

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- NOTES:
1. THIS EXHIBIT HAS BEEN PREPARED PARTIALLY FROM ACTUAL FIELD OBSERVATIONS AND/OR PARTIALLY FROM MAPS AND DEEDS OF RECORD.
 2. THIS MAP REPRESENTS ONLY AN EXHIBIT OF THE DUKE ENERGY TELECOM EQUIPMENT AREA, AND IS NOT INTENDED FOR ANY OTHER USE.
 3. THIS EXHIBIT IS A PORTION OF AN EXISTING PARCEL OR PARCELS OF LAND AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET.
 4. RIGHT-OF-WAY INFORMATION IS BASED ON EXISTING PLATS.
 5. SITE INFORMATION PROVIDED BY DUKE ENERGY, SITE: SPRINT RA03XC005.
 6. EQUIPMENT AREA LOCATED ON ORANGE COUNTY NORTH CAROLINA FLOOD INSURANCE RATE MAP PANEL 9880, COMM. PANEL NO. 3710988000J, EFFECTIVE: FEBRUARY 2, 2007, FLOOD ZONE "X" OUTSIDE 0.2 % ANNUAL CHANCE FLOODPLAIN.



PROPOSED UNMANNED WIRELESS COMMUNICATION SITE
LINE INDEX NUMBER 1E1968
TOWER #8 / SPRINT RA03XC005
(E911) 200 NORTHERN PARK DRIVE
CHAPEL HILL, N.C. 27516
ORANGE COUNTY

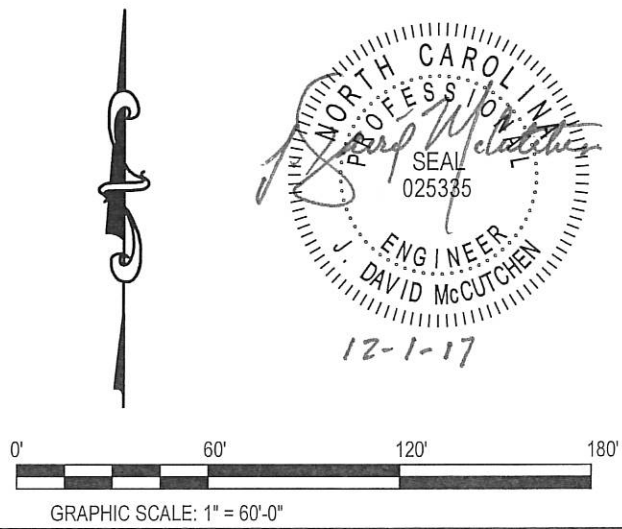
McCutchen Engineering Associates, PC
898 W. Saint John St., Spartanburg, S.C. 29301
Phone: 864 582 0585 | Fax: 864 582 0581
NC License No. C-2626

JDM
Engineer
WGW
Drawn By
10/27/17
Date
A FOR REVIEW 11/10/17
0 INITIAL ISSUE 12/01/17

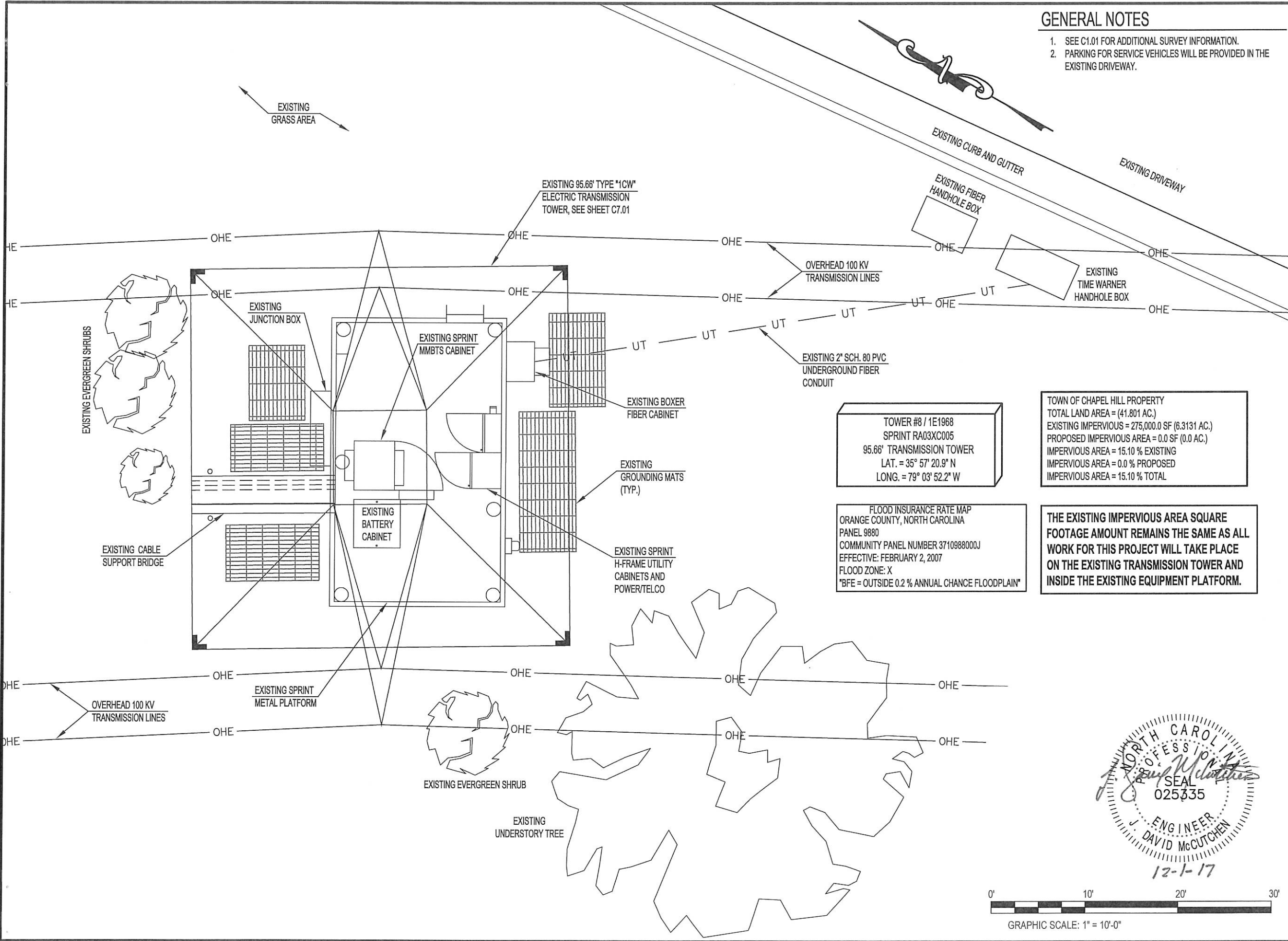
Project Number
1701.004

OVERALL
SITE PLAN

Sheet Number:
C1.01



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GENERAL NOTES

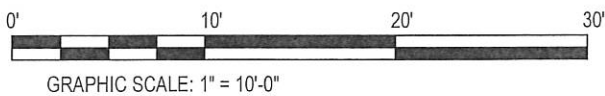
1. SEE C1.01 FOR ADDITIONAL SURVEY INFORMATION.
2. PARKING FOR SERVICE VEHICLES WILL BE PROVIDED IN THE EXISTING DRIVEWAY.

