QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

March 8, 2017

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT2058
20 Mell Road, Lisbon, CT 06351
N 41-35-26.92
W 72-01-00.73

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 184-foot level of the existing 180-foot Monopole at 20 Mell Road, Lisbon, CT. The tower is owned by American Tower and the property is owned by Stanley Wildowsky Jr.. AT&T now intends to remove three (3) KMW antennas and replace them with three (3) CCI antennas. AT&T also plans to install three (3) Ericsson remote radio units (RRUS-32 B2) also at the 184-foot level of the tower.

This facility was approved by the Connecticut Siting Council in Docket # 124 on March 12, 1990. This approval included conditions that the tower be constructed as a Monopole and not exceed 199 feet above ground level. Since no modification to the overall facility height is proposed, this modification therefore complies with the aforementioned approval.

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.C.S.A. § 16-50j-73, a copy of this letter is being sent to Thomas W. Sparkman, Chair of the Lisbon Board of Selectmen, and the Lisbon Zoning Office as well as the property owner and the tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications 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 Communications Commission safety standard.

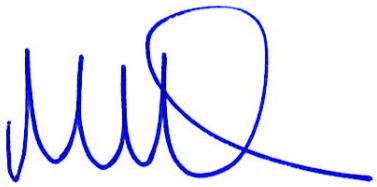
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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-referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,



Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Thomas W. Sparkman - as elected official (via e-mail)
Carl Brown –Zoning Enforcement Officer (via e-mail)
Stanley Wildowsky Jr – as property owner
American Tower - as tower owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0.00%
AT&T GSM	2	565	180	0.0134	880	0.5867	0.23%
AT&T UMTS	1	283	180	0.0034	880	0.5867	0.06%
AT&T UMTS	2	875	180	0.0208	1900	1.0000	0.21%
AT&T LTE	1	1615	180	0.0192	734	0.4893	0.39%
AT&T LTE	4	525	180	0.0249	1900	1.0000	0.25%
Site Total							1.14%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0.00%
AT&T GSM	2	565	180	0.0134	880	0.5867	0.23%
AT&T UMTS	1	279	180	0.0033	880	0.5867	0.06%
AT&T UMTS	2	348	180	0.0083	1900	1.0000	0.08%
AT&T LTE	1	1045	180	0.0124	734	0.4893	0.25%
AT&T LTE	4	3381	180	0.1606	1900	1.0000	1.61%
Site Total							2.23%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	20 MELL ROAD LISBON, CT 06351
LATITUDE: LONGITUDE:	41° 35' 27" N 72° 01' 01" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
DESIGN GUIDELINE:	LTE 2C

SITE NUMBER: CT2058

SITE NAME: LISBON-MELL RD

20 MELL ROAD
LISBON, CT 06351
NEW LONDON COUNTY

DRAWING INDEX

		REV
T-1	TITLE SHEET	0
GN-1	GENERAL NOTES	0
A-1	COMPOUND AND EQUIPMENT SHLETER PLANS	0
A-2	ELEVATIONS	0
A-3	ANTENNA PLANS	0
A-4	DETAILS	0
S-1	STRUCTURAL DETAILS	0
G-1	GROUNDING DETAILS AND ONE-LINE DIAGRAM	0

STATE OF CONNECTICUT
MARC R. CHRETIEN
NO. 28307
LICENSED
PROFESSIONAL ENGINEER

LOCUS MAP

DRIVING DIRECTIONS FROM 550 COCHITUATE ROAD, FRAMINGHAM, MA:

1. Head northeast
2. Turn right toward Speen St
3. Turn right onto Speen St
4. Turn right onto Cochituate Rd
5. Use the right lane to take the ramp to I-90/Masspike/Springfield/Boston
6. Keep left at the fork, follow signs for Interstate 90 W/Massachusetts Turnpike/Worchester/Springfield and merge onto I-90 W/Massachusetts Turnpike
7. Merge onto I-90 W/Massachusetts Turnpike
8. Take exit 10 toward MA-12 N/Auburn/Worcester
9. Keep right at the fork, follow signs for I-395 S/US-20 E/Norwich Ct
10. Continue onto I-395 S
11. Entering Connecticut
12. Take exit 84S for CT-12 S
13. Merge onto CT-12
14. Turn right onto Mell Rd
15. Site entrance on right side after Rt.395 underpass

GENERAL NOTES

1. 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.
2. 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.
3. 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.

DIG SAFE SYSTEM, INC.

CALL BEFORE YOU DIG

CALL TOLL FREE: 811 OR 888-DIG-SAFE

UNDERGROUND SERVICE ALERT

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development - Surveying - Telecommunications
500 North Broadway, East Providence, RI 02914
Phone: (401) 354-2403
Fax: (401) 633-6354

SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2058
SITE NAME: LISBON-MELL RD
20 MELL ROAD
LISBON, CT 06351
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at&t
550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

NO.	DATE	REVISIONS	BY	CHK
0	01/19/16	ISSUED FOR REVIEW	AAB	MRC

TITLE SHEET

SHEET NO. T-1

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE LESEE/LICENSEE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.

4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.

7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.

13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.

14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.

15. THE CONTRACTOR SHALL NOTIFY THE LESEE/LICENSEE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESEE/LICENSEE REPRESENTATIVE.

16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.

17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455

18. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS SHOWN HEREIN.

19. ALL DIMENSIONS SHOWN THUS ± ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WHICH EFFECT THE CONTRACTORS WORK. CONTRACTOR TO VERIFY ALL DIMENSIONS WITH PROJECT OWNER PRIOR TO CONSTRUCTION.

20. NORTH ARROW SHOWN ON PLANS REFERS TO APPROXIMATE TRUE NORTH. PRIOR TO THE START OF CONSTRUCTION, ORDERING OR FABRICATING OF ANTENNA MOUNTS, CONTRACTOR SHALL CONSULT WITH PROJECT OWNER'S RF ENGINEER AND FIELD VERIFY ALL ANTENNA SECTOR LOCATIONS AND ANTENNA AZIMUTHS.

21. THE CONTRACTOR AND OR HIS SUB CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

22. ANTENNA INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES.

23. COAXIAL CABLE CONNECTORS AND TRANSMITTER EQUIPMENT SHALL BE PROVIDED BY THE PROJECT OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. A SCHEDULE OF PROJECT OWNER SUPPLIED MATERIALS IS ATTACHED TO THE BID DOCUMENTS (SEE EXHIBIT 3). ALL OTHER HARDWARE TO BE PROVIDED BY THE CONTRACTOR. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.

24. WHEN "PAINT TO MATCH" IS SPECIFIED FOR ANTENNA CONCEALMENT, PAINT PRODUCT FOR ANTENNA RADOME SHALL BE SHERWIN WILLIAMS COROTHANE II. SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND PROJECT OWNER'S GUIDELINE'S.

25. COORDINATION, LAYOUT, AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

26. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.

27. ALL (E)ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW.

28. ALL (E)INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF UTILITY COMPANY ENGINEERING. THE AREAS OF THE PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE EQUIPMENT, DRIVEWAY OR

29. GRAVEL, SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED AND COVERED WITH MULCH UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN SOIL EROSION AND SEDIMENTATION CONTROLS AT ALL TIMES

30. DURING CONSTRUCTION. PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS

31. FOR WIRELESS COMMUNICATIONS SYSTEMS. PROJECT OWNER'S IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNAS GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE BTS RADIO CABINETS. PROJECT OWNER RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.

32. APPLICABLE BUILDING CODES:
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.

BUILDING CODE:

2009 INTERNATIONAL BUILDING CODE
2005 CT STATE BUILDING CODE
ELECTRICAL CODE: NEC 2014
LIGHTING CODE: NEC 2014

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, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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.

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.

2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.

3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.

4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.

5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.

6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.

7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.

8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.

9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE AND GREENLEE CONDUIT MEASURING TAPE IN EACH INSTALLED TELCO CONDUIT.

10. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.

11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.

12. PPC SUPPLIED BY PROJECT OWNER.

13. GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".

14. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.

15. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.

16. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.

17. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.

18. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.

19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.

20. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.

21. CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXISTING TOWER/ (E) MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.

22. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MAXIMUM RESISTANCE REQUIRED.

23.CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

STATE OF CONNECTICUT
MARC R. CHRETIEN
No. 28307
LICENSED
PROFESSIONAL ENGINEER

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	(P)	PROPOSED/NEW	TBR	TO BE REMOVED
(E)	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL
(F)	FUTURE				

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development - Surveying - Telecommunications
500 North Broadway
East Providence, RI 02914
Phone: (401) 354-2403
Fax: (401) 633-6354

SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2058
SITE NAME: LISBON-MELL RD
20 MELL ROAD
LISBON, CT 06351
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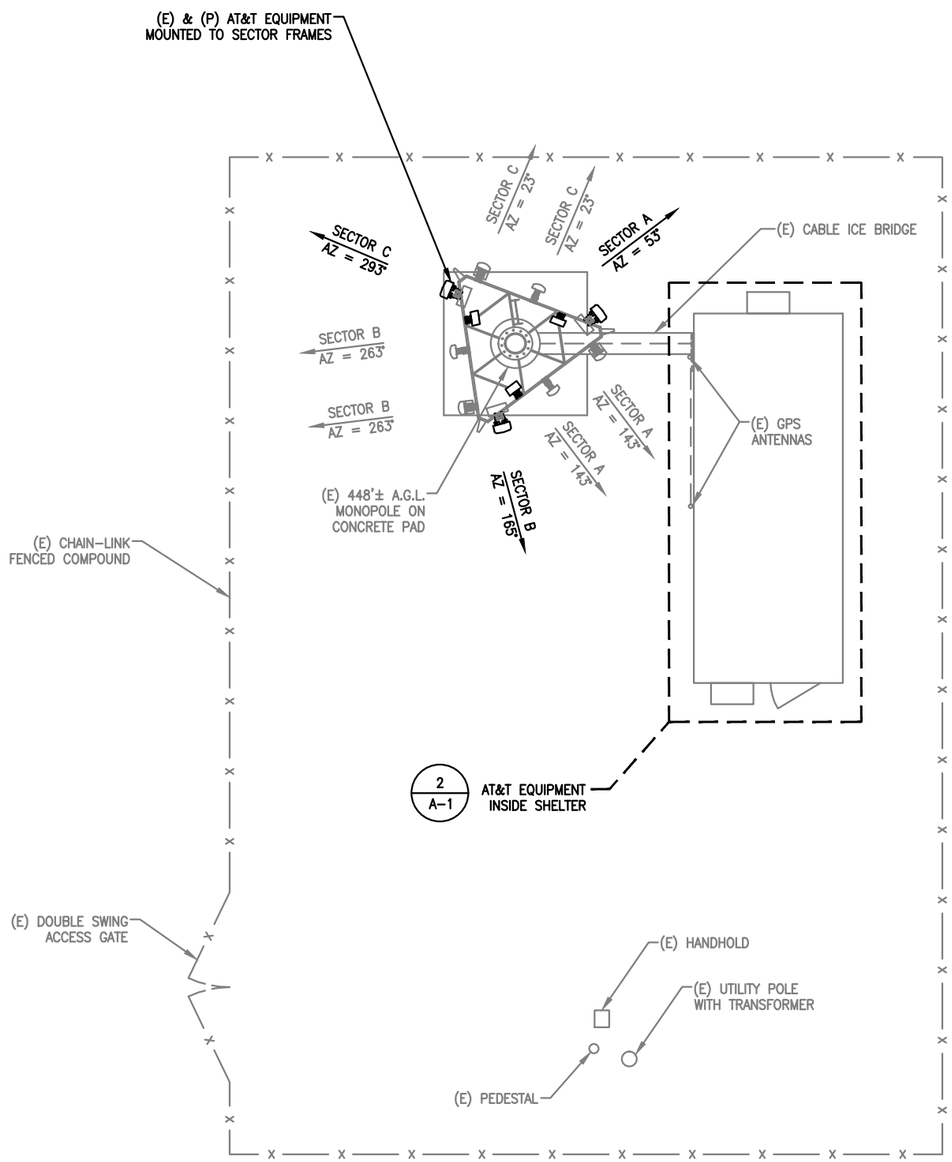
at&t
550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

NO.	DATE	REVISIONS	BY	CHK
0	01/19/16	ISSUED FOR REVIEW	AAB	MRC

GENERAL NOTES

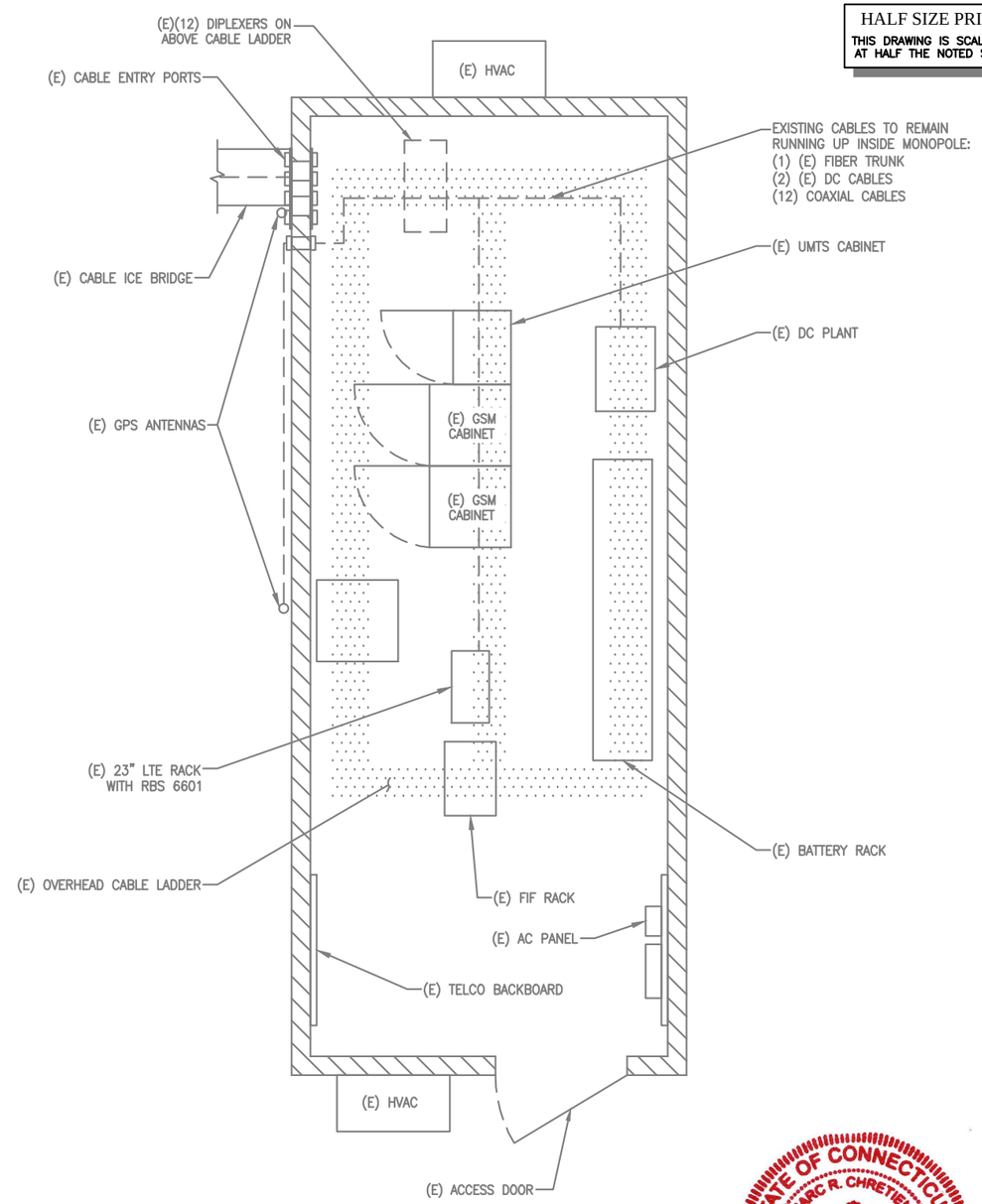
SHEET NO. **GN-1**



NORTH

1 A-1 COMPOUND PLAN

SCALE: 3/16"=1'-0"



NORTH

2 A-1 EQUIPMENT SHELTER PLAN

SCALE: 1/2"=1'-0"

HALF SIZE PRINT

THIS DRAWING IS SCALEABLE AT HALF THE NOTED SCALE

STATE OF CONNECTICUT
MARC R. CHRETIEN
NO. 28307
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PROFESSIONAL ENGINEER

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SAI

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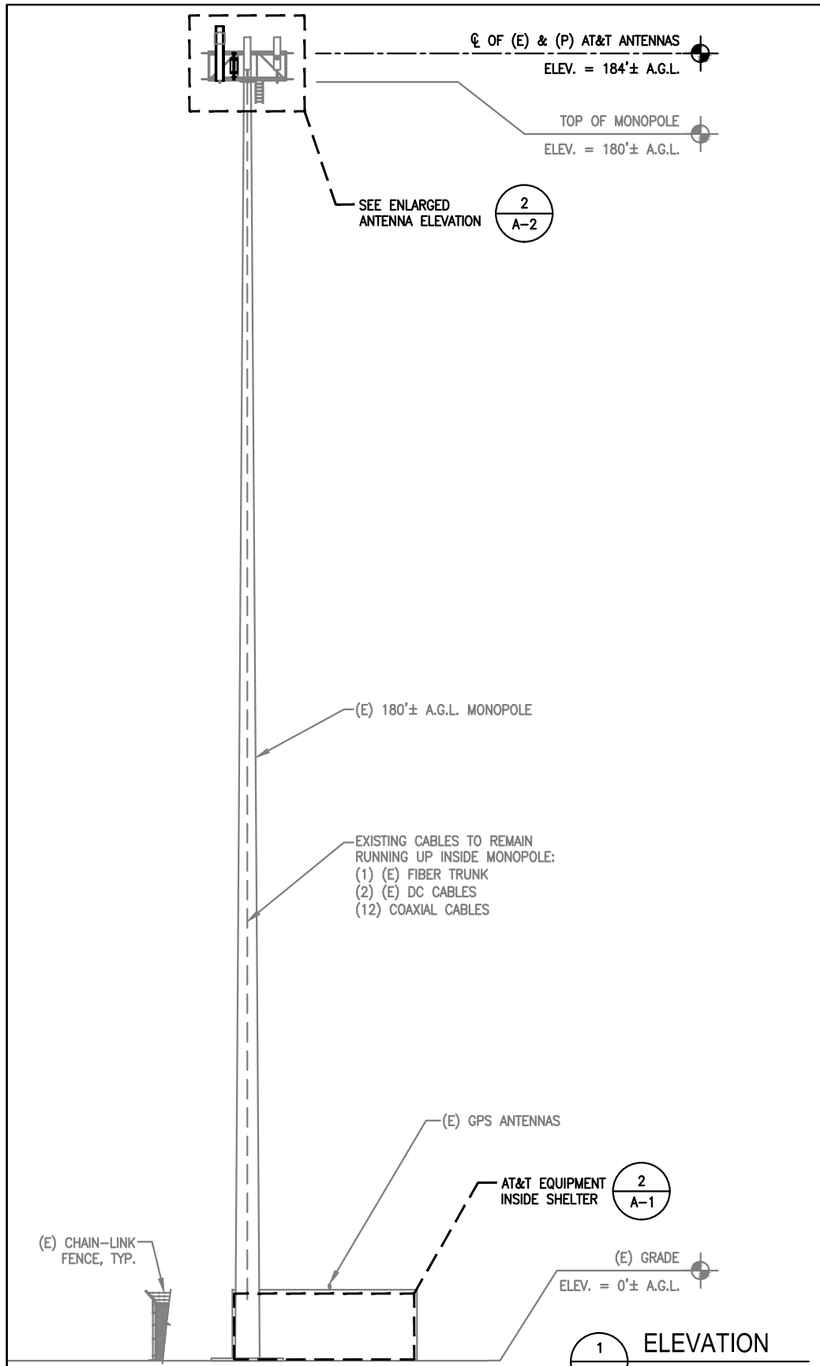
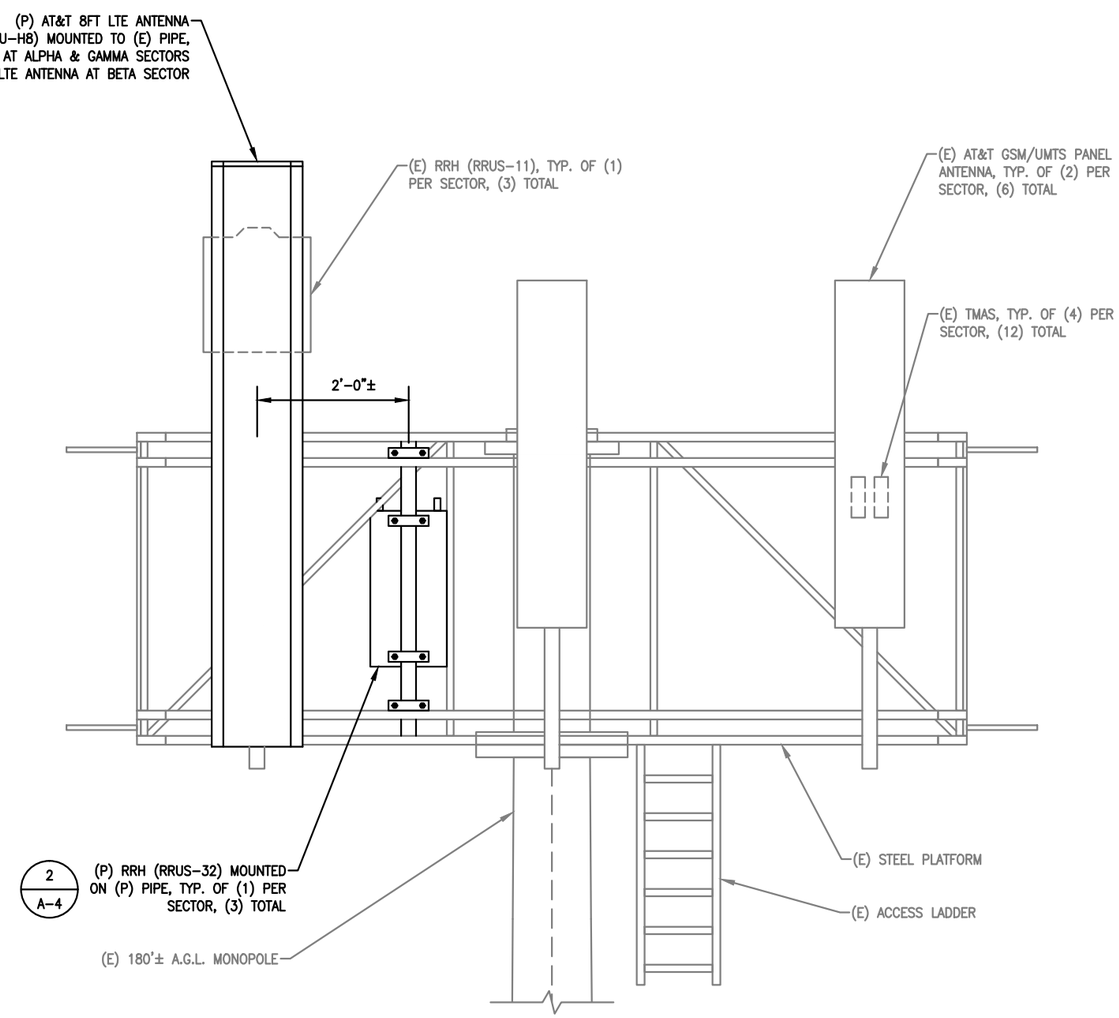
COMPOUND AND EQUIPMENT SHELTER PLANS

