



Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

September 22, 2016

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 851939
AT&T Site ID: CT5022
100 Reef Road, Fairfield, CT 06824
Latitude: 41° 8' 22.381" / Longitude: -73° 15' 24.119"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 130-foot level of the existing rooftop cell tower site at 100 Reef Road in Fairfield, CT. The tower is owned by Crown Castle. The property is owned by the Town of Fairfield. AT&T now install three (3) RRUS11s.

According to the Town Planner, Mr. Joe Devonchuck, the Town of Fairfield does not have original zoning documents due to the tower being originally constructed for town use; no zoning approval was necessary.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Michael C. Tetreau, First-Selectman, Town of Fairfield, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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September 22, 2016

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6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Michael C. Tetreau, First-Selectman
Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

Town of Fairfield
725 Old Post Road
Fairfield, CT 06824

100 REEF ROAD

Location 100 REEF ROAD

Mblu 182/ 670/ / /

Acct# 05288

Owner FAIRFIELD TOWN OF

Assessment \$4,450,390

Appraisal \$6,357,700

PID 16390

Building Count 2

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$4,826,700	\$1,531,000	\$6,357,700
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$3,378,690	\$1,071,700	\$4,450,390

Owner of Record

Owner FAIRFIELD TOWN OF

Sale Price \$0

Co-Owner

Certificate

Address 725 OLD POST ROAD
FAIRFIELD, CT 06824

Book & Page 137/ 640

Sale Date

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
FAIRFIELD TOWN OF	\$0		137/ 640	

Building Information

Building 1 : Section 1

Year Built: 1975
Living Area: 24,580
Replacement Cost: \$5,708,959
Building Percent Good: 68
Replacement Cost Less Depreciation: \$3,882,100

Building Photo

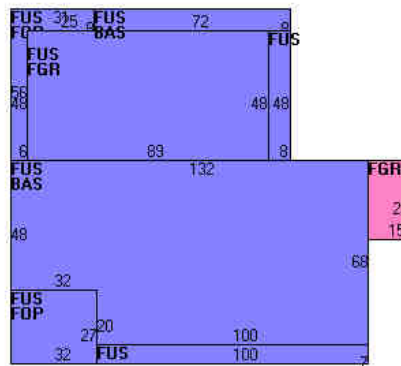
Building Attributes	
Field	Description
STYLE	Police Station
MODEL	Ind/Comm

Stories:	2
Occupancy	1
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	Central
Bldg Use	Police Dept
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	9031
Heat/AC	Heat/AC Split
Frame Type	Fireprf Steel
Baths/Plumbing	Average



(http://images.vgsi.com/photos/FairfieldCTPhotos//\02\05\41\59.jpg)

Building Layout



Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
FUS	Upper Story, Finished	15,668	15,668
BAS	First Floor	8,912	8,912
FGR	Garage	4,707	0
FOP	Porch, Open, Finished	1,400	0
		30,687	24,580

Building 2 : Section 1

Year Built: 1953
Living Area: 8,000
Replacement Cost: \$1,119,760
Building Percent 56
Good:
Replacement Cost
Less Depreciation: \$627,100

Building Attributes : Bldg 2 of 2	
Field	Description
STYLE	Office
MODEL	Ind/Comm
Stories:	2
Occupancy	1

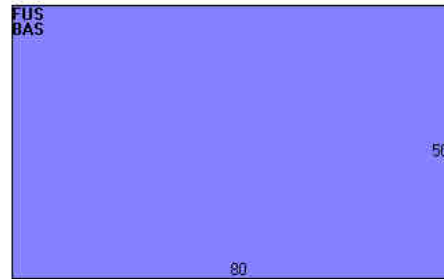
Building Photo

Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Plastered
Interior Wall 2	Minim/Masonry
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	Central
Bldg Use	Police Dept
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	9031
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	Average



(<http://images.vgsi.com/photos/FairfieldCTPhotos//\00\00\14\66.jpg>)

Building Layout



Building Sub-Areas (sq ft)			
Code	Description	Gross Area	Living Area
BAS	First Floor	4,000	4,000
FUS	Upper Story, Finished	4,000	4,000
		8,000	8,000

Extra Features

Extra Features				
Code	Description	Size	Value	Bldg #
MEZ1	MEZZANINE-UNF	1760 S.F.	\$27,500	1
SPR1	SPRINKLERS-WET	8000 S.F.	\$10,300	2
ELV1	PASS ELEV	2 STOPS	\$39,200	2
VLT1	VAULT-AVG	84 S.F.	\$19,100	1
ELV1	PASS ELEV	2 STOPS	\$47,600	1
ELV2	FREIGHT ELEV	2 STOPS	\$34,000	1

Land

Land Use

Use Code 9031

Land Line Valuation

Size (Acres) 1.50

Description Police Dept
Zone R3
Neighborhood C3
Alt Land Appr No
Category

Depth 0
Assessed Value \$1,071,700
Appraised Value \$1,531,000

Outbuildings

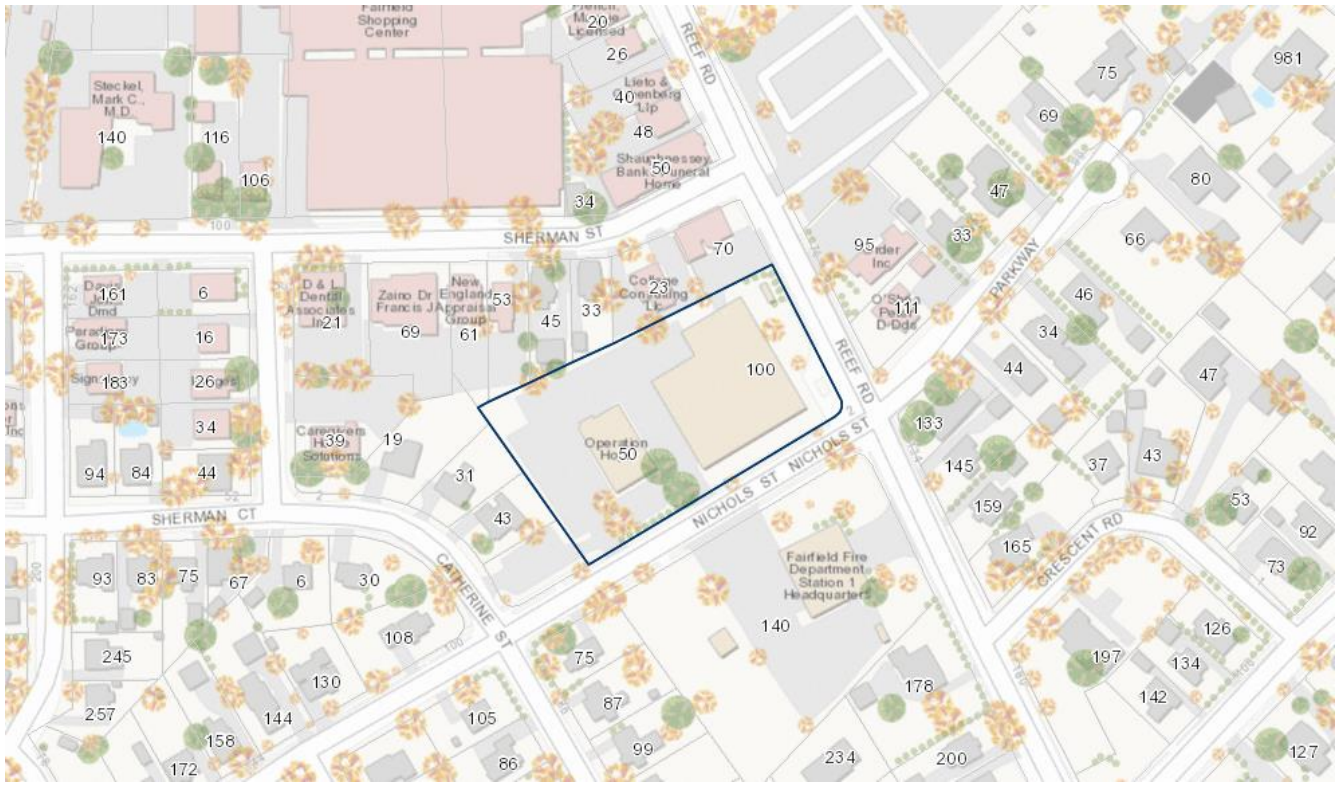
Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
LT1	LIGHTS-IN W/PL			9 UNITS	\$6,500	1
FN3	FENCE-6' CHAIN			300 L.F.	\$2,700	1
PAV1	PAVING-ASPHALT			40000 S.F.	\$126,000	1
SHD2	W/LIGHTS ETC			300 S.F.	\$4,600	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$4,826,700	\$1,531,000	\$6,357,700
2014	\$3,157,900	\$1,420,700	\$4,578,600
2013	\$3,157,900	\$1,420,700	\$4,578,600

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$3,378,690	\$1,071,700	\$4,450,390
2014	\$2,210,530	\$994,490	\$3,205,020
2013	\$2,210,530	\$994,490	\$3,205,020

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PROJECT INFORMATION

SCOPE OF WORK: • AT&T ANTENNAS: (3) EXISTING ANTENNAS PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (9) EXISTING ANTENNAS TO REMAIN.
 • AT&T RRUS: (1) NEW RRUS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUS; (1) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (3) EXISTING RRUS.

SITE ADDRESS: 100 REEF ROAD
 FAIRFIELD, CT 06824

LATITUDE: 41.1396919 41°-08'-22.89"N
 LONGITUDE: -73.2577989 73°-15'-28.076"W

USID: 4522

TOWER OWNER: TBD

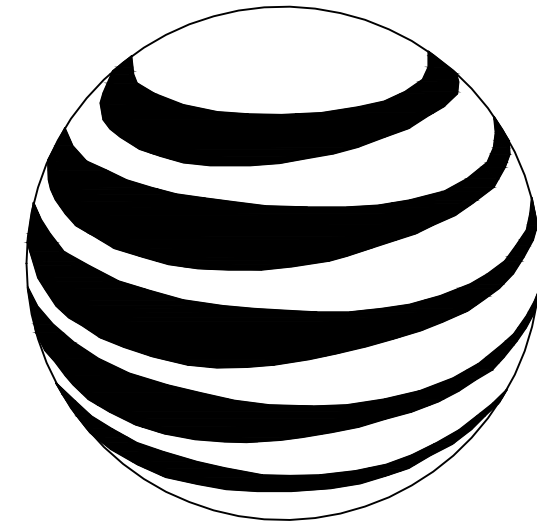
TYPE OF SITE: MONOPOLE/INDOOR EQUIPMENT ON ROOF

MONOPOLE HEIGHT: 150'-0"±

RAD CENTER: 130'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



at&t
MOBILITY

FA CODE: 10108711
SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD
BUN# 851939

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: EMPIRE TELECOM
 ADDRESS: 16 ESQUIRE ROAD
 BILLERICA, MA 01821
 CONTACT: DAVID COOPER
 PHONE: 617-639-4908
 EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:

COMPANY: EMPIRE TELECOM
 ADDRESS: 16 ESQUIRE ROAD
 BILLERICA, MA 01821
 CONTACT: DAVID COOPER
 PHONE: 617-639-4908
 EMAIL: dcooper@empiretelecomm.com

ZONING:

COMPANY: EMPIRE TELECOM
 ADDRESS: 16 ESQUIRE ROAD
 BILLERICA, MA 01821
 CONTACT: DAVID COOPER
 PHONE: 617-639-4908
 EMAIL: dcooper@empiretelecomm.com

ENGINEERING:

COMPANY: COM-EX CONSULTANTS, LLC
 ADDRESS: 115 ROUTE 46
 SUITE E39
 MOUNTAIN LAKES, NJ 07046
 CONTACT: NICHOLAS D. BARILE, P.E.
 PHONE: 862-209-4300
 EMAIL: nbarile@comexconsultants.com

RF ENGINEER:

COMPANY: AT&T MOBILITY – NEW ENGLAND
 ADDRESS: 550 COCHITUATE ROAD
 SUITE 550 13 & 14
 FRAMINGHAM, MA 01701
 CONTACT: CAMERON SYME
 PHONE: 508-596-7146
 EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:

COMPANY: EMPIRE TELECOM
 ADDRESS: 16 ESQUIRE ROAD
 BILLERICA, MA 01821
 CONTACT: GRZEGORZ "GREG" DORMAN
 PHONE: 484-683-1750
 EMAIL: gdorman@empiretelecomm.com

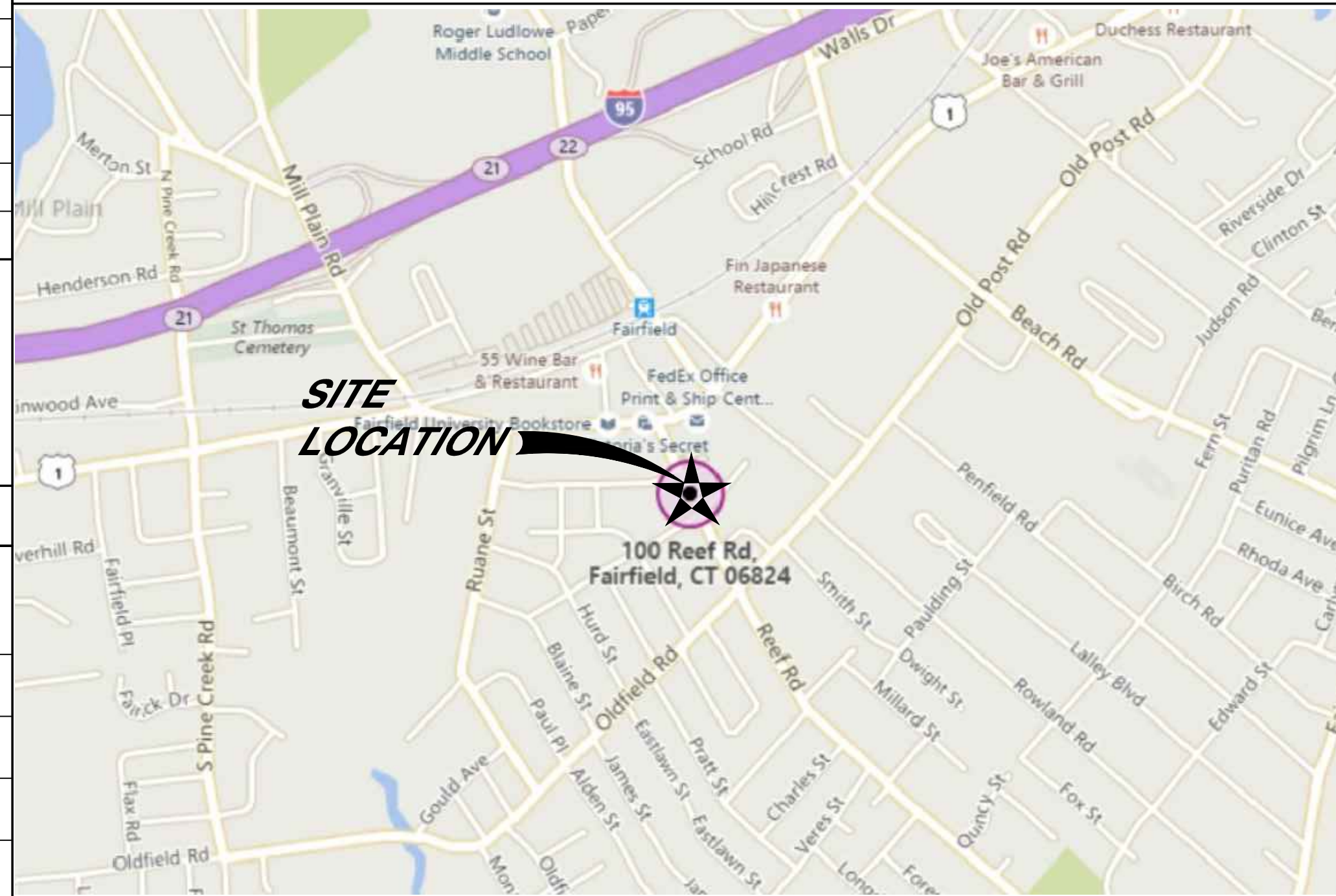
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VICINITY MAP

START OUT GOING NE ON ENTERPRISE DR TOWARD CAPITOL BLVD. TURN LEFT ONTO CAPITOL BLVD. TURN LEFT ONTO WEST ST. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. MERGE ONTO I-95S/GOVERNOR JOHN DAVIS LODGE TURNPIKE VIA THE EXIT ON THE LEFT TOWARD N.Y. CITY. TAKE THE CT-135/N BENSON ROAD EXIT, EXIT 22. TURN LEFT ONTO N BENSON RD/CT-135. TURN RIGHT ONTO POST RD/US-1. TURN LEFT ONTO REEF RD. 100 REEF RD IS ON THE RIGHT.



GENERAL NOTES

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		



CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

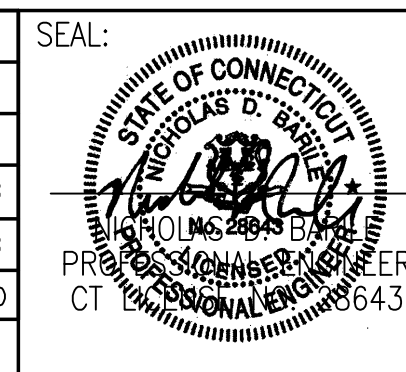


SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD
 100 REEF ROAD
 FAIRFIELD, CT 06824
 FAIRFIELD COUNTY



NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/22/16	REVISED PER STRUCTURAL MODS	NJM	NDB	NDB
0	02/22/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN DESIGNED BY: NJM DRAWN BY: NJM



AT&T		
DRAWING TITLE: TITLE SHEET		
JOB NUMBER 15077-EMP	DRAWING NUMBER T-1	REV 1

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR - EMPIRE TELECOM
 SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER - AT&T MOBILITY
 OEM - ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

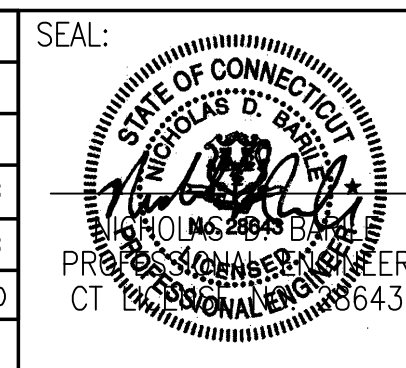
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
 - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
 - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
 - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
 - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
 - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
 - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
 - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
 - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
 - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
 - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.
22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.



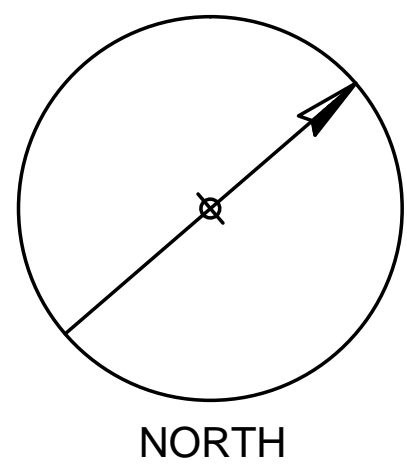
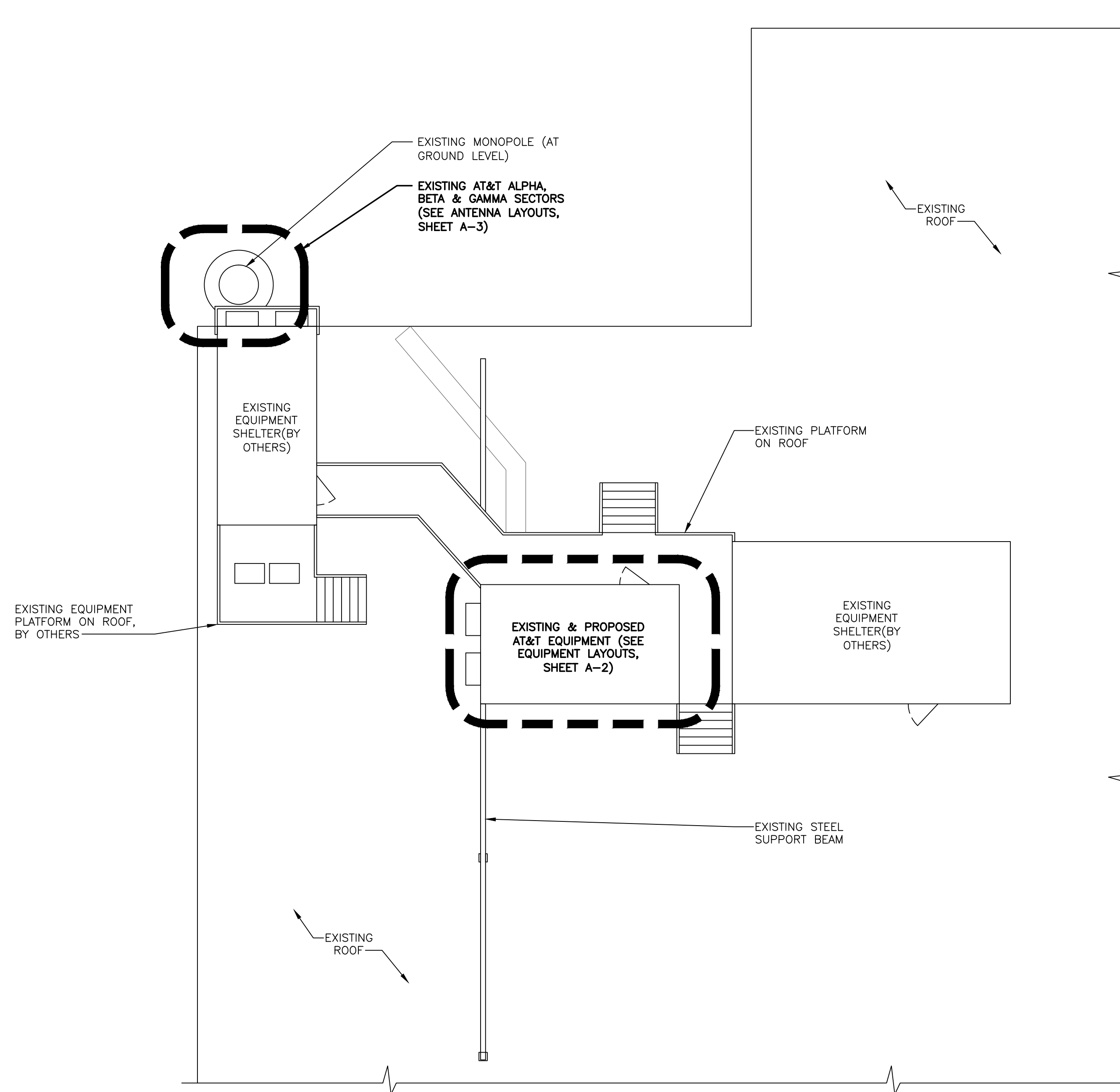
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SITE NAME: AWE - FAIRFIELD
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 FAIRFIELD, CT 06824
 FAIRFIELD COUNTY



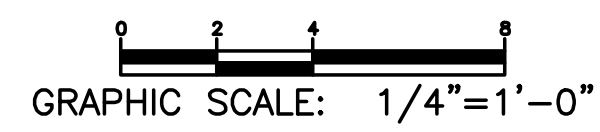
1	08/22/16	REVISED PER STRUCTURAL MODS	NJM	NDB	NDB
0	02/22/16	ISSUED AS FINAL	NJM	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: NJM	DRAWN BY: NJM		



AT&T		
DRAWING TITLE: GROUNDING & GENERAL NOTES		
JOB NUMBER 15077-EMP	DRAWING NUMBER GN-1	REV 1



ROOFTOP LAYOUT
SCALE: 1/4" = 1'-0"



NOTE:
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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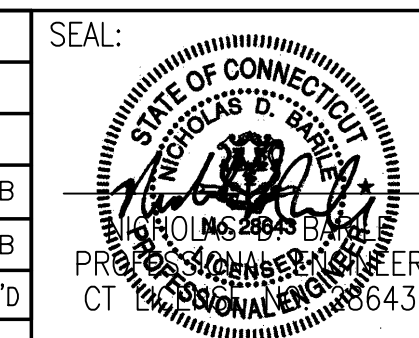
EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

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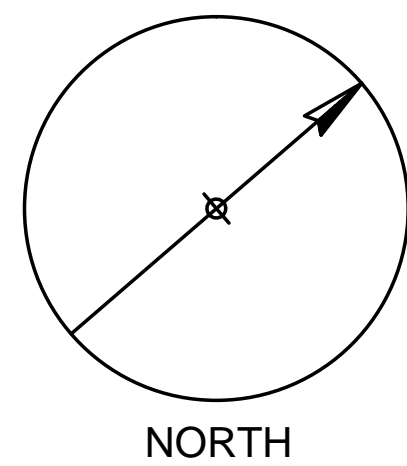
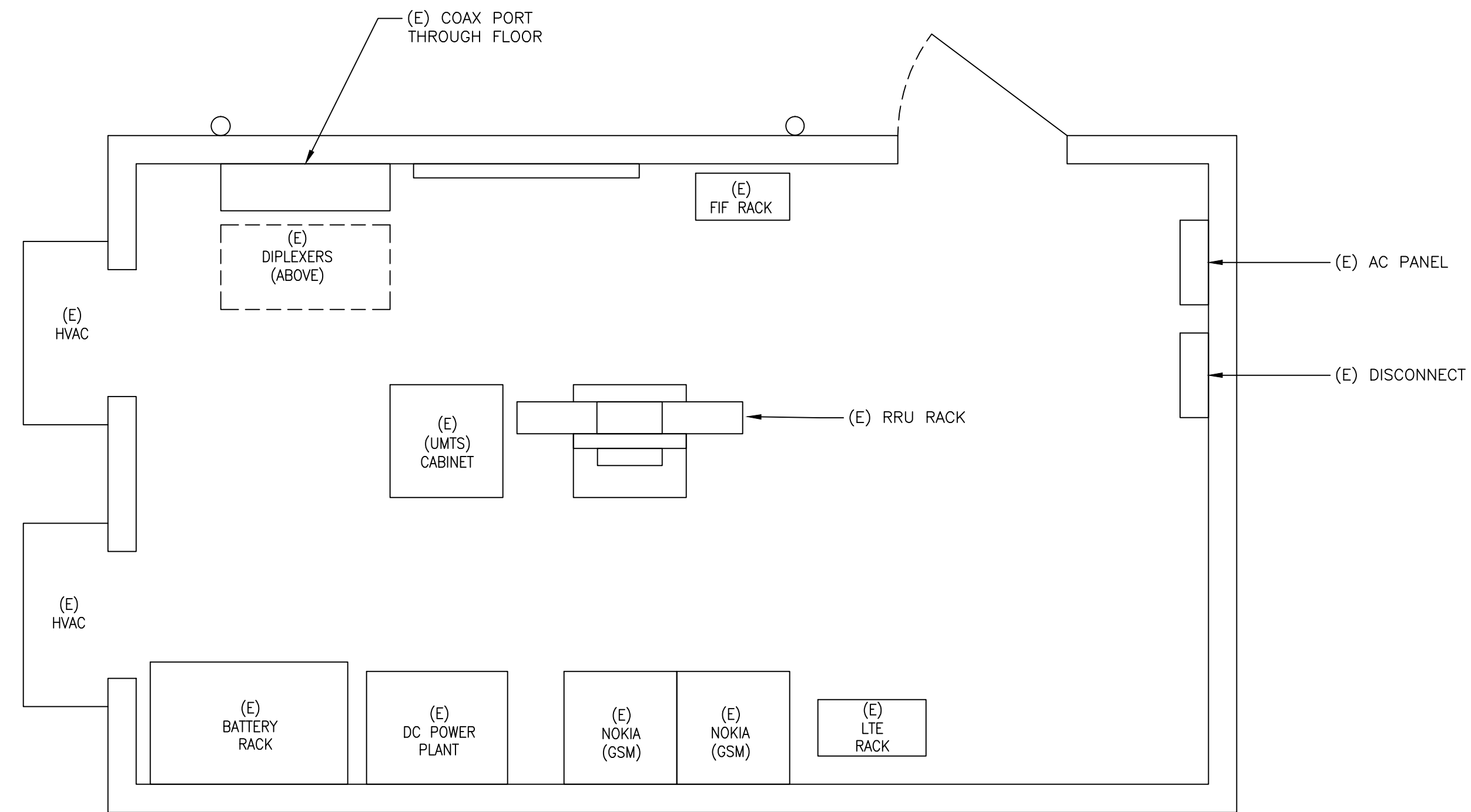
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MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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AT&T		
DRAWING TITLE: ROOFTOP LAYOUT		
JOB NUMBER 15077-EMP	DRAWING NUMBER A-1	REV 1



NORTH

PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"



(IN FEET)

1/2 Inch = 1 Foot

NO GROUND EQUIPMENT MODIFICATIONS ARE BEING MADE AS PART OF THIS SCOPE. EXISTING GROUND EQUIPMENT CONFIGURATION TO REMAIN.