TOWER #8 / 1E1968
SPRINT RA03XC005
95.66' TRANSMISSION TOWER
LAT. = 35° 57' 20.9" N
LONG. = 79° 03' 52.2" W

FLOOD INSURANCE RATE MAP
ORANGE COUNTY, NORTH CAROLINA
PANEL 9880
COMMUNITY PANEL NUMBER 3710988000J
EFFECTIVE: FEBRUARY 2, 2007
FLOOD ZONE: X
"BFE = OUTSIDE 0.2 % ANNUAL CHANCE FLOODPLAIN"

TOWN OF CHAPEL HILL PROPERTY
TOTAL LAND AREA = (41.801 AC.)
EXISTING IMPERVIOUS = 275,000.0 SF (6.3131 AC.)
PROPOSED IMPERVIOUS AREA = 0.0 SF (0.0 AC.)
IMPERVIOUS AREA = 15.10 % EXISTING
IMPERVIOUS AREA = 0.0 % PROPOSED
IMPERVIOUS AREA = 15.10 % TOTAL

THE EXISTING IMPERVIOUS AREA SQUARE
FOOTAGE AMOUNT REMAINS THE SAME AS ALL
WORK FOR THIS PROJECT WILL TAKE PLACE
ON THE EXISTING TRANSMISSION TOWER AND
INSIDE THE EXISTING EQUIPMENT PLATFORM.



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PROPOSED UNMANNED WIRELESS COMMUNICATION SITE

LINE INDEX NUMBER 1E1968
TOWER #8 / SPRINT RA03XC005
(E911) 200 NORTHERN PARK DRIVE
CHAPEL HILL, N.C. 27516
ORANGE COUNTY

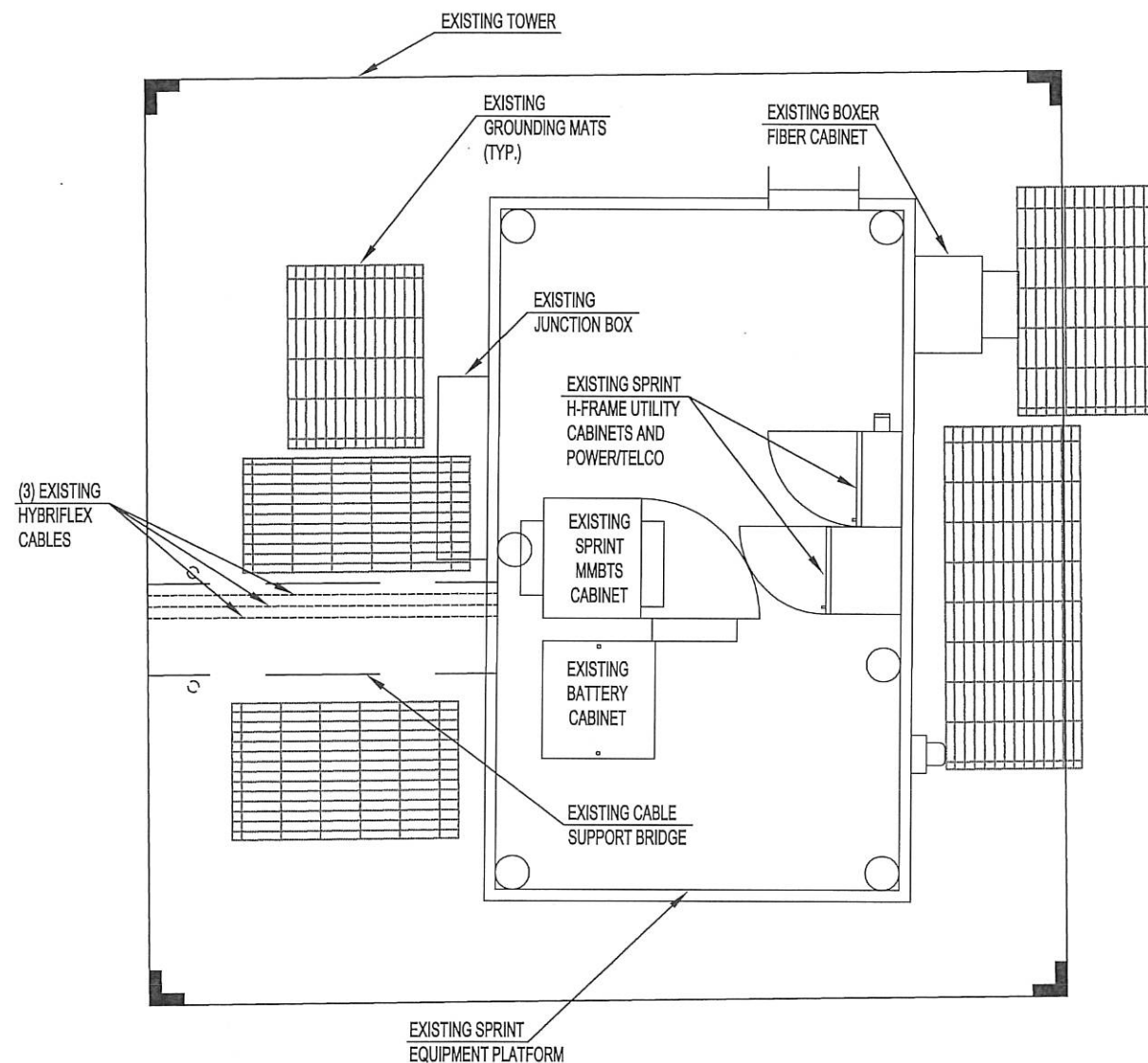
JDM	
Engineer	
WGW	
Drawn By	
10/27/17	
Date	
A FOR REVIEW	11/10/17
0 INITIAL ISSUE	12/01/17