SHEET NO. A-1

HALF SIZE PRINT
THIS DRAWING IS SCALEABLE AT HALF THE NOTED SCALE



1 A-2 ELEVATION
SCALE: 3/32" = 1'-0"



TYPICAL OF SECTORS ALPHA & GAMMA

2 A-2 ENLARGED ANTENNA ELEVATION
SCALE: 1" = 1'-0"

STATE OF CONNECTICUT
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SAI COMMUNICATIONS
27 NORTHWESTERN DRIVE
SALEM, NH 03079

SITE NUMBER: CT2058
SITE NAME: LISBON-MELL RD
20 MELL ROAD
LISBON, CT 06351
NEW LONDON COUNTY

at&t
550 COCHITUATE ROAD, SUITE 13,
FRAMINGHAM, MA 01701-4681

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ELEVATIONS

SHEET NO. A-2

HALF SIZE PRINT
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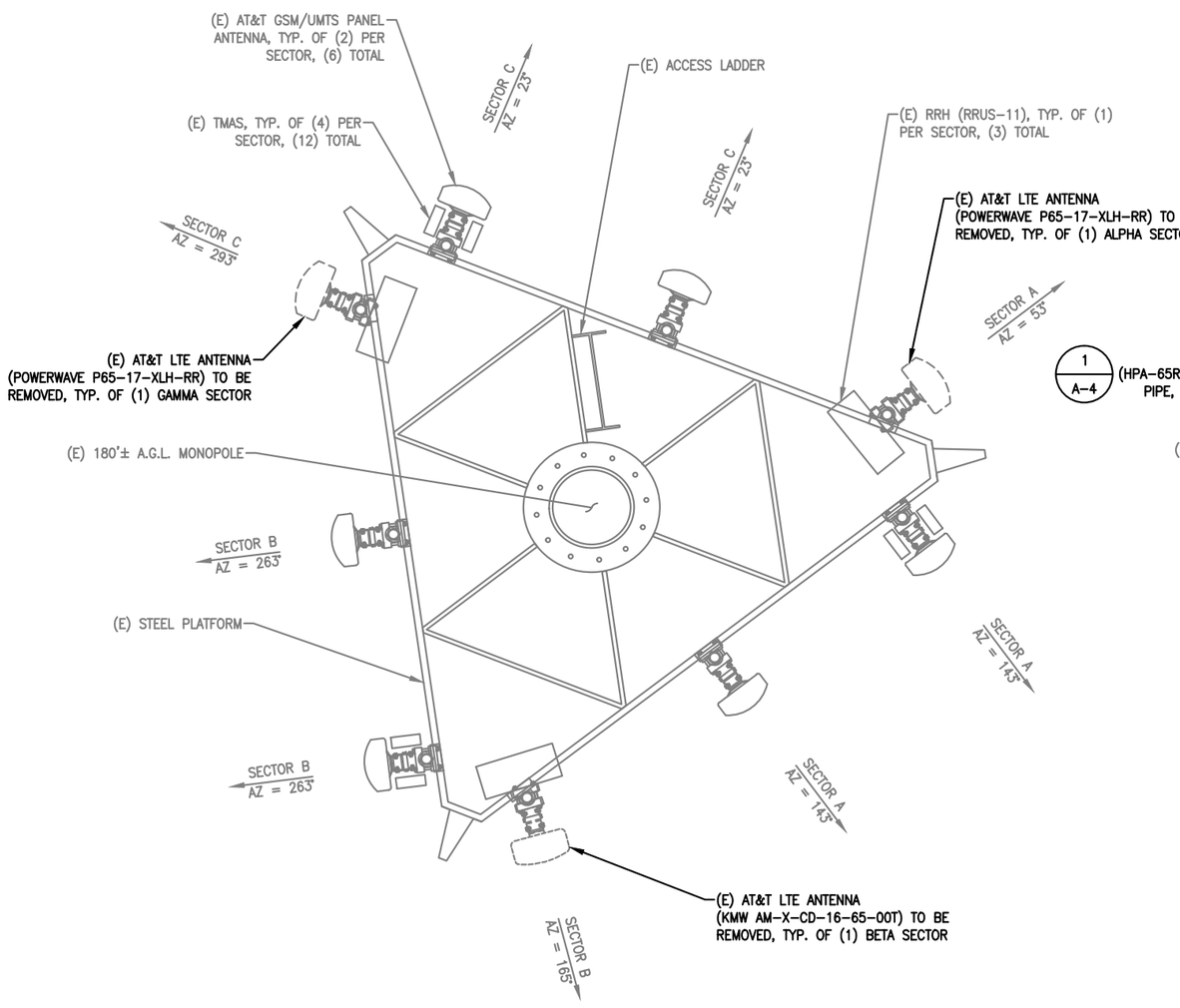
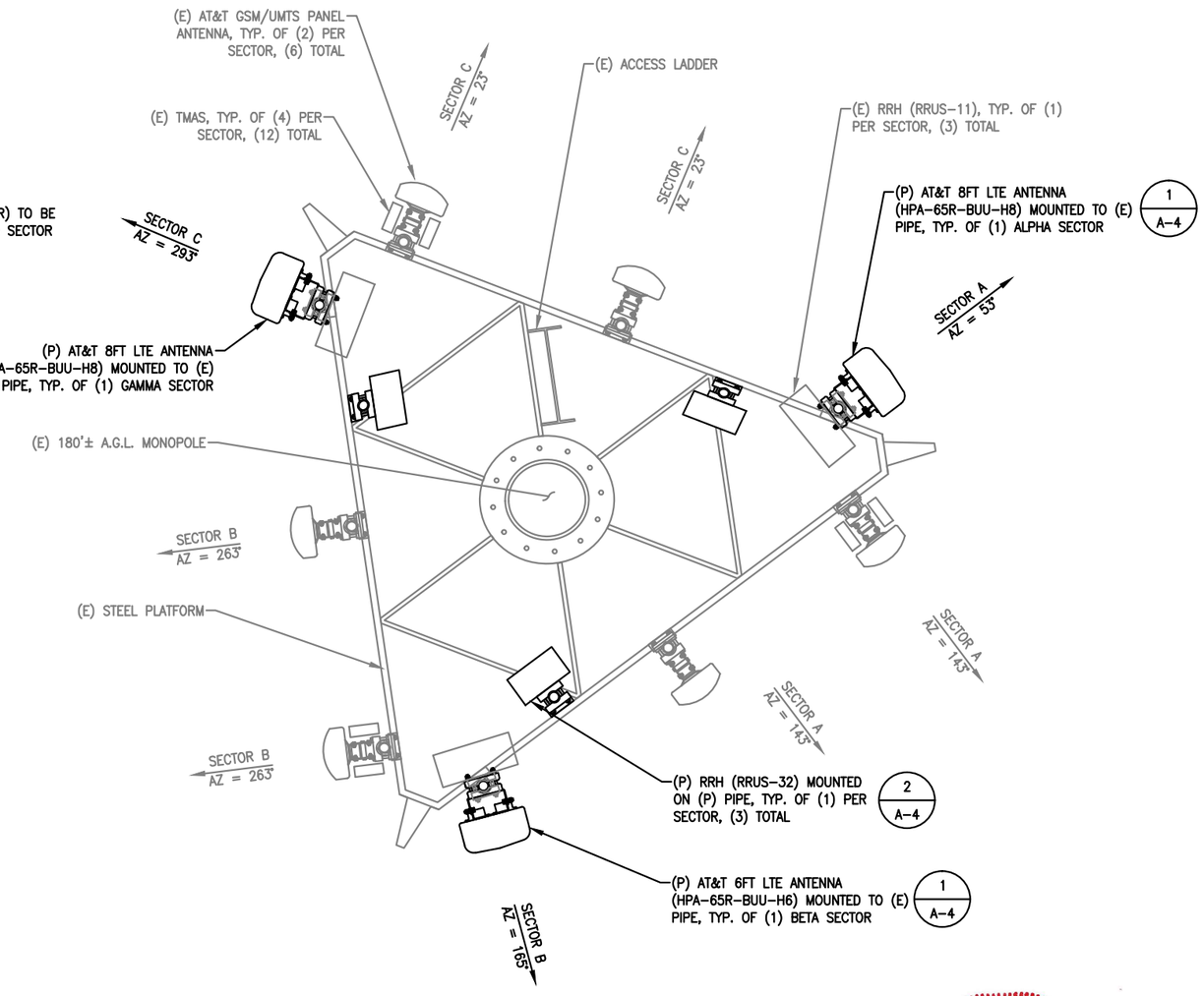


1 / A-3 EXISTING ANTENNA PLAN
SCALE: 3/4" = 1'-0"



2 / A-3 PROPOSED ANTENNA PLAN
SCALE: 3/4" = 1'-0"

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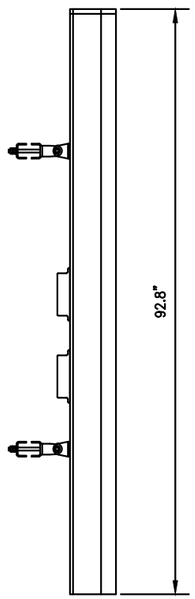
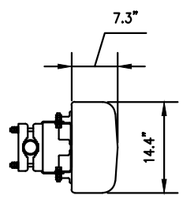
ANTENNA PLANS

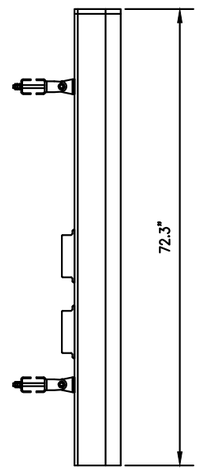
SHEET NO. A-3

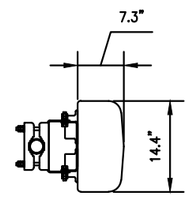




HPA-65R-BUU-H8

MANUFACTURER: CCI
DIMENSIONS: (HxWxD) 92.8"x14.4"x7.3"
WEIGHT: 53.0 LBS.
(EXCLUDES MOUNTS & RET SYSTEM)





HPA-65R-BUU-H6

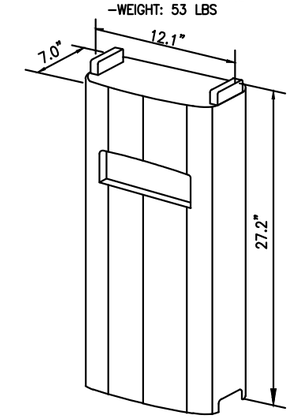
MANUFACTURER: CCI
DIMENSIONS: (HxWxD) 72.3"x14.4"x7.3"
WEIGHT: 42.9 LBS.
(EXCLUDES MOUNTS & RET SYSTEM)

1 / A-4 ANTENNA DETAILS

SCALE: N.T.S.

ERICSSON RRUS-32 B2

-DIMENSIONS (H x W x D):
27.2" x 12.1" x 7.0"
-WEIGHT: 53 LBS



NOTES:
RRU CAN ONLY BE PAINTED ON SOLAR SHIELD.

2 / A-4 REMOTE RADIO HEAD (RRH) DETAILS

SCALE: N.T.S.

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SAI

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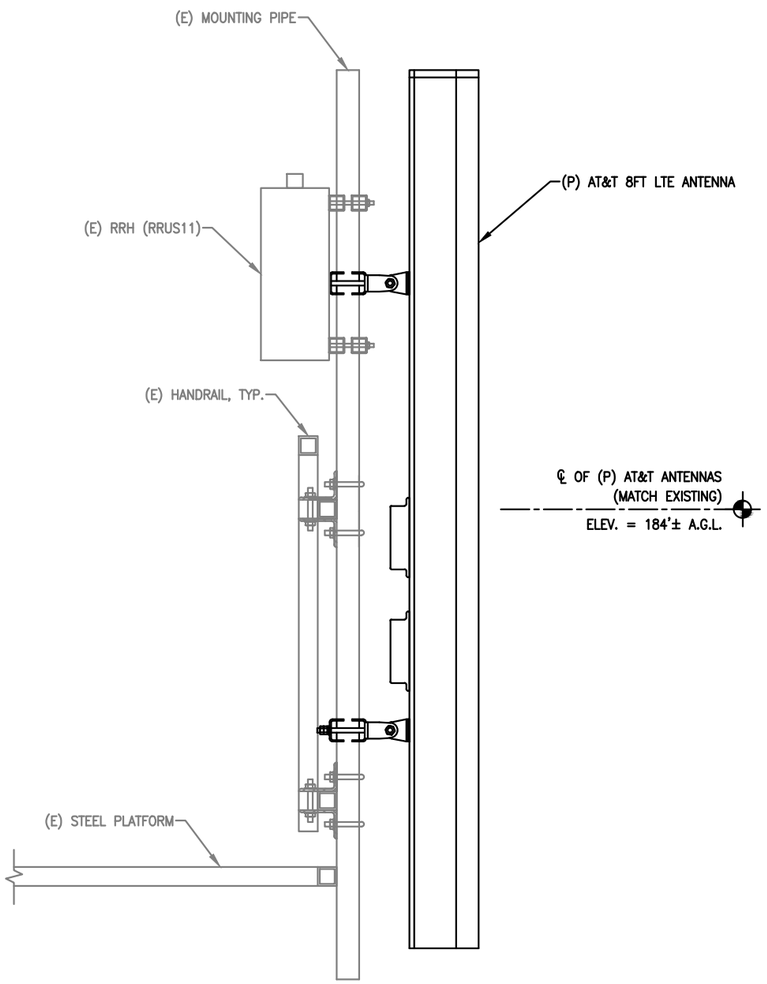
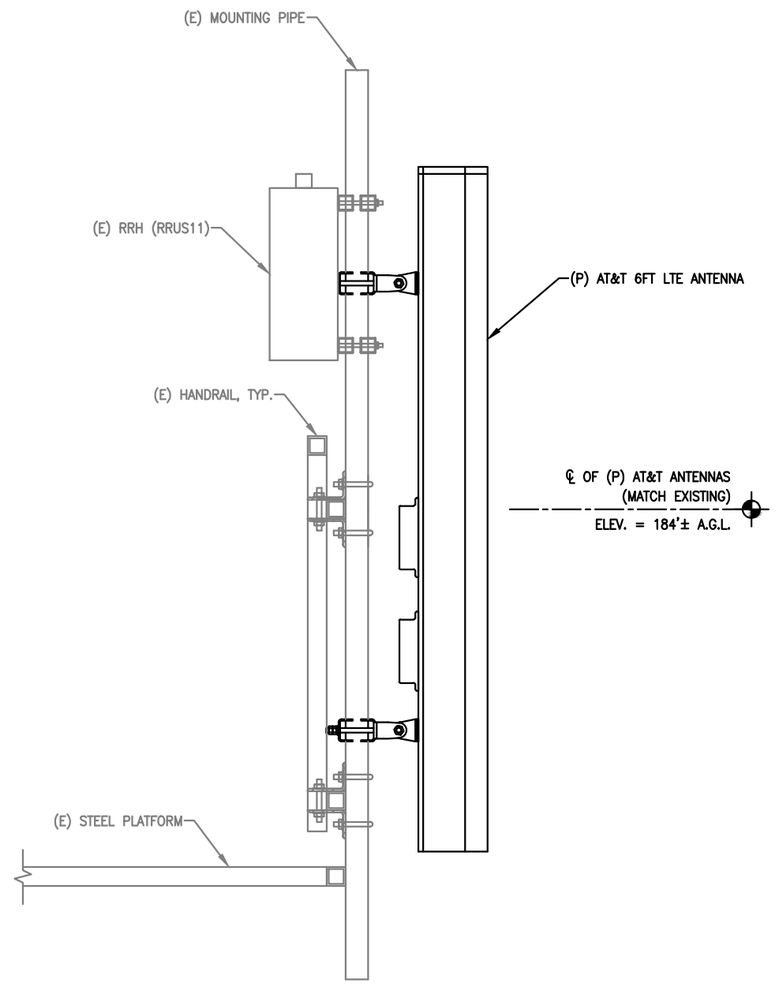
DETAILS

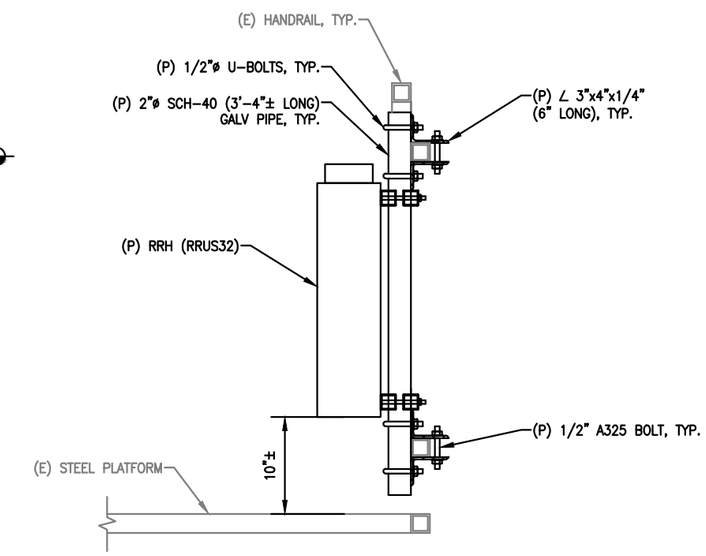
SHEET NO. A-3



1 S-1 ANTENNA MOUNTING DETAIL (ALPHA & GAMMA)
SCALE: 1 1/2" = 1'-0"



2 S-1 ANTENNA MOUNTING DETAIL (BETA)
SCALE: 1 1/2" = 1'-0"



3 S-1 RRH MOUNTING DETAIL
SCALE: 1 1/2" = 1'-0"

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STRUCTURAL DETAILS

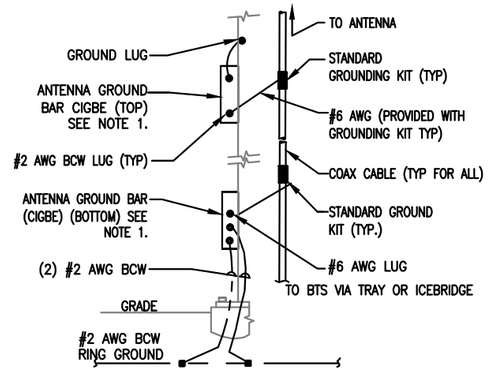
SHEET NO. S-1

CIRCUIT BREAKER	
ELECTRIC BOX	
ELECTRICAL CONDUIT	
EXOTHERMIC CONNECTION (CADWELD) TO GROUND RING AND COMPRESSION TO GROUND HALO	
DISCONNECT SWITH	
GROUND ROD	
GROUND ROD WITH ACCESS	
MECHANICAL GROUND CONN.	
GROUND ACCESS WELL	
GROUNDING WIRE	
GENERATOR	
FUSE	
GROUND BUS BAR	
REVISION	
TELEPHONE BOX	
UTILITY METER	
XIT GROUND ROD	

ACCA	ANTENNA CABLE COVER ASSEMBLY
AWG	AMERICAN WIRE GAUGE
BTCW	BARE TINNED COPPER WIRE
C	CONDUIT
CIGBE	COAX INSULATED GROUND BAR EXTERNAL
CO	CONDUIT ONLY
DWG	DRAWING
EGB	EXTERNAL GROUND BAR
EMT	ELECTRICAL METALLIC TUBING
(E)	EXISTING
(F)	FUTURE
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GPS	GLOBAL POSITIONING SYSTEM
GR	GROWTH
IGR	INTERIOR GROUND RING (HALO)
MIGB	MASTER ISOLATED GROUND BAR
(P)	PROPOSED, NEW (PROVIDE AND INSTALL UNLESS NOTED OTHERWISE)
PCS	PERSONAL COMMUNICATION SERVICE
PPC	POWER PROTECTION CABINET
PRC	PRIMARY RADIO CABINET
PVC	POLYVINYL CHLORIDE CONDUIT
RGS	RIGID GALVANIZED STEEL
RWY	RACEWAY
S.L.D.	SINGLE LINE DIAGRAM
TEL	TELEPHONE
TYP.	TYPICAL
WP	WEATHERPROOF EQUIPMENT

1 / G-1 ELEC. / GROUNDING LEGEND

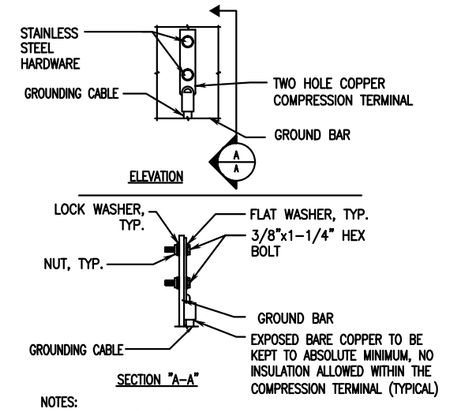
SCALE: N.T.S.



NOTE:
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

2 / G-1 TYP. ANTENNA CABLE GROUNDING

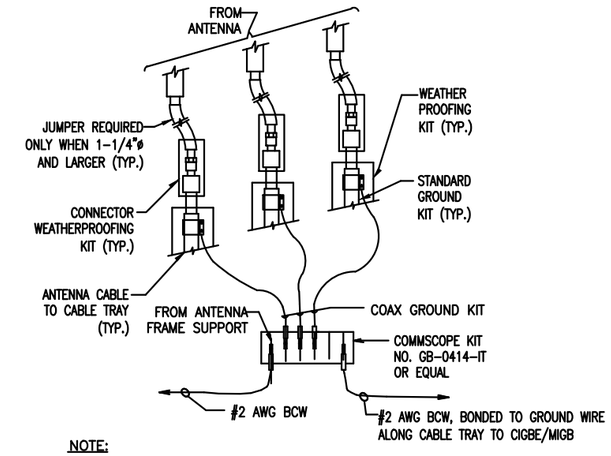
SCALE: N.T.S.



NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.
4. ALL GROUND LUGS MUST BE HEAT SHRUNK AT WIRE/LUG CONNECTION

3 / G-1 TYP. GROUND BAR CONNECTION

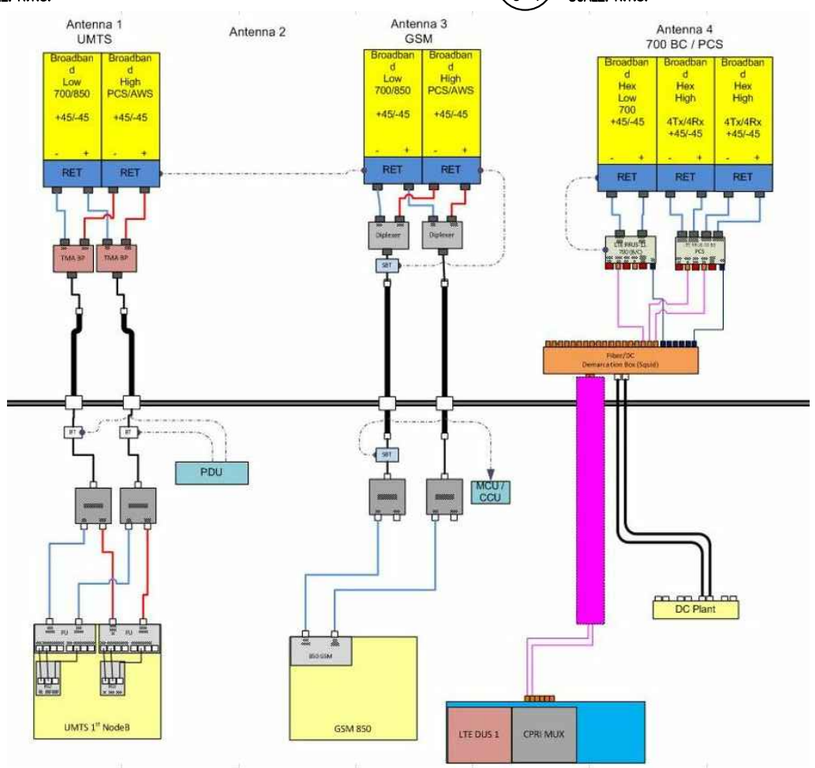
SCALE: N.T.S.



NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

4 / G-1 TYP. GROUND WIRE TO GROUND BAR CONN.

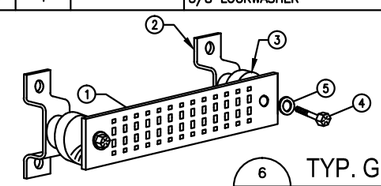
SCALE: N.T.S.



5 / G-1 ONE LINE PLUMBING DIAGRAM

SCALE: N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



6 / G-1 TYP. GROUND BAR CONN.

SCALE: N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

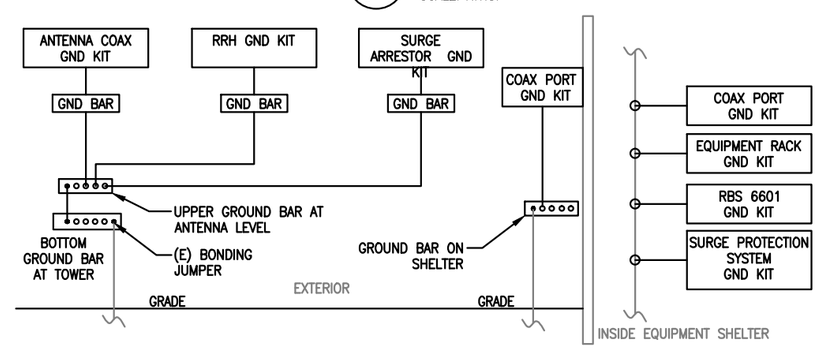
SECTION "P" – SURGE PRODUCERS

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)

GROUNDING NOTES:
ALL GROUNDING SHALL BE DONE IN ACCORDANCE WITH THE AT&T MOBILITY GROUNDING GUIDE.



7 / G-1 ONE LINE GROUNDING DIAGRAM

SCALE: N.T.S.

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GROUNDING DETAILS AND ONE LINE DIAGRAM

SHEET NO. **G-1**

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**180.4 ft Monopole**
ATC Site Name	:	**Lisbon CT 3, CT**
ATC Site Number	:	**302503**
Engineering Number	:	**OAA694373_C3_01**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**CT2058**
Carrier Site Number	:	**Lisbon-Mel Rd**
Site Location	:	**20 Mel Road** **Jewett City, CT 06351-3017** **41.590800,-72.016900**
County	:	**New London**
Date	:	**March 3, 2017**
Max Usage	:	**82%**
Result	:	**Pass**

Prepared By:
Timothy Kassakatis
Structural Engineer I

Reviewed By:

COA: PEC.0001553

Table of Contents

Introduction 1

Supporting Documents 1

Analysis 1

Conclusion 1

Existing and Reserved Equipment 2

Equipment to be Removed 2

Proposed Equipment 2

Structure Usages 3

Foundations 3

Deflection, Twist, and Sway 3

Standard Conditions 4

Calculations ..... Attached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180.4 ft monopole to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	HTS Mapping Project #HTS011509, dated January 13, 2009
Foundation Drawing	SNET Drawing #3C255, dated August 8, 1990
Geotechnical Report	DOG Project #GEO17-00679-01, dated March 3, 2017
Modifications	ATC Job #50406832, dated October 25, 2012 ATC Job #42728432, dated January 28, 2009

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	105 mph (3-Second Gust, Vasd) / 135 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.17, S_1 = 0.06
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
180.4	184.0	6	LGP LGP21903	Platform w/ Handrails	(12) 1 5/8" Coax (2) 0.65" 8 AWG 2C (1) 1.3" (33mm) Hybrid (Type 1)	AT&T Mobility
		6	Powerwave LGP21401			
		1	Raycap DC6-48-60-18-8F			
		3	Ericsson RRUS-11 800MHz			
		6	Powerwave 7770.00			
180.4	188.0	1	6' Omni		(1) 1 5/8" Coax	Spok Holdings, Inc.
16.0	16.0	1	Channel Master Type 120	Leg	(1) 0.28" RG-6	

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
180.4	184.0	3	KMW AM-X-CD-16-65-00T-RET	-	-	AT&T Mobility

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
180.4	184.0	3	Ericsson RRUS 32 B2	Platform w/ Handrails	(1) 2" Conduit	AT&T Mobility
		1	CCI HPA-65R-BUU-H6			
		2	CCI HPA-65R-BUU-H8			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	67%	Pass
Shaft	72%	Pass
Base Plate	37%	Pass
Flanges	34%	Pass
Reinforcement	82%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3,116.3	77%
Axial (Kips)	38.7	2%
Shear (Kips)	29.6	5%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
180.4	Ericsson RRUS 32 B2	AT&T Mobility	2.926	1.794
	CCI HPA-65R-BUU-H6			
	CCI HPA-65R-BUU-H8			
16.0	Channel Master Type 120	Spok Holdings, Inc.	0.025	0.184

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

AMERICAN TOWER®
CORPORATION

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

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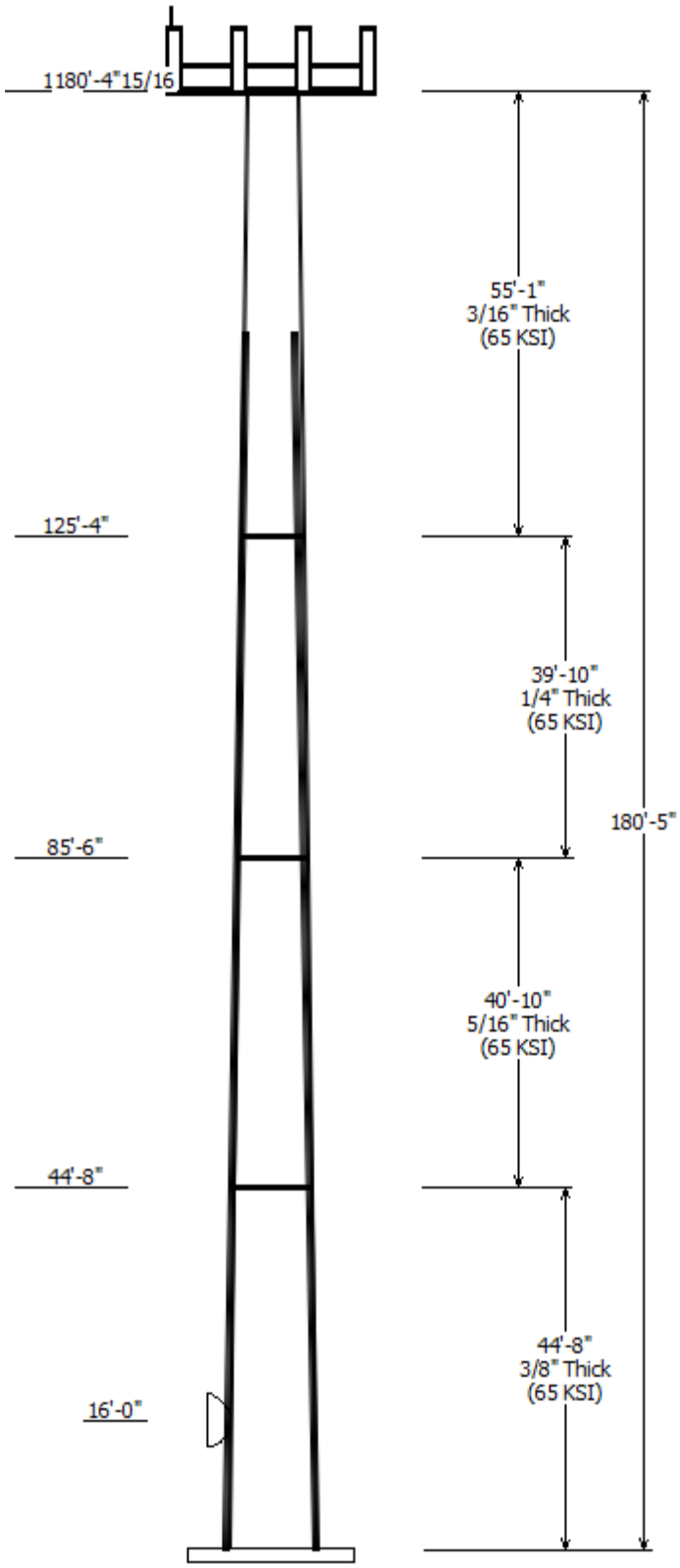


Job Information

Pole :	302503	Code:	ANSI/TIA-222-G
Description :	180'-5" Mapped Monopole		
Client :	AT&T MOBILITY	Struct Class :	II
Location :	Lisbon CT 3, CT		
Shape :	12 Sides	Exposure :	B
Height :	180.42 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.147760 (in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	44.667	35.09	41.69	0.375		0.000	0.147800	65
2	40.833	29.06	35.09	0.313	Butt Joint	0.000	0.147800	65
3	39.833	23.17	29.06	0.250	Butt Joint	0.000	0.147800	65
4	55.083	15.04	23.17	0.188	Butt Joint	0.000	0.147800	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
180.410	184.000	3	Ericsson RRUS 32 B2
180.410	187.000	6	LGP Allgon LGP21903
180.410	187.000	6	Powerwave Allgon LGP21401
180.410	184.000	6	Powerwave 7770.00
180.410	180.410	1	Flat Platform w/ Handrails
180.410	188.000	1	6' Omni
180.410	184.000	1	Raycap DC6-48-60-18-8F
180.410	184.000	2	CCI HPA-65R-BUU-H8
180.410	184.000	1	CCI HPA-65R-BUU-H6
180.410	184.000	3	Ericsson RRUS-11 800 MHz
16.000	16.000	1	Channel Master Type 120

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	16.000	0.28" (7mm) RG-6	Yes
0.000	155.0	#20 Dywdag Bars	Yes
0.000	180.4	0.65" (16.4mm) 8	No
0.000	180.4	1 5/8" Coax	No
0.000	180.4	1 5/8" Coax	No
0.000	180.4	1.3" (33mm)	No
0.000	180.4	2" Conduit	No

Load Cases

1.2D + 1.6W	105 mph with No Ice
0.9D + 1.6W	105 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

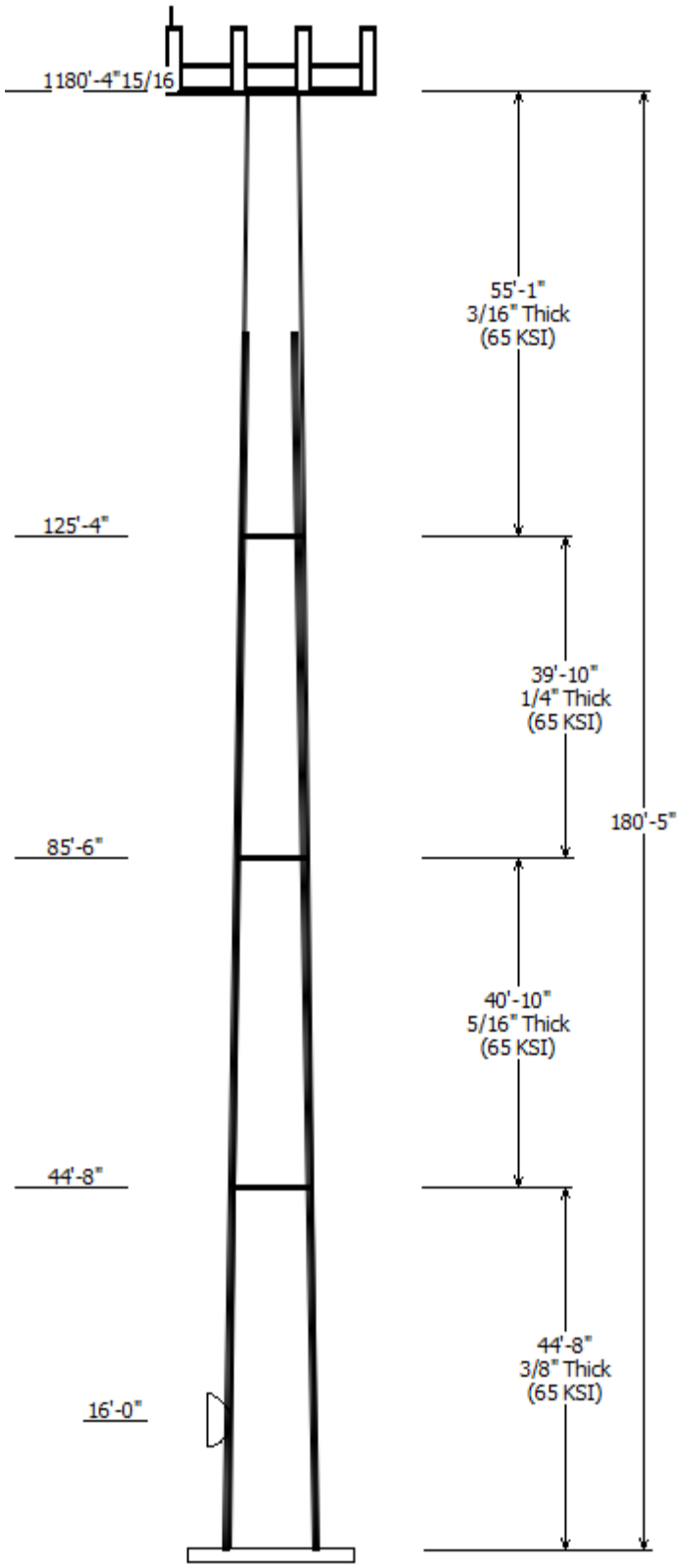
Reactions

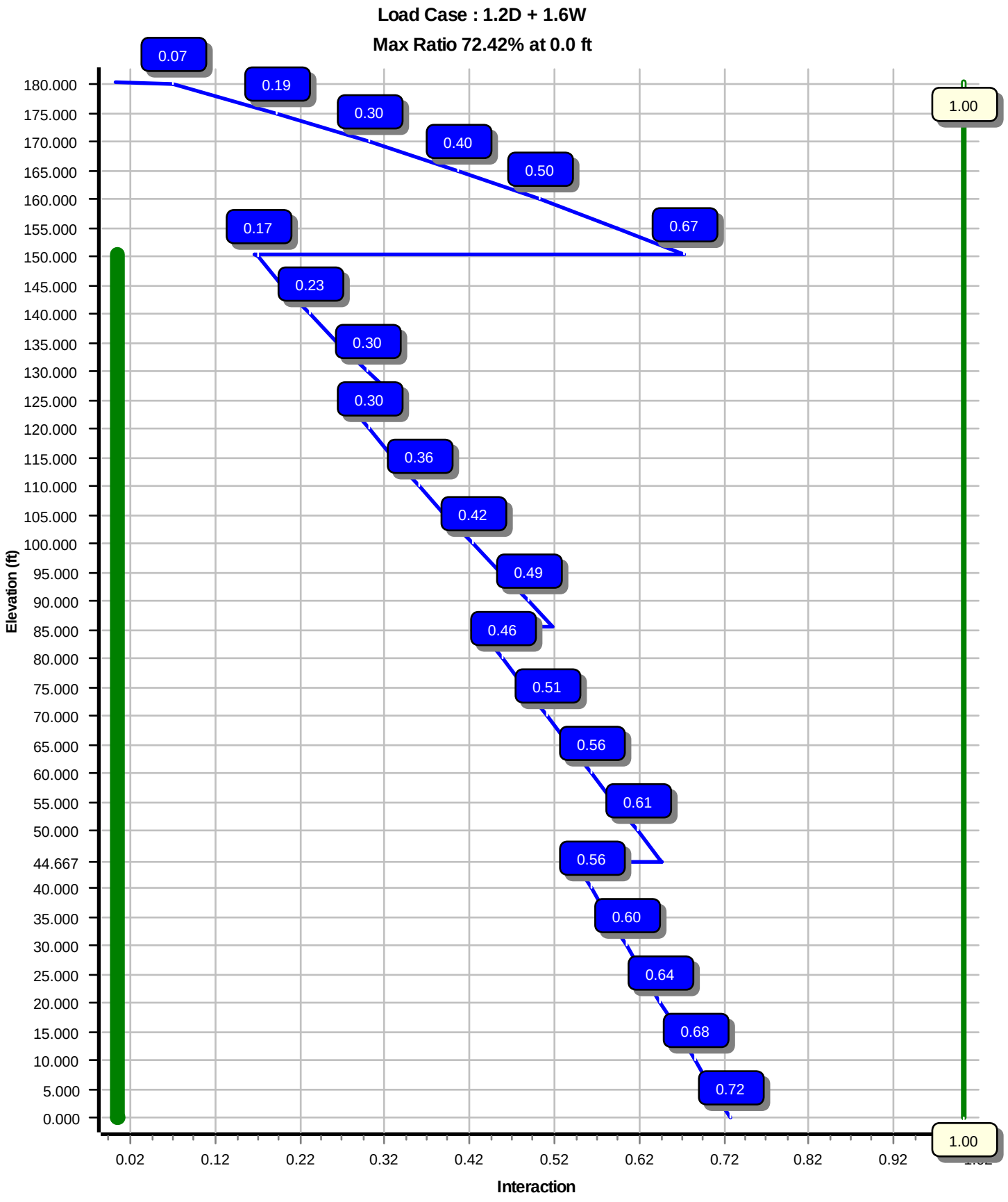
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	3116.30	29.61	38.71

0.9D + 1.6W	3054.88	28.65	29.02
1.2D + 1.0Di + 1.0Wi	622.86	5.41	54.04
(1.2 + 0.2Sds) * DL + E ELFM	181.86	1.26	38.40
(1.2 + 0.2Sds) * DL + E EMAM	214.99	1.61	38.40
(0.9 - 0.2Sds) * DL + E ELFM	178.65	1.26	26.84
(0.9 - 0.2Sds) * DL + E EMAM	210.89	1.60	26.84
1.0D + 1.0W	658.18	6.15	32.32

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	16.00	0.296	0.175




Load Case : 1.2D + 1.6W
Max Ratio 72.42% at 0.0 ft
0.07
0.19
0.30
0.40
0.50
0.67
0.17
0.23
0.30
0.30
0.36
0.42
0.49
0.46
0.51
0.56
0.61
0.56
0.60
0.64
0.68
0.72
1.00
1.00
Elevation (ft)
180.000
175.000
170.000
165.000
160.000
155.000
150.000
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
44.667
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number:	302503	Code: ANSI/TIA-222-G	© 2007 - 2017 by ATC IP LLC. All rights reserved.
Site Name:	Lisbon CT 3, CT	Engineering Number:OAA694373_C3_01	3/3/2017 5:06:10 PM
Customer:	AT&T MOBILITY		

Analysis Parameters

Location:	NEW LONDON County, CT	Height (ft):	180.
Code:	ANSI/TIA-222-G	Base Diameter (in):	41.70
Shape:	12 Sides	Top Diameter (in):	15.04
Pole Type:	Taper	Taper (in/ft) :	0.148
Pole Manfacturer:		Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	105 mph
Exposure Category:	B	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods
Site Class:	D - Stiff Soil
Period Based on Rayleigh Method (sec):	2.83

T_L (sec):	6	p:	1.3	C_s:	0.030
S_s:	0.169	S_1:	0.060	C_s Max:	0.030
F_a:	1.600	F_v :	2.400	C_s Min:	0.030
S_{ds}:	0.180	S_{d1}:	0.096		

Load Cases

1.2D + 1.6W	105 mph with No Ice
0.9D + 1.6W	105 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

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Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	44.667	0.3750	65		0.00	6,978	41.69	0.00	49.90	10875.9	27.12	111.20	35.09	44.67	41.93	6452.8	22.40	93.60	0.147760
2-12	40.833	0.3125	65	Butt	0.00	4,442	35.09	44.67	35.00	5406.4	27.42	112.32	29.06	85.50	28.93	3052.9	22.24	93.01	0.147760
3-12	39.833	0.2500	65	Butt	0.00	2,823	29.06	85.50	23.20	2458.3	28.47	116.26	23.17	125.33	18.46	1238.7	22.16	92.72	0.147760
4-12	55.083	0.1875	65	Butt	0.00	2,141	23.17	125.33	13.88	936.6	30.45	123.62	15.04	180.42	8.97	252.5	18.81	80.21	0.147760
				Shaft Weight		16,385													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
180.41	6' Omni	1	25.00	1.760	1.00	109.21	3.097	1.00	0.000	7.590
180.41	CCI HPA-65R-BUU-H6	1	51.00	9.660	0.69	304.46	11.053	0.69	0.000	3.590
180.41	CCI HPA-65R-BUU-H8	2	68.00	12.980	0.67	365.34	14.627	0.67	0.000	3.590
180.41	Ericsson RRUS 32 B2	3	53.00	2.740	0.67	143.14	3.488	0.67	0.000	3.590
180.41	Ericsson RRUS-11 800 MHz	3	54.00	2.520	0.67	145.37	3.191	0.67	0.000	3.590
180.41	Flat Platform w/ Handrails	1	2000.00	42.400	1.00	3,450.45	63.804	1.00	0.000	0.000
180.41	LGP Allgon LGP21903	6	5.50	0.270	0.50	19.52	0.480	0.50	0.000	6.590
180.41	Powerwave 7770.00	6	35.00	5.510	0.65	173.17	6.581	0.65	0.000	3.590
180.41	Powerwave Allgon LGP21401	6	14.10	1.100	0.50	48.62	1.573	0.50	0.000	6.590
180.41	Raycap DC6-48-60-18-8F	1	20.00	1.110	1.00	102.38	2.534	1.00	0.000	3.590
16.00	Channel Master Type 120	1	126.00	20.190	1.00	290.24	22.594	1.00	0.000	0.000
	Totals	31	3006.60			7,300.76			Number of Loadings :	11

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	180.41	2	0.65" (16.4mm) 8	0.65	0.31	N	0.00	N	AT&T Mobility
0.00	180.41	12	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
0.00	180.41	1	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
0.00	180.41	1	1.3" (33mm) Hybrid	1.30	1.00	N	0.00	N	AT&T Mobility
0.00	180.41	1	2" Conduit	2.38	3.65	N	0.00	N	AT&T Mobility
0.00	155.00	4	#20 Dywdag Bars	0.00	0.00	N	7.50	Y	-
0.00	16.00	1	0.28" (7mm) RG-6	0.28	0.03	N	0.00	Y	Spok Holdings, Inc.