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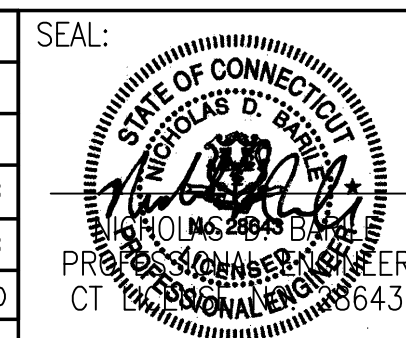
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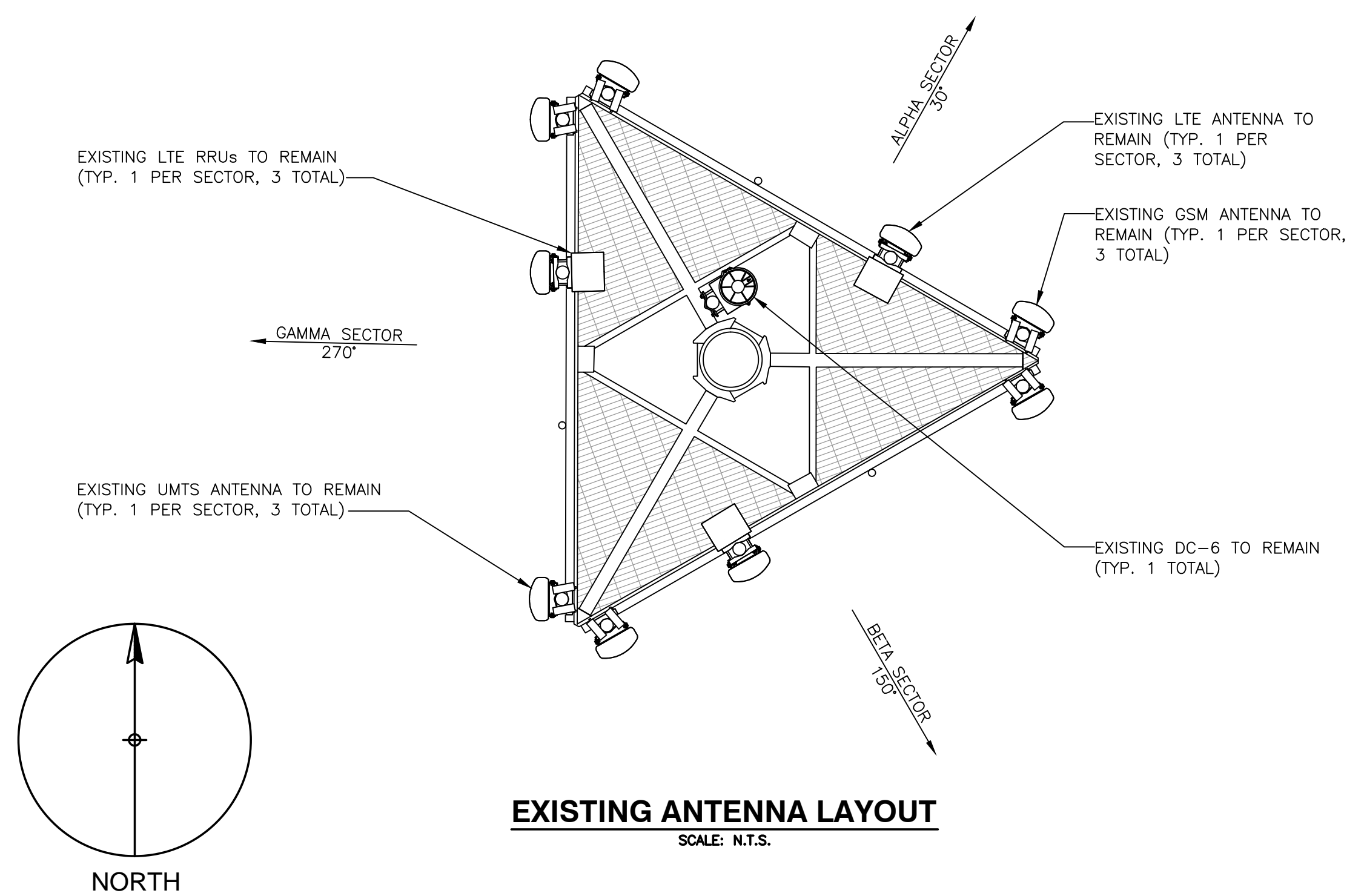
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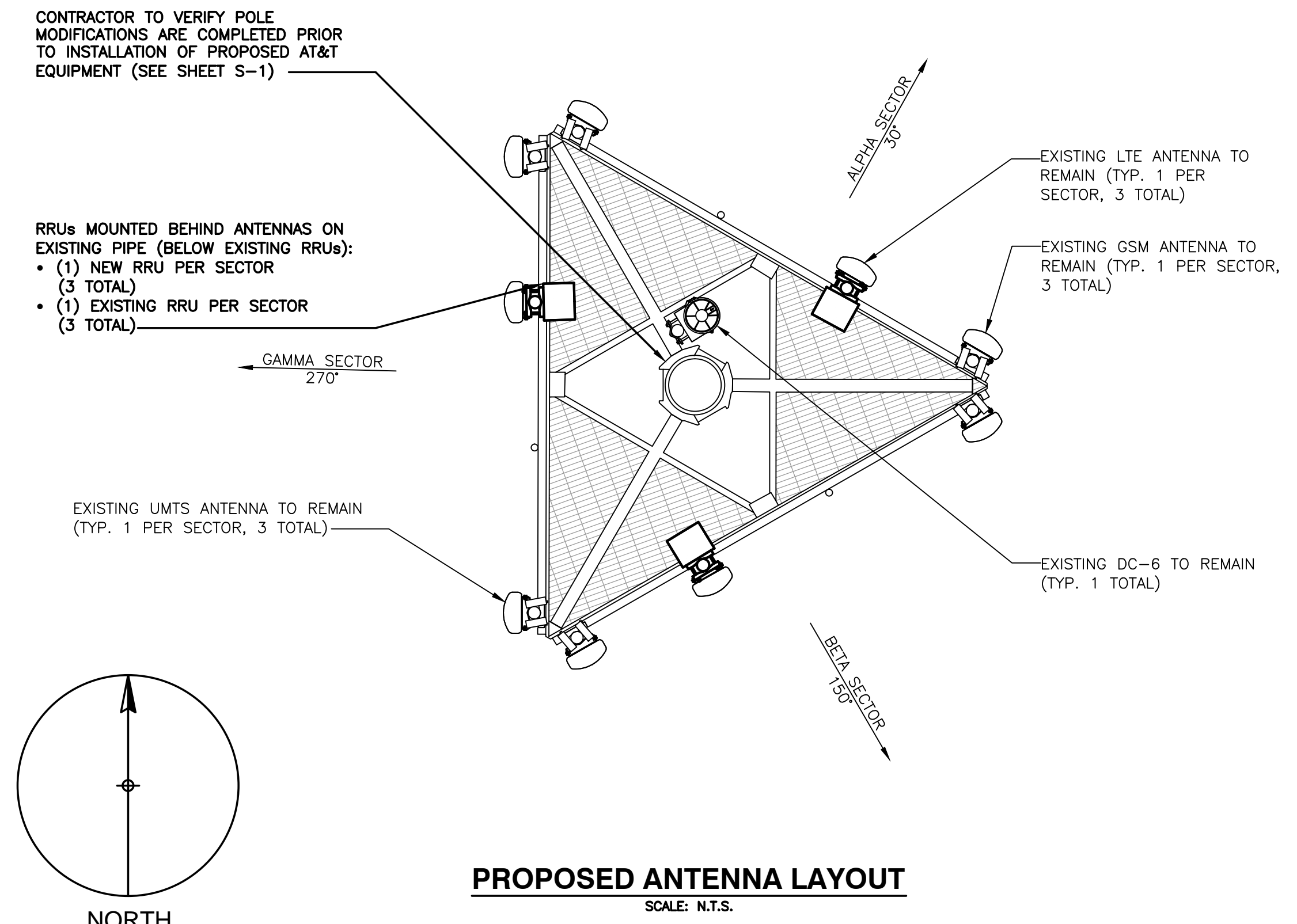
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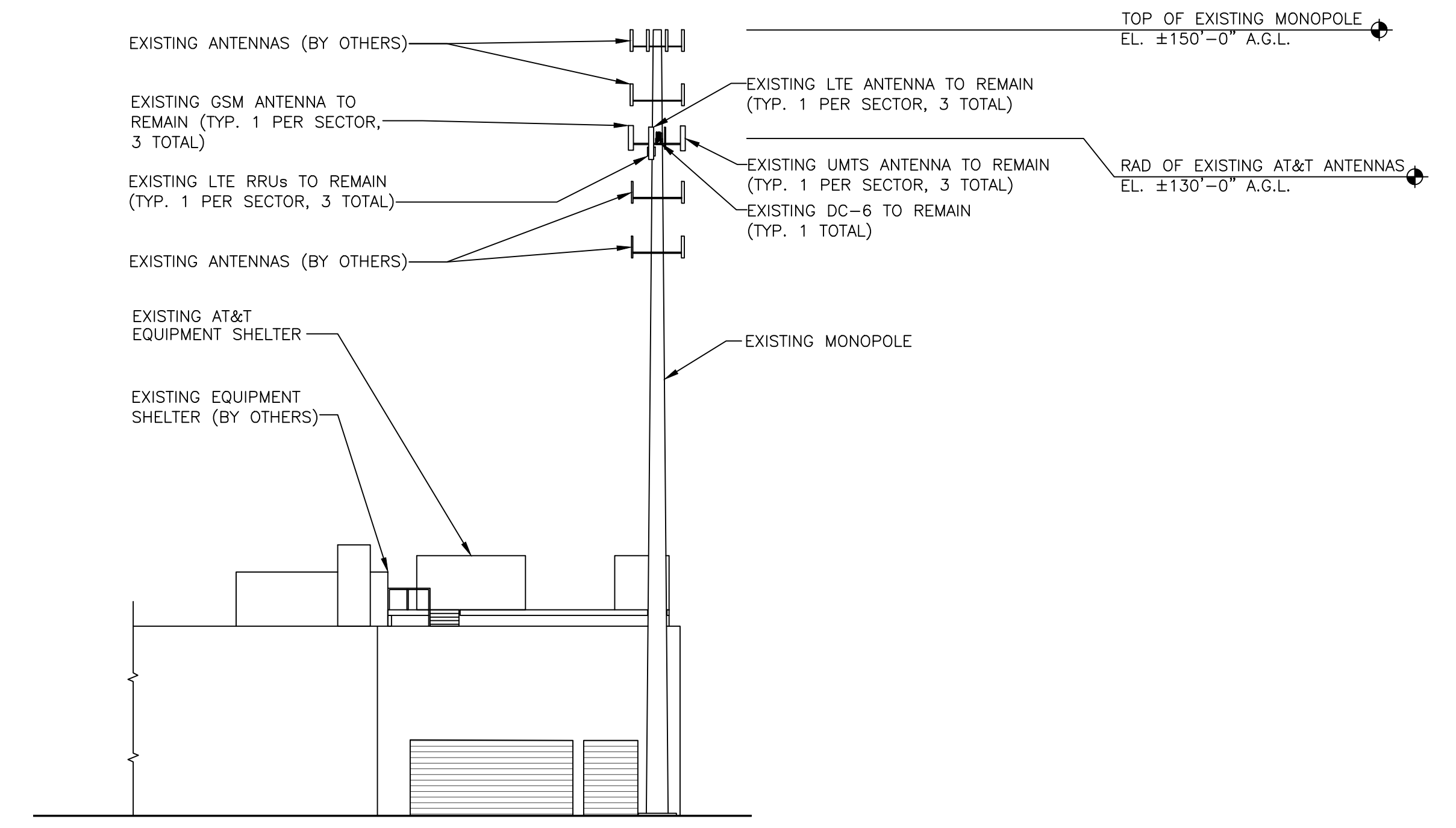
AT&T		
DRAWING TITLE: EQUIPMENT LAYOUTS		
JOB NUMBER 15077-EMP	DRAWING NUMBER A-2	REV 1



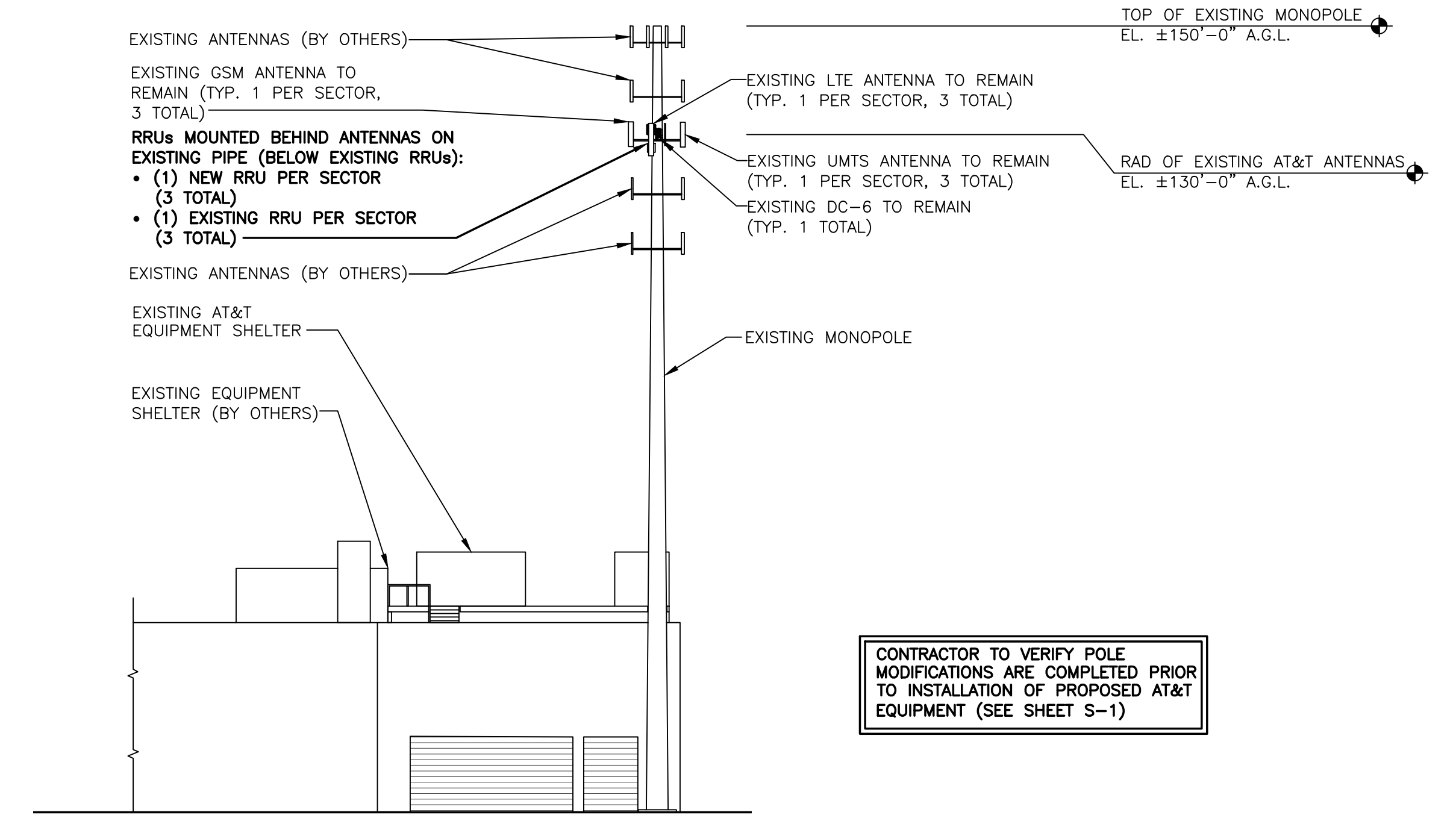
EXISTING ANTENNA LAYOUT
SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT
SCALE: N.T.S.



EXISTING TOWER ELEVATION
SCALE: NTS



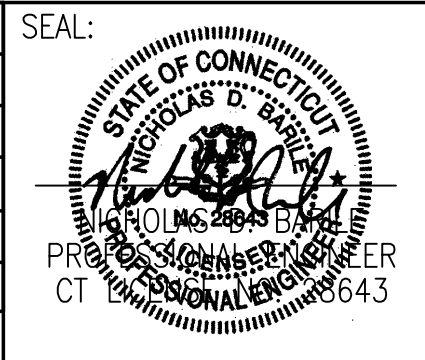
PROPOSED TOWER ELEVATION
SCALE: NTS

CONTRACTOR TO VERIFY POLE MODIFICATIONS ARE COMPLETED PRIOR TO INSTALLATION OF PROPOSED AT&T EQUIPMENT (SEE SHEET S-1)

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

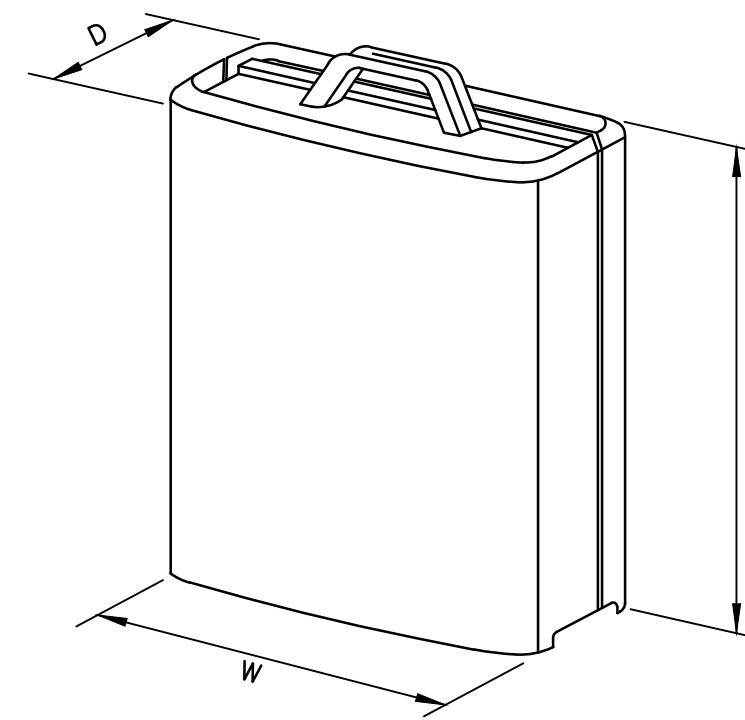
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AT&T		
DRAWING TITLE: ANTENNA LAYOUTS & ELEVATIONS		
JOB NUMBER 15077-EMP	DRAWING NUMBER A-3	REV 1

N/A
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS

*DENOTES EXISTING.

RRUS DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	-	-	-
	A3	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	-	-	-
	B3	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	-	-	-
	G3	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	G4	POWERWAVE	7770	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	-	-	-
	A3	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	-	-	-
	B3	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	-	-	-
	G3	POWERWAVE	P65-16-XLH-RR	72"x12"x6"
	G4	POWERWAVE	7770	55"x11"x5"

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	ERICSSON	RRUS-11	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	ERICSSON	RRUS-11	19.7"x16.9"x7.2"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

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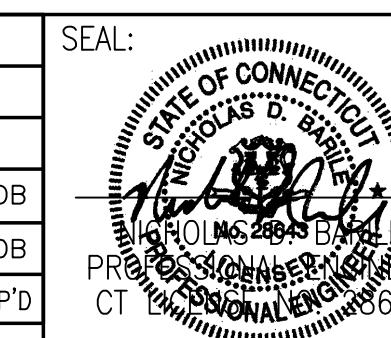
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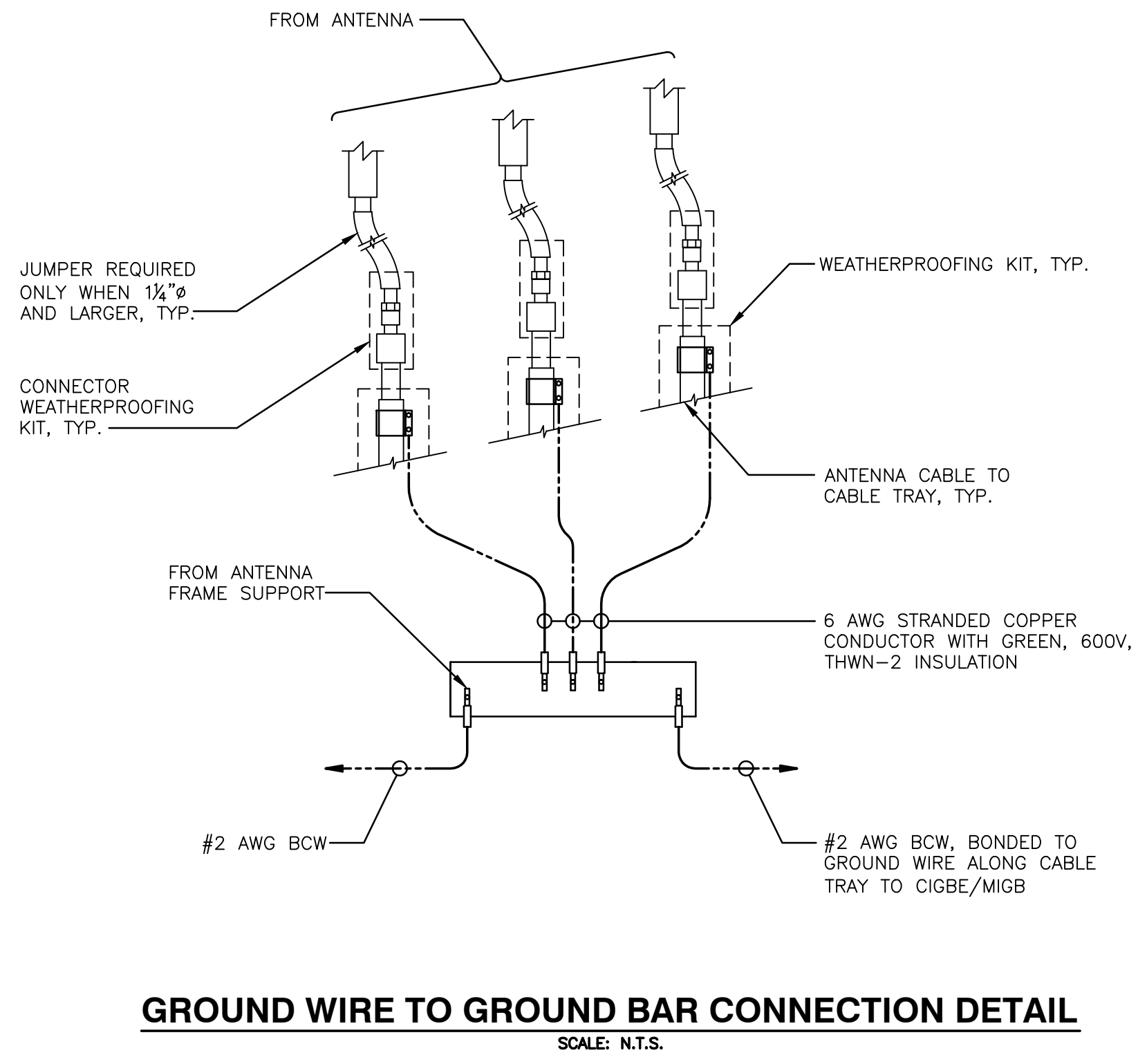
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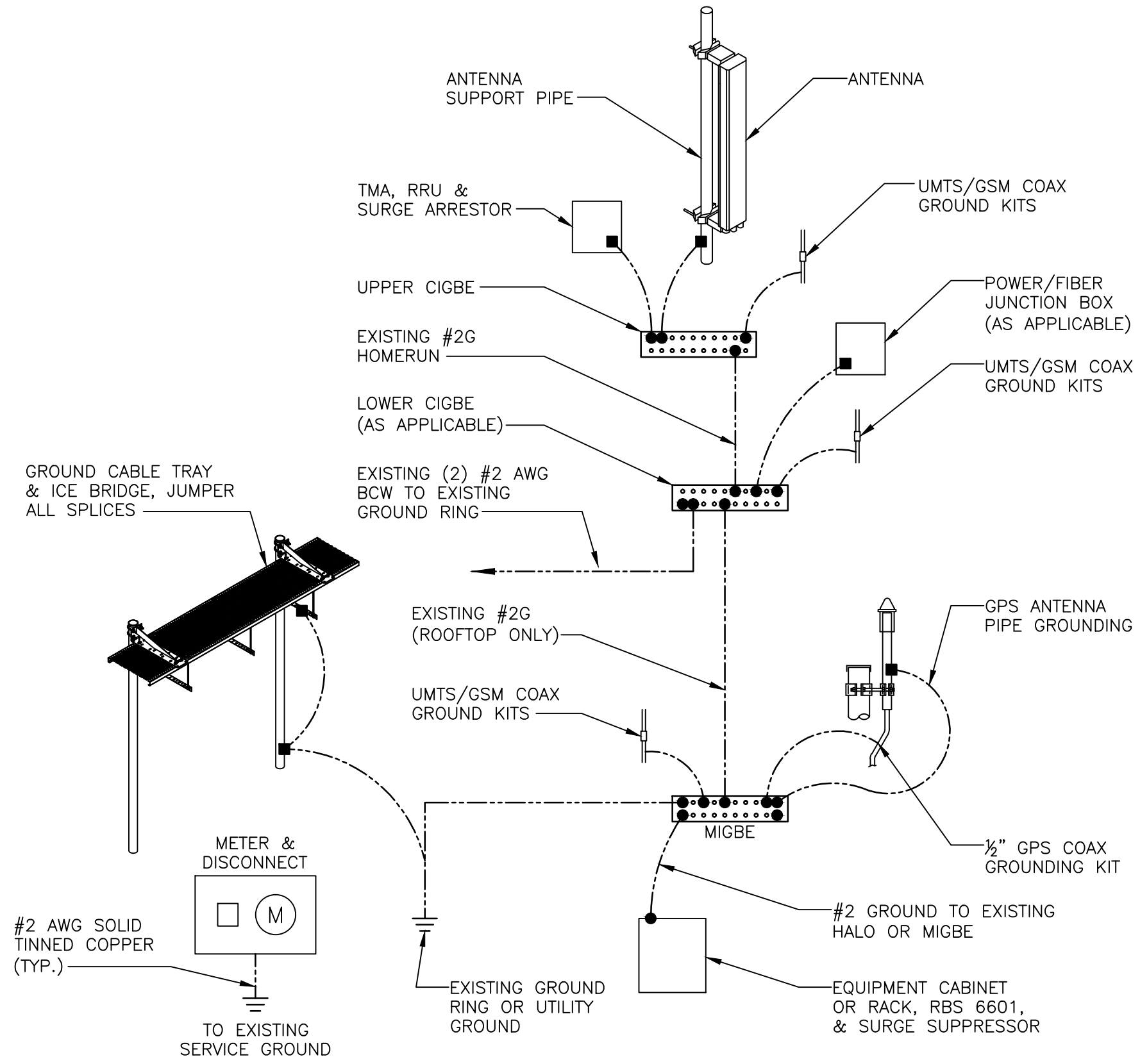
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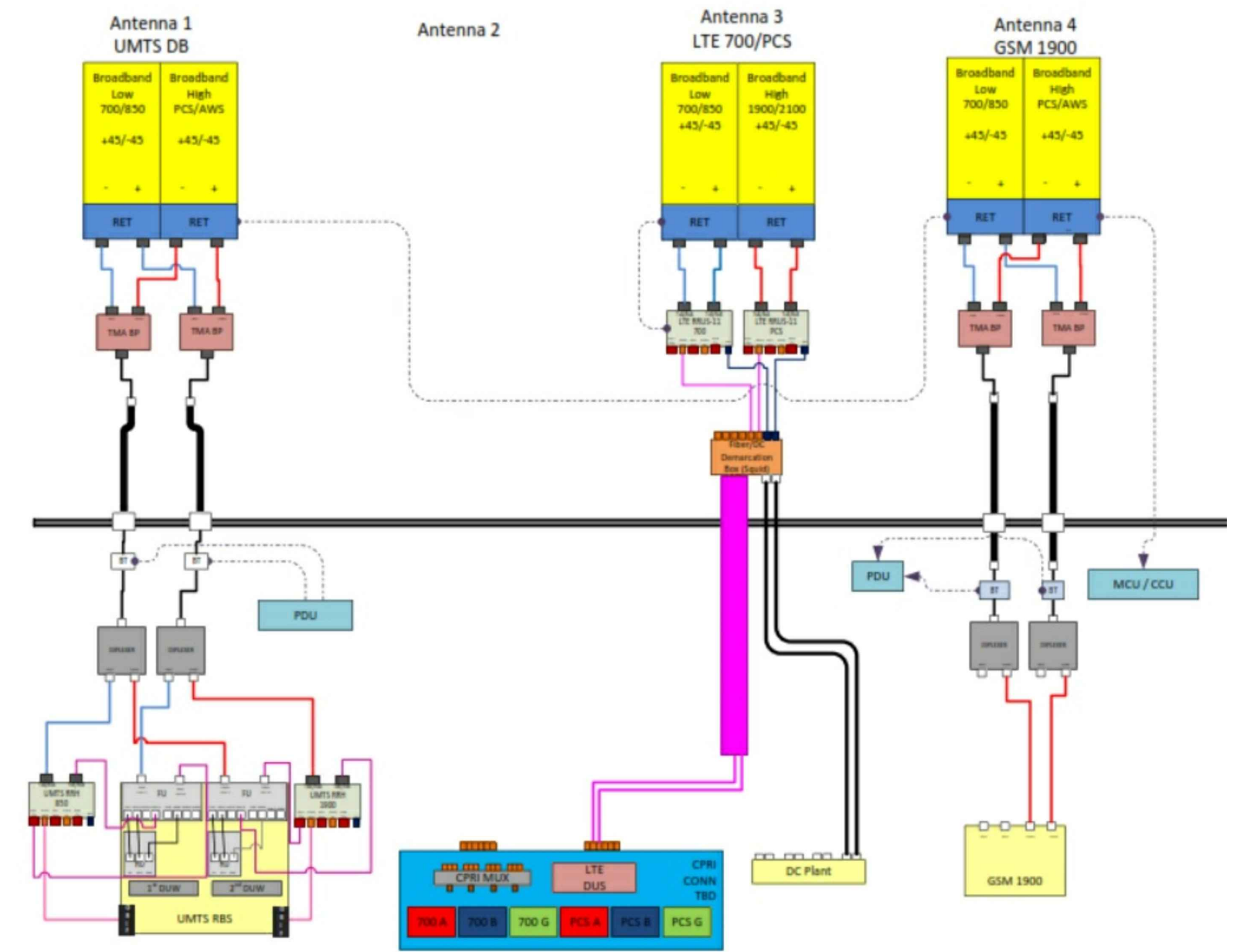
AT&T		
DRAWING TITLE:		
JOB NUMBER	DRAWING NUMBER	REV
15077-EMP	A-4	1



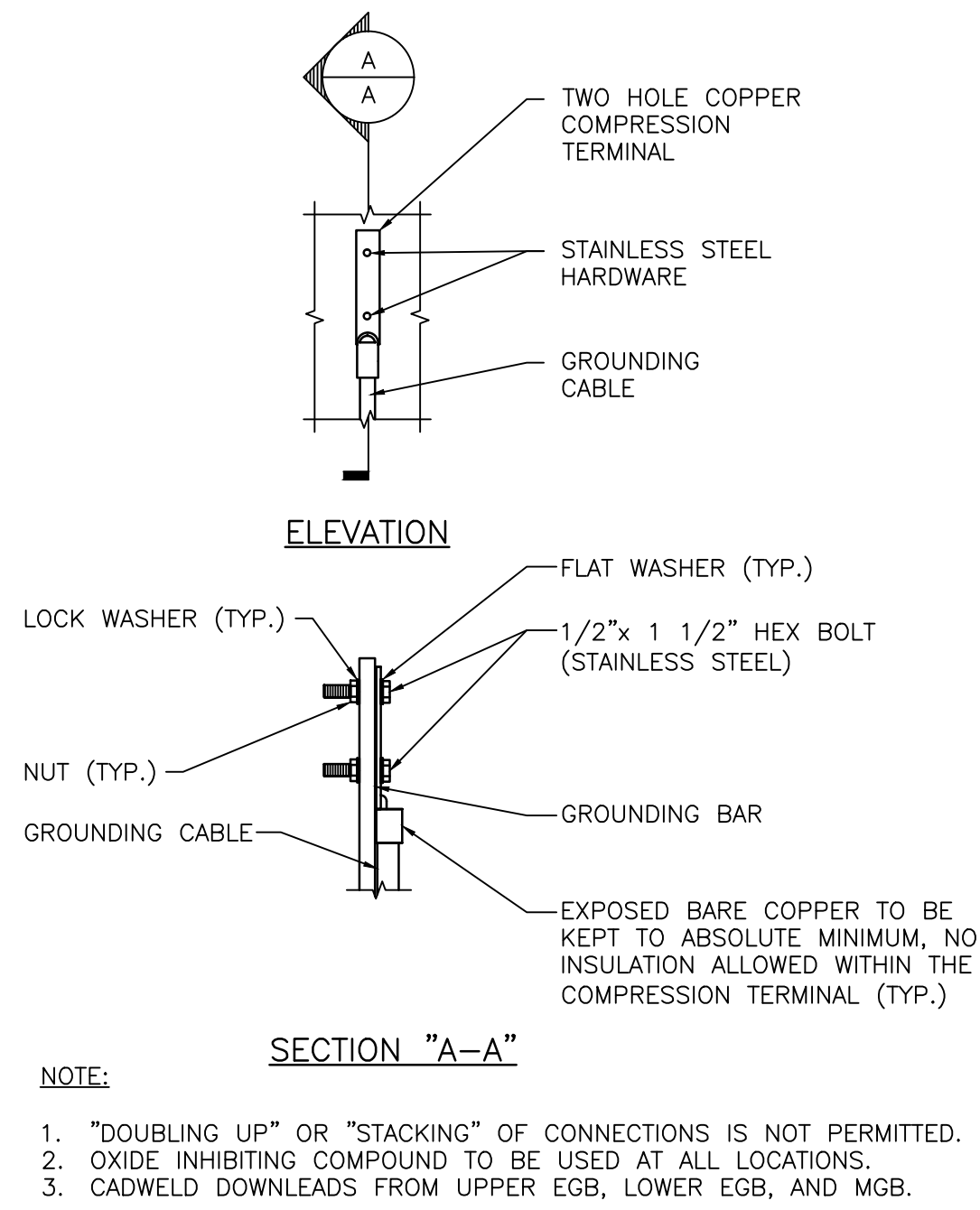
GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



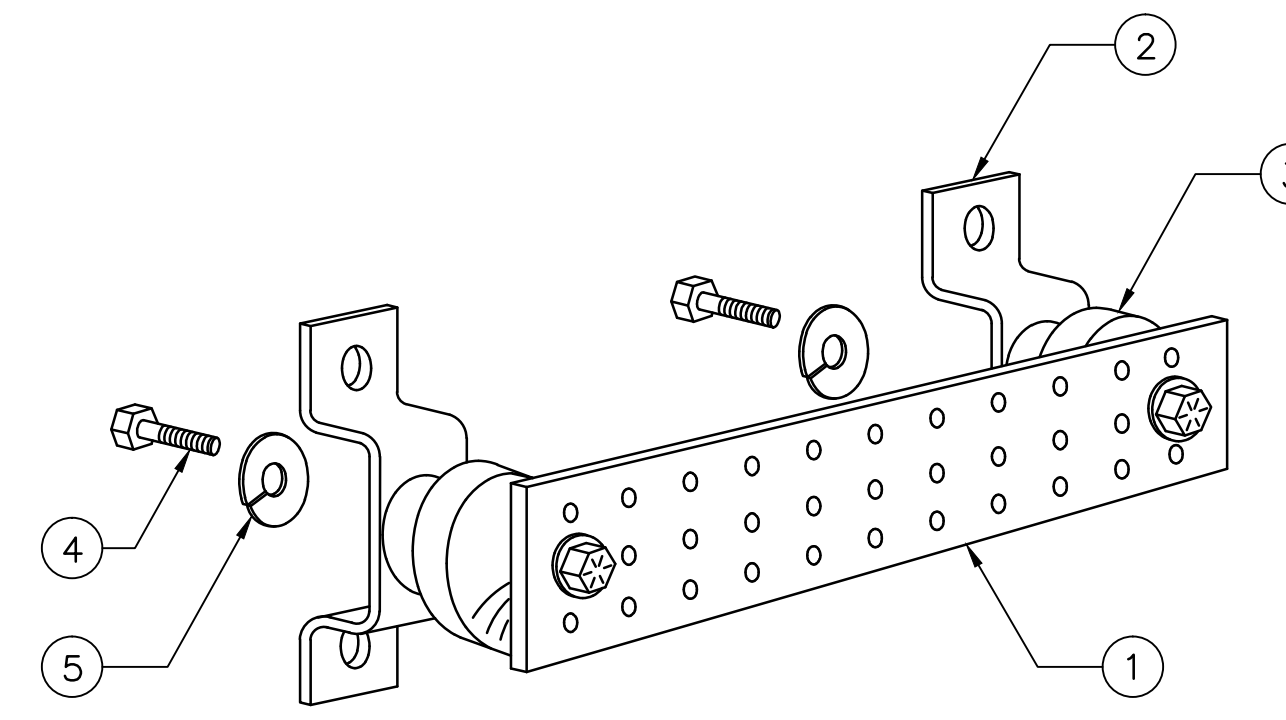
GROUNDING RISER DIAGRAM
SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)
SCALE: N.T.S.



TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



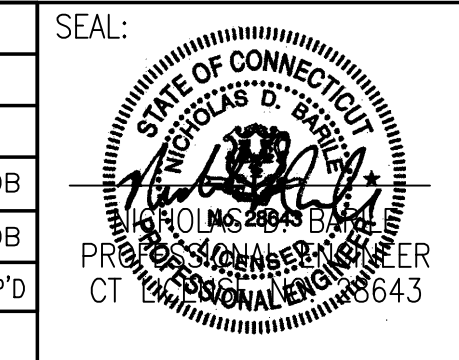
ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x 1/4")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	5/8"-11x1" H.H.C.S.
5	4	5/8" LOCK WASHER

- NOTES:
- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION
- SECTION "P" - SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
 - GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
 - TELCO GROUND BAR
 - COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
 - +24V POWER SUPPLY RETURN BAR (#2)
 - 48V POWER SUPPLY RETURN BAR (#2)
 - RECTIFIER FRAMES
- SECTION "A" - SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
 - EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
 - METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
 - BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL
SCALE: N.T.S.

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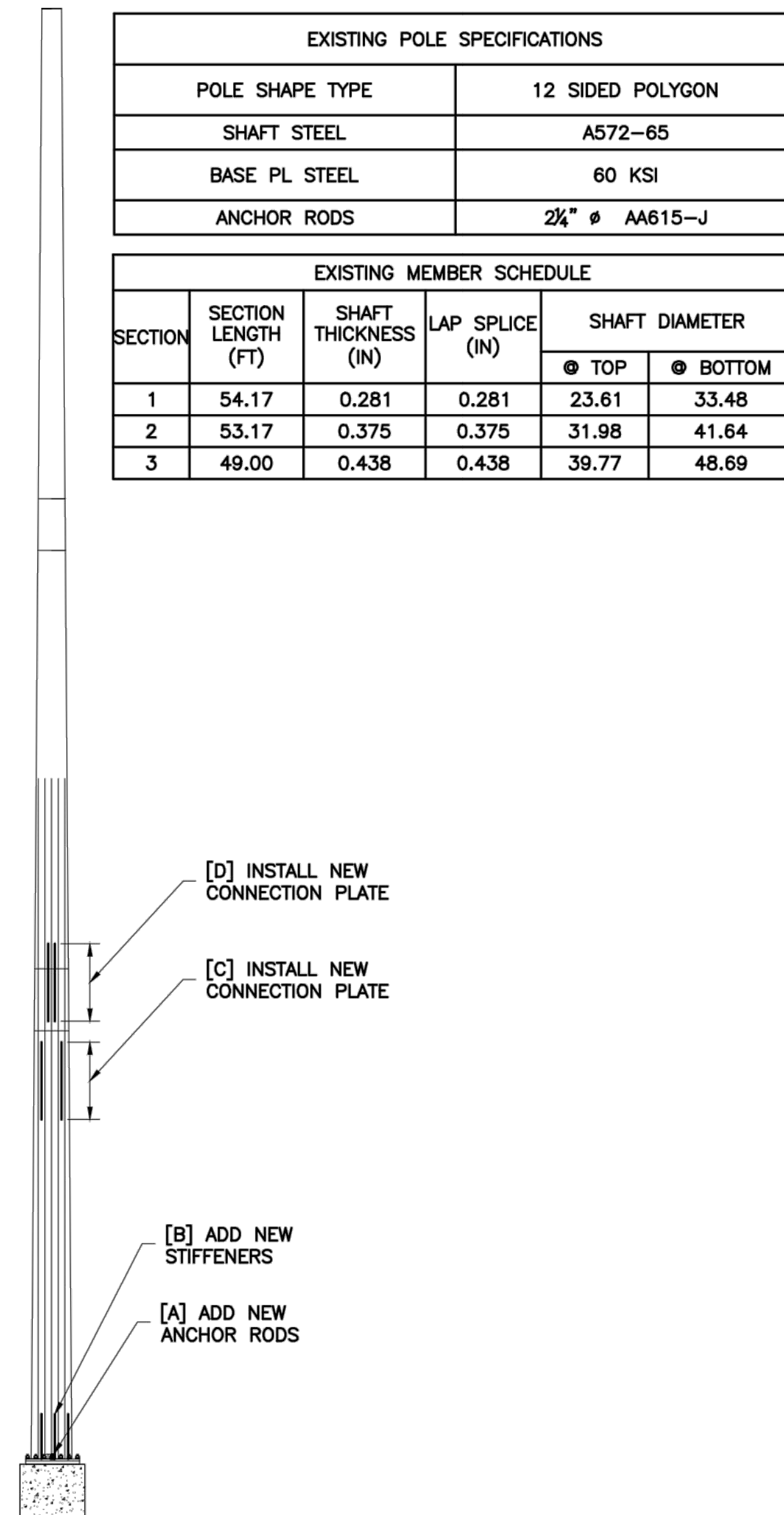


145'-0" AGL

90'-9" AGL

42'-9" AGL

0'-0" AGL



1 TOWER ELEVATION
S1 N.T.S.

EXISTING POLE SPECIFICATIONS	
POLE SHAPE TYPE	12 SIDED POLYGON
SHAFT STEEL	A572-65
BASE PL STEEL	60 KSI
ANCHOR RODS	2 1/4" ø AA615-J

EXISTING MEMBER SCHEDULE					
SECTION	SECTION LENGTH (FT)	SHAFT THICKNESS (IN)	LAP SPLICE (IN)	SHAFT DIAMETER	
				ø TOP	ø BOTTOM
1	54.17	0.281	0.281	23.61	33.48
2	53.17	0.375	0.375	31.98	41.64
3	49.00	0.438	0.438	39.77	48.69

NOTES:

- UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN DESTEK ANALYSIS REPORT DATED 08/19/2016. CONTRACTOR TO REVIEW AND SHOULD ADHERE TO THE REPORT.
- CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AS NEEDED.
- ALL DIMENSIONS ARE BASED ON A TOWER MAPPING PREPARED BY COM-EX DATED 03/25/2016.
- CONTRACTOR TO FIELD VERIFY EXISTING TOWER MEMBER SIZES AND TOWER DIMENSIONS IN THE VICINITY OF THE UPGRADE, BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO DESTEK IMMEDIATELY FOR FURTHER EVALUATION.
- DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 20 MPH AT THE GROUND LEVEL.
- NEW TOWER REACTIONS:
SHAFT MOMENT: 3557 KIPS-FT
SHAFT SHEAR: 42 KIPS
SHAFT COMPRESSION: 36 KIPS
- CONTRACTOR TO HAVE THE SAFETY CLIMB INTACT AND FUNCTIONAL AFTER WORK IS COMPLETE.
- TOWER WILL BECOME UNSTABLE WHEN MEMBERS ARE DISCONNECTED OR BEING REPLACED. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER DURING WORK AND SHOULD CONSULT WITH AN ENGINEER.
- DESTEK DISCLAIMS ANY LIABILITY ARISING FROM THE ORIGINAL MATERIAL, FABRICATION OR ERECTION OF THE TOWER.
- ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

POLE MODIFICATION SCHEDULE			
	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	0'-0"	ADD (3) 2 1/2" A1554 GR105 ANCHOR RODS MATCH EXISTING ANCHOR RODS B.C.	S-2
B	0'-0"	ADD (6) NEW GR65 STIFFENERS	S-2, S-4
C	43'-9" TO 51'-6"	INSTALL NEW CONNECTION PLATE	S-3
D	33'-11" TO 41'-8"		
E	-	RELOCATE ALL TME AND RRUS BEHIND ANTENNA	S-4

FLAT PLATE (65 KSI) REINFORCING		
ELEVATION (FT)	FLAT / DEGREES	PLATE SIZE
43'-9" TO 51'-6"	3,7,11	SEE S3
33'-11" TO 41'-8"	3,5,11	

1. DESIGN INFORMATION AND GENERAL REQUIREMENTS

- 1.1 CODES
 - CONNECTICUT STATE BUILDING CODE 2005, WITH ALL OF THE ADOPTED SUPPLEMENTS AND AMENDMENTS.
 - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-02, AMERICAN SOCIETY OF CIVIL ENGINEERS
 - STEEL CONSTRUCTION MANUAL, 9TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
 - STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, ANSI/TIA-222-F, TELECOMMUNICATIONS INDUSTRY ASSOCIATION
 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-02
- 1.2 GENERAL
 - PRIOR TO PURCHASE OR FABRICATION OF MATERIAL, THE CONTRACTOR SHALL PERFORM AN INSPECTION VERIFYING MEMBER DIMENSIONS AND BOLT SIZES. SHOULD THE CONTRACTOR DISCOVER ANY DAMAGED OR MISSING MEMBERS OR THE MEMBER OR BOLT SIZES DO NOT MATCH THOSE LISTED, DESTEK SHALL BE NOTIFIED IMMEDIATELY.
 - CONTRACTOR TO REPLACE ALL BOLTS REMOVED WITH NEW BOLTS OF SAME TYPE, UNLESS NOTED OTHERWISE.
- 1.3 LOADS & DESIGN CRITERIA
WIND LOADING: V=85 MPH;

2. STRUCTURAL STEEL

- 2.1 MATERIALS
 - STRUCTURAL STEEL ASTM A992
ANGLE & PLATE ASTM A36 U.N.O.
PIPE ASTM A53 GRADE B (OR Fy>35KSI) U.N.O.
HSS ROUND ASTM A500 GRADE B (Fy>42KSI) U.N.O.
BARS (SOLID RODS) ASTM A36 U.N.O.
 - BOLTS ASTM A325 U.N.O.
 - WELDING ELECTRODES AWS A5.1 (E70XX)
 - STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 335-89s1"
 - WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
 - THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
 - POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR RE-DRILLING WILL NOT BE PERMITTED.

2.2 CONNECTIONS

- SHOP CONNECTIONS MAY BE BOLTED OR WELDED
- FIELD CONNECTIONS BOLTED WITH A325 BOLTS, (INSTALLED SNUG TIGHT) UNLESS OTHERWISE SPECIFIED OR IF WELDED CONNECTIONS ARE NOTED ON DRAWINGS
- FIELD CONNECTIONS SHALL BE MADE WITH A325 BOLTS AND HARDENED WASHERS EXCEPT AS INDICATED ON THE DESIGN DRAWINGS
- CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
- DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
- BOLT HOLES SHALL BE CUT, DRILLED OR PUNCHED AT RIGHT ANGLES TO THE SURFACE OF THE METAL AND SHALL NOT BE MADE OR ENLARGED BY BURNING. HOLES SHALL BE CLEAN CUT WITHOUT TORN OR RAGGED EDGES. OUTSIDE BURRS RESULTING FROM DRILLING OR REAMING OPERATION SHALL BE REMOVED WITH A TOOL MAKING A 1/16 INCH BEVEL. BOLT HOLES SHALL BE 1/16 INCH OVERSIZE.

2.3 FINISHES

- STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
- BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
- ALL SURFACES DAMAGED DURING THE WORK SHALL BE PAINTED WITH COLD GALVANIZING COMPOUND TWICE. THE PAINT SHOULD BE AT LEAST 93% PURE ZINC. RUST-OLEUM PROFESSIONAL, (MODEL# 7585838) OR SIMILAR.

2.4 WELDING

- CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS; INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
- WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GRIND GALVANIZING BEFORE WELDING.
- WELDING CERTIFICATE MUST BE PROVIDED PRIOR TO WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.

PREPARED BY:
DESTEK ENGINEERING
DESTEK ENGINEERING, LLC
1281 KENNESTONE CIR, STE 100
MARIETTA, GA 30066
TEL NO: 770-993-0835
ADMIN@DESTKEENGINEERING.COM

PREPARED FOR:
COM-EX Consultants

DESCRIPTION:	DATE	NUM
ISSUED FOR CONSTRUCTION	08/19/2016	A

NUM: A 08/19/2016

DATE: 08/19/2016

NUM: A

SITE ADDRESS:
100 REEF ROAD
FAIRFIELD, CT 06824

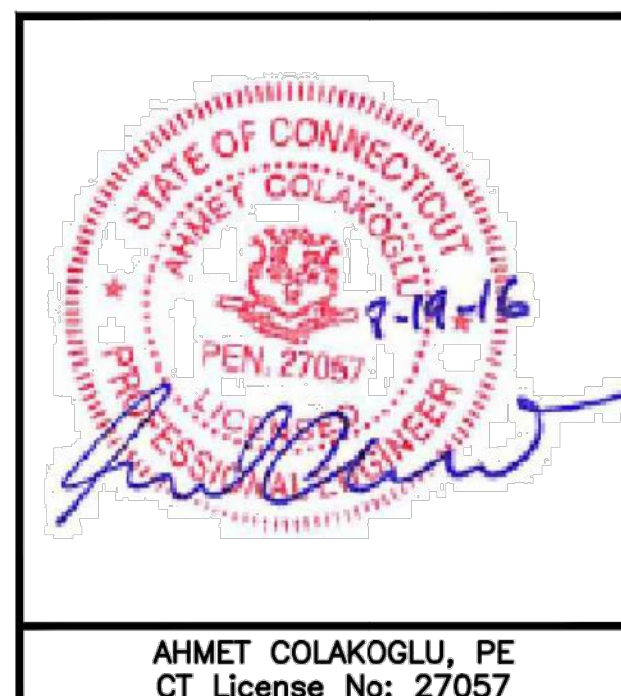
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CARRIER: AT&T
SITE ID: CT5022
SITE NAME: AWE - FAIRFIELD

TOWER INFORMATION:
FA NUMBER: 10108711

DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1629043

S1 SCOPE OF MODIFICATION



AHMET COLAKOGLU, PE
CT License No: 27057

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

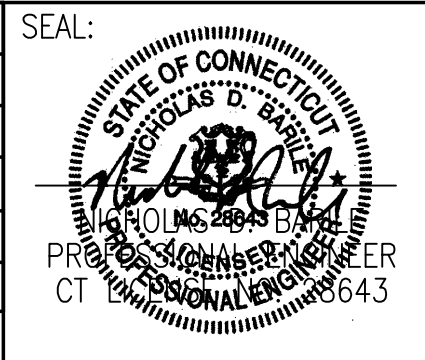
EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT5022
SITE NAME: AWE - FAIRFIELD
100 REEF ROAD
FAIRFIELD, CT 06824
FAIRFIELD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	02/22/16	ISSUED AS FINAL			

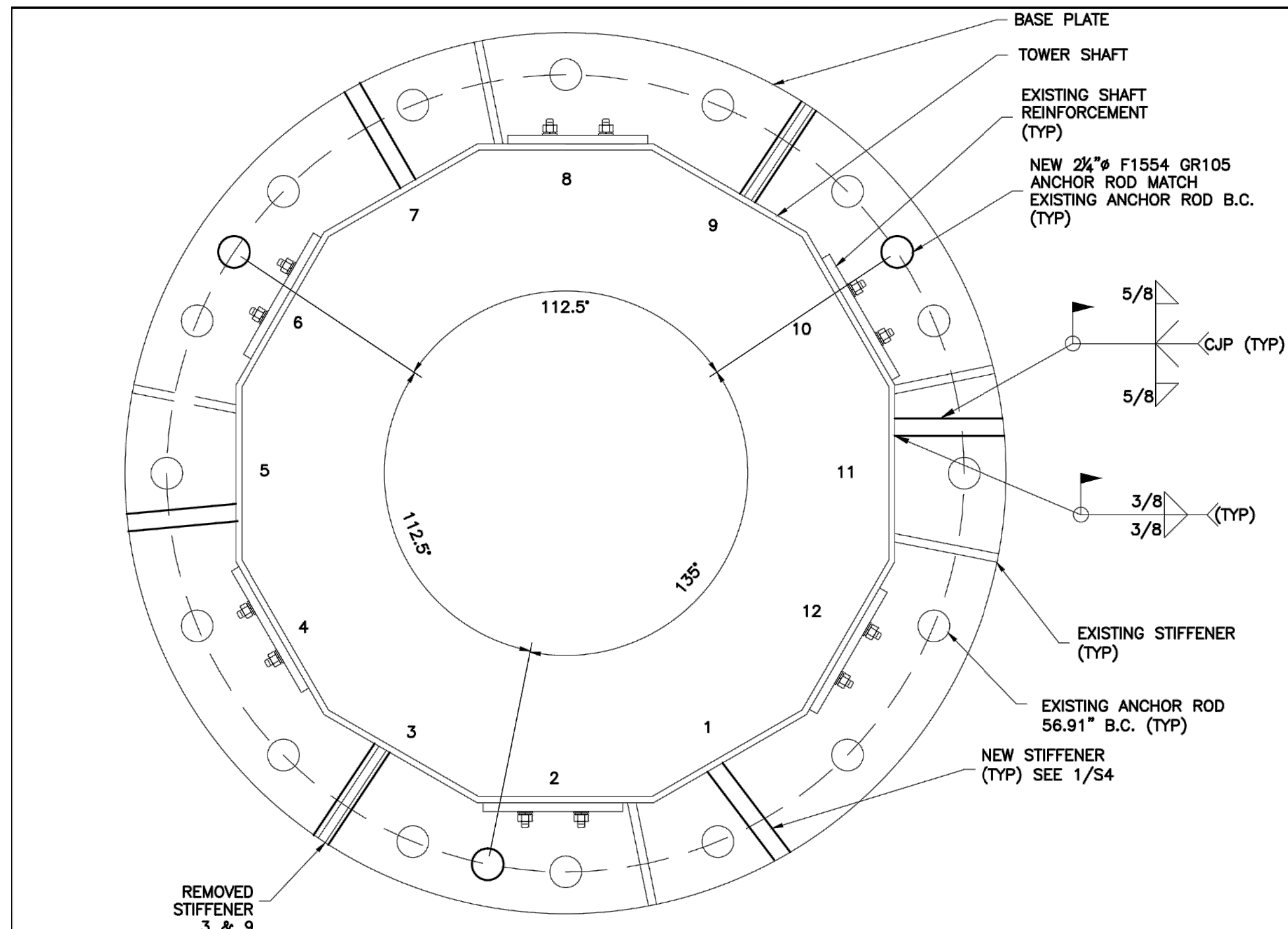
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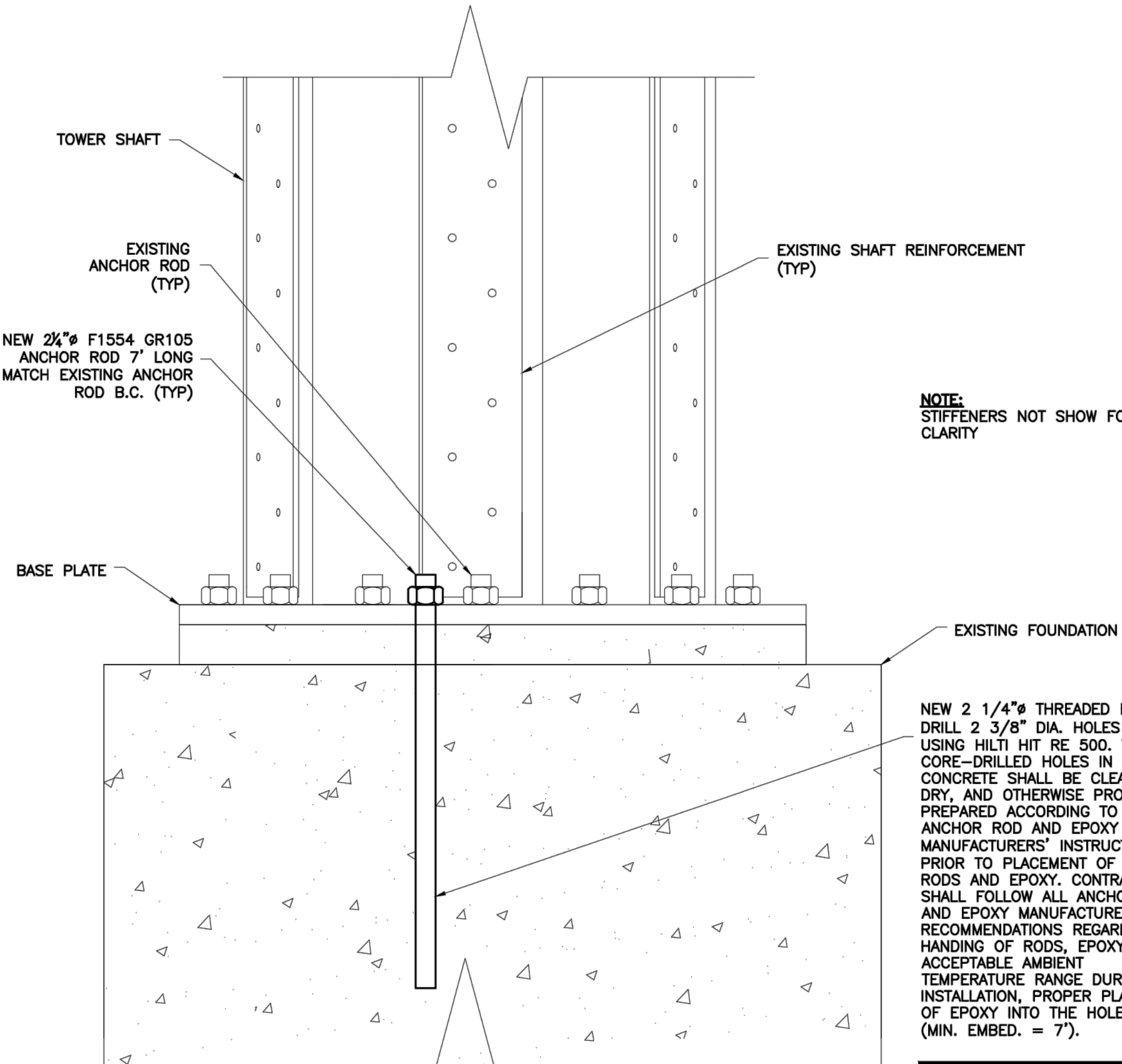
AT&T

DRAWING TITLE:
STRUCTURAL DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15077-EMP	S-1	1



1 ELEVATION 0' SECTION VIEW
S2 N.T.S.



2 ELEVATION VIEW
S2 N.T.S.

NOTE:
STIFFENERS NOT SHOW FOR CLARITY

NEW 2 1/4" THREADED ROD. DRILL 2 3/8" DIA. HOLES AND EPOXY USING HILTI HIT RE 500. THE CORE-DRILLED HOLES IN THE CONCRETE SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION, PROPER PLACEMENT OF EPOXY INTO THE HOLE, ETC. (MIN. EMBED. = 7").

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 CT License No: 27057

EPOXY GROUTED REINFORCING ANCHOR ROD NOTES:

- IF EXISTING ANCHOR/REBAR MATERIAL IS ENCOUNTERED DURING DRILLING, RELOCATE HOLE AND GROUT FILL IMPEDED HOLE WITH 5000 PSI NON SHRINK GROUT.
- THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
- ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED, ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER MANUFACTURER SPECIFICATION. NEW ANCHOR SHALL BE PROOF LOADED TO 160 KIPS.
- ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED, CONTRACTOR SHALL RELEASE ALL OF THE PROOF LOAD AND TIGHTEN ALL ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF THE NUT.
- CONTRACTOR SHALL VERIFY THAT EXISTING BASE PLATE GROUT IS IN GOOD CONDITION.

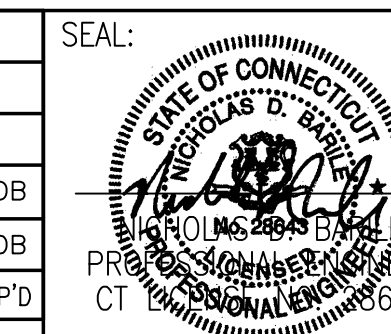
MATERIAL NOTES:

- DRILLED IN ANCHOR RODS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GR105. ANCHOR RODS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

PREPARED BY: DESTEK ENGINEERING DESTEK ENGINEERING, LLC 1281 KENNEDY BLVD, STE 100 MARIETTA, GA 30066 TEL NO: 770-693-0835 ADMIN@DESTENGINEERING.COM	
PREPARED FOR: COM-EX Consultants	
DESCRIPTION: ISSUED FOR CONSTRUCTION	DATE 08/19/2016
NUM A	
SITE ADDRESS: 100 REEF ROAD FAIRFIELD, CT 06824	
CARRIER DESIGNATION: AT&T	CARRIER: CT5022
FA NUMBER: 10108711	SITE ID: CT5022
	SITE NAME: AWE - FAIRFIELD
DESIGNED: DC	DRAWN: DC
	CHECKED: RP
JOB #: 1629043	
S2 STRUCTURAL DETAILS	

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/22/16	REVISED PER STRUCTURAL MODS	NJM	NDB	NDB
0	02/22/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN DESIGNED BY: NJM DRAWN BY: NJM



DRAWING TITLE: STRUCTURAL DETAILS		
JOB NUMBER 15077-EMP	DRAWING NUMBER S-1	REV 1

PREPARED BY:
DESTEK ENGINEERING
 DESTEK ENGINEERING, LLC
 1281 KENNESWORTH CIR. STE 100
 MARIETTA, GA 30066
 TEL. NO. 770-693-0635
 ADMIN@DESTENGINEERING.COM

PREPARED FOR:
COM-EX Consultants

DESCRIPTION:	ISSUED FOR CONSTRUCTION
DATE	08/19/2016
NUM	A

SITE ADDRESS:
 100 REEF ROAD
 FAIRFIELD, CT 06824

CARRIER DESIGNATION: AT&T
 CARRIER: AT&T
 SITE ID: CT5022
 SITE NAME: AWE - FAIRFIELD

TOWER INFORMATION:
 FA NUMBER: 10108711

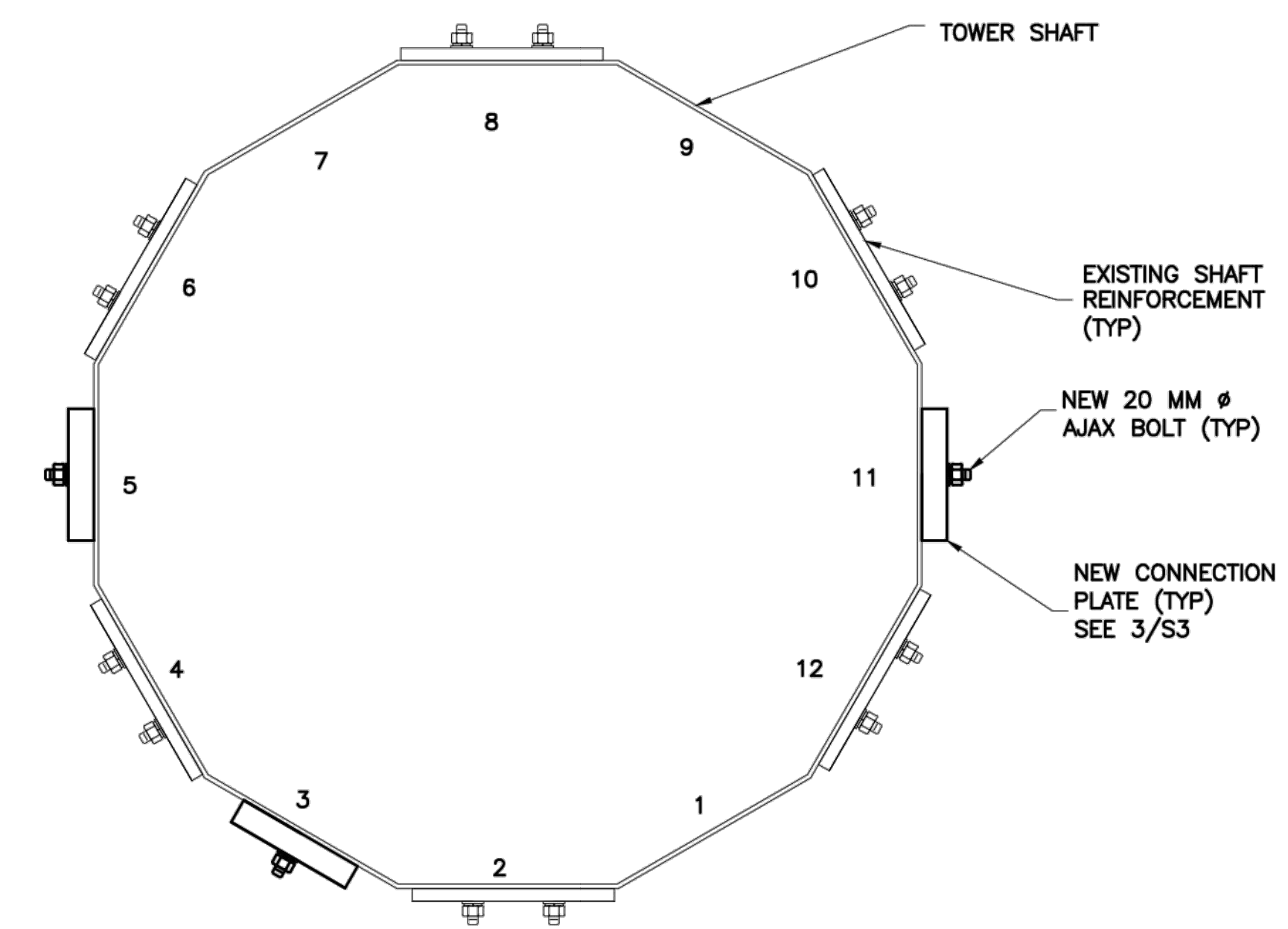
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 DRAWN: DC
 CHECKED: RP

JOB #: 1629043

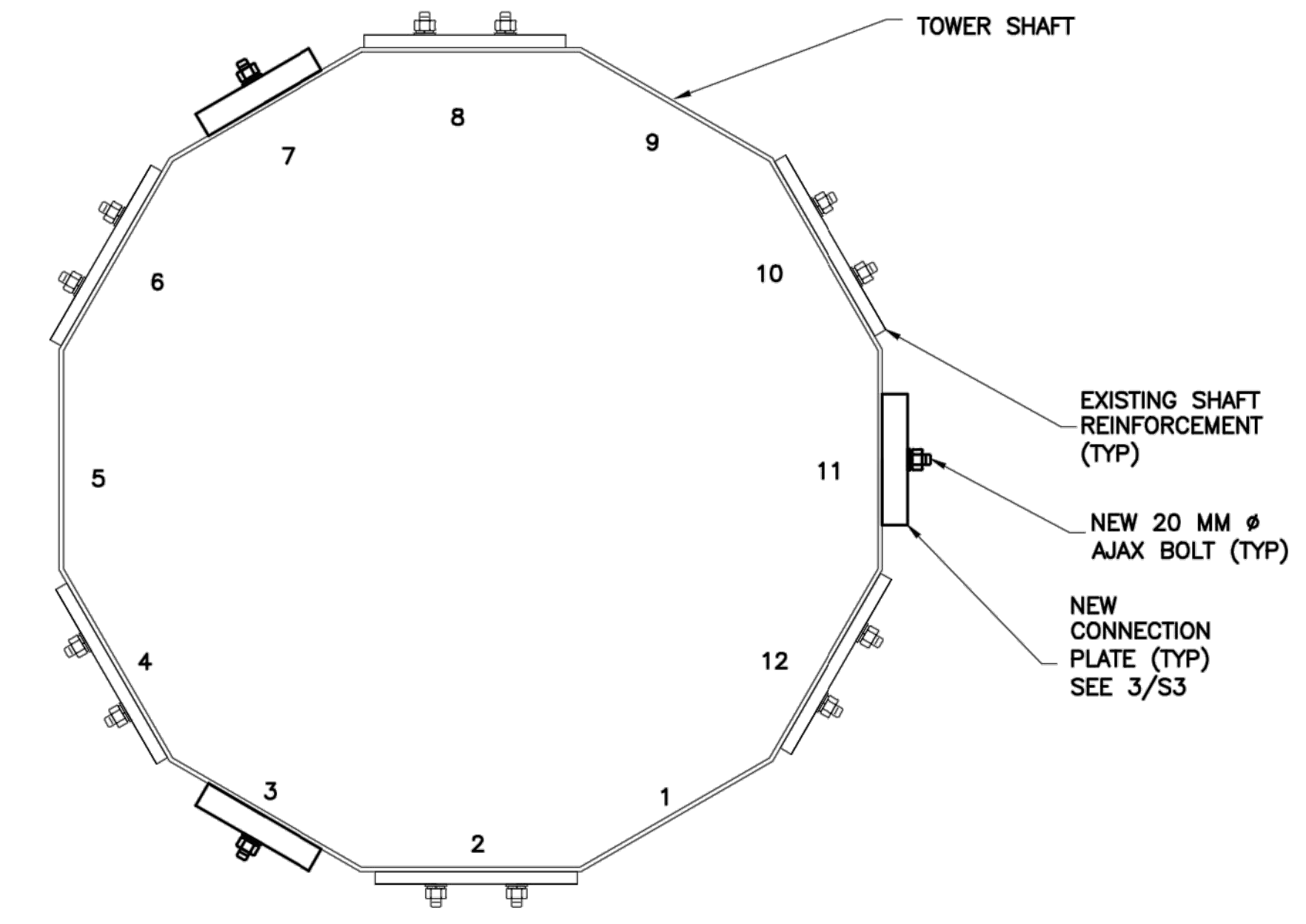
S3
STRUCTURAL
DETAILS



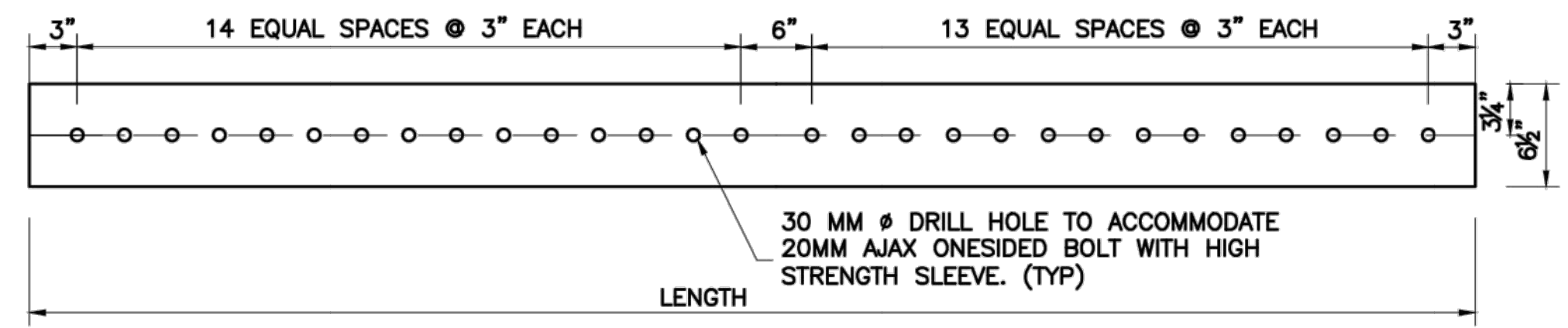
AHMET COLAKOGLU, PE
 CT License No: 27057



1
S3 N.T.S.
ELEVATION 37'-11\"/>



2
S3 N.T.S.
ELEVATION 47'-9\"/>



3
S3 N.T.S.
CONNECTION PLATE

LENGTH	BOTTOM ELEVATION (FT)	TOP ELEVATION (FT)	FLAT PLATE QUANTITY	TERMINATION BOLT		PLATE THICKNESS
				(BOT.)	(TOP)	
7'-9"	33'-11"	41'-8"	3	15	14	1.25"
7'-9"	43'-9"	51'-6"	3	15	14	1.25"

- NOTES:**
- ALL HOLES ARE TO BE DRILLED. DO NOT BURN OR PUNCH.
 - TOLERANCES: FRACTIONS $\pm 1/16"$
 ANGLES $\pm 1/2$ DEGREE
 DECIMALS $\pm .010"$
 - THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
 A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
 B. THE FINISH SHALL BE HOT-DIP GALVANIZED PER ASTM A123
 - AJAX BOLTS NEED TO INSTALL PER MANUFACTURE SPECIFICATIONS.