Project Number
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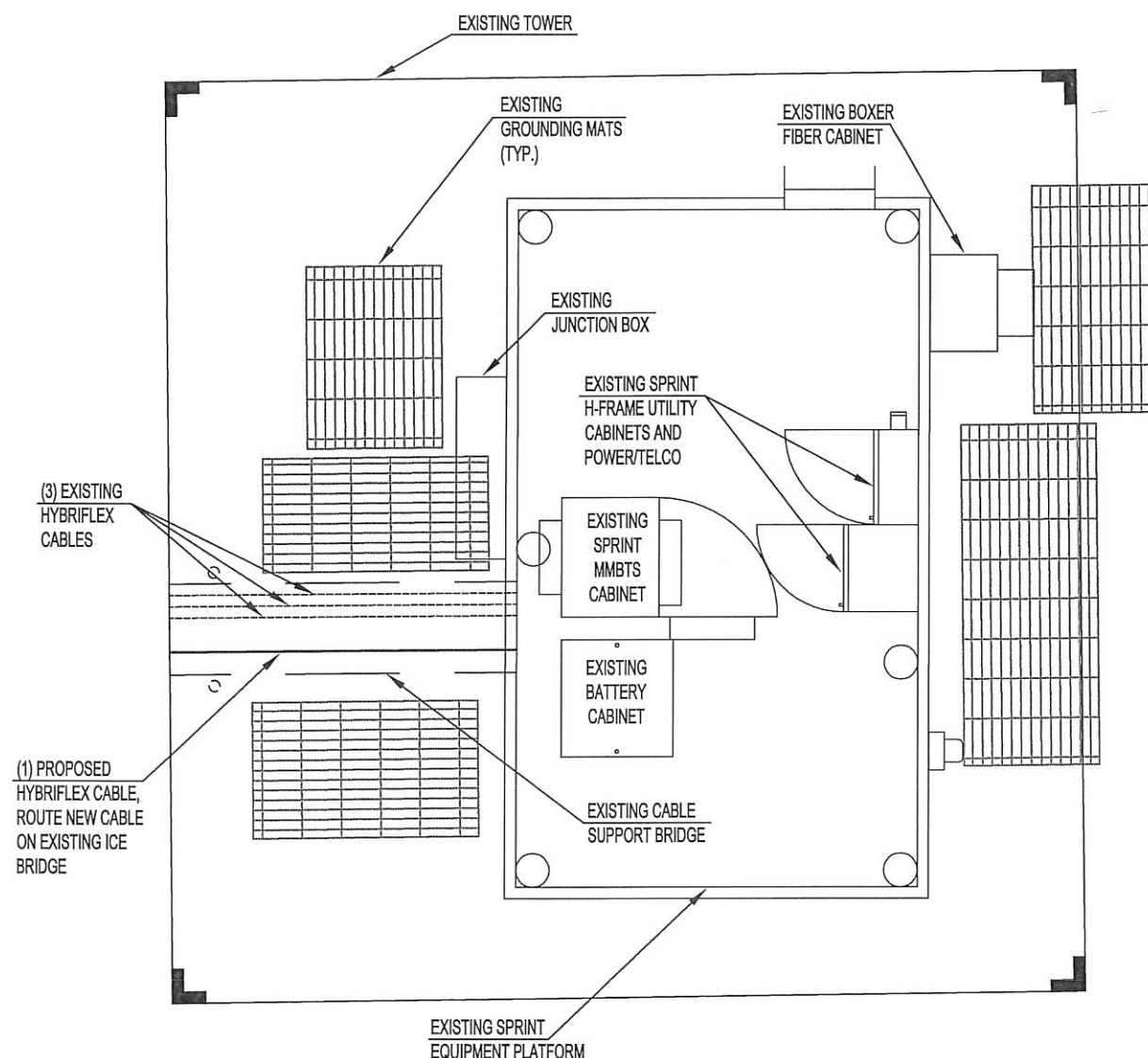
SITE LAYOUT
PLAN

Sheet Number:
C2.01

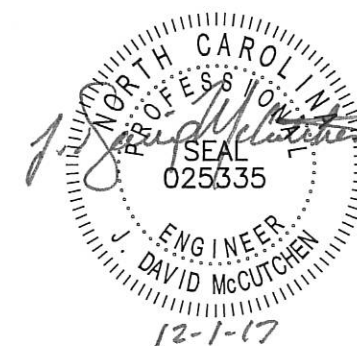
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1 EXISTING EQUIPMENT LAYOUT
C6.01 SCALE: 1" = 4'



1 PROPOSED EQUIPMENT LAYOUT
C6.01 SCALE: 1" = 4'



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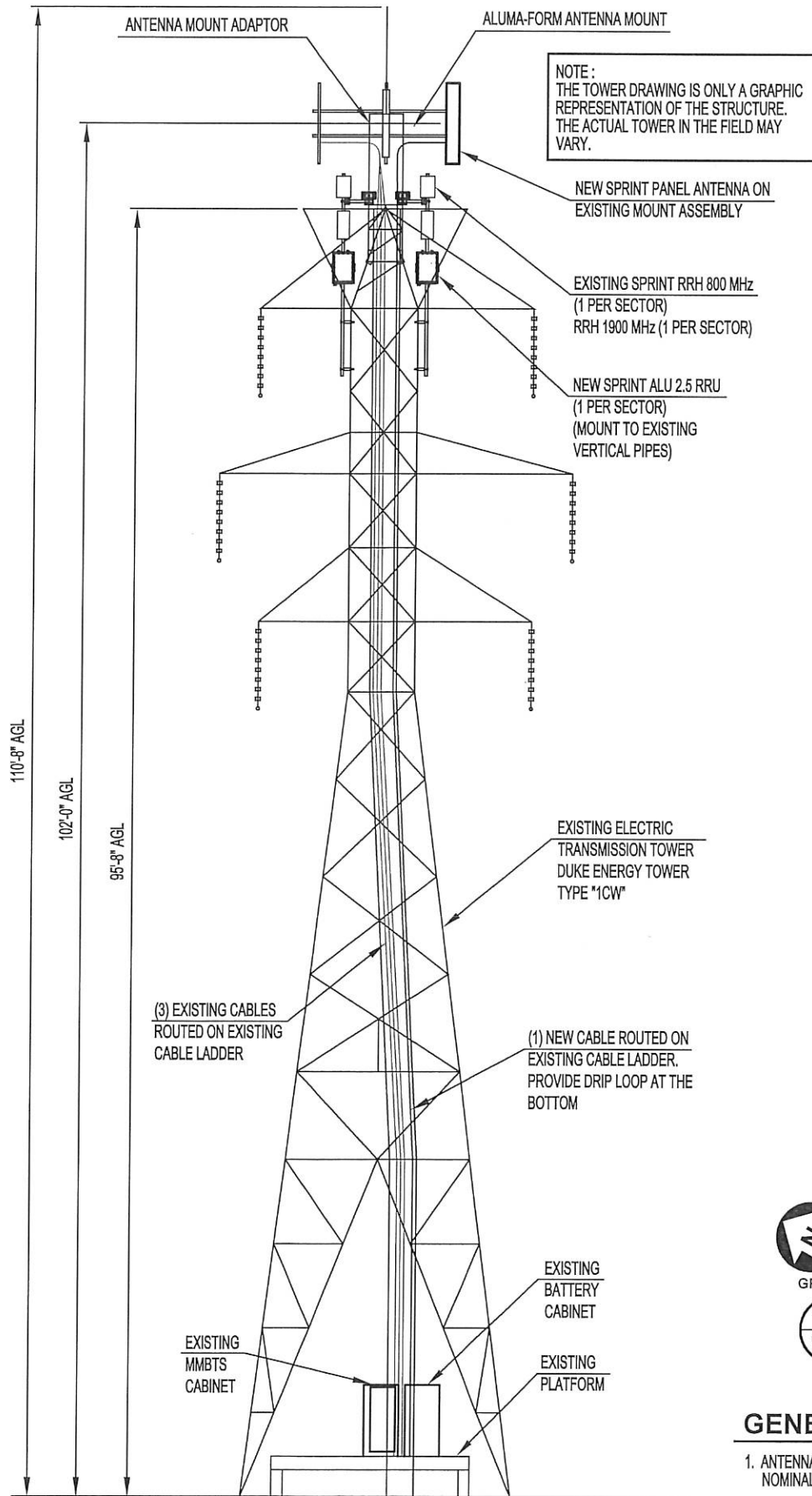
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Drawn By
10/27/17
Date
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0 INITIAL ISSUE 12/01/17

