Alex Murshteyn, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

August 15, 2016

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

RE: Notice of Exempt Modification // Site Number: CT2035 (Name: Hamden CT)
975 Mix Avenue, Hamden, CT 06514
N 41.37855 // W 72.91787

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains 9 antennas at the 61-foot level of the existing 65-foot rooftop monopole tower at 975 Mix Avenue, Hamden, CT. The tower is owned by Mix Avenue, LLC. The property is also owned by Mix Avenue, LLC. AT&T now intends to replace 3 of its existing antennas with 3 new LTE (WCS/1900 band) antennas for its LTE upgrade. These antennas would be installed at the 61-foot level of the tower. AT&T also intends to replace 3 existing and install 3 new remote radio units plus 1 squid, 2 DC cables and 1 fiber trunk.

The current proposal involves an antenna swap only (three for three); no antennas will be added.

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 Curt B. Leng, Mayor for the Town of Hamden, as well as the tower owner and the ground owner, Mix Avenue, LLC.

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

Attached to accommodate this filing are construction drawings dated August 12, 2016 by ComEx Consultants, a structural analysis dated August 12, 2016 by Destek Engineering, LLC. and an Emissions Analysis Report dated November 11, 2015 by EBI Consulting.

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, as shown in the attached structural analysis by Destek Engineering, LLC, dated August 12, 2016.

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).

Sincerely,

Alex Murshteyn, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

Attachments

cc: Curt B. Leng, Mayor, Town of Hamden - as elected official
Mix Avenue, LLC - as tower owner
Mix Avenue, LLC - as property owners

STRUCTURAL ANALYSIS REPORT – UPGRADE REV. 1
ROOFTOP / MONOPOLE

Prepared For:

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

Structure Rating:	
Antenna Monopole:	**Pass**
Support Platform:	**Pass**
Building:	**Pass**

Sincerely,
Destek Engineering, LLC

08-12-2016

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

AT&T Site ID: CT2035
FA Code: 10035036
Site Name: HAMDEN
975 Mix Avenue
Hamden, CT 06514

Destek Job No: 1529181 August 12, 2016

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing telecommunication installation on the building located at 975 Mix Avenue, Hamden, CT 06514, for the additions and alterations proposed by AT&T Mobility (AT&T).

The structural analysis is based on a site visit performed by Destek Engineering, LLC (Destek), personnel on July 8, 2016, and on the following information provided to Destek:

- Construction Drawings prepared by Com-Ex Consultants and Empire Telecom, dated 03/22/2016
- As-Built Construction Drawings prepared by Centek Engineering and Nexlink Global services, Job Number 11118.C09, dated 07/24/2012
- Structural Analysis Report prepared by Hudson Design Group, LLC, dated 03/07/2012
- Existing Rooftop Pole Structural Assessment Letter prepared by URS Corporation, URS Project Number 36924848/SAI-050, dated 01/06/2010
- RFDS provided by AT&T, dated 11/05/2015

1.1 STRUCTURE AND EXISTING EQUIPMENT

The structure is a four-story residential building comprised of reinforced concrete floor slabs supported on concrete masonry unit (CMU) walls. The elevation of the main roof is approximately 34 feet above ground level (AGL). AT&T currently has equipment cabinets located in the second floor of the building and directly supported on the floor slab. AT&T also currently has (9) panel antennas on the roof of the building at a RAD center of 61' AGL, (3) per sector. The panel antennas are mounted to sector mounts attached to a 25'-6" tall galvanized structural steel monopole. The monopole has a round section with an approximate diameter of 8 5/8"and is anchored with bolts and a stiffened base plate to a steel platform directly supported on the building CMU walls. Please refer to the calculations in Appendix B for details.

2.0 APPURTENANCES

This analysis is based on the following existing and proposed appurtenances:

Existing Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
61	(6) Kathrein 800-10121 (3) KMW AM-X-CD-16-65-00T-RET (6) TT19-08BP1119001 TMA's* (6) RRUS-11* & (1) DC Fiber Squid*	(3) Sector Mounts	(12) 1-5/8" + (3) Hybrid DC/Fiber cable

*** Equipment installed at steel platform level**

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

Proposed and Final Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
61	(3) Kathrein 800-10121 (3) KMW AM-X-CD-16-65-00T-RET (3) QS66512-3 (3) TT19-08BP1119001 TMA's (3) RRUS-11* (3) RRUS-32 (3) RRUS-32 B2 (1) DC Fiber Squid* (1) DC Fiber Squid (6) Diplexers	(3) Sector Mounts	(12) 1-5/8" + (3) Hybrid DC/Fiber cable + (2) DC & (1) Fiber Cables

*** Equipment installed at steel platform level**

3.0 CODES AND LOADING

The analysis is in accordance with the following codes and loading as adopted in Connecticut:

- 2005 State Building Code with all of the adopted Supplements and Amendments.
- Minimum Design Loads for Buildings and Other Structures SEI/ASCE 7-02, American Society of Civil Engineers
- Specifications for Structural Steel Buildings – Allowable Stress ANSI/AISC 335-89s1, American National Standards Institute/American Institute for Steel Construction
- Basic Wind Speed: 110 mph (3 second gust)
- Exposure: C

The monopole was analyzed per *TIA/EIA-222-F* as referenced by *2005 State Building Code*. The following wind loading was used in compliance with the standard for New Haven County:

- Basic wind speed: 85 mph (fastest mile)
- Basic wind speed: 38 mph with 1/2" radial ice
- Basic wind speed: 50 mph for service loads

The following load combinations were used with wind blowing at 0^o, 60^o, and 90^o measured from a line normal to the face of the monopole:

- $D + W_o$
- $D + 0.75W_I + I$

D: Dead Load of structure and appurtenances
W_o: Wind Load, without ice
W_i: Wind Load with ice
I: Weight of ice

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

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

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc., or lack of maintenance. The analysis does not include a qualification of the mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

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

5.0 ANALYSIS AND ASSUMPTIONS

The structure is considered to have adequate strength for the proposed loading if the existing structural members that will be used to support the proposed equipment are structurally adequate per the applicable code criteria, or that the additions or alterations to the existing structure do not increase the force in any structural element by more than 5%.

The monopole was analyzed using TNX Tower, a three-dimensional, non-linear, finite element-analysis software package produced by Tower Numerics. The analysis of the support platform was performed by utilizing Risa 3-D, a commercially available structural engineering software package by Risa Technologies. Software output for this analysis is provided in Appendix B of this report.

The monopole was measured on site and the approximate diameter is 8 5/8”. The thickness and material strength of the monopole were not available at the time of this analysis. Steel strength of 42 ksi (A500 Gr. 42 steel) and a thickness of 0.322” were assumed. The base plate steel strength was assumed at 36 ksi (A36 steel) and the anchor bolt steel strength was assumed at 92 ksi (A325 steel). The steel platform was assumed to be composed of A992 steel (50 ksi).

6.0 RESULTS AND CONCLUSION

Monopole: Based on an analysis per *TIA/EIA-222-F*, the existing monopole **will have adequate** structural capacity for the proposed changes once reinforced per Destek drawings dated 8/1/2016. For the aforementioned load combinations, the monopole bottom shaft section is stressed to a maximum of **99.1%** of its allowable capacity. The base plate and anchor bolts are stressed to **94.7%** and **86.9%** of capacity, respectively.

Steel Platform: The existing steel platform supporting the existing monopole is found to have **adequate** structural capacity for the proposed installation by AT&T. For the code specified load combinations and the proposed loading configuration, the structural members are stressed to **61%** of their structural capacity as a maximum.

Building: The existing concrete masonry unit (CMU) building walls that support the platform and monopole were observed to be continuous throughout the building height. The CMU walls were visually inspected and no signs of overstress, deterioration or structural damage caused by the AT&T installation were observed. Therefore, the existing CMU walls are considered to have **adequate** capacity to support the proposed installation by AT&T.

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

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

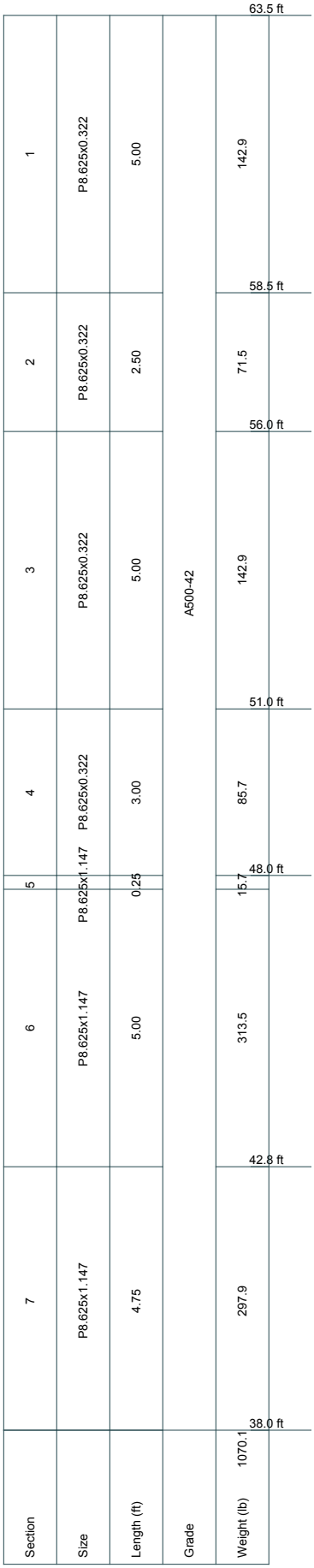
DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

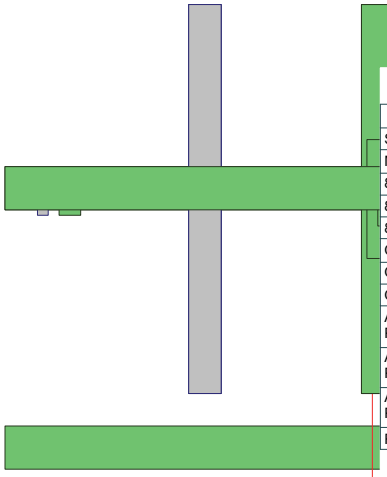
APPENDIX A
PICTURES

EXISTING MONOPOLE AND SUPPORTING STEEL PLATFORM ON ROOF

EXISTING STEEL PLATFORM ANCHORED TO ROOF STRUCTURE

APPENDIX B
SOFTWARE OUTPUT & CALCULATIONS





DESIGNED APPURTENANCE LOADING