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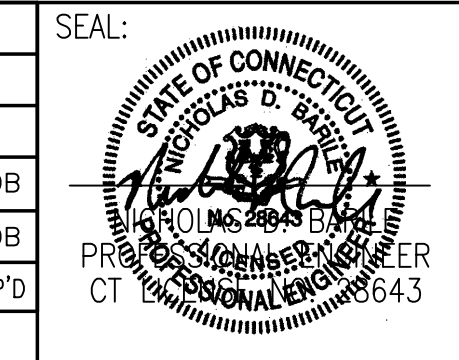
EMPIRE
 telecom
 16 ESQUIRE ROAD
 BILLERICA, MA 01821

SITE NUMBER: CT5022
 SITE NAME: AWE - FAIRFIELD
 100 REEF ROAD
 FAIRFIELD, CT 06824
 FAIRFIELD COUNTY

at&t
 MOBILITY
 550 COCHITUATE ROAD
 FRAMINGHAM, MA 01701

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SCALE: AS SHOWN DESIGNED BY: NJM DRAWN BY: NJM



AT&T
 DRAWING TITLE:
STRUCTURAL DETAILS
 JOB NUMBER: 15077-EMP DRAWING NUMBER: S-1 REV: 1

PREPARED BY:
DESTEK
 ENGINEERING
 DESTEK ENGINEERING, LLC
 1281 KENNEDY DRIVE, STE 100
 MARIETTA, GA 30066
 TEL NO: 770-693-0835
 ADMIN@DESTKENGINEERING.COM

PREPARED FOR:
COM-EX
 Consultants

NUM	DATE	DESCRIPTION:
A	08/19/2016	ISSUED FOR CONSTRUCTION

SITE ADDRESS:
 100 REEF ROAD
 FAIRFIELD, CT 06824

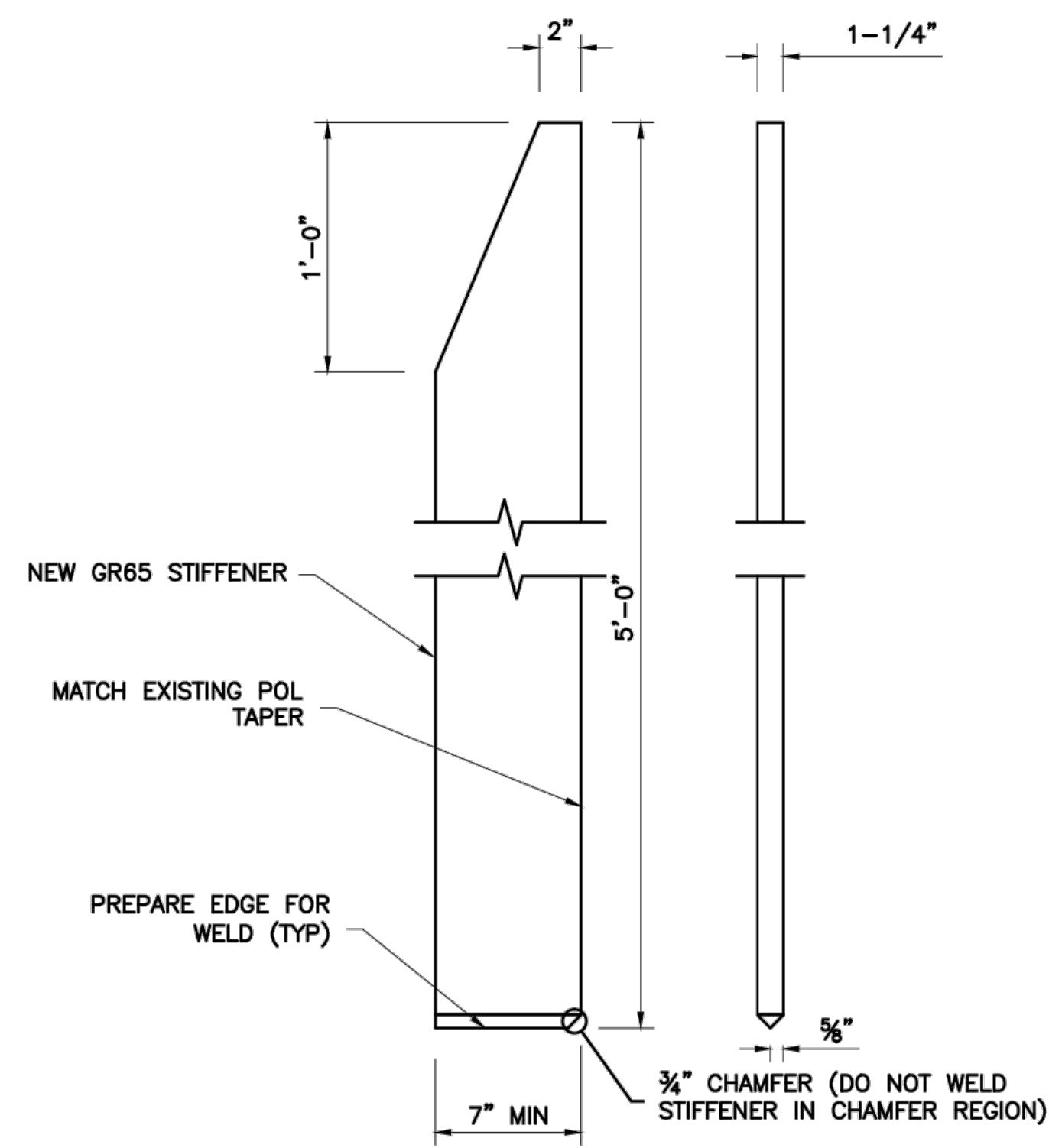
CARRIER DESIGNATION:	AT&T
CARRIER:	CT5022
SITE ID:	AWE - FAIRFIELD
SITE NAME:	AWE - FAIRFIELD

TOWER INFORMATION:	10108711
FA NUMBER:	

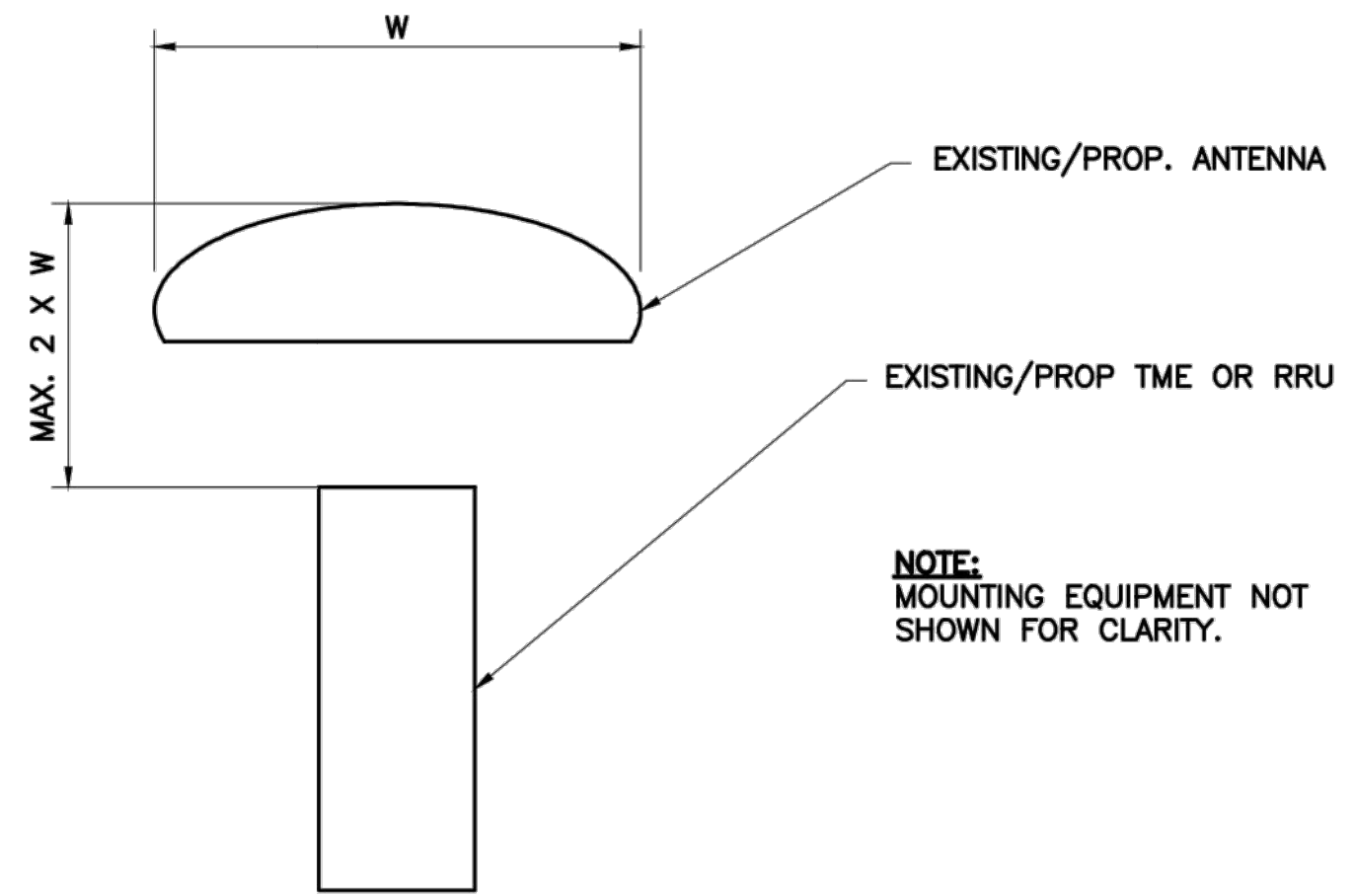
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 CHECKED: RP

JOB #: 1629043

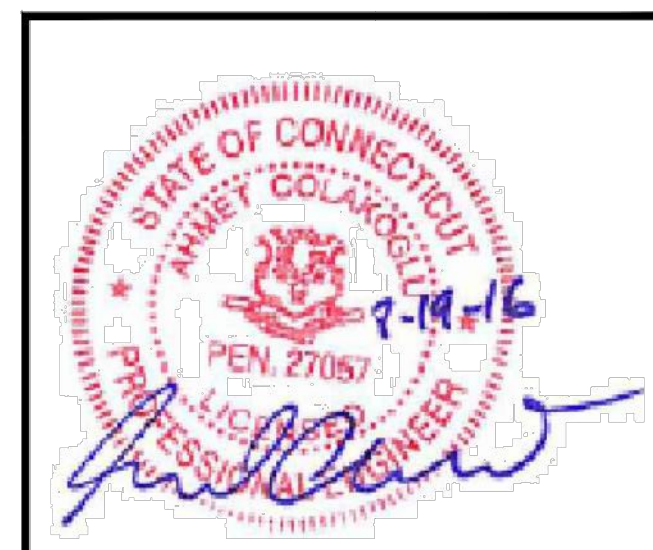
S4
STRUCTURAL
DETAILS



1
S4 **NEW STIFFENER DETAIL**
 N.T.S.



2
S4 **TME LAYOUT TYP.**
 N.T.S.



AHMET COLAKOGLU, PE
 CT License No: 27057

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 Consultants
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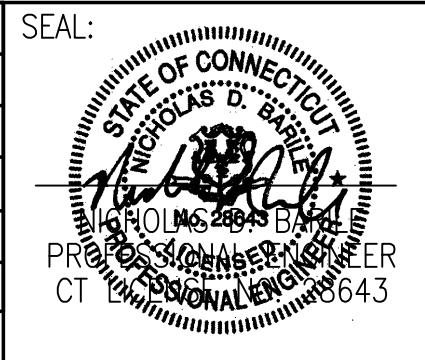
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SITE NUMBER: CT5022
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SCALE: AS SHOWN DESIGNED BY: NJM DRAWN BY: NJM



AT&T		
DRAWING TITLE: STRUCTURAL DETAILS		
JOB NUMBER: 15077-EMP	DRAWING NUMBER: S-1	REV: 1

**STRUCTURAL ANALYSIS REPORT – UPGRADE
MONOPOLE**



Prepared For:
Com-Ex Consultants, LLC
115 Route 46 – Suite E39
Mountain Lakes, NJ 07046



Structure Rating:

Monopole:	Pass (82.8%)
Anchor Rods:	Pass (82.3%)
Foundation	Pass (66.9%)
Soil Interaction:	Pass (99.0%)

Sincerely,
Destek Engineering, LLC

08-19-2016



Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

AT&T Site ID: CT5022
FA Number: 10108711
Site Name: AWE - Fairfield
100 Reef Road
Fairfield, CT 06824

CONTENTS

1.0 – SUBJECT AND REFERENCES

1.1 – STRUCTURE

2.0 – EXISTING AND PROPOSED APPURTENANCES

3.0 - CODES AND LOADING

4.0 - STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

5.0 - ANALYSIS AND ASSUMPTIONS

6.0 – RESULTS AND CONCLUSION

APPENDIX

A– SOFTWARE OUTPUT & CALCULATIONS

B – TOWER UPGRADE DRAWINGS

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing monopole located at 100 Reef Road, Fairfield, CT 06824 for the additions and alterations proposed by AT&T.

The structural analysis is based on the following information provided to Destek Engineering, LLC (Destek):

- Tower manufacturing drawings prepared by Valmont, Order Number 11635-94, Dated 05/19/1994.
- Structural Analysis Report prepared by Fullerton Engineering Design, Project Number CT03XC354, dated 5/13/2015.
- RFDS prepared by AT&T, dated 06/23/2015.
- Construction Drawings prepared by Com-Ex, dated 09/22/2015.
- Tower Mapping prepared by Com-Ex, dated 03/25/2016.
- Geotechnical Data Report prepared by Terracon Consultants, Inc., dated 07/08/2016.

1.1 STRUCTURE

The structure is a 145'-0" (12) sided monopole, which is attached to the foundation with anchor bolts and a base plate. Please refer to the software output in Appendix A, for tower geometry, member sizes, and other details.

ELEVATION (FEET)	SECTION LENGTH (FEET)	LAP SPLICE (FT)	SHAFT THICKNESS (IN)	TOP DIAMETER (IN)	BOTTOM DIAMETER (IN)	YIELD STRENGTH (KSI)
145.00-90.83	54.17	5.17	0.281	23.6100	33.4800	65
90.83-42.83	53.17	6.17	0.375	31.9760	41.6400	65
42.83-0.00	49.00	-	0.438	39.7686	48.6900	65

*Does not include description of existing monopole modifications.

2.0 EXISTING AND PROPOSED APPURTENANCES

AT&T is proposing the following antenna configuration on the tower:

Existing Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
130.0	(6) 7770.00 w/Mount Pipe (3) P65-16-XLH-RR w/Mount Pipe (12) LGP21401 TMAs (3) RRUS-11 (1) DC 6	(3) Sector Mounts	(12) 1-5/8" (1) 7/8" (1) Fiber Cable

Proposed and Final Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
130.0	(6) 7770.00 w/Mount Pipe (3) P65-16-XLH-RR w/Mount Pipe (12) LGP21401 TMAs (6) RRUS-11 (1) DC 6	(3) Sector Mounts	(12) 1-5/8" (1) 7/8" (1) Fiber Cable

Existing Appurtenances by Others

Rad. Center (ft)	Antenna & TMA	Mount	Feedlines
143.0 Nextel	(1) 10' Omni (10) Andrew 5' Antennas	(3) Sector Mounts	(6) 1-5/8" (10) 7/8"
135.0 T-Mobile	(6) Kathrein 8101002R4B (6) Powerwave LGP21401 TMA (1) 24"x24" Panel	(3) Sector Mounts	(6) 1-5/8" (6) 1-1/4" (2) 1"
110.3 Sprint	(3) Andrew APXVSPP16 (3) RRH1900-4x45 (3) 9442 RRH2x40-07L (1) 10' Omni	(1) Platform Mount	(3) 1-1/4"

3.0 CODES AND LOADING

The Monopole was analyzed per *TIA/EIA-222-F* as referenced by *the 2005 State Building Code with all of the adopted Supplements and Amendments*, International Code Council. The following wind loading was used in compliance with the standard for Fairfield County:

- Basic wind speed 85 mph without ice (W)
- Basic wind speed 38 mph with 1/2" radial ice (W_i)

The following load combinations were used with wind blowing at 0°, 60° and 90°, measured from a line normal to the face of the tower.

- $D + W$
- $D + W_i + I$

D: Dead Load W: Wind Load, without ice
 W_i: Wind Load with ice I: Ice Gravity Load

4.0 **STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES**

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure is assumed to be in good condition, free of defects, and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service lifespan. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the antenna mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed appurtenances. Any deviation of the appurtenances and placement, etc., will require Destek to generate an additional structural analysis. Additionally, the proposed linear appurtenances should be placed per recommendations of this report.

5.0 **ANALYSIS AND ASSUMPTIONS**

The Monopole was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix A of this report.

6.0 **RESULTS AND CONCLUSION**

Based on analysis, per TIA/EIA-222-F, the existing monopole **will have adequate** structural capacity for the proposed changes by AT&T once it is reinforced per Destek drawings dated 8/19/2016. As a maximum, the monopole shaft between 66 feet and 69.83feet is stressed to **82.8%** of its capacity. The anchor rods also **will have adequate** structural capacity for the proposed changes by AT&T once they are reinforced per Destek drawings dated 8/19/2016. As a maximum, the anchor rods are stressed to **82.3%** of its capacity. The existing foundation **is found to have adequate** capacity to support the proposed installation by AT&T.

Therefore, the proposed additions and alterations by AT&T **can** be implemented as intended with the conditions outlined in this report.

Should you have any questions about this report, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com.

APPENDIX A
SOFTWARE OUTPUT & CALCULATIONS

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) Andrew 5' Antennas w/Mount Pipe	143	(2) 7770.00 w/ Mount Pipe	130
(4) Andrew 5' Antennas w/Mount Pipe	143	(2) 7770.00 w/ Mount Pipe	130
(3) Andrew 5' Antennas w/Mount Pipe	143	P65-16-XLH-RR w/ Mount Pipe	130
10' Omni	143	P65-16-XLH-RR w/ Mount Pipe	130
T-Arm Mount [TA 602-3]	143	P65-16-XLH-RR w/ Mount Pipe	130
(2) Kathrein 8101002R4B	135	(4) LGP21401	130
(2) Kathrein 8101002R4B	135	APXVSP16w/ Mount Pipe	110.3
(2) Kathrein 8101002R4B	135	APXVSP16w/ Mount Pipe	110.3
(2) LGP21401	135	APXVSP16w/ Mount Pipe	110.3
(2) LGP21401	135	9442 RRH2X40-07L	110.3
(2) LGP21401	135	9442 RRH2X40-07L	110.3
24"x24" Panel	135	9442 RRH2X40-07L	110.3
T-Arm Mount [TA 602-3]	135	PCS 1900MHz 4x45W-65MHz	110.3
(4) LGP21401	130	PCS 1900MHz 4x45W-65MHz	110.3
(4) LGP21401	130	PCS 1900MHz 4x45W-65MHz	110.3
(2) RRUS 11	130	(2) 6' x 2" Mount Pipe	110.3
(2) RRUS 11	130	(2) 6' x 2" Mount Pipe	110.3
(2) RRUS 11	130	(2) 6' x 2" Mount Pipe	110.3
DC6-48-60-18-8F	130	10' Omni	110.3
T-Arm Mount [TA 602-3]	130	Platform Mount [LP 405-1]	110.3
(2) 7770.00 w/ Mount Pipe	130		

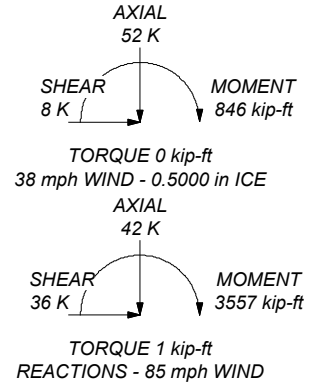
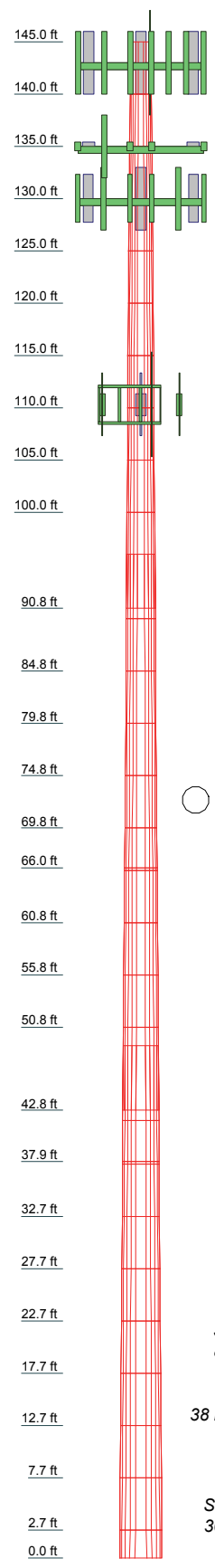
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 82.8%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	12	0.2810	5.17	30.8982	31.8092	0.4	0.4
2	5.00	12	0.2810	5.17	28.1651	27.2541	0.4	0.4
3	5.00	12	0.2810	5.17	25.4320	24.5210	0.4	0.4
4	5.00	12	0.2810	5.17	22.6989	21.7879	0.4	0.4
5	5.00	12	0.2810	5.17	19.9658	19.0548	0.4	0.4
6	5.00	12	0.2810	5.17	17.2327	16.3217	0.4	0.4
7	5.00	12	0.2810	5.17	14.4996	13.5886	0.4	0.4
8	5.00	12	0.2810	5.17	11.7665	10.8555	0.4	0.4
9	5.00	12	0.2810	5.17	9.0334	8.1224	0.4	0.4
10	5.00	12	0.2810	5.17	6.3003	5.3913	0.4	0.4
11	5.00	12	0.3750	6.17	3.5672	2.6562	0.9	0.8
12	5.00	12	0.3750	6.17	0.8341	0.0000	0.7	0.7
13	5.00	12	0.3750	6.17			0.7	0.7
14	5.00	12	0.3750	6.17			0.7	0.7
15	5.00	12	0.3750	6.17			0.7	0.7
16	5.00	12	0.3750	6.17			0.7	0.7
17	5.00	12	0.3750	6.17			0.7	0.7
18	5.00	12	0.3750	6.17			0.7	0.7
19	5.00	12	0.6000	6.17			1.2	1.2
20	5.00	12	0.6000	6.17			1.3	1.3
21	5.00	12	0.6000	6.17			2.0	2.0
22	5.00	12	0.6000	6.17			2.1	2.1
23	5.00	12	0.6000	6.17			1.2	1.2
24	5.00	12	0.6000	6.17			1.6	1.6
25	5.00	12	0.7380	6.17			1.7	1.7
26	5.00	12	0.7380	6.17			1.7	1.7
27	5.00	12	0.7255	6.17			1.7	1.7
28	5.00	12	0.7255	6.17			1.7	1.7
29	5.00	12	0.7130	6.17			1.7	1.7
30	5.00	12	0.7130	6.17			1.7	1.7
31	5.00	12	0.7005	6.17			1.8	1.8
32	2.67	12	0.7005	6.17			1.0	1.0



	Destek Engineering, LLC		Job: CT5022	
	1281 Kennestone Circle, Suite 100		Project: 1629043	
Marietta, GA 30066		Client:	Drawn by: Ahmet Coakoglu	App'd:
Phone: (770) 693-0835		Code: TIA/EIA-222-F	Date: 08/19/16	Scale: NTS
FAX:		Path:		Dwg No. E-1

tnxTower Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:	Job	CT5022	Page	1 of 27
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Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 38 mph is used in combination with ice.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys √ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	145.00-140.00	5.00	0.00	12	23.6100	24.5210	0.2810	1.1240	A572-65 (65 ksi)
L2	140.00-135.00	5.00	0.00	12	24.5210	25.4320	0.2810	1.1240	A572-65 (65 ksi)
L3	135.00-130.00	5.00	0.00	12	25.4320	26.3431	0.2810	1.1240	A572-65 (65 ksi)
L4	130.00-125.00	5.00	0.00	12	26.3431	27.2541	0.2810	1.1240	A572-65 (65 ksi)
L5	125.00-120.00	5.00	0.00	12	27.2541	28.1651	0.2810	1.1240	A572-65 (65 ksi)

<p>tnxTower</p> <p>Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:</p>	Job	CT5022	Page	2 of 27
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Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L6	120.00-115.00	5.00	0.00	12	28.1651	29.0761	0.2810	1.1240	A572-65 (65 ksi)
L7	115.00-110.00	5.00	0.00	12	29.0761	29.9871	0.2810	1.1240	A572-65 (65 ksi)
L8	110.00-105.00	5.00	0.00	12	29.9871	30.8982	0.2810	1.1240	A572-65 (65 ksi)
L9	105.00-100.00	5.00	0.00	12	30.8982	31.8092	0.2810	1.1240	A572-65 (65 ksi)
L10	100.00-90.83	9.17	5.17	12	31.8092	33.4800	0.2810	1.1240	A572-65 (65 ksi)
L11	90.83-89.83	6.17	0.00	12	31.9760	33.0974	0.3750	1.5000	A572-65 (65 ksi)
L12	89.83-84.83	5.00	0.00	12	33.0974	34.0062	0.3750	1.5000	A572-65 (65 ksi)
L13	84.83-79.83	5.00	0.00	12	34.0062	34.9150	0.3750	1.5000	A572-65 (65 ksi)
L14	79.83-74.83	5.00	0.00	12	34.9150	35.8238	0.3750	1.5000	A572-65 (65 ksi)
L15	74.83-69.83	5.00	0.00	12	35.8238	36.7326	0.3750	1.5000	A572-65 (65 ksi)
L16	69.83-66.00	3.83	0.00	12	36.7326	37.4287	0.3750	1.5000	A572-65 (65 ksi)
L17	66.00-65.75	0.25	0.00	12	37.4287	37.4741	0.6125	2.4500	A572-65 (65 ksi)
L18	65.75-60.75	5.00	0.00	12	37.4741	38.3829	0.6125	2.4500	A572-65 (65 ksi)
L19	60.75-55.75	5.00	0.00	12	38.3829	39.2917	0.6000	2.4000	A572-65 (65 ksi)
L20	55.75-50.75	5.00	0.00	12	39.2917	40.2005	0.6000	2.4000	A572-65 (65 ksi)
L21	50.75-42.83	7.92	6.17	12	40.2005	41.6400	0.6000	2.4000	A572-65 (65 ksi)
L22	42.83-41.83	7.17	0.00	12	39.7686	41.0740	0.7130	2.8520	A572-65 (65 ksi)
L23	41.83-37.92	3.91	0.00	12	41.0740	41.7865	0.7005	2.8020	A572-65 (65 ksi)
L24	37.92-37.67	0.25	0.00	12	41.7865	41.8320	0.7505	3.0020	A572-65 (65 ksi)
L25	37.67-32.67	5.00	0.00	12	41.8320	42.7424	0.7380	2.9520	A572-65 (65 ksi)
L26	32.67-27.67	5.00	0.00	12	42.7424	43.6527	0.7380	2.9520	A572-65 (65 ksi)
L27	27.67-22.67	5.00	0.00	12	43.6527	44.5631	0.7255	2.9020	A572-65 (65 ksi)
L28	22.67-17.67	5.00	0.00	12	44.5631	45.4734	0.7255	2.9020	A572-65 (65 ksi)
L29	17.67-12.67	5.00	0.00	12	45.4734	46.3838	0.7130	2.8520	A572-65 (65 ksi)
L30	12.67-7.67	5.00	0.00	12	46.3838	47.2941	0.7130	2.8520	A572-65 (65 ksi)
L31	7.67-2.67	5.00	0.00	12	47.2941	48.2045	0.7005	2.8020	A572-65 (65 ksi)
L32	2.67-0.00	2.67		12	48.2045	48.6900	0.7005	2.8020	A572-65 (65 ksi)

Tapered Pole Properties

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:</p>	Job	CT5022	Page	3 of 27
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	Client		Designed by	Ahmet Coakoglu