Project Number
1701.004

**EQUIPMENT
LAYOUT**

Sheet Number:
C6.01

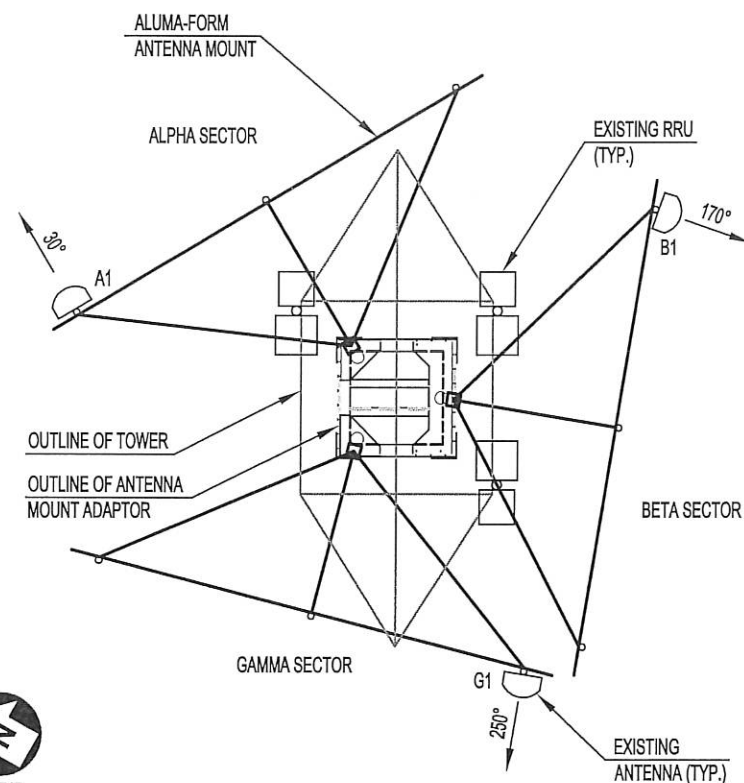
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1 TOWER ELEVATION
C7.01 SCALE: N.T.S.

ANTENNA AND APPURTENANCES SCHEDULE									
SECTOR	AZIMUTH	ANTENNA HEIGHT \pm	ANTENNA	REMOTE RADIO HEAD (RRH)	RRH LOCATION	DIPLEXER	DIPLEXER LOCATION	COAXIAL CABLE (SIZE/TYPE)	COMMENTS
ALPHA (A1)	30°	102.0' \pm	RFS MODEL NO. APXVSP18-C-A20	1900 MHZ 4X45 RRH 800 MHZ 2x50 RRH	TOWER TOWER	—	—	(1) 1 1/4" HYBRIFLEX	EXISTING
ALPHA (A2)	15°	102.0' \pm	RFS MODEL NO. APXVTM14-ALU-20	ALU MODEL NO. TD-RRH8x20-25	TOWER	—	—	(1) 1 1/4" HYBRIFLEX	PROPOSED
BETA (B1)	170°	102.0' \pm	RFS MODEL NO. APXVSP18-C-A20	1900 MHZ 4X45 RRH 800 MHZ 2x50 RRH	TOWER TOWER	—	—	(1) 1 1/4" HYBRIFLEX	EXISTING
BETA (B2)	155°	102.0' \pm	RFS MODEL NO. APXVTM14-ALU-20	ALU MODEL NO. TD-RRH8x20-25	TOWER	—	—	—	PROPOSED
GAMMA (G1)	250°	102.0' \pm	RFS MODEL NO. APXVSP18-C-A20	1900 MHZ 4X45 RRH 800 MHZ 2x50 RRH	TOWER TOWER	—	—	(1) 1 1/4" HYBRIFLEX	EXISTING
GAMMA (G2)	235°	102.0' \pm	RFS MODEL NO. APXVTM14-ALU-20	ALU MODEL NO. TD-RRH8x20-25	TOWER	—	—	—	PROPOSED
TOTAL		—	6	9	—	—	—	4	—