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Intermediate Connections Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	150.5	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	No

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Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)	Additional Reinforcing Area (in^2)	Ix (in^4)	Weight (lb)
0.00		0.3750	41.699	49.898	10,875.9	27.12	111.20	75.1	503.9	0.0	0.0	19.64	5,801	0.0
5.00		0.3750	40.960	49.006	10,302.9	26.59	109.23	75.7	485.9	0.0	841.4	19.64	5,626	334.0
10.00		0.3750	40.221	48.114	9,750.4	26.06	107.26	76.3	468.3	0.0	826.2	19.64	5,454	334.0
15.00		0.3750	39.482	47.222	9,218.1	25.53	105.29	76.9	451.0	0.0	811.0	19.64	5,284	334.0
16.00		0.3750	39.334	47.043	9,114.0	25.43	104.89	77.0	447.6	0.0	160.4	19.64	5,251	66.8
20.00		0.3750	38.743	46.330	8,705.4	25.00	103.32	77.4	434.1	0.0	635.5	19.64	5,117	267.2
25.00		0.3750	38.004	45.438	8,212.2	24.48	101.35	78.0	417.4	0.0	780.7	19.64	4,953	334.0
30.00		0.3750	37.266	44.546	7,737.9	23.95	99.38	78.6	401.1	0.0	765.5	19.64	4,792	334.0
35.00		0.3750	36.527	43.653	7,282.3	23.42	97.41	79.2	385.1	0.0	750.3	19.64	4,633	334.0
40.00		0.3750	35.788	42.761	6,844.9	22.89	95.43	79.7	369.5	0.0	735.1	19.64	4,477	334.0
44.67	Top - Section 1	0.3750	35.099	41.929	6,452.8	22.40	93.60	80.3	355.2	0.0	672.4	19.64	4,333	311.7
44.67	Bot - Section 2	0.3125	35.099	35.003	5,406.4	27.42	112.32	74.8	297.6	0.0		19.64	4,333	
45.00		0.3125	35.049	34.954	5,383.5	27.37	112.16	74.9	296.7	0.0	39.7	19.64	4,323	22.3
50.00		0.3125	34.310	34.210	5,047.2	26.74	109.79	75.6	284.2	0.0	588.4	19.64	4,173	334.0
55.00		0.3125	33.572	33.467	4,725.3	26.11	107.43	76.2	271.9	0.0	575.7	19.64	4,024	334.0
60.00		0.3125	32.833	32.724	4,417.3	25.47	105.07	76.9	259.9	0.0	563.1	19.64	3,879	334.0
65.00		0.3125	32.094	31.980	4,123.0	24.84	102.70	77.6	248.2	0.0	550.4	19.64	3,736	334.0
70.00		0.3125	31.355	31.237	3,842.1	24.21	100.34	78.3	236.7	0.0	537.8	19.64	3,596	334.0
75.00		0.3125	30.616	30.493	3,574.3	23.57	97.97	79.0	225.5	0.0	525.1	19.64	3,459	334.0
80.00		0.3125	29.878	29.750	3,319.2	22.94	95.61	79.7	214.6	0.0	512.5	19.64	3,324	334.0
85.00		0.3125	29.139	29.007	3,076.5	22.31	93.24	80.4	204.0	0.0	499.8	19.64	3,192	334.0
85.50	Top - Section 2	0.3125	29.065	28.932	3,052.9	22.24	93.01	80.5	202.9	0.0	49.3	19.64	3,179	33.4
85.50	Bot - Section 3	0.2500	29.065	23.196	2,458.3	28.47	116.26	73.7	163.4	0.0		19.64	3,179	
90.00		0.2500	28.400	22.661	2,292.0	27.76	113.60	74.4	155.9	0.0	351.1	19.64	3,063	300.6
95.00		0.2500	27.661	22.066	2,116.3	26.97	110.65	75.3	147.8	0.0	380.5	19.64	2,936	334.0
100.0		0.2500	26.922	21.471	1,949.7	26.18	107.69	76.2	139.9	0.0	370.4	19.64	2,812	334.0
105.0		0.2500	26.184	20.877	1,792.1	25.38	104.73	77.0	132.2	0.0	360.3	19.64	2,691	334.0
110.0		0.2500	25.445	20.282	1,643.3	24.59	101.78	77.9	124.8	0.0	350.1	19.64	2,572	334.0
115.0		0.2500	24.706	19.687	1,502.9	23.80	98.82	78.8	117.5	0.0	340.0	19.64	2,457	334.0
120.0		0.2500	23.967	19.092	1,370.8	23.01	95.87	79.6	110.5	0.0	329.9	19.64	2,343	334.0
125.0		0.2500	23.228	18.498	1,246.7	22.22	92.91	80.5	103.7	0.0	319.8	19.64	2,233	334.0
125.3	Top - Section 3	0.2500	23.179	18.458	1,238.7	22.16	92.72	80.5	103.2	0.0	21.0	19.64	2,225	22.3
125.3	Bot - Section 4	0.1875	23.179	13.881	936.6	30.45	123.62	71.5	78.1	0.0		19.64	2,225	
130.0		0.1875	22.490	13.465	854.8	29.46	119.94	72.6	73.4	0.0	217.1	19.64	2,125	311.7
135.0		0.1875	21.751	13.019	772.7	28.40	116.00	73.7	68.6	0.0	225.3	19.64	2,020	334.0
140.0		0.1875	21.012	12.573	695.9	27.35	112.06	74.9	64.0	0.0	217.7	19.64	1,917	334.0
145.0		0.1875	20.273	12.127	624.5	26.29	108.12	76.0	59.5	0.0	210.1	19.64	1,817	334.0
150.0		0.1875	19.534	11.681	558.1	25.24	104.18	77.2	55.2	0.0	202.5	19.64	1,720	334.0
150.5	Reinf. Top	0.1875	19.461	11.636	551.7	25.13	103.79	77.3	54.8	0.0	19.8	19.64	1,711	33.4
155.0		0.1875	18.796	11.235	496.5	24.18	100.24	78.3	51.0	0.0	175.1			
160.0		0.1875	18.057	10.789	439.7	23.12	96.30	79.5	47.0	0.0	187.4			
165.0		0.1875	17.318	10.343	387.4	22.07	92.36	80.6	43.2	0.0	179.8			
170.0		0.1875	16.579	9.897	339.4	21.01	88.42	81.8	39.5	0.0	172.2			
175.0		0.1875	15.840	9.450	295.6	19.96	84.48	81.9	36.0	0.0	164.6			
180.0		0.1875	15.102	9.004	255.6	18.90	80.54	81.9	32.7	0.0	157.0			
180.4		0.1875	15.041	8.968	252.5	18.82	80.22	81.9	32.4	0.0	12.5			
180.4		0.1875	15.040	8.967	252.5	18.81	80.21	81.9	32.4	0.0	0.2			
											16,384.5			10,053.

Site Number: 302503 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Lisbon CT 3, CT Engineering Number:OAA694373_C3_01 3/3/2017 5:06:11 PM

Customer: AT&T MOBILITY

Load Case: 1.2D + 1.6W 105 mph with No Ice 30 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		361.0	0.0					0.0	0.0	361.0	0.0	0.0	0.0
5.00		718.2	1,009.6					0.0	496.5	718.2	1,506.2	0.0	0.0
10.00		710.9	991.4					0.0	496.5	710.9	1,488.0	0.0	0.0
15.00		423.9	973.2					0.0	496.5	423.9	1,469.8	0.0	0.0
16.00	Appertunance(s)	349.9	192.5	666.9	0.0	0.0	151.2	0.0	99.3	1,016.9	443.0	0.0	0.0
20.00		625.9	762.5					0.0	397.1	625.9	1,159.6	0.0	0.0
25.00		688.8	936.8					0.0	496.4	688.8	1,433.2	0.0	0.0
30.00		689.5	918.6					0.0	496.4	689.5	1,414.9	0.0	0.0
35.00		676.8	900.4					0.0	496.4	676.8	1,396.7	0.0	0.0
40.00		642.1	882.2					74.6	496.4	716.7	1,378.5	0.0	0.0
44.67	Top - Section 1	334.8	806.9					70.8	463.3	405.6	1,270.2	0.0	0.0
45.00		360.8	47.6					5.1	33.1	365.9	80.7	0.0	0.0
50.00		679.2	706.1					77.1	496.4	756.3	1,202.4	0.0	0.0
55.00		682.9	690.9					78.2	496.4	761.2	1,187.2	0.0	0.0
60.00		684.7	675.7					79.3	496.4	764.0	1,172.1	0.0	0.0
65.00		684.8	660.5					80.2	496.4	765.1	1,156.9	0.0	0.0
70.00		683.4	645.3					81.1	496.4	764.5	1,141.7	0.0	0.0
75.00		680.6	630.2					81.9	496.4	762.5	1,126.5	0.0	0.0
80.00		676.6	615.0					82.7	496.4	759.3	1,111.4	0.0	0.0
85.00		370.7	599.8					83.5	496.4	454.1	1,096.2	0.0	0.0
85.50	Top - Section 2	334.2	59.1					8.4	49.6	342.6	108.8	0.0	0.0
90.00		631.6	421.3					75.8	446.7	707.4	868.1	0.0	0.0
95.00		657.9	456.6					85.5	496.4	743.4	953.0	0.0	0.0
100.00		649.8	444.4					86.8	496.4	736.6	940.8	0.0	0.0
105.00		640.9	432.3					88.1	496.4	728.9	928.7	0.0	0.0
110.00		631.1	420.2					89.3	496.4	720.4	916.5	0.0	0.0
115.00		620.6	408.0					90.4	496.4	711.1	904.4	0.0	0.0
120.00		609.4	395.9					91.6	496.4	701.0	892.2	0.0	0.0
125.00		321.7	383.7					92.7	496.4	414.4	880.1	0.0	0.0
125.33	Top - Section 3	295.7	25.1					6.2	33.1	302.0	58.2	0.0	0.0
130.00		565.2	260.6					87.5	463.3	652.7	723.8	0.0	0.0
135.00		572.0	270.4					94.8	496.4	666.8	766.7	0.0	0.0
140.00		558.3	261.2					95.8	496.4	654.1	757.6	0.0	0.0
145.00		544.1	252.1					96.8	496.4	640.9	748.5	0.0	0.0
150.00		294.9	243.0					97.7	496.4	392.6	739.4	0.0	0.0
150.50	Reinf. Top	261.0	23.8					9.8	49.6	270.8	73.4	0.0	0.0
155.00		445.5	210.1					88.8	86.0	534.4	296.1	0.0	0.0
160.00		415.4	224.8					0.0	95.6	415.4	320.4	0.0	0.0
165.00		401.9	215.7					0.0	95.6	401.9	311.3	0.0	0.0
170.00		388.1	206.6					0.0	95.6	388.1	302.2	0.0	0.0
175.00		373.9	197.5					0.0	95.6	373.9	293.1	0.0	0.0
180.00		198.0	188.4					0.0	95.6	198.0	284.0	0.0	0.0
180.41		14.9	15.0					0.0	7.8	14.9	22.9	0.0	0.0
180.42		0.2	0.2					0.0	0.0	0.2	0.2	0.0	0.0
								Totals:		24,899.3	35,325.6	0.00	0.00

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Load Case: 1.2D + 1.6W 105 mph with No Ice 30 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-38.71	-29.61	0.00	-3,116.30	0.00	3,116.30	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.724
5.00	-37.08	-29.06	0.00	-2,968.25	0.00	2,968.25	3,339.53	1,669.77	5,587.61	2,759.51	0.14	-0.26	0.704
10.00	-35.47	-28.50	0.00	-2,822.96	0.00	2,822.96	3,303.67	1,651.84	5,426.07	2,679.73	0.55	-0.52	0.683
15.00	-33.93	-28.15	0.00	-2,680.48	0.00	2,680.48	3,266.89	1,633.44	5,265.23	2,600.30	1.23	-0.78	0.663
16.00	-33.44	-27.20	0.00	-2,652.33	0.00	2,652.33	3,259.42	1,629.71	5,233.16	2,584.46	1.40	-0.83	0.659
20.00	-32.18	-26.69	0.00	-2,543.54	0.00	2,543.54	3,229.18	1,614.59	5,105.20	2,521.27	2.18	-1.03	0.643
25.00	-30.65	-26.10	0.00	-2,410.11	0.00	2,410.11	3,190.54	1,595.27	4,946.05	2,442.67	3.40	-1.29	0.622
30.00	-29.14	-25.51	0.00	-2,279.60	0.00	2,279.60	3,150.98	1,575.49	4,787.88	2,364.55	4.89	-1.54	0.602
35.00	-27.65	-24.91	0.00	-2,152.06	0.00	2,152.06	3,110.50	1,555.25	4,630.76	2,286.96	6.64	-1.79	0.581
40.00	-26.20	-24.26	0.00	-2,027.51	0.00	2,027.51	3,069.09	1,534.55	4,474.78	2,209.92	8.65	-2.04	0.561
44.67	-24.89	-23.86	0.00	-1,914.30	0.00	1,914.30	3,029.61	1,514.81	4,330.30	2,138.57	10.76	-2.27	0.541
44.67	-24.89	-23.86	0.00	-1,914.30	0.00	1,914.30	2,356.88	1,178.44	3,380.89	1,669.69	10.76	-2.27	0.644
45.00	-24.77	-23.55	0.00	-1,906.35	0.00	1,906.35	2,354.99	1,177.50	3,373.36	1,665.97	10.92	-2.29	0.642
50.00	-23.49	-22.86	0.00	-1,788.58	0.00	1,788.58	2,326.18	1,163.09	3,260.58	1,610.28	13.46	-2.56	0.615
55.00	-22.24	-22.14	0.00	-1,674.29	0.00	1,674.29	2,296.44	1,148.22	3,148.31	1,554.83	16.29	-2.83	0.588
60.00	-21.01	-21.42	0.00	-1,563.57	0.00	1,563.57	2,265.77	1,132.89	3,036.63	1,499.68	19.39	-3.09	0.561
65.00	-19.80	-20.68	0.00	-1,456.49	0.00	1,456.49	2,234.19	1,117.09	2,925.62	1,444.85	22.77	-3.35	0.535
70.00	-18.62	-19.93	0.00	-1,353.11	0.00	1,353.11	2,201.67	1,100.84	2,815.37	1,390.41	26.41	-3.61	0.508
75.00	-17.47	-19.17	0.00	-1,253.48	0.00	1,253.48	2,168.24	1,084.12	2,705.97	1,336.38	30.32	-3.85	0.482
80.00	-16.33	-18.40	0.00	-1,157.64	0.00	1,157.64	2,133.87	1,066.94	2,597.50	1,282.81	34.48	-4.10	0.456
85.00	-15.23	-17.90	0.00	-1,065.63	0.00	1,065.63	2,098.59	1,049.29	2,490.04	1,229.74	38.90	-4.34	0.430
85.50	-15.11	-17.58	0.00	-1,056.69	0.00	1,056.69	2,095.01	1,047.50	2,479.36	1,224.46	39.36	-4.36	0.427
85.50	-15.11	-17.58	0.00	-1,056.69	0.00	1,056.69	1,537.79	768.90	1,827.83	902.70	39.36	-4.36	0.516
90.00	-14.24	-16.87	0.00	-977.56	0.00	977.56	1,518.16	759.08	1,762.50	870.43	43.56	-4.57	0.486
95.00	-13.28	-16.11	0.00	-893.22	0.00	893.22	1,495.46	747.73	1,690.19	834.72	48.48	-4.82	0.453
100.00	-12.34	-15.34	0.00	-812.69	0.00	812.69	1,471.85	735.92	1,618.25	799.19	53.65	-5.06	0.421
105.00	-11.43	-14.58	0.00	-735.98	0.00	735.98	1,447.30	723.65	1,546.78	763.90	59.06	-5.29	0.390
110.00	-10.53	-13.81	0.00	-663.10	0.00	663.10	1,421.84	710.92	1,475.86	728.87	64.71	-5.51	0.359
115.00	-9.65	-13.05	0.00	-594.03	0.00	594.03	1,395.45	697.72	1,405.58	694.16	70.59	-5.72	0.329
120.00	-8.79	-12.29	0.00	-528.76	0.00	528.76	1,368.13	684.07	1,336.01	659.81	76.68	-5.92	0.299
125.00	-7.94	-11.80	0.00	-467.29	0.00	467.29	1,339.89	669.95	1,267.25	625.85	82.98	-6.12	0.271
125.33	-7.90	-11.51	0.00	-463.36	0.00	463.36	1,337.98	668.99	1,262.70	623.60	83.41	-6.13	0.269
125.33	-7.90	-11.51	0.00	-463.36	0.00	463.36	893.38	446.69	847.72	418.66	83.41	-6.13	0.332
130.00	-7.21	-10.81	0.00	-409.64	0.00	409.64	879.61	439.81	809.42	399.74	89.47	-6.30	0.298
135.00	-6.50	-10.08	0.00	-355.61	0.00	355.61	863.96	431.98	768.47	379.52	96.15	-6.48	0.263
140.00	-5.79	-9.36	0.00	-305.23	0.00	305.23	847.39	423.70	727.68	359.37	103.01	-6.65	0.229
145.00	-5.10	-8.65	0.00	-258.44	0.00	258.44	829.90	414.95	687.15	339.36	110.04	-6.80	0.198
150.00	-4.40	-8.17	0.00	-215.21	0.00	215.21	811.48	405.74	646.95	319.51	117.22	-6.94	0.167
150.50	-4.36	-7.90	0.00	-211.12	0.00	211.12	809.59	404.79	642.96	317.53	117.95	-6.95	0.164
150.50	-4.36	-7.90	0.00	-211.12	0.00	211.12	809.59	404.79	642.96	317.53	117.95	-6.95	0.671
155.00	-4.09	-7.35	0.00	-175.57	0.00	175.57	792.13	396.07	607.18	299.86	124.54	-7.06	0.591
160.00	-3.77	-6.93	0.00	-138.80	0.00	138.80	771.86	385.93	567.92	280.48	132.16	-7.51	0.500
165.00	-3.48	-6.51	0.00	-104.15	0.00	104.15	750.67	375.34	529.26	261.38	140.22	-7.90	0.403
170.00	-3.20	-6.10	0.00	-71.59	0.00	71.59	728.55	364.28	491.27	242.62	148.65	-8.23	0.300
175.00	-2.95	-5.70	0.00	-41.09	0.00	41.09	696.59	348.30	448.31	221.40	157.37	-8.46	0.190
180.00	-2.69	-5.46	0.00	-12.60	0.00	12.60	663.72	331.86	406.75	200.88	166.28	-8.59	0.067
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	167.02	-8.60	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	167.03	-8.60	0.000

Site Number: 302503 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Lisbon CT 3, CT Engineering Number:OAA694373_C3_01 3/3/2017 5:06:12 PM

Customer: AT&T MOBILITY

Load Case: 0.9D + 1.6W 105 mph with No Ice (Reduced DL) 30 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		294.5	0.0					0.0	0.0	294.5	0.0	0.0	0.0
5.00		583.7	757.2					0.0	372.4	583.7	1,129.6	0.0	0.0
10.00		573.1	743.6					0.0	372.4	573.1	1,116.0	0.0	0.0
15.00		340.1	729.9					0.0	372.4	340.1	1,102.3	0.0	0.0
16.00	Appertunance(s)	278.7	144.3	666.9	0.0	0.0	113.4	0.0	74.5	945.6	332.2	0.0	0.0
20.00		495.9	571.9					0.0	297.8	495.9	869.7	0.0	0.0
25.00		541.5	702.6					0.0	372.3	541.5	1,074.9	0.0	0.0
30.00		537.3	688.9					0.0	372.3	537.3	1,061.2	0.0	0.0
35.00		598.9	675.3					0.0	372.3	598.9	1,047.6	0.0	0.0
40.00		642.1	661.6					74.6	372.3	716.7	1,033.9	0.0	0.0
44.67	Top - Section 1	334.8	605.2					70.8	347.5	405.6	952.6	0.0	0.0
45.00		360.8	35.7					5.1	24.8	365.9	60.5	0.0	0.0
50.00		679.2	529.5					77.1	372.3	756.3	901.8	0.0	0.0
55.00		682.9	518.2					78.2	372.3	761.2	890.4	0.0	0.0
60.00		684.7	506.8					79.3	372.3	764.0	879.0	0.0	0.0
65.00		684.8	495.4					80.2	372.3	765.1	867.7	0.0	0.0
70.00		683.4	484.0					81.1	372.3	764.5	856.3	0.0	0.0
75.00		680.6	472.6					81.9	372.3	762.5	844.9	0.0	0.0
80.00		676.6	461.2					82.7	372.3	759.3	833.5	0.0	0.0
85.00		370.7	449.9					83.5	372.3	454.1	822.1	0.0	0.0
85.50	Top - Section 2	334.2	44.4					8.4	37.2	342.6	81.6	0.0	0.0
90.00		631.6	316.0					75.8	335.1	707.4	651.0	0.0	0.0
95.00		657.9	342.4					85.5	372.3	743.4	714.7	0.0	0.0
100.00		649.8	333.3					86.8	372.3	736.6	705.6	0.0	0.0
105.00		640.9	324.2					88.1	372.3	728.9	696.5	0.0	0.0
110.00		631.1	315.1					89.3	372.3	720.4	687.4	0.0	0.0
115.00		620.6	306.0					90.4	372.3	711.1	678.3	0.0	0.0
120.00		609.4	296.9					91.6	372.3	701.0	669.2	0.0	0.0
125.00		321.7	287.8					92.7	372.3	414.4	660.1	0.0	0.0
125.33	Top - Section 3	295.7	18.9					6.2	24.8	302.0	43.7	0.0	0.0
130.00		565.2	195.4					87.5	347.5	652.7	542.9	0.0	0.0
135.00		572.0	202.8					94.8	372.3	666.8	575.0	0.0	0.0
140.00		558.3	195.9					95.8	372.3	654.1	568.2	0.0	0.0
145.00		544.1	189.1					96.8	372.3	640.9	561.4	0.0	0.0
150.00		294.9	182.3					97.7	372.3	392.6	554.6	0.0	0.0
150.50	Reinf. Top	261.0	17.9					9.8	37.2	270.8	55.1	0.0	0.0
155.00		445.5	157.6					88.8	64.5	534.4	222.1	0.0	0.0
160.00		415.4	168.6					0.0	71.7	415.4	240.3	0.0	0.0
165.00		401.9	161.8					0.0	71.7	401.9	233.5	0.0	0.0
170.00		388.1	155.0					0.0	71.7	388.1	226.6	0.0	0.0
175.00		373.9	148.1					0.0	71.7	373.9	219.8	0.0	0.0
180.00		198.0	141.3					0.0	71.7	198.0	213.0	0.0	0.0
180.41		14.9	11.3					0.0	5.9	14.9	17.2	0.0	0.0
180.42		0.2	0.2					0.0	0.0	0.2	0.2	0.0	0.0
								Totals:		23,898.3	26,494.2	0.00	0.00