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	24.4429	21.1085	1466.3462	8.3518	12.2300	119.8977	2971.2149	10.3890	5.5744	19.838
	25.3860	21.9329	1644.9288	8.6779	12.7019	129.5027	3333.0718	10.7947	5.8186	20.707
L2	25.3860	21.9329	1644.9288	8.6779	12.7019	129.5027	3333.0718	10.7947	5.8186	20.707
	26.3292	22.7572	1837.4524	9.0041	13.1738	139.4778	3723.1767	11.2004	6.0627	21.575
L3	26.3292	22.7572	1837.4524	9.0041	13.1738	139.4778	3723.1767	11.2004	6.0627	21.575
	27.2723	23.5815	2044.4407	9.3302	13.6457	149.8230	4142.5911	11.6061	6.3069	22.444
L4	27.2723	23.5815	2044.4407	9.3302	13.6457	149.8230	4142.5911	11.6061	6.3069	22.444
	28.2155	24.4058	2266.4175	9.6564	14.1176	160.5383	4592.3762	12.0118	6.5510	23.313
L5	28.2155	24.4058	2266.4175	9.6564	14.1176	160.5383	4592.3762	12.0118	6.5510	23.313
	29.1587	25.2301	2503.9072	9.9825	14.5895	171.6236	5073.5948	12.4175	6.7952	24.182
L6	29.1587	25.2301	2503.9072	9.9825	14.5895	171.6236	5073.5948	12.4175	6.7952	24.182
	30.1018	26.0544	2757.4335	10.3087	15.0614	183.0791	5587.3078	12.8232	7.0393	25.051
L7	30.1018	26.0544	2757.4335	10.3087	15.0614	183.0791	5587.3078	12.8232	7.0393	25.051
	31.0450	26.8787	3027.5204	10.6348	15.5333	194.9046	6134.5771	13.2289	7.2835	25.92
L8	31.0450	26.8787	3027.5204	10.6348	15.5333	194.9046	6134.5771	13.2289	7.2835	25.92
	31.9881	27.7030	3314.6918	10.9609	16.0053	207.1003	6716.4642	13.6346	7.5276	26.789
L9	31.9881	27.7030	3314.6918	10.9609	16.0053	207.1003	6716.4642	13.6346	7.5276	26.789
	32.9313	28.5273	3619.4716	11.2871	16.4772	219.6660	7334.0308	14.0403	7.7718	27.658
L10	32.9313	28.5273	3619.4716	11.2871	16.4772	219.6660	7334.0308	14.0403	7.7718	27.658
	34.6610	30.0391	4225.9383	11.8852	17.3426	243.6733	8562.8966	14.7843	8.2196	29.251
L11	34.6610	30.0391	4225.9383	11.8852	17.3426	243.6733	8562.8966	14.7843	8.2196	29.251
	34.0768	38.1582	4863.8003	11.3132	16.5636	293.6444	9855.3780	18.7803	7.5646	20.172
L12	34.0768	38.1582	4863.8003	11.3132	16.5636	293.6444	9855.3780	18.7803	7.5646	20.172
	34.2650	39.5123	5400.2045	11.7146	17.1445	314.9822	10942.2785	19.4468	7.8651	20.974
L13	34.2650	39.5123	5400.2045	11.7146	17.1445	314.9822	10942.2785	19.4468	7.8651	20.974
	35.2058	40.6097	5862.7469	12.0400	17.6152	332.8227	11879.5148	19.9869	8.1087	21.623
L14	35.2058	40.6097	5862.7469	12.0400	17.6152	332.8227	11879.5148	19.9869	8.1087	21.623
	36.1467	41.7071	6350.9748	12.3653	18.0860	351.1547	12868.7968	20.5269	8.3522	22.273
L15	36.1467	41.7071	6350.9748	12.3653	18.0860	351.1547	12868.7968	20.5269	8.3522	22.273
	37.0875	42.8044	6865.5822	12.6907	18.5567	369.9781	13911.5310	21.0670	8.5958	22.922
L16	37.0875	42.8044	6865.5822	12.6907	18.5567	369.9781	13911.5310	21.0670	8.5958	22.922
	38.0284	43.9018	7407.2626	13.0160	19.0275	389.2930	15009.1223	21.6071	8.8393	23.572
L17	38.0284	43.9018	7407.2626	13.0160	19.0275	389.2930	15009.1223	21.6071	8.8393	23.572
	38.7490	44.7423	7840.9353	13.2652	19.3881	404.4207	15887.8606	22.0208	9.0259	24.069
L18	38.7490	44.7423	7840.9353	13.2652	19.3881	404.4207	15887.8606	22.0208	9.0259	24.069
	38.7961	72.7004	12608.7454	13.1965	19.4116	649.5468	25548.7366	35.7809	8.4016	13.717
L19	38.7961	72.7004	12608.7454	13.1965	19.4116	649.5468	25548.7366	35.7809	8.4016	13.717
	39.7369	74.4927	13564.4897	13.5218	19.8824	682.2376	27485.3337	36.6630	8.6451	14.114
L20	39.7369	74.4927	13564.4897	13.5218	19.8824	682.2376	27485.3337	36.6630	8.6451	14.114
	40.6778	74.7524	14283.8959	13.8516	20.3531	701.8043	28943.0456	36.7908	8.9222	14.87
L21	40.6778	74.7524	14283.8959	13.8516	20.3531	701.8043	28943.0456	36.7908	8.9222	14.87
	41.6186	76.5081	15314.2131	14.1770	20.8239	735.4169	31030.7476	37.6550	9.1657	15.276
L22	41.6186	76.5081	15314.2131	14.1770	20.8239	735.4169	31030.7476	37.6550	9.1657	15.276
	43.1089	79.2893	17045.7113	14.6923	21.5695	790.2685	34539.2324	39.0238	9.5515	15.919
L23	43.1089	79.2893	17045.7113	14.6923	21.5695	790.2685	34539.2324	39.0238	9.5515	15.919
	42.3344	89.6661	17457.4186	13.9819	20.6001	847.4428	35373.4631	44.1309	8.7471	12.268
L24	42.3344	89.6661	17457.4186	13.9819	20.6001	847.4428	35373.4631	44.1309	8.7471	12.268
	42.5229	92.6632	19267.1406	14.4492	21.2763	905.5667	39040.4505	45.6060	9.0970	12.759
L25	42.5229	92.6632	19267.1406	14.4492	21.2763	905.5667	39040.4505	45.6060	9.0970	12.759
	43.2606	92.6740	19967.8611	14.7088	21.6454	922.4988	40460.3001	45.6113	9.3214	13.307
L26	43.2606	92.6740	19967.8611	14.7088	21.6454	922.4988	40460.3001	45.6113	9.3214	13.307
	43.3077	99.1680	21315.1102	14.6909	21.6454	984.7406	43190.1920	48.8075	9.1874	12.242
L27	43.3077	99.1680	21315.1102	14.6909	21.6454	984.7406	43190.1920	48.8075	9.1874	12.242
	43.3077	99.2780	21386.1184	14.7072	21.6690	986.9460	43334.0739	48.8616	9.1996	12.258
L28	43.3077	99.2780	21386.1184	14.7072	21.6690	986.9460	43334.0739	48.8616	9.1996	12.258
	43.3077	97.6542	21049.1229	14.7117	21.6690	971.3940	42651.2297	48.0624	9.2331	12.511
L29	43.3077	97.6542	21049.1229	14.7117	21.6690	971.3940	42651.2297	48.0624	9.2331	12.511
	44.2502	99.8175	22479.2377	15.0376	22.1405	1015.2973	45549.0299	49.1271	9.4771	12.842
L30	44.2502	99.8175	22479.2377	15.0376	22.1405	1015.2973	45549.0299	49.1271	9.4771	12.842
	45.1926	101.9808	23972.7029	15.3635	22.6121	1060.1711	48575.1954	50.1919	9.7211	13.172
L31	45.1926	101.9808	23972.7029	15.3635	22.6121	1060.1711	48575.1954	50.1919	9.7211	13.172
	46.1351	100.2827	23587.2604	15.3679	22.6121	1043.1252	47794.1843	49.3561	9.7546	13.445
L32	46.1351	100.2827	23587.2604	15.3679	22.6121	1043.1252	47794.1843	49.3561	9.7546	13.445
	46.1351	102.4094	25119.9434	15.6939	23.0837	1088.2127	50899.8156	50.4028	9.9986	13.782
L33	46.1351	102.4094	25119.9434	15.6939	23.0837	1088.2127	50899.8156	50.4028	9.9986	13.782
	47.0775	104.5361	26717.6236	16.0198	23.5552	1134.2543	54137.1489	51.4495	10.2425	14.118
L34	47.0775	104.5361	26717.6236	16.0198	23.5552	1134.2543	54137.1489	51.4495	10.2425	14.118
	47.0775	102.7637	26279.3028	16.0242	23.5552	1115.6461	53248.9922	50.5771	10.2760	14.412
L35	47.0775	102.7637	26279.3028	16.0242	23.5552	1115.6461	53248.9922	50.5771	10.2760	14.412
	48.0200	104.8537	27915.5642	16.3501	24.0268	1161.8514	56564.5014	51.6058	10.5200	14.755
L36	48.0200	104.8537	27915.5642	16.3501	24.0268	1161.8514	56564.5014	51.6058	10.5200	14.755
	48.9625	106.9437	29618.3742	16.6760	24.4984	1208.9944	60014.8560	52.6345	10.7640	15.097
L37	48.9625	106.9437	29618.3742	16.6760	24.4984	1208.9944	60014.8560	52.6345	10.7640	15.097
	48.9625	105.0970	29122.5504	16.6805	24.4984	1188.7553	59010.1826	51.7256	10.7975	15.414
L38	48.9625	105.0970	29122.5504	16.6805	24.4984	1188.7553	59010.1826	51.7256	10.7975	15.414
	49.9049	107.1504	30863.1153	17.0064	24.9699	1236.0119	62537.0391	52.7362	11.0415	15.762
L39	49.9049	107.1504	30863.1153	17.0064	24.9699	1236.0119	62537.0391	52.7362	11.0415	15.762

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:</p>	Job	CT5022	Page	4 of 27
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Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I _t /Q in ²	w in	w/t
L32	49.9049	107.1504	30863.1153	17.0064	24.9699	1236.0119	62537.0391	52.7362	11.0415	15.762
	50.4076	108.2456	31819.1546	17.1802	25.2214	1261.5925	64474.2338	53.2752	11.1716	15.948

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L1				1	1	1			
145.00-140.00									
L2				1	1	1			
140.00-135.00									
L3				1	1	1			
135.00-130.00									
L4				1	1	1			
130.00-125.00									
L5				1	1	1			
125.00-120.00									
L6				1	1	1			
120.00-115.00									
L7				1	1	1			
115.00-110.00									
L8				1	1	1			
110.00-105.00									
L9				1	1	1			
105.00-100.00									
L10				1	1	1			
100.00-90.83									
L11				1	1	1			
90.83-89.83									
L12				1	1	1			
89.83-84.83									
L13				1	1	1			
84.83-79.83									
L14				1	1	1			
79.83-74.83									
L15				1	1	1			
74.83-69.83									
L16				1	1	1			
69.83-66.00									
L17				1	1	0.977778			
66.00-65.75									
L18				1	1	0.968983			
65.75-60.75									
L19				1	1	0.980297			
60.75-55.75									
L20				1	1	0.972144			
55.75-50.75									
L21				1	1	0.969378			
50.75-42.83									
L22				1	1	0.962972			
42.83-41.83									
L23				1	1	0.973703			
41.83-37.92									
L24				1	1	0.966319			
37.92-37.67									
L25				1	1	0.973959			
37.67-32.67									
L26				1	1	0.965888			
32.67-27.67									
L27				1	1	0.974383			

tnxTower Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:	Job	CT5022	Page	5 of 27
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	Client		Designed by	Ahmet Coakoglu

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
27.67-22.67 L28				1	1	0.966843			
22.67-17.67 L29				1	1	0.976159			
17.67-12.67 L30				1	1	0.969087			
12.67-7.67 L31				1	1	0.9792			
7.67-2.67 L32				1	1	0.975619			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_{AA} ft ² /ft	Weight plf
**** Nextel ****								
LDF7-50A(1-5/8")	C	No	Inside Pole	143.00 - 30.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF5-50A(7/8)	C	No	Inside Pole	143.00 - 30.00	6	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
LDF5-50A(7/8")	C	No	Inside Pole	143.00 - 30.00	4	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
T-Mobile								
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	135.00 - 30.00	3	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	135.00 - 30.00	3	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF6-50A(1-1/4")	A	No	CaAa (Out Of Face)	135.00 - 30.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
						1" Ice	0.00	3.78
						2" Ice	0.00	9.33
						4" Ice	0.00	27.78
LDF2-2R(1")	A	No	CaAa (Out Of Face)	135.00 - 30.00	1	No Ice	0.00	0.30
						1/2" Ice	0.00	1.21
						1" Ice	0.00	2.73
						2" Ice	0.00	7.60
						4" Ice	0.00	24.67
LDF2-2R(1")	A	No	CaAa (Out Of Face)	135.00 - 30.00	1	No Ice	0.10	0.30
						1/2" Ice	0.20	1.21
						1" Ice	0.30	2.73
						2" Ice	0.50	7.60

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
**** AT&T ****						4" Ice	0.90	24.67
LDF7-50A(1-5/8")	B	No	Inside Pole	130.00 - 30.00	3	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A(1-5/8")	B	No	Inside Pole	130.00 - 30.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF5-50A(7/8)	B	No	Inside Pole	130.00 - 30.00	2	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
106.2ft								
3" Conduit	B	No	CaAa (Out Of Face)	130.00 - 30.00	1	No Ice	0.30	2.80
						1/2" Ice	0.40	0.00
						1" Ice	0.50	0.00
						2" Ice	0.70	0.00
						4" Ice	1.10	0.00
LDF6-50A(1-1/4")	B	No	CaAa (Out Of Face)	110.30 - 30.00	3	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
						1" Ice	0.00	3.78
						2" Ice	0.00	9.33
						4" Ice	0.00	27.78
LDF5-50A(7/8)	B	No	CaAa (Out Of Face)	143.00 - 30.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	1.26
						1" Ice	0.00	2.81
						2" Ice	0.00	7.73
						4" Ice	0.00	24.91
****Reinforcement***								
10" Plate	A	No	CaAa (Out Of Face)	47.75 - 0.00	1	No Ice	0.10	0.00
						1/2" Ice	0.19	0.00
						1" Ice	0.27	0.00
						2" Ice	0.44	0.00
						4" Ice	0.77	0.00
7" Plate	A	No	CaAa (Out Of Face)	68.00 - 47.75	1	No Ice	0.10	0.00
						1/2" Ice	0.19	0.00
						1" Ice	0.27	0.00
						2" Ice	0.44	0.00
						4" Ice	0.77	0.00
10" Plate	B	No	CaAa (Out Of Face)	47.75 - 0.00	1	No Ice	0.10	0.00
						1/2" Ice	0.19	0.00
						1" Ice	0.27	0.00
						2" Ice	0.44	0.00
						4" Ice	0.77	0.00
7" Plate	B	No	CaAa (Out Of Face)	68.00 - 47.75	1	No Ice	0.10	0.00
						1/2" Ice	0.19	0.00
						1" Ice	0.27	0.00
						2" Ice	0.44	0.00
						4" Ice	0.77	0.00

Feed Line/Linear Appurtenances Section Areas

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	145.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L2	140.00-135.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L3	135.00-130.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L4	130.00-125.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.07
		C	0.000	0.000	0.000	0.000	0.04
L5	125.00-120.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.07
		C	0.000	0.000	0.000	0.000	0.04
L6	120.00-115.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.07
		C	0.000	0.000	0.000	0.000	0.04
L7	115.00-110.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.07
		C	0.000	0.000	0.000	0.000	0.04
L8	110.00-105.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.08
		C	0.000	0.000	0.000	0.000	0.04
L9	105.00-100.00	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.08
		C	0.000	0.000	0.000	0.000	0.04
L10	100.00-90.83	A	0.000	0.000	0.000	6.351	0.09
		B	0.000	0.000	0.000	2.751	0.14
		C	0.000	0.000	0.000	0.000	0.08
L11	90.83-89.83	A	0.000	0.000	0.000	0.693	0.01
		B	0.000	0.000	0.000	0.300	0.02
		C	0.000	0.000	0.000	0.000	0.01
L12	89.83-84.83	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.08
		C	0.000	0.000	0.000	0.000	0.04
L13	84.83-79.83	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.08
		C	0.000	0.000	0.000	0.000	0.04
L14	79.83-74.83	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.08
		C	0.000	0.000	0.000	0.000	0.04
L15	74.83-69.83	A	0.000	0.000	0.000	3.463	0.05
		B	0.000	0.000	0.000	1.500	0.08
		C	0.000	0.000	0.000	0.000	0.04
L16	69.83-66.00	A	0.000	0.000	0.000	2.861	0.04
		B	0.000	0.000	0.000	1.357	0.06
		C	0.000	0.000	0.000	0.000	0.03
L17	66.00-65.75	A	0.000	0.000	0.000	0.199	0.00
		B	0.000	0.000	0.000	0.101	0.00
		C	0.000	0.000	0.000	0.000	0.00
L18	65.75-60.75	A	0.000	0.000	0.000	3.984	0.05
		B	0.000	0.000	0.000	2.021	0.08
		C	0.000	0.000	0.000	0.000	0.04
L19	60.75-55.75	A	0.000	0.000	0.000	3.984	0.05
		B	0.000	0.000	0.000	2.021	0.08
		C	0.000	0.000	0.000	0.000	0.04
L20	55.75-50.75	A	0.000	0.000	0.000	3.984	0.05
		B	0.000	0.000	0.000	2.021	0.08
		C	0.000	0.000	0.000	0.000	0.04
L21	50.75-42.83	A	0.000	0.000	0.000	6.310	0.08

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:</p>	Job	CT5022	Page	8 of 27
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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L22	42.83-41.83	B	0.000	0.000	0.000	3.201	0.12
		C	0.000	0.000	0.000	0.000	0.07
		A	0.000	0.000	0.000	0.797	0.01
L23	41.83-37.92	B	0.000	0.000	0.000	0.404	0.02
		C	0.000	0.000	0.000	0.000	0.01
		A	0.000	0.000	0.000	3.118	0.04
L24	37.92-37.67	B	0.000	0.000	0.000	1.582	0.06
		C	0.000	0.000	0.000	0.000	0.03
		A	0.000	0.000	0.000	0.199	0.00
L25	37.67-32.67	B	0.000	0.000	0.000	0.101	0.00
		C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	3.984	0.05
L26	32.67-27.67	B	0.000	0.000	0.000	2.021	0.08
		C	0.000	0.000	0.000	0.000	0.04
		A	0.000	0.000	0.000	2.368	0.03
L27	27.67-22.67	B	0.000	0.000	0.000	1.321	0.04
		C	0.000	0.000	0.000	0.000	0.02
		A	0.000	0.000	0.000	0.521	0.00
L28	22.67-17.67	B	0.000	0.000	0.000	0.521	0.00
		C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.521	0.00
L29	17.67-12.67	B	0.000	0.000	0.000	0.521	0.00
		C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.521	0.00
L30	12.67-7.67	B	0.000	0.000	0.000	0.521	0.00
		C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.521	0.00
L31	7.67-2.67	B	0.000	0.000	0.000	0.521	0.00
		C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.521	0.00
L32	2.67-0.00	B	0.000	0.000	0.000	0.278	0.00
		C	0.000	0.000	0.000	0.278	0.00
		A	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	145.00-140.00	A	0.596	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L2	140.00-135.00	A	0.593	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.04
L3	135.00-130.00	A	0.591	0.000	0.000	0.000	5.826	0.14
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.04
L4	130.00-125.00	A	0.588	0.000	0.000	0.000	5.815	0.13
		B		0.000	0.000	0.000	2.088	0.06
		C		0.000	0.000	0.000	0.000	0.04
L5	125.00-120.00	A	0.585	0.000	0.000	0.000	5.804	0.13
		B		0.000	0.000	0.000	2.085	0.06
		C		0.000	0.000	0.000	0.000	0.04
L6	120.00-115.00	A	0.582	0.000	0.000	0.000	5.792	0.13
		B		0.000	0.000	0.000	2.082	0.06

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L7	115.00-110.00	C		0.000	0.000	0.000	0.000	0.04
		A	0.579	0.000	0.000	0.000	5.780	0.13
		B		0.000	0.000	0.000	2.079	0.06
		C		0.000	0.000	0.000	0.000	0.04
L8	110.00-105.00	A	0.576	0.000	0.000	0.000	5.767	0.13
		B		0.000	0.000	0.000	2.076	0.09
		C		0.000	0.000	0.000	0.000	0.04
L9	105.00-100.00	A	0.573	0.000	0.000	0.000	5.754	0.13
		B		0.000	0.000	0.000	2.073	0.09
		C		0.000	0.000	0.000	0.000	0.04
L10	100.00-90.83	A	0.568	0.000	0.000	0.000	10.517	0.24
		B		0.000	0.000	0.000	3.793	0.17
		C		0.000	0.000	0.000	0.000	0.08
L11	90.83-89.83	A	0.564	0.000	0.000	0.000	1.147	0.03
		B		0.000	0.000	0.000	0.414	0.02
		C		0.000	0.000	0.000	0.000	0.01
L12	89.83-84.83	A	0.562	0.000	0.000	0.000	5.711	0.13
		B		0.000	0.000	0.000	2.062	0.09
		C		0.000	0.000	0.000	0.000	0.04
L13	84.83-79.83	A	0.558	0.000	0.000	0.000	5.695	0.13
		B		0.000	0.000	0.000	2.058	0.09
		C		0.000	0.000	0.000	0.000	0.04
L14	79.83-74.83	A	0.554	0.000	0.000	0.000	5.678	0.13
		B		0.000	0.000	0.000	2.054	0.09
		C		0.000	0.000	0.000	0.000	0.04
L15	74.83-69.83	A	0.549	0.000	0.000	0.000	5.660	0.13
		B		0.000	0.000	0.000	2.049	0.09
		C		0.000	0.000	0.000	0.000	0.04
L16	69.83-66.00	A	0.545	0.000	0.000	0.000	4.713	0.10
		B		0.000	0.000	0.000	1.957	0.07
		C		0.000	0.000	0.000	0.000	0.03
L17	66.00-65.75	A	0.543	0.000	0.000	0.000	0.330	0.01
		B		0.000	0.000	0.000	0.151	0.00
		C		0.000	0.000	0.000	0.000	0.00
L18	65.75-60.75	A	0.541	0.000	0.000	0.000	6.597	0.13
		B		0.000	0.000	0.000	3.012	0.09
		C		0.000	0.000	0.000	0.000	0.04
L19	60.75-55.75	A	0.535	0.000	0.000	0.000	6.571	0.12
		B		0.000	0.000	0.000	3.002	0.09
		C		0.000	0.000	0.000	0.000	0.04
L20	55.75-50.75	A	0.530	0.000	0.000	0.000	6.543	0.12
		B		0.000	0.000	0.000	2.992	0.09
		C		0.000	0.000	0.000	0.000	0.04
L21	50.75-42.83	A	0.521	0.000	0.000	0.000	10.302	0.19
		B		0.000	0.000	0.000	4.715	0.14
		C		0.000	0.000	0.000	0.000	0.07
L22	42.83-41.83	A	0.515	0.000	0.000	0.000	1.301	0.02
		B		0.000	0.000	0.000	0.595	0.02
		C		0.000	0.000	0.000	0.000	0.01
L23	41.83-37.92	A	0.511	0.000	0.000	0.000	5.053	0.09
		B		0.000	0.000	0.000	2.316	0.07
		C		0.000	0.000	0.000	0.000	0.03
L24	37.92-37.67	A	0.508	0.000	0.000	0.000	0.322	0.01
		B		0.000	0.000	0.000	0.148	0.00
		C		0.000	0.000	0.000	0.000	0.00
L25	37.67-32.67	A	0.504	0.000	0.000	0.000	6.419	0.12
		B		0.000	0.000	0.000	2.944	0.09
		C		0.000	0.000	0.000	0.000	0.04
L26	32.67-27.67	A	0.500	0.000	0.000	0.000	3.851	0.06
		B		0.000	0.000	0.000	2.004	0.05
		C		0.000	0.000	0.000	0.000	0.02

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	Client		Designed by	Ahmet Coakoglu

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_{AA} In Face ft^2	C_{AA} Out Face ft^2	Weight K
L27	27.67-22.67	A	0.500	0.000	0.000	0.000	0.938	0.00
		B		0.000	0.000	0.000	0.938	0.00
		C		0.000	0.000	0.000	0.000	0.00
L28	22.67-17.67	A	0.500	0.000	0.000	0.000	0.938	0.00
		B		0.000	0.000	0.000	0.938	0.00
		C		0.000	0.000	0.000	0.000	0.00
L29	17.67-12.67	A	0.500	0.000	0.000	0.000	0.938	0.00
		B		0.000	0.000	0.000	0.938	0.00
		C		0.000	0.000	0.000	0.000	0.00
L30	12.67-7.67	A	0.500	0.000	0.000	0.000	0.938	0.00
		B		0.000	0.000	0.000	0.938	0.00
		C		0.000	0.000	0.000	0.000	0.00
L31	7.67-2.67	A	0.500	0.000	0.000	0.000	0.938	0.00
		B		0.000	0.000	0.000	0.938	0.00
		C		0.000	0.000	0.000	0.000	0.00
L32	2.67-0.00	A	0.500	0.000	0.000	0.000	0.500	0.00
		B		0.000	0.000	0.000	0.500	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	145.00-140.00	0.0000	0.0000	0.0000	0.0000
L2	140.00-135.00	0.0000	0.0000	0.0000	0.0000
L3	135.00-130.00	0.0000	-0.7864	0.0000	-1.1022
L4	130.00-125.00	0.2698	-0.5635	0.3097	-0.8171
L5	125.00-120.00	0.2726	-0.5692	0.3140	-0.8278
L6	120.00-115.00	0.2752	-0.5747	0.3180	-0.8379
L7	115.00-110.00	0.2777	-0.5800	0.3219	-0.8475
L8	110.00-105.00	0.2801	-0.5850	0.3257	-0.8567
L9	105.00-100.00	0.2824	-0.5898	0.3292	-0.8653
L10	100.00-90.83	0.2855	-0.5963	0.3340	-0.8768
L11	90.83-89.83	0.2864	-0.5981	0.3354	-0.8804
L12	89.83-84.83	0.2876	-0.6007	0.3370	-0.8833
L13	84.83-79.83	0.2896	-0.6048	0.3401	-0.8902
L14	79.83-74.83	0.2915	-0.6089	0.3429	-0.8968
L15	74.83-69.83	0.2934	-0.6127	0.3457	-0.9029
L16	69.83-66.00	0.3396	-0.6302	0.4170	-0.9185
L17	66.00-65.75	0.3791	-0.6442	0.4762	-0.9298
L18	65.75-60.75	0.3805	-0.6464	0.4782	-0.9332
L19	60.75-55.75	0.3829	-0.6506	0.4817	-0.9394
L20	55.75-50.75	0.3853	-0.6547	0.4851	-0.9450
L21	50.75-42.83	0.3883	-0.6597	0.4890	-0.9514
L22	42.83-41.83	0.3884	-0.6600	0.4893	-0.9519
L23	41.83-37.92	0.3895	-0.6618	0.4896	-0.9509
L24	37.92-37.67	0.3904	-0.6634	0.4906	-0.9525
L25	37.67-32.67	0.3916	-0.6653	0.4919	-0.9542
L26	32.67-27.67	0.2840	-0.4233	0.3851	-0.6312
L27	27.67-22.67	0.1281	-0.0739	0.2166	-0.1250
L28	22.67-17.67	0.1282	-0.0740	0.2171	-0.1253
L29	17.67-12.67	0.1283	-0.0741	0.2175	-0.1256
L30	12.67-7.67	0.1285	-0.0742	0.2180	-0.1258
L31	7.67-2.67	0.1286	-0.0742	0.2184	-0.1261
L32	2.67-0.00	0.1287	-0.0743	0.2187	-0.1263

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Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C_{AA} Front</i> <i>ft²</i>	<i>C_{AA} Side</i> <i>ft²</i>	<i>Weight</i> <i>K</i>	
143ft									
(3) Andrew 5' Antennas w/Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	143.00	No Ice 8.50 1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03 4" Ice 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91	
(4) Andrew 5' Antennas w/Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	143.00	No Ice 8.50 1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03 4" Ice 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91	
(3) Andrew 5' Antennas w/Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	143.00	No Ice 8.50 1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03 4" Ice 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91	
10' Omni	B	From Leg	0.00 0.00 0.00	0.0000	143.00	No Ice 2.00 1/2" Ice 3.03 1" Ice 4.06 2" Ice 6.12 4" Ice 10.24	2.00 3.03 4.06 6.12 10.24	0.01 0.03 0.04 0.07 0.13	
T-Arm Mount [TA 602-3]	C	None		0.0000	143.00	No Ice 11.59 1/2" Ice 15.44 1" Ice 19.29 2" Ice 26.99 4" Ice 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50	
130ft									
T-Arm Mount [TA 602-3]	C	None		0.0000	130.00	No Ice 11.59 1/2" Ice 15.44 1" Ice 19.29 2" Ice 26.99 4" Ice 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50	
(2) 7770.00 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 6.12 1/2" Ice 6.63 1" Ice 7.13 2" Ice 8.16 4" Ice 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66	
(2) 7770.00 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 6.12 1/2" Ice 6.63 1" Ice 7.13 2" Ice 8.16 4" Ice 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66	
(2) 7770.00 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 6.12 1/2" Ice 6.63 1" Ice 7.13 2" Ice 8.16 4" Ice 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66	
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 8.64 1/2" Ice 9.29 1" Ice 9.91	6.36 7.54 8.43	0.08 0.14 0.22	

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Vert					
							ft ²	ft ²	K
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	3.00	0.0000	130.00	2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
						No Ice	8.64	6.36	0.08
						1/2" Ice	9.29	7.54	0.14
						1" Ice	9.91	8.43	0.22
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	3.00	0.0000	130.00	2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
						No Ice	8.64	6.36	0.08
						1/2" Ice	9.29	7.54	0.14
						1" Ice	9.91	8.43	0.22
(4) LGP21401	A	From Leg	3.00	0.0000	130.00	2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
						No Ice	0.00	0.23	0.01
						1/2" Ice	0.00	0.31	0.02
						1" Ice	0.00	0.40	0.03
(4) LGP21401	B	From Leg	3.00	0.0000	130.00	2" Ice	0.00	0.61	0.05
						4" Ice	0.00	1.12	0.14
						No Ice	0.00	0.23	0.01
						1/2" Ice	0.00	0.31	0.02
						1" Ice	0.00	0.40	0.03
(4) LGP21401	C	From Leg	3.00	0.0000	130.00	2" Ice	0.00	0.61	0.05
						4" Ice	0.00	1.12	0.14
						No Ice	0.00	0.23	0.01
						1/2" Ice	0.00	0.31	0.02
						1" Ice	0.00	0.40	0.03
(2) RRUS 11	A	From Leg	3.00	0.0000	130.00	2" Ice	0.00	0.61	0.05
						4" Ice	0.00	1.12	0.14
						No Ice	0.00	1.37	0.05
						1/2" Ice	0.00	1.55	0.07
						1" Ice	0.00	1.74	0.10
(2) RRUS 11	B	From Leg	3.00	0.0000	130.00	2" Ice	0.00	2.14	0.15
						4" Ice	0.00	3.04	0.31
						No Ice	0.00	1.37	0.05
						1/2" Ice	0.00	1.55	0.07
						1" Ice	0.00	1.74	0.10
(2) RRUS 11	C	From Leg	3.00	0.0000	130.00	2" Ice	0.00	2.14	0.15
						4" Ice	0.00	3.04	0.31
						No Ice	0.00	1.37	0.05
						1/2" Ice	0.00	1.55	0.07
						1" Ice	0.00	1.74	0.10
DC6-48-60-18-8F	A	From Leg	3.00	0.0000	130.00	2" Ice	0.00	2.14	0.15
						4" Ice	0.00	3.04	0.31
						No Ice	1.27	1.27	0.02
						1/2" Ice	1.46	1.46	0.03
						1" Ice	1.66	1.66	0.05
135ft (2) Kathrein 8101002R4B	A	From Leg	3.00	0.0000	135.00	2" Ice	2.09	2.09	0.09
						4" Ice	3.10	3.10	0.21
						No Ice	11.56	9.22	0.16
						1/2" Ice	12.28	10.51	0.25
						1" Ice	12.97	11.58	0.35
(2) Kathrein 8101002R4B	B	From Leg	3.00	0.0000	135.00	2" Ice	14.36	13.63	0.58
						4" Ice	17.25	18.12	1.19
						No Ice	11.56	9.22	0.16
						1/2" Ice	12.28	10.51	0.25
						1" Ice	12.97	11.58	0.35
						2" Ice	14.36	13.63	0.58

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
(2) Kathrein 8101002R4B	C	From Leg	3.00	0.0000	135.00	4" Ice	17.25	18.12	1.19
						No Ice	11.56	9.22	0.16
						1/2" Ice	12.28	10.51	0.25
						1" Ice	12.97	11.58	0.35
						2" Ice	14.36	13.63	0.58
(2) LGP21401	A	From Leg	3.00	0.0000	135.00	4" Ice	17.25	18.12	1.19
						No Ice	1.29	0.23	0.01
						1/2" Ice	1.45	0.31	0.02
						1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
(2) LGP21401	B	From Leg	3.00	0.0000	135.00	4" Ice	2.79	1.12	0.14
						No Ice	1.29	0.23	0.01
						1/2" Ice	1.45	0.31	0.02
						1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
(2) LGP21401	C	From Leg	3.00	0.0000	135.00	4" Ice	2.79	1.12	0.14
						No Ice	1.29	0.23	0.01
						1/2" Ice	1.45	0.31	0.02
						1" Ice	1.61	0.40	0.03
						2" Ice	1.97	0.61	0.05
24"x24" Panel	C	From Leg	3.00	0.0000	135.00	4" Ice	2.79	1.12	0.14
						No Ice	6.57	0.79	0.02
						1/2" Ice	6.91	0.96	0.05
						1" Ice	7.25	1.13	0.08
						2" Ice	7.93	1.47	0.14
T-Arm Mount [TA 602-3]	C	None	0.0000	135.00	4" Ice	9.29	2.15	0.26	
					No Ice	11.59	11.59	0.77	
					1/2" Ice	15.44	15.44	0.99	
					1" Ice	19.29	19.29	1.21	
					2" Ice	26.99	26.99	1.64	
110.3ft									
APXVSPP16w/ Mount Pipe	A	From Leg	3.00	0.0000	110.30	4" Ice	13.68	14.85	0.91
						No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
APXVSPP16w/ Mount Pipe	B	From Leg	3.00	0.0000	110.30	4" Ice	13.68	14.85	0.91
						No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
APXVSPP16w/ Mount Pipe	C	From Leg	3.00	0.0000	110.30	4" Ice	13.68	14.85	0.91
						No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
9442 RRH2X40-07L	A	From Leg	3.00	0.0000	110.30	4" Ice	4.49	4.13	0.32
						No Ice	2.49	2.21	0.05
						1/2" Ice	2.71	2.42	0.07
						1" Ice	2.94	2.63	0.10
						2" Ice	3.42	3.10	0.16
9442 RRH2X40-07L	B	From Leg	3.00	0.0000	110.30	4" Ice	4.49	4.13	0.32
						No Ice	2.49	2.21	0.05
						1/2" Ice	2.71	2.42	0.07
						1" Ice	2.94	2.63	0.10
						2" Ice	3.42	3.10	0.16

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
9442 RRH2X40-07L	C	From Leg	3.00	0.0000	110.30	No Ice	2.49	2.21	0.05
			0.00			1/2" Ice	2.71	2.42	0.07
			0.00			1" Ice	2.94	2.63	0.10
						2" Ice	3.42	3.10	0.16
						4" Ice	4.49	4.13	0.32
PCS 1900MHz 4x45W-65MHz	A	From Leg	3.00	0.0000	110.30	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			0.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	3.00	0.0000	110.30	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			0.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	3.00	0.0000	110.30	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			0.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
(2) 6' x 2" Mount Pipe	A	From Leg	3.00	0.0000	110.30	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
(2) 6' x 2" Mount Pipe	B	From Leg	3.00	0.0000	110.30	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
(2) 6' x 2" Mount Pipe	C	From Leg	3.00	0.0000	110.30	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
						2" Ice	3.06	3.06	0.09
						4" Ice	4.70	4.70	0.23
10' Omni	B	From Leg	0.00	0.0000	110.30	No Ice	2.00	2.00	0.01
			0.00			1/2" Ice	3.03	3.03	0.03
			0.00			1" Ice	4.06	4.06	0.04
						2" Ice	6.12	6.12	0.07
						4" Ice	10.24	10.24	0.13
Platform Mount [LP 405-1]	C	From Leg	0.00	0.0000	110.30	No Ice	20.80	20.80	1.80
			0.00			1/2" Ice	28.10	28.10	2.07
			0.00			1" Ice	35.40	35.40	2.33
						2" Ice	50.00	50.00	2.86
						4" Ice	79.20	79.20	3.93