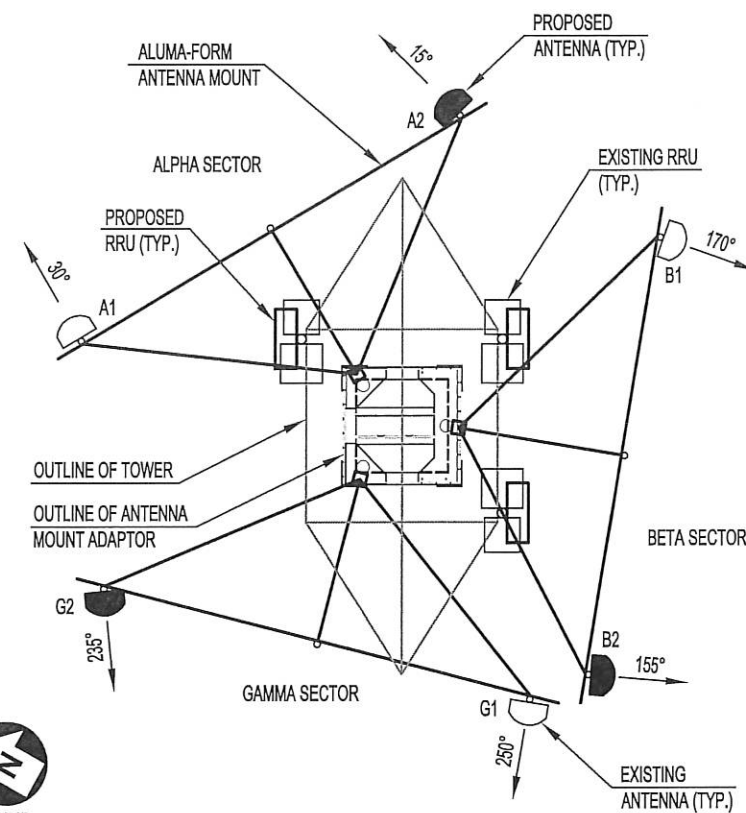
* NOTE: ITEMS IDENTIFIED WITH "BOLD" FONT ARE PROPOSED/NEW. ALL OTHER ITEMS ARE EXISTING.



2 EXISTING ANTENNA LAYOUT PLAN
C7.01 SCALE: N.T.S.

GENERAL NOTES

1. ANTENNA CENTERLINE HEIGHT BASED ON TOP OF NOMINAL GROUND ELEVATION.
2. ALL ANTENNA INFORMATION TO BE CONFIRMED WITH SPRINT PRIOR TO INSTALLATION.



3 PROPOSED ANTENNA LAYOUT PLAN
C7.01 SCALE: N.T.S.



PROPOSED UNMANNED WIRELESS COMMUNICATION SITE
LINE INDEX NUMBER 1E1968
TOWER #8 / SPRINT RA03XC005
(E911) 200 NORTHERN PARK DRIVE
CHAPEL HILL, N.C. 27516
ORANGE COUNTY

JDM
Engineer
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Drawn By
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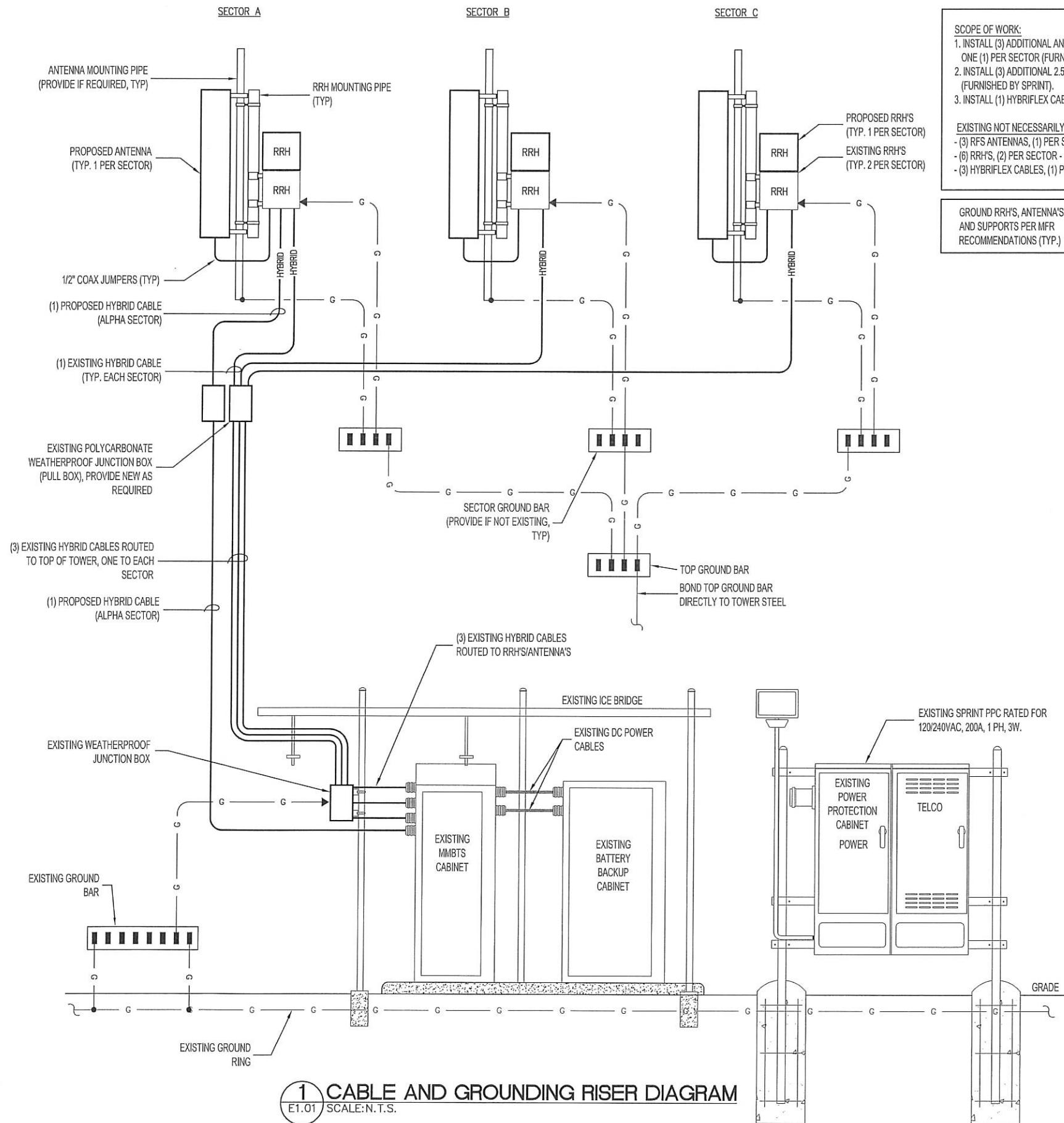
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TOWER ELEVATION, ANTENNA
LAYOUT PLANS AND ANTENNA
SCHEDULE

Sheet Number:
C7.01

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1 CABLE AND GROUNDING RISER DIAGRAM
E1.01 SCALE: N.T.S.