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Load Case: 0.9D + 1.6W 105 mph with No Ice (Reduced DL) 30 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-29.02	-28.65	0.00	-3,054.88	0.00	3,054.88	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.708
5.00	-27.77	-28.19	0.00	-2,911.62	0.00	2,911.62	3,339.53	1,669.77	5,587.61	2,759.51	0.14	-0.25	0.689
10.00	-26.53	-27.73	0.00	-2,770.67	0.00	2,770.67	3,303.67	1,651.84	5,426.07	2,679.73	0.54	-0.51	0.669
15.00	-25.36	-27.44	0.00	-2,632.03	0.00	2,632.03	3,266.89	1,633.44	5,265.23	2,600.30	1.21	-0.76	0.649
16.00	-24.99	-26.55	0.00	-2,604.59	0.00	2,604.59	3,259.42	1,629.71	5,233.16	2,584.46	1.37	-0.81	0.645
20.00	-24.02	-26.13	0.00	-2,498.41	0.00	2,498.41	3,229.18	1,614.59	5,105.20	2,521.27	2.14	-1.01	0.630
25.00	-22.84	-25.67	0.00	-2,367.74	0.00	2,367.74	3,190.54	1,595.27	4,946.05	2,442.67	3.34	-1.26	0.610
30.00	-21.69	-25.20	0.00	-2,239.40	0.00	2,239.40	3,150.98	1,575.49	4,787.88	2,364.55	4.80	-1.51	0.590
35.00	-20.55	-24.66	0.00	-2,113.39	0.00	2,113.39	3,110.50	1,555.25	4,630.76	2,286.96	6.51	-1.76	0.570
40.00	-19.44	-23.99	0.00	-1,990.09	0.00	1,990.09	3,069.09	1,534.55	4,474.78	2,209.92	8.49	-2.01	0.549
44.67	-18.46	-23.59	0.00	-1,878.14	0.00	1,878.14	3,029.61	1,514.81	4,330.30	2,138.57	10.56	-2.23	0.530
44.67	-18.46	-23.59	0.00	-1,878.14	0.00	1,878.14	2,356.88	1,178.44	3,380.89	1,669.69	10.56	-2.23	0.630
45.00	-18.35	-23.27	0.00	-1,870.28	0.00	1,870.28	2,354.99	1,177.50	3,373.36	1,665.97	10.72	-2.25	0.628
50.00	-17.38	-22.55	0.00	-1,753.94	0.00	1,753.94	2,326.18	1,163.09	3,260.58	1,610.28	13.22	-2.51	0.601
55.00	-16.43	-21.83	0.00	-1,641.18	0.00	1,641.18	2,296.44	1,148.22	3,148.31	1,554.83	15.99	-2.78	0.575
60.00	-15.49	-21.09	0.00	-1,532.04	0.00	1,532.04	2,265.77	1,132.89	3,036.63	1,499.68	19.04	-3.03	0.549
65.00	-14.58	-20.34	0.00	-1,426.60	0.00	1,426.60	2,234.19	1,117.09	2,925.62	1,444.85	22.35	-3.29	0.522
70.00	-13.69	-19.59	0.00	-1,324.90	0.00	1,324.90	2,201.67	1,100.84	2,815.37	1,390.41	25.92	-3.54	0.496
75.00	-12.81	-18.83	0.00	-1,226.97	0.00	1,226.97	2,168.24	1,084.12	2,705.97	1,336.38	29.76	-3.78	0.470
80.00	-11.96	-18.06	0.00	-1,132.85	0.00	1,132.85	2,133.87	1,066.94	2,597.50	1,282.81	33.84	-4.02	0.445
85.00	-11.13	-17.57	0.00	-1,042.55	0.00	1,042.55	2,098.59	1,049.29	2,490.04	1,229.74	38.17	-4.25	0.419
85.50	-11.04	-17.25	0.00	-1,033.76	0.00	1,033.76	2,095.01	1,047.50	2,479.36	1,224.46	38.62	-4.28	0.417
85.50	-11.04	-17.25	0.00	-1,033.76	0.00	1,033.76	1,537.79	768.90	1,827.83	902.70	38.62	-4.28	0.504
90.00	-10.38	-16.53	0.00	-956.15	0.00	956.15	1,518.16	759.08	1,762.50	870.43	42.75	-4.48	0.474
95.00	-9.67	-15.77	0.00	-873.49	0.00	873.49	1,495.46	747.73	1,690.19	834.72	47.57	-4.72	0.442
100.00	-8.96	-15.02	0.00	-794.61	0.00	794.61	1,471.85	735.92	1,618.25	799.19	52.63	-4.96	0.411
105.00	-8.28	-14.26	0.00	-719.53	0.00	719.53	1,447.30	723.65	1,546.78	763.90	57.94	-5.18	0.380
110.00	-7.61	-13.51	0.00	-648.22	0.00	648.22	1,421.84	710.92	1,475.86	728.87	63.48	-5.40	0.350
115.00	-6.96	-12.76	0.00	-580.67	0.00	580.67	1,395.45	697.72	1,405.58	694.16	69.24	-5.61	0.320
120.00	-6.32	-12.02	0.00	-516.87	0.00	516.87	1,368.13	684.07	1,336.01	659.81	75.21	-5.81	0.292
125.00	-5.69	-11.55	0.00	-456.78	0.00	456.78	1,339.89	669.95	1,267.25	625.85	81.39	-5.99	0.264
125.33	-5.66	-11.25	0.00	-452.93	0.00	452.93	1,337.98	668.99	1,262.70	623.60	81.80	-6.00	0.262
125.33	-5.66	-11.25	0.00	-452.93	0.00	452.93	893.38	446.69	847.72	418.66	81.80	-6.00	0.324
130.00	-5.16	-10.56	0.00	-400.42	0.00	400.42	879.61	439.81	809.42	399.74	87.75	-6.17	0.290
135.00	-4.63	-9.85	0.00	-347.61	0.00	347.61	863.96	431.98	768.47	379.52	94.29	-6.35	0.256
140.00	-4.11	-9.15	0.00	-298.37	0.00	298.37	847.39	423.70	727.68	359.37	101.01	-6.51	0.223
145.00	-3.61	-8.45	0.00	-252.63	0.00	252.63	829.90	414.95	687.15	339.36	107.90	-6.66	0.192
150.00	-3.09	-8.00	0.00	-210.36	0.00	210.36	811.48	405.74	646.95	319.51	114.94	-6.80	0.163
150.50	-3.06	-7.73	0.00	-206.36	0.00	206.36	809.59	404.79	642.96	317.53	115.65	-6.81	0.160
150.50	-3.06	-7.73	0.00	-206.36	0.00	206.36	809.59	404.79	642.96	317.53	115.65	-6.81	0.654
155.00	-2.87	-7.19	0.00	-171.57	0.00	171.57	792.13	396.07	607.18	299.86	122.10	-6.92	0.576
160.00	-2.64	-6.77	0.00	-135.62	0.00	135.62	771.86	385.93	567.92	280.48	129.57	-7.36	0.487
165.00	-2.42	-6.35	0.00	-101.79	0.00	101.79	750.67	375.34	529.26	261.38	137.46	-7.74	0.393
170.00	-2.22	-5.95	0.00	-70.04	0.00	70.04	728.55	364.28	491.27	242.62	145.72	-8.06	0.292
175.00	-2.04	-5.55	0.00	-40.30	0.00	40.30	696.59	348.30	448.31	221.40	154.26	-8.29	0.185
180.00	-1.85	-5.33	0.00	-12.54	0.00	12.54	663.72	331.86	406.75	200.88	162.99	-8.41	0.065
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	163.71	-8.42	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	163.72	-8.42	0.000

Site Number: 302503 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Lisbon CT 3, CT Engineering Number:OAA694373_C3_01 3/3/2017 5:06:13 PM

Customer: AT&T MOBILITY

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 29 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor 1.00 Wind Importance Factor 1.00

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		52.8	0.0					0.0	0.0	52.8	0.0	0.0	0.0
5.00		105.0	1,325.7					0.0	514.2	105.0	1,840.0	0.0	0.0
10.00		103.7	1,339.1					0.0	518.4	103.7	1,857.5	0.0	0.0
15.00		61.7	1,333.2					0.0	520.7	61.7	1,853.9	0.0	0.0
16.00	Appertunance(s)	50.7	265.8	105.8	0.0	0.0	256.4	0.0	104.3	156.5	626.6	0.0	0.0
20.00		90.4	1,056.2					0.0	406.8	90.4	1,463.0	0.0	0.0
25.00		98.9	1,305.5					0.0	509.1	98.9	1,814.6	0.0	0.0
30.00		98.4	1,287.9					0.0	509.6	98.4	1,797.6	0.0	0.0
35.00		99.9	1,269.0					0.0	510.1	99.9	1,779.1	0.0	0.0
40.00		98.5	1,249.0					26.3	510.5	124.8	1,759.5	0.0	0.0
44.67	Top - Section 1	51.4	1,147.3					25.5	476.8	76.9	1,624.0	0.0	0.0
45.00		55.6	72.0					1.9	34.1	57.4	106.1	0.0	0.0
50.00		104.7	1,067.2					28.3	511.2	133.1	1,578.3	0.0	0.0
55.00		105.6	1,048.3					29.3	511.5	134.8	1,559.7	0.0	0.0
60.00		106.1	1,028.9					30.1	511.7	136.2	1,540.6	0.0	0.0
65.00		106.4	1,009.2					30.9	512.0	137.3	1,521.1	0.0	0.0
70.00		106.5	989.1					31.7	512.2	138.2	1,501.3	0.0	0.0
75.00		106.4	968.7					32.4	512.5	138.8	1,481.2	0.0	0.0
80.00		106.0	948.1					33.1	512.7	139.1	1,460.8	0.0	0.0
85.00		58.2	927.2					33.7	512.9	91.9	1,440.1	0.0	0.0
85.50	Top - Section 2	52.6	91.9					3.4	51.3	56.0	143.2	0.0	0.0
90.00		99.6	710.8					31.0	461.8	130.6	1,172.6	0.0	0.0
95.00		104.1	772.0					35.0	513.3	139.1	1,285.3	0.0	0.0
100.00		103.2	753.7					35.6	513.4	138.7	1,267.1	0.0	0.0
105.00		102.1	735.1					36.1	513.6	138.3	1,248.7	0.0	0.0
110.00		100.9	716.4					36.7	513.8	137.6	1,230.2	0.0	0.0
115.00		99.6	697.6					37.2	513.9	136.9	1,211.5	0.0	0.0
120.00		98.3	678.6					37.7	514.1	136.0	1,192.7	0.0	0.0
125.00		52.0	659.5					38.2	514.2	90.2	1,173.8	0.0	0.0
125.33	Top - Section 3	48.0	43.5					2.6	34.3	50.6	77.8	0.0	0.0
130.00		92.0	511.5					36.2	480.1	128.1	991.6	0.0	0.0
135.00		93.5	532.0					39.2	514.5	132.7	1,046.5	0.0	0.0
140.00		91.7	515.6					39.7	514.7	131.4	1,030.3	0.0	0.0
145.00		89.9	499.2					40.1	514.8	130.0	1,014.0	0.0	0.0
150.00		48.9	482.7					40.6	514.9	89.4	997.6	0.0	0.0
150.50	Reinf. Top	43.5	47.7					4.1	51.5	47.6	99.2	0.0	0.0
155.00		81.6	419.1					36.9	102.8	118.5	521.9	0.0	0.0
160.00		83.9	449.3					0.0	95.6	83.9	544.9	0.0	0.0
165.00		81.8	432.6					0.0	95.6	81.8	528.1	0.0	0.0
170.00		79.6	415.7					0.0	95.6	79.6	511.3	0.0	0.0
175.00		77.3	398.8					0.0	95.6	77.3	494.4	0.0	0.0
180.00		41.2	381.9					0.0	95.6	41.2	477.4	0.0	0.0
180.41		3.1	30.9					0.0	7.8	3.1	38.7	0.0	0.0
180.42		0.0	0.5					0.0	0.0	0.0	0.5	0.0	0.0
									Totals:	4,474.66	46,904.2	0.00	0.00

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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 29 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor 1.00 Wind Importance Factor 1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-54.04	-5.41	0.00	-622.86	0.00	622.86	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.155
5.00	-52.19	-5.35	0.00	-595.81	0.00	595.81	3,339.53	1,669.77	5,587.61	2,759.51	0.03	-0.05	0.151
10.00	-50.33	-5.29	0.00	-569.05	0.00	569.05	3,303.67	1,651.84	5,426.07	2,679.73	0.11	-0.10	0.147
15.00	-48.47	-5.25	0.00	-542.59	0.00	542.59	3,266.89	1,633.44	5,265.23	2,600.30	0.25	-0.16	0.143
16.00	-47.85	-5.12	0.00	-537.34	0.00	537.34	3,259.42	1,629.71	5,233.16	2,584.46	0.28	-0.17	0.142
20.00	-46.38	-5.06	0.00	-516.88	0.00	516.88	3,229.18	1,614.59	5,105.20	2,521.27	0.44	-0.21	0.139
25.00	-44.56	-4.99	0.00	-491.59	0.00	491.59	3,190.54	1,595.27	4,946.05	2,442.67	0.68	-0.26	0.135
30.00	-42.76	-4.92	0.00	-466.63	0.00	466.63	3,150.98	1,575.49	4,787.88	2,364.55	0.98	-0.31	0.131
35.00	-40.98	-4.85	0.00	-442.01	0.00	442.01	3,110.50	1,555.25	4,630.76	2,286.96	1.34	-0.36	0.127
40.00	-39.21	-4.75	0.00	-417.76	0.00	417.76	3,069.09	1,534.55	4,474.78	2,209.92	1.75	-0.41	0.123
44.67	-37.59	-4.67	0.00	-395.61	0.00	395.61	3,029.61	1,514.81	4,330.30	2,138.57	2.18	-0.46	0.119
44.67	-37.59	-4.67	0.00	-395.61	0.00	395.61	2,356.88	1,178.44	3,380.89	1,669.69	2.18	-0.46	0.142
45.00	-37.48	-4.64	0.00	-394.05	0.00	394.05	2,354.99	1,177.50	3,373.36	1,665.97	2.21	-0.47	0.141
50.00	-35.90	-4.52	0.00	-370.87	0.00	370.87	2,326.18	1,163.09	3,260.58	1,610.28	2.73	-0.52	0.136
55.00	-34.34	-4.41	0.00	-348.26	0.00	348.26	2,296.44	1,148.22	3,148.31	1,554.83	3.30	-0.58	0.130
60.00	-32.79	-4.29	0.00	-326.22	0.00	326.22	2,265.77	1,132.89	3,036.63	1,499.68	3.94	-0.63	0.125
65.00	-31.27	-4.16	0.00	-304.79	0.00	304.79	2,234.19	1,117.09	2,925.62	1,444.85	4.63	-0.69	0.119
70.00	-29.77	-4.03	0.00	-283.99	0.00	283.99	2,201.67	1,100.84	2,815.37	1,390.41	5.38	-0.74	0.114
75.00	-28.28	-3.90	0.00	-263.84	0.00	263.84	2,168.24	1,084.12	2,705.97	1,336.38	6.18	-0.79	0.108
80.00	-26.82	-3.76	0.00	-244.35	0.00	244.35	2,133.87	1,066.94	2,597.50	1,282.81	7.04	-0.84	0.103
85.00	-25.38	-3.66	0.00	-225.54	0.00	225.54	2,098.59	1,049.29	2,490.04	1,229.74	7.95	-0.89	0.097
85.50	-25.24	-3.61	0.00	-223.71	0.00	223.71	2,095.01	1,047.50	2,479.36	1,224.46	8.04	-0.90	0.097
85.50	-25.24	-3.61	0.00	-223.71	0.00	223.71	1,537.79	768.90	1,827.83	902.70	8.04	-0.90	0.117
90.00	-24.06	-3.48	0.00	-207.45	0.00	207.45	1,518.16	759.08	1,762.50	870.43	8.91	-0.94	0.111
95.00	-22.78	-3.34	0.00	-190.03	0.00	190.03	1,495.46	747.73	1,690.19	834.72	9.93	-1.00	0.103
100.00	-21.51	-3.20	0.00	-173.32	0.00	173.32	1,471.85	735.92	1,618.25	799.19	11.00	-1.05	0.096
105.00	-20.26	-3.06	0.00	-157.31	0.00	157.31	1,447.30	723.65	1,546.78	763.90	12.12	-1.10	0.090
110.00	-19.03	-2.91	0.00	-142.03	0.00	142.03	1,421.84	710.92	1,475.86	728.87	13.30	-1.14	0.083
115.00	-17.82	-2.76	0.00	-127.48	0.00	127.48	1,395.45	697.72	1,405.58	694.16	14.52	-1.19	0.076
120.00	-16.63	-2.61	0.00	-113.66	0.00	113.66	1,368.13	684.07	1,336.01	659.81	15.79	-1.23	0.070
125.00	-15.46	-2.50	0.00	-100.59	0.00	100.59	1,339.89	669.95	1,267.25	625.85	17.10	-1.27	0.063
125.33	-15.38	-2.46	0.00	-99.76	0.00	99.76	1,337.98	668.99	1,262.70	623.60	17.19	-1.28	0.063
125.33	-15.38	-2.46	0.00	-99.76	0.00	99.76	893.38	446.69	847.72	418.66	17.19	-1.28	0.078
130.00	-14.39	-2.32	0.00	-88.29	0.00	88.29	879.61	439.81	809.42	399.74	18.46	-1.31	0.070
135.00	-13.35	-2.17	0.00	-76.71	0.00	76.71	863.96	431.98	768.47	379.52	19.85	-1.35	0.062
140.00	-12.32	-2.02	0.00	-65.88	0.00	65.88	847.39	423.70	727.68	359.37	21.29	-1.39	0.055
145.00	-11.31	-1.87	0.00	-55.78	0.00	55.78	829.90	414.95	687.15	339.36	22.76	-1.42	0.047
150.00	-10.31	-1.76	0.00	-46.43	0.00	46.43	811.48	405.74	646.95	319.51	24.27	-1.45	0.040
150.50	-10.21	-1.71	0.00	-45.55	0.00	45.55	809.59	404.79	642.96	317.53	24.42	-1.45	0.040
150.50	-10.21	-1.71	0.00	-45.55	0.00	45.55	809.59	404.79	642.96	317.53	24.42	-1.45	0.156
155.00	-9.69	-1.59	0.00	-37.85	0.00	37.85	792.13	396.07	607.18	299.86	25.80	-1.48	0.138
160.00	-9.15	-1.51	0.00	-29.90	0.00	29.90	771.86	385.93	567.92	280.48	27.40	-1.57	0.118
165.00	-8.62	-1.42	0.00	-22.37	0.00	22.37	750.67	375.34	529.26	261.38	29.10	-1.66	0.097
170.00	-8.11	-1.33	0.00	-15.27	0.00	15.27	728.55	364.28	491.27	242.62	30.87	-1.73	0.074
175.00	-7.62	-1.25	0.00	-8.59	0.00	8.59	696.59	348.30	448.31	221.40	32.71	-1.78	0.050
180.00	-7.14	-1.19	0.00	-2.36	0.00	2.36	663.72	331.86	406.75	200.88	34.59	-1.80	0.022
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	34.74	-1.81	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	34.75	-1.81	0.000

Site Number: 302503 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Lisbon CT 3, CT Engineering Number:OAA694373_C3_01 3/3/2017 5:06:14 PM

Customer: AT&T MOBILITY

Load Case: 1.0D + 1.0W Serviceability 60 mph 28 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		60.1	0.0					0.0	0.0	60.1	0.0	0.0	0.0
5.00		119.1	841.4					0.0	413.8	119.1	1,255.2	0.0	0.0
10.00		117.0	826.2					0.0	413.8	117.0	1,240.0	0.0	0.0
15.00		69.4	811.0					0.0	413.8	69.4	1,224.8	0.0	0.0
16.00	Appertunance(s)	56.9	160.4	136.1	0.0	0.0	126.0	0.0	82.8	193.0	369.1	0.0	0.0
20.00		101.2	635.5					0.0	330.9	101.2	966.4	0.0	0.0
25.00		110.5	780.7					0.0	413.6	110.5	1,194.3	0.0	0.0
30.00		109.7	765.5					0.0	413.6	109.7	1,179.1	0.0	0.0
35.00		122.2	750.3					0.0	413.6	122.2	1,163.9	0.0	0.0
40.00		131.0	735.1					26.6	413.6	157.7	1,148.8	0.0	0.0
44.67	Top - Section 1	68.3	672.4					25.3	386.1	93.6	1,058.5	0.0	0.0
45.00		73.6	39.7					1.8	27.6	75.5	67.3	0.0	0.0
50.00		138.6	588.4					27.5	413.6	166.2	1,002.0	0.0	0.0
55.00		139.4	575.7					27.9	413.6	167.3	989.4	0.0	0.0
60.00		139.7	563.1					28.3	413.6	168.1	976.7	0.0	0.0
65.00		139.8	550.4					28.6	413.6	168.4	964.1	0.0	0.0
70.00		139.5	537.8					29.0	413.6	168.4	951.4	0.0	0.0
75.00		138.9	525.1					29.3	413.6	168.2	938.8	0.0	0.0
80.00		138.1	512.5					29.5	413.6	167.6	926.1	0.0	0.0
85.00		75.6	499.8					29.8	413.6	105.5	913.5	0.0	0.0
85.50	Top - Section 2	68.2	49.3					3.0	41.4	71.2	90.6	0.0	0.0
90.00		128.9	351.1					27.1	372.3	156.0	723.4	0.0	0.0
95.00		134.3	380.5					30.3	413.6	164.6	794.1	0.0	0.0
100.00		132.6	370.4					30.5	413.6	163.1	784.0	0.0	0.0
105.00		130.8	360.3					30.7	413.6	161.5	773.9	0.0	0.0
110.00		128.8	350.1					31.0	413.6	159.8	763.8	0.0	0.0
115.00		126.7	340.0					31.2	413.6	157.8	753.7	0.0	0.0
120.00		124.4	329.9					31.4	413.6	155.7	743.5	0.0	0.0
125.00		65.7	319.8					31.5	413.6	97.2	733.4	0.0	0.0
125.33	Top - Section 3	60.4	21.0					2.1	27.6	62.5	48.5	0.0	0.0
130.00		115.3	217.1					29.6	386.1	145.0	603.2	0.0	0.0
135.00		116.7	225.3					31.9	413.6	148.6	638.9	0.0	0.0
140.00		113.9	217.7					32.1	413.6	146.0	631.3	0.0	0.0
145.00		111.1	210.1					32.2	413.6	143.3	623.8	0.0	0.0
150.00		60.2	202.5					32.4	413.6	92.6	616.2	0.0	0.0
150.50	Reinf. Top	53.3	19.8					3.2	41.4	56.5	61.2	0.0	0.0
155.00		90.9	175.1					29.3	71.7	120.2	246.8	0.0	0.0
160.00		84.8	187.4					0.0	79.6	84.8	267.0	0.0	0.0
165.00		82.0	179.8					0.0	79.6	82.0	259.4	0.0	0.0
170.00		79.2	172.2					0.0	79.6	79.2	251.8	0.0	0.0
175.00		76.3	164.6					0.0	79.6	76.3	244.2	0.0	0.0
180.00		40.4	157.0					0.0	79.6	40.4	236.6	0.0	0.0
180.41		3.0	12.5					0.0	6.5	3.0	19.1	0.0	0.0
180.42		0.0	0.2					0.0	0.0	0.0	0.2	0.0	0.0
									Totals:	5,175.84	29,438.0	0.00	0.00

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Load Case: 1.0D + 1.0W Serviceability 60 mph 28 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-32.32	-6.15	0.00	-658.18	0.00	658.18	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.158
5.00	-31.05	-6.06	0.00	-627.44	0.00	627.44	3,339.53	1,669.77	5,587.61	2,759.51	0.03	-0.05	0.154
10.00	-29.81	-5.97	0.00	-597.15	0.00	597.15	3,303.67	1,651.84	5,426.07	2,679.73	0.12	-0.11	0.149
15.00	-28.58	-5.91	0.00	-567.32	0.00	567.32	3,266.89	1,633.44	5,265.23	2,600.30	0.26	-0.16	0.145
16.00	-28.21	-5.73	0.00	-561.41	0.00	561.41	3,259.42	1,629.71	5,233.16	2,584.46	0.30	-0.18	0.144
20.00	-27.24	-5.65	0.00	-538.48	0.00	538.48	3,229.18	1,614.59	5,105.20	2,521.27	0.46	-0.22	0.140
25.00	-26.04	-5.56	0.00	-510.24	0.00	510.24	3,190.54	1,595.27	4,946.05	2,442.67	0.72	-0.27	0.136
30.00	-24.86	-5.47	0.00	-482.45	0.00	482.45	3,150.98	1,575.49	4,787.88	2,364.55	1.03	-0.33	0.131
35.00	-23.69	-5.36	0.00	-455.12	0.00	455.12	3,110.50	1,555.25	4,630.76	2,286.96	1.40	-0.38	0.127
40.00	-22.54	-5.21	0.00	-428.33	0.00	428.33	3,069.09	1,534.55	4,474.78	2,209.92	1.83	-0.43	0.122
44.67	-21.48	-5.12	0.00	-404.01	0.00	404.01	3,029.61	1,514.81	4,330.30	2,138.57	2.28	-0.48	0.118
44.67	-21.48	-5.12	0.00	-404.01	0.00	404.01	2,356.88	1,178.44	3,380.89	1,669.69	2.28	-0.48	0.140
45.00	-21.41	-5.06	0.00	-402.30	0.00	402.30	2,354.99	1,177.50	3,373.36	1,665.97	2.31	-0.48	0.140
50.00	-20.40	-4.90	0.00	-377.02	0.00	377.02	2,326.18	1,163.09	3,260.58	1,610.28	2.85	-0.54	0.134
55.00	-19.41	-4.74	0.00	-352.52	0.00	352.52	2,296.44	1,148.22	3,148.31	1,554.83	3.45	-0.60	0.128
60.00	-18.43	-4.58	0.00	-328.81	0.00	328.81	2,265.77	1,132.89	3,036.63	1,499.68	4.10	-0.65	0.122
65.00	-17.46	-4.42	0.00	-305.91	0.00	305.91	2,234.19	1,117.09	2,925.62	1,444.85	4.82	-0.71	0.116
70.00	-16.51	-4.25	0.00	-283.82	0.00	283.82	2,201.67	1,100.84	2,815.37	1,390.41	5.59	-0.76	0.110
75.00	-15.57	-4.09	0.00	-262.56	0.00	262.56	2,168.24	1,084.12	2,705.97	1,336.38	6.41	-0.81	0.104
80.00	-14.64	-3.92	0.00	-242.13	0.00	242.13	2,133.87	1,066.94	2,597.50	1,282.81	7.29	-0.86	0.098
85.00	-13.73	-3.80	0.00	-222.55	0.00	222.55	2,098.59	1,049.29	2,490.04	1,229.74	8.22	-0.91	0.093
85.50	-13.64	-3.74	0.00	-220.65	0.00	220.65	2,095.01	1,047.50	2,479.36	1,224.46	8.32	-0.92	0.092
85.50	-13.64	-3.74	0.00	-220.65	0.00	220.65	1,537.79	768.90	1,827.83	902.70	8.32	-0.92	0.111
90.00	-12.92	-3.58	0.00	-203.83	0.00	203.83	1,518.16	759.08	1,762.50	870.43	9.21	-0.96	0.105
95.00	-12.12	-3.41	0.00	-185.93	0.00	185.93	1,495.46	747.73	1,690.19	834.72	10.24	-1.01	0.098
100.00	-11.34	-3.24	0.00	-168.87	0.00	168.87	1,471.85	735.92	1,618.25	799.19	11.33	-1.06	0.091
105.00	-10.56	-3.08	0.00	-152.64	0.00	152.64	1,447.30	723.65	1,546.78	763.90	12.47	-1.11	0.084
110.00	-9.80	-2.91	0.00	-137.26	0.00	137.26	1,421.84	710.92	1,475.86	728.87	13.66	-1.16	0.077
115.00	-9.05	-2.74	0.00	-122.71	0.00	122.71	1,395.45	697.72	1,405.58	694.16	14.90	-1.20	0.070
120.00	-8.31	-2.58	0.00	-108.99	0.00	108.99	1,368.13	684.07	1,336.01	659.81	16.18	-1.24	0.064
125.00	-7.58	-2.47	0.00	-96.10	0.00	96.10	1,339.89	669.95	1,267.25	625.85	17.50	-1.28	0.058
125.33	-7.53	-2.41	0.00	-95.28	0.00	95.28	1,337.98	668.99	1,262.70	623.60	17.59	-1.29	0.057
125.33	-7.53	-2.41	0.00	-95.28	0.00	95.28	893.38	446.69	847.72	418.66	17.59	-1.29	0.071
130.00	-6.93	-2.25	0.00	-84.05	0.00	84.05	879.61	439.81	809.42	399.74	18.87	-1.32	0.064
135.00	-6.29	-2.09	0.00	-72.79	0.00	72.79	863.96	431.98	768.47	379.52	20.27	-1.36	0.056
140.00	-5.66	-1.93	0.00	-62.32	0.00	62.32	847.39	423.70	727.68	359.37	21.71	-1.39	0.049
145.00	-5.04	-1.78	0.00	-52.65	0.00	52.65	829.90	414.95	687.15	339.36	23.19	-1.42	0.042
150.00	-4.43	-1.67	0.00	-43.76	0.00	43.76	811.48	405.74	646.95	319.51	24.69	-1.45	0.036
150.50	-4.37	-1.61	0.00	-42.92	0.00	42.92	809.59	404.79	642.96	317.53	24.85	-1.45	0.035
150.50	-4.37	-1.61	0.00	-42.92	0.00	42.92	809.59	404.79	642.96	317.53	24.85	-1.45	0.141
155.00	-4.12	-1.49	0.00	-35.65	0.00	35.65	792.13	396.07	607.18	299.86	26.23	-1.48	0.124
160.00	-3.85	-1.41	0.00	-28.19	0.00	28.19	771.86	385.93	567.92	280.48	27.82	-1.57	0.106
165.00	-3.60	-1.32	0.00	-21.16	0.00	21.16	750.67	375.34	529.26	261.38	29.51	-1.65	0.086
170.00	-3.34	-1.24	0.00	-14.55	0.00	14.55	728.55	364.28	491.27	242.62	31.27	-1.71	0.065
175.00	-3.10	-1.16	0.00	-8.35	0.00	8.35	696.59	348.30	448.31	221.40	33.09	-1.76	0.042
180.00	-2.87	-1.11	0.00	-2.57	0.00	2.57	663.72	331.86	406.75	200.88	34.95	-1.79	0.017
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	35.11	-1.79	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	35.11	-1.79	0.000

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Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.17	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06	
Long-Period Transition Period (T_L):	6	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.60	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.18	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10	
Seismic Response Coefficient (C_s):	0.03	
Upper Limit C_s	0.03	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	2.83	
Redundancy Factor (p):	1.30	
Seismic Force Distribution Exponent (k):	2.00	
Total Unfactored Dead Load:	32.32	k
Seismic Base Shear (E):	1.26	k

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
43	180.41	0	7	0.000	0	0
42	180.21	19	619	0.002	3	24
41	177.50	237	7,456	0.024	31	292
40	172.50	244	7,267	0.024	30	302
39	167.50	252	7,065	0.023	29	311
38	162.50	259	6,850	0.022	28	321
37	157.50	267	6,623	0.022	27	330
36	152.75	247	5,758	0.019	24	305
35	150.25	61	1,382	0.005	6	76
34	147.50	616	13,406	0.044	55	762
33	142.50	624	12,666	0.042	52	771
32	137.50	631	11,936	0.039	49	780
31	132.50	639	11,217	0.037	46	790
30	127.67	603	9,832	0.032	41	746
29	125.17	49	760	0.002	3	60
28	122.50	733	11,006	0.036	45	907
27	117.50	744	10,265	0.034	42	919
26	112.50	754	9,538	0.031	39	932
25	107.50	764	8,826	0.029	36	944
24	102.50	774	8,131	0.027	34	957
23	97.50	784	7,453	0.024	31	969
22	92.50	794	6,795	0.022	28	982
21	87.75	723	5,570	0.018	23	894

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20	85.25	91	659	0.002	3	112
19	82.50	913	6,217	0.020	26	1,129
18	77.50	926	5,563	0.018	23	1,145
17	72.50	939	4,934	0.016	20	1,160
16	67.50	951	4,335	0.014	18	1,176
15	62.50	964	3,766	0.012	16	1,192
14	57.50	977	3,229	0.011	13	1,207
13	52.50	989	2,727	0.009	11	1,223
12	47.50	1,002	2,261	0.007	9	1,239
11	44.83	67	135	0.000	1	83
10	42.33	1,058	1,897	0.006	8	1,308
9	37.50	1,149	1,615	0.005	7	1,420
8	32.50	1,164	1,229	0.004	5	1,439
7	27.50	1,179	892	0.003	4	1,457
6	22.50	1,194	605	0.002	2	1,476
5	18.00	966	313	0.001	1	1,194
4	15.50	243	58	0.000	0	301
3	12.50	1,225	191	0.001	1	1,514
2	7.50	1,240	70	0.000	0	1,533
1	2.50	1,255	8	0.000	0	1,551
LGP Allgon LGP21903	180.41	33	1,074	0.004	4	41
Powerwave Allgon LGP	180.41	85	2,754	0.009	11	105
Raycap DC6-48-60-18-	180.41	20	651	0.002	3	25
6' Omni	180.41	25	814	0.003	3	31
Ericsson RRUS-11 800	180.41	162	5,273	0.017	22	200
Ericsson RRUS 32 B2	180.41	159	5,175	0.017	21	197
Powerwave 7770.00	180.41	210	6,835	0.022	28	260
CCI HPA-65R-BUU-H6	180.41	51	1,660	0.005	7	63
CCI HPA-65R-BUU-H8	180.41	136	4,426	0.015	18	168
Flat Platform w/ Han	180.41	2,000	65,096	0.213	269	2,472
Channel Master Type	16.00	126	32	0.000	0	156
		32,319	304,922	1.000	1,260	39,948

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
43	180.41	0	7	0.000	0	0
42	180.21	19	619	0.002	3	16
41	177.50	237	7,456	0.024	31	204
40	172.50	244	7,267	0.024	30	211
39	167.50	252	7,065	0.023	29	218
38	162.50	259	6,850	0.022	28	224
37	157.50	267	6,623	0.022	27	231
36	152.75	247	5,758	0.019	24	213
35	150.25	61	1,382	0.005	6	53
34	147.50	616	13,406	0.044	55	532
33	142.50	624	12,666	0.042	52	539
32	137.50	631	11,936	0.039	49	545
31	132.50	639	11,217	0.037	46	552
30	127.67	603	9,832	0.032	41	521
29	125.17	49	760	0.002	3	42
28	122.50	733	11,006	0.036	45	634
27	117.50	744	10,265	0.034	42	642
26	112.50	754	9,538	0.031	39	651
25	107.50	764	8,826	0.029	36	660
24	102.50	774	8,131	0.027	34	669
23	97.50	784	7,453	0.024	31	677
22	92.50	794	6,795	0.022	28	686
21	87.75	723	5,570	0.018	23	625

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20	85.25	91	659	0.002	3	78
19	82.50	913	6,217	0.020	26	789
18	77.50	926	5,563	0.018	23	800
17	72.50	939	4,934	0.016	20	811
16	67.50	951	4,335	0.014	18	822
15	62.50	964	3,766	0.012	16	833
14	57.50	977	3,229	0.011	13	844
13	52.50	989	2,727	0.009	11	855
12	47.50	1,002	2,261	0.007	9	866
11	44.83	67	135	0.000	1	58
10	42.33	1,058	1,897	0.006	8	914
9	37.50	1,149	1,615	0.005	7	992
8	32.50	1,164	1,229	0.004	5	1,006
7	27.50	1,179	892	0.003	4	1,019
6	22.50	1,194	605	0.002	2	1,032
5	18.00	966	313	0.001	1	835
4	15.50	243	58	0.000	0	210
3	12.50	1,225	191	0.001	1	1,058
2	7.50	1,240	70	0.000	0	1,071
1	2.50	1,255	8	0.000	0	1,084
LGP Allgon LGP21903	180.41	33	1,074	0.004	4	29
Powerwave Allgon LGP	180.41	85	2,754	0.009	11	73
Raycap DC6-48-60-18-	180.41	20	651	0.002	3	17
6' Omni	180.41	25	814	0.003	3	22
Ericsson RRUS-11 800	180.41	162	5,273	0.017	22	140
Ericsson RRUS 32 B2	180.41	159	5,175	0.017	21	137
Powerwave 7770.00	180.41	210	6,835	0.022	28	181
CCI HPA-65R-BUU-H6	180.41	51	1,660	0.005	7	44
CCI HPA-65R-BUU-H8	180.41	136	4,426	0.015	18	117
Flat Platform w/ Han	180.41	2,000	65,096	0.213	269	1,728
Channel Master Type	16.00	126	32	0.000	0	109
		32,319	304,922	1.000	1,260	27,922

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Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-38.40	-1.26	0.00	-181.86	0.00	181.86	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.050
5.00	-36.86	-1.27	0.00	-175.54	0.00	175.54	3,339.53	1,669.77	5,587.61	2,759.51	0.01	-0.02	0.049
10.00	-35.35	-1.28	0.00	-169.17	0.00	169.17	3,303.67	1,651.84	5,426.07	2,679.73	0.03	-0.03	0.048
15.00	-35.05	-1.29	0.00	-162.76	0.00	162.76	3,266.89	1,633.44	5,265.23	2,600.30	0.07	-0.05	0.047
16.00	-33.70	-1.29	0.00	-161.47	0.00	161.47	3,259.42	1,629.71	5,233.16	2,584.46	0.08	-0.05	0.047
20.00	-32.22	-1.29	0.00	-156.31	0.00	156.31	3,229.18	1,614.59	5,105.20	2,521.27	0.13	-0.06	0.046
25.00	-30.76	-1.30	0.00	-149.84	0.00	149.84	3,190.54	1,595.27	4,946.05	2,442.67	0.20	-0.08	0.045
30.00	-29.32	-1.30	0.00	-143.36	0.00	143.36	3,150.98	1,575.49	4,787.88	2,364.55	0.29	-0.09	0.044
35.00	-27.90	-1.30	0.00	-136.87	0.00	136.87	3,110.50	1,555.25	4,630.76	2,286.96	0.40	-0.11	0.043
40.00	-26.60	-1.29	0.00	-130.39	0.00	130.39	3,069.09	1,534.55	4,474.78	2,209.92	0.52	-0.13	0.042
44.67	-26.51	-1.30	0.00	-124.36	0.00	124.36	3,029.61	1,514.81	4,330.30	2,138.57	0.65	-0.14	0.041
44.67	-26.51	-1.30	0.00	-124.36	0.00	124.36	2,356.88	1,178.44	3,380.89	1,669.69	0.65	-0.14	0.049
45.00	-25.27	-1.29	0.00	-123.92	0.00	123.92	2,354.99	1,177.50	3,373.36	1,665.97	0.66	-0.14	0.048
50.00	-24.05	-1.28	0.00	-117.49	0.00	117.49	2,326.18	1,163.09	3,260.58	1,610.28	0.82	-0.16	0.047
55.00	-22.84	-1.27	0.00	-111.08	0.00	111.08	2,296.44	1,148.22	3,148.31	1,554.83	1.00	-0.18	0.045
60.00	-21.65	-1.26	0.00	-104.73	0.00	104.73	2,265.77	1,132.89	3,036.63	1,499.68	1.19	-0.19	0.043
65.00	-20.47	-1.24	0.00	-98.44	0.00	98.44	2,234.19	1,117.09	2,925.62	1,444.85	1.40	-0.21	0.041
70.00	-19.31	-1.22	0.00	-92.23	0.00	92.23	2,201.67	1,100.84	2,815.37	1,390.41	1.63	-0.23	0.040
75.00	-18.17	-1.20	0.00	-86.12	0.00	86.12	2,168.24	1,084.12	2,705.97	1,336.38	1.88	-0.25	0.038
80.00	-17.04	-1.17	0.00	-80.12	0.00	80.12	2,133.87	1,066.94	2,597.50	1,282.81	2.15	-0.26	0.036
85.00	-16.93	-1.17	0.00	-74.24	0.00	74.24	2,098.59	1,049.29	2,490.04	1,229.74	2.43	-0.28	0.034
85.50	-16.03	-1.15	0.00	-73.66	0.00	73.66	2,095.01	1,047.50	2,479.36	1,224.46	2.46	-0.28	0.034
85.50	-16.03	-1.15	0.00	-73.66	0.00	73.66	1,537.79	768.90	1,827.83	902.70	2.46	-0.28	0.041
90.00	-15.05	-1.12	0.00	-68.48	0.00	68.48	1,518.16	759.08	1,762.50	870.43	2.73	-0.30	0.039
95.00	-14.08	-1.09	0.00	-62.88	0.00	62.88	1,495.46	747.73	1,690.19	834.72	3.05	-0.31	0.037
100.00	-13.12	-1.05	0.00	-57.44	0.00	57.44	1,471.85	735.92	1,618.25	799.19	3.39	-0.33	0.034
105.00	-12.18	-1.01	0.00	-52.17	0.00	52.17	1,447.30	723.65	1,546.78	763.90	3.75	-0.35	0.032
110.00	-11.25	-0.97	0.00	-47.10	0.00	47.10	1,421.84	710.92	1,475.86	728.87	4.12	-0.36	0.029
115.00	-10.33	-0.93	0.00	-42.24	0.00	42.24	1,395.45	697.72	1,405.58	694.16	4.50	-0.38	0.027
120.00	-9.42	-0.88	0.00	-37.60	0.00	37.60	1,368.13	684.07	1,336.01	659.81	4.91	-0.39	0.024
125.00	-9.36	-0.88	0.00	-33.21	0.00	33.21	1,339.89	669.95	1,267.25	625.85	5.32	-0.41	0.022
125.33	-8.62	-0.83	0.00	-32.92	0.00	32.92	1,337.98	668.99	1,262.70	623.60	5.35	-0.41	0.022
125.33	-8.62	-0.83	0.00	-32.92	0.00	32.92	893.38	446.69	847.72	418.66	5.35	-0.41	0.027
130.00	-7.83	-0.78	0.00	-29.05	0.00	29.05	879.61	439.81	809.42	399.74	5.76	-0.42	0.024
135.00	-7.05	-0.73	0.00	-25.15	0.00	25.15	863.96	431.98	768.47	379.52	6.20	-0.43	0.022
140.00	-6.28	-0.67	0.00	-21.51	0.00	21.51	847.39	423.70	727.68	359.37	6.66	-0.44	0.019
145.00	-5.52	-0.61	0.00	-18.17	0.00	18.17	829.90	414.95	687.15	339.36	7.13	-0.45	0.016
150.00	-5.44	-0.60	0.00	-15.12	0.00	15.12	811.48	405.74	646.95	319.51	7.61	-0.46	0.014
150.50	-5.14	-0.58	0.00	-14.82	0.00	14.82	809.59	404.79	642.96	317.53	7.66	-0.46	0.014
150.50	-5.14	-0.58	0.00	-14.82	0.00	14.82	809.59	404.79	642.96	317.53	7.66	-0.46	0.053
155.00	-4.81	-0.55	0.00	-12.22	0.00	12.22	792.13	396.07	607.18	299.86	8.10	-0.47	0.047
160.00	-4.49	-0.52	0.00	-9.47	0.00	9.47	771.86	385.93	567.92	280.48	8.61	-0.50	0.040
165.00	-4.17	-0.49	0.00	-6.87	0.00	6.87	750.67	375.34	529.26	261.38	9.15	-0.53	0.032
170.00	-3.87	-0.46	0.00	-4.42	0.00	4.42	728.55	364.28	491.27	242.62	9.72	-0.55	0.024
175.00	-3.58	-0.43	0.00	-2.13	0.00	2.13	696.59	348.30	448.31	221.40	10.30	-0.56	0.015
180.00	0.00	0.00	0.00	0.00	0.00	0.00	663.72	331.86	406.75	200.88	10.89	-0.57	0.000
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	10.94	-0.57	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	10.94	-0.57	0.000

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Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-26.84	-1.26	0.00	-178.65	0.00	178.65	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.047
5.00	-25.77	-1.27	0.00	-172.33	0.00	172.33	3,339.53	1,669.77	5,587.61	2,759.51	0.01	-0.01	0.046
10.00	-24.71	-1.27	0.00	-165.98	0.00	165.98	3,303.67	1,651.84	5,426.07	2,679.73	0.03	-0.03	0.045
15.00	-24.50	-1.28	0.00	-159.61	0.00	159.61	3,266.89	1,633.44	5,265.23	2,600.30	0.07	-0.05	0.044
16.00	-23.55	-1.28	0.00	-158.33	0.00	158.33	3,259.42	1,629.71	5,233.16	2,584.46	0.08	-0.05	0.044
20.00	-22.52	-1.28	0.00	-153.21	0.00	153.21	3,229.18	1,614.59	5,105.20	2,521.27	0.13	-0.06	0.043
25.00	-21.50	-1.28	0.00	-146.80	0.00	146.80	3,190.54	1,595.27	4,946.05	2,442.67	0.20	-0.08	0.042
30.00	-20.50	-1.28	0.00	-140.39	0.00	140.39	3,150.98	1,575.49	4,787.88	2,364.55	0.29	-0.09	0.041
35.00	-19.50	-1.28	0.00	-133.99	0.00	133.99	3,110.50	1,555.25	4,630.76	2,286.96	0.39	-0.11	0.040
40.00	-18.59	-1.27	0.00	-127.59	0.00	127.59	3,069.09	1,534.55	4,474.78	2,209.92	0.51	-0.12	0.039
44.67	-18.53	-1.28	0.00	-121.65	0.00	121.65	3,029.61	1,514.81	4,330.30	2,138.57	0.64	-0.14	0.038
44.67	-18.53	-1.28	0.00	-121.65	0.00	121.65	2,356.88	1,178.44	3,380.89	1,669.69	0.64	-0.14	0.045
45.00	-17.66	-1.27	0.00	-121.23	0.00	121.23	2,354.99	1,177.50	3,373.36	1,665.97	0.65	-0.14	0.045
50.00	-16.81	-1.26	0.00	-114.89	0.00	114.89	2,326.18	1,163.09	3,260.58	1,610.28	0.80	-0.16	0.044
55.00	-15.96	-1.25	0.00	-108.60	0.00	108.60	2,296.44	1,148.22	3,148.31	1,554.83	0.98	-0.17	0.042
60.00	-15.13	-1.23	0.00	-102.36	0.00	102.36	2,265.77	1,132.89	3,036.63	1,499.68	1.17	-0.19	0.041
65.00	-14.31	-1.22	0.00	-96.20	0.00	96.20	2,234.19	1,117.09	2,925.62	1,444.85	1.38	-0.21	0.039
70.00	-13.50	-1.20	0.00	-90.11	0.00	90.11	2,201.67	1,100.84	2,815.37	1,390.41	1.60	-0.22	0.037
75.00	-12.70	-1.18	0.00	-84.12	0.00	84.12	2,168.24	1,084.12	2,705.97	1,336.38	1.84	-0.24	0.036
80.00	-11.91	-1.15	0.00	-78.25	0.00	78.25	2,133.87	1,066.94	2,597.50	1,282.81	2.11	-0.26	0.034
85.00	-11.83	-1.15	0.00	-72.50	0.00	72.50	2,098.59	1,049.29	2,490.04	1,229.74	2.38	-0.27	0.032
85.50	-11.20	-1.12	0.00	-71.93	0.00	71.93	2,095.01	1,047.50	2,479.36	1,224.46	2.41	-0.28	0.032
85.50	-11.20	-1.12	0.00	-71.93	0.00	71.93	1,537.79	768.90	1,827.83	902.70	2.41	-0.28	0.039
90.00	-10.52	-1.10	0.00	-66.87	0.00	66.87	1,518.16	759.08	1,762.50	870.43	2.68	-0.29	0.037
95.00	-9.84	-1.06	0.00	-61.39	0.00	61.39	1,495.46	747.73	1,690.19	834.72	2.99	-0.31	0.034
100.00	-9.17	-1.03	0.00	-56.08	0.00	56.08	1,471.85	735.92	1,618.25	799.19	3.32	-0.32	0.032
105.00	-8.51	-0.99	0.00	-50.93	0.00	50.93	1,447.30	723.65	1,546.78	763.90	3.67	-0.34	0.030
110.00	-7.86	-0.95	0.00	-45.98	0.00	45.98	1,421.84	710.92	1,475.86	728.87	4.03	-0.35	0.027
115.00	-7.22	-0.91	0.00	-41.23	0.00	41.23	1,395.45	697.72	1,405.58	694.16	4.41	-0.37	0.025
120.00	-6.59	-0.86	0.00	-36.70	0.00	36.70	1,368.13	684.07	1,336.01	659.81	4.80	-0.38	0.023
125.00	-6.54	-0.85	0.00	-32.42	0.00	32.42	1,339.89	669.95	1,267.25	625.85	5.21	-0.40	0.021
125.33	-6.02	-0.81	0.00	-32.13	0.00	32.13	1,337.98	668.99	1,262.70	623.60	5.24	-0.40	0.021
125.33	-6.02	-0.81	0.00	-32.13	0.00	32.13	893.38	446.69	847.72	418.66	5.24	-0.40	0.026
130.00	-5.47	-0.76	0.00	-28.35	0.00	28.35	879.61	439.81	809.42	399.74	5.63	-0.41	0.023
135.00	-4.93	-0.71	0.00	-24.54	0.00	24.54	863.96	431.98	768.47	379.52	6.07	-0.42	0.020
140.00	-4.39	-0.65	0.00	-20.99	0.00	20.99	847.39	423.70	727.68	359.37	6.52	-0.43	0.018
145.00	-3.85	-0.60	0.00	-17.72	0.00	17.72	829.90	414.95	687.15	339.36	6.98	-0.44	0.015
150.00	-3.80	-0.59	0.00	-14.75	0.00	14.75	811.48	405.74	646.95	319.51	7.44	-0.45	0.013
150.50	-3.59	-0.56	0.00	-14.45	0.00	14.45	809.59	404.79	642.96	317.53	7.49	-0.45	0.013
150.50	-3.59	-0.56	0.00	-14.45	0.00	14.45	809.59	404.79	642.96	317.53	7.49	-0.45	0.050
155.00	-3.36	-0.54	0.00	-11.91	0.00	11.91	792.13	396.07	607.18	299.86	7.92	-0.46	0.044
160.00	-3.13	-0.51	0.00	-9.23	0.00	9.23	771.86	385.93	567.92	280.48	8.42	-0.49	0.037
165.00	-2.92	-0.48	0.00	-6.69	0.00	6.69	750.67	375.34	529.26	261.38	8.95	-0.52	0.029
170.00	-2.71	-0.45	0.00	-4.30	0.00	4.30	728.55	364.28	491.27	242.62	9.51	-0.54	0.021
175.00	-2.50	-0.41	0.00	-2.07	0.00	2.07	696.59	348.30	448.31	221.40	10.08	-0.55	0.013
180.00	0.00	0.00	0.00	0.00	0.00	0.00	663.72	331.86	406.75	200.88	10.66	-0.56	0.000
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	10.70	-0.56	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	10.71	-0.56	0.000

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Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.17
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.18
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	2.83
Redundancy Factor (p):	1.30

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
43	180.41	0	1.890	1.980	1.140	0.340	0	0
42	180.21	19	1.886	1.957	1.132	0.338	6	24
41	177.50	237	1.829	1.675	1.029	0.304	62	292
40	172.50	244	1.728	1.230	0.858	0.246	52	302
39	167.50	252	1.629	0.871	0.710	0.194	42	311
38	162.50	259	1.533	0.586	0.583	0.147	33	321
37	157.50	267	1.440	0.365	0.475	0.105	24	330
36	152.75	247	1.355	0.204	0.387	0.070	15	305
35	150.25	61	1.311	0.136	0.346	0.053	3	76
34	147.50	616	1.263	0.073	0.305	0.036	19	762
33	142.50	624	1.179	-0.014	0.239	0.010	5	771
32	137.50	631	1.098	-0.071	0.185	-0.012	-7	780
31	132.50	639	1.019	-0.105	0.141	-0.029	-16	790
30	127.67	603	0.946	-0.119	0.106	-0.041	-21	746
29	125.17	49	0.910	-0.122	0.091	-0.045	-2	60
28	122.50	733	0.871	-0.121	0.077	-0.048	-31	907
27	117.50	744	0.802	-0.112	0.054	-0.050	-33	919
26	112.50	754	0.735	-0.097	0.037	-0.047	-31	932
25	107.50	764	0.671	-0.078	0.025	-0.040	-26	944
24	102.50	774	0.610	-0.057	0.016	-0.028	-19	957
23	97.50	784	0.552	-0.035	0.010	-0.013	-9	969
22	92.50	794	0.497	-0.015	0.007	0.002	2	982
21	87.75	723	0.447	0.003	0.006	0.016	10	894
20	85.25	91	0.422	0.011	0.006	0.023	2	112
19	82.50	913	0.395	0.020	0.007	0.030	23	1,129
18	77.50	926	0.349	0.033	0.009	0.039	31	1,145
17	72.50	939	0.305	0.044	0.012	0.046	37	1,160
16	67.50	951	0.265	0.053	0.016	0.050	41	1,176
15	62.50	964	0.227	0.059	0.020	0.051	43	1,192
14	57.50	977	0.192	0.064	0.024	0.052	44	1,207
13	52.50	989	0.160	0.067	0.029	0.052	44	1,223
12	47.50	1,002	0.131	0.069	0.033	0.051	44	1,239
11	44.83	67	0.117	0.070	0.035	0.051	3	83
10	42.33	1,058	0.104	0.071	0.037	0.050	46	1,308

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9	37.50	1,149	0.082	0.072	0.039	0.049	49	1,420
8	32.50	1,164	0.061	0.072	0.041	0.048	48	1,439
7	27.50	1,179	0.044	0.071	0.042	0.047	48	1,457
6	22.50	1,194	0.029	0.068	0.040	0.045	47	1,476
5	18.00	966	0.019	0.063	0.037	0.043	36	1,194
4	15.50	243	0.014	0.060	0.035	0.041	9	301
3	12.50	1,225	0.009	0.053	0.031	0.038	40	1,514
2	7.50	1,240	0.003	0.038	0.021	0.029	31	1,533
1	2.50	1,255	0.000	0.015	0.008	0.013	14	1,551
LGP Allgon LGP21903	180.41	33	1.890	1.979	1.140	0.340	10	41
Powerwave Allgon LGP	180.41	85	1.890	1.979	1.140	0.340	25	105
Raycap DC6-48-60-18-	180.41	20	1.890	1.979	1.140	0.340	6	25
6' Omni	180.41	25	1.890	1.979	1.140	0.340	7	31
Ericsson RRUS-11 800	180.41	162	1.890	1.979	1.140	0.340	48	200
Ericsson RRUS 32 B2	180.41	159	1.890	1.979	1.140	0.340	47	197
Powerwave 7770.00	180.41	210	1.890	1.979	1.140	0.340	62	260
CCI HPA-65R-BUU-H6	180.41	51	1.890	1.979	1.140	0.340	15	63
CCI HPA-65R-BUU-H8	180.41	136	1.890	1.979	1.140	0.340	40	168
Flat Platform w/ Han	180.41	2,000	1.890	1.979	1.140	0.340	590	2,472
Channel Master Type	16.00	126	0.015	0.060	0.035	0.041	5	156
		32,319	48.043	29.060	19.912	5.797	1,614	39,948

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
43	180.41	0	1.890	1.980	1.140	0.340	0	0
42	180.21	19	1.886	1.957	1.132	0.338	6	16
41	177.50	237	1.829	1.675	1.029	0.304	62	204
40	172.50	244	1.728	1.230	0.858	0.246	52	211
39	167.50	252	1.629	0.871	0.710	0.194	42	218
38	162.50	259	1.533	0.586	0.583	0.147	33	224
37	157.50	267	1.440	0.365	0.475	0.105	24	231
36	152.75	247	1.355	0.204	0.387	0.070	15	213
35	150.25	61	1.311	0.136	0.346	0.053	3	53
34	147.50	616	1.263	0.073	0.305	0.036	19	532
33	142.50	624	1.179	-0.014	0.239	0.010	5	539
32	137.50	631	1.098	-0.071	0.185	-0.012	-7	545
31	132.50	639	1.019	-0.105	0.141	-0.029	-16	552
30	127.67	603	0.946	-0.119	0.106	-0.041	-21	521
29	125.17	49	0.910	-0.122	0.091	-0.045	-2	42
28	122.50	733	0.871	-0.121	0.077	-0.048	-31	634
27	117.50	744	0.802	-0.112	0.054	-0.050	-33	642
26	112.50	754	0.735	-0.097	0.037	-0.047	-31	651
25	107.50	764	0.671	-0.078	0.025	-0.040	-26	660
24	102.50	774	0.610	-0.057	0.016	-0.028	-19	669
23	97.50	784	0.552	-0.035	0.010	-0.013	-9	677
22	92.50	794	0.497	-0.015	0.007	0.002	2	686
21	87.75	723	0.447	0.003	0.006	0.016	10	625
20	85.25	91	0.422	0.011	0.006	0.023	2	78
19	82.50	913	0.395	0.020	0.007	0.030	23	789
18	77.50	926	0.349	0.033	0.009	0.039	31	800
17	72.50	939	0.305	0.044	0.012	0.046	37	811
16	67.50	951	0.265	0.053	0.016	0.050	41	822
15	62.50	964	0.227	0.059	0.020	0.051	43	833
14	57.50	977	0.192	0.064	0.024	0.052	44	844
13	52.50	989	0.160	0.067	0.029	0.052	44	855
12	47.50	1,002	0.131	0.069	0.033	0.051	44	866
11	44.83	67	0.117	0.070	0.035	0.051	3	58

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10	42.33	1,058	0.104	0.071	0.037	0.050	46	914
9	37.50	1,149	0.082	0.072	0.039	0.049	49	992
8	32.50	1,164	0.061	0.072	0.041	0.048	48	1,006
7	27.50	1,179	0.044	0.071	0.042	0.047	48	1,019
6	22.50	1,194	0.029	0.068	0.040	0.045	47	1,032
5	18.00	966	0.019	0.063	0.037	0.043	36	835
4	15.50	243	0.014	0.060	0.035	0.041	9	210
3	12.50	1,225	0.009	0.053	0.031	0.038	40	1,058
2	7.50	1,240	0.003	0.038	0.021	0.029	31	1,071
1	2.50	1,255	0.000	0.015	0.008	0.013	14	1,084
LGP Allgon LGP21903	180.41	33	1.890	1.979	1.140	0.340	10	29
Powerwave Allgon LGP	180.41	85	1.890	1.979	1.140	0.340	25	73
Raycap DC6-48-60-18-	180.41	20	1.890	1.979	1.140	0.340	6	17
6' Omni	180.41	25	1.890	1.979	1.140	0.340	7	22
Ericsson RRUS-11 800	180.41	162	1.890	1.979	1.140	0.340	48	140
Ericsson RRUS 32 B2	180.41	159	1.890	1.979	1.140	0.340	47	137
Powerwave 7770.00	180.41	210	1.890	1.979	1.140	0.340	62	181
CCI HPA-65R-BUU-H6	180.41	51	1.890	1.979	1.140	0.340	15	44
CCI HPA-65R-BUU-H8	180.41	136	1.890	1.979	1.140	0.340	40	117
Flat Platform w/ Han	180.41	2,000	1.890	1.979	1.140	0.340	590	1,728
Channel Master Type	16.00	126	0.015	0.060	0.035	0.041	5	109
		32,319	48.043	29.060	19.912	5.797	1,614	27,922

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Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-38.40	-1.61	0.00	-214.99	0.00	214.99	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.058
5.00	-36.86	-1.59	0.00	-206.97	0.00	206.97	3,339.53	1,669.77	5,587.61	2,759.51	0.01	-0.02	0.056
10.00	-35.35	-1.56	0.00	-199.04	0.00	199.04	3,303.67	1,651.84	5,426.07	2,679.73	0.04	-0.04	0.055
15.00	-35.05	-1.55	0.00	-191.26	0.00	191.26	3,266.89	1,633.44	5,265.23	2,600.30	0.09	-0.05	0.054
16.00	-33.70	-1.52	0.00	-189.71	0.00	189.71	3,259.42	1,629.71	5,233.16	2,584.46	0.10	-0.06	0.054
20.00	-32.22	-1.48	0.00	-183.64	0.00	183.64	3,229.18	1,614.59	5,105.20	2,521.27	0.15	-0.07	0.053
25.00	-30.76	-1.44	0.00	-176.25	0.00	176.25	3,190.54	1,595.27	4,946.05	2,442.67	0.24	-0.09	0.052
30.00	-29.32	-1.40	0.00	-169.06	0.00	169.06	3,150.98	1,575.49	4,787.88	2,364.55	0.34	-0.11	0.051
35.00	-27.90	-1.35	0.00	-162.07	0.00	162.07	3,110.50	1,555.25	4,630.76	2,286.96	0.47	-0.13	0.050
40.00	-26.59	-1.31	0.00	-155.30	0.00	155.30	3,069.09	1,534.55	4,474.78	2,209.92	0.61	-0.15	0.048
44.67	-26.51	-1.31	0.00	-149.17	0.00	149.17	3,029.61	1,514.81	4,330.30	2,138.57	0.77	-0.17	0.048
44.67	-26.51	-1.31	0.00	-149.17	0.00	149.17	2,356.88	1,178.44	3,380.89	1,669.69	0.77	-0.17	0.057
45.00	-25.27	-1.27	0.00	-148.73	0.00	148.73	2,354.99	1,177.50	3,373.36	1,665.97	0.78	-0.17	0.056
50.00	-24.05	-1.23	0.00	-142.37	0.00	142.37	2,326.18	1,163.09	3,260.58	1,610.28	0.97	-0.19	0.055
55.00	-22.84	-1.19	0.00	-136.21	0.00	136.21	2,296.44	1,148.22	3,148.31	1,554.83	1.17	-0.21	0.054
60.00	-21.65	-1.15	0.00	-130.24	0.00	130.24	2,265.77	1,132.89	3,036.63	1,499.68	1.41	-0.23	0.052
65.00	-20.47	-1.12	0.00	-124.47	0.00	124.47	2,234.19	1,117.09	2,925.62	1,444.85	1.66	-0.25	0.051
70.00	-19.31	-1.08	0.00	-118.89	0.00	118.89	2,201.67	1,100.84	2,815.37	1,390.41	1.94	-0.28	0.050
75.00	-18.17	-1.05	0.00	-113.49	0.00	113.49	2,168.24	1,084.12	2,705.97	1,336.38	2.24	-0.30	0.048
80.00	-17.04	-1.03	0.00	-108.23	0.00	108.23	2,133.87	1,066.94	2,597.50	1,282.81	2.56	-0.32	0.047
85.00	-16.93	-1.03	0.00	-103.09	0.00	103.09	2,098.59	1,049.29	2,490.04	1,229.74	2.91	-0.34	0.046
85.50	-16.03	-1.02	0.00	-102.58	0.00	102.58	2,095.01	1,047.50	2,479.36	1,224.46	2.94	-0.34	0.046
85.50	-16.03	-1.02	0.00	-102.58	0.00	102.58	1,537.79	768.90	1,827.83	902.70	2.94	-0.34	0.055
90.00	-15.05	-1.02	0.00	-98.00	0.00	98.00	1,518.16	759.08	1,762.50	870.43	3.28	-0.37	0.053
95.00	-14.08	-1.02	0.00	-92.92	0.00	92.92	1,495.46	747.73	1,690.19	834.72	3.68	-0.39	0.052
100.00	-13.12	-1.04	0.00	-87.80	0.00	87.80	1,471.85	735.92	1,618.25	799.19	4.10	-0.42	0.050
105.00	-12.18	-1.07	0.00	-82.59	0.00	82.59	1,447.30	723.65	1,546.78	763.90	4.55	-0.44	0.048
110.00	-11.25	-1.10	0.00	-77.26	0.00	77.26	1,421.84	710.92	1,475.86	728.87	5.02	-0.47	0.045
115.00	-10.33	-1.12	0.00	-71.78	0.00	71.78	1,395.45	697.72	1,405.58	694.16	5.53	-0.49	0.043
120.00	-9.42	-1.15	0.00	-66.16	0.00	66.16	1,368.13	684.07	1,336.01	659.81	6.06	-0.52	0.040
125.00	-9.36	-1.16	0.00	-60.40	0.00	60.40	1,339.89	669.95	1,267.25	625.85	6.61	-0.54	0.038
125.33	-8.61	-1.17	0.00	-60.01	0.00	60.01	1,337.98	668.99	1,262.70	623.60	6.65	-0.54	0.038
125.33	-8.61	-1.17	0.00	-60.01	0.00	60.01	893.38	446.69	847.72	418.66	6.65	-0.54	0.046
130.00	-7.82	-1.18	0.00	-54.55	0.00	54.55	879.61	439.81	809.42	399.74	7.19	-0.56	0.043
135.00	-7.04	-1.19	0.00	-48.63	0.00	48.63	863.96	431.98	768.47	379.52	7.80	-0.59	0.039
140.00	-6.27	-1.17	0.00	-42.71	0.00	42.71	847.39	423.70	727.68	359.37	8.43	-0.61	0.035
145.00	-5.51	-1.15	0.00	-36.84	0.00	36.84	829.90	414.95	687.15	339.36	9.08	-0.63	0.030
150.00	-5.43	-1.15	0.00	-31.09	0.00	31.09	811.48	405.74	646.95	319.51	9.75	-0.65	0.026
150.50	-5.13	-1.13	0.00	-30.52	0.00	30.52	809.59	404.79	642.96	317.53	9.82	-0.66	0.026
150.50	-5.13	-1.13	0.00	-30.52	0.00	30.52	809.59	404.79	642.96	317.53	9.82	-0.66	0.102
155.00	-4.80	-1.10	0.00	-25.44	0.00	25.44	792.13	396.07	607.18	299.86	10.45	-0.67	0.091
160.00	-4.48	-1.07	0.00	-19.92	0.00	19.92	771.86	385.93	567.92	280.48	11.19	-0.74	0.077
165.00	-4.16	-1.03	0.00	-14.57	0.00	14.57	750.67	375.34	529.26	261.38	11.99	-0.79	0.061
170.00	-3.86	-0.97	0.00	-9.42	0.00	9.42	728.55	364.28	491.27	242.62	12.85	-0.84	0.044
175.00	-3.57	-0.91	0.00	-4.55	0.00	4.55	696.59	348.30	448.31	221.40	13.74	-0.87	0.026
180.00	0.00	0.00	0.00	0.00	0.00	0.00	663.72	331.86	406.75	200.88	14.66	-0.88	0.000
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	14.73	-0.88	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	14.73	-0.88	0.000

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Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-26.84	-1.60	0.00	-210.89	0.00	210.89	3,374.47	1,687.24	5,749.79	2,839.61	0.00	0.00	0.054
5.00	-25.77	-1.58	0.00	-202.87	0.00	202.87	3,339.53	1,669.77	5,587.61	2,759.51	0.01	-0.02	0.053
10.00	-24.71	-1.55	0.00	-194.97	0.00	194.97	3,303.67	1,651.84	5,426.07	2,679.73	0.04	-0.04	0.052
15.00	-24.50	-1.54	0.00	-187.24	0.00	187.24	3,266.89	1,633.44	5,265.23	2,600.30	0.08	-0.05	0.051
16.00	-23.55	-1.51	0.00	-185.70	0.00	185.70	3,259.42	1,629.71	5,233.16	2,584.46	0.10	-0.06	0.051
20.00	-22.52	-1.46	0.00	-179.67	0.00	179.67	3,229.18	1,614.59	5,105.20	2,521.27	0.15	-0.07	0.050
25.00	-21.50	-1.42	0.00	-172.36	0.00	172.36	3,190.54	1,595.27	4,946.05	2,442.67	0.23	-0.09	0.049
30.00	-20.50	-1.38	0.00	-165.25	0.00	165.25	3,150.98	1,575.49	4,787.88	2,364.55	0.34	-0.11	0.048
35.00	-19.50	-1.33	0.00	-158.36	0.00	158.36	3,110.50	1,555.25	4,630.76	2,286.96	0.46	-0.13	0.047
40.00	-18.59	-1.29	0.00	-151.70	0.00	151.70	3,069.09	1,534.55	4,474.78	2,209.92	0.60	-0.14	0.046
44.67	-18.53	-1.29	0.00	-145.67	0.00	145.67	3,029.61	1,514.81	4,330.30	2,138.57	0.75	-0.16	0.045
44.67	-18.53	-1.29	0.00	-145.67	0.00	145.67	2,356.88	1,178.44	3,380.89	1,669.69	0.75	-0.16	0.053
45.00	-17.66	-1.25	0.00	-145.24	0.00	145.24	2,354.99	1,177.50	3,373.36	1,665.97	0.76	-0.16	0.053
50.00	-16.81	-1.21	0.00	-139.01	0.00	139.01	2,326.18	1,163.09	3,260.58	1,610.28	0.95	-0.18	0.052
55.00	-15.96	-1.17	0.00	-132.97	0.00	132.97	2,296.44	1,148.22	3,148.31	1,554.83	1.15	-0.21	0.051
60.00	-15.13	-1.12	0.00	-127.15	0.00	127.15	2,265.77	1,132.89	3,036.63	1,499.68	1.38	-0.23	0.049
65.00	-14.31	-1.09	0.00	-121.52	0.00	121.52	2,234.19	1,117.09	2,925.62	1,444.85	1.62	-0.25	0.048
70.00	-13.50	-1.05	0.00	-116.09	0.00	116.09	2,201.67	1,100.84	2,815.37	1,390.41	1.90	-0.27	0.047
75.00	-12.70	-1.02	0.00	-110.84	0.00	110.84	2,168.24	1,084.12	2,705.97	1,336.38	2.19	-0.29	0.046
80.00	-11.91	-1.00	0.00	-105.74	0.00	105.74	2,133.87	1,066.94	2,597.50	1,282.81	2.50	-0.31	0.045
85.00	-11.83	-1.00	0.00	-100.75	0.00	100.75	2,098.59	1,049.29	2,490.04	1,229.74	2.84	-0.33	0.044
85.50	-11.20	-0.99	0.00	-100.25	0.00	100.25	2,095.01	1,047.50	2,479.36	1,224.46	2.88	-0.34	0.043
85.50	-11.20	-0.99	0.00	-100.25	0.00	100.25	1,537.79	768.90	1,827.83	902.70	2.88	-0.34	0.052
90.00	-10.52	-0.98	0.00	-95.82	0.00	95.82	1,518.16	759.08	1,762.50	870.43	3.21	-0.36	0.051
95.00	-9.84	-0.99	0.00	-90.90	0.00	90.90	1,495.46	747.73	1,690.19	834.72	3.59	-0.38	0.049
100.00	-9.17	-1.01	0.00	-85.93	0.00	85.93	1,471.85	735.92	1,618.25	799.19	4.01	-0.41	0.047
105.00	-8.51	-1.04	0.00	-80.88	0.00	80.88	1,447.30	723.65	1,546.78	763.90	4.45	-0.43	0.045
110.00	-7.86	-1.07	0.00	-75.70	0.00	75.70	1,421.84	710.92	1,475.86	728.87	4.91	-0.46	0.043
115.00	-7.22	-1.10	0.00	-70.37	0.00	70.37	1,395.45	697.72	1,405.58	694.16	5.40	-0.48	0.041
120.00	-6.58	-1.12	0.00	-64.89	0.00	64.89	1,368.13	684.07	1,336.01	659.81	5.92	-0.51	0.039
125.00	-6.54	-1.13	0.00	-59.27	0.00	59.27	1,339.89	669.95	1,267.25	625.85	6.46	-0.53	0.036
125.33	-6.02	-1.14	0.00	-58.89	0.00	58.89	1,337.98	668.99	1,262.70	623.60	6.50	-0.53	0.036
125.33	-6.02	-1.14	0.00	-58.89	0.00	58.89	893.38	446.69	847.72	418.66	6.50	-0.53	0.044
130.00	-5.46	-1.16	0.00	-53.55	0.00	53.55	879.61	439.81	809.42	399.74	7.03	-0.55	0.041
135.00	-4.92	-1.16	0.00	-47.76	0.00	47.76	863.96	431.98	768.47	379.52	7.62	-0.58	0.037
140.00	-4.38	-1.15	0.00	-41.95	0.00	41.95	847.39	423.70	727.68	359.37	8.24	-0.60	0.033
145.00	-3.85	-1.13	0.00	-36.19	0.00	36.19	829.90	414.95	687.15	339.36	8.88	-0.62	0.029
150.00	-3.79	-1.13	0.00	-30.54	0.00	30.54	811.48	405.74	646.95	319.51	9.54	-0.64	0.025
150.50	-3.58	-1.11	0.00	-29.98	0.00	29.98	809.59	404.79	642.96	317.53	9.61	-0.64	0.025
150.50	-3.58	-1.11	0.00	-29.98	0.00	29.98	809.59	404.79	642.96	317.53	9.61	-0.64	0.099
155.00	-3.35	-1.09	0.00	-24.98	0.00	24.98	792.13	396.07	607.18	299.86	10.22	-0.66	0.088
160.00	-3.12	-1.05	0.00	-19.56	0.00	19.56	771.86	385.93	567.92	280.48	10.94	-0.72	0.074
165.00	-2.91	-1.01	0.00	-14.30	0.00	14.30	750.67	375.34	529.26	261.38	11.73	-0.78	0.059
170.00	-2.70	-0.96	0.00	-9.24	0.00	9.24	728.55	364.28	491.27	242.62	12.57	-0.82	0.042
175.00	-2.49	-0.89	0.00	-4.46	0.00	4.46	696.59	348.30	448.31	221.40	13.44	-0.85	0.024
180.00	0.00	0.00	0.00	0.00	0.00	0.00	663.72	331.86	406.75	200.88	14.34	-0.86	0.000
180.41	0.00	0.00	0.00	0.00	0.00	0.00	661.02	330.51	403.43	199.24	14.41	-0.86	0.000
180.42	0.00	0.00	0.00	0.00	0.00	0.00	660.98	330.49	403.38	199.21	14.41	-0.86	0.000

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Analysis Summary

Load Case	Reactions Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Max Usage Elev (ft)	Interaction Ratio
1.2D + 1.6W	29.61	0.00	38.71	0.00	0.00	3116.30	0.00	0.72
0.9D + 1.6W	28.65	0.00	29.02	0.00	0.00	3054.88	0.00	0.71
1.2D + 1.0Di + 1.0Wi	5.41	0.00	54.04	0.00	0.00	622.86	150.50	0.16
(1.2 + 0.2Sds) * DL + E ELFM	1.26	0.00	38.40	0.00	0.00	181.86	150.50	0.05
(1.2 + 0.2Sds) * DL + E EMAM	1.61	0.00	38.40	0.00	0.00	214.99	150.50	0.10
(0.9 - 0.2Sds) * DL + E ELFM	1.26	0.00	26.84	0.00	0.00	178.65	150.50	0.05
(0.9 - 0.2Sds) * DL + E EMAM	1.60	0.00	26.84	0.00	0.00	210.89	150.50	0.10
1.0D + 1.0W	6.15	0.00	32.32	0.00	0.00	658.18	0.00	0.16

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	Upper Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Lower Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Max Member Pu (kip)	phiPn (kip)	Ratio
0.00	150.	(4) SOL-#20 All Thre	272.8	8.2	16.8	72.4	12.0	7	12	0.0	12.0	0	0	270.2	330.5	0.817

Base/Flange Plate	Plate Type	***Baseplate***	
	Pole Diameter	41.699	in
	Pole Thickness	0.375	in
	Plate Diameter	53.699	in
	Plate Thickness	2.5	in
	Plate Fy	60	ksi
	Weld Length	0.25	in
	ϕ_s Resistance	921.10	k-in
	Applied	336.26	k-in
Stiffeners	#	***0***	

Bolts	#	***12***	
	Bolt Circle	48.699	in
	(R)adial / (S)quare	R	
	Diameter	2.25	in
	Hole Diameter	2.625	in
	Type	A615-75	
	Fy	75	ksi
	Fu	100	ksi
	ϕ_s Resistance	259.82	k
	Applied	173.55	k
Reinforcement ●	#	***4***	
	DYW. Circle	48.574	in
	Offset Angle	15	°
	Type	#20	
	Diameter	2.5	in
	Fu	100	ksi
Extra Bolts O	#	***0***	

Code Rev.	***G***
Moment	3116.3 k-ft
Axial	38.7 k

Date	3/3/2017
Engineer	T. Kassakatis
Site #	302503
Carrier	AT&T Mobility

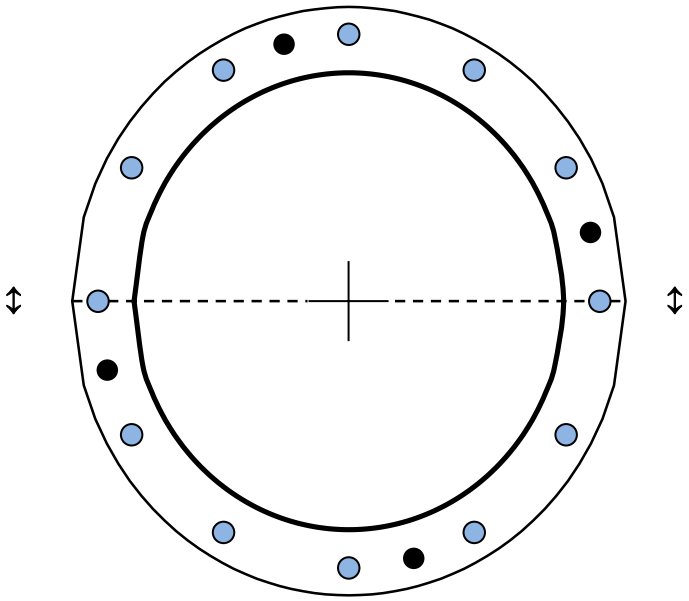


Plate Stress Ratio:

0.37 (Pass)

Bolt Stress Ratio:

0.67 (Pass)

Base/Flange Plate	Plate Type	***Flange***	***@ 125.3 ft***
	Pole Diameter	23.179	in
	Pole Thickness	0.1875	in
	Plate Diameter	29.6028	in
	Plate Thickness	1.25	in
	Plate Fy	36	ksi
	Weld Length	0.1875	in
	ϕ_s Resistance	51.20	k-in
	Applied	17.57	k-in
Stiffeners	#	***0***	

Bolts	#	***18***	
	Bolt Circle	27.237	in
	(R)adial / (S)quare	R	
	Diameter	1	in
	Hole Diameter	1.125	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	ϕ_s Resistance	54.52	k
	Applied	13.73	k
Reinforcement	#	***4***	
	DYW. Circle	30.054	in
	Offset Angle	0	°
	Type	#20	
	Diameter	2.5	in
	Fu	100	ksi
Extra Bolts O	#	***0***	

Code Rev.	***G***
Moment	463.4 k-ft
Axial	7.9 k

Date	3/3/2017
Engineer	T. Kassakatis
Site #	302503
Carrier	AT&T Mobility

Required Flange Thickness:

0.73 in OK

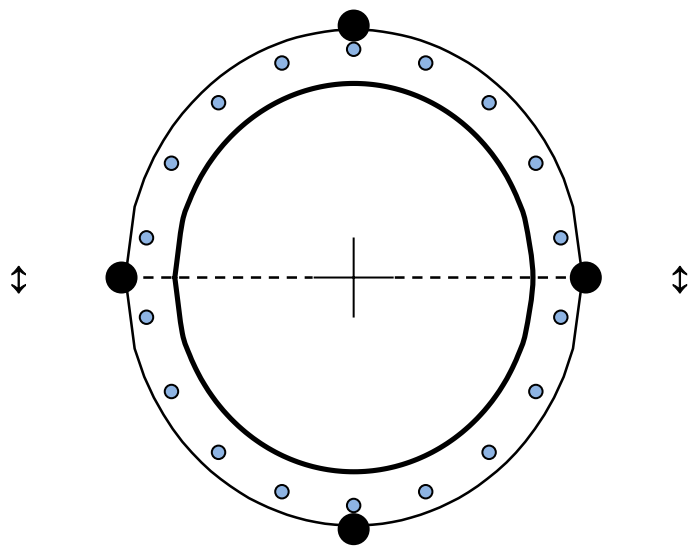


Plate Stress Ratio:

0.34 (Pass)

Bolt Stress Ratio:

0.25 (Pass)

Site Name:	**Lisbon CT3**
Site Number:	**302503**
Engineering Number:	**OAA694373_C3_01**
Engineer:	**T. Kassakatis**
Date:	**3/3/2017**

Design Base Loads (Factored) - Design per TIA-222-G Standard

Moment (Overturning) (M_u):	3116.3	k-ft
Shear/Leg (V_u):	29.6	k
Compression/Leg (P_u):	38.7	k
Uplift/Leg (T_u):	0.0	k
Tower Type (GT / SST / MP):	MP	

Length / Width of Block:	14.0	ft
Thickness of Block:	6.0	ft
Block Height Above Ground:	0.5	ft
Depth Below Ground Surface to Water Table (w):	30.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil:	130.0	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	30000	psf
Capacity Increase (Due to Transient Loads):	1.00	
Pullout Angle:	45.0	degrees
Rod Diameter:	1.00	in
Rod Ultimate Strength:	90	ksi
Rod Net Area:	0.85	in^2
Number of Rods:	16	
Diameter of Cored Hole:	3.00	in
Ultimate Grout / Rock Interface Bond Strength:	100	psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	400	psi
Overall Rod Embedment Length:	72	in
Rod Exposure Above Lock Off Nut in Foundation:	36	in
Rod Embedment Circle:	137	in (Adjustment necessary if square co
Free Stress Length:	0	in
Soil / Concrete Friction Coefficient:	0.55	
Lock Off Load:	0	k
Rock Anchor Design Plastic or Elastic:	Elastic	
Ignore Pullout Weight Resistance (Y/N):	Y	
Weight of Concrete (Buoyancy Effect Considered):	176.4	k
Compressive Bearing Resistance:	4618.1	k
Pullout Weight / Rod:		k - Ignored
Rock / Grout Bond Strength / Rod:	67.9	k
Grout / Rod Bond Strength / Rod:	90.5	k
Rod Mechanical Strength / Rod:	76.5	k
Soil Strength Reduction Factor (ϕ_s):	0.75	
Factored Nominal Moment Capacity per Leg ($\phi_s M_n$):	4252.4	k
Factored Nominal Uplift Capacity per Leg ($\phi_s T_n$):	161.3	k
Factored Nominal Compressive Capacity per Leg ($\phi_s P_n$):	3463.6	k
Factored Nominal Shear Capacity per Leg ($\phi_s V_n$):	550.8	k
M_u:	3294.0	k-ft
T_u:	0.0	k
P_u:	64.6	k
V_u:	29.6	k
$T_u/\phi_s T_n + M_u/\phi_s M_n$:	0.77	Result: OK
$P_u/\phi_s P_n$:	0.02	Result: OK
$V_u/\phi_s V_n$:	0.05	Result: OK
Recommended Lock Off Load:	24.6	k
Recommended Test Load:	39.4	k
Maximum Allowable Test Load:	54.3	k

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	3000	psi
Vertical Steel Rebar Size #:	11	
Vertical Steel Rebar Area:	1.56	in^2
# of Vertical Steel Rebars:	52	Minimum # of vertical rebar met
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	4	
Horizontal Tie / Stirrup Area:	0.20	in^2
Horizontal Tie / Stirrup Spacing:	12.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	40	ksi
Rod Bearing Plate Diameter:	8.0	in
Rod Bearing Plate Thickness:	1.0	in
Anchor Bearing Plate Yield Strength:	36	ksi
Anchor Rod Nut Diameter:	2.02	in
Rebar Cage Diameter:	160.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression/Bearing Reduction Factor ($\phi_{P/B}$):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	3294.0	k-ft
Factored Nominal Moment Capacity ($\phi_B M_n$):	28558.1	k-ft - ACI318-05 - 10.2
$M_u/\phi_B M_n$:	0.12	Result: OK
Design Shear (V_u):	246.4	k
Factored Nominal Shear Capacity ($\phi_V V_n$):	938.6	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.26	Result: OK
Design Tension (T_u):	0.0	k
Factored Nominal Tension Capacity ($\phi_T T_n$):	4380.5	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	38.7	k
Factored Nominal Compression Capacity ($\phi_P P_n$):	34454.1	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.00	Result: OK

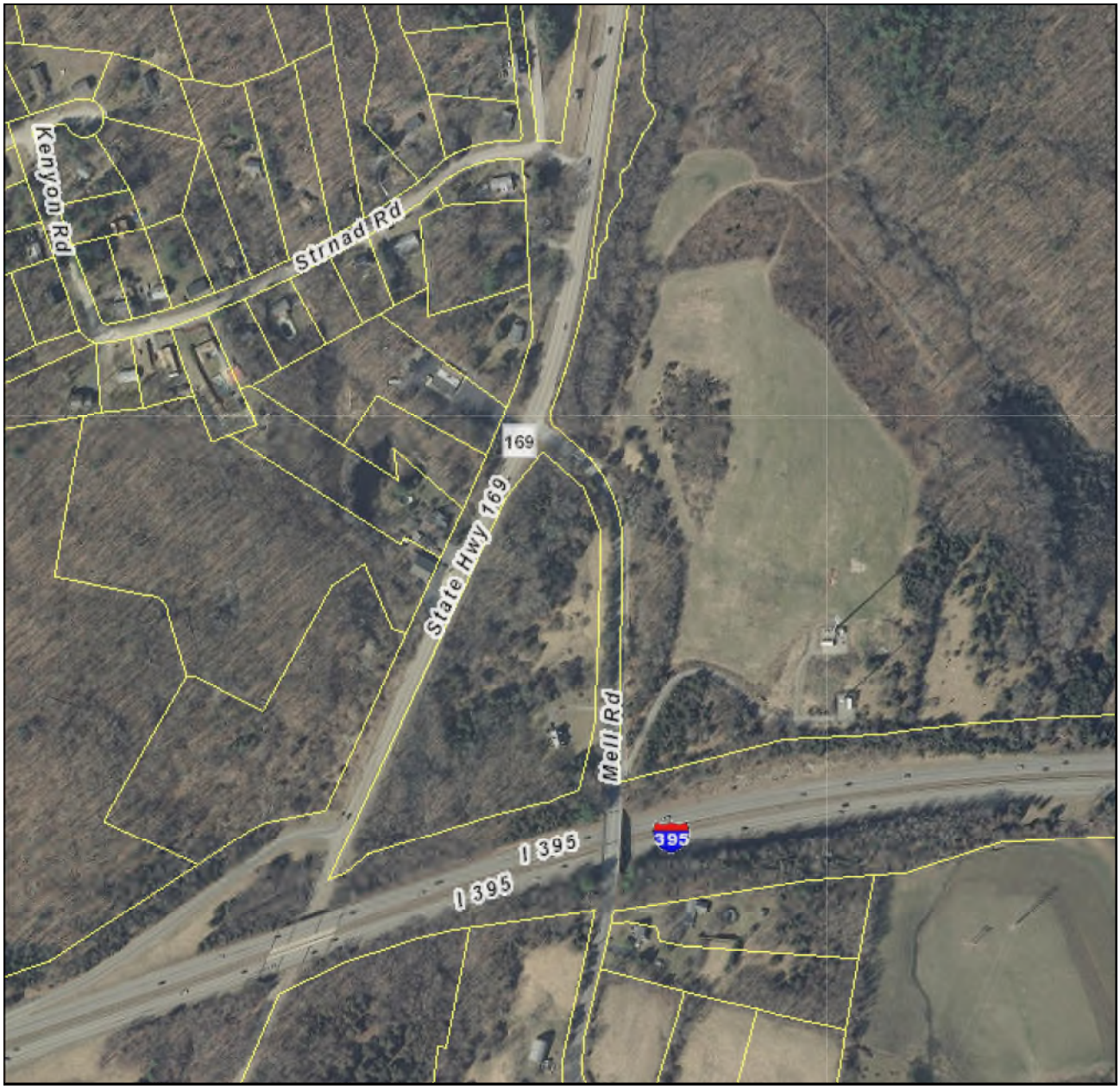
Bearing Plate Design

Plate Bearing Design Load (P_u):	39.4	k
Plate Shear Design Load (V_u):	39.4	k
Factored Rod Bearing Plate Capacity of a Single Anchor ($\phi_B P_n$):	164.0	k
Bearing Plate Pressure:	0.8	ksi
Plate Design Moment (M_u):	11.3	k-in
Critical Length:	6.88	in
Plastic Modulus:	1.72	in^3
Factored Nominal Plate Flexural Resistance ($\phi_B M_n$):	55.7	k-in
Factored Nominal Plate Shear Resistance ($\phi_V V_n$):	123.4	k
Factored Punch Shear Capacity Resisting Plate Load ($\phi_P P_n$):	667.7	k - ACI318-05 - 11.11.2.1
Interaction Equation:	0.32	Result: OK

Town of Lisbon

Geographic Information System (GIS)

Date Printed: 3/8/2017



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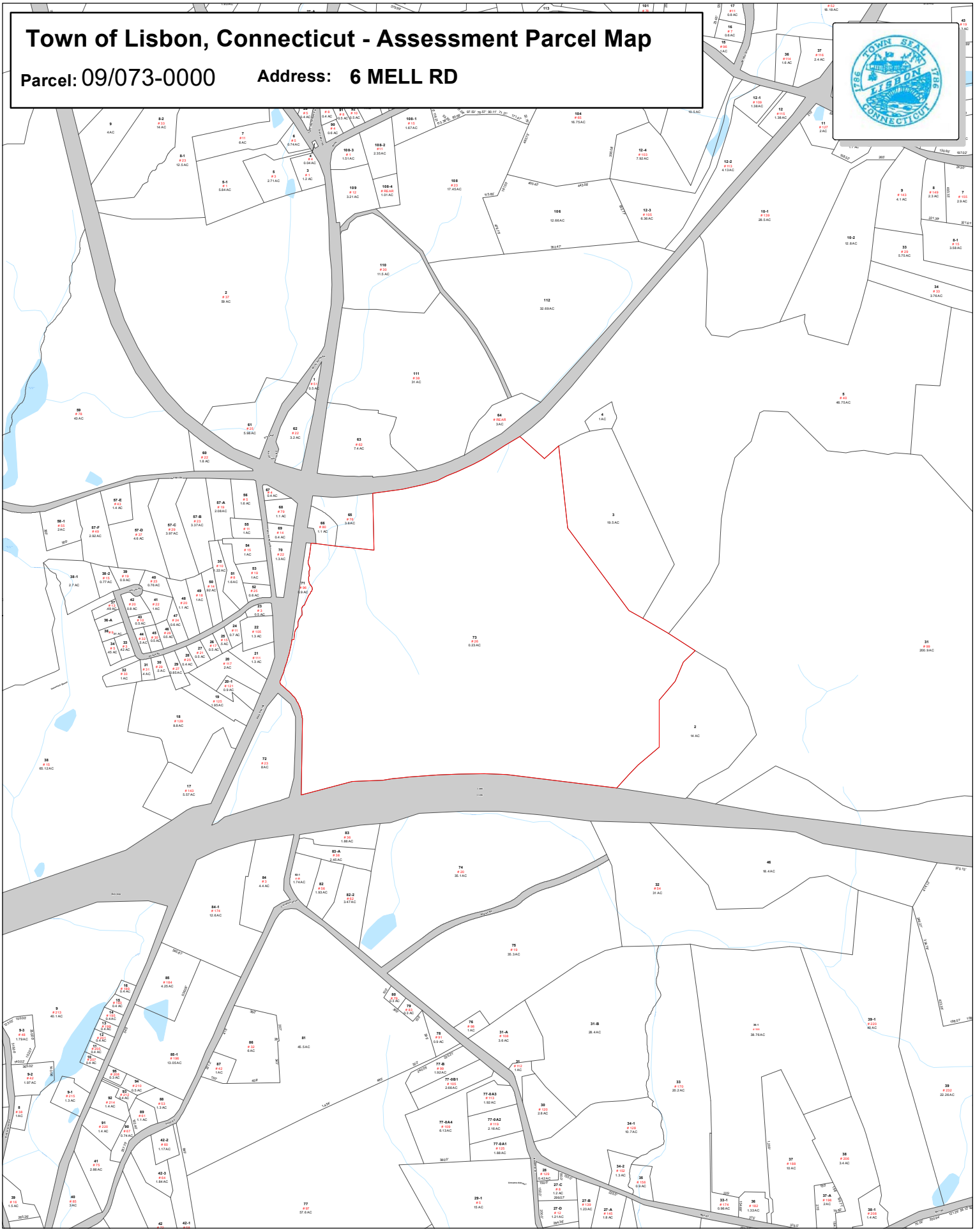
Approximate Scale: 1 inch = 400 feet

0 400 Feet

N W E S

Town of Lisbon, Connecticut - Assessment Parcel Map

Parcel: 09/073-0000 **Address:** 6 MELL RD



Map Produced October 2015

Approximate Scale: 1 inch = 1,000 feet

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