Dishes

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 140	Pole	Max Tension	5	0.00	0.0	0.0
			Max. Compression	14	-3.20	-0.6	-0.3
			Max. Mx	5	-1.59	-14.9	-0.2

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	140 - 135	Pole	Max. My	8	-1.59	-0.3	-14.7
			Max. Vy	11	-4.97	14.3	-0.0
			Max. Vx	8	4.93	-0.3	-14.7
			Max. Torque	9			1.4
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-3.72	-0.6	-0.4
			Max. Mx	5	-1.97	-41.1	-0.4
			Max. My	8	-1.98	-0.4	-40.7
			Max. Vy	11	-5.50	40.5	0.1
			Max. Vx	8	5.46	-0.4	-40.7
L3	135 - 130	Pole	Max. Torque	9			1.4
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-7.23	-0.4	-0.3
			Max. Mx	5	-3.91	-90.5	0.1
			Max. My	8	-3.92	0.0	-89.3
			Max. Vy	11	-10.25	90.1	-0.3
			Max. Vx	8	10.08	0.0	-89.3
			Max. Torque	9			1.4
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-10.92	-0.4	-0.0
L4	130 - 125	Pole	Max. Mx	5	-5.98	-161.0	0.6
			Max. My	8	-6.00	0.5	-158.8
			Max. Vy	11	-14.51	160.6	-0.6
			Max. Vx	8	14.33	0.5	-158.8
			Max. Torque	9			1.3
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-11.68	-0.4	0.1
			Max. Mx	5	-6.53	-235.6	1.1
			Max. My	2	-6.55	-1.2	232.4
			Max. Vy	11	-15.30	235.1	-1.0
L5	125 - 120	Pole	Max. Vx	8	15.13	0.9	-232.4
			Max. Torque	9			1.2
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-12.45	-0.4	0.3
			Max. Mx	5	-7.10	-314.1	1.6
			Max. My	2	-7.12	-1.7	310.1
			Max. Vy	11	-16.10	313.5	-1.4
			Max. Vx	8	15.93	1.3	-309.9
			Max. Torque	9			1.2
			Max Tension	1	0.00	0.0	0.0
L6	120 - 115	Pole	Max. Compression	14	-16.57	1.8	-0.9
			Max. Mx	11	-9.98	398.9	-2.9
			Max. My	8	-10.00	3.6	-393.6
			Max. Vy	11	-20.14	398.9	-2.9
			Max. Vx	8	19.96	3.6	-393.6
			Max. Torque	3			-1.2
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-17.42	1.7	-0.7
			Max. Mx	11	-10.62	501.6	-3.3
			Max. My	8	-10.65	4.0	-495.3
L7	115 - 110	Pole	Max. Vy	11	-20.93	501.6	-3.3
			Max. Vx	8	20.76	4.0	-495.3
			Max. Torque	10			1.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-18.27	1.7	-0.6
			Max. Mx	11	-11.30	608.1	-3.7
			Max. My	8	-11.32	4.4	-601.0
			Max. Vy	11	-21.73	608.1	-3.7
			Max. Vx	8	21.55	4.4	-601.0
			Max. Torque	10			1.0
L8	110 - 105	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-18.27	1.7	-0.6
L9	105 - 100	Pole	Max. Mx	11	-11.30	608.1	-3.7
			Max. My	8	-11.32	4.4	-601.0
			Max. Vy	11	-21.73	608.1	-3.7
			Max. Vx	8	21.55	4.4	-601.0
			Max. Torque	10			1.0
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-18.27	1.7	-0.6
			Max. Mx	11	-11.30	608.1	-3.7
			Max. My	8	-11.32	4.4	-601.0
			Max. Vy	11	-21.73	608.1	-3.7
L10	100 - 90.83	Pole	Max. Vx	8	21.55	4.4	-601.0
			Max. Torque	10			1.0
L10	100 - 90.83	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-18.27	1.7	-0.6

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L11	90.83 - 89.83	Pole	Max. Compression	14	-18.97	1.7	-0.5
			Max. Mx	11	-11.86	696.3	-4.0
			Max. My	8	-11.88	4.8	-688.4
			Max. Vy	11	-22.35	696.3	-4.0
			Max. Vx	8	22.17	4.8	-688.4
			Max. Torque	10			0.9
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-20.90	1.6	-0.3
			Max. Mx	11	-13.41	837.4	-4.5
			Max. My	8	-13.43	5.3	-828.4
L12	89.83 - 84.83	Pole	Max. Vy	11	-23.40	837.4	-4.5
			Max. Vx	8	23.22	5.3	-828.4
			Max. Torque	4			-0.9
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-21.97	1.6	-0.1
			Max. Mx	11	-14.31	956.3	-4.9
			Max. My	8	-14.33	5.7	-946.4
			Max. Vy	11	-24.19	956.3	-4.9
			Max. Vx	8	24.01	5.7	-946.4
			Max. Torque	4			-0.9
L13	84.83 - 79.83	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-23.05	1.5	0.0
			Max. Mx	11	-15.24	1079.1	-5.3
			Max. My	8	-15.25	6.1	-1068.3
			Max. Vy	11	-24.97	1079.1	-5.3
			Max. Vx	8	24.79	6.1	-1068.3
			Max. Torque	4			-0.9
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-24.16	1.5	0.2
			Max. Mx	11	-16.19	1205.8	-5.7
L14	79.83 - 74.83	Pole	Max. My	8	-16.21	6.5	-1194.1
			Max. Vy	11	-25.75	1205.8	-5.7
			Max. Vx	8	25.57	6.5	-1194.1
			Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-25.28	1.4	0.3
			Max. Mx	11	-17.18	1336.4	-6.1
			Max. My	8	-17.19	6.9	-1323.8
			Max. Vy	11	-26.51	1336.4	-6.1
			Max. Vx	8	26.34	6.9	-1323.8
L15	74.83 - 69.83	Pole	Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-26.15	1.4	0.5
			Max. Mx	11	-17.95	1439.0	-6.4
			Max. My	8	-17.96	7.2	-1425.7
			Max. Vy	11	-27.11	1439.0	-6.4
			Max. Vx	8	26.93	7.2	-1425.7
			Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-26.23	1.4	0.5
L16	69.83 - 66	Pole	Max. Mx	11	-18.03	1445.8	-6.4
			Max. My	8	-18.05	7.2	-1432.5
			Max. Vy	11	-27.15	1445.8	-6.4
			Max. Vx	8	26.97	7.2	-1432.5
			Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-27.83	1.3	0.6
			Max. Mx	11	-19.46	1583.6	-6.8
			Max. My	8	-19.47	7.6	-1569.3
			Max. Vy	11	-27.98	1583.6	-6.8
L17	66 - 65.75	Pole	Max. Vx	8	27.80	7.6	-1569.3
			Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-27.83	1.3	0.6
			Max. Mx	11	-19.46	1583.6	-6.8
			Max. My	8	-19.47	7.6	-1569.3
L18	65.75 - 60.75	Pole	Max. Vy	11	-27.98	1583.6	-6.8
			Max. Vx	8	27.80	7.6	-1569.3
			Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-27.83	1.3	0.6
			Max. Mx	11	-19.46	1583.6	-6.8

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L19	60.75 - 55.75	Pole	Max. Torque	4			-0.8
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-29.45	1.3	0.8
			Max. Mx	11	-20.91	1725.4	-7.2
			Max. My	8	-20.92	8.0	-1710.3
			Max. Vy	11	-28.80	1725.4	-7.2
			Max. Vx	8	28.62	8.0	-1710.3
L20	55.75 - 50.75	Pole	Max. Torque	4			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-31.09	1.2	1.0
			Max. Mx	11	-22.39	1871.3	-7.6
			Max. My	8	-22.40	8.4	-1855.3
			Max. Vy	11	-29.60	1871.3	-7.6
			Max. Vx	8	29.42	8.4	-1855.3
L21	50.75 - 42.83	Pole	Max. Torque	3			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-31.67	1.2	1.0
			Max. Mx	11	-22.91	1923.4	-7.7
			Max. My	8	-22.92	8.6	-1907.0
			Max. Vy	11	-29.87	1923.4	-7.7
			Max. Vx	8	29.70	8.6	-1907.0
L22	42.83 - 41.83	Pole	Max. Torque	3			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-36.12	1.1	1.3
			Max. Mx	11	-26.93	2141.8	-8.2
			Max. My	8	-26.94	9.1	-2124.1
			Max. Vy	11	-31.07	2141.8	-8.2
			Max. Vx	8	30.90	9.1	-2124.1
L23	41.83 - 37.9167	Pole	Max. Torque	3			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-37.61	1.1	1.4
			Max. Mx	11	-28.31	2264.4	-8.5
			Max. My	8	-28.32	9.5	-2246.1
			Max. Vy	11	-31.66	2264.4	-8.5
			Max. Vx	8	31.48	9.5	-2246.1
L24	37.9167 - 37.6667	Pole	Max. Torque	3			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-37.71	1.1	1.4
			Max. Mx	11	-28.41	2272.4	-8.5
			Max. My	8	-28.42	9.5	-2253.9
			Max. Vy	11	-31.69	2272.4	-8.5
			Max. Vx	8	31.51	9.5	-2253.9
L25	37.6667 - 32.6667	Pole	Max. Torque	3			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-39.73	1.0	1.6
			Max. Mx	11	-30.28	2432.5	-8.9
			Max. My	8	-30.29	9.9	-2413.2
			Max. Vy	11	-32.42	2432.5	-8.9
			Max. Vx	8	32.24	9.9	-2413.2
L26	32.6667 - 27.6667	Pole	Max. Torque	3			-0.7
			Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-41.66	1.0	1.7
			Max. Mx	11	-32.10	2596.2	-9.3
			Max. My	8	-32.11	10.3	-2575.9
			Max. Vy	11	-33.06	2596.2	-9.3
			Max. Vx	8	32.88	10.3	-2575.9
			Max. Torque	3			-0.7

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L27	27.6667 - 22.6667	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-43.48	1.0	1.7
			Max. Mx	11	-33.86	2762.8	-9.8
			Max. My	8	-33.87	10.7	-2741.7
			Max. Vy	11	-33.61	2762.8	-9.8
			Max. Vx	8	33.44	10.7	-2741.7
			Max. Torque	3			-0.7
L28	22.6667 - 17.6667	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-45.32	1.0	1.7
			Max. Mx	11	-35.65	2932.2	-10.2
			Max. My	8	-35.65	11.2	-2910.2
			Max. Vy	11	-34.18	2932.2	-10.2
			Max. Vx	8	34.00	11.2	-2910.2
			Max. Torque	3			-0.7
L29	17.6667 - 12.6667	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-47.19	1.0	1.7
			Max. Mx	11	-37.46	3104.4	-10.6
			Max. My	8	-37.47	11.6	-3081.6
			Max. Vy	11	-34.74	3104.4	-10.6
			Max. Vx	8	34.56	11.6	-3081.6
			Max. Torque	3			-0.7
L30	12.6667 - 7.6667	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-49.09	1.0	1.7
			Max. Mx	11	-39.30	3279.5	-11.0
			Max. My	8	-39.30	12.0	-3255.8
			Max. Vy	11	-35.30	3279.5	-11.0
			Max. Vx	8	35.13	12.0	-3255.8
			Max. Torque	3			-0.7
L31	7.6667 - 2.6667	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-51.00	1.0	1.7
			Max. Mx	11	-41.17	3457.4	-11.5
			Max. My	8	-41.17	12.4	-3432.8
			Max. Vy	11	-35.87	3457.4	-11.5
			Max. Vx	8	35.70	12.4	-3432.8
			Max. Torque	3			-0.8
L32	2.6667 - 0	Pole	Max Tension	1	0.00	0.0	0.0
			Max. Compression	14	-52.04	1.0	1.7
			Max. Mx	11	-42.17	3553.4	-11.7
			Max. My	8	-42.17	12.7	-3528.4
			Max. Vy	11	-36.18	3553.4	-11.7
			Max. Vx	8	36.01	12.7	-3528.4
			Max. Torque	3			-0.8

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	52.04	0.00	0.00
	Max. H _x	11	42.18	36.16	-0.09
	Max. H _z	2	42.18	-0.09	35.99
	Max. M _x	2	3528.0	-0.09	35.99

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M _z	5	3551.1	-36.16	0.09
	Max. Torsion	9	0.8	18.15	-31.21
	Min. Vert	1	42.18	0.00	0.00
	Min. H _x	5	42.18	-36.16	0.09
	Min. H _z	8	42.18	0.09	-35.99
	Min. M _x	8	-3528.4	0.09	-35.99
	Min. M _z	11	-3553.4	36.16	-0.09
	Min. Torsion	3	-0.8	-18.15	31.21

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overtuning Moment, M _x kip-ft	Overtuning Moment, M _z kip-ft	Torque kip-ft
Dead Only	42.18	0.00	0.00	0.2	1.1	0.0
Dead+Wind 0 deg - No Ice	42.18	0.09	-35.99	-3528.0	-10.3	0.7
Dead+Wind 30 deg - No Ice	42.18	18.15	-31.21	-3061.0	-1784.9	0.8
Dead+Wind 60 deg - No Ice	42.18	31.36	-18.07	-1773.8	-3080.9	0.6
Dead+Wind 90 deg - No Ice	42.18	36.16	-0.09	-11.3	-3551.1	0.3
Dead+Wind 120 deg - No Ice	42.18	31.27	17.92	1754.3	-3069.5	-0.1
Dead+Wind 150 deg - No Ice	42.18	18.01	31.13	3049.9	-1765.0	-0.5
Dead+Wind 180 deg - No Ice	42.18	-0.09	35.99	3528.4	12.7	-0.7
Dead+Wind 210 deg - No Ice	42.18	-18.15	31.21	3061.4	1787.3	-0.8
Dead+Wind 240 deg - No Ice	42.18	-31.36	18.07	1774.2	3083.2	-0.6
Dead+Wind 270 deg - No Ice	42.18	-36.16	0.09	11.7	3553.4	-0.3
Dead+Wind 300 deg - No Ice	42.18	-31.27	-17.92	-1753.9	3071.8	0.1
Dead+Wind 330 deg - No Ice	42.18	-18.01	-31.13	-3049.6	1767.3	0.5
Dead+Ice	52.04	0.00	0.00	-1.7	1.0	0.0
Dead+Wind 0 deg+Ice	52.04	0.02	-8.40	-841.5	-1.7	0.2
Dead+Wind 30 deg+Ice	52.04	4.23	-7.28	-730.4	-423.5	0.2
Dead+Wind 60 deg+Ice	52.04	7.31	-4.22	-424.0	-731.5	0.1
Dead+Wind 90 deg+Ice	52.04	8.43	-0.02	-4.6	-843.2	0.0
Dead+Wind 120 deg+Ice	52.04	7.29	4.18	415.7	-728.7	-0.1
Dead+Wind 150 deg+Ice	52.04	4.20	7.26	724.1	-418.7	-0.1
Dead+Wind 180 deg+Ice	52.04	-0.02	8.40	838.0	3.9	-0.2
Dead+Wind 210 deg+Ice	52.04	-4.23	7.28	726.9	425.6	-0.2
Dead+Wind 240 deg+Ice	52.04	-7.31	4.22	420.5	733.7	-0.1
Dead+Wind 270 deg+Ice	52.04	-8.43	0.02	1.0	845.4	-0.0
Dead+Wind 300 deg+Ice	52.04	-7.29	-4.18	-419.2	730.9	0.1
Dead+Wind 330 deg+Ice	52.04	-4.20	-7.26	-727.6	420.8	0.1
Dead+Wind 0 deg - Service	42.18	0.03	-12.45	-1221.5	-2.8	0.2
Dead+Wind 30 deg - Service	42.18	6.28	-10.80	-1059.9	-617.3	0.3
Dead+Wind 60 deg - Service	42.18	10.85	-6.25	-614.1	-1066.1	0.2
Dead+Wind 90 deg - Service	42.18	12.51	-0.03	-3.8	-1228.9	0.1
Dead+Wind 120 deg - Service	42.18	10.82	6.20	607.6	-1062.1	-0.0
Dead+Wind 150 deg - Service	42.18	6.23	10.77	1056.3	-610.4	-0.2
Dead+Wind 180 deg - Service	42.18	-0.03	12.45	1221.9	5.2	-0.2
Dead+Wind 210 deg - Service	42.18	-6.28	10.80	1060.2	619.7	-0.3
Dead+Wind 240 deg - Service	42.18	-10.85	6.25	614.5	1068.4	-0.2
Dead+Wind 270 deg - Service	42.18	-12.51	0.03	4.2	1231.3	-0.1
Dead+Wind 300 deg - Service	42.18	-10.82	-6.20	-607.2	1064.5	0.0
Dead+Wind 330 deg - Service	42.18	-6.23	-10.77	-1055.9	612.8	0.2

Solution Summary

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-42.18	0.00	0.00	42.18	0.00	0.000%
2	0.09	-42.18	-35.99	-0.09	42.18	35.99	0.000%
3	18.15	-42.18	-31.21	-18.15	42.18	31.21	0.000%
4	31.36	-42.18	-18.07	-31.36	42.18	18.07	0.000%
5	36.16	-42.18	-0.09	-36.16	42.18	0.09	0.000%
6	31.27	-42.18	17.92	-31.27	42.18	-17.92	0.000%
7	18.01	-42.18	31.13	-18.01	42.18	-31.13	0.000%
8	-0.09	-42.18	35.99	0.09	42.18	-35.99	0.000%
9	-18.15	-42.18	31.21	18.15	42.18	-31.21	0.000%
10	-31.36	-42.18	18.07	31.36	42.18	-18.07	0.000%
11	-36.16	-42.18	0.09	36.16	42.18	-0.09	0.000%
12	-31.27	-42.18	-17.92	31.27	42.18	17.92	0.000%
13	-18.01	-42.18	-31.13	18.01	42.18	31.13	0.000%
14	0.00	-52.04	0.00	0.00	52.04	0.00	0.000%
15	0.02	-52.04	-8.40	-0.02	52.04	8.40	0.000%
16	4.23	-52.04	-7.28	-4.23	52.04	7.28	0.000%
17	7.31	-52.04	-4.22	-7.31	52.04	4.22	0.000%
18	8.43	-52.04	-0.02	-8.43	52.04	0.02	0.000%
19	7.29	-52.04	4.18	-7.29	52.04	-4.18	0.000%
20	4.20	-52.04	7.26	-4.20	52.04	-7.26	0.000%
21	-0.02	-52.04	8.40	0.02	52.04	-8.40	0.000%
22	-4.23	-52.04	7.28	4.23	52.04	-7.28	0.000%
23	-7.31	-52.04	4.22	7.31	52.04	-4.22	0.000%
24	-8.43	-52.04	0.02	8.43	52.04	-0.02	0.000%
25	-7.29	-52.04	-4.18	7.29	52.04	4.18	0.000%
26	-4.20	-52.04	-7.26	4.20	52.04	7.26	0.000%
27	0.03	-42.18	-12.45	-0.03	42.18	12.45	0.000%
28	6.28	-42.18	-10.80	-6.28	42.18	10.80	0.000%
29	10.85	-42.18	-6.25	-10.85	42.18	6.25	0.000%
30	12.51	-42.18	-0.03	-12.51	42.18	0.03	0.000%
31	10.82	-42.18	6.20	-10.82	42.18	-6.20	0.000%
32	6.23	-42.18	10.77	-6.23	42.18	-10.77	0.000%
33	-0.03	-42.18	12.45	0.03	42.18	-12.45	0.000%
34	-6.28	-42.18	10.80	6.28	42.18	-10.80	0.000%
35	-10.85	-42.18	6.25	10.85	42.18	-6.25	0.000%
36	-12.51	-42.18	0.03	12.51	42.18	-0.03	0.000%
37	-10.82	-42.18	-6.20	10.82	42.18	6.20	0.000%
38	-6.23	-42.18	-10.77	6.23	42.18	10.77	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00088201
3	Yes	5	0.00000001	0.00062360
4	Yes	5	0.00000001	0.00060302
5	Yes	4	0.00000001	0.00052223
6	Yes	5	0.00000001	0.00060612
7	Yes	5	0.00000001	0.00060773
8	Yes	4	0.00000001	0.00057993
9	Yes	5	0.00000001	0.00060334
10	Yes	5	0.00000001	0.00062580
11	Yes	4	0.00000001	0.00081135
12	Yes	5	0.00000001	0.00060357

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13	Yes	5	0.00000001	0.00060011
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00035122
16	Yes	5	0.00000001	0.00005036
17	Yes	5	0.00000001	0.00004739
18	Yes	4	0.00000001	0.00034429
19	Yes	5	0.00000001	0.00004748
20	Yes	5	0.00000001	0.00004810
21	Yes	4	0.00000001	0.00034729
22	Yes	5	0.00000001	0.00004745
23	Yes	5	0.00000001	0.00005059
24	Yes	4	0.00000001	0.00034874
25	Yes	5	0.00000001	0.00004818
26	Yes	5	0.00000001	0.00004741
27	Yes	4	0.00000001	0.00025448
28	Yes	5	0.00000001	0.00005271
29	Yes	5	0.00000001	0.00004917
30	Yes	4	0.00000001	0.00023953
31	Yes	5	0.00000001	0.00005026
32	Yes	5	0.00000001	0.00005052
33	Yes	4	0.00000001	0.00024462
34	Yes	5	0.00000001	0.00004960
35	Yes	5	0.00000001	0.00005345
36	Yes	4	0.00000001	0.00025020
37	Yes	5	0.00000001	0.00004993
38	Yes	5	0.00000001	0.00004938

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	145 - 140 (1)	TP24.521x23.61x0.281	5.00	0.00	0.0	39.000	21.9329	-1.59	855.38	0.002
L2	140 - 135 (2)	TP25.432x24.521x0.281	5.00	0.00	0.0	39.000	22.7572	-1.97	887.53	0.002
L3	135 - 130 (3)	TP26.3431x25.432x0.281	5.00	0.00	0.0	39.000	23.5815	-3.91	919.68	0.004
L4	130 - 125 (4)	TP27.2541x26.3431x0.281	5.00	0.00	0.0	39.000	24.4058	-5.98	951.83	0.006
L5	125 - 120 (5)	TP28.1651x27.2541x0.281	5.00	0.00	0.0	39.000	25.2301	-6.52	983.97	0.007
L6	120 - 115 (6)	TP29.0761x28.1651x0.281	5.00	0.00	0.0	39.000	26.0544	-7.10	1016.12	0.007
L7	115 - 110 (7)	TP29.9871x29.0761x0.281	5.00	0.00	0.0	39.000	26.8787	-9.97	1048.27	0.010
L8	110 - 105 (8)	TP30.8982x29.9871x0.281	5.00	0.00	0.0	39.000	27.7030	-10.62	1080.42	0.010
L9	105 - 100 (9)	TP31.8092x30.8982x0.281	5.00	0.00	0.0	39.000	28.5273	-11.30	1112.57	0.010
L10	100 - 90.83 (10)	TP33.48x31.8092x0.281	9.17	0.00	0.0	39.000	29.1868	-11.85	1138.28	0.010
L11	90.83 - 89.83 (11)	TP33.0974x31.976x0.375	6.17	0.00	0.0	39.000	39.5123	-13.41	1540.98	0.009
L12	89.83 - 84.83 (12)	TP34.0062x33.0974x0.375	5.00	0.00	0.0	39.000	40.6097	-14.31	1583.78	0.009
L13	84.83 - 79.83 (13)	TP34.915x34.0062x0.375	5.00	0.00	0.0	39.000	41.7071	-15.23	1626.58	0.009
L14	79.83 - 74.83 (14)	TP35.8238x34.915x0.375	5.00	0.00	0.0	39.000	42.8044	-16.19	1669.37	0.010
L15	74.83 - 69.83 (15)	TP36.7326x35.8238x0.375	5.00	0.00	0.0	39.000	43.9018	-17.17	1712.17	0.010
L16	69.83 - 66 (16)	TP37.4287x36.7326x0.375	3.83	0.00	0.0	39.000	44.7423	-17.94	1744.95	0.010
L17	66 - 65.75 (17)	TP37.4741x37.4287x0.6125	0.25	0.00	0.0	39.000	72.7004	-18.03	2835.31	0.006
L18	65.75 - 60.75	TP38.3829x37.4741x0.6125	5.00	0.00	0.0	39.000	74.4927	-19.45	2905.22	0.007

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L19	60.75 - 55.75 (18)	TP39.2917x38.3829x0.6	5.00	0.00	0.0	39.000	74.7524	-20.91	2915.34	0.007
L20	55.75 - 50.75 (19)	TP40.2005x39.2917x0.6	5.00	0.00	0.0	39.000	76.5081	-22.39	2983.82	0.008
L21	50.75 - 42.83 (20)	TP41.64x40.2005x0.6	7.92	0.00	0.0	39.000	77.1227	-22.91	3007.78	0.008
L22	42.83 - 41.83 (21)	TP41.074x39.7686x0.713	7.17	0.00	0.0	39.000	92.6632	-26.93	3613.87	0.007
L23	41.83 - 37.9167 (22)	TP41.7865x41.074x0.7005	3.91	0.00	0.0	39.000	92.6740	-28.31	3614.29	0.008
L24	37.9167 - 37.6667 (24)	TP41.832x41.7865x0.7505	0.25	0.00	0.0	39.000	99.2780	-28.41	3871.84	0.007
L25	37.6667 - 32.6667 (25)	TP42.7424x41.832x0.738	5.00	0.00	0.0	39.000	99.8175	-30.28	3892.88	0.008
L26	32.6667 - 27.6667 (26)	TP43.6527x42.7424x0.738	5.00	0.00	0.0	39.000	101.9810	-32.10	3977.25	0.008
L27	27.6667 - 22.6667 (27)	TP44.5631x43.6527x0.7255	5.00	0.00	0.0	39.000	102.4090	-33.86	3993.97	0.008
L28	22.6667 - 17.6667 (28)	TP45.4734x44.5631x0.7255	5.00	0.00	0.0	39.000	104.5360	-35.65	4076.91	0.009
L29	17.6667 - 12.6667 (29)	TP46.3838x45.4734x0.713	5.00	0.00	0.0	39.000	104.8540	-37.46	4089.29	0.009
L30	12.6667 - 7.6667 (30)	TP47.2941x46.3838x0.713	5.00	0.00	0.0	39.000	106.9440	-39.30	4170.81	0.009
L31	7.6667 - 2.6667 (31)	TP48.2045x47.2941x0.7005	5.00	0.00	0.0	39.000	107.1500	-41.17	4178.87	0.010
L32	2.6667 - 0 (32)	TP48.69x48.2045x0.7005	2.67	0.00	0.0	39.000	108.2460	-42.17	4221.58	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	145 - 140 (1)	TP24.521x23.61x0.281	15.0	1.391	39.000	0.036	0.0	0.000	39.000	0.000
L2	140 - 135 (2)	TP25.432x24.521x0.281	41.3	3.550	39.000	0.091	0.0	0.000	39.000	0.000
L3	135 - 130 (3)	TP26.3431x25.432x0.281	90.5	7.248	39.000	0.186	0.0	0.000	39.000	0.000
L4	130 - 125 (4)	TP27.2541x26.3431x0.281	161.0	12.038	39.000	0.309	0.0	0.000	39.000	0.000
L5	125 - 120 (5)	TP28.1651x27.2541x0.281	235.7	16.481	39.000	0.423	0.0	0.000	39.000	0.000
L6	120 - 115 (6)	TP29.0761x28.1651x0.281	314.4	20.607	39.000	0.528	0.0	0.000	39.000	0.000
L7	115 - 110 (7)	TP29.9871x29.0761x0.281	399.7	24.609	39.000	0.631	0.0	0.000	39.000	0.000
L8	110 - 105 (8)	TP30.8982x29.9871x0.281	502.5	29.115	39.000	0.747	0.0	0.000	39.000	0.000
L9	105 - 100 (9)	TP31.8092x30.8982x0.281	609.2	33.280	39.000	0.853	0.0	0.000	39.000	0.000
L10	100 - 90.83 (10)	TP33.48x31.8092x0.281	697.4	36.389	39.000	0.933	0.0	0.000	39.000	0.000
L11	90.83 - 89.83 (11)	TP33.0974x31.976x0.375	838.7	31.952	39.000	0.819	0.0	0.000	39.000	0.000
L12	89.83 - 84.83 (12)	TP34.0062x33.0974x0.375	957.7	34.531	39.000	0.885	0.0	0.000	39.000	0.000
L13	84.83 - 79.83 (13)	TP34.915x34.0062x0.375	1080.7	36.931	39.000	0.947	0.0	0.000	39.000	0.000
L14	79.83 - 74.83 (14)	TP35.8238x34.915x0.375	1207.6	39.167	39.000	1.004	0.0	0.000	39.000	0.000
L15	74.83 - 69.83 (15)	TP36.7326x35.8238x0.375	1338.3	41.253	39.000	1.058	0.0	0.000	39.000	0.000
L16	69.83 - 66 (16)	TP37.4287x36.7326x0.375	1441.0	42.758	39.000	1.096	0.0	0.000	39.000	0.000

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">CT5022</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">24 of 27</p>
	<p style="text-align: center;">Project</p> <p style="text-align: center;">1629043</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">15:39:18 08/19/16</p>
	<p style="text-align: center;">Client</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Ahmet Coakoglu</p>

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L17	66 - 65.75 (17)	TP37.4741x37.4287x0.6125	1447.8	26.747	39.000	0.686	0.0	0.000	39.000	0.000
L18	65.75 - 60.75 (18)	TP38.3829x37.4741x0.6125	1585.7	27.891	39.000	0.715	0.0	0.000	39.000	0.000
L19	60.75 - 55.75 (19)	TP39.2917x38.3829x0.6	1727.7	29.542	39.000	0.757	0.0	0.000	39.000	0.000
L20	55.75 - 50.75 (20)	TP40.2005x39.2917x0.6	1873.8	30.574	39.000	0.784	0.0	0.000	39.000	0.000
L21	50.75 - 42.83 (21)	TP41.64x40.2005x0.6	1925.8	30.921	39.000	0.793	0.0	0.000	39.000	0.000
L22	42.83 - 41.83 (22)	TP41.074x39.7686x0.713	2144.4	28.416	39.000	0.729	0.0	0.000	39.000	0.000
L23	41.83 - 37.9167 (23)	TP41.7865x41.074x0.7005	2267.2	29.492	39.000	0.756	0.0	0.000	39.000	0.000
L24	37.9167 - 37.6667 (24)	TP41.832x41.7865x0.7505	2275.1	27.662	39.000	0.709	0.0	0.000	39.000	0.000
L25	37.6667 - 32.6667 (25)	TP42.7424x41.832x0.738	2435.4	28.785	39.000	0.738	0.0	0.000	39.000	0.000
L26	32.6667 - 27.6667 (26)	TP43.6527x42.7424x0.738	2599.2	29.420	39.000	0.754	0.0	0.000	39.000	0.000
L27	27.6667 - 22.6667 (27)	TP44.5631x43.6527x0.7255	2766.0	30.501	39.000	0.782	0.0	0.000	39.000	0.000
L28	22.6667 - 17.6667 (28)	TP45.4734x44.5631x0.7255	2935.5	31.057	39.000	0.796	0.0	0.000	39.000	0.000
L29	17.6667 - 12.6667 (29)	TP46.3838x45.4734x0.713	3107.9	32.100	39.000	0.823	0.0	0.000	39.000	0.000
L30	12.6667 - 7.6667 (30)	TP47.2941x46.3838x0.713	3283.1	32.587	39.000	0.836	0.0	0.000	39.000	0.000
L31	7.6667 - 2.6667 (31)	TP48.2045x47.2941x0.7005	3461.2	33.603	39.000	0.862	0.0	0.000	39.000	0.000
L32	2.6667 - 0 (32)	TP48.69x48.2045x0.7005	3557.3	33.836	39.000	0.868	0.0	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	145 - 140 (1)	TP24.521x23.61x0.281	4.98	0.227	26.000	0.018	0.0	0.000	26.000	0.000
L2	140 - 135 (2)	TP25.432x24.521x0.281	5.52	0.243	26.000	0.019	0.0	0.000	26.000	0.000
L3	135 - 130 (3)	TP26.3431x25.432x0.281	10.25	0.435	26.000	0.034	0.8	0.029	26.000	0.001
L4	130 - 125 (4)	TP27.2541x26.3431x0.281	14.51	0.594	26.000	0.046	0.5	0.017	26.000	0.001
L5	125 - 120 (5)	TP28.1651x27.2541x0.281	15.33	0.608	26.000	0.047	1.0	0.031	26.000	0.001
L6	120 - 115 (6)	TP29.0761x28.1651x0.281	16.13	0.619	26.000	0.048	0.9	0.029	26.000	0.001
L7	115 - 110 (7)	TP29.9871x29.0761x0.281	20.17	0.750	26.000	0.059	1.0	0.029	26.000	0.001
L8	110 - 105 (8)	TP30.8982x29.9871x0.281	20.97	0.757	26.000	0.059	1.0	0.027	26.000	0.001
L9	105 - 100 (9)	TP31.8092x30.8982x0.281	21.76	0.763	26.000	0.060	1.0	0.025	26.000	0.001
L10	100 - 90.83 (10)	TP33.48x31.8092x0.281	22.38	0.767	26.000	0.060	0.9	0.023	26.000	0.001
L11	90.83 - 89.83 (11)	TP33.0974x31.976x0.375	23.43	0.593	26.000	0.046	0.9	0.016	26.000	0.001
L12	89.83 - 84.83 (12)	TP34.0062x33.0974x0.375	24.22	0.596	26.000	0.047	0.9	0.015	26.000	0.001
L13	84.83 - 79.83 (13)	TP34.915x34.0062x0.375	25.00	0.600	26.000	0.047	0.8	0.014	26.000	0.001
L14	79.83 - 74.83 (14)	TP35.8238x34.915x0.375	25.78	0.602	26.000	0.047	0.8	0.013	26.000	0.000
L15	74.83 - 69.83	TP36.7326x35.8238x0.375	26.55	0.605	26.000	0.047	0.8	0.012	26.000	0.000