- SCOPE OF WORK:
1. INSTALL (3) ADDITIONAL ANTENNAS (RFS APXVTM14-ALU-20), ONE (1) PER SECTOR (FURNISHED BY SPRINT).
 2. INSTALL (3) ADDITIONAL 2.5 GHz RRH'S, ONE (1) PER SECTOR, (FURNISHED BY SPRINT).
 3. INSTALL (1) HYBRIFLEX CABLE (ALPHA SECTOR).
- EXISTING NOT NECESSARILY INDICATED HERE:
- (3) RFS ANTENNAS, (1) PER SECTOR.
 - (6) RRH'S, (2) PER SECTOR - (1) 1900 MHz & (1) 800 MHz.
 - (3) HYBRIFLEX CABLES, (1) PER SECTOR.

GROUND RRH'S, ANTENNA'S
AND SUPPORTS PER MFR
RECOMMENDATIONS (TYP.)


GENERAL NOTES

1. THE FACILITY IS AN UNOCCUPIED WIRELESS FACILITY.
2. PLANS ARE NOT TO BE SCALED AND ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS NOTED OTHERWISE. THE WORK WILL INCLUDE PROVIDING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
3. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS, AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ARCHITECT/ENGINEER AND OWNER ASSUME NO RESPONSIBILITY AS TO SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY, DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.
4. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS WILL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. WRITTEN AUTHORIZATION IS REQUIRED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
6. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE CONTRACTOR WILL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
7. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
8. THE GENERAL CONTRACTOR WILL SUPERVISE AND DIRECT THE WORK USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT INCLUDING CONTACT AND COORDINATION WITH THE OWNER AND WITH THE LANDLORD'S AUTHORIZED REPRESENTATIVE.
9. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS WILL BE INCLUDED AS PART OF THE WORK.
10. ALL BELOW GRADE CONNECTIONS: EXOTHERMIC WELD TYPE; ABOVE GRADE CONNECTIONS: EXOTHERMIC WELD TYPE (FENCE AND TOWER) OR MECHANICAL TYPE (2-HOLE LUGS WITH MECHANICAL CONNECTORS AT EQUIPMENT). ALL HARDWARE SHALL BE STAINLESS STEEL WITH LOCKWASHERS.
11. CLEAN EXOTHERMIC WELD CONNECTIONS ON GALVANIZED SURFACES THOROUGHLY AND COVER W/ (2) TWO COATS SHERWIN WILLIAMS GALVITE PAINT B350W3 (OR EQUIVALENT).
12. ALL ELECTRICAL AND MECHANICAL GROUND CONNECTIONS SHALL BE TO BARE BRIGHT SURFACES AND HAVE ANTI-OXIDATION COMPOUND APPLIED TO CONNECTION (THOMAS AND BETTS KOPR-SHIELD).
13. THE MINIMUM BEND RADIUS FOR GROUND CONDUCTORS SHALL BE 8 INCHES FOR #6 AWG WIRE AND 12 INCHES FOR #2 AWG AND GREATER WIRE.
14. GROUNDING INSTALLATIONS AND CONNECTIONS SHALL BE MADE BY ELECTRICAL CONTRACTOR.
15. CONTRACTOR SHALL VERIFY EXACT CONDUIT ROUTING AND PENETRATION LOCATIONS WITH CONSTRUCTION MANAGER AND EQUIPMENT MANUFACTURER/SPECIFICATIONS.
16. REFER TO CIVIL DRAWINGS FOR EXACT ITEMS BEING REMOVED AND/OR RELOCATED.
17. ALL PROPOSED CONDUITS SHALL BE FURNISHED WITH PULL STRINGS.

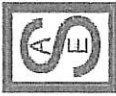
LOAD SUMMARY TABLE	
EXISTING LOAD (TOTAL CONNECTED)	30.0 KVA
RRU's (ADDED)	1.1 KVA
TOTAL	31.1 KVA (129.6A AT 240V, 1PH.)

NOTE: EXISTING SERVICE IS 120/240V, 200A, 1 PHASE.





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Sturkie & Associates
Engineering, PC
141 Grassy Meadow Drive
Travelers Rest, SC 29690
Ph: 864-363-4855
NC License No. C-2924



DUKE ENERGY

PROPOSED UNMANNED WIRELESS COMMUNICATION SITE

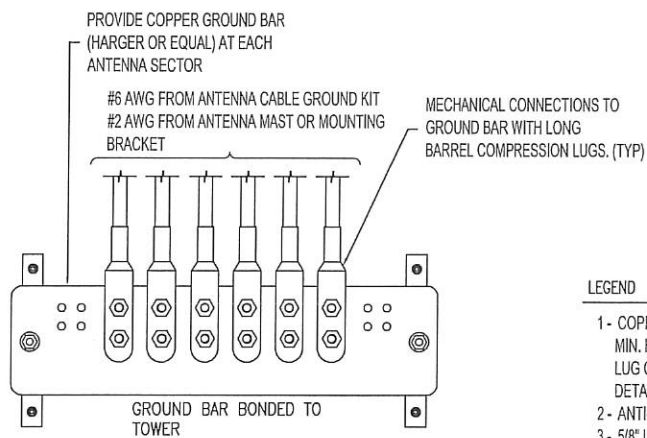
LINE INDEX NUMBER 1E1968
TOWER #8 / SPRINT RA03XC005
(E911) 200 NORTHERN PARK DRIVE
CHAPEL HILL, N.C. 27516
ORANGE COUNTY

CDS
Engineer
CDS
Drawn By
11/10/17
Date
A FOR REVIEW 11/10/17
O INITIAL ISSUE 12/01/17

Project Number
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GENERAL NOTES
AND RISER DIAGRAM

Sheet Number:
E1.01



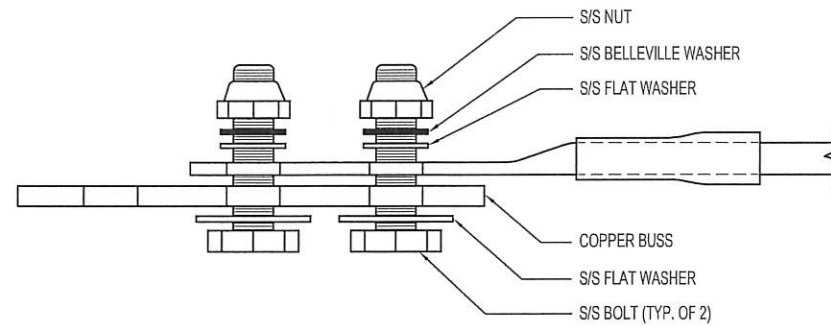
LEGEND

- | | |
|---|---|
| 1 - COPPER TINNED GROUND BAR, 1/4"x4"x14" MIN. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION (SEE LUG CONNECTION DETAIL THIS SHEET) | 4 - MOUNTING BRACKET, (MOUNT HORIZ. ON VERTICAL CABLE LADDER) |
| 2 - ANTI-OXIDATION APPLIED | 5 - 5/8-11 X 1" H.H.C.S.BOLTS |
| 3 - 5/8" LOCKWASHERS | 6 - GROUND BAR SHALL BE SIZED TO ACCOMMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY |

1 ANTENNA GROUND BAR DETAILS
E8.01 SCALE: N.T.S.

NOTES:

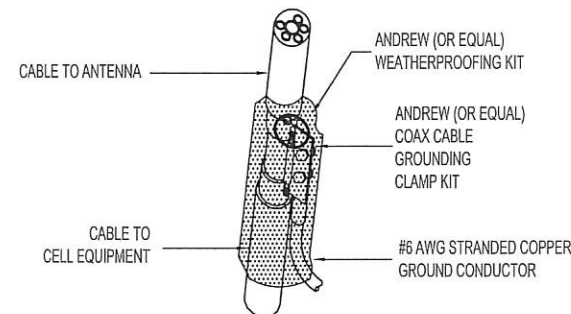
1. COPPER GROUND BAR 1/4"x4"x14" 2-HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. ALL HARDWARE SHALL BE STAINLESS STEEL OR GALVANIZED UNLESS NOTED OTHERWISE.
3. STACKING OF LUGS IS NOT ACCEPTABLE. BACK-TO-BACK LUGS WILL ONLY BE ACCEPTED WHEN OTHER HOLES ARE UNAVAILABLE.
4. GROUND LEADS SHALL BE RUN IN DOWNWARD DIRECTION, IN THE STRAIGHTEST PATH POSSIBLE TO TERMINATION POINT.
5. ALL GROUND KIT WRAPPINGS SHALL BE SEALED WITH SCOTCHKOTE.
6. WRAPLOCK SHALL BE CABLEWAVE STRAPTITE PART #910061 OR EQUAL.
7. GROUND BARS LOCATED AT GROUND LEVEL SHALL BE INSULATED FROM MOUNTING SURFACE USING INSULATORS, AND BONDED TO THE GROUND RING. GROUND BARS LOCATED ON THE TOWER SHALL BE BONDED TO THE TOWER.



NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING BELLEVILLES. COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH KOPR-SHIELD.

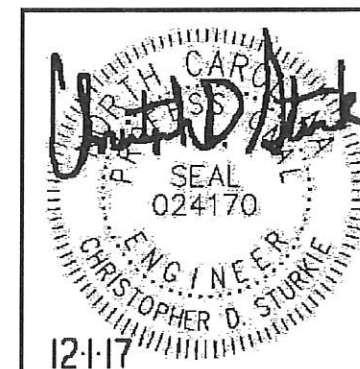
2 LUG DETAIL
E8.01 SCALE: NTS



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND IN CABLE.
2. ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
3. 2-1/2" DIA. MAX FOR TX/RX ANTENNA CABLES.
4. ALLOW FOR 1/2" DEFLECTION IN CABLES.

3 COAX CABLE GROUND KIT
E8.01 SCALE: N.T.S.



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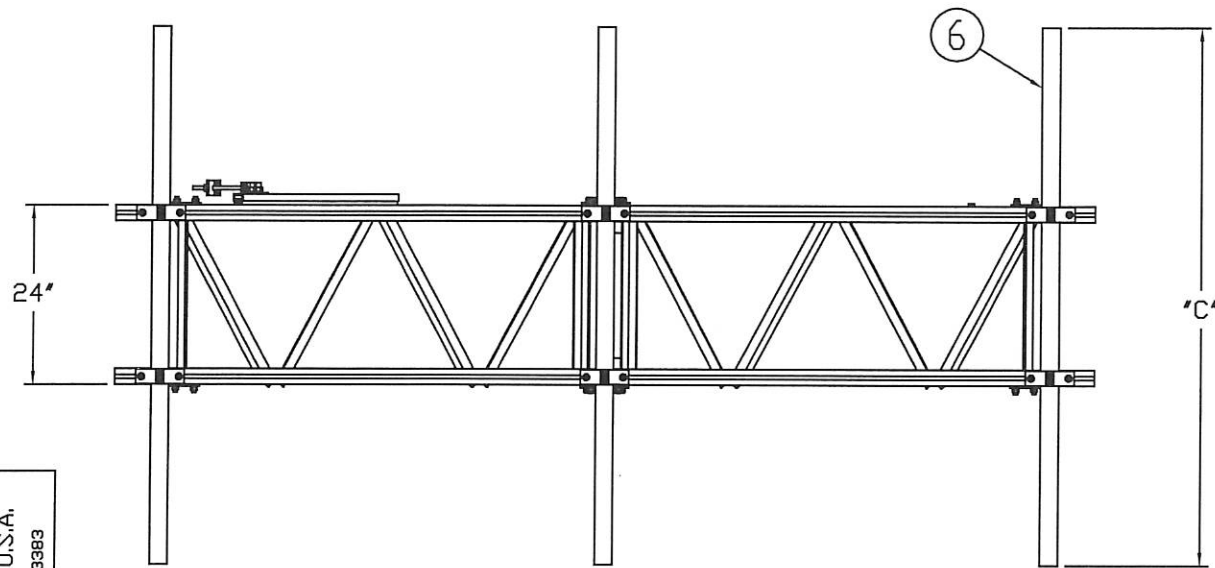
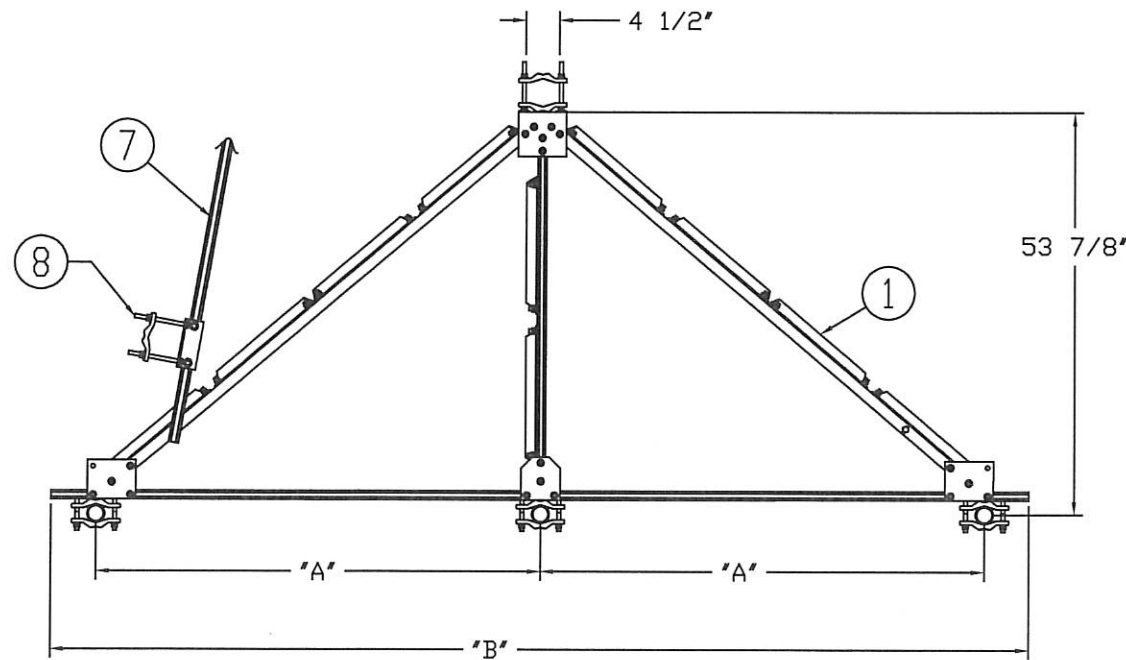
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DETAILS

Sheet Number:
E8.01

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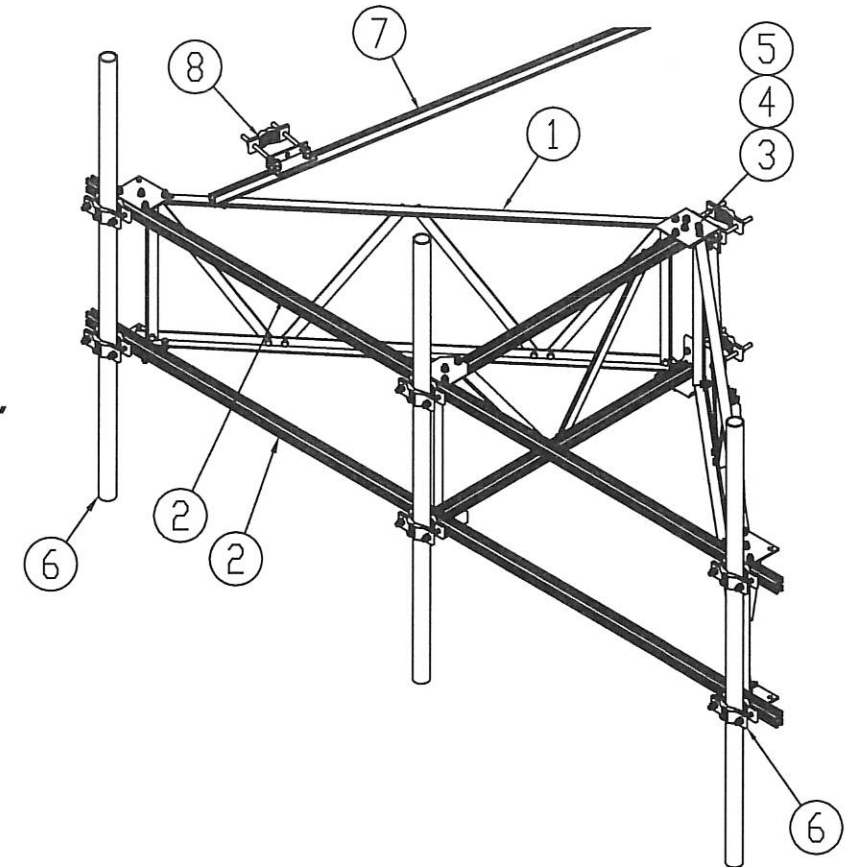
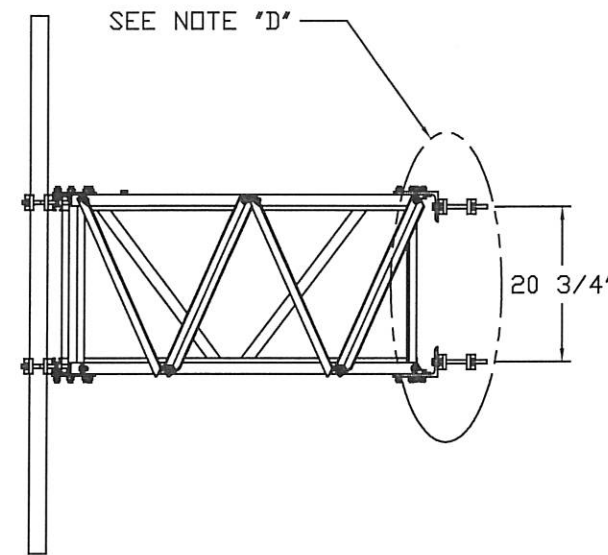
NOTES:

A) DIMENSION "A" = ADJUSTABLE & CAN BE EQUALLY SPACED (BASED ON NUMBER OF "AMP" MOUNTING PIPE KITS)

B) DIMENSION "B" = 132" FOR 10'-0" MOUNT, OR 156" FOR THE 12'-0" MOUNT

C) DIMENSION "C" = LENGTH OF PIPE INDICATED ON THE "AMP" KIT

D) ATTACHMENT TO TOWER - REFER TO DIAGRAM #69044 FOR TOWER ATTACHMENT OPTION DETAILS.



ITEM	PART No.	QTY	DESCRIPTION	LENGTH
1	43535	1	COLLAPSED ASSEMBLY (CAM-SERIES)	-
2	-	2	4-WAY T-SLOT	132" OR 156"
3	30307	18	BOLT, HEX, 1/2" X 1-1/4" - GRD 5	1-1/4"
4	30039	18	1/2" MEDIUM HELICAL LOCKWASHER	-
5	30009	18	NUT, HEX, 1/2"	-
6	-	-	"AMP" (MOUNTING PIPE) KIT	VARIES
7	14002	1	2-WAY T-SLOT (1/2" X 5/8")	121"
8	42600	1	STABILIZER CLAMP ASSEMBLY	-

SUFFIX	CHANGE / REVISION DESCRIPTION	E. A. NO.	CHANGE DATE

PART NUMBER	REVISION LEVEL	RELEASE E. A.	PROJECT CODE	RELEASE DATE	SCALE	WEIGHT	USED ON
69043	-	3332	-	13-JAN-04	-	-	-

CATALOG NAME

DIAGRAM, STAND-OFF FRAME (CAM-SF)

PRODUCT / ITEM DESCRIPTION

-

MATERIAL / SECTION NO.

-

CARLISLE DRAWN BY

REVIEWED

APPROVED

69043

PART NUMBER

-

REVISION