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

April 5, 2019

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT5482
63 Industrial Park Road, Putnam, CT 06260
N 41.89722222
W 71.89222222

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 186-foot level of the existing 196-foot Self-Support Tower at 63 Industrial Park Road, Putnam, CT. The tower is owned by SBA and the property is owned by DMW Putnam LLC. AT&T now intends to remove three (3) Powerwave antennas and install (3) Kathrein 800-10966 antennas. AT&T also intends to swap (3) Ericsson RRUS-11 for (3) 4449-B5/B12 Remote Radio Units (RRU) and add (3) 4415-B30 RRUs. The Antennas and RRUs would also be installed at the 186-foot level of the tower. AT&T's use of this facility was approved by the Siting Council on May 5th, 2002.

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 The Honorable Barney Seney, Mayor of the Town of Putnam, and the Putnam Planning & Land Use Department as well as the property owner and 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: Mayor Barney Seney - Elected Official
Chad Sessums – Local Building & Zoning Official
DMW Putnam LLC – Property Owner
SBA - 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*							1.35%
AT&T GSM	4	351	186	0.0156	850	0.5667	0.28%
AT&T LTE	4	718	186	0.0478	700	0.4667	1.02%
AT&T LTE	6	853	186	0.0379	700	0.4667	0.81%
Site Total							3.47%

*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*							1.35%
AT&T UMTS	1	262	186	0.0031	850	0.5667	0.05%
AT&T LTE	1	1476	186	0.0164	700	0.4667	0.35%
AT&T LTE	1	1000	186	0.0111	850	0.5667	0.20%
AT&T 5G	1	1000	186	0.0111	850	0.5667	0.20%
AT&T LTE	2	3664	186	0.0813	1900	1.0000	0.81%
AT&T LTE	1	1285	186	0.0143	2300	1.0000	0.14%
Site Total							3.11%

*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:

ITEMS TO BE MOUNTED ON THE EXISTING SELF SUPPORT TOWER:
- NEW AT&T ANTENNAS: (800–10966) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4415 B30 (WCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: B5/B12 4449 (700/850) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T SURGE ARRESTOR (DC6–48–60–18–8C) (TOTAL OF 1).
- INSTALL (2) DC POWER CABLES & (1) FIBER RUN (TO FOLLOW EXISTING ROUTE).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- SWAP DUS WITH 6630.
- ADD (1) DC12.
- ADD 5G RBS 6630.

SITE ADDRESS:	63 PUTNAM INDUSTRIAL PARK PUTNAM, CT 06260
LATITUDE:	41.897191 N, 41° 53' 49.89" N
LONGITUDE:	71.891900 W, 71° 53' 30.84" W
TYPE OF SITE:	SELF SUPPORT TOWER / OUTDOOR EQUIPMENT
STRUCTURE HEIGHT:	196'–0"±
RAD CENTER:	186'–0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

at&t

SITE NUMBER: CT5482

SITE NAME: PUTNAM WEST

FA CODE: 10071213

PACE ID: MRCTB035189, MRCTB035231, MRCTB035290

PROJECT: LTE 3C_4C 2019 UPGRADE

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
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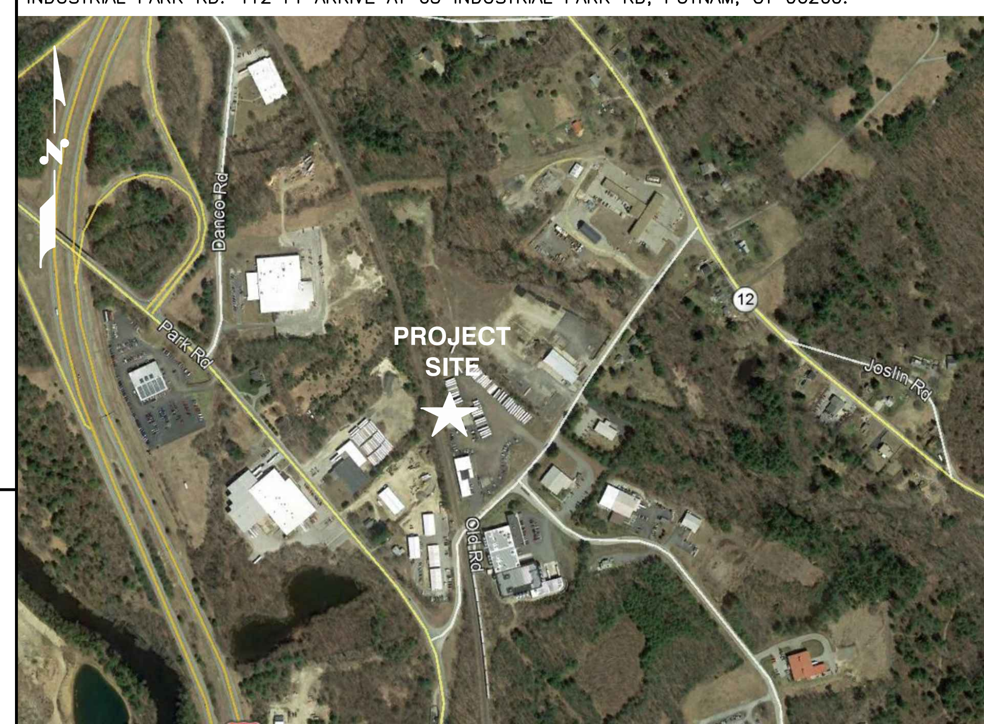
A–2	ANTENNA LAYOUTS & ELEVATION	1
A–3	DETAILS	1
SN–1	STRUCTURAL NOTES	1
S–1	STRUCTURAL DETAILS	1
RF–1	RF PLUMBING DIAGRAM	1
G–1	GROUNDING DETAILS	1

SBA SITE #: CT00802

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI TURN LEFT ONTO CAPITOL BLVD. 0.2 MI TURN LEFT ONTO WEST ST. 0.2 MI TAKE RAMP LEFT FOR I–91 N. 4.5 MI AT EXIT 25, TAKE RAMP RIGHT FOR CT–3 NORTH TOWARD GLASTONBURY. 2.4 MI TAKE RAMP RIGHT FOR CT–2 EAST TOWARD NORWICH. 31.9 MI KEEP STRAIGHT ONTO CT–2 E / CT–32 S. 0.8 MI AT EXIT 28N, TAKE RAMP RIGHT FOR I–395 NORTH TOWARD PROVIDENCE. 22.0 MI KEEP LEFT TO STAY ON I–395 N. 9.8 MI AT EXIT 95, TAKE RAMP RIGHT AND FOLLOW SIGNS FOR KENNEDY DRIVE. 0.3 MI TURN LEFT ONTO KENNEDY DR. 370 FT ROAD NAME CHANGES TO PARK RD. 0.3 MI TURN LEFT ONTO INDUSTRIAL PARK RD. 412 FT ARRIVE AT 63 INDUSTRIAL PARK RD, PUTNAM, CT 06260.



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 MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG

CALL TOLL FREE 1–800–922–4455

OR CALL 811

UNDERGROUND SERVICE ALERT

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5482
SITE NAME: PUTNAM WEST
SBA SITE #: CT00802
63 PUTNAM INDUSTRIAL PARK
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WINDHAM COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

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A	01/21/19	ISSUED FOR REVIEW	AM	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED
PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	T–1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. 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: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

    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, FOURTEENTH EDITION;

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

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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5482
SITE NAME: PUTNAM WEST
SBA SITE #: CT00802
63 PUTNAM INDUSTRIAL PARK
PUTNAM, CT 06260
WINDHAM COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREASEY · 26,258 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	GN-1	1

NOTE:

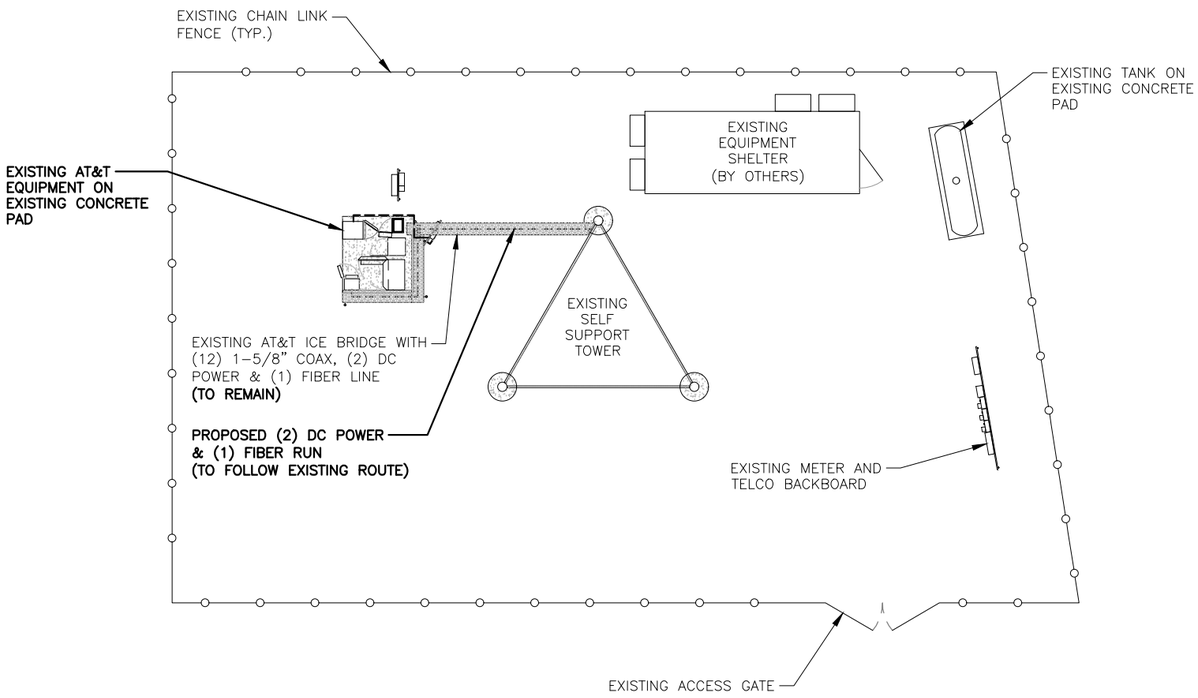
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: MARCH 18, 2019 (REV.1)

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

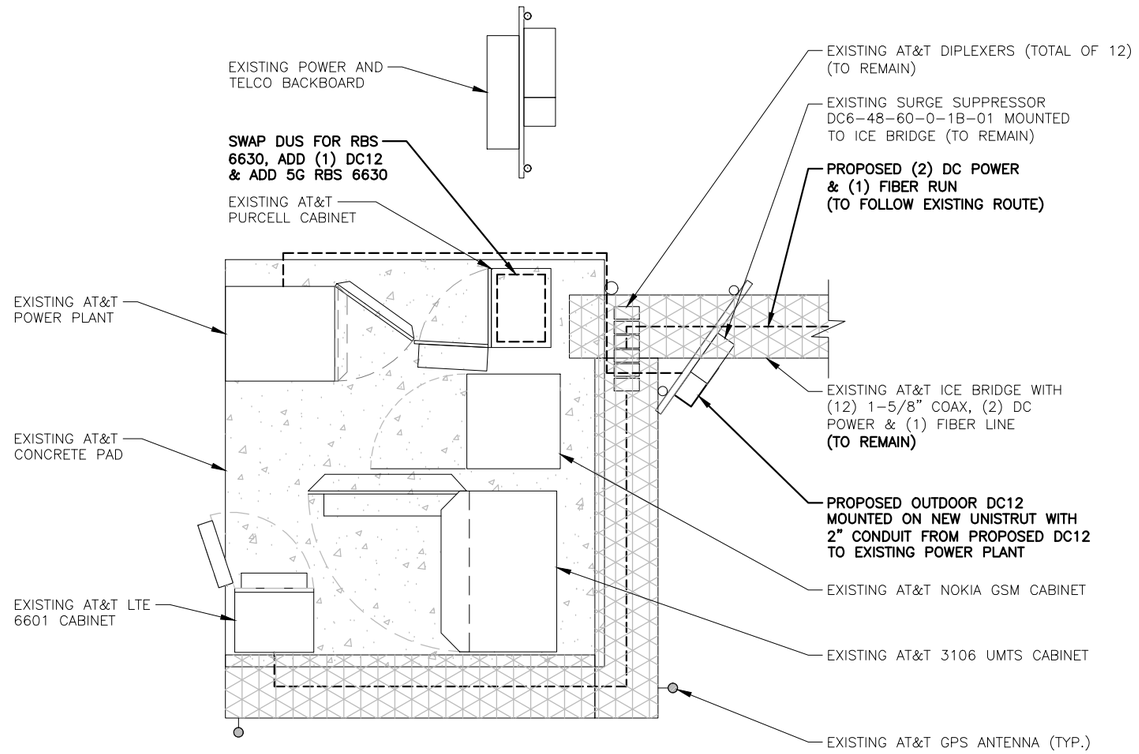
NOTE:

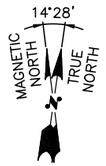
REFER TO **STRUCTURAL ANALYSIS** BY: TOWER ENGINEERING SOLUTIONS
DATED: APRIL 1, 2019
FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"





EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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FAX: (978) 336-5586

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500 ENTERPRISE DRIVE, SUITE 3A
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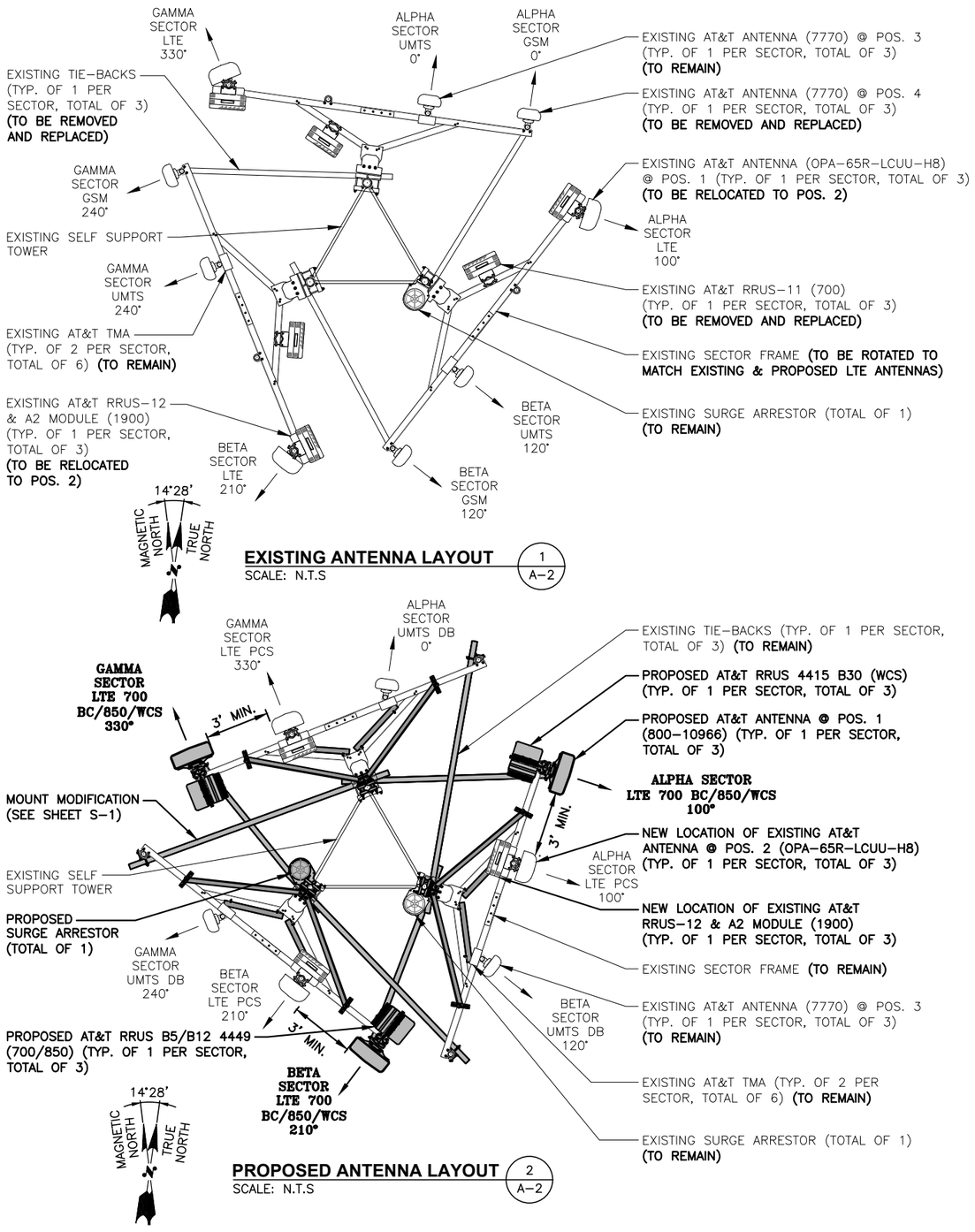
STATE OF CONNECTICUT · DEREK J. CREASER · No. 24054 · LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	A-1	1



EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S

PROPOSED ANTENNA LAYOUT (2 / A-2)
SCALE: N.T.S

NOTE:
REFER TO **STRUCTURAL ANALYSIS** BY: TOWER ENGINEERING SOLUTIONS DATED: APRIL 1, 2019 FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

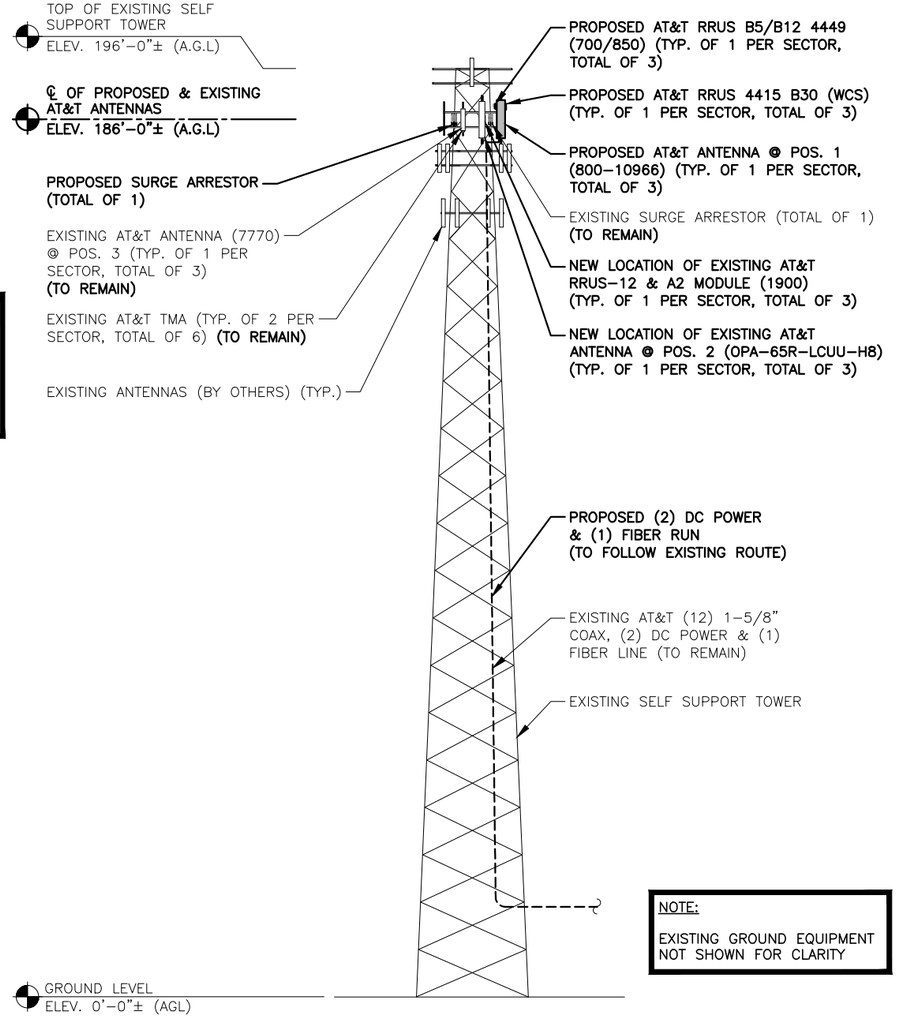
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: MARCH 18, 2019 (REV.1)

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
ROTATION OF MOUNTS OR INSTALLATION OF MOUNT MODS MUST NOT ADVERSELY AFFECT, OBSTRUCT, BEND OR PINCH EXISTING SAFETY CABLE IN ANY WAY. GC, C/O AT&T, WILL PURCHASE AND INSTALL CABLE RE-ROUTING BRACKETS AS REQUIRED.

NOTE:
EXISTING ANTENNA MOUNT TO BE ROTATED TO MATCH LTE AZIMUTHS

NOTE:
ANTENNAS AND MOUNTS TO BE ADJUSTED AS REQUIRED TO ACHIEVE A 3'-0" MINIMUM SEPARATION BETWEEN ANTENNAS



NOTE:
EXISTING GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION (3 / A-2)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"
0 5'-4" 10'-8" 21'-4" 32'-0"

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5482
SITE NAME: PUTNAM WEST
SBA SITE #: CT00802
63 PUTNAM INDUSTRIAL PARK
PUTNAM, CT 06260
WINDHAM COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/20/19	ISSUED FOR CONSTRUCTION	AM	AT	DJC
A	01/21/19	ISSUED FOR REVIEW	AM	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREASER · 26,258 · LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & ELEVATION
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	A-2	1

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

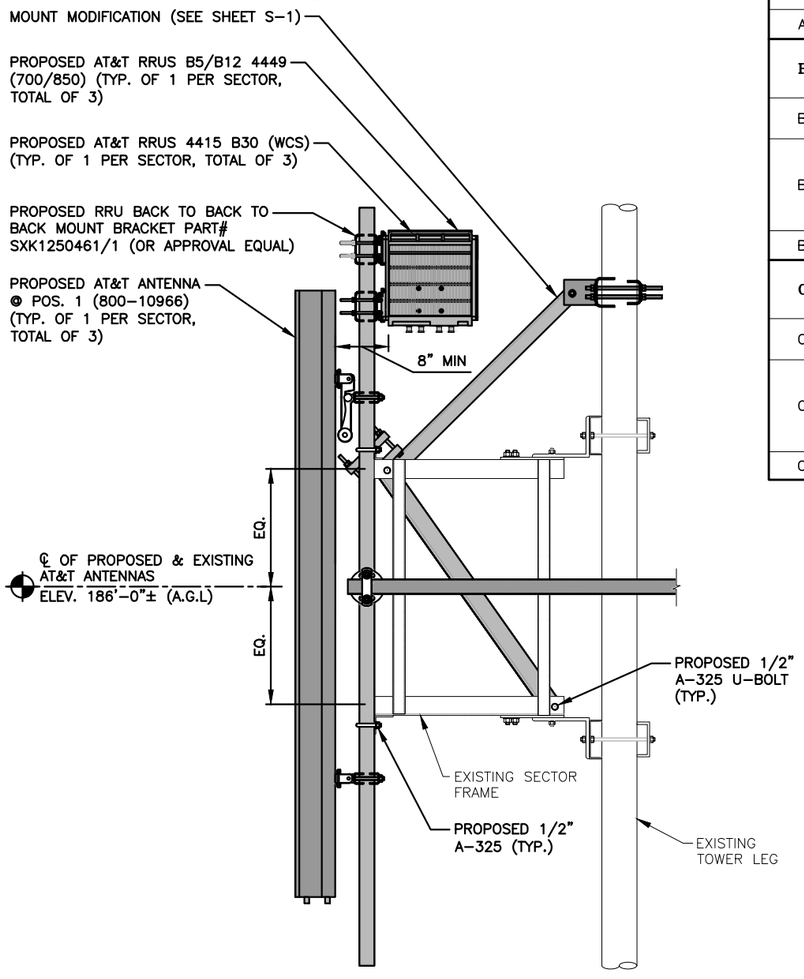
MINIMUM OF 8" SEPARATION REQUIRED BETWEEN THE BACK OF ANTENNA AND THE RRH.

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: TOWER ENGINEERING SOLUTIONS DATED: APRIL 1, 2019 FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: MARCH 18, 2019 (REV.1)



PROPOSED ANTENNA & RRH MOUNTING DETAIL (2 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	**PROPOSED**	**LTE 700 BC/850/WCS**	**800-10966**	**96X20X6.9**	**±186'**	**100°**	–	**(P)(1) B5/B12 4449 (700/850) (P)(1) 4415 B30 (WCS)**	**14.96X13.19X5.39 14.96X13.19X5.39**	–	(E) (1) RAYCAP DC6-48-60-18-8C
A2	EXISTING	PCS	OPA-65R-LCUU-H8	92.7X14.4X7	±186'	100°	(E)(2)(G) POWERWAVE LGP 21901	(E)(1) RRUS-12 (1900) (E)(1) RRUS-A2 (1900)	– –	(2) 1-5/8" COAX (LENGTH 255'±)	
A3	EXISTING	UMTS DB	7770	55X11X5	±186'	0°	(E)(2)(G) POWERWAVE LGP 21901 (E)(2) POWERWAVE LGP21401 SINGLE 1900 W/ 850BP (850)	–	–	(2) 1-5/8" COAX (LENGTH 255'±)	
A4	–	–	–	–	–	–	–	–	–	–	
B1	**PROPOSED**	**LTE 700 BC/850/WCS**	**800-10966**	**96X20X6.9**	**±186'**	**210°**	–	**(P)(1) B5/B12 4449 (700/850) (P)(1) 4415 B30 (WCS)**	**14.96X13.19X5.39 14.96X13.19X5.39**	–	**(P) (1) RAYCAP DC6-48-60-18-8C**
B2	EXISTING	PCS	OPA-65R-LCUU-H8	92.7X14.4X7	±186'	210°	(E)(2)(G) POWERWAVE LGP 21901	(E)(1) RRUS-12 (1900) (E)(1) RRUS-A2 (1900)	– –	(2) 1-5/8" COAX (LENGTH 255'±)	
B3	EXISTING	UMTS DB	7770	55X11X5	±186'	120°	(E)(2)(G) POWERWAVE LGP 21901 (E)(2) POWERWAVE LGP21401 SINGLE 1900 W/ 850BP (850)	–	–	(2) 1-5/8" COAX (LENGTH 255'±)	
B4	–	–	–	–	–	–	–	–	–	–	
C1	**PROPOSED**	**LTE 700 BC/850/WCS**	**800-10966**	**96X20X6.9**	**±186'**	**330°**	–	**(P)(1) B5/B12 4449 (700/850) (P)(1) 4415 B30 (WCS)**	**14.9X13.2X10.4 14.9X13.2X5.4**	–	SHARED
C2	EXISTING	PCS	OPA-65R-LCUU-H8	92.7X14.4X7	±186'	330°	(E)(2)(G) POWERWAVE LGP 21901	(E)(1) RRUS-12 (1900) (E)(1) RRUS-A2 (1900)	– –	(2) 1-5/8" COAX (LENGTH 255'±)	
C3	EXISTING	UMTS DB	7770	55X11X5	±186'	240°	(E)(2)(G) POWERWAVE LGP 21901 (E)(2) POWERWAVE LGP21401 SINGLE 1900 W/ 850BP (850)	–	–	(2) 1-5/8" COAX (LENGTH 255'±)	
C4	–	–	–	–	–	–	–	–	–	–	

FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

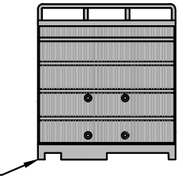
RRU CHART

QUANTITY	MODEL	L	W	D
3(E)	RRUS 12 (1900)	20.4"	18.5"	7.5"
3(E)	RRUS A2 (1900)	16.4"	15.2"	3.4"
3(P)	4415 B30 (WCS)	14.9"	13.2"	5.4"
3(P)	B5/B12 4449 (700/850)	14.9"	13.2"	10.4"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:

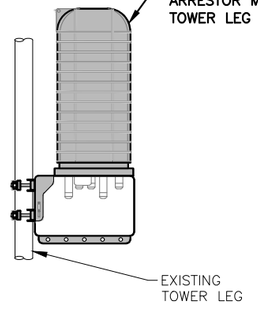
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



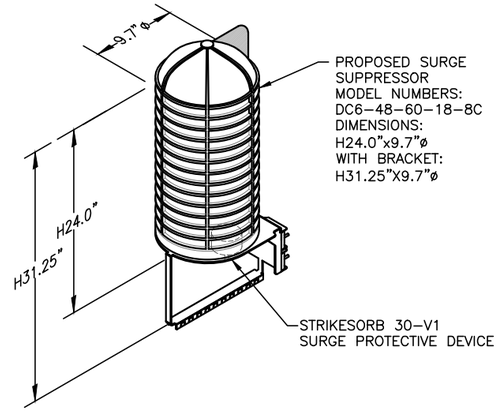
PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (3 / A-3)
SCALE: N.T.S



PROPOSED SURGE ARRESTOR MOUNTING DETAIL (4 / A-3)
SCALE: N.T.S



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL (5 / A-3)
SCALE: N.T.S

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STATE OF CONNECTICUT · DEREK J. CHASE · LICENSED PROFESSIONAL ENGINEER

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DETAILS
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	A-3	1

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREASER · No. 26,258 · LICENSED PROFESSIONAL ENGINEER

AT&T

STRUCTURAL NOTES
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	SN-1	1

NOTE:

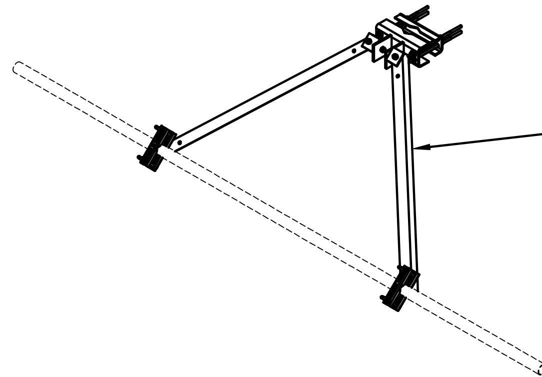
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: MARCH 18, 2019 (REV.1)

NOTE:

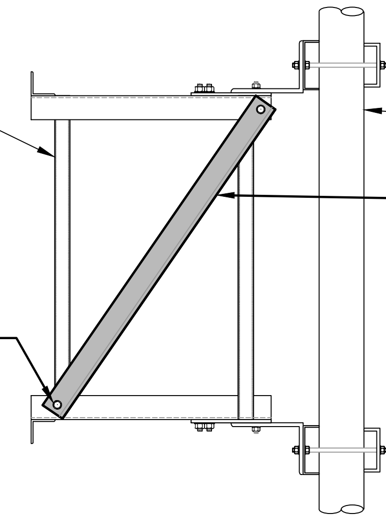
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: TOWER ENGINEERING SOLUTIONS DATED: APRIL 1, 2019 FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

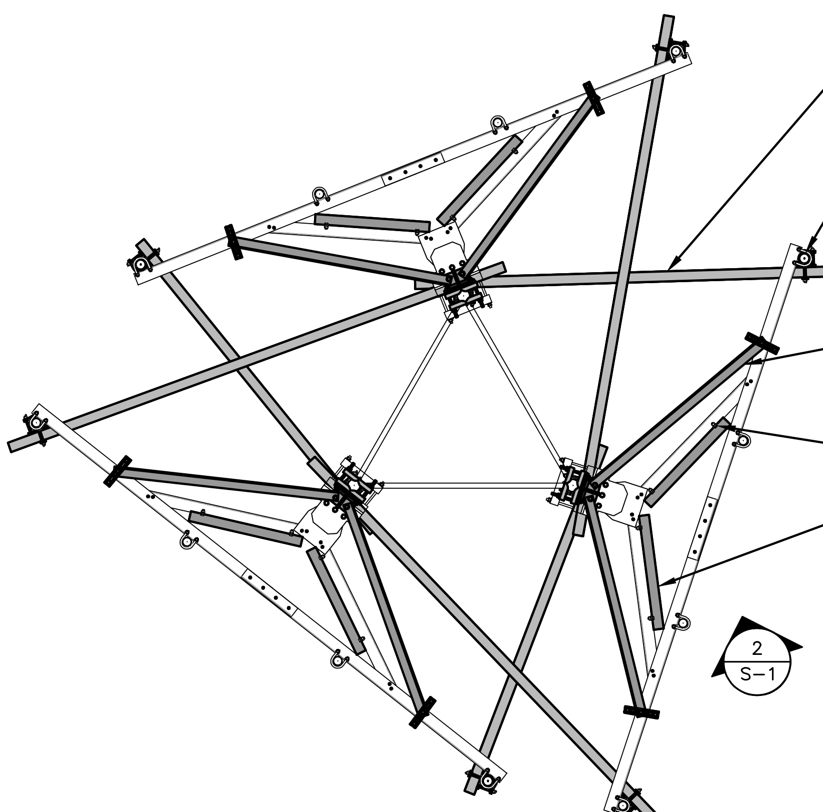


PROPOSED SECTOR FRAME STABILIZER KIT (1 / S-1)
SCALE: N.T.S



PROPOSED MOUNT MODIFICATIONS DETAILS (2 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

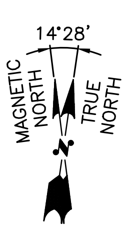


NOTE:

EXISTING ANTENNA MOUNT TO BE ROTATED TO MATCH LTE AZIMUTHS

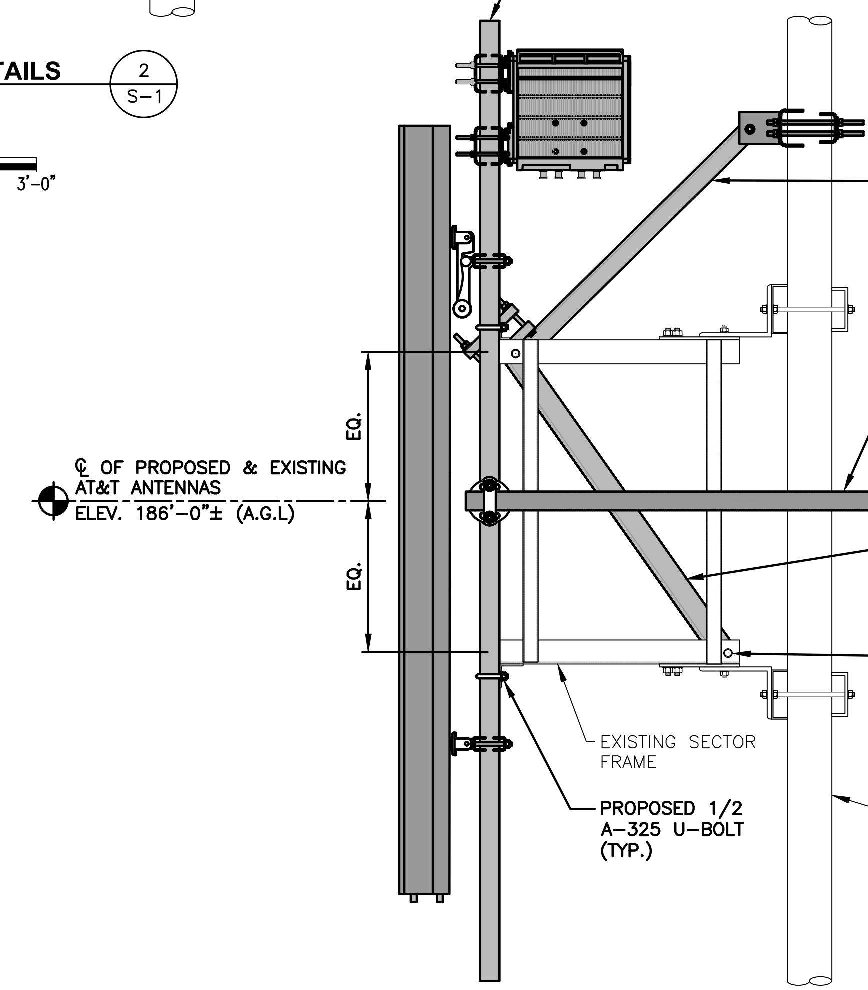
NOTE:

ANTENNAS AND MOUNTS TO BE ADJUSTED AS REQUIRED TO ACHIEVE A 3'-0" MINIMUM SEPARATION BETWEEN ANTENNAS



PROPOSED REINFORCEMENT PLAN (3 / S-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"



PROPOSED MOUNT MODIFICATIONS DETAILS (4 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

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STATE OF CONNECTICUT — DEREK J. CREASER — No. 28551 — LICENSED PROFESSIONAL ENGINEER

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STRUCTURAL DETAILS (LTE 3C_4C)

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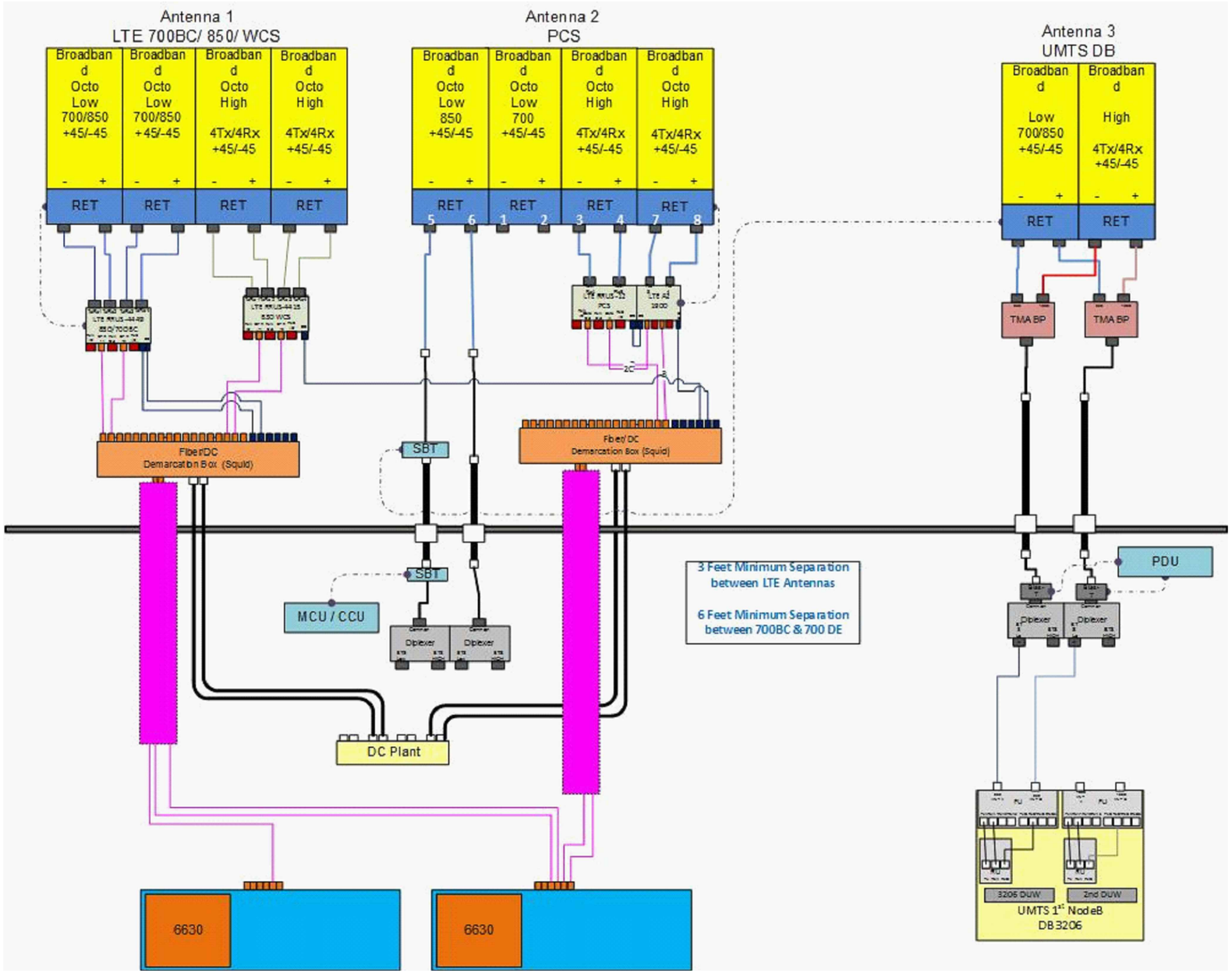

RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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SITE NAME: PUTNAM WEST
SBA SITE #: CT00802
63 PUTNAM INDUSTRIAL PARK
PUTNAM, CT 06260
WINDHAM COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/20/19	ISSUED FOR CONSTRUCTION	AM	AT	DJC
A	01/21/19	ISSUED FOR REVIEW	AM	AT	DJC

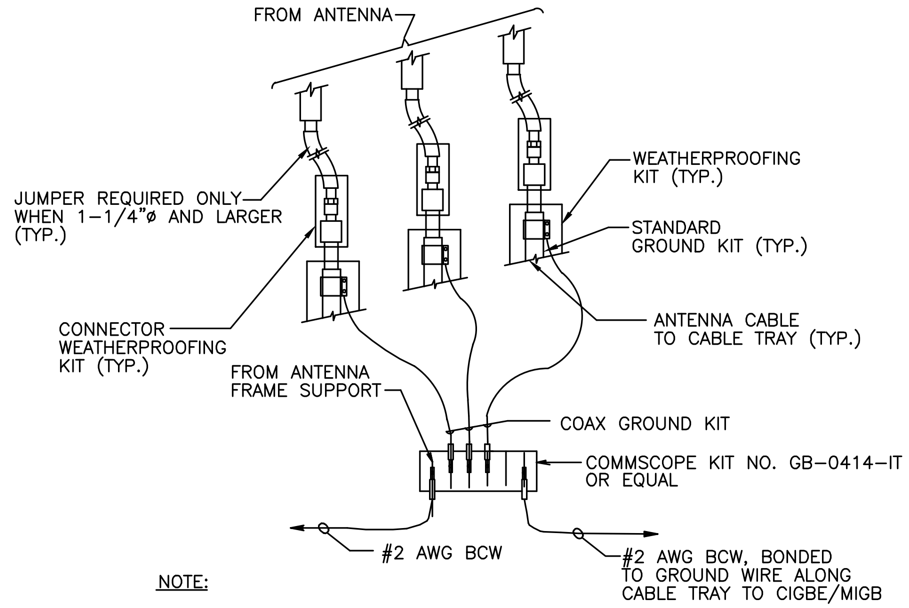
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREASEY · 30,295 · LICENSED PROFESSIONAL ENGINEER

AT&T

RF PLUMBING DIAGRAM
(LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	RF–1	1

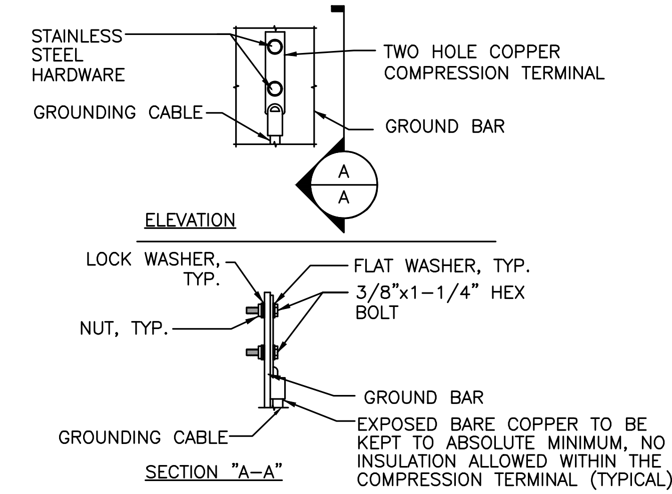


NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S

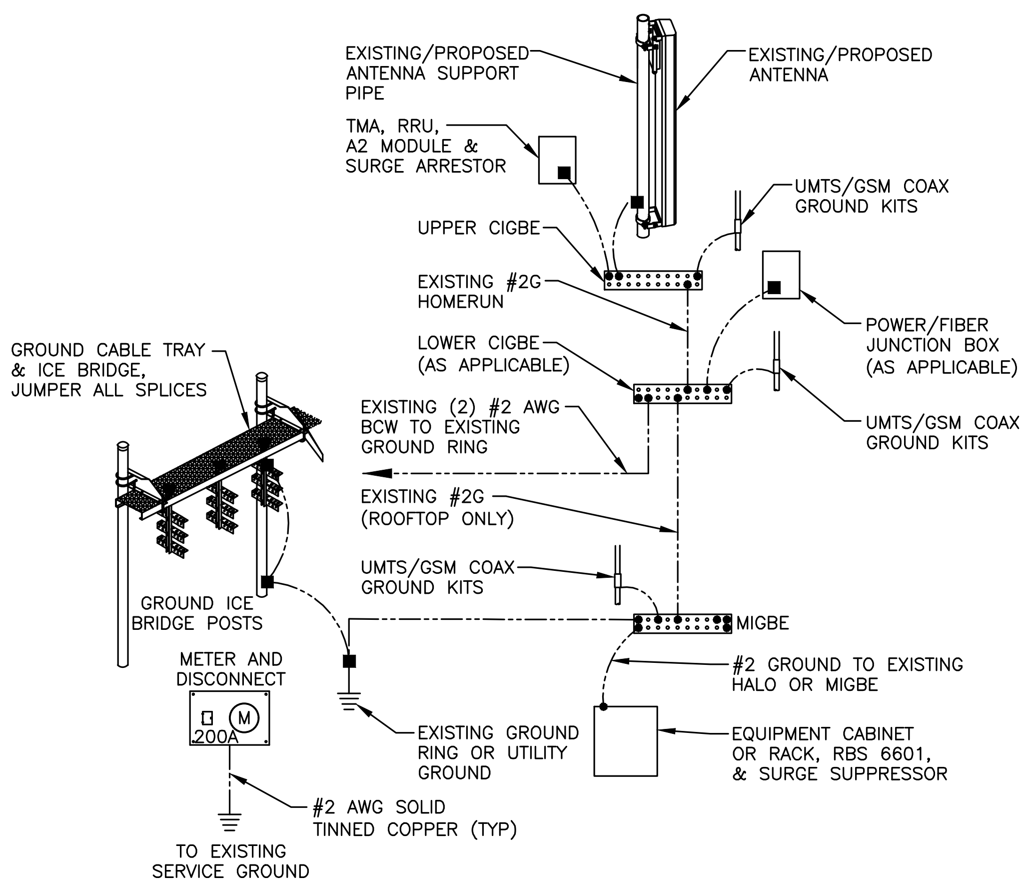


NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S

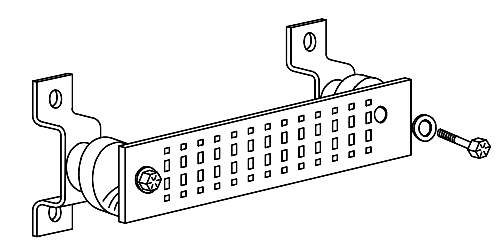
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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)



GROUND BAR - DETAIL (4 / G-1)

SCALE: N.T.S

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845
TEL: (978) 557-5553 FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5482
SITE NAME: PUTNAM WEST
SBA SITE #: CT00802
63 PUTNAM INDUSTRIAL PARK
PUTNAM, CT 06260
WINDHAM COUNTY

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NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/20/19	ISSUED FOR CONSTRUCTION	AM	AT	DJC
A	01/21/19	ISSUED FOR REVIEW	AM	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT DEREK J. CREASER LICENSED PROFESSIONAL ENGINEER

AT&T
GROUNDING DETAILS (LTE 3C_4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5482	G-1	1

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 196 ft Sabre Self Supporting Tower
Customer Name: SBA Communications Corp
Customer Site Number: CT00802-S
Customer Site Name: Putnam Freight
Carrier Name: AT&T (App#: 106746-3)
Carrier Site ID / Name: CT5482 / Putnam West
Site Location: 63 Industrial Park Road
Putnam, Connecticut
Windham County
Latitude: 41.897141
Longitude: -71.892247

Analysis Result:

Max Structural Usage: 91.9% [Pass]
Max Foundation Usage: 39.0% [Pass]
Additional Usage Caused by Mount Modification: +1%

Report Prepared By : Tawfeeq Alajaj

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

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Windham County

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Additional Usage Caused by Mount Modification: +1%

Report Prepared By : Tawfeeq Alajaj

Introduction

The purpose of this report is to summarize the analysis results on the 196 ft Sabre Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Sabre Communications Corporation, Job No. 99-04060. dated 04/19/1999.
Foundation Drawing	Sabre Communications Corporation, Job No. 99-04060. dated 04/19/1999.
Geotechnical Report	Jaworski Geotech, Inc.Project No. C98364G. dated 12/18/1998.
Modification Drawings	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G**.** In accordance with this standard, the structure was analyzed using **TESTowers,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 117.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.172, S_1 = 0.063

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
-	196.0	-	-	(3) T Frame	-	-
-	186.0	3	Powerwave - 7770 - Panel	(3) Frames MTC3615	(12) 1 5/8" (1) 3" Conduit (6) 3/4" DC (2) 5/8" Fiber	AT&T
-		3	CCI - HPA-65R-BUU-H8 - Panel			
-		3	CCI - OPA-65R-LCUU-H6 - Panel			
-		6	Powerwave 21401 TMA			
-		6	Powerwave LGP21401 TMA			
-		3	Ericsson RRUS-11			
-		3	Ericsson RRUS 12			
-		3	Ericsson RRUS E2			
-		3	Ericsson RRUS 32			
-		3	Ericsson RRUS A2			
-		2	Raycap DC6-48-60-18-8F			
14	176.0	6	CommScope JAHH-65B-R3B - Panel	(3) T Frame	(10) 1 5/8" (2) 1 5/8" Hybrid	Verizon
15		3	Andrew LNX-6514DS-AIM - Panel			
16		3	ALU RRH2x90AWS -			
17		3	ALU RRH 4x40 850 -			
18		3	ALU RRH2x60 700 -			
19		2	RFS DB-T1-6Z-8AB-0Z - TMA/TTA			

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	186.0	3	Powerwave - 7770 - Panel	(3) Frames MTC3615 with modifications, (3) Pipe Mast, (6) Diagonal Angles and (3) Pipe Brace	(12) 1 5/8" (1) 3" Conduit (6) 3/4" DC (2) 5/8" Fiber	AT&T
2		3	Kathrein - 800-10966 - Panel			
3		3	CCI - OPA-65R-LCUU-H8 - Panel			
4		6	Powerwave LGP21401 TMA			
5		6	Powerwave 21401TMA			
6		3	Ericsson RRUS-11 (19)			
7		3	Ericsson RRUS 4415 B30			
8		3	Ericsson RRUS 12			
9		3	Ericsson RRUS E2			
10		3	Ericsson RRUS 4449 B5, B12			
11		3	Ericsson RRUS A2			
12		2	Raycap DC6-48-60-18-8F			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	**64.2%**	**91.9%**	**52.6%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	354.8	297.2	41.0

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.1187 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-G Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Structure: CT00802-S-SBA

Site Name:	Putnam Freight			**Code:**	EIA/TIA-222-G	4/1/2019
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	101.00	
Height:	196.00 (ft)	**Base Width:**	27.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	7.40	**Operational WS:**	60.00	Page: 1

IES Tower Engineering Solutions

Section Properties

Sect	Leg Members	Diagonal Members	Horizontal Members
1-2	PST 10" DIA PIPE	SAE 3.5X3.5X0.375	SAE 4X4X0.375
3-4	PX 8" DIA PIPE	SAE 3.5X3.5X0.375	SAE 4X4X0.375
5	PX 8" DIA PIPE	SAE 4X4X0.375	
6	PX 8" DIA PIPE	SAE 3.5X3.5X0.375	
7	PST 8" DIA PIPE	SAE 3.5X3.5X0.25	
8-9	PX 6" DIA PIPE	SAE 3.5X3.5X0.25	
10	PX 5" DIA PIPE	SAE 2.5X2.5X0.25	
11	PSP 4.5 x 0.438	SAE 2.5X2.5X0.1875	
12	PX 3-1/2" DIA PIPE	SAE 2X2X0.1875	SAE 2X2X0.1875

Discrete Appurtenances

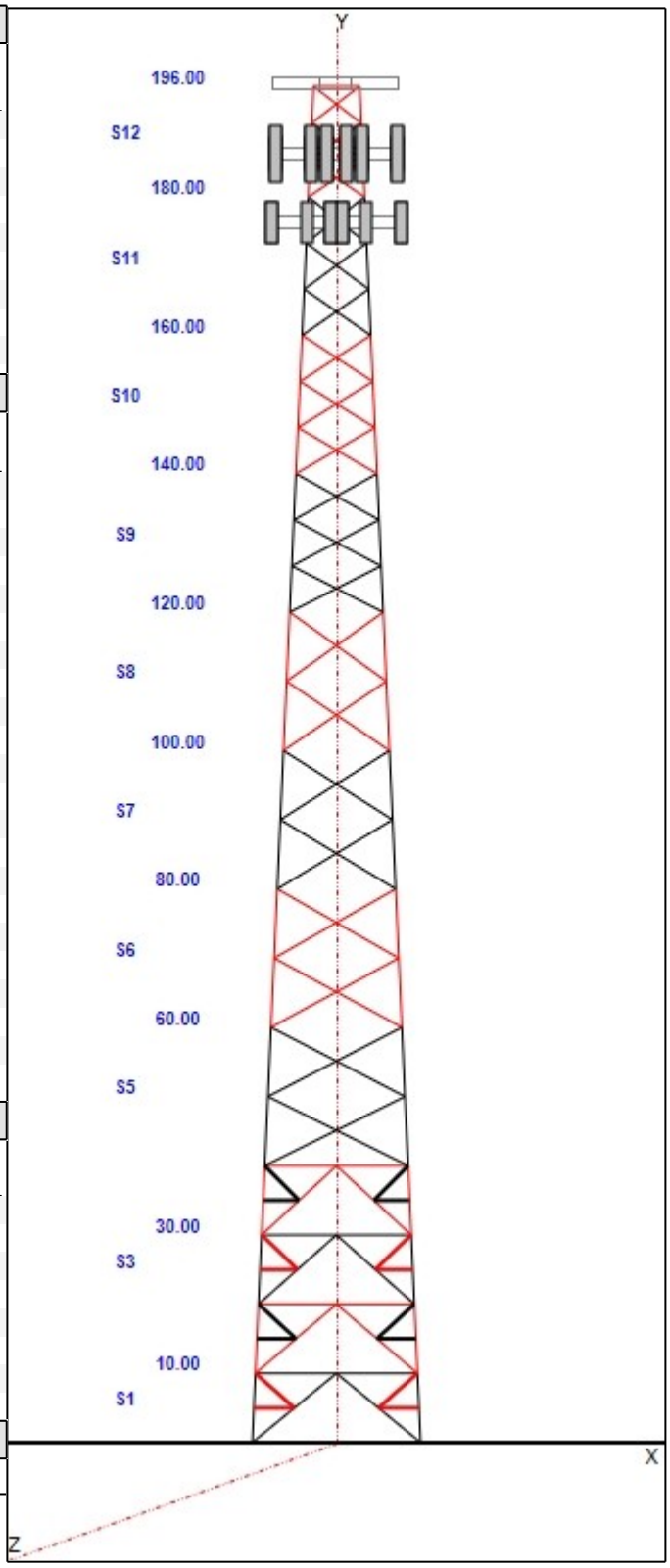
Attach Elev (ft)	Force Elev (ft)	Qty	Description
196.00	196.00	3	Sector Frame
186.00	186.00	3	7770
186.00	186.00	3	800-10966
186.00	186.00	3	OPA-65R-LCUU-H8
186.00	186.00	6	Powerwave LGP21401 TMA
186.00	186.00	6	Powerwave 21401TMA
186.00	186.00	3	Ericsson RRUS-11 (19)
186.00	186.00	3	Ericsson RRUS 4415 B30
186.00	186.00	3	Ericsson RRUS 12
186.00	186.00	3	Ericsson RRUS E2
186.00	186.00	3	Ericsson RRUS 4449 B5, B12
186.00	186.00	3	Ericsson RRUS A2
186.00	186.00	2	Raycap DC6-48-60-18-8F
186.00	186.00	3	Sector Frame
186.00	186.00	1	Reinforing Kit
176.00	176.00	6	JAHH-65B-R3B
176.00	176.00	3	LNX-6514DS-AIM
176.00	176.00	3	ALU RRH2x90AWS
176.00	176.00	3	ALU RRH 4x40 850
176.00	176.00	3	ALU RRH2x60 700
176.00	176.00	2	RFS DB-T1-6Z-8AB-0Z
176.00	176.00	3	Sector Frame

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	196.00	1	W/G Ladder
0.00	196.00	1	W/G Ladder
0.00	186.00	12	1 5/8" Coax
0.00	186.00	1	3" Conduit
0.00	186.00	6	3/4" DC
0.00	186.00	2	5/8" Fiber
0.00	176.00	10	1 5/8" Coax
0.00	176.00	2	1 5/8" Hybrid

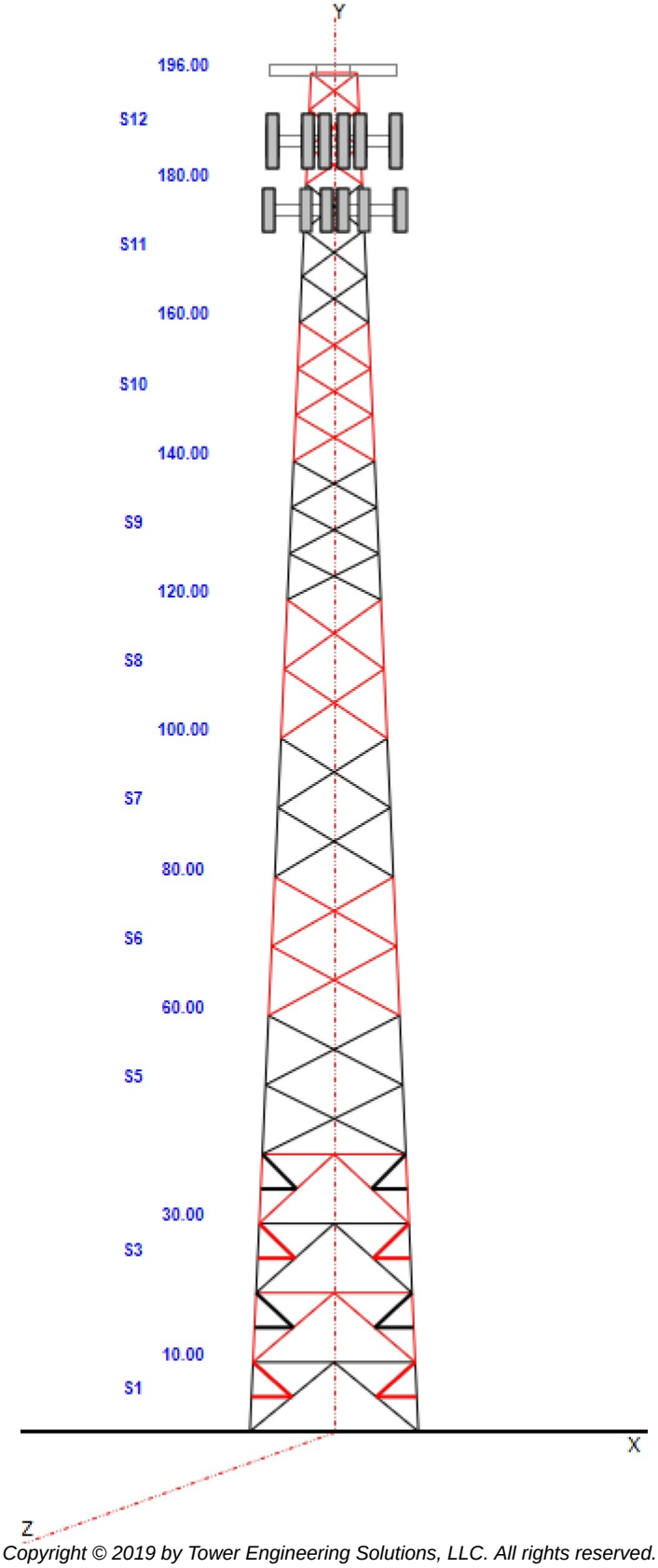
Base Reactions

Leg			Overturning	
Max Uplift:	-297.20 (kips	Moment:	7787.04	(ft-kips)
Max Down:	354.80 (kips	Total Down:	65.32	(kips)
Max Shear:	40.97 (kips	Total Shear:	69.92	(kips)



Structure: CT00802-S-SBA

Site Name:	Putnam Freight			**Code:**	EIA/TIA-222-G	4/1/2019
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	101.00	
Height:	196.00 (ft)	**Base Width:**	27.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	7.40	**Operational WS:**	60.00	Page: 2

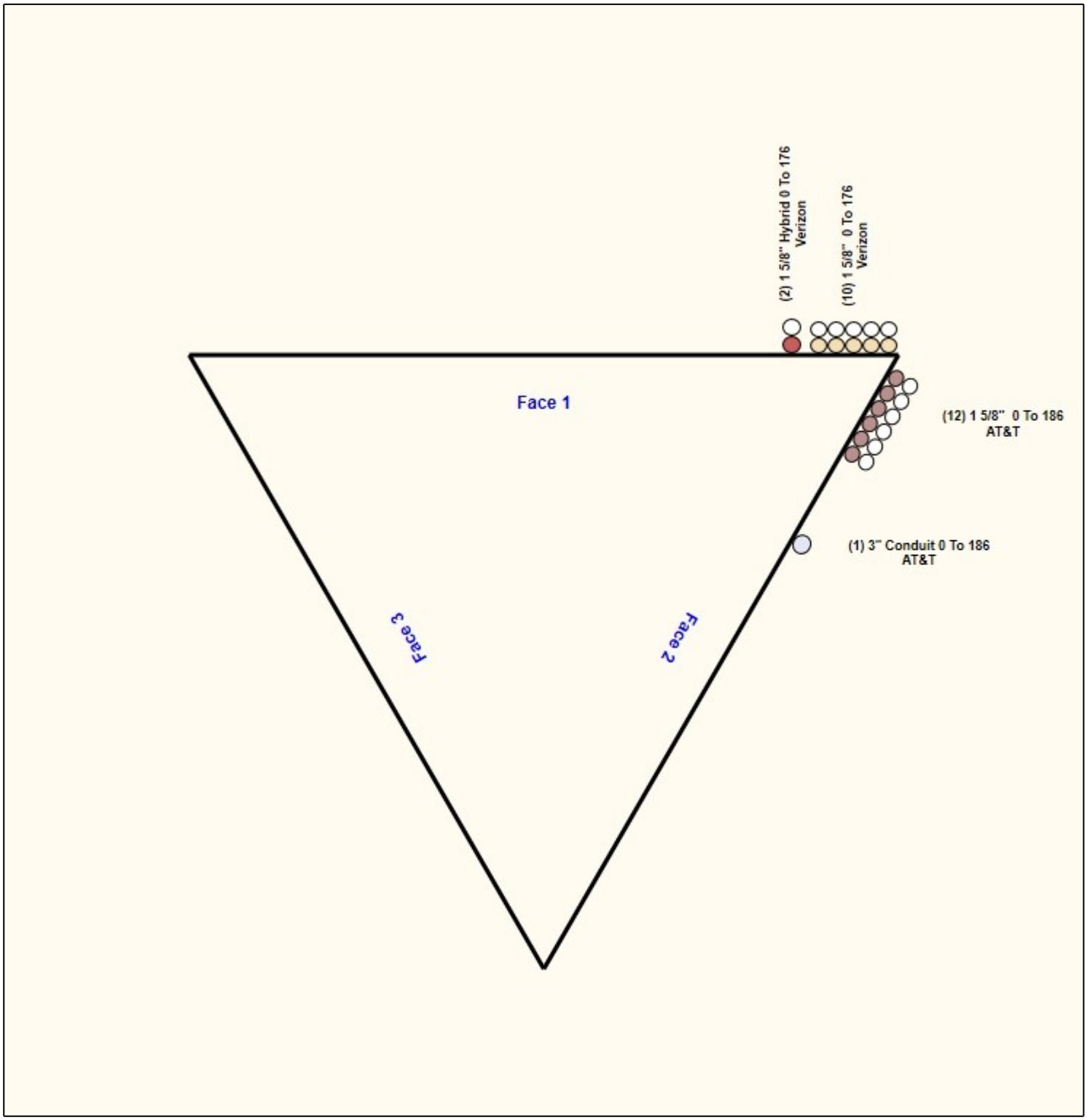


Structure: CT00802-S-SBA - Coax Line Placement

Type: Self Support
Site Name: Putnam Freight
Height: 196.00 (ft)

4/1/2019

Tower Engineering Solutions



Loading Summary

Structure:	CT00802-S-SBA		**Code:**	EIA/TIA-222-G	4/1/2019
Site Name:	Putnam Freight		**Exposure:**	C	
Height:	196.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 4

Tower Engineering Solutions

Discrete Appurtenances Properties

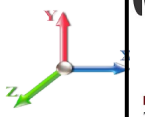
Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	Ice Weight (lb)	Ice CaAa (sf)	Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
196.00	Sector Frame	3	450.00	14.000	929.83	23.596	0.000	0.000	0.000	0.75	0.75	0.000
186.00	7770	3	35.00	5.500	234.87	6.987	55.000	11.000	5.000	0.80	0.73	0.000
186.00	800-10966	3	125.70	17.360	639.11	19.864	96.000	20.000	6.900	0.80	0.72	0.000
186.00	OPA-65R-LCUU-H8	3	88.00	12.980	508.99	15.231	92.400	14.800	7.400	0.80	0.91	0.000
186.00	Powerwave LGP21401 TMA	6	14.10	1.290	48.20	2.430	14.400	9.200	2.600	0.80	1.00	0.000
186.00	Powerwave 21401TMA	6	14.10	1.290	48.20	2.430	14.400	9.200	2.600	0.80	1.00	0.000
186.00	Ericsson RRUS-11 (19)	3	50.70	2.520	182.58	3.437	17.000	17.800	9.200	0.80	0.67	0.000
186.00	Ericsson RRUS 4415 B30	3	46.00	1.640	102.06	2.343	15.000	13.200	5.400	0.80	0.67	0.000
186.00	Ericsson RRUS 12	3	58.00	3.150	198.80	4.155	20.400	18.500	7.500	0.80	0.67	0.000
186.00	Ericsson RRUS E2	3	59.40	3.150	147.62	4.110	20.400	18.500	7.500	0.80	0.67	0.000
186.00	Ericsson RRUS 4449 B5, B12	3	71.00	1.970	143.80	2.716	17.900	13.200	9.400	0.80	0.67	0.000
186.00	Ericsson RRUS A2	3	21.20	1.860	70.45	3.188	12.800	15.000	3.400	0.80	0.67	0.000
186.00	Raycap DC6-48-60-18-8F	2	31.80	0.920	116.12	1.517	24.000	11.000	11.000	0.80	1.00	0.000
186.00	Sector Frame	3	500.00	17.500	1452.04	36.493	0.000	0.000	0.000	0.75	0.75	0.000
186.00	Reinforing Kit	1	650.00	15.500	1763.88	37.635	0.000	0.000	0.000	1.00	1.00	0.000
176.00	JAHH-65B-R3B	6	63.30	9.110	393.53	10.966	72.000	13.800	8.200	0.80	0.83	0.000
176.00	LNX-6514DS-AIM	3	38.40	8.170	276.40	11.982	72.700	11.900	7.100	0.80	0.83	0.000
176.00	ALU RRH2x90AWS	3	56.80	2.540	132.28	3.450	25.800	11.800	7.200	0.80	0.67	0.000
176.00	ALU RRH 4x40 850	3	59.50	2.710	168.46	4.416	25.100	11.100	10.700	0.80	0.67	0.000
176.00	ALU RRH2x60 700	3	55.00	2.200	178.75	3.087	22.000	12.000	9.400	0.80	0.67	0.000
176.00	RFS DB-T1-6Z-8AB-0Z	2	18.90	4.800	225.31	6.008	24.000	24.000	10.000	0.80	0.71	0.000
176.00	Sector Frame	3	500.00	17.500	1442.50	36.303	0.000	0.000	0.000	0.75	0.75	0.000
	Totals:	**71**	**7,944.50**		**25,811.88**						**Number of Appurtenances :**	**22**

Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	196.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	196.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	
0.00	186.00	1 5/8" Coax	12	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	186.00	3" Conduit	1	3.00	1.61	100.00	2	Individual NR		N	1.00	1.00	
0.00	186.00	3/4" DC	6	0.75	0.40	100.00	2	Individual NR		N	1.00	1.00	
0.00	186.00	5/8" Fiber	2	0.87	0.15	100.00	2	Individual NR		N	1.00	1.00	
0.00	176.00	1 5/8" Coax	10	1.98	1.04	50.00	1	Block		N	1.00	1.00	
0.00	176.00	1 5/8" Hybrid	2	2.00	1.10	50.00	1	Block		N	1.00	1.00	

Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 6	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W Normal Wind — 1.2D + 1.6W 101 mph Wind at Normal To Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	1.00	1.00	0.00	31.86	38.35	0.00	4,711.2	0.0	2253.39	875.76	3,129.15
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	1.00	1.00	0.00	31.12	38.35	0.00	4,622.9	0.0	2192.24	875.76	3,068.00
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	1.00	1.00	0.00	28.84	38.35	0.00	4,641.4	0.0	2288.34	973.91	3,262.25
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	1.00	1.00	0.00	28.16	38.35	0.00	4,554.0	0.0	2387.73	1045.40	3,433.13
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	1.00	1.00	0.00	43.07	76.70	0.00	7,536.2	0.0	4036.19	2253.84	6,290.03
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	1.00	1.00	0.00	37.03	76.70	0.00	6,862.8	0.0	3733.80	2419.28	6,153.08
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	1.00	1.00	0.00	35.09	76.70	0.00	4,772.5	0.0	3688.04	2550.73	6,238.77
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	1.00	1.00	0.00	30.45	76.70	0.00	4,630.0	0.0	3373.07	2660.79	6,033.86
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	1.00	1.00	0.00	35.62	76.70	0.00	4,996.8	0.0	3902.88	2756.04	6,658.92
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	1.00	1.00	0.00	25.06	76.70	0.00	3,708.1	0.0	2924.83	2840.33	5,765.16
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	1.00	1.00	0.00	22.13	71.40	0.00	3,100.5	0.0	2646.36	2712.38	5,358.74
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	1.00	1.00	0.00	16.28	18.39	0.00	1,653.2	0.0	1953.15	755.91	2,709.06
														55,789.7	**0.0**			**58,100.15**

Load Case: 1.2D + 1.6W 60° Wind — 1.2D + 1.6W 101 mph Wind at 60° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

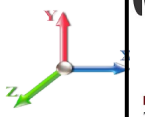
Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.80	1.00	0.00	27.00	38.35	0.00	4,711.2	0.0	1909.54	875.76	2,785.30
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.80	1.00	0.00	26.41	38.35	0.00	4,622.9	0.0	1860.59	875.76	2,736.35
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.80	1.00	0.00	24.28	38.35	0.00	4,641.4	0.0	1926.06	973.91	2,899.97
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.80	1.00	0.00	23.73	38.35	0.00	4,554.0	0.0	2012.54	1045.40	3,057.94
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.80	1.00	0.00	36.82	76.70	0.00	7,536.2	0.0	3450.18	2253.84	5,704.01
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.80	1.00	0.00	31.98	76.70	0.00	6,862.8	0.0	3224.57	2419.28	5,643.85
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.80	1.00	0.00	30.45	76.70	0.00	4,772.5	0.0	3200.54	2550.73	5,751.27
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.80	1.00	0.00	26.18	76.70	0.00	4,630.0	0.0	2900.62	2660.79	5,561.41
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.80	1.00	0.00	30.38	76.70	0.00	4,996.8	0.0	3329.28	2756.04	6,085.32
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.80	1.00	0.00	21.75	76.70	0.00	3,708.1	0.0	2538.11	2840.33	5,378.44
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.80	1.00	0.00	19.22	71.40	0.00	3,100.5	0.0	2298.52	2712.38	5,010.90
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.80	1.00	0.00	14.16	18.39	0.00	1,653.2	0.0	1698.24	755.91	2,454.15
														55,789.7	**0.0**			**53,068.90**

Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 7	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W 90° Wind — 1.2D + 1.6W 101 mph Wind at 90° From Face

Wind Load Factor: 1.60
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.85	1.00	0.00	28.22	38.35	0.00	4,711.2	0.0	1995.51	875.76	2,871.26
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.85	1.00	0.00	27.59	38.35	0.00	4,622.9	0.0	1943.50	875.76	2,819.26
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.85	1.00	0.00	25.42	38.35	0.00	4,641.4	0.0	2016.63	973.91	2,990.54
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.85	1.00	0.00	24.84	38.35	0.00	4,554.0	0.0	2106.34	1045.40	3,151.73
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.85	1.00	0.00	38.38	76.70	0.00	7,536.2	0.0	3596.68	2253.84	5,850.52
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.85	1.00	0.00	33.24	76.70	0.00	6,862.8	0.0	3351.88	2419.28	5,771.16
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.85	1.00	0.00	31.61	76.70	0.00	4,772.5	0.0	3322.42	2550.73	5,873.14
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.85	1.00	0.00	27.25	76.70	0.00	4,630.0	0.0	3018.73	2660.79	5,679.53
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.85	1.00	0.00	31.69	76.70	0.00	4,996.8	0.0	3472.68	2756.04	6,228.72
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.85	1.00	0.00	22.57	76.70	0.00	3,708.1	0.0	2634.79	2840.33	5,475.12
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.85	1.00	0.00	19.95	71.40	0.00	3,100.5	0.0	2385.48	2712.38	5,097.86
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.85	1.00	0.00	14.69	18.39	0.00	1,653.2	0.0	1761.97	755.91	2,517.88
														55,789.7	**0.0**			**54,326.71**

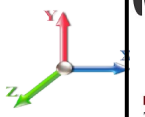
Load Case: 0.9D + 1.6W Normal Wind — 0.9D + 1.6W 101 mph Wind at Normal To Face

Wind Load Factor: 1.60
Dead Load Factor: 0.90
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	1.00	1.00	0.00	31.86	38.35	0.00	3,533.4	0.0	2253.39	875.76	3,129.15
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	1.00	1.00	0.00	31.12	38.35	0.00	3,467.2	0.0	2192.24	875.76	3,068.00
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	1.00	1.00	0.00	28.84	38.35	0.00	3,481.1	0.0	2288.34	973.91	3,262.25
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	1.00	1.00	0.00	28.16	38.35	0.00	3,415.5	0.0	2387.73	1045.40	3,433.13
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	1.00	1.00	0.00	43.07	76.70	0.00	5,652.2	0.0	4036.19	2253.84	6,290.03
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	1.00	1.00	0.00	37.03	76.70	0.00	5,147.1	0.0	3733.80	2419.28	6,153.08
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	1.00	1.00	0.00	35.09	76.70	0.00	3,579.3	0.0	3688.04	2550.73	6,238.77
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	1.00	1.00	0.00	30.45	76.70	0.00	3,472.5	0.0	3373.07	2660.79	6,033.86
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	1.00	1.00	0.00	35.62	76.70	0.00	3,747.6	0.0	3902.88	2756.04	6,658.92
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	1.00	1.00	0.00	25.06	76.70	0.00	2,781.0	0.0	2924.83	2840.33	5,765.16
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	1.00	1.00	0.00	22.13	71.40	0.00	2,325.4	0.0	2646.36	2712.38	5,358.74
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	1.00	1.00	0.00	16.28	18.39	0.00	1,239.9	0.0	1953.15	755.91	2,709.06
														41,842.3	**0.0**			**58,100.15**

Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 8	



Tower Engineering Solutions

Load Case: 0.9D + 1.6W 60° Wind — 0.9D + 1.6W 101 mph Wind at 60° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.80	1.00	0.00	27.00	38.35	0.00	3,533.4	0.0	1909.54	875.76	2,785.30
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.80	1.00	0.00	26.41	38.35	0.00	3,467.2	0.0	1860.59	875.76	2,736.35
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.80	1.00	0.00	24.28	38.35	0.00	3,481.1	0.0	1926.06	973.91	2,899.97
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.80	1.00	0.00	23.73	38.35	0.00	3,415.5	0.0	2012.54	1045.40	3,057.94
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.80	1.00	0.00	36.82	76.70	0.00	5,652.2	0.0	3450.18	2253.84	5,704.01
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.80	1.00	0.00	31.98	76.70	0.00	5,147.1	0.0	3224.57	2419.28	5,643.85
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.80	1.00	0.00	30.45	76.70	0.00	3,579.3	0.0	3200.54	2550.73	5,751.27
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.80	1.00	0.00	26.18	76.70	0.00	3,472.5	0.0	2900.62	2660.79	5,561.41
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.80	1.00	0.00	30.38	76.70	0.00	3,747.6	0.0	3329.28	2756.04	6,085.32
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.80	1.00	0.00	21.75	76.70	0.00	2,781.0	0.0	2538.11	2840.33	5,378.44
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.80	1.00	0.00	19.22	71.40	0.00	2,325.4	0.0	2298.52	2712.38	5,010.90
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.80	1.00	0.00	14.16	18.39	0.00	1,239.9	0.0	1698.24	755.91	2,454.15
														41,842.3	**0.0**			**53,068.90**

Load Case: 0.9D + 1.6W 90° Wind — 0.9D + 1.6W 101 mph Wind at 90° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

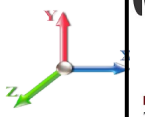
Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.85	1.00	0.00	28.22	38.35	0.00	3,533.4	0.0	1995.51	875.76	2,871.26
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.85	1.00	0.00	27.59	38.35	0.00	3,467.2	0.0	1943.50	875.76	2,819.26
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.85	1.00	0.00	25.42	38.35	0.00	3,481.1	0.0	2016.63	973.91	2,990.54
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.85	1.00	0.00	24.84	38.35	0.00	3,415.5	0.0	2106.34	1045.40	3,151.73
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.85	1.00	0.00	38.38	76.70	0.00	5,652.2	0.0	3596.68	2253.84	5,850.52
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.85	1.00	0.00	33.24	76.70	0.00	5,147.1	0.0	3351.88	2419.28	5,771.16
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.85	1.00	0.00	31.61	76.70	0.00	3,579.3	0.0	3322.42	2550.73	5,873.14
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.85	1.00	0.00	27.25	76.70	0.00	3,472.5	0.0	3018.73	2660.79	5,679.53
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.85	1.00	0.00	31.69	76.70	0.00	3,747.6	0.0	3472.68	2756.04	6,228.72
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.85	1.00	0.00	22.57	76.70	0.00	2,781.0	0.0	2634.79	2840.33	5,475.12
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.85	1.00	0.00	19.95	71.40	0.00	2,325.4	0.0	2385.48	2712.38	5,097.86
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.85	1.00	0.00	14.69	18.39	0.00	1,239.9	0.0	1761.97	755.91	2,517.88
														41,842.3	**0.0**			**54,326.71**

Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 9	



Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	4.62	24.312	39.93	21.98	0.23	2.49	1.00	1.00	1.66	47.50	52.15	24.84	10,398.	5687.3	465.30	285.53	750.83
2	15.0	4.62	23.540	41.93	23.98	0.25	2.45	1.00	1.00	1.85	48.02	53.75	27.73	10,984.	6361.7	462.78	300.22	763.01
3	25.0	5.14	22.832	39.06	24.66	0.24	2.46	1.00	1.00	1.95	45.61	54.56	29.18	11,128.	6486.6	490.56	343.78	834.33
4	35.0	5.52	22.121	39.30	24.91	0.25	2.44	1.00	1.00	2.01	45.12	55.12	30.18	11,179.	6625.7	515.85	374.25	890.10
5	50.0	5.95	31.267	76.31	47.51	0.23	2.49	1.00	1.00	2.08	75.61	111.45	62.55	18,051.	10514.9	951.76	831.15	1,782.90
6	70.0	6.39	25.252	75.34	46.55	0.24	2.47	1.00	1.00	2.16	69.13	112.64	64.69	17,005.	10142.6	927.69	906.60	1,834.29
7	90.0	6.73	23.189	73.92	45.12	0.25	2.42	1.00	1.00	2.21	66.51	113.55	66.33	14,904.	10131.6	922.99	960.96	1,883.95
8	110.0	7.02	21.325	65.57	43.45	0.26	2.42	1.00	1.00	2.26	59.79	114.30	67.68	14,354.	9724.6	863.11	1012.81	1,875.92
9	130.0	7.28	26.175	73.01	50.89	0.33	2.21	1.00	1.00	2.29	70.68	114.93	68.82	15,805.	10808.3	967.89	1012.20	1,980.09
10	150.0	7.50	16.566	66.07	47.49	0.32	2.24	1.00	1.00	2.33	56.60	115.48	69.81	13,099.	9391.7	808.17	1058.71	1,866.88
11	170.0	7.70	14.543	59.09	44.07	0.34	2.19	1.00	1.00	2.36	50.77	107.53	70.69	11,765.	8665.2	727.75	1031.40	1,759.15
12	188.0	7.86	10.623	49.63	38.94	0.42	2.02	1.00	1.00	2.38	42.68	33.47	21.42	6,184.5	4531.2	576.97	322.90	899.87
														154,861.1	**99071.4**			**17,121.32**

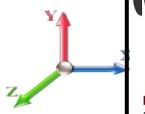
Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	4.62	24.312	39.93	21.98	0.23	2.49	0.80	1.00	1.66	42.64	52.15	24.84	10,398.	5687.3	417.67	285.53	703.20
2	15.0	4.62	23.540	41.93	23.98	0.25	2.45	0.80	1.00	1.85	43.31	53.75	27.73	10,984.	6361.7	417.41	300.22	717.63
3	25.0	5.14	22.832	39.06	24.66	0.24	2.46	0.80	1.00	1.95	41.04	54.56	29.18	11,128.	6486.6	441.44	343.78	785.22
4	35.0	5.52	22.121	39.30	24.91	0.25	2.44	0.80	1.00	2.01	40.69	55.12	30.18	11,179.	6625.7	465.26	374.25	839.51
5	50.0	5.95	31.267	76.31	47.51	0.23	2.49	0.80	1.00	2.08	69.36	111.45	62.55	18,051.	10514.9	873.04	831.15	1,704.19
6	70.0	6.39	25.252	75.34	46.55	0.24	2.47	0.80	1.00	2.16	64.07	112.64	64.69	17,005.	10142.6	859.91	906.60	1,766.51
7	90.0	6.73	23.189	73.92	45.12	0.25	2.42	0.80	1.00	2.21	61.87	113.55	66.33	14,904.	10131.6	858.63	960.96	1,819.60
8	110.0	7.02	21.325	65.57	43.45	0.26	2.42	0.80	1.00	2.26	55.52	114.30	67.68	14,354.	9724.6	801.54	1012.81	1,814.35
9	130.0	7.28	26.175	73.01	50.89	0.33	2.21	0.80	1.00	2.29	65.45	114.93	68.82	15,805.	10808.3	896.20	1012.20	1,908.40
10	150.0	7.50	16.566	66.07	47.49	0.32	2.24	0.80	1.00	2.33	53.28	115.48	69.81	13,099.	9391.7	760.86	1058.71	1,819.57
11	170.0	7.70	14.543	59.09	44.07	0.34	2.19	0.80	1.00	2.36	47.86	107.53	70.69	11,765.	8665.2	686.06	1031.40	1,717.46
12	188.0	7.86	10.623	49.63	38.94	0.42	2.02	0.80	1.00	2.38	40.55	33.47	21.42	6,184.5	4531.2	548.24	322.90	871.14
														154,861.1	**99071.4**			**16,466.78**

Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 10	



Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	4.62	24.312	39.93	21.98	0.23	2.49	0.85	1.00	1.66	43.86	52.15	24.84	10,398.	5687.3	429.58	285.53	715.11
2	15.0	4.62	23.540	41.93	23.98	0.25	2.45	0.85	1.00	1.85	44.49	53.75	27.73	10,984.	6361.7	428.75	300.22	728.98
3	25.0	5.14	22.832	39.06	24.66	0.24	2.46	0.85	1.00	1.95	42.18	54.56	29.18	11,128.	6486.6	453.72	343.78	797.50
4	35.0	5.52	22.121	39.30	24.91	0.25	2.44	0.85	1.00	2.01	41.80	55.12	30.18	11,179.	6625.7	477.91	374.25	852.16
5	50.0	5.95	31.267	76.31	47.51	0.23	2.49	0.85	1.00	2.08	70.92	111.45	62.55	18,051.	10514.9	892.72	831.15	1,723.87
6	70.0	6.39	25.252	75.34	46.55	0.24	2.47	0.85	1.00	2.16	65.34	112.64	64.69	17,005.	10142.6	876.86	906.60	1,783.46
7	90.0	6.73	23.189	73.92	45.12	0.25	2.42	0.85	1.00	2.21	63.03	113.55	66.33	14,904.	10131.6	874.72	960.96	1,835.68
8	110.0	7.02	21.325	65.57	43.45	0.26	2.42	0.85	1.00	2.26	56.59	114.30	67.68	14,354.	9724.6	816.93	1012.81	1,829.74
9	130.0	7.28	26.175	73.01	50.89	0.33	2.21	0.85	1.00	2.29	66.76	114.93	68.82	15,805.	10808.3	914.12	1012.20	1,926.32
10	150.0	7.50	16.566	66.07	47.49	0.32	2.24	0.85	1.00	2.33	54.11	115.48	69.81	13,099.	9391.7	772.68	1058.71	1,831.40
11	170.0	7.70	14.543	59.09	44.07	0.34	2.19	0.85	1.00	2.36	48.59	107.53	70.69	11,765.	8665.2	696.48	1031.40	1,727.88
12	188.0	7.86	10.623	49.63	38.94	0.42	2.02	0.85	1.00	2.38	41.08	33.47	21.42	6,184.5	4531.2	555.43	322.90	878.33
														154,861.1	**99071.4**			**16,630.42**

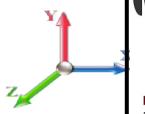
Load Case: 1.0D + 1.0W Normal Wind — 1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00
Dead Load Factor: 1.00
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	6.66	24.312	17.95	0.00	0.15	2.76	1.00	1.00	0.00	33.06	38.35	0.00	3,926.0	0.0	515.61	193.16	708.78
2	15.0	6.66	23.540	17.95	0.00	0.16	2.75	1.00	1.00	0.00	32.30	38.35	0.00	3,852.4	0.0	501.90	193.16	695.07
3	25.0	7.40	22.832	14.40	0.00	0.15	2.78	1.00	1.00	0.00	30.33	38.35	0.00	3,867.8	0.0	530.77	214.81	745.58
4	35.0	7.95	22.121	14.40	0.00	0.15	2.77	1.00	1.00	0.00	29.53	38.35	0.00	3,795.0	0.0	552.36	230.58	782.93
5	50.0	8.57	31.267	28.80	0.00	0.13	2.84	1.00	1.00	0.00	45.72	76.70	0.00	6,280.2	0.0	945.12	497.12	1,442.25
6	70.0	9.20	25.252	28.80	0.00	0.13	2.84	1.00	1.00	0.00	39.47	76.70	0.00	5,719.0	0.0	877.76	533.61	1,411.37
7	90.0	9.70	23.189	28.80	0.00	0.14	2.81	1.00	1.00	0.00	37.30	76.70	0.00	3,977.0	0.0	864.72	562.61	1,427.33
8	110.0	10.12	21.325	22.12	0.00	0.13	2.84	1.00	1.00	0.00	33.23	76.70	0.00	3,858.3	0.0	811.97	586.88	1,398.85
9	130.0	10.48	26.175	22.12	0.00	0.17	2.71	1.00	1.00	0.00	38.15	76.70	0.00	4,164.0	0.0	921.95	607.89	1,529.84
10	150.0	10.80	16.566	18.57	0.00	0.14	2.80	1.00	1.00	0.00	27.03	76.70	0.00	3,090.1	0.0	695.98	626.48	1,322.46
11	170.0	11.09	14.543	15.02	0.00	0.14	2.80	1.00	1.00	0.00	23.06	71.40	0.00	2,583.7	0.0	608.26	598.26	1,206.52
12	188.0	11.32	10.623	10.68	0.00	0.16	2.75	1.00	1.00	0.00	16.69	18.39	0.00	1,377.7	0.0	441.76	166.73	608.49
														46,491.4	**0.0**			**13,279.48**

Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 11	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60° Wind — 1.0D + 1.0W 60 mph Wind at 60° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	6.66	24.312	17.95	0.00	0.15	2.76	0.80	1.00	0.00	28.19	38.35	0.00	3,926.0	0.0	439.77	193.16	632.93
2	15.0	6.66	23.540	17.95	0.00	0.16	2.75	0.80	1.00	0.00	27.59	38.35	0.00	3,852.4	0.0	428.75	193.16	621.91
3	25.0	7.40	22.832	14.40	0.00	0.15	2.78	0.80	1.00	0.00	25.76	38.35	0.00	3,867.8	0.0	450.86	214.81	665.67
4	35.0	7.95	22.121	14.40	0.00	0.15	2.77	0.80	1.00	0.00	25.11	38.35	0.00	3,795.0	0.0	469.60	230.58	700.18
5	50.0	8.57	31.267	28.80	0.00	0.13	2.84	0.80	1.00	0.00	39.47	76.70	0.00	6,280.2	0.0	815.87	497.12	1,312.99
6	70.0	9.20	25.252	28.80	0.00	0.13	2.84	0.80	1.00	0.00	34.42	76.70	0.00	5,719.0	0.0	765.44	533.61	1,299.06
7	90.0	9.70	23.189	28.80	0.00	0.14	2.81	0.80	1.00	0.00	32.66	76.70	0.00	3,977.0	0.0	757.20	562.61	1,319.80
8	110.0	10.12	21.325	22.12	0.00	0.13	2.84	0.80	1.00	0.00	28.97	76.70	0.00	3,858.3	0.0	707.76	586.88	1,294.65
9	130.0	10.48	26.175	22.12	0.00	0.17	2.71	0.80	1.00	0.00	32.91	76.70	0.00	4,164.0	0.0	795.44	607.89	1,403.33
10	150.0	10.80	16.566	18.57	0.00	0.14	2.80	0.80	1.00	0.00	23.72	76.70	0.00	3,090.1	0.0	610.68	626.48	1,237.16
11	170.0	11.09	14.543	15.02	0.00	0.14	2.80	0.80	1.00	0.00	20.15	71.40	0.00	2,583.7	0.0	531.54	598.26	1,129.80
12	188.0	11.32	10.623	10.68	0.00	0.16	2.75	0.80	1.00	0.00	14.57	18.39	0.00	1,377.7	0.0	385.54	166.73	552.27
														46,491.4	**0.0**			**12,169.75**

Load Case: 1.0D + 1.0W 90° Wind — 1.0D + 1.0W 60 mph Wind at 90° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

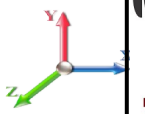
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	6.66	24.312	17.95	0.00	0.15	2.76	0.85	1.00	0.00	29.41	38.35	0.00	3,926.0	0.0	458.73	193.16	651.89
2	15.0	6.66	23.540	17.95	0.00	0.16	2.75	0.85	1.00	0.00	28.77	38.35	0.00	3,852.4	0.0	447.04	193.16	640.20
3	25.0	7.40	22.832	14.40	0.00	0.15	2.78	0.85	1.00	0.00	26.91	38.35	0.00	3,867.8	0.0	470.84	214.81	685.65
4	35.0	7.95	22.121	14.40	0.00	0.15	2.77	0.85	1.00	0.00	26.21	38.35	0.00	3,795.0	0.0	490.29	230.58	720.87
5	50.0	8.57	31.267	28.80	0.00	0.13	2.84	0.85	1.00	0.00	41.03	76.70	0.00	6,280.2	0.0	848.18	497.12	1,345.30
6	70.0	9.20	25.252	28.80	0.00	0.13	2.84	0.85	1.00	0.00	35.68	76.70	0.00	5,719.0	0.0	793.52	533.61	1,327.13
7	90.0	9.70	23.189	28.80	0.00	0.14	2.81	0.85	1.00	0.00	33.82	76.70	0.00	3,977.0	0.0	784.08	562.61	1,346.69
8	110.0	10.12	21.325	22.12	0.00	0.13	2.84	0.85	1.00	0.00	30.03	76.70	0.00	3,858.3	0.0	733.82	586.88	1,320.70
9	130.0	10.48	26.175	22.12	0.00	0.17	2.71	0.85	1.00	0.00	34.22	76.70	0.00	4,164.0	0.0	827.06	607.89	1,434.95
10	150.0	10.80	16.566	18.57	0.00	0.14	2.80	0.85	1.00	0.00	24.55	76.70	0.00	3,090.1	0.0	632.01	626.48	1,258.49
11	170.0	11.09	14.543	15.02	0.00	0.14	2.80	0.85	1.00	0.00	20.88	71.40	0.00	2,583.7	0.0	550.72	598.26	1,148.98
12	188.0	11.32	10.623	10.68	0.00	0.16	2.75	0.85	1.00	0.00	15.10	18.39	0.00	1,377.7	0.0	399.60	166.73	566.32
														46,491.4	**0.0**			**12,447.18**

Force/Stress Compression Summary

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 12	



Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	10	PST - 10" DIA PIPE	-337.15	1.2D + 1.6W Normal Wind	10.02	50	50	50	16.38	50.00	525.10	64.2	Member X
2	20	PST - 10" DIA PIPE	-317.47	1.2D + 1.6W Normal Wind	10.02	50	50	50	16.38	50.00	525.10	60.5	Member X
3	30	PX - 8" DIA PIPE	-297.68	1.2D + 1.6W Normal Wind	10.02	50	50	50	20.88	50.00	556.18	53.5	Member X
4	40	PX - 8" DIA PIPE	-277.80	1.2D + 1.6W Normal Wind	10.02	50	50	50	20.88	50.00	556.18	49.9	Member X
5	60	PX - 8" DIA PIPE	-267.36	1.2D + 1.6W Normal Wind	10.02	100	100	100	41.77	50.00	505.44	52.9	Member X
6	80	PX - 8" DIA PIPE	-228.75	1.2D + 1.6W Normal Wind	10.02	100	100	100	41.77	50.00	505.44	45.3	Member X
7	100	PST - 8" DIA PIPE	-190.02	1.2D + 1.6W Normal Wind	10.02	100	100	100	40.88	50.00	334.51	56.8	Member X
8	120	PX - 6" DIA PIPE	-152.11	1.2D + 1.6W Normal Wind	10.02	100	100	100	54.89	50.00	303.27	50.2	Member X
9	140	PX - 6" DIA PIPE	-117.06	1.2D + 1.6W Normal Wind	6.68	100	100	100	36.59	50.00	342.75	34.2	Member X
10	160	PX - 5" DIA PIPE	-79.36	1.2D + 1.6W Normal Wind	6.68	100	100	100	43.55	50.00	239.35	33.2	Member X
11	180	PSP - 4.5 x 0.438	-42.52	1.2D + 1.6W Normal Wind	6.68	100	100	100	55.78	50.00	200.33	21.2	Member X
12	196	PX - 3-1/2" DIA PIPE	-9.31	1.2D + 1.6W Normal Wind	5.34	100	100	100	48.94	50.00	139.00	6.7	Member X

Splices

		Top Splice						Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	10	1.2D + 1.6W Normal Wind	335.98	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	356.03	0.00			
2	20	1.2D + 1.6W Normal Wind	316.30	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	335.98	0.00			
3	30	1.2D + 1.6W Normal Wind	296.57	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	316.30	0.00		3/8 A325	6
4	40	1.2D + 1.6W Normal Wind	276.70	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	296.57	0.00		3/8 A325	6
5	60	1.2D + 1.6W Normal Wind	238.49	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	276.70	0.00		3/8 A325	6
6	80	1.2D + 1.6W Normal Wind	199.74	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	238.49	0.00		3/8 A325	6
7	100	1.2D + 1.6W Normal Wind	161.48	0.00	0.0	1 1/4	6	1.2D + 1.6W Normal Wind	199.74	0.00		3/8 A325	6
8	120	1.2D + 1.6W Normal Wind	123.25	0.00	0.0	1 1/4	6	1.2D + 1.6W Normal Wind	161.48	0.00		1/4 A325	6
9	140	1.2D + 1.6W Normal Wind	85.40	0.00	0.0	1 1/4	4	1.2D + 1.6W Normal Wind	123.25	0.00		1/4 A325	6
10	160	1.2D + 1.6W Normal Wind	48.45	0.00	0.0	1 1/4	4	1.2D + 1.6W Normal Wind	85.40	0.00		1/4 A325	4
11	180	1.2D + 1.6W Normal Wind	13.03	0.00	0.0	1 A325	4	1.2D + 1.6W Normal Wind	48.45	0.00		1/4 A325	4
12	196	1.2D + 1.0Di + 1.0Wi 60° Wind	1.62	0.00	0.0			1.2D + 1.6W Normal Wind	13.03	0.00		1 A325	4

HORIZONTAL MEMBERS

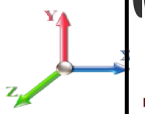
Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	SAE - 4X4X0.375	-12.0	0.9D + 1.6W 90° Wind	13.00	100	100	100	167.95	36.00	22.91	2	1	24.86	52.20	53	Member Z
2	20	SAE - 4X4X0.375	-12.2	0.9D + 1.6W 90° Wind	12.50	100	100	100	163.27	36.00	24.24	2	1	24.86	52.20	51	Member Z
3	30	SAE - 4X4X0.375	-11.6	0.9D + 1.6W 90° Wind	12.00	100	100	100	158.59	36.00	25.69	2	1	24.86	52.20	47	Bolt Shear
4	40	SAE - 4X4X0.375	-11.4	0.9D + 1.6W 90° Wind	11.50	100	100	100	153.90	36.00	27.28	2	1	24.86	52.20	46	Bolt Shear
5	60										0.00	0	0				
6	80										0.00	0	0				
7	100										0.00	0	0				
8	120										0.00	0	0				
9	140										0.00	0	0				
10	160										0.00	0	0				
11	180										0.00	0	0				
12	196	SAE - 2X2X0.1875	-0.62	1.2D + 1.6W 60° Wind	7.40	100	100	100	225.38	36.00	3.16	1	1	12.43	9.79	20	Member Z

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls

Force/Stress Compression Summary

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 13	



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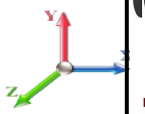
DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	SAE - 3.5X3.5X0.375	-16.1	1.2D + 1.6W 90° Wind	16.80	48	96	48	157.46	36.00	22.60	2	1	24.86	52.2	71	Member Y
2	20	SAE - 3.5X3.5X0.375	-16.9	1.2D + 1.6W 90° Wind	16.40	48	96	48	154.81	36.00	23.38	2	1	24.86	52.2	73	Member Y
3	30	SAE - 3.5X3.5X0.375	-16.4	1.2D + 1.6W 90° Wind	16.01	48	96	48	152.21	36.00	24.18	2	1	24.86	50.2	68	Member Y
4	40	SAE - 3.5X3.5X0.375	-16.1	1.2D + 1.6W 90° Wind	15.62	48	96	48	149.65	36.00	25.02	2	1	24.86	50.2	65	Bolt Shear
5	60	SAE - 4X4X0.375	-12.3	1.2D + 1.6W 90° Wind	24.62	48	48	48	179.99	36.00	19.94	1	1	17.89	21.5	69	Bolt Shear
6	80	SAE - 3.5X3.5X0.375	-11.4	1.2D + 1.6W 90° Wind	22.81	50	50	50	199.22	36.00	14.12	1	1	17.89	21.5	81	Member Z
7	100	SAE - 3.5X3.5X0.25	-10.6	1.2D + 1.6W 90° Wind	21.03	50	50	50	181.83	36.00	11.55	1	1	17.89	14.3	92	Member Z
8	120	SAE - 3.5X3.5X0.25	-9.78	1.2D + 1.6W 90° Wind	19.30	50	50	50	166.82	36.00	13.72	1	1	17.89	14.3	71	Member Z
9	140	SAE - 3.5X3.5X0.25	-8.07	1.2D + 1.6W 90° Wind	16.11	50	50	50	139.30	36.00	19.68	1	1	17.89	14.3	56	Bolt Bear
10	160	SAE - 2.5X2.5X0.25	-7.10	1.2D + 1.6W 90° Wind	14.32	50	50	50	174.93	36.00	8.79	1	1	12.43	14.7	81	Member Z
11	180	SAE - 2.5X2.5X0.1875	-6.43	1.2D + 1.6W 90° Wind	12.58	50	50	50	152.49	36.00	8.76	1	1	12.43	11.0	73	Member Z
12	196	SAE - 2X2X0.1875	-3.66	1.2D + 1.6W 90° Wind	10.23	50	50	50	155.85	36.00	6.60	1	1	12.43	11.0	55	Member Z

Force/Stress Tension Summary

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 14	



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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	10	PST - 10" DIA PIPE	282.70	0.9D + 1.6W 60° Wind	50	535.50	52.8	Member
2	20	PST - 10" DIA PIPE	266.77	0.9D + 1.6W 60° Wind	50	535.50	49.8	Member
3	30	PX - 8" DIA PIPE	251.11	0.9D + 1.6W 60° Wind	50	574.20	43.7	Member
4	40	PX - 8" DIA PIPE	235.30	0.9D + 1.6W 60° Wind	50	574.20	41.0	Member
5	60	PX - 8" DIA PIPE	227.10	0.9D + 1.6W 60° Wind	50	574.20	39.6	Member
6	80	PX - 8" DIA PIPE	195.33	0.9D + 1.6W 60° Wind	50	574.20	34.0	Member
7	100	PST - 8" DIA PIPE	162.99	0.9D + 1.6W 60° Wind	50	378.00	43.1	Member
8	120	PX - 6" DIA PIPE	130.05	0.9D + 1.6W 60° Wind	50	378.00	34.4	Member
9	140	PX - 6" DIA PIPE	99.53	0.9D + 1.6W 60° Wind	50	378.00	26.3	Member
10	160	PX - 5" DIA PIPE	66.52	0.9D + 1.6W 60° Wind	50	274.95	24.2	Member
11	180	PSP - 4.5 x 0.438	33.07	0.9D + 1.6W 60° Wind	50	251.51	13.1	Member
12	196	PX - 3-1/2" DIA PIPE	4.41	0.9D + 1.6W 60° Wind	50	165.60	2.7	Member

Splices

		Top Splice					Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	10	0.9D + 1.6W 60° Wind	281.68	545.68	51.6	1 3/8	6	0.9D + 1.6W 60° Wind	299.1	0.00			
2	20	0.9D + 1.6W 60° Wind	265.75	545.68	48.7	1 3/8	6	0.9D + 1.6W 60° Wind	281.6	0.00			
3	30	0.9D + 1.6W 60° Wind	250.14	545.68	45.8	1 3/8	6	0.9D + 1.6W 60° Wind	265.7	545.68	48.7	1 3/8 A325	6
4	40	0.9D + 1.6W 60° Wind	234.29	545.68	42.9	1 3/8	6	0.9D + 1.6W 60° Wind	250.1	545.68	45.8	1 3/8 A325	6
5	60	0.9D + 1.6W 60° Wind	202.16	545.68	37.0	1 3/8	6	0.9D + 1.6W 60° Wind	234.2	545.68	42.9	1 3/8 A325	6
6	80	0.9D + 1.6W 60° Wind	170.01	545.68	31.2	1 3/8	6	0.9D + 1.6W 60° Wind	202.1	545.68	37.0	1 3/8 A325	6
7	100	0.9D + 1.6W 60° Wind	137.42	457.92	30.0	1 1/4	6	0.9D + 1.6W 60° Wind	170.0	545.68	31.2	1 3/8 A325	6
8	120	0.9D + 1.6W 60° Wind	104.06	457.92	22.7	1 1/4	6	0.9D + 1.6W 60° Wind	137.4	457.92	30.0	1 1/4 A325	6
9	140	0.9D + 1.6W 60° Wind	71.30	305.28	23.4	1 1/4	4	0.9D + 1.6W 60° Wind	104.0	457.92	22.7	1 1/4 A325	6
10	160	0.9D + 1.6W 60° Wind	38.12	305.28	12.5	1 1/4	4	0.9D + 1.6W 60° Wind	71.30	305.28	23.4	1 1/4 A325	4
11	180	0.9D + 1.6W 60° Wind	7.38	212.04	3.5	1 A325	4	0.9D + 1.6W 60° Wind	38.12	305.28	12.5	1 1/4 A325	4
12	196		0.00	0.00	0.0			0.9D + 1.6W 60° Wind	7.38	212.04	3.5	1 A325	4

HORIZONTAL MEMBERS

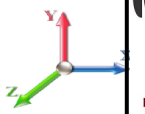
Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	10	SAE - 4X4X0.375	12.58	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	50.6	Bolt Shear
2	20	SAE - 4X4X0.375	12.78	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	51.4	Bolt Shear
3	30	SAE - 4X4X0.375	12.18	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	49.0	Bolt Shear
4	40	SAE - 4X4X0.375	11.47	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	46.1	Bolt Shear
5	60	-			36	0.00	0	0					
6	80	-			36	0.00	0	0					
7	100	-			36	0.00	0	0					
8	120	-			36	0.00	0	0					
9	140	-			36	0.00	0	0					
10	160	-			36	0.00	0	0					
11	180	-			36	0.00	0	0					
12	196	SAE - 2X2X0.1875	0.57	0.9D + 1.6W Normal Wi	36	23.00	1	1	12.43	9.79	8.51	6.7	Blck Shear

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	10	SAE - 3.5X3.5X0.375	15.32	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	52.20	38.10	61.6	Bolt Shear

Force/Stress Tension Summary

Structure:	CT00802-S-SBA		**Code:**	EIA/TIA-222-G	4/1/2019
Site Name:	Putnam Freight		**Exposure:**	C	
Height:	196.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 15



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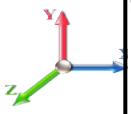
DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
2	20	SAE - 3.5X3.5X0.375	15.83	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	52.20	38.10	63.7	Bolt Shear
3	30	SAE - 3.5X3.5X0.375	15.39	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	50.24	37.34	61.9	Bolt Shear
4	40	SAE - 3.5X3.5X0.375	15.13	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	50.24	37.34	60.9	Bolt Shear
5	60	SAE - 4X4X0.375	12.09	0.9D + 1.6W 90° Wind	36	82.60	1	1	17.89	21.53	24.93	67.6	Bolt Shear
6	80	SAE - 3.5X3.5X0.375	11.26	0.9D + 1.6W 90° Wind	36	70.20	1	1	17.89	21.53	24.93	62.9	Bolt Shear
7	100	SAE - 3.5X3.5X0.25	10.43	0.9D + 1.6W 90° Wind	36	48.00	1	1	17.89	14.35	16.62	72.7	Bolt Bear
8	120	SAE - 3.5X3.5X0.25	9.70	1.2D + 1.6W 90° Wind	36	48.00	1	1	17.89	14.35	16.62	67.6	Bolt Bear
9	140	SAE - 3.5X3.5X0.25	8.06	1.2D + 1.6W 90° Wind	36	48.00	1	1	17.89	14.35	16.62	56.2	Bolt Bear
10	160	SAE - 2.5X2.5X0.25	7.02	1.2D + 1.6W 90° Wind	36	32.71	1	1	12.43	14.79	13.22	56.5	Bolt Shear
11	180	SAE - 2.5X2.5X0.1875	6.47	1.2D + 1.6W 90° Wind	36	24.84	1	1	12.43	11.09	9.91	65.2	Blck Shear
12	196	SAE - 2X2X0.1875	3.59	0.9D + 1.6W 90° Wind	36	18.58	1	1	12.43	11.09	7.88	45.5	Blck Shear

Seismic Section Forces

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 16	



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Load Case: 1.2D + 1.0E

Dead Load Factor	1.20	**Sds**	0.183	**Ss**	0.1720	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.100	**S1**	0.0630	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.183	**R**	3.0000	**Vs**	3.9969	**f1**	1.9732

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	5.00	3926.0	0.00	0.03	0.01	6.56
2	15.00	3852.4	0.01	0.06	0.03	15.64
3	25.00	3867.8	0.03	0.07	0.04	22.98
4	35.00	3794.9	0.06	0.07	0.04	30.00
5	50.00	6280.1	0.12	0.07	0.03	72.85
6	70.00	5719.0	0.24	0.06	0.02	103.31
7	90.00	3977.0	0.40	0.02	0.01	101.16
8	110.00	3858.3	0.60	-0.05	0.01	127.55
9	130.00	4164.0	0.83	-0.12	0.06	176.54
10	150.00	3090.0	1.11	-0.07	0.19	180.34
11	170.00	5130.4	1.42	0.33	0.45	455.03
12	188.00	6775.5	1.74	1.28	0.88	912.35

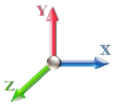
Load Case: 0.9D + 1.0E

Dead Load Factor	0.90	**Sds**	0.183	**Ss**	0.1720	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.100	**S1**	0.0630	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.183	**R**	3.0000	**Vs**	3.9969	**f1**	1.9732

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	5.00	3926.0	0.00	0.03	0.01	6.56
2	15.00	3852.4	0.01	0.06	0.03	15.64
3	25.00	3867.8	0.03	0.07	0.04	22.98
4	35.00	3794.9	0.06	0.07	0.04	30.00
5	50.00	6280.1	0.12	0.07	0.03	72.85
6	70.00	5719.0	0.24	0.06	0.02	103.31
7	90.00	3977.0	0.40	0.02	0.01	101.16
8	110.00	3858.3	0.60	-0.05	0.01	127.55
9	130.00	4164.0	0.83	-0.12	0.06	176.54
10	150.00	3090.0	1.11	-0.07	0.19	180.34
11	170.00	5130.4	1.42	0.33	0.45	455.03
12	188.00	6775.5	1.74	1.28	0.88	912.35

Support Forces Summary

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 17	



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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind	1	0.00	354.80	-40.97	
	1a	12.29	-144.74	-14.48	
	1b	-12.29	-144.74	-14.48	
1.2D + 1.6W 60° Wind	1	-5.69	178.66	-20.09	
	1a	-20.24	178.66	5.12	
	1b	-30.26	-292.01	-17.47	
1.2D + 1.6W 90° Wind	1	-6.82	21.78	-1.84	
	1a	-31.09	297.68	14.11	
	1b	-28.24	-254.13	-12.27	
0.9D + 1.6W Normal Wind	1	0.00	349.09	-40.50	
	1a	12.68	-150.05	-14.71	
	1b	-12.68	-150.05	-14.71	
0.9D + 1.6W 60° Wind	1	-5.70	173.10	-19.63	
	1a	-19.85	173.10	4.88	
	1b	-30.65	-297.20	-17.70	
0.9D + 1.6W 90° Wind	1	-6.83	16.33	-1.38	
	1a	-30.69	292.02	13.88	
	1b	-28.64	-259.36	-12.49	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	157.15	-15.41	
	1a	0.42	11.46	-2.27	
	1b	-0.42	11.46	-2.27	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-1.68	107.37	-9.60	
	1a	-9.15	107.37	3.35	
	1b	-5.89	-34.67	-3.40	
1.2D + 1.0Di + 1.0Wi 90° Wind	1	-1.96	60.02	-4.14	
	1a	-12.33	142.56	5.99	
	1b	-5.18	-22.51	-1.85	
1.2D + 1.0E	1	0.00	36.27	-1.85	
	1a	0.02	14.53	-0.17	
	1b	-0.02	14.53	-0.17	
0.9D + 1.0E	1	0.00	30.81	-1.38	
	1a	0.42	9.09	-0.40	
	1b	-0.42	9.09	-0.40	
1.0D + 1.0W Normal Wind	1	0.00	93.38	-10.44	
	1a	1.83	-19.47	-2.72	
	1b	-1.83	-19.47	-2.72	
1.0D + 1.0W 60° Wind	1	-1.32	53.64	-5.68	
	1a	-5.58	53.64	1.70	
	1b	-5.89	-52.85	-3.40	
1.0D + 1.0W 90° Wind	1	-1.56	18.15	-1.53	
	1a	-8.06	80.55	3.76	
	1b	-5.43	-44.26	-2.23	

Max Reactions

	Leg			Overturning	
Max Uplift:	-297.20	(kips)	Moment:	7787.04	(ft-kips)
Max Down:	354.80	(kips)	Total Down:	65.32	(kips)
Max Shear:	40.97	(kips)	Total Shear:	69.92	(kips)

Analysis Summary

Structure:	CT00802-S-SBA	**Code:**	EIA/TIA-222-G	4/1/2019	
Site Name:	Putnam Freight	**Exposure:**	C		
Height:	196.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Max Reactions

Leg			Overturning		
Max Uplift:	-297.20	(kips)	Moment:	7787.04	(ft-kips)
Max Down:	354.80	(kips)	Total Down:	65.32	(kips)
Max Shear:	40.97	(kips)	Total Shear:	69.92	(kips)

Anchor Bolts

Bolt Size (in.):	1.50	Number Bolts:	8
Yield Strength (Ksi):	50.00	Tensile Strength (Ksi):	65.00
Detail Type:	D	Length:	0.25

Interaction Ratio: 0.75

Max Usages

Max Leg: 64.2% (1.2D + 1.6W Normal Wind - Sect 1)
Max Diag: 91.9% (1.2D + 1.6W 90° Wind - Sect 7)
Max Horiz: 52.6% (0.9D + 1.6W 90° Wind - Sect 1)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	173.33	0.0468	-0.0010	0.0314
	185.33	0.0534	-0.0009	0.0327
	196.00	0.0592	-0.0005	0.0316
0.9D + 1.6W 101 mph Wind at 60° From Face	173.33	0.8343	0.0146	0.5033
	185.33	0.9402	0.0114	0.5056
	196.00	1.0312	0.0070	0.5042
0.9D + 1.6W 101 mph Wind at 90° From Face	173.33	0.8454	-0.0174	0.5077
	185.33	0.9526	-0.0138	0.5134
	196.00	1.0442	-0.0090	0.5162
0.9D + 1.6W 101 mph Wind at Normal To Face	173.33	0.8775	0.0159	0.5258
	185.33	0.9881	0.0129	0.5285
	196.00	1.0832	0.0088	0.5272
1.0D + 1.0W 60 mph Wind at 60° From Face	173.33	0.1880	0.0034	0.1129
	185.33	0.2117	0.0027	0.1132
	196.00	0.2322	0.0017	0.1127
1.0D + 1.0W 60 mph Wind at 90° From Face	173.33	0.1904	-0.0040	0.1139
	185.33	0.2145	-0.0031	0.1151
	196.00	0.2351	-0.0020	0.1157
1.0D + 1.0W 60 mph Wind at Normal To Face	173.33	0.1975	0.0036	0.1179
	185.33	0.2223	-0.0028	0.1187
	196.00	0.2437	-0.0019	0.1186
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	173.33	0.2512	0.0045	0.1493
	185.33	0.2824	0.0035	0.1502
	196.00	0.3095	0.0022	0.1478

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	173.33	0.2524	-0.0052	0.1496
	185.33	0.2838	-0.0041	0.1511
	196.00	0.3110	-0.0027	0.1513
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	173.33	0.2562	-0.0046	0.1517
	185.33	0.2881	-0.0037	0.1535
	196.00	0.3156	-0.0024	0.1532
1.2D + 1.0E - Normal To Face	173.33	0.0468	0.0010	0.0314
	185.33	0.0534	0.0009	0.0328
	196.00	0.0593	0.0005	0.0317
1.2D + 1.6W 101 mph Wind at 60° From Face	173.33	0.8352	0.0146	0.5040
	185.33	0.9412	0.0114	0.5061
	196.00	1.0324	0.0070	0.5047
1.2D + 1.6W 101 mph Wind at 90° From Face	173.33	0.8463	-0.0174	0.5084
	185.33	0.9536	-0.0138	0.5141
	196.00	1.0454	-0.0090	0.5169
1.2D + 1.6W 101 mph Wind at Normal To Face	173.33	0.8784	0.0160	0.5265
	185.33	0.9892	-0.0129	0.5293
	196.00	1.0845	-0.0088	0.5280

Pier Foundation For Self Supporting Tower

			Date: 4/1/2019
Customer Name:	**SBA Communications Corp**	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	196
Site Number:	CT00802-S-SBA	**Engineer Name:**	T. Alajaj
Engr. Number:	72583	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Self Supporting Tower

Analysis or Design? Analysis

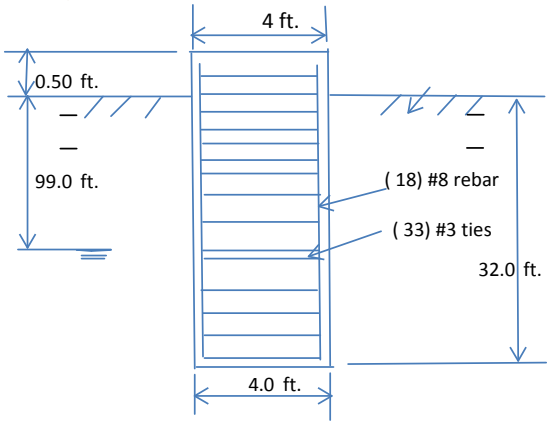
Acceptable overstress (% 5.0%

Base Reactions (Factored):

Axial Load (Kips):	354.8	Shear Force (Kips):	41.0
Uplift Force (Kips):	297.2	Moment (Kips-ft):	0.0

Foundation Geometries:

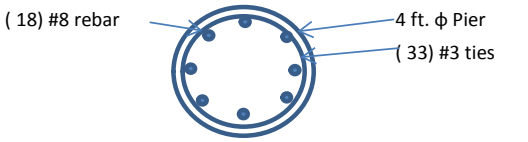
Diameter of Pier (ft.):	4.0	Depth of Base B. G. S. :	32.0	ft.
Pier Height A. G. (ft.):	0.50			



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	60	ksi
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	3	
Qty. of Vertical Rebars:	18	Tie Spacing:	12.0	in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0	pcf

Consider ties in concrete shear strength? Yes



SST Pier Foundation

Soil Design Parameters:

Water Table B.G.S. (ft):	99.0	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.00	Pullout failure Angle:	30	(°)

Skin Frictions are to be obtained from: Soil Report

Sand

Depth of Layers (ft) Top	Depth of Layers (ft) Bottom	γ_{soil} (pcf)	ϕ (°)	Cohesion (psf)	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types
0.0	2.0	115	0	0	0		Clay
2.0	4.0	115	32	0	1500	0	Sand
4.0	20.0	115	32	0	1500	0	Sand
20.0	26.0	115	32	0	4000	40000	Sand
26.0	32.0	135	36	0	4000	40000	Sand
32.0	37.0						

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75	
Total Dry Soil Volume from Conical Failure (cu. Ft.):	15147	Dry Soil Weight from Conical Failure:	1556	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	0	Buoyant Soil Weight from Conical Failure (Ki	0	Kips
Total Dry Concrete Volume (cu. Ft.):	408	Total Dry Concrete Weight:	61.26	Kips
Total Buoyant Concrete Volume (cu. Ft.):	0	Total Buoyant Concrete Weight:	0.00	Kips
Total Effective Concrete Weight (Kips):	61.3	Total Effective Soil Weight:	1556	Kips
Total Effective Vertical Load on Base (Kips):	375			

Check Soil Capacities:

					Usage	
Calculated Foundation Allowable Axail Capacity (Kips):	1053.0	>	Design Factored Axial Load (Kips):	375	0.36	OK!
Calculated Foundation Uplift Capacity (Kips):	761.99	>	Design Factored Uplift Load (Kips):	297	0.39	OK!

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75	
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00	

Reinforcing Concrete Pier:

					Usage	
Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.11		
Calculated Moment Capacity (Mn,Kips-Ft):	792	>	Design Factored Moment (Mu, K-Ft):	220.5	0.28	OK!
Calculated Shear Capacity (Kips):	123.8	>	Design Factored Shear (Kips):	41.0	0.33	OK!
Calculated Tension Capacity (Tn, Kips):	767.9	>	Design Factored Tension (Tu Kips):	297.2	0.39	OK!
Calculated Compression Capacity (Pn, Kips):	2381	>	Design Factored Axial Load (Pu Kips):	354.8	0.15	OK!
Moment & Tension Strength Combination:	0.28	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.008	Reinforcement Ratio is satisfied per ACI				

Reinforce Pier Foundation by Adding Concrete Block (Yes/No ?) No

January 16, 2019
March 18, 2019 (Rev.1)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:		
	Site Number:	CT5482 (LTE 3C/4C)
	FA Number:	10071213
	PACE Number:	MRCTB035189
	PT Number:	2051A0KPHL
	Site Name:	PUTNAM WEST
	Site Address:	63 Putnam Industrial Park Putnam, CT 06260

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI Communications to perform a mount analysis on the existing AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) OPA-65R-LCUU-H8 Antennas (92.7"x14.4"x7.0" – Wt. = 88 lbs. /each)
- (3) 7770 Antennas (55.0"x11.0"x5.0" - Wt. = 35 lbs. /each)
- (3) RRUS-12 RRH's (20.4"x18.5"x7.5" – Wt. = 58 lbs. /each)
- (3) A2 Modules (16.4"x15.2"x3.4" – Wt. = 22 lbs. /each)
- (6) LGP21401 TMA's (14.4"x9.0"x2.7" – Wt. = 19 lbs. /each)
- (1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)
- **(3) 800-10966 Antennas (96.0"x20.0"x6.9"– Wt. = 115 lbs. /each)**
- **(3) B5/B12 4449 RRH's (18.0"x13.2"x9.5" – Wt. = 71 lbs. /each)**
- **(3) 4415 B30 RRH's (15.0"x13.2"x5.4" – Wt. = 44 lbs. /each)**
- **(1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)**

**Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on November 29, 2018.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R12.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 130 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.78 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- The mount has been analyzed with load combinations consisting of 250 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 1.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing tower with clamps and threaded rods. The connection is considered OK by visual inspection.

Based on our evaluation, we have determined that the existing mounts **ARE NOT CAPABLE** of supporting the proposed installation. HDG recommends the following modifications:

- **Install new 2" std. (2.38" O.D.) pipe brace secure to the existing mount and tower (typ. of 1 per sector, total of 3).**
- **Install new 2-1/2" std. (2.88" O.D.) pipe mast behind new 800-10966 antenna secure to the existing mount (typ. of 1 per sector, total of 3).**
- **Install new L3x3x1/2 diagonal angles secure to the existing standoff (typ. of 2 per sector, total of 6).**
- **Install new sector frame stabilizer, SitePro1 P/N SFS-V (or approved equal) (typ. of 1 per sector, total of 3).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (LTE 3C/4C) Mount Rating	17	LC30	482%	**FAIL**
Modified (LTE 3C/4C) Mount Rating	1	LC25	94%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

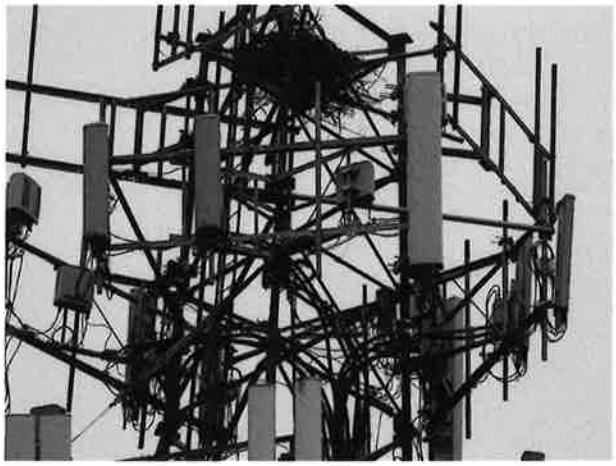
Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Structural Dept. Head

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:



p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027






p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

		z=	186 (ft)
		z_g=	1200 (ft)
K_z=	**1.180**	α=	7.0

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c K_t/K_h)]^2$ $K_h = e^{(f*z/H)}$

K_{zt}=	**#DIV/0!**	K_h=	#DIV/0!
		K_c=	0 (from Table 2-4)
(If Category 1 then K_{zt}=1.0)		K_t=	0 (from Table 2-5)
		f=	0 (from Table 2-5)
Category=	1	z=	186
		z_s=	270 (Mean elevation of base of structure above se
		H=	0 (Ht. of the crest above surrounding terrain)
		K_{zt}=	1.00 (from 2.6.6.2.1)
		K_e=	0.99 (from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =		t_i =	1.50 in
Importance Factor =		I=	1.0 (from Table 2-3)
		K_{iz} =	1.19 (from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ t_{iz} = 1.78 in

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	190	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	Gh=	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	1.180	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**48.03**	K_e=	0.99	(from 2.6.8)
$q_{z\ (Ice)}$=	**7.10**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.56**	V_{max}=	130	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.78 in** **Angle = 0 (deg)** **Equivalent Angle = 180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
800-10966 Antenna	96.0	20.0	6.9	13.33	4.80	1.30	834	151	44
OPA-65R-LCUU-H8 Antenna	92.7	14.4	7.0	9.27	6.44	1.38	612	117	33
7770 Antenna	55.0	11.0	5.0	4.20	5.00	1.31	265	55	14
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.89	1.20	68	17	4
B5/B12 4449 RRH (Shielded)	18.0	4.8	13.2	0.59	3.79	1.26	36	11	2
4415 B30 RRH	15.0	5.4	13.2	0.56	2.78	1.21	33	10	2
4415 B30 RRH (Shielded)	15.0	2.7	13.2	0.28	5.56	1.34	18	8	1
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.10	1.20	151	31	8
RRUS-12 + A2 RRH (Shielded)	20.4	4.1	10.9	0.58	4.98	1.31	37	12	2
LGP21401 TMA	14.4	2.7	9.0	0.27	5.33	1.33	17	7	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	54	13	3

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 30 (deg) | Ice Thickness = 1.78 in. | Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	834	360	715
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	546
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	265	141	234
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	68	95	75
B5/B12 4449 RRH (Shi	18.0	4.8	13.2	0.59	1.65	3.79	1.36	1.26	1.20	36	95	51
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	33	79	44
4415 B30 RRH (Shielde	15.0	2.7	13.2	0.28	1.38	5.56	1.14	1.34	1.20	18	79	33
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	151	89	136
RRUS-12 + A2 RRH (Shi	20.4	9.3	10.9	1.31	1.54	2.21	1.87	1.20	1.20	76	89	79
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	26

WIND LOADS WITH ICE:

800-10966 Antenna	99.6	23.6	10.5	16.29	7.24	4.22	9.51	1.28	1.48	148	76	130
OPA-65R-LCUU-H8 Ant	96.3	18.0	10.6	12.01	7.06	5.36	9.11	1.33	1.47	113	74	103
7770 Antenna	58.6	14.6	8.6	5.92	3.48	4.02	6.84	1.27	1.39	53	34	49
B5/B12 4449 RRH	21.6	13.1	16.8	1.96	2.51	1.65	1.29	1.20	1.20	17	21	18
B5/B12 4449 RRH (Shi	21.6	6.5	16.8	0.98	2.51	3.30	1.29	1.24	1.20	9	21	12
4415 B30 RRH	18.6	9.0	16.8	1.16	2.16	2.07	1.11	1.20	1.20	10	18	12
4415 B30 RRH (Shielde	18.6	4.5	16.8	0.58	2.16	4.14	1.11	1.27	1.20	5	18	9
RRUS-12 + A2 RRH	24.0	22.1	14.5	3.67	2.41	1.09	1.66	1.20	1.20	31	21	29
RRUS-12 + A2 RRH (Shi	24.0	11.0	14.5	1.84	2.41	2.17	1.66	1.20	1.20	16	21	17
LGP21401 TMA	18.0	6.3	12.6	0.78	1.57	2.87	1.43	1.22	1.20	7	13	8

WIND LOADS AT 30 MPH:

800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	44	19	38
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	33	19	29
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	14	7	12
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	4	5	4
B5/B12 4449 RRH (Shi	18.0	4.8	13.2	0.59	1.65	3.79	1.36	1.26	1.20	2	5	3
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	2	4	2
4415 B30 RRH (Shielde	15.0	2.7	13.2	0.28	1.38	5.56	1.14	1.34	1.20	1	4	2
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	8	5	7
RRUS-12 + A2 RRH (Shi	20.4	9.3	10.9	1.31	1.54	2.21	1.87	1.20	1.20	4	5	4
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	1

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.78	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	834	360	479
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	414
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	265	141	172
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	68	95	88
B5/B12 4449 RRH (Shi	18.0	7.1	13.2	0.89	1.65	2.53	1.36	1.20	1.20	51	95	84
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	33	79	68
4415 B30 RRH (Shielde	15.0	4.1	13.2	0.42	1.38	3.70	1.14	1.25	1.20	25	79	66
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	151	89	105
RRUS-12 + A2 RRH (Shi	20.4	13.9	10.9	1.97	1.54	1.47	1.87	1.20	1.20	113	89	95
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	43

WIND LOADS WITH ICE:

800-10966 Antenna	99.6	23.6	10.5	16.29	7.24	4.22	9.51	1.28	1.48	148	76	94
OPA-65R-LCUU-H8 Ant	96.3	18.0	10.6	12.01	7.06	5.36	9.11	1.33	1.47	113	74	84
7770 Antenna	58.6	14.6	8.6	5.92	3.48	4.02	6.84	1.27	1.39	53	34	39
B5/B12 4449 RRH	21.6	13.1	16.8	1.96	2.51	1.65	1.29	1.20	1.20	17	21	20
B5/B12 4449 RRH (Shi	21.6	9.8	16.8	1.47	2.51	2.20	1.29	1.20	1.20	13	21	19
4415 B30 RRH	18.6	9.0	16.8	1.16	2.16	2.07	1.11	1.20	1.20	10	18	16
4415 B30 RRH (Shielde	18.6	6.7	16.8	0.87	2.16	2.76	1.11	1.21	1.20	7	18	16
RRUS-12 + A2 RRH	24.0	22.1	14.5	3.67	2.41	1.09	1.66	1.20	1.20	31	21	23
RRUS-12 + A2 RRH (Shi	24.0	16.5	14.5	2.75	2.41	1.45	1.66	1.20	1.20	23	21	21
LGP21401 TMA	18.0	6.3	12.6	0.78	1.57	2.87	1.43	1.22	1.20	7	13	12

WIND LOADS AT 30 MPH:

800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	44	19	25
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	33	19	22
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	14	7	9
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	4	5	5
B5/B12 4449 RRH (Shi	18.0	7.1	13.2	0.89	1.65	2.53	1.36	1.20	1.20	3	5	4
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	2	4	4
4415 B30 RRH (Shielde	15.0	4.1	13.2	0.42	1.38	3.70	1.14	1.25	1.20	1	4	4
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	8	5	6
RRUS-12 + A2 RRH (Shi	20.4	13.9	10.9	1.97	1.54	1.47	1.87	1.20	1.20	6	5	5
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	2

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 90 (deg)

Ice Thickness = 1.78 in.

Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	834	360	360
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	348
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	265	141	141
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	68	95	95
B5/B12 4449 RRH (Shi	18.0	4.8	13.2	0.59	1.65	3.79	1.36	1.26	1.20	36	95	95
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	33	79	79
4415 B30 RRH (Shielde	15.0	2.7	13.2	0.28	1.38	5.56	1.14	1.34	1.20	18	79	79
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	151	89	89
RRUS-12 + A2 RRH (Shi	20.4	4.1	10.9	0.58	1.54	4.98	1.87	1.31	1.20	37	89	89
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	52

WIND LOADS WITH ICE:

800-10966 Antenna	99.6	23.6	10.5	16.29	7.24	4.22	9.51	1.28	1.48	148	76	76
OPA-65R-LCUU-H8 Ant	96.3	18.0	10.6	12.01	7.06	5.36	9.11	1.33	1.47	113	74	74
7770 Antenna	58.6	14.6	8.6	5.92	3.48	4.02	6.84	1.27	1.39	53	34	34
B5/B12 4449 RRH	21.6	13.1	16.8	1.96	2.51	1.65	1.29	1.20	1.20	17	21	21
B5/B12 4449 RRH (Shi	21.6	8.3	16.8	1.25	2.51	2.59	1.29	1.20	1.20	11	21	21
4415 B30 RRH	18.6	9.0	16.8	1.16	2.16	2.07	1.11	1.20	1.20	10	18	18
4415 B30 RRH (Shielde	18.6	6.3	16.8	0.81	2.16	2.96	1.11	1.22	1.20	7	18	18
RRUS-12 + A2 RRH	24.0	22.1	14.5	3.67	2.41	1.09	1.66	1.20	1.20	31	21	21
RRUS-12 + A2 RRH (Shi	24.0	7.7	14.5	1.28	2.41	3.13	1.66	1.23	1.20	11	21	21
LGP21401 TMA	18.0	6.3	12.6	0.78	1.57	2.87	1.43	1.22	1.20	7	13	13

WIND LOADS AT 30 MPH:

800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	44	19	19
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	33	19	19
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	14	7	7
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	4	5	5
B5/B12 4449 RRH (Shi	18.0	4.8	13.2	0.59	1.65	3.79	1.36	1.26	1.20	2	5	5
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	2	4	4
4415 B30 RRH (Shielde	15.0	2.7	13.2	0.28	1.38	5.56	1.14	1.34	1.20	1	4	4
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	8	5	5
RRUS-12 + A2 RRH (Shi	20.4	4.1	10.9	0.58	1.54	4.98	1.87	1.31	1.20	2	5	5
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	3

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.78	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	834	360	479
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	414
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	265	141	172
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	68	95	88
B5/B12 4449 RRH (Shi	18.0	7.1	13.2	0.89	1.65	2.53	1.36	1.20	1.20	51	95	84
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	33	79	68
4415 B30 RRH (Shielde	15.0	4.1	13.2	0.42	1.38	3.70	1.14	1.25	1.20	25	79	66
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	151	89	105
RRUS-12 + A2 RRH (Shi	20.4	13.9	10.9	1.97	1.54	1.47	1.87	1.20	1.20	113	89	95
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	43

WIND LOADS WITH ICE:

800-10966 Antenna	99.6	23.6	10.5	16.29	7.24	4.22	9.51	1.28	1.48	148	76	94
OPA-65R-LCUU-H8 Ant	96.3	18.0	10.6	12.01	7.06	5.36	9.11	1.33	1.47	113	74	84
7770 Antenna	58.6	14.6	8.6	5.92	3.48	4.02	6.84	1.27	1.39	53	34	39
B5/B12 4449 RRH	21.6	13.1	16.8	1.96	2.51	1.65	1.29	1.20	1.20	17	21	20
B5/B12 4449 RRH (Shi	21.6	9.8	16.8	1.47	2.51	2.20	1.29	1.20	1.20	13	21	19
4415 B30 RRH	18.6	9.0	16.8	1.16	2.16	2.07	1.11	1.20	1.20	10	18	16
4415 B30 RRH (Shielde	18.6	6.7	16.8	0.87	2.16	2.76	1.11	1.21	1.20	7	18	16
RRUS-12 + A2 RRH	24.0	22.1	14.5	3.67	2.41	1.09	1.66	1.20	1.20	31	21	23
RRUS-12 + A2 RRH (Shi	24.0	16.5	14.5	2.75	2.41	1.45	1.66	1.20	1.20	23	21	21
LGP21401 TMA	18.0	6.3	12.6	0.78	1.57	2.87	1.43	1.22	1.20	7	13	12

WIND LOADS AT 30 MPH:

800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	44	19	25
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	33	19	22
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	14	7	9
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	4	5	5
B5/B12 4449 RRH (Shi	18.0	7.1	13.2	0.89	1.65	2.53	1.36	1.20	1.20	3	5	4
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	2	4	4
4415 B30 RRH (Shielde	15.0	4.1	13.2	0.42	1.38	3.70	1.14	1.25	1.20	1	4	4
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	8	5	6
RRUS-12 + A2 RRH (Shi	20.4	13.9	10.9	1.97	1.54	1.47	1.87	1.20	1.20	6	5	5
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	2

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 150 (deg)

Ice Thickness = 1.78 in.

Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	834	360	715
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	612	348	546
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	265	141	234
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	68	95	75
B5/B12 4449 RRH (Shi	18.0	4.8	13.2	0.59	1.65	3.79	1.36	1.26	1.20	36	95	51
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	33	79	44
4415 B30 RRH (Shielde	15.0	2.7	13.2	0.28	1.38	5.56	1.14	1.34	1.20	18	79	33
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	151	89	136
RRUS-12 + A2 RRH (Shi	20.4	9.3	10.9	1.31	1.54	2.21	1.87	1.20	1.20	76	89	79
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	17	52	26

WIND LOADS WITH ICE:

800-10966 Antenna	99.6	23.6	10.5	16.29	7.24	4.22	9.51	1.28	1.48	148	76	130
OPA-65R-LCUU-H8 Ant	96.3	18.0	10.6	12.01	7.06	5.36	9.11	1.33	1.47	113	74	103
7770 Antenna	58.6	14.6	8.6	5.92	3.48	4.02	6.84	1.27	1.39	53	34	49
B5/B12 4449 RRH	21.6	13.1	16.8	1.96	2.51	1.65	1.29	1.20	1.20	17	21	18
B5/B12 4449 RRH (Shi	21.6	6.5	16.8	0.98	2.51	3.30	1.29	1.24	1.20	9	21	12
4415 B30 RRH	18.6	9.0	16.8	1.16	2.16	2.07	1.11	1.20	1.20	10	18	12
4415 B30 RRH (Shielde	18.6	4.5	16.8	0.58	2.16	4.14	1.11	1.27	1.20	5	18	9
RRUS-12 + A2 RRH	24.0	22.1	14.5	3.67	2.41	1.09	1.66	1.20	1.20	31	21	29
RRUS-12 + A2 RRH (Shi	24.0	11.0	14.5	1.84	2.41	2.17	1.66	1.20	1.20	16	21	17
LGP21401 TMA	18.0	6.3	12.6	0.78	1.57	2.87	1.43	1.22	1.20	7	13	8

WIND LOADS AT 30 MPH:

800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	44	19	38
OPA-65R-LCUU-H8 Ant	92.7	14.4	7.0	9.27	4.51	6.44	13.24	1.38	1.61	33	19	29
7770 Antenna	55.0	11.0	5.0	4.20	1.91	5.00	11.00	1.31	1.53	14	7	12
B5/B12 4449 RRH	18.0	9.5	13.2	1.19	1.65	1.89	1.36	1.20	1.20	4	5	4
B5/B12 4449 RRH (Shi	18.0	4.8	13.2	0.59	1.65	3.79	1.36	1.26	1.20	2	5	3
4415 B30 RRH	15.0	5.4	13.2	0.56	1.38	2.78	1.14	1.21	1.20	2	4	2
4415 B30 RRH (Shielde	15.0	2.7	13.2	0.28	1.38	5.56	1.14	1.34	1.20	1	4	2
RRUS-12 + A2 RRH	20.4	18.5	10.9	2.62	1.54	1.10	1.87	1.20	1.20	8	5	7
RRUS-12 + A2 RRH (Shi	20.4	9.3	10.9	1.31	1.54	2.21	1.87	1.20	1.20	4	5	4
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	3	1

Date: 01/16/2019
Project Name: PUTNAM WEST
Project No.: CT5482
Designed By: JN **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.78 in.
Density of ice: 56 pcf

800-10966 Antenna
Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	20.0	
Depth (in):	6.9	
Total weight of ice on object:		399 lbs
Weight of object:	115.0 lbs	
Combined weight of ice and object:		514 lbs

OPA-65R-LCUU-H8 Antenna
Weight of ice based on total radial SF area:

Height (in):	92.7	
Width (in):	14.4	
Depth (in):	7.0	
Total weight of ice on object:		299 lbs
Weight of object:	88.0 lbs	
Combined weight of ice and object:		387 lbs

7770 Antenna
Weight of ice based on total radial SF area:

Height (in):	55.0	
Width (in):	11.0	
Depth (in):	5.0	
Total weight of ice on object:		138 lbs
Weight of object:	35.0 lbs	
Combined weight of ice and object:		173 lbs

B5/B12 4449 RRH
Weight of ice based on total radial SF area:

Height (in):	18.0	
Width (in):	13.2	
Depth (in):	9.5	
Total weight of ice on object:		59 lbs
Weight of object:	71.0 lbs	
Combined weight of ice and object:		130 lbs

4415 B30 RRH
Weight of ice based on total radial SF area:

Height (in):	15.0	
Width (in):	13.2	
Depth (in):	5.4	
Total weight of ice on object:		44 lbs
Weight of object:	44.0 lbs	
Combined weight of ice and object:		88 lbs

RRUS-12 + A2 RRH
Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	10.9	
Total weight of ice on object:		86 lbs
Weight of object:	80.0 lbs	
Combined weight of ice and object:		166 lbs

LGP21401 TMA
Weight of ice based on total radial SF area:

Height (in):	14.4	
Width (in):	2.7	
Depth (in):	9.0	
Total weight of ice on object:		29 lbs
Weight of object:	19.0 lbs	
Combined weight of ice and object:		48 lbs

Squid Surge Arrestor
Weight of ice based on total radial SF area:

Depth (in):	24.0	
Diameter(in):	9.7	
Total weight of ice on object:		50 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		83 lbs

L 2-1/2x2-1/2x3/16 Angles
Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		12 plf

L 3x3x1/4 Angles
Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		13 plf

PL 10x3/8
Weight of ice based on total radial SF area:

Height (in):	10	
Width (in):	0.375	
Per foot weight of ice on object:		26 plf

3/4" Round Bar
Per foot weight of ice:

diameter (in):	0.75	
Per foot weight of ice on object:		6 plf

1-1/4" Pipe
Per foot weight of ice:

diameter (in):	1.66	
Per foot weight of ice on object:		7 plf

2" pipe
Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		9 plf

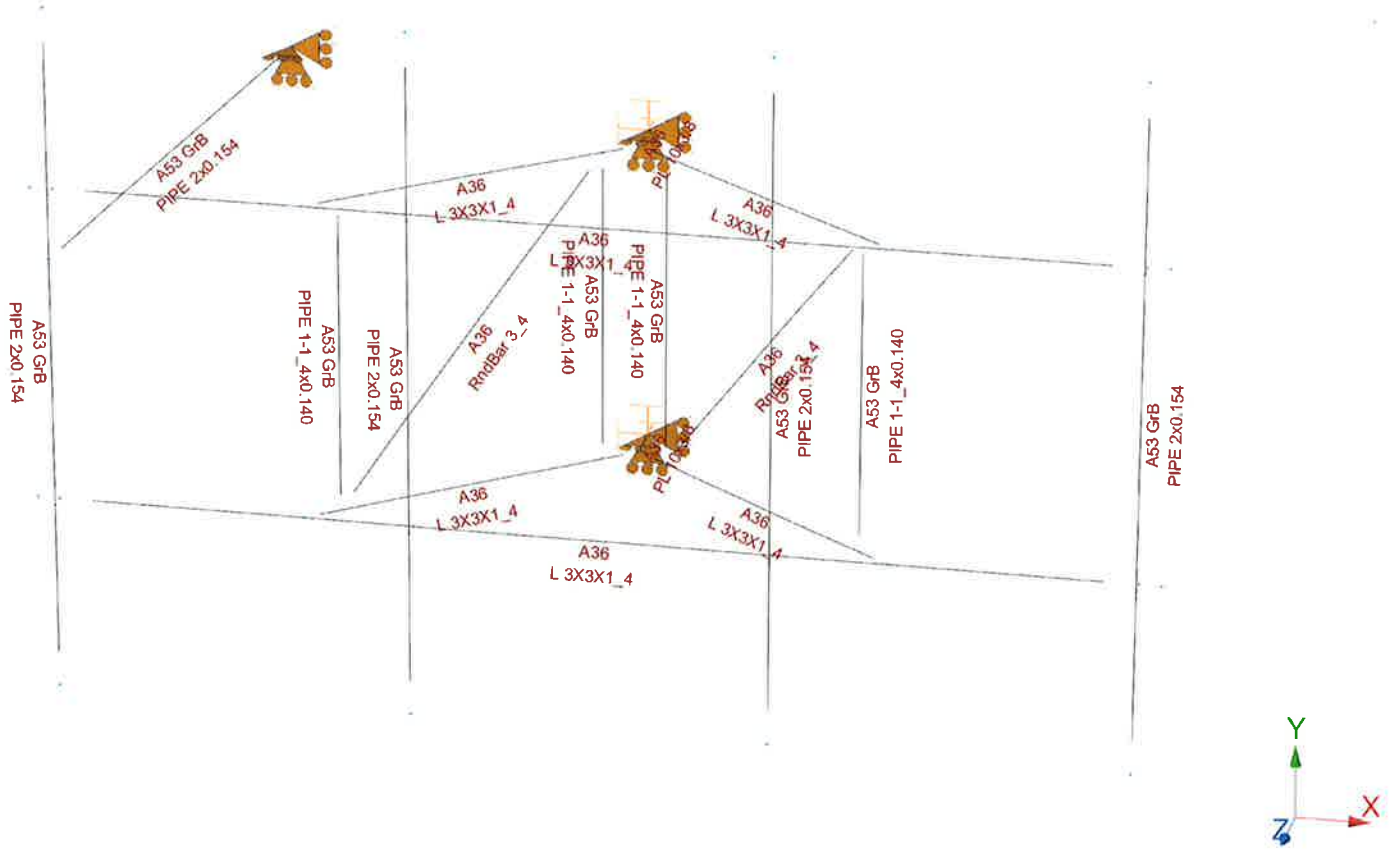
2-1/2" pipe
Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		10 plf

HUDSON
Design Group LLC

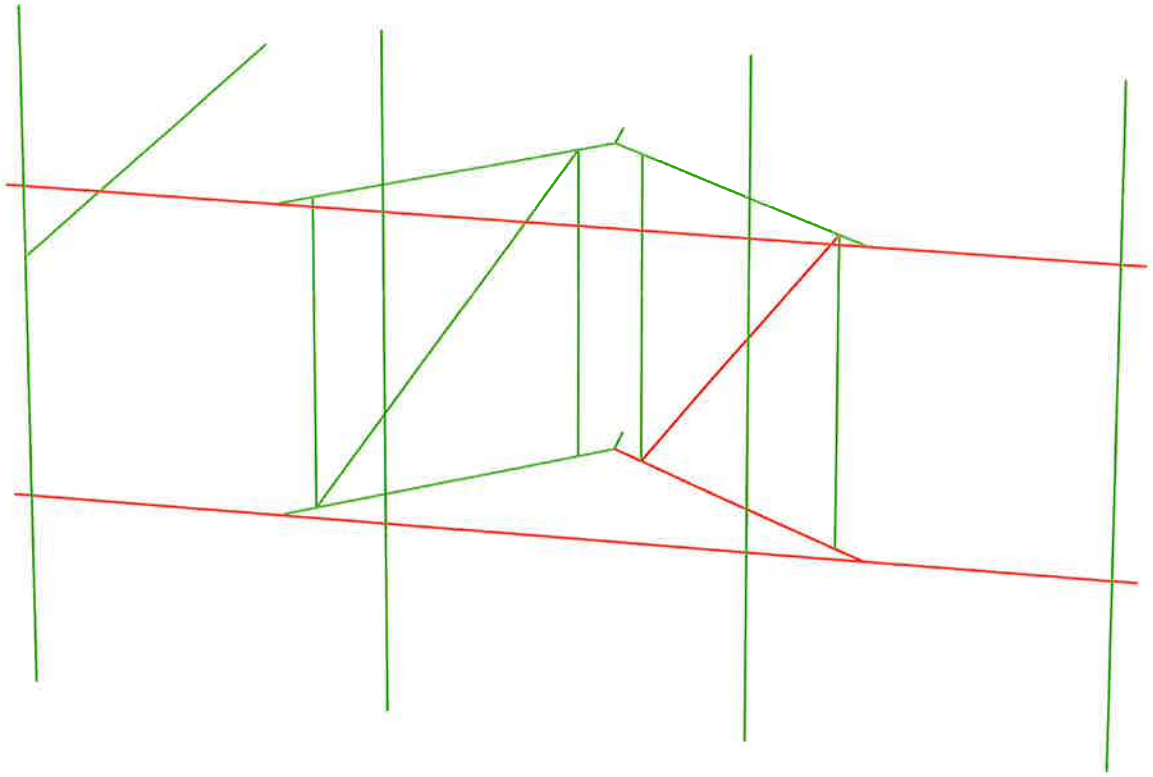
Mount Calculations
(Existing Conditions)

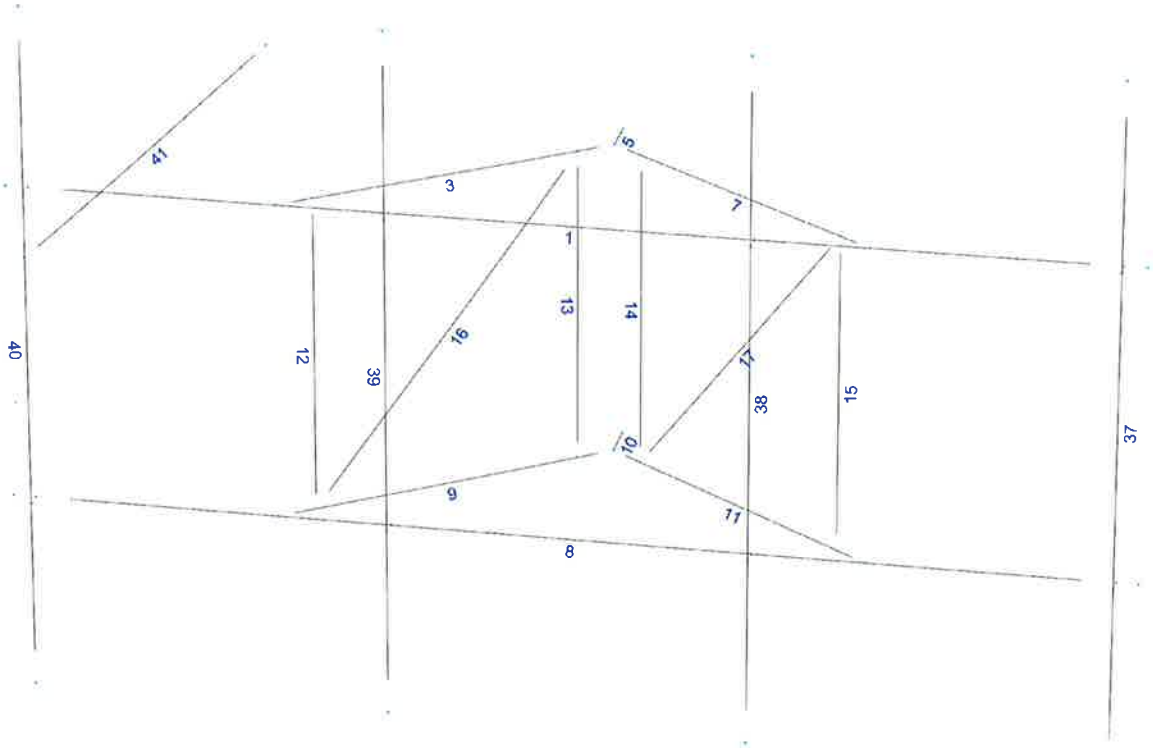

Y
X
Z


A53 GrB
PIPE 2x0.154
A36
L 3X3X1_4
A53 GrB
PIPE 1-1_4x0.140
A53 GrB
PIPE 2x0.154
A36
RndBar 3_4
Y
X
Z

Design status

- Not designed
- Error on design
- Design O.K.
- With warnings




41
3
5
7
1
40
12
39
16
13
14
17
38
15
37
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11
8
Y
X
Z

Bentley Hewlett-Packard Company

Current Date: 1/16/2019 6:33 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT5482\LTE 3C-4C\CT5482 (LTE 3C-4C).etz\

Load data

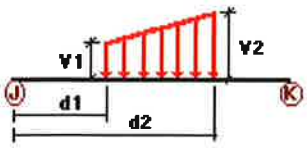
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL

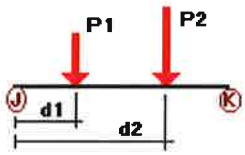
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.024	0.00	0.00	No	0.00	No
	3	z	-0.024	0.00	0.00	No	0.00	No
	7	z	-0.024	0.00	0.00	No	0.00	No
	8	z	-0.024	0.00	0.00	No	0.00	No
	9	z	-0.024	0.00	0.00	No	0.00	No
	11	z	-0.024	0.00	0.00	No	0.00	No
	12	z	-0.008	0.00	0.00	No	0.00	No
	13	z	-0.008	0.00	0.00	No	0.00	No
	14	z	-0.008	0.00	0.00	No	0.00	No
	15	z	-0.008	0.00	0.00	No	0.00	No
	16	z	-0.004	0.00	0.00	No	0.00	No
	17	z	-0.004	0.00	0.00	No	0.00	No
	40	z	-0.011	0.00	0.00	No	0.00	No
	41	z	-0.011	0.00	0.00	No	0.00	No
W30	1	z	-0.024	0.00	0.00	No	0.00	No
	3	z	-0.024	0.00	0.00	No	0.00	No
	7	z	-0.024	0.00	0.00	No	0.00	No
	8	z	-0.024	0.00	0.00	No	0.00	No
	9	z	-0.024	0.00	0.00	No	0.00	No
	11	z	-0.024	0.00	0.00	No	0.00	No
	12	z	-0.008	0.00	0.00	No	0.00	No
	13	z	-0.008	0.00	0.00	No	0.00	No
	14	z	-0.008	0.00	0.00	No	0.00	No
	15	z	-0.008	0.00	0.00	No	0.00	No
	16	z	-0.004	0.00	0.00	No	0.00	No
	17	z	-0.004	0.00	0.00	No	0.00	No
	37	z	-0.011	0.00	0.00	No	0.00	No
	38	z	-0.011	0.00	0.00	No	0.00	No
	39	z	-0.011	0.00	0.00	No	0.00	No
	40	z	-0.011	0.00	0.00	No	0.00	No
	41	z	-0.011	0.00	0.00	No	0.00	No
W60	1	x	-0.024	0.00	0.00	No	0.00	No
	3	x	-0.024	0.00	0.00	No	0.00	No
	7	x	-0.024	0.00	0.00	No	0.00	No
	8	x	-0.024	0.00	0.00	No	0.00	No
	9	x	-0.024	0.00	0.00	No	0.00	No
	11	x	-0.024	0.00	0.00	No	0.00	No
	12	x	-0.008	0.00	0.00	No	0.00	No
	13	x	-0.008	0.00	0.00	No	0.00	No
	14	x	-0.008	0.00	0.00	No	0.00	No
	15	x	-0.008	0.00	0.00	No	0.00	No
	16	x	-0.004	0.00	0.00	No	0.00	No
	17	x	-0.004	0.00	0.00	No	0.00	No
	37	x	-0.011	0.00	0.00	No	0.00	No
	38	x	-0.011	0.00	0.00	No	0.00	No
	39	x	-0.011	0.00	0.00	No	0.00	No
	40	x	-0.011	0.00	0.00	No	0.00	No
	41	x	-0.011	0.00	0.00	No	0.00	No
W90	3	x	-0.024	0.00	0.00	No	0.00	No
	7	x	-0.024	0.00	0.00	No	0.00	No
	9	x	-0.024	0.00	0.00	No	0.00	No
	11	x	-0.024	0.00	0.00	No	0.00	No
	12	x	-0.008	0.00	0.00	No	0.00	No
	13	x	-0.008	0.00	0.00	No	0.00	No
	14	x	-0.008	0.00	0.00	No	0.00	No
	15	x	-0.008	0.00	0.00	No	0.00	No
	16	x	-0.004	0.00	0.00	No	0.00	No
	17	x	-0.004	0.00	0.00	No	0.00	No
	37	x	-0.011	0.00	0.00	No	0.00	No
	38	x	-0.011	0.00	0.00	No	0.00	No

	39	x	-0.011	0.00	0.00	No	0.00	No
	40	x	-0.011	0.00	0.00	No	0.00	No
	41	x	-0.011	0.00	0.00	No	0.00	No
W120	1	x	-0.024	0.00	0.00	No	0.00	No
	3	x	-0.024	0.00	0.00	No	0.00	No
	7	x	-0.024	0.00	0.00	No	0.00	No
	8	x	-0.024	0.00	0.00	No	0.00	No
	9	x	-0.024	0.00	0.00	No	0.00	No
	11	x	-0.024	0.00	0.00	No	0.00	No
	12	x	-0.008	0.00	0.00	No	0.00	No
	13	x	-0.008	0.00	0.00	No	0.00	No
	14	x	-0.008	0.00	0.00	No	0.00	No
	15	x	-0.008	0.00	0.00	No	0.00	No
	16	x	-0.004	0.00	0.00	No	0.00	No
	17	x	-0.004	0.00	0.00	No	0.00	No
	37	x	-0.011	0.00	0.00	No	0.00	No
	38	x	-0.011	0.00	0.00	No	0.00	No
	39	x	-0.011	0.00	0.00	No	0.00	No
	40	x	-0.011	0.00	0.00	No	0.00	No
	41	x	-0.011	0.00	0.00	No	0.00	No
W150	1	z	0.024	0.00	0.00	No	0.00	No
	3	z	0.024	0.00	0.00	No	0.00	No
	7	z	0.024	0.00	0.00	No	0.00	No
	8	z	0.024	0.00	0.00	No	0.00	No
	9	z	0.024	0.00	0.00	No	0.00	No
	11	z	0.024	0.00	0.00	No	0.00	No
	12	z	0.008	0.00	0.00	No	0.00	No
	13	z	0.008	0.00	0.00	No	0.00	No
	14	z	0.008	0.00	0.00	No	0.00	No
	15	z	0.008	0.00	0.00	No	0.00	No
	16	z	0.004	0.00	0.00	No	0.00	No
	17	z	0.004	0.00	0.00	No	0.00	No
	37	z	0.011	0.00	0.00	No	0.00	No
	38	z	0.011	0.00	0.00	No	0.00	No
	39	z	0.011	0.00	0.00	No	0.00	No
	40	z	0.011	0.00	0.00	No	0.00	No
	41	z	0.011	0.00	0.00	No	0.00	No
Di	1	y	-0.013	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	5	y	-0.026	0.00	0.00	No	0.00	No
	7	y	-0.013	0.00	0.00	No	0.00	No
	8	y	-0.013	0.00	0.00	No	0.00	No
	9	y	-0.013	0.00	0.00	No	0.00	No
	10	y	-0.026	0.00	0.00	No	0.00	No
	11	y	-0.013	0.00	0.00	No	0.00	No
	12	y	-0.007	0.00	0.00	No	0.00	No
	13	y	-0.007	0.00	0.00	No	0.00	No
	14	y	-0.007	0.00	0.00	No	0.00	No
	15	y	-0.007	0.00	0.00	No	0.00	No
	16	y	-0.006	0.00	0.00	No	0.00	No
	17	y	-0.006	0.00	0.00	No	0.00	No
	37	y	-0.009	0.00	0.00	No	0.00	No
	38	y	-0.009	0.00	0.00	No	0.00	No
	39	y	-0.009	0.00	0.00	No	0.00	No
	40	y	-0.009	0.00	0.00	No	0.00	No
	41	y	-0.009	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	37	y	-0.058	0.50	No
		y	-0.058	7.50	No
		y	-0.071	1.25	No
		y	-0.044	1.75	No
	38	y	-0.044	0.50	No
		y	-0.044	7.50	No
		y	-0.08	1.50	No
	39	y	-0.018	2.00	No
		y	-0.018	6.00	No
		y	-0.038	4.00	No
Wo	37	z	-0.417	0.50	No
		z	-0.417	7.50	No
		z	-0.036	1.25	No
		z	-0.018	1.75	No
	38	z	-0.307	0.50	No
		z	-0.307	7.50	No
		z	-0.037	1.50	No
	39	z	-0.133	2.00	No
		z	-0.133	6.00	No
W30	37	3	-0.358	0.50	No
		3	-0.358	7.50	No
		3	-0.051	1.25	No
	38	3	-0.274	0.50	No
		3	-0.274	7.50	No
		3	-0.079	1.50	No
	39	3	-0.117	2.00	No
		3	-0.117	6.00	No
		3	-0.026	4.00	No
W60	37	3	-0.24	0.50	No
		3	-0.24	7.50	No
		3	-0.084	1.25	No
	38	3	-0.208	0.50	No
		3	-0.208	7.50	No
		3	-0.095	1.50	No
	39	3	-0.086	2.00	No
		3	-0.086	6.00	No
		3	-0.043	4.00	No
W90	37	x	-0.181	0.50	No
		x	-0.181	7.50	No
		x	-0.095	1.25	No
	38	x	-0.175	0.50	No
		x	-0.175	7.50	No
		x	-0.089	1.50	No
	39	x	-0.071	2.00	No
		x	-0.071	6.00	No
		x	-0.052	4.00	No
W120	37	2	-0.24	0.50	No
		2	-0.24	7.50	No
		2	-0.084	1.25	No
	38	2	-0.208	0.50	No
		2	-0.208	7.50	No
		2	-0.095	1.50	No
	39	2	-0.086	2.00	No
		2	-0.086	6.00	No

		2	-0.043	4.00	No
W150	37	2	-0.358	0.50	No
		2	-0.358	7.50	No
		2	-0.051	1.25	No
	38	2	-0.274	0.50	No
		2	-0.274	7.50	No
		2	-0.079	1.50	No
	39	2	-0.117	2.00	No
		2	-0.117	6.00	No
		2	-0.026	4.00	No
Di	37	y	-0.20	0.50	No
		y	-0.20	7.50	No
		y	-0.059	1.25	No
		y	-0.044	1.75	No
	38	y	-0.15	0.50	No
		y	-0.15	7.50	No
		y	-0.086	1.50	No
	39	y	-0.069	2.00	No
		y	-0.069	6.00	No
		y	-0.058	4.00	No
WI0	37	z	-0.076	0.50	No
		z	-0.076	7.50	No
		z	-0.017	1.25	No
		z	-0.01	1.75	No
	38	z	-0.059	0.50	No
		z	-0.059	7.50	No
		z	-0.031	1.50	No
	39	z	-0.028	2.00	No
		z	-0.028	6.00	No
		z	-0.007	4.00	No
WI30	37	3	-0.065	0.50	No
		3	-0.065	7.50	No
		3	-0.018	1.25	No
	38	3	-0.052	0.50	No
		3	-0.052	7.50	No
		3	-0.029	1.50	No
	39	3	-0.025	2.00	No
		3	-0.025	6.00	No
		3	-0.008	4.00	No
WI60	37	3	-0.048	0.50	No
		3	-0.048	7.50	No
		3	-0.02	1.25	No
	38	3	-0.042	0.50	No
		3	-0.042	7.50	No
		3	-0.023	1.50	No
	39	3	-0.02	2.00	No
		3	-0.02	6.00	No
		3	-0.012	4.00	No
WI90	37	x	-0.039	0.50	No
		x	-0.039	7.50	No
		x	-0.021	1.25	No
	38	x	-0.037	0.50	No
		x	-0.037	7.50	No
		x	-0.021	1.50	No
	39	x	-0.018	2.00	No
		x	-0.018	6.00	No
		x	-0.013	4.00	No
WI120	37	2	-0.048	0.50	No
		2	-0.048	7.50	No
		2	-0.02	1.25	No

	38	2	-0.042	0.50	No
		2	-0.042	7.50	No
		2	-0.023	1.50	No
	39	2	-0.02	2.00	No
		2	-0.02	6.00	No
		2	-0.012	4.00	No
WI150	37	2	-0.065	0.50	No
		2	-0.065	7.50	No
		2	-0.018	1.25	No
	38	2	-0.052	0.50	No
		2	-0.052	7.50	No
		2	-0.029	1.50	No
	39	2	-0.025	2.00	No
		2	-0.025	6.00	No
		2	-0.008	4.00	No
WL0	37	z	-0.023	0.50	No
		z	-0.023	7.50	No
		z	-0.004	1.25	No
		z	-0.002	1.75	No
	38	z	-0.017	0.50	No
		z	-0.017	7.50	No
		z	-0.008	1.50	No
	39	z	-0.008	2.00	No
		z	-0.008	6.00	No
		z	-0.001	4.00	No
WL30	37	3	-0.02	0.50	No
		3	-0.02	7.50	No
		3	-0.004	1.25	No
	38	3	-0.015	0.50	No
		3	-0.015	7.50	No
		3	-0.007	1.50	No
	39	3	-0.007	2.00	No
		3	-0.007	6.00	No
		3	-0.001	4.00	No
WL60	37	3	-0.013	0.50	No
		3	-0.013	7.50	No
		3	-0.005	1.25	No
	38	3	-0.012	0.50	No
		3	-0.012	7.50	No
		3	-0.006	1.50	No
	39	3	-0.005	2.00	No
		3	-0.005	6.00	No
		3	-0.002	4.00	No
WL90	37	x	-0.01	0.50	No
		x	-0.01	7.50	No
		x	-0.005	1.25	No
	38	x	-0.01	0.50	No
		x	-0.01	7.50	No
		x	-0.005	1.50	No
	39	x	-0.004	2.00	No
		x	-0.004	6.00	No
		x	-0.003	4.00	No
WL120	37	2	-0.013	0.50	No
		2	-0.013	7.50	No
		2	-0.005	1.25	No
	38	2	-0.012	0.50	No
		2	-0.012	7.50	No
		2	-0.006	1.50	No
	39	2	-0.005	2.00	No
		2	-0.005	6.00	No

		2	-0.002	4.00	No
WL150	37	2	-0.02	0.50	No
		2	-0.02	7.50	No
		2	-0.004	1.25	No
	38	2	-0.015	0.50	No
		2	-0.015	7.50	No
		2	-0.007	1.50	No
	39	2	-0.007	2.00	No
		2	-0.007	6.00	No
		2	-0.001	4.00	No
LL1	1	y	-0.25	50.00	Yes
LL2	1	y	-0.25	100.00	Yes
LL3	1	y	-0.25	0.00	Yes
LLa1	37	y	-0.25	50.00	Yes
LLa2	38	y	-0.25	50.00	Yes
LLa3	39	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC38=1.2D+1.5LL1
LC39=1.2D+1.5LL2
LC40=1.2D+1.5LL3
LC41=1.2D+WL0+1.5LLa1
LC42=1.2D+WL30+1.5LLa1
LC43=1.2D+WL60+1.5LLa1
LC44=1.2D+WL90+1.5LLa1
LC45=1.2D+WL120+1.5LLa1
LC46=1.2D+WL150+1.5LLa1
LC47=1.2D-WL0+1.5LLa1
LC48=1.2D-WL30+1.5LLa1
LC49=1.2D-WL60+1.5LLa1
LC50=1.2D-WL90+1.5LLa1
LC51=1.2D-WL120+1.5LLa1
LC52=1.2D-WL150+1.5LLa1
LC53=1.2D+WL0+1.5LLa2

LC54=1.2D+WL30+1.5LLa2
LC55=1.2D+WL60+1.5LLa2
LC56=1.2D+WL90+1.5LLa2
LC57=1.2D+WL120+1.5LLa2
LC58=1.2D+WL150+1.5LLa2
LC59=1.2D-WL0+1.5LLa2
LC60=1.2D-WL30+1.5LLa2
LC61=1.2D-WL60+1.5LLa2
LC62=1.2D-WL90+1.5LLa2
LC63=1.2D-WL120+1.5LLa2
LC64=1.2D-WL150+1.5LLa2
LC65=1.2D+WL0+1.5LLa3
LC66=1.2D+WL30+1.5LLa3
LC67=1.2D+WL60+1.5LLa3
LC68=1.2D+WL90+1.5LLa3
LC69=1.2D+WL120+1.5LLa3
LC70=1.2D+WL150+1.5LLa3
LC71=1.2D-WL0+1.5LLa3
LC72=1.2D-WL30+1.5LLa3
LC73=1.2D-WL60+1.5LLa3
LC74=1.2D-WL90+1.5LLa3
LC75=1.2D-WL120+1.5LLa3
LC76=1.2D-WL150+1.5LLa3

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 3X3X1_4	**1**	LC7 at 76.79%	1.23	**N.G.**	Eq. H2-1
		3	LC6 at 0.00%	0.99	OK	Eq. H2-1
		7	LC12 at 0.00%	0.59	OK	Eq. H2-1
		8	LC7 at 75.89%	1.12	N.G.	Eq. H2-1
		9	LC12 at 0.00%	0.99	OK	Eq. H2-1
		11	LC30 at 0.00%	1.08	N.G.	Eq. H3-8
	PIPE 1-1_4x0.140	**12**	LC12 at 0.00%	0.15	OK	Eq. H1-1b
		13	LC36 at 0.00%	0.27	OK	Eq. H1-1b
		14	LC25 at 100.00%	**0.41**	**OK**	Eq. H1-1b
		15	LC25 at 0.00%	0.24	OK	Eq. H1-1b
	PIPE 2x0.154	**37**	LC7 at 27.08%	**0.85**	**OK**	Eq. H1-1b
		38	LC1 at 27.08%	0.62	OK	Eq. H1-1b
		39	LC38 at 29.17%	0.10	OK	Eq. H1-1b
		40	LC5 at 37.50%	0.52	OK	Eq. H1-1b
		41	LC6 at 0.00%	0.28	OK	Eq. H1-1b
	PL 10x3/8	**5**	LC36 at 100.00%	0.74	OK	Eq. H1-1b
		10	LC30 at 100.00%	**0.76**	**OK**	Eq. H1-1b
	RndBar 3_4	**16**	LC30 at 100.00%	0.15	OK	Eq. H1-1b
		17	LC30 at 100.00%	**4.82**	**N.G.**	Eq. H1-1a

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	-6.25	0.00	0.00	0
2	6.25	0.00	0.00	0
4	-3.25	0.00	0.00	0
6	0.00	0.00	-2.50	0
9	0.00	0.00	-3.00	0
11	3.25	0.00	0.00	0
12	-6.25	-3.6667	0.00	0
13	6.25	-3.6667	0.00	0
14	-3.25	-3.6667	0.00	0
15	0.00	-3.6667	-2.50	0
16	0.00	-3.6667	-3.00	0
17	3.25	-3.6667	0.00	0
18	-2.8889	0.00	-0.2778	0
25	-0.3611	0.00	-2.2222	0
26	-2.8889	-3.6667	-0.2778	0
27	-0.3611	-3.6667	-2.2222	0
28	2.8889	0.00	-0.2778	0
29	0.3611	0.00	-2.2222	0
30	2.8889	-3.6667	-0.2778	0
31	0.3611	-3.6667	-2.2222	0
36	-6.00	2.1667	0.20	0

37	6.00	2.1667	0.20	0
38	-2.00	2.1667	0.20	0
39	2.00	2.1667	0.20	0
40	-6.00	-5.8333	0.20	0
41	6.00	-5.8333	0.20	0
42	-2.00	-5.8333	0.20	0
43	2.00	-5.8333	0.20	0
69	-6.00	-0.75	0.20	0
70	-5.00	-0.75	-6.80	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
9	1	1	1	1	1	1
16	1	1	1	1	1	1
70	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	1	2		L 3X3X1_4	A36	0.00	0.00	0.00
3	6	4		L 3X3X1_4	A36	0.00	0.00	0.00
5	6	9		PL 10x3/8	A36	0.00	0.00	0.00
7	6	11		L 3X3X1_4	A36	0.00	0.00	0.00
8	12	13		L 3X3X1_4	A36	0.00	0.00	0.00
9	15	14		L 3X3X1_4	A36	0.00	0.00	0.00
10	15	16		PL 10x3/8	A36	0.00	0.00	0.00
11	15	17		L 3X3X1_4	A36	0.00	0.00	0.00
12	18	26		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
13	25	27		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
14	29	31		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
15	28	30		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
16	25	26		RndBar 3_4	A36	0.00	0.00	0.00
17	31	28		RndBar 3_4	A36	0.00	0.00	0.00
37	37	41		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
38	39	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
39	38	42		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
40	36	40		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
41	69	70		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	270.00	0	0.00	0.00	0.00
3	90.00	0	0.00	0.00	0.00
5	90.00	0	0.00	0.00	0.00
7	180.00	0	0.00	0.00	0.00
8	180.00	0	0.00	0.00	0.00
10	90.00	0	0.00	0.00	0.00
11	270.00	0	0.00	0.00	0.00
37	315.00	0	0.00	0.00	0.00
38	315.00	0	0.00	0.00	0.00
39	315.00	0	0.00	0.00	0.00
40	315.00	0	0.00	0.00	0.00

HUDSON
Design Group LLC

Mount Calculations
(Proposed Conditions)

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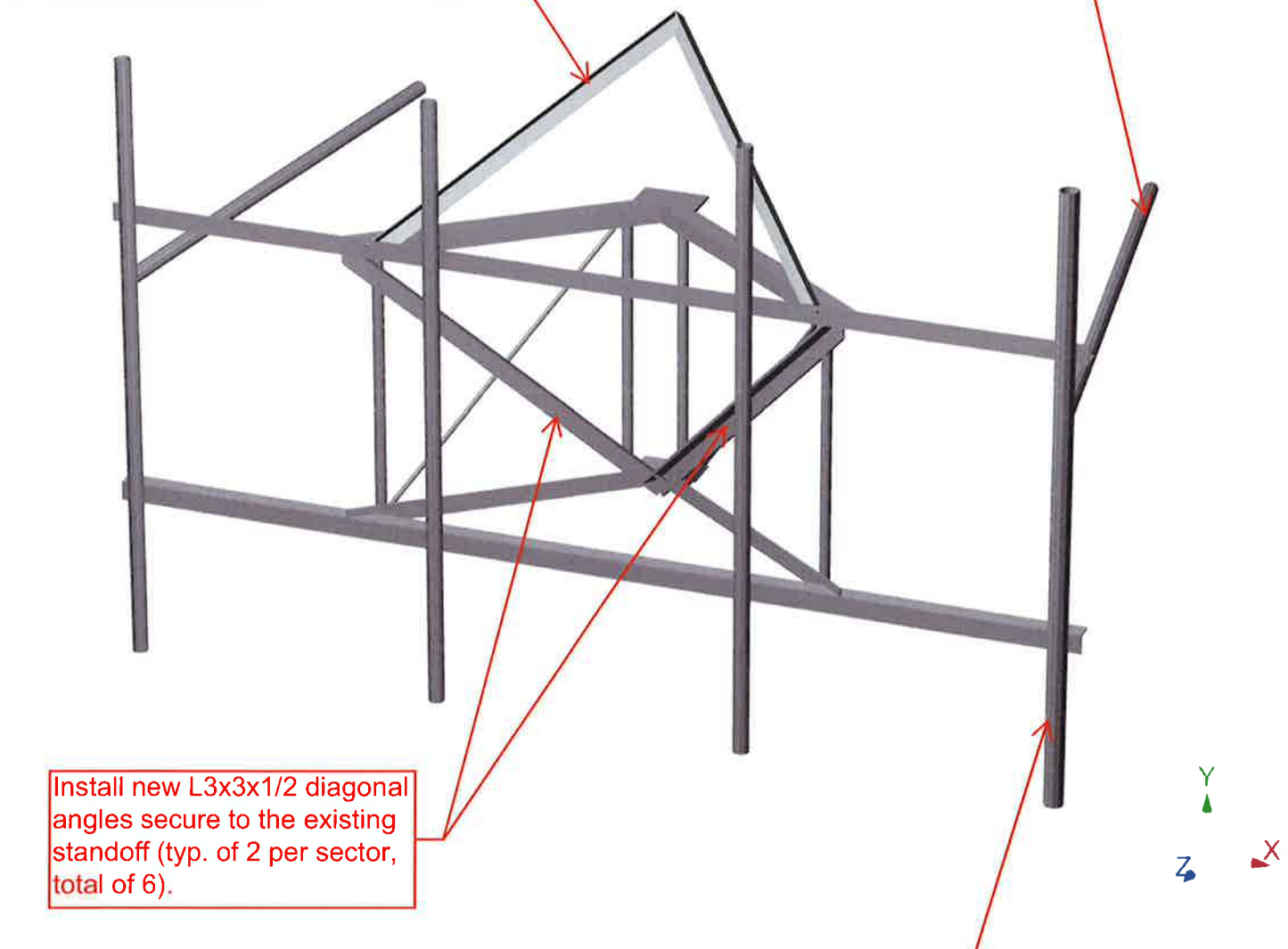
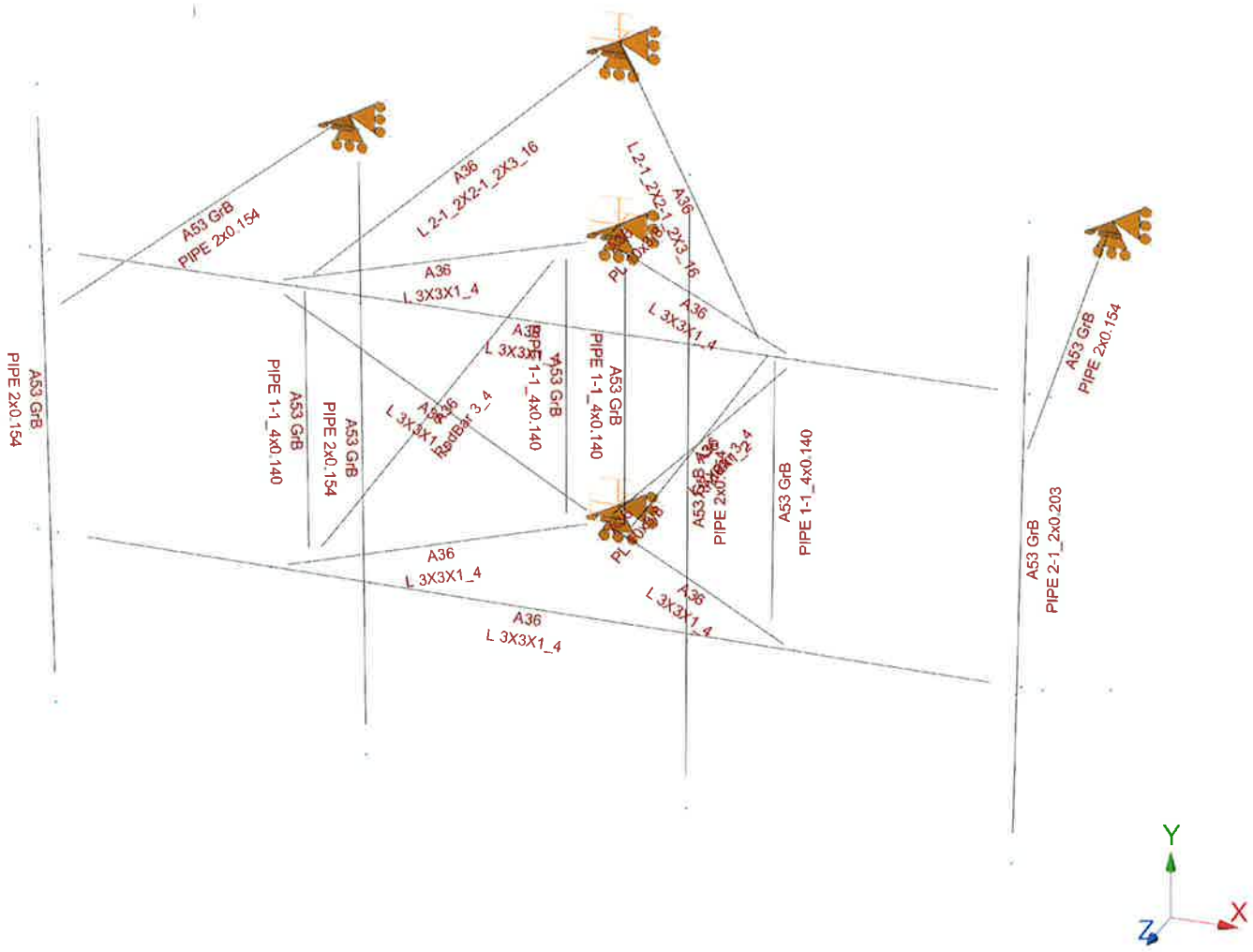
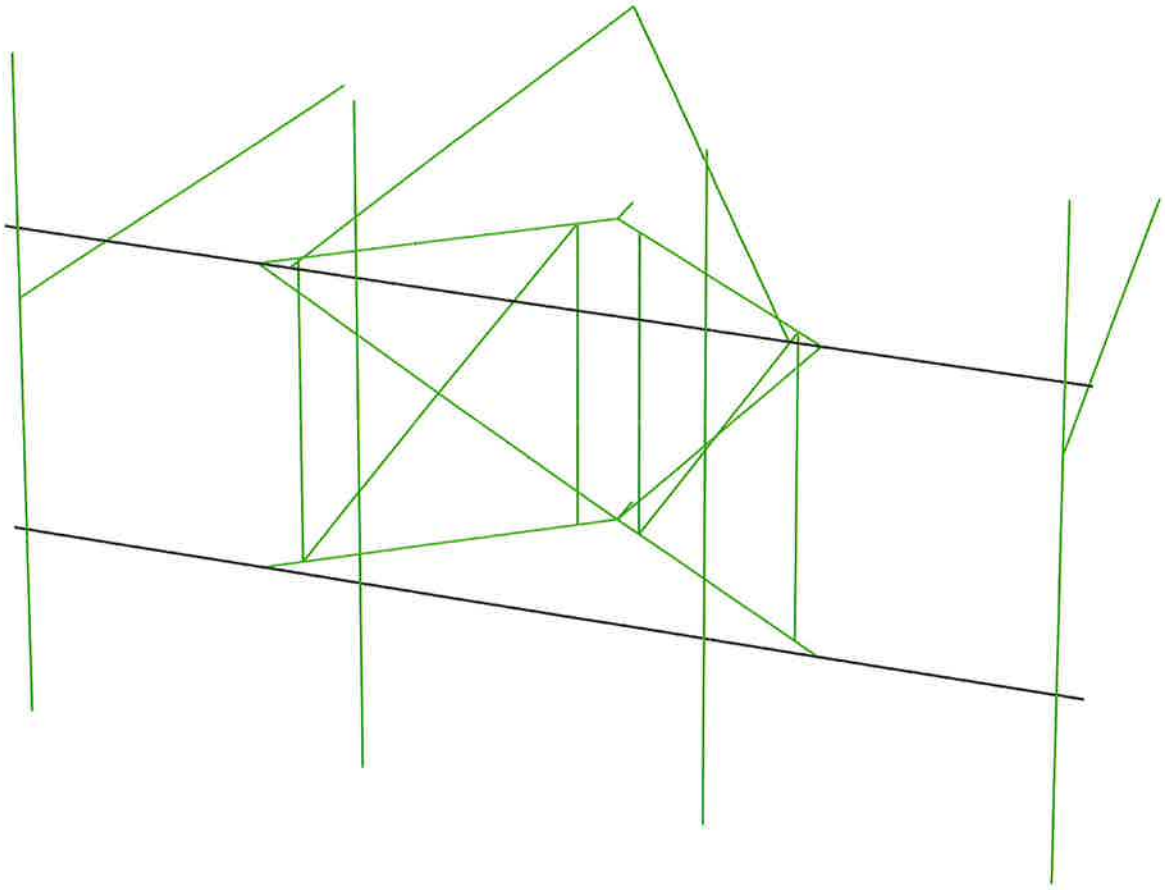
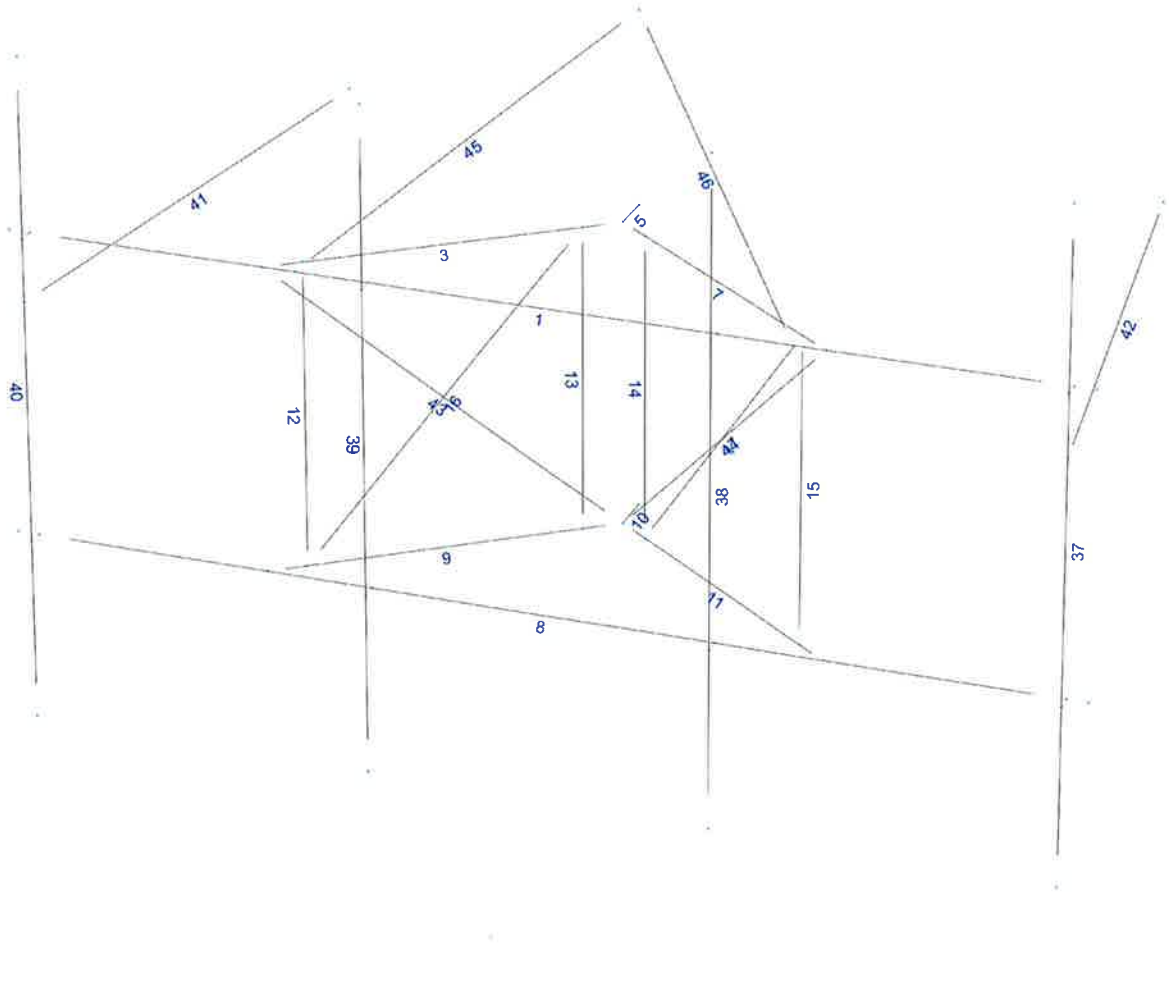



A53 GrB
PIPE 2x0.154
A36
L 2-1_2X2-1_2X3_16
L 3X3X1_4
PIPE 1-1_4x0.140
PIPE 2x0.154
PIPE 2-1_2x0.203
RodBar 3_4
Y
X
Z

Design status

- Not designed
- Error on design
- Design O.K.
- With warnings

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC38=1.2D+1.5LL1
LC39=1.2D+1.5LL2
LC40=1.2D+1.5LL3
LC41=1.2D+WL0+1.5LLa1
LC42=1.2D+WL30+1.5LLa1
LC43=1.2D+WL60+1.5LLa1
LC44=1.2D+WL90+1.5LLa1
LC45=1.2D+WL120+1.5LLa1
LC46=1.2D+WL150+1.5LLa1
LC47=1.2D-WL0+1.5LLa1
LC48=1.2D-WL30+1.5LLa1
LC49=1.2D-WL60+1.5LLa1
LC50=1.2D-WL90+1.5LLa1
LC51=1.2D-WL120+1.5LLa1
LC52=1.2D-WL150+1.5LLa1
LC53=1.2D+WL0+1.5LLa2

LC54=1.2D+WL30+1.5LLa2
LC55=1.2D+WL60+1.5LLa2
LC56=1.2D+WL90+1.5LLa2
LC57=1.2D+WL120+1.5LLa2
LC58=1.2D+WL150+1.5LLa2
LC59=1.2D-WL0+1.5LLa2
LC60=1.2D-WL30+1.5LLa2
LC61=1.2D-WL60+1.5LLa2
LC62=1.2D-WL90+1.5LLa2
LC63=1.2D-WL120+1.5LLa2
LC64=1.2D-WL150+1.5LLa2
LC65=1.2D+WL0+1.5LLa3
LC66=1.2D+WL30+1.5LLa3
LC67=1.2D+WL60+1.5LLa3
LC68=1.2D+WL90+1.5LLa3
LC69=1.2D+WL120+1.5LLa3
LC70=1.2D+WL150+1.5LLa3
LC71=1.2D-WL0+1.5LLa3
LC72=1.2D-WL30+1.5LLa3
LC73=1.2D-WL60+1.5LLa3
LC74=1.2D-WL90+1.5LLa3
LC75=1.2D-WL120+1.5LLa3
LC76=1.2D-WL150+1.5LLa3

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2-1_2X2-1_2X3_16	**45**	LC10 at 100.00%	0.16	OK	Eq. H2-1
		46	LC36 at 0.00%	**0.22**	**OK**	Eq. H2-1
	L 3X3X1_2	**43**	LC40 at 0.00%	0.14	OK	Sec. F1
		44	LC30 at 87.50%	**0.29**	**OK**	Eq. H2-1
	L 3X3X1_4	**1**	LC25 at 76.39%	**0.94**	**With warnings**	Eq. H2-1
		3	LC5 at 0.00%	0.41	OK	Eq. H3-8
		7	LC11 at 0.00%	0.41	OK	Eq. H2-1
		8	LC7 at 75.89%	0.74	With warnings	Eq. H2-1
		9	LC23 at 0.00%	0.38	OK	Eq. H2-1
		11	LC31 at 89.58%	0.74	OK	Eq. H3-8
	PIPE 1-1_4x0.140	**12**	LC6 at 12.50%	0.17	OK	Eq. H1-1b
		13	LC30 at 0.00%	0.13	OK	Eq. H1-1b
		14	LC36 at 0.00%	0.18	OK	Eq. H1-1b
		15	LC36 at 12.50%	**0.33**	**OK**	Eq. H1-1b
	PIPE 2-1_2x0.203	**37**	LC7 at 37.50%	**0.72**	**OK**	Eq. H1-1b
	PIPE 2x0.154	**38**	LC7 at 27.08%	**0.62**	**OK**	Eq. H1-1b
		39	LC6 at 72.92%	0.12	OK	Eq. H1-1b
		40	LC40 at 28.13%	0.29	OK	Eq. H1-1b
		41	LC6 at 0.00%	0.12	OK	Eq. H1-1b
		42	LC1 at 0.00%	0.13	OK	Eq. H1-1b
	PL 10x3/8	**5**	LC36 at 100.00%	0.37	OK	Eq. H1-1b
		10	LC26 at 100.00%	**0.48**	**OK**	Eq. H1-1b
	RndBar 3_4	**16**	LC30 at 46.88%	**0.07**	**OK**	Eq. H1-1b
		17	LC31 at 68.75%	0.05	OK	Eq. H1-1b

Current Date: 1/16/2019 6:34 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT5482\LTE 3C-4C\CT5482 (LTE 3C-4(MOD).etz\

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	-6.25	0.00	0.00	0
2	6.25	0.00	0.00	0
4	-3.25	0.00	0.00	0
6	0.00	0.00	-2.50	0
9	0.00	0.00	-3.00	0
11	3.25	0.00	0.00	0
12	-6.25	-3.6667	0.00	0
13	6.25	-3.6667	0.00	0
14	-3.25	-3.6667	0.00	0
15	0.00	-3.6667	-2.50	0
16	0.00	-3.6667	-3.00	0
17	3.25	-3.6667	0.00	0
18	-2.8889	0.00	-0.2778	0
25	-0.3611	0.00	-2.2222	0
26	-2.8889	-3.6667	-0.2778	0
27	-0.3611	-3.6667	-2.2222	0
28	2.8889	0.00	-0.2778	0
29	0.3611	0.00	-2.2222	0
30	2.8889	-3.6667	-0.2778	0
31	0.3611	-3.6667	-2.2222	0
36	-6.00	2.1667	0.20	0

37	6.00	2.1667	0.20	0
38	-2.00	2.1667	0.20	0
39	2.00	2.1667	0.20	0
40	-6.00	-5.8333	0.20	0
41	6.00	-5.8333	0.20	0
42	-2.00	-5.8333	0.20	0
43	2.00	-5.8333	0.20	0
69	-6.00	-0.75	0.20	0
70	-5.00	-0.75	-6.80	0
71	6.00	-0.75	0.20	0
72	5.00	-0.75	-6.80	0
73	0.00	2.33	-3.00	0
74	2.875	0.00	0.00	0
75	-2.875	0.00	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
9	1	1	1	1	1	1
16	1	1	1	1	1	1
70	1	1	1	0	0	0
72	1	1	1	0	0	0
73	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	1	2		L 3X3X1_4	A36	0.00	0.00	0.00
3	6	4		L 3X3X1_4	A36	0.00	0.00	0.00
5	6	9		PL 10x3/8	A36	0.00	0.00	0.00
7	6	11		L 3X3X1_4	A36	0.00	0.00	0.00
8	12	13		L 3X3X1_4	A36	0.00	0.00	0.00
9	15	14		L 3X3X1_4	A36	0.00	0.00	0.00
10	15	16		PL 10x3/8	A36	0.00	0.00	0.00
11	15	17		L 3X3X1_4	A36	0.00	0.00	0.00
12	18	26		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
13	25	27		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
14	29	31		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
15	28	30		PIPE 1-1_4x0.140	A53 GrB	0.00	0.00	0.00
16	25	26		RndBar 3_4	A36	0.00	0.00	0.00
17	31	28		RndBar 3_4	A36	0.00	0.00	0.00
37	37	41		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
38	39	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
39	38	42		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
40	36	40		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
41	69	70		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
42	71	72		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
43	4	15		L 3X3X1_2	A36	0.00	0.00	0.00
44	15	11		L 3X3X1_2	A36	0.00	0.00	0.00
45	75	73		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

46	73	74	L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	270.00	0	0.00	0.00	0.00
3	90.00	0	0.00	0.00	0.00
5	90.00	0	0.00	0.00	0.00
7	180.00	0	0.00	0.00	0.00
8	180.00	0	0.00	0.00	0.00
10	90.00	0	0.00	0.00	0.00
11	270.00	0	0.00	0.00	0.00
37	315.00	0	0.00	0.00	0.00
38	315.00	0	0.00	0.00	0.00
39	315.00	0	0.00	0.00	0.00
40	315.00	0	0.00	0.00	0.00
43	90.00	0	0.00	0.00	0.00
44	90.00	0	0.00	0.00	0.00
45	45.00	0	0.00	0.00	0.00
46	45.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
43	2.00	-1.00	0.00	1.00	-1.00	1.00
44	-1.00	-1.00	1.00	-2.00	-1.00	0.00

Hinges

	Node-J				Node-K						
Member	M33	M22	V3	V2	M33	M22	V3	V2	TOR	AXL	Axial rigidity
16	0	0	0	0	0	0	0	0	0	0	Tension only
17	0	0	0	0	0	0	0	0	0	0	Tension only

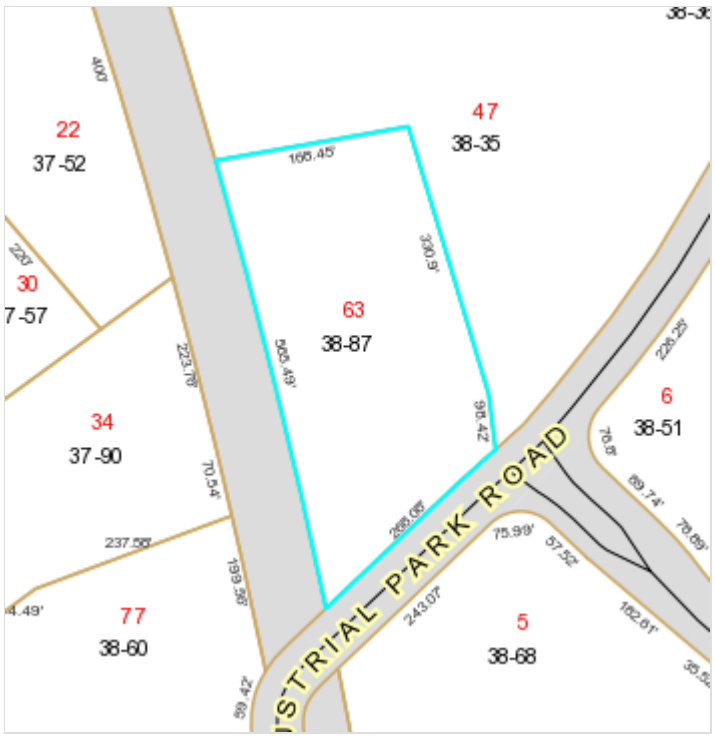
Town of Putnam, Connecticut

Property Record Card

Card 1 of 1

63 INDUSTRIAL PARK RD

ID: **038-087** Account #: **000013**



Owner: DMW PUTNAM LLC
Co-Owner:
Address: 643 MANLEY STREET
WEST BRIDGEWATER MA 02379

Assessment: Total: 315400
Building: 95900 Land: 119300 Yard: 100200

Sales History

Grantor	Book / Page	Sale Date	Sale Price
DMW PUTNAM LLC	791/ 090	2016-10-19	200000
PUTNAM FINANCIAL ASSOCIATES LLC	738/ 012	2014-04-09	0
PUTNAM PARK ASSOCIATES LLC	0310/0159	1997-07-17	170000

MainStreetGIS, LLC
www.mainstreetgis.com

Land Information
Land Area: 2.39 AC Zoning: I
Land Use: 3-1 - Industrial MDL-96
Neighborhood: 2

Building Information
Style:
Year Built: 1956
Rooms: Bedrooms:
Baths: Half Baths:
Living Area:
Gross Area:

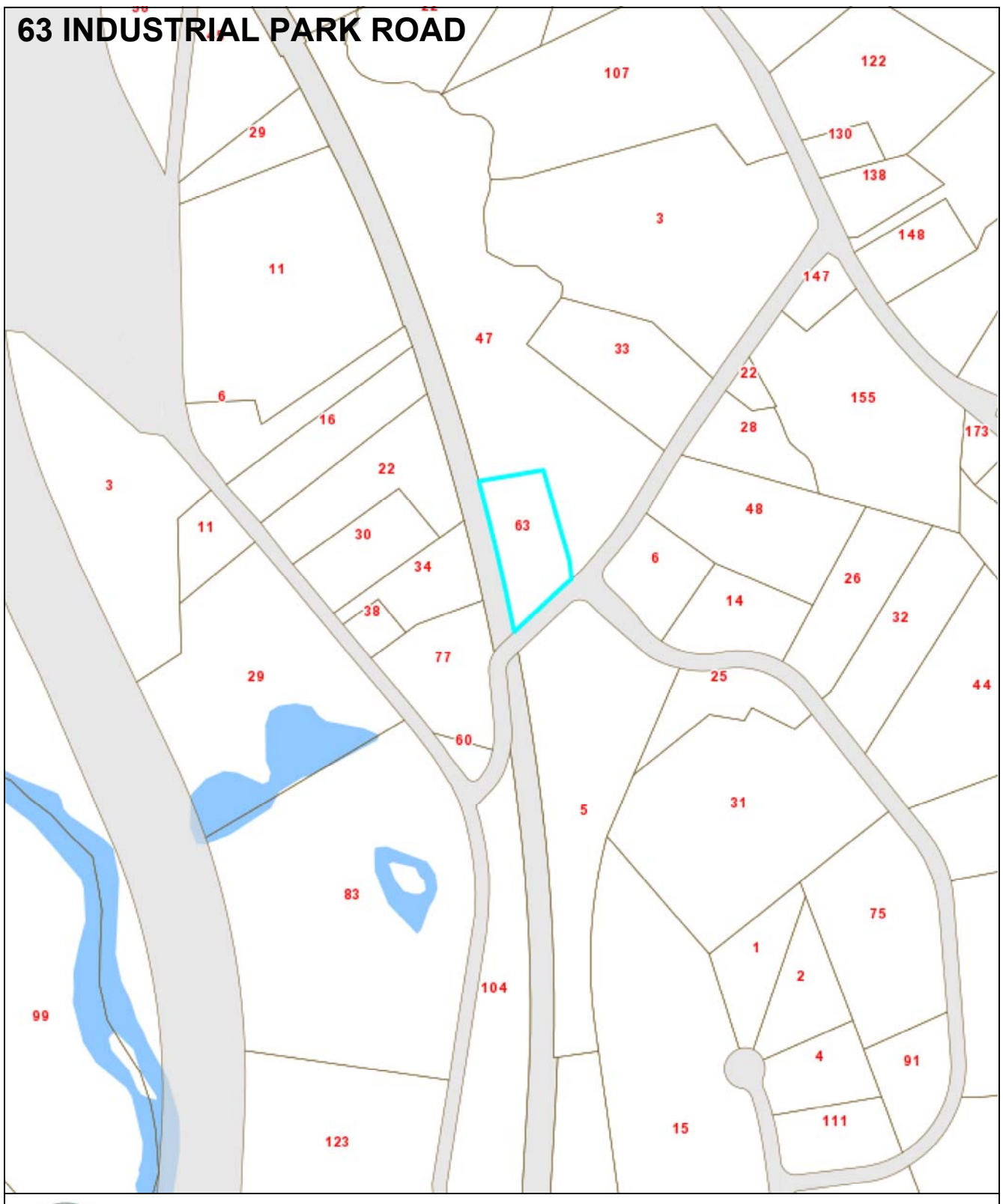
Stories:
Heat Fuel:
Heat Type:
AC Type:
Roof Structure:
Roof Covering:

Extra Features

Description	Area / Units	Assessment
Paving Cement	10000	31500
Cell Tower	186000	65100
Overhead Door	456	1700
Fence 8'	360	3600

Sub Areas

Description	Living Area	Gross Area
First Floor	9904	9904
Loading Platform Covered	0	720



Town of Putnam, Connecticut

Selected Parcel: 63 INDUSTRIAL PARK RD ID: 038-087

100 m
500 ft

N

MainStreetGIS, LLC
www.mainstreetgis.com

Printed 3/15/2019 from http://www.mainstreetmaps.com/ct/putnam/public.asp

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0469 6582 54 0073 5000 0010 6260

usps.com
$7.35
US POSTAL SERVICE
Flat Rate Env

04/06/2019 Mailed from 06268 062S0000001308

P

PRIORITY MAIL 1-DAY™

Expected Delivery Date: 04/08/19

MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

0024

Carrier -- Leave if No Response

C003

SHIP TO: MAYOR BARNEY SENEY
TOWN OF PUTNAM
126 CHURCH ST
CC: CHAD SESSUMS, BUILDING OFFICIAL
PUTNAM CT 06260-1831

USPS TRACKING #

9405 5036 9930 0469 6582 54

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0469 6582 54

Trans. #:	460972142
Print Date:	04/05/2019
Ship Date:	04/06/2019
Expected Delivery Date:	04/08/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

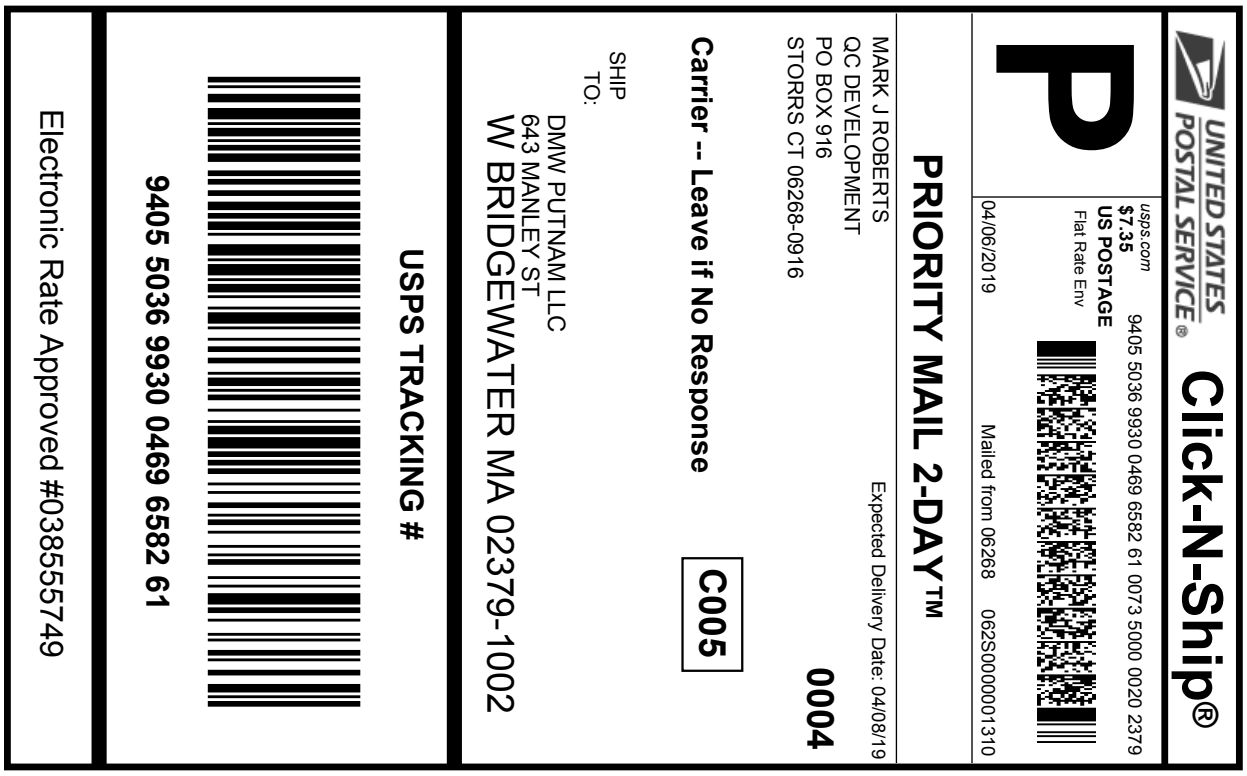
From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MAYOR BARNEY SENEY
TOWN OF PUTNAM
126 CHURCH ST
CC: CHAD SESSUMS, BUILDING OFFICIAL
PUTNAM CT 06260-1831

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE®

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

Instructions

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0469 6582 61

Trans. #:	460972142
Print Date:	04/05/2019
Ship Date:	04/06/2019
Expected Delivery Date:	04/08/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: DMW PUTNAM LLC
643 MANLEY ST
W BRIDGEWATER MA 02379-1002

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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Check the status of your shipment on the USPS Tracking® page at usps.com