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	Client	Designed by Ahmet Coakoglu

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v / F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} / F _{vt}
L16	69.83 - 66 (16)	TP37.4287x36.7326x0.375	27.14	0.607	26.000	0.047	0.8	0.011	26.000	0.000
L17	66 - 65.75 (17)	TP37.4741x37.4287x0.6125	27.18	0.374	26.000	0.029	0.8	0.007	26.000	0.000
L18	65.75 - 60.75 (18)	TP38.3829x37.4741x0.6125	28.01	0.376	26.000	0.029	0.8	0.006	26.000	0.000
L19	60.75 - 55.75 (19)	TP39.2917x38.3829x0.6	28.83	0.386	26.000	0.030	0.7	0.006	26.000	0.000
L20	55.75 - 50.75 (20)	TP40.2005x39.2917x0.6	29.63	0.387	26.000	0.030	0.7	0.005	26.000	0.000
L21	50.75 - 42.83 (21)	TP41.64x40.2005x0.6	29.90	0.388	26.000	0.030	0.7	0.005	26.000	0.000
L22	42.83 - 41.83 (22)	TP41.074x39.7686x0.713	31.10	0.336	26.000	0.026	0.7	0.004	26.000	0.000
L23	41.83 - 37.9167 (23)	TP41.7865x41.074x0.7005	31.69	0.342	26.000	0.027	0.6	0.004	26.000	0.000
L24	37.9167 - 37.6667 (24)	TP41.832x41.7865x0.7505	31.72	0.319	26.000	0.025	0.6	0.004	26.000	0.000
L25	37.6667 - 32.6667 (25)	TP42.7424x41.832x0.738	32.45	0.325	26.000	0.025	0.6	0.003	26.000	0.000
L26	32.6667 - 27.6667 (26)	TP43.6527x42.7424x0.738	33.09	0.324	26.000	0.025	0.6	0.003	26.000	0.000
L27	27.6667 - 22.6667 (27)	TP44.5631x43.6527x0.7255	33.65	0.329	26.000	0.026	0.6	0.003	26.000	0.000
L28	22.6667 - 17.6667 (28)	TP45.4734x44.5631x0.7255	34.21	0.327	26.000	0.026	0.6	0.003	26.000	0.000
L29	17.6667 - 12.6667 (29)	TP46.3838x45.4734x0.713	34.77	0.332	26.000	0.026	0.6	0.003	26.000	0.000
L30	12.6667 - 7.6667 (30)	TP47.2941x46.3838x0.713	35.33	0.330	26.000	0.026	0.6	0.003	26.000	0.000
L31	7.6667 - 2.6667 (31)	TP48.2045x47.2941x0.7005	35.90	0.335	26.000	0.026	0.6	0.003	26.000	0.000
L32	2.6667 - 0 (32)	TP48.69x48.2045x0.7005	36.21	0.334	26.000	0.026	0.6	0.003	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Ratio f _v F _v	Ratio f _{vt} F _{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	145 - 140 (1)	0.002	0.036	0.000	0.018	0.000	0.038	1.333	H1-3+VT ✓
L2	140 - 135 (2)	0.002	0.091	0.000	0.019	0.000	0.093	1.333	H1-3+VT ✓
L3	135 - 130 (3)	0.004	0.186	0.000	0.034	0.001	0.190	1.333	H1-3+VT ✓
L4	130 - 125 (4)	0.006	0.309	0.000	0.046	0.001	0.315	1.333	H1-3+VT ✓
L5	125 - 120 (5)	0.007	0.423	0.000	0.047	0.001	0.430	1.333	H1-3+VT ✓
L6	120 - 115 (6)	0.007	0.528	0.000	0.048	0.001	0.536	1.333	H1-3+VT ✓
L7	115 - 110 (7)	0.010	0.631	0.000	0.059	0.001	0.641	1.333	H1-3+VT ✓

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:</p>	Job	CT5022	Page	26 of 27
	Project	1629043	Date	15:39:18 08/19/16
	Client		Designed by	Ahmet Coakoglu

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P	f_{bx}	f_{by}	f_v	f_{vt}			
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
L8	110 - 105 (8)	0.010	0.747	0.000	0.059	0.001	0.757	1.333	H1-3+VT ✓
L9	105 - 100 (9)	0.010	0.853	0.000	0.060	0.001	0.864	1.333	H1-3+VT ✓
L10	100 - 90.83 (10)	0.010	0.933	0.000	0.060	0.001	0.944	1.333	H1-3+VT ✓
L11	90.83 - 89.83 (11)	0.009	0.819	0.000	0.046	0.001	0.829	1.333	H1-3+VT ✓
L12	89.83 - 84.83 (12)	0.009	0.885	0.000	0.047	0.001	0.895	1.333	H1-3+VT ✓
L13	84.83 - 79.83 (13)	0.009	0.947	0.000	0.047	0.001	0.957	1.333	H1-3+VT ✓
L14	79.83 - 74.83 (14)	0.010	1.004	0.000	0.047	0.000	1.015	1.333	H1-3+VT ✓
L15	74.83 - 69.83 (15)	0.010	1.058	0.000	0.047	0.000	1.068	1.333	H1-3+VT ✓
L16	69.83 - 66 (16)	0.010	1.096	0.000	0.047	0.000	1.107	1.333	H1-3+VT ✓
L17	66 - 65.75 (17)	0.006	0.686	0.000	0.029	0.000	0.692	1.333	H1-3+VT ✓
L18	65.75 - 60.75 (18)	0.007	0.715	0.000	0.029	0.000	0.722	1.333	H1-3+VT ✓
L19	60.75 - 55.75 (19)	0.007	0.757	0.000	0.030	0.000	0.765	1.333	H1-3+VT ✓
L20	55.75 - 50.75 (20)	0.008	0.784	0.000	0.030	0.000	0.792	1.333	H1-3+VT ✓
L21	50.75 - 42.83 (21)	0.008	0.793	0.000	0.030	0.000	0.801	1.333	H1-3+VT ✓
L22	42.83 - 41.83 (22)	0.007	0.729	0.000	0.026	0.000	0.736	1.333	H1-3+VT ✓
L23	41.83 - 37.9167 (23)	0.008	0.756	0.000	0.027	0.000	0.764	1.333	H1-3+VT ✓
L24	37.9167 - 37.6667 (24)	0.007	0.709	0.000	0.025	0.000	0.717	1.333	H1-3+VT ✓
L25	37.6667 - 32.6667 (25)	0.008	0.738	0.000	0.025	0.000	0.746	1.333	H1-3+VT ✓
L26	32.6667 - 27.6667 (26)	0.008	0.754	0.000	0.025	0.000	0.763	1.333	H1-3+VT ✓
L27	27.6667 - 22.6667 (27)	0.008	0.782	0.000	0.026	0.000	0.791	1.333	H1-3+VT ✓
L28	22.6667 - 17.6667 (28)	0.009	0.796	0.000	0.026	0.000	0.805	1.333	H1-3+VT ✓
L29	17.6667 - 12.6667 (29)	0.009	0.823	0.000	0.026	0.000	0.832	1.333	H1-3+VT ✓
L30	12.6667 - 7.6667 (30)	0.009	0.836	0.000	0.026	0.000	0.845	1.333	H1-3+VT ✓
L31	7.6667 - 2.6667 (31)	0.010	0.862	0.000	0.026	0.000	0.872	1.333	H1-3+VT ✓
L32	2.6667 - 0 (32)	0.010	0.868	0.000	0.026	0.000	0.878	1.333	H1-3+VT ✓

tnxTower Destek Engineering, LLC 1281 Kennestone Circle, Suite 100 Marietta, GA 30066 Phone: (770) 693-0835 FAX:	Job	CT5022	Page	27 of 27
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	Client		Designed by	Ahmet Coakoglu

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	145 - 140	Pole	TP24.521x23.61x0.281	1	-1.59	1140.22	2.8	Pass
L2	140 - 135	Pole	TP25.432x24.521x0.281	2	-1.97	1183.08	7.0	Pass
L3	135 - 130	Pole	TP26.3431x25.432x0.281	3	-3.91	1225.93	14.3	Pass
L4	130 - 125	Pole	TP27.2541x26.3431x0.281	4	-5.98	1268.78	23.7	Pass
L5	125 - 120	Pole	TP28.1651x27.2541x0.281	5	-6.52	1311.64	32.2	Pass
L6	120 - 115	Pole	TP29.0761x28.1651x0.281	6	-7.10	1354.49	40.2	Pass
L7	115 - 110	Pole	TP29.9871x29.0761x0.281	7	-9.97	1397.34	48.1	Pass
L8	110 - 105	Pole	TP30.8982x29.9871x0.281	8	-10.62	1440.20	56.8	Pass
L9	105 - 100	Pole	TP31.8092x30.8982x0.281	9	-11.30	1483.06	64.8	Pass
L10	100 - 90.83	Pole	TP33.48x31.8092x0.281	10	-11.85	1517.33	70.8	Pass
L11	90.83 - 89.83	Pole	TP33.0974x31.976x0.375	11	-13.41	2054.13	62.2	Pass
L12	89.83 - 84.83	Pole	TP34.0062x33.0974x0.375	12	-14.31	2111.18	67.1	Pass
L13	84.83 - 79.83	Pole	TP34.915x34.0062x0.375	13	-15.23	2168.23	71.8	Pass
L14	79.83 - 74.83	Pole	TP35.8238x34.915x0.375	14	-16.19	2225.27	76.1	Pass
L15	74.83 - 69.83	Pole	TP36.7326x35.8238x0.375	15	-17.17	2282.32	80.1	Pass
L16	69.83 - 66	Pole	TP37.4287x36.7326x0.375	16	-17.94	2326.02	83.1	Pass
L17	66 - 65.75	Pole	TP37.4741x37.4287x0.6125	17	-18.03	3779.47	51.9	Pass
L18	65.75 - 60.75	Pole	TP38.3829x37.4741x0.6125	18	-19.45	3872.66	54.2	Pass
L19	60.75 - 55.75	Pole	TP39.2917x38.3829x0.6	19	-20.91	3886.15	57.4	Pass
L20	55.75 - 50.75	Pole	TP40.2005x39.2917x0.6	20	-22.39	3977.43	59.4	Pass
L21	50.75 - 42.83	Pole	TP41.64x40.2005x0.6	21	-22.91	4009.37	60.1	Pass
L22	42.83 - 41.83	Pole	TP41.074x39.7686x0.713	22	-26.93	4817.29	55.2	Pass
L23	41.83 - 37.9167	Pole	TP41.7865x41.074x0.7005	23	-28.31	4817.85	57.3	Pass
L24	37.9167 - 37.6667	Pole	TP41.832x41.7865x0.7505	24	-28.41	5161.16	53.8	Pass
L25	37.6667 - 32.6667	Pole	TP42.7424x41.832x0.738	25	-30.28	5189.21	56.0	Pass
L26	32.6667 - 27.6667	Pole	TP43.6527x42.7424x0.738	26	-32.10	5301.67	57.2	Pass
L27	27.6667 - 22.6667	Pole	TP44.5631x43.6527x0.7255	27	-33.86	5323.96	59.3	Pass
L28	22.6667 - 17.6667	Pole	TP45.4734x44.5631x0.7255	28	-35.65	5434.52	60.4	Pass
L29	17.6667 - 12.6667	Pole	TP46.3838x45.4734x0.713	29	-37.46	5451.02	62.4	Pass
L30	12.6667 - 7.6667	Pole	TP47.2941x46.3838x0.713	30	-39.30	5559.69	63.4	Pass
L31	7.6667 - 2.6667	Pole	TP48.2045x47.2941x0.7005	31	-41.17	5570.43	65.4	Pass
L32	2.6667 - 0	Pole	TP48.69x48.2045x0.7005	32	-42.17	5627.37	65.8	Pass
						Summary		
						Pole (L16)	83.1	Pass
						RATING =	83.1*	Pass

*Due to limitations of the TNXTOWER software when analyzing monopoles with additional bolted plates, the above output has not been used to determine the governing tower usage. Please see additional calculation results in Appendix C which are based on the Section forces generated in this output.

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#:	
Site Name:	CT 5022
App #:	
Pole Manufacturer:	Other

Reactions		
Moment:	3557	ft-kips
Axial:	42	kips
Shear:	36	kips

Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	56.91	in

If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

Base Plate Check Only

Plate Data

Diam:	62.9	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	9.98	in

Base Plate Results

Base Plate Stress: 34.2 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 57.0% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
27.76

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.5	in
Width:	5	in
Height:	12	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

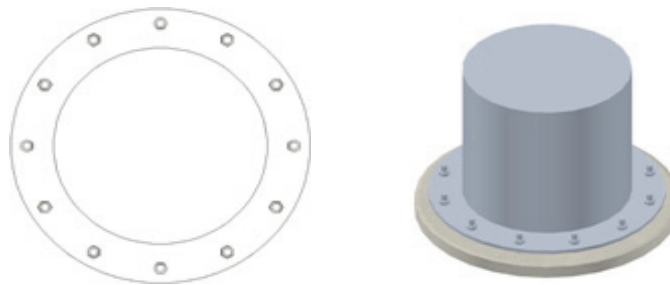
Pole Punching Shear Check: n/a

Pole Data

Diam:	49.68	in
Thick:	0.438	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

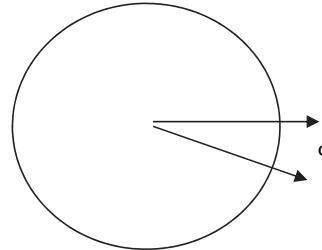
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes



BU#	
Site Name	CT5022
App #	

Number Of Bolts (Ext + Mod)	19
Diameter Of Exist. Bolt Circle(inch)	56.91
Moment (ft. kips)	3557
Axial Compression (kips)	42
Outer Diamter of Mod. Bolt Circle(inch)	56.91

42684 in. kips



	Bolt Diameter (inch)	Grade	Allowable Axial (kips)	Capacity
Existing	2.25	A615 (Gr 75)	195	82.3%
Mod	2.25	F1554 (105 KSI)	218.6	72.8%

Sum Ax_i^2 29917.34

T(+) C(-)

Bolt #	ϕ°	Bolt Circle	D (in)	Radians	$\text{Cos}(\phi^\circ)$	x_i (inch)	x_i^2	Area	Ax_i	Ax_i^2	Force (Kip)	Capacities
1	-11.25	56.91	2.25	-0.196	0.981	27.908	778.870	3.98	110.97	3096.85	156.1	80.1%
2	11.25	56.91	2.25	0.196	0.981	27.908	778.870	3.98	110.97	3096.85	156.1	80.1%
3	33.75	56.91	2.25	0.589	0.831	23.659	559.770	3.98	94.07	2225.69	132.0	67.7%
4	56.25	56.91	2.25	0.982	0.556	15.809	249.917	3.98	62.86	993.69	87.5	44.9%
5	78.75	56.91	2.25	1.374	0.195	5.551	30.817	3.98	22.07	122.53	29.3	15.0%
6	101.25	56.91	2.25	1.767	-0.195	-5.551	30.817	3.98	-22.07	122.53	-33.7	17.3%
7	123.75	56.91	2.25	2.160	-0.556	-15.809	249.917	3.98	-62.86	993.69	-91.9	47.1%
8	146.25	56.91	2.25	2.553	-0.831	-23.659	559.770	3.98	-94.07	2225.69	-136.4	70.0%
9	168.75	56.91	2.25	2.945	-0.981	-27.908	778.870	3.98	-110.97	3096.85	-160.5	82.3%
10	191.25	56.91	2.25	3.338	-0.981	-27.908	778.870	3.98	-110.97	3096.85	-160.5	82.3%
11	213.75	56.91	2.25	3.731	-0.831	-23.659	559.770	3.98	-94.07	2225.69	-136.4	70.0%
12	236.25	56.91	2.25	4.123	-0.556	-15.809	249.917	3.98	-62.86	993.69	-91.9	47.1%
13	258.75	56.91	2.25	4.516	-0.195	-5.551	30.817	3.98	-22.07	122.53	-33.7	17.3%
14	281.25	56.91	2.25	4.909	0.195	5.551	30.817	3.98	22.07	122.53	29.3	15.0%
15	303.75	56.91	2.25	5.301	0.556	15.809	249.917	3.98	62.86	993.69	87.5	44.9%
16	326.25	56.91	2.25	5.694	0.831	23.659	559.770	3.98	94.07	2225.69	132.0	67.7%
17	0	56.91	2.25	0.000	1.000	28.455	809.687	3.98	113.14	3219.38	159.2	72.8%
18	112.5	56.91	2.25	1.963	-0.383	-10.889	118.576	3.98	-43.30	471.47	-64.0	29.3%
19	247.5	56.91	2.25	4.320	-0.383	-10.889	118.576	3.98	-43.30	471.47	-64.0	29.3%

BU: _____
 Site Name: AWE - FAIRFIELD
 App Number: _____
 Work Order: _____

Monopole Drilled Pier

Input

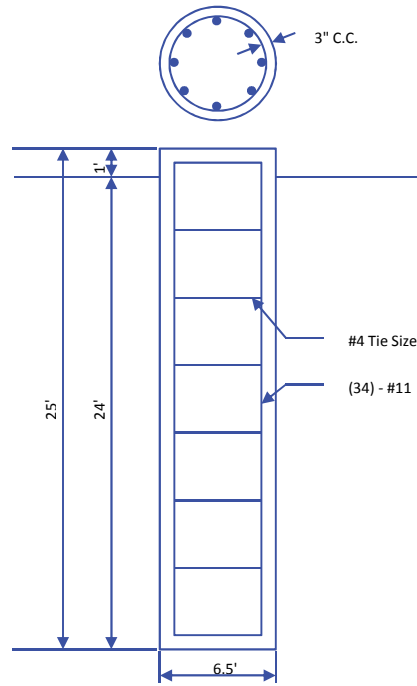
Criteria
 TIA Revision: F
 ACI 318 Revision: 2002
 Seismic Category: B

Forces
 Compression: 42 kips
 Shear: 36 kips
 Moment: 3557 k-ft
 Swelling Force: 0 kips

Foundation Dimensions
 Pier Diameter: 6.5 ft
 Ext. above grade: 1 ft
 Depth below grade: 24 ft

Material Properties
 Number of Rebar: 34
 Rebar Size: #11
 Tie Size: #4
 Rebar tensile strength: 60 ksi
 Concrete Strength: 3000 psi
 Ultimate Concrete Strain: 0.003 in/in
 Clear Cover to Ties: 3 in

Soil Profile: SOIL



Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.33	0	3.33	125	0	28	0	0	0	
2	6.67	3.33	10	125	0	28	0	0	0	
3	0.5	10	10.5	63	0	28	0	0	0	
4	14.5	10.5	25	58	0	32	0	0		21

Analysis Results

Soil Lateral Capacity
 Depth to Zero Shear: 4.64 ft
 Max Moment, Mu: 3752.61 k-ft
 Soil Safety Factor: 2.02
 Safety Factor Req'd: 2
RATING: 99.0%

Soil Axial Capacity
 Skin Friction (k): 0.00 kips
 End Bearing (k): 192.80 kips
 Comp. Capacity (k), φCn: 192.80 kips
 Comp. (k), Cu: 54.60 kips
RATING: 28.3%

Concrete/Steel Check
 Mu (from soil analysis): 4878.40 k-ft
 φMn: 7292.89 k-ft
RATING: 66.9%

rho provided: 1.11
 rho required: 0.33 OK

Rebar Spacing: 5.02
 Spacing required: 22.56 OK

Dev. Length required: 19.11
 Dev. Length provided: 61.78 OK

Overall Foundation Rating: 99.0%

Additional Calculations



per TIA-222- F

Site BU: CT5022

Work Order: _____

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	145	54.17	5.17	12	23.61	33.48	0.281	1.124	A572-65
2	96	53.17	6.17	12	31.98	41.64	0.375	1.5	A572-65
3	49	49	0	12	39.77	48.69	0.438	1.752	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number												
						1	2	3	4	5	6	7	8	9	10	11	12
1	0	47.75	plate	10"	3		1				1				1		
2	0	37.9167	plate	10"	3				1				1				1
3	47.75	66	plate	7"	3		1				1				1		
4	37.9167	66	plate	7"	3				1				1				1
5																	
6																	
7																	
8																	
9																	
10																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _u (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	10	0.625	6.25	0.3125	n/a	24.000	11.000	5.664	0.8750	A572-65
2	10	0.625	6.25	0.3125	n/a	24.000	11.000	5.664	0.8750	A572-65
3	7	0.625	4.375	0.3125	24.000	24.000	11.000	3.789	0.8750	A572-65
4	7	0.625	4.375	0.3125	24.000	24.000	11.000	3.789	0.8750	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	145 - 140	5		12	23.610	24.521	0.281	A572-65	1.000
2	140 - 135	5		12	24.521	25.432	0.281	A572-65	1.000
3	135 - 130	5		12	25.432	26.343	0.281	A572-65	1.000
4	130 - 125	5		12	26.343	27.254	0.281	A572-65	1.000
5	125 - 120	5		12	27.254	28.165	0.281	A572-65	1.000
6	120 - 115	5		12	28.165	29.076	0.281	A572-65	1.000
7	115 - 110	5		12	29.076	29.987	0.281	A572-65	1.000
8	110 - 105	5		12	29.987	30.898	0.281	A572-65	1.000
9	105 - 100	5		12	30.898	31.809	0.281	A572-65	1.000
10	100 - 96	9.17	5.17	12	31.809	33.480	0.281	A572-65	1.000
11	96 - 89.83	6.17		12	31.976	33.097	0.375	A572-65	1.000
12	89.83 - 84.83	5		12	33.097	34.006	0.375	A572-65	1.000
13	84.83 - 79.83	5		12	34.006	34.915	0.375	A572-65	1.000
14	79.83 - 74.83	5		12	34.915	35.824	0.375	A572-65	1.000
15	74.83 - 69.83	5		12	35.824	36.733	0.375	A572-65	1.000
16	69.83 - 66	3.83		12	36.733	37.429	0.375	A572-65	1.000
17	66 - 65.75	0.25		12	37.429	37.474	0.6125	A572-65	0.978
18	65.75 - 60.75	5		12	37.474	38.383	0.6125	A572-65	0.969
19	60.75 - 55.75	5		12	38.383	39.292	0.6	A572-65	0.980
20	55.75 - 50.75	5		12	39.292	40.200	0.6	A572-65	0.972
21	50.75 - 49	7.92	6.17	12	40.200	41.640	0.6	A572-65	0.969
22	49 - 41.83	7.17		12	39.769	41.074	0.713	A572-65	0.963
23	41.83 - 37.9167	3.9133		12	41.074	41.787	0.7005	A572-65	0.974
24	37.9167 - 37.6667	0.25		12	41.787	41.832	0.7505	A572-65	0.966
25	37.6667 - 32.6667	5		12	41.832	42.742	0.738	A572-65	0.974
26	32.6667 - 27.6667	5		12	42.742	43.653	0.738	A572-65	0.966
27	27.6667 - 22.6667	5		12	43.653	44.563	0.7255	A572-65	0.974
28	22.6667 - 17.6667	5		12	44.563	45.473	0.7255	A572-65	0.967
29	17.6667 - 12.6667	5		12	45.473	46.384	0.713	A572-65	0.976
30	12.6667 - 7.6667	5		12	46.384	47.294	0.713	A572-65	0.969
31	7.6667 - 2.6667	5		12	47.294	48.204	0.7005	A572-65	0.979
32	2.6667 - 0	2.6667		12	48.204	48.690	0.7005	A572-65	0.976

TNX Section Forces

Increment (ft):		5	TNX Output		
	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)	
1	145 - 140	1.5865	15.015	4.9843	
2	140 - 135	1.9703	41.266	5.5192	
3	135 - 130	3.9054	90.488	10.254	
4	130 - 125	5.9766	161.04	14.506	
5	125 - 120	6.5217	235.71	15.333	
6	120 - 115	7.0957	314.39	16.132	
7	115 - 110	9.9722	399.7	20.171	
8	110 - 105	10.619	502.47	20.966	
9	105 - 100	11.296	609.2	21.758	
10	100 - 96	11.855	697.42	22.384	
11	96 - 89.83	13.407	838.69	23.432	
12	89.83 - 84.83	14.305	957.74	24.221	
13	84.83 - 79.83	15.232	1080.7	25.004	
14	79.83 - 74.83	16.189	1207.6	25.779	
15	74.83 - 69.83	17.174	1338.3	26.546	
16	69.83 - 66	17.945	1441	27.143	
17	66 - 65.75	18.03	1447.8	27.18	
18	65.75 - 60.75	19.453	1585.7	28.012	
19	60.75 - 55.75	20.91	1727.7	28.828	
20	55.75 - 50.75	22.392	1873.7	29.629	
21	50.75 - 49	22.911	1925.8	29.904	
22	49 - 41.83	26.933	2144.4	31.103	
23	41.83 - 37.9167	28.306	2267.2	31.688	
24	37.9167 - 37.6667	28.409	2275.1	31.718	
25	37.6667 - 32.6667	30.276	2435.4	32.447	
26	32.6667 - 27.6667	32.099	2599.2	33.088	
27	27.6667 - 22.6667	33.862	2766	33.646	
28	22.6667 - 17.6667	35.649	2935.5	34.207	
29	17.6667 - 12.6667	37.463	3107.9	34.769	
30	12.6667 - 7.6667	39.302	3283.1	35.334	
31	7.6667 - 2.6667	41.167	3461.2	35.901	
32	2.6667 - 0	42.17	3557.3	36.208	

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
145 - 140	Pole	TP24.521x23.61x0.281	Pole	2.8%	Pass
140 - 135	Pole	TP25.432x24.521x0.281	Pole	7.0%	Pass
135 - 130	Pole	TP26.343x25.432x0.281	Pole	14.2%	Pass
130 - 125	Pole	TP27.254x26.343x0.281	Pole	23.6%	Pass
125 - 120	Pole	TP28.165x27.254x0.281	Pole	32.1%	Pass
120 - 115	Pole	TP29.076x28.165x0.281	Pole	40.0%	Pass
115 - 110	Pole	TP29.987x29.076x0.281	Pole	47.9%	Pass
110 - 105	Pole	TP30.898x29.987x0.281	Pole	56.6%	Pass
105 - 100	Pole	TP31.809x30.898x0.281	Pole	64.6%	Pass
100 - 96	Pole	TP33.48x31.809x0.281	Pole	70.6%	Pass
96 - 89.83	Pole	TP33.097x31.976x0.375	Pole	61.9%	Pass
89.83 - 84.83	Pole	TP34.006x33.097x0.375	Pole	66.9%	Pass
84.83 - 79.83	Pole	TP34.915x34.006x0.375	Pole	71.5%	Pass
79.83 - 74.83	Pole	TP35.824x34.915x0.375	Pole	75.8%	Pass
74.83 - 69.83	Pole	TP36.733x35.824x0.375	Pole	79.9%	Pass
69.83 - 66	Pole	TP37.429x36.733x0.375	Pole	82.8%	Pass
66 - 65.75	Pole + Reinf.	TP37.474x37.429x0.6125	Reinf. 4 Compression	64.6%	Pass
65.75 - 60.75	Pole + Reinf.	TP38.383x37.474x0.6125	Reinf. 4 Compression	68.1%	Pass
60.75 - 55.75	Pole + Reinf.	TP39.292x38.383x0.6	Reinf. 4 Compression	71.4%	Pass
55.75 - 50.75	Pole + Reinf.	TP40.2x39.292x0.6	Reinf. 4 Compression	74.6%	Pass
50.75 - 49	Pole + Reinf.	TP41.64x40.2x0.6	Reinf. 4 Compression	75.6%	Pass
49 - 41.83	Pole + Reinf.	TP41.074x39.769x0.713	Reinf. 1 Bolt Shear	71.2%	Pass
41.83 - 37.92	Pole + Reinf.	TP41.787x41.074x0.7005	Reinf. 4 Compression	71.6%	Pass
37.92 - 37.67	Pole + Reinf.	TP41.832x41.787x0.7505	Reinf. 2 Bolt Shear	68.8%	Pass
37.67 - 32.67	Pole + Reinf.	TP42.742x41.832x0.738	Reinf. 2 Compression	69.6%	Pass
32.67 - 27.67	Pole + Reinf.	TP43.653x42.742x0.738	Reinf. 2 Compression	71.8%	Pass
27.67 - 22.67	Pole + Reinf.	TP44.563x43.653x0.7255	Reinf. 2 Compression	73.9%	Pass
22.67 - 17.67	Pole + Reinf.	TP45.473x44.563x0.7255	Reinf. 2 Compression	75.9%	Pass
17.67 - 12.67	Pole + Reinf.	TP46.384x45.473x0.713	Reinf. 2 Compression	77.8%	Pass
12.67 - 7.67	Pole + Reinf.	TP47.294x46.384x0.713	Reinf. 2 Compression	79.6%	Pass
7.67 - 2.67	Pole + Reinf.	TP48.204x47.294x0.7005	Reinf. 2 Compression	81.3%	Pass
2.67 - 0	Pole + Reinf.	TP48.69x48.204x0.7005	Reinf. 2 Compression	82.3%	Pass
				Summary	
			Pole	82.8%	Pass
			Reinforcement	82.2%	Pass
			Overall	82.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity				
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4
145 - 140	1647	n/a	1647	21.90	n/a	21.90	2.8%				
140 - 135	1840	n/a	1840	22.72	n/a	22.72	7.0%				
135 - 130	2047	n/a	2047	23.55	n/a	23.55	14.2%				
130 - 125	2269	n/a	2269	24.37	n/a	24.37	23.6%				
125 - 120	2507	n/a	2507	25.19	n/a	25.19	32.1%				
120 - 115	2761	n/a	2761	26.02	n/a	26.02	40.0%				
115 - 110	3032	n/a	3032	26.84	n/a	26.84	47.9%				
110 - 105	3319	n/a	3319	27.66	n/a	27.66	56.6%				
105 - 100	3624	n/a	3624	28.49	n/a	28.49	64.6%				
100 - 96	3882	n/a	3882	29.14	n/a	29.14	70.6%				
96 - 89.83	5408	n/a	5408	39.46	n/a	39.46	61.9%				
89.83 - 84.83	5871	n/a	5871	40.55	n/a	40.55	66.9%				
84.83 - 79.83	6360	n/a	6360	41.65	n/a	41.65	71.5%				
79.83 - 74.83	6875	n/a	6875	42.74	n/a	42.74	75.8%				
74.83 - 69.83	7417	n/a	7417	43.84	n/a	43.84	79.9%				
69.83 - 66	7852	n/a	7852	44.68	n/a	44.68	82.8%				
66 - 65.75	7880	4817	12697	44.73	26.25	70.98	49.8%			64.7%	64.7%
65.75 - 60.75	8474	5047	13521	45.83	26.25	72.08	52.5%			68.1%	68.1%
60.75 - 55.75	9096	5282	14379	46.92	26.25	73.17	55.1%			71.4%	71.4%
55.75 - 50.75	9749	5523	15272	48.02	26.25	74.27	57.5%			74.6%	74.6%
50.75 - 49	9984	5608	15593	48.40	26.25	74.65	58.4%			75.6%	75.6%
49 - 41.83	12096	7033	19129	57.23	31.88	89.10	53.8%	71.2%			69.6%
41.83 - 37.92	12743	7272	20016	58.23	31.88	90.11	55.3%	71.6%			71.6%
37.92 - 37.67	12785	8607	21392	58.30	37.50	95.80	52.0%	67.3%	68.8%		
37.67 - 32.67	13648	8973	22620	59.58	37.50	97.08	53.8%	69.6%	69.6%		
32.67 - 27.67	14548	9347	23895	60.86	37.50	98.36	55.5%	71.8%	71.8%		
27.67 - 22.67	15487	9729	25215	62.14	37.50	99.64	57.1%	73.9%	73.9%		
22.67 - 17.67	16465	10118	26583	63.43	37.50	100.93	58.7%	75.9%	75.9%		
17.67 - 12.67	17484	10515	27999	64.71	37.50	102.21	60.2%	77.8%	77.8%		
12.67 - 7.67	18544	10920	29464	65.99	37.50	103.49	61.6%	79.6%	79.6%		
7.67 - 2.67	19646	11333	30979	67.27	37.50	104.77	63.0%	81.3%	81.3%		
2.67 - 0	20251	11557	31808	67.96	37.50	105.46	63.7%	82.2%	82.2%		

Note: Section capacity checked in 5 degree increments.

APPENDIX B
TOWER UPGRADE DRAWINGS

DESCRIPTION:	ISSUED FOR CONSTRUCTION
DATE	A 08/19/2016
NUM	

SITE ADDRESS:
 100 REEF ROAD
 FAIRFIELD, CT 06824

CARRIER DESIGNATION:	AT&T
CARRIER:	CT5022
SITE ID:	AWE - FAIRFIELD
SITE NAME:	

TOWER INFORMATION:	FA NUMBER:
10108711	

DESIGNED: DC
 DRAWN: DC
 CHECKED: RP

JOB #: 1629043

S1
 SCOPE OF
 MODIFICATION

1. DESIGN INFORMATION AND GENERAL REQUIREMENTS

- 1.1 CODES
 a. CONNECTICUT STATE BUILDING CODE 2005, WITH ALL OF THE ADOPTED SUPPLEMENTS AND AMENDMENTS.
 b. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-02, AMERICAN SOCIETY OF CIVIL ENGINEERS
 c. STEEL CONSTRUCTION MANUAL, 9TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
 d. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, ANSI/TIA-222-F, TELECOMMUNICATIONS INDUSTRY ASSOCIATION
 e. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-02

- 1.2 GENERAL
 a. PRIOR TO PURCHASE OR FABRICATION OF MATERIAL, THE CONTRACTOR SHALL PERFORM AN INSPECTION VERIFYING MEMBER DIMENSIONS AND BOLT SIZES. SHOULD THE CONTRACTOR DISCOVER ANY DAMAGED OR MISSING MEMBERS OR THE MEMBER OR BOLT SIZES DO NOT MATCH THOSE LISTED, DESTEK SHALL BE NOTIFIED IMMEDIATELY.
 b. CONTRACTOR TO REPLACE ALL BOLTS REMOVED WITH NEW BOLTS OF SAME TYPE, UNLESS NOTED OTHERWISE.

- 1.3 LOADS & DESIGN CRITERIA
 WIND LOADING: V=85 MPH;

2. STRUCTURAL STEEL

- 2.1 MATERIALS
 a. STRUCTURAL STEEL ASTM A992
 ANGLE & PLATE ASTM A36 U.N.O.
 PIPE ASTM A53 GRADE B (OR Fy>35KSI) U.N.O.
 HSS ROUND ASTM A500 GRADE B (Fy>42KSI) U.N.O.
 BARS (SOLID RODS) ASTM A36 U.N.O.
 b. BOLTS ASTM A325 U.N.O.
 c. WELDING ELECTRODES AWS A5.1 (E70XX)
 d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 335-89s1"
 e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
 f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
 g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR RE-DRILLING WILL NOT BE PERMITTED.

- 2.2 CONNECTIONS
 a. SHOP CONNECTIONS MAY BE BOLTED OR WELDED
 b. FIELD CONNECTIONS BOLTED WITH A325 BOLTS, (INSTALLED SNUG TIGHT) UNLESS OTHERWISE SPECIFIED OR IF WELDED CONNECTIONS ARE NOTED ON DRAWINGS
 c. FIELD CONNECTIONS SHALL BE MADE WITH A325 BOLTS AND HARDENED WASHERS EXCEPT AS INDICATED ON THE DESIGN DRAWINGS
 d. CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
 e. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
 f. BOLT HOLES SHALL BE CUT, DRILLED OR PUNCHED AT RIGHT ANGLES TO THE SURFACE OF THE METAL AND SHALL NOT BE MADE OR ENLARGED BY BURNING. HOLES SHALL BE CLEAN CUT WITHOUT TORN OR RAGGED EDGES. OUTSIDE BURRS RESULTING FROM DRILLING OR REAMING OPERATION SHALL BE REMOVED WITH A TOOL MAKING A 1/16 INCH BEVEL. BOLT HOLES SHALL BE 1/16 INCH OVERSIZE.

- 2.3 FINISHES
 a. STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
 b. BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
 c. ALL SURFACES DAMAGED DURING THE WORK SHALL BE PAINTED WITH COLD GALVANIZING COMPOUND TWICE. THE PAINT SHOULD BE AT LEAST 93% PURE ZINC. RUST-OLEUM PROFESSIONAL, (MODEL# 7585838) OR SIMILAR.

- 2.4 WELDING
 a. CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS; INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
 b. WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GRIND GALVANIZING BEFORE WELDING.
 c. WELDING CERTIFICATE MUST BE PROVIDED PRIOR TO WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.

NOTES:

1. UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN DESTEK ANALYSIS REPORT DATED 08/19/2016. CONTRACTOR TO REVIEW AND SHOULD ADHERE TO THE REPORT.
 2. CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AS NEEDED.
 3. ALL DIMENSIONS ARE BASED ON A TOWER MAPPING PREPARED BY COM-EX DATED 03/25/2016.
 4. CONTRACTOR TO FIELD VERIFY EXISTING TOWER MEMBER SIZES AND TOWER DIMENSIONS IN THE VICINITY OF THE UPGRADE, BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO DESTEK IMMEDIATELY FOR FURTHER EVALUATION.
 5. DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 20 MPH AT THE GROUND LEVEL.
 6. NEW TOWER REACTIONS:
 SHAFT MOMENT: 3557 KIPS-FT
 SHAFT SHEAR: 42 KIPS
 SHAFT COMPRESSION: 36 KIPS
 7. CONTRACTOR TO HAVE THE SAFETY CLIMB INTACT AND FUNCTIONAL AFTER WORK IS COMPLETE.
 8. TOWER WILL BECOME UNSTABLE WHEN MEMBERS ARE DISCONNECTED OR BEING REPLACED. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER DURING WORK AND SHOULD CONSULT WITH AN ENGINEER.
 9. DESTEK DISCLAIMS ANY LIABILITY ARISING FROM THE ORIGINAL MATERIAL, FABRICATION OR ERECTION OF THE TOWER.
 10. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

POLE MODIFICATION SCHEDULE			
	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	0'-0"	ADD (3) 2 1/2" A1554 GR105 ANCHOR RODS MATCH EXISTING ANCHOR RODS B.C.	S-2
B	0'-0"	ADD (6) NEW GR65 STIFFENERS	S-2, S-4
C	43'-9" TO 51'-6"	INSTALL NEW CONNECTION PLATE	S-3
D	33'-11" TO 41'-8"		
E	-	RELOCATE ALL TME AND RRUS BEHIND ANTENNA	S-4

FLAT PLATE (65 KSI) REINFORCING		
ELEVATION (FT)	FLAT / DEGREES	PLATE SIZE
43'-9" TO 51'-6"	3,7,11	SEE S3
33'-11" TO 41'-8"	3,5,11	

EXISTING POLE SPECIFICATIONS	
POLE SHAPE TYPE	12 SIDED POLYGON
SHAFT STEEL	A572-65
BASE PL STEEL	60 KSI
ANCHOR RODS	2 1/4" ø AA615-J

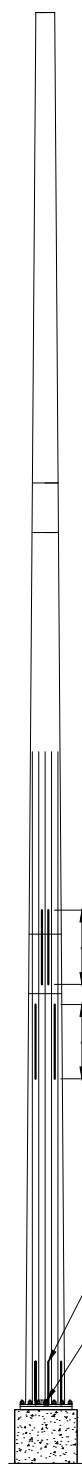
EXISTING MEMBER SCHEDULE					
SECTION	SECTION LENGTH (FT)	SHAFT THICKNESS (IN)	LAP SPLICE (IN)	SHAFT DIAMETER	
				ø TOP	ø BOTTOM
1	54.17	0.281	0.281	23.61	33.48
2	53.17	0.375	0.375	31.98	41.64
3	49.00	0.438	0.438	39.77	48.69

145'-0" AGL

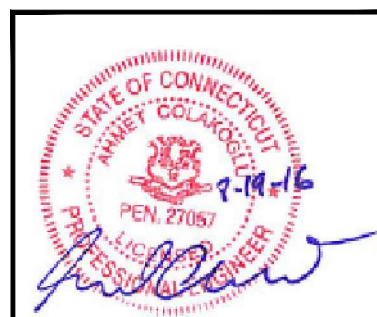
90'-9" AGL

42'-9" AGL

0'-0" AGL



1
 S1
TOWER ELEVATION
 N.T.S.



AHMET COLAKOGLU, PE
 CT License No: 27057

PREPARED BY:



DESTEK ENGINEERING, LLC
1281 KENNESTONE CIR., STE 100
MARIETTA, GA 30066
TEL NO: 770-693-0835
ADMIN@DESTEKENGINEERING.COM

PREPARED FOR:



NUM	DATE	DESCRIPTION:
A	08/19/2016	ISSUED FOR CONSTRUCTION

SITE ADDRESS:
100 REEF ROAD
FAIRFIELD, CT 06824

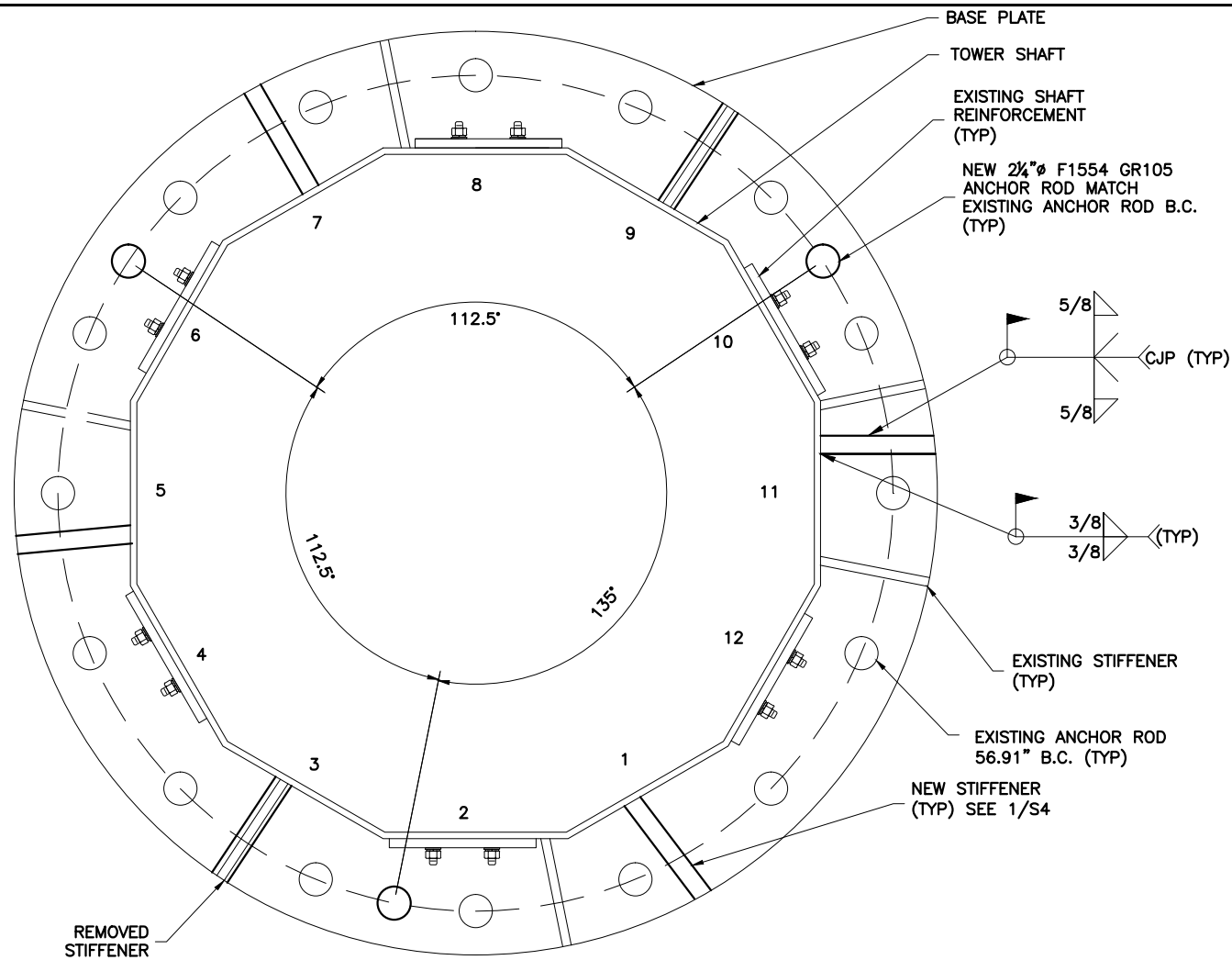
CARRIER DESIGNATION:	AT&T
CARRIER:	CT5022
SITE ID:	AWC - FAIRFIELD
SITE NAME:	

TOWER INFORMATION:	
FA NUMBER:	10108711

DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1629043

S2
STRUCTURAL
DETAILS



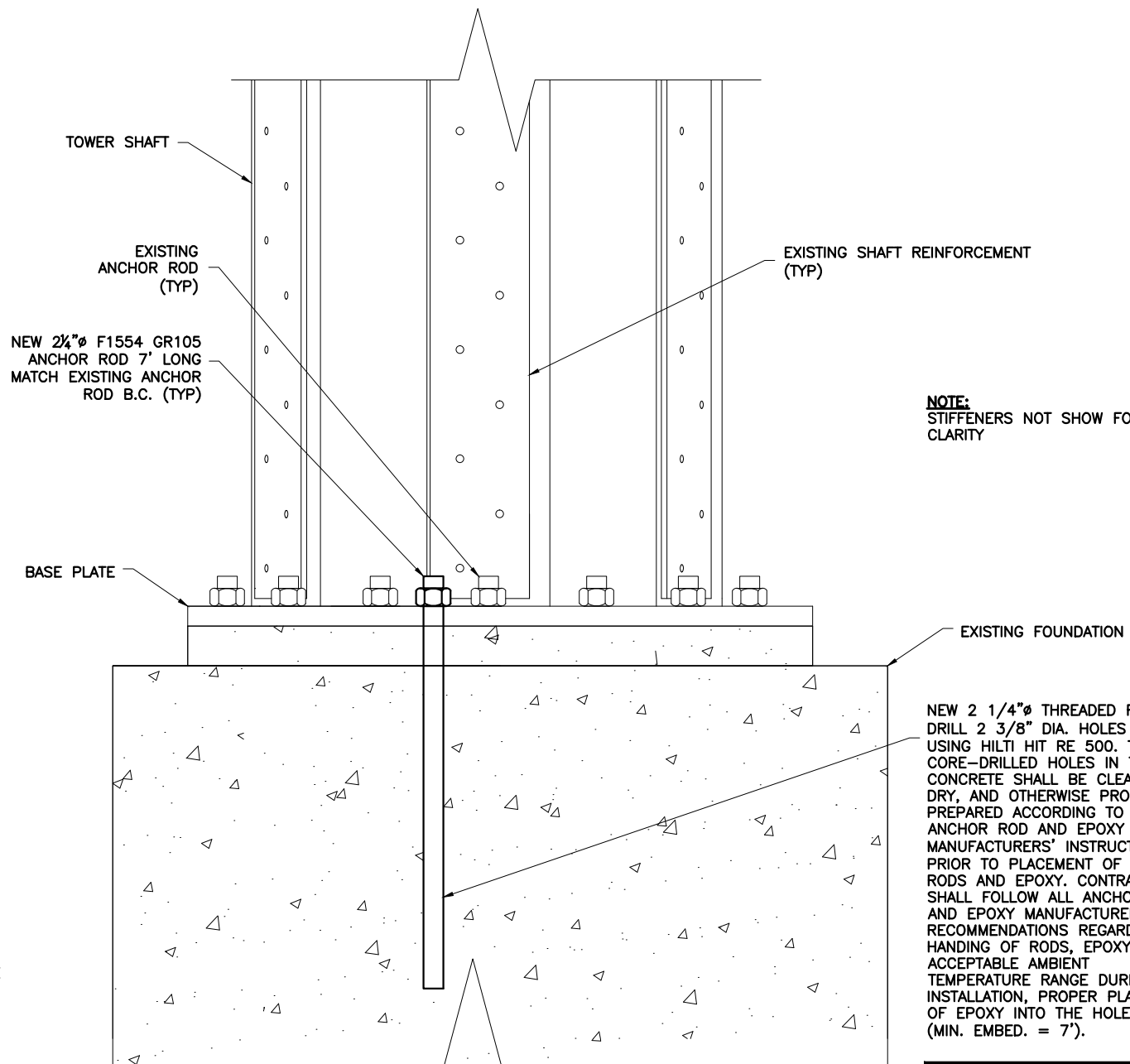
1
S2
ELEVATION 0' SECTION VIEW
N.T.S.

EPOXY GROUTED REINFORCING ANCHOR ROD NOTES:

- IF EXISTING ANCHOR/REBAR MATERIAL IS ENCOUNTERED DURING DRILLING, RELOCATE HOLE AND GROUT FILL IMPEDED HOLE WITH 5000 PSI NON SHRINK GROUT.
- THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
- ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED, ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER MANUFACTURER SPECIFICATION. NEW ANCHOR SHALL BE PROOF LOADED TO 160 KIPS.
- ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED, CONTRACTOR SHALL RELEASE ALL OF THE PROOF LOAD AND TIGHTEN ALL ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF THE NUT.
- CONTRACTOR SHALL VERIFY THAT EXISTING BASE PLATE GROUT IS IN GOOD CONDITION.

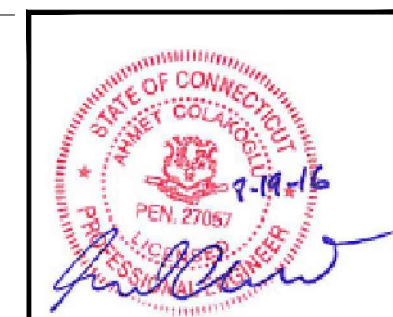
MATERIAL NOTES:

- DRILLED IN ANCHOR RODS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GR105. ANCHOR RODS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.



NOTE:
STIFFENERS NOT SHOW FOR CLARITY

2
S2
ELEVATION VIEW
N.T.S.



AHMET COLAKOGLU, PE
CT License No: 27057

NUM	DATE	DESCRIPTION:
A	08/19/2016	ISSUED FOR CONSTRUCTION

SITE ADDRESS:
100 REEF ROAD
FAIRFIELD, CT 06824

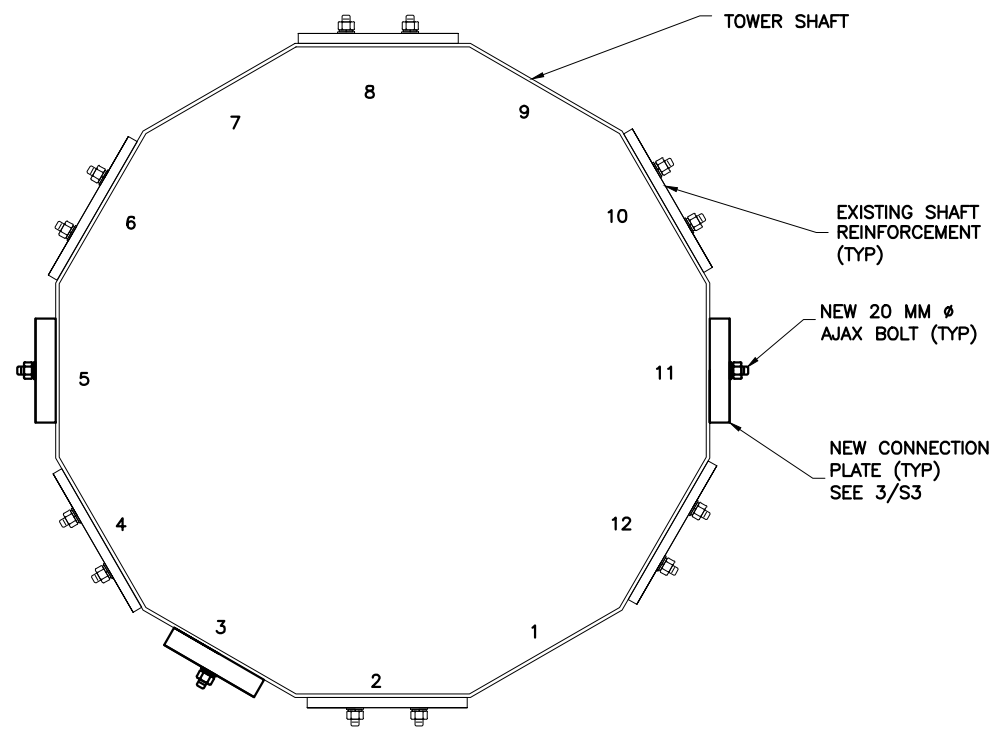
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CARRIER:	CT5022
SITE ID:	AWE - FAIRFIELD
SITE NAME:	

TOWER INFORMATION:	10108711
FA NUMBER:	

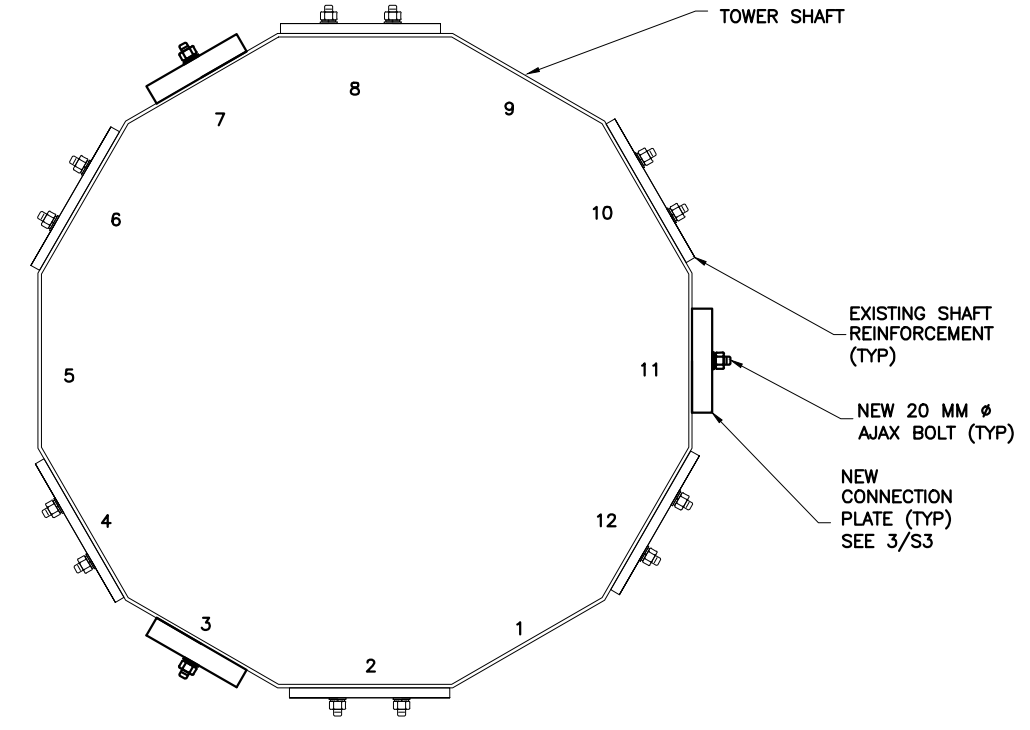
DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1629043

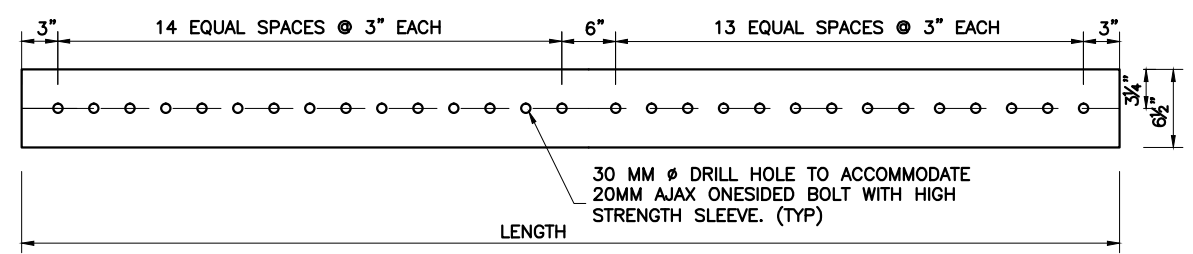
S3
STRUCTURAL
DETAILS



1
S3 N.T.S.
ELEVATION 37'-11" SECTION VIEW



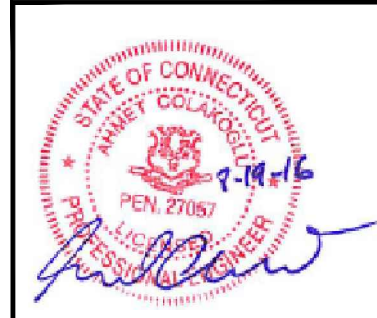
2
S3 N.T.S.
ELEVATION 47'-9" SECTION VIEW



3
S3 N.T.S.
CONNECTION PLATE

LENGTH	BOTTOM ELEVATION (FT)	TOP ELEVATION (FT)	FLAT PLATE QUANTITY	TERMINATION BOLT		PLATE THICKNESS
				(BOT.)	(TOP)	
7'-9"	33'-11"	41'-8"	3	15	14	1.25"
7'-9"	43'-9"	51'-6"	3	15	14	1.25"

- NOTES:**
- ALL HOLES ARE TO BE DRILLED. DO NOT BURN OR PUNCH.
 - TOLERANCES: FRACTIONS $\pm 1/16"$
ANGLES $\pm 1/2$ DEGREE
DECIMALS $\pm .010"$
 - THE 65 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
A. MATERIAL SHALL BE ASTM A572 HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 80 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 65 KSI.
B. THE FINISH SHALL BE HOT-DIP GALVANIZED PER ASTM A123
 - AJAX BOLTS NEED TO INSTALL PER MANUFACTURE SPECIFICATIONS.



AHMET COLAKOGLU, PE
CT License No: 27057

PREPARED BY:



DESTEK ENGINEERING, LLC
1281 KENNESTONE CIR, STE 100
MARIETTA, GA 30066
TEL NO: 770-693-0835
ADMIN@DESTEKENGINEERING.COM

PREPARED FOR:



DESCRIPTION:
ISSUED FOR CONSTRUCTION

DATE
08/19/2016

NUM
A

SITE ADDRESS:
100 REEF ROAD
FAIRFIELD, CT 06824

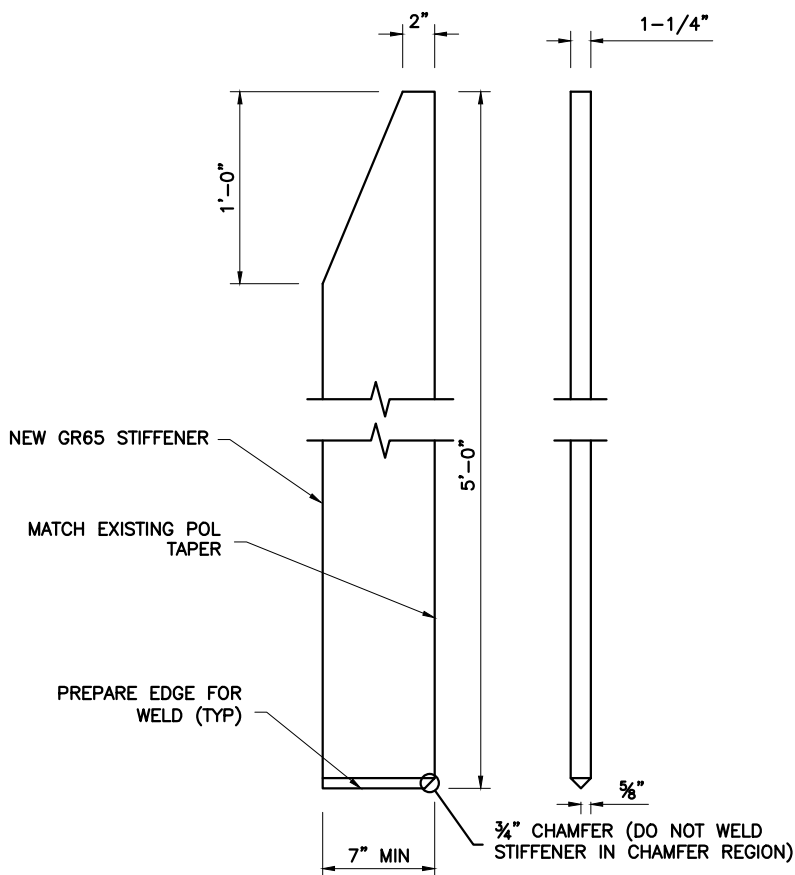
CARRIER DESIGNATION:
AT&T
CARRIER:
CT5022
SITE ID:
SITE NAME:
AWE - FAIRFIELD

TOWER INFORMATION:
FA NUMBER:
10108711

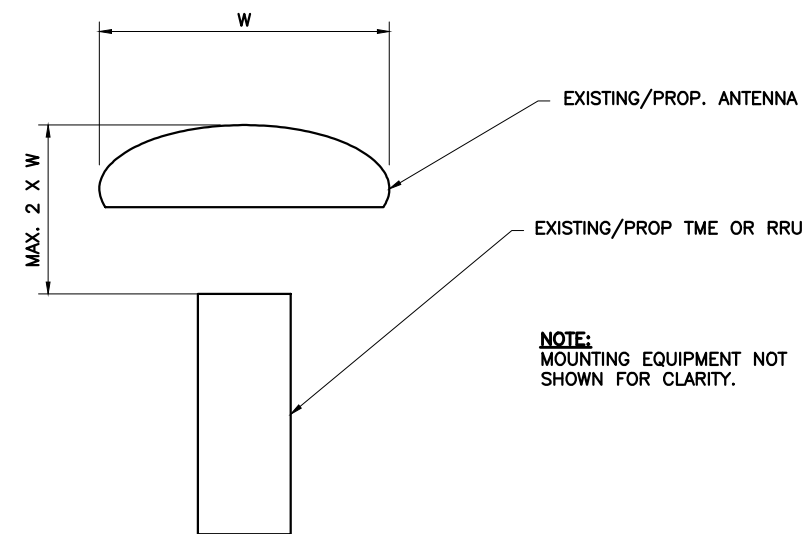
DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1629043

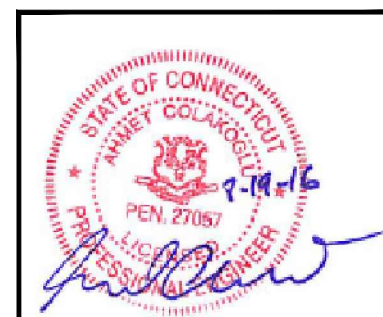
S4
STRUCTURAL
DETAILS



1
S4 **NEW STIFFENER DETAIL**
N.T.S.



2
S4 **TME LAYOUT TYP.**
N.T.S.



AHMET COLAKOGLU, PE
CT License No: 27057



RADIO FREQUENCY EMISSIONS ANALYSIS REPORT EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

AT&T Existing Facility

Site ID: CT5022

AWE - Fairfield
100 Reef Road
Fairfield, CT 06824

September 14, 2016

EBI Project Number: 6216004000

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	6.27 %



September 14, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT5022 – AWE - Fairfield**

EBI Consulting was directed to analyze the proposed AT&T facility located at **100 Reef Road, Fairfield, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **100 Reef Road, Fairfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.



- 6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 7) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antennas used in this modeling are the **Powerwave 7770 and the Powerwave P65-16-XLH-RR** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antenna mounting height centerlines of the proposed antennas are **130 feet** above ground level (AGL) for **Sector A**, **130 feet** above ground level (AGL) for **Sector B** and **130 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.



AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	0.65 %	Antenna B1 MPE%	0.65 %	Antenna C1 MPE%	0.65 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR	Make / Model:	Powerwave P65-16-XLH-RR
Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd	Gain:	12.7 / 15.1 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	6,117.63	ERP (W):	6,117.63	ERP (W):	6,117.63
Antenna A2 MPE%	2.03 %	Antenna B2 MPE%	2.03 %	Antenna C2 MPE%	2.03 %
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A3 MPE%	0.34 %	Antenna B3 MPE%	0.34 %	Antenna C3 MPE%	0.34 %

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	3.02 %
T-Mobile	0.02 %
Clearwire	0.10 %
Sprint	1.28 %
MetroPCS	1.83 %
Nextel	0.00 %
FCI900	0.01 %
Fairfield	0.01 %
Site Total MPE %:	6.27 %

AT&T Sector A Total:	3.02 %
AT&T Sector B Total:	3.02 %
AT&T Sector C Total:	3.02 %
Site Total:	6.27 %

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	130	1.94	850 MHz	567	0.34%
AT&T 1900 MHz (PCS) UMTS	2	656.33	130	3.07	1900 MHz (PCS)	1000	0.31%
AT&T 700 MHz LTE	2	1,117.25	130	5.22	700 MHz	467	1.12%
AT&T 1900 MHz (PCS) LTE	2	1,941.56	130	9.08	1900 MHz (PCS)	1000	0.91%
AT&T 850 MHz GSM	2	414.12	130	1.94	850 MHz	567	0.34%
						Total:	3.02%



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	3.02 %
Sector B:	3.02 %
Sector C:	3.02 %
AT&T Maximum Total (per sector):	3.02 %
Site Total:	6.27 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **6.27 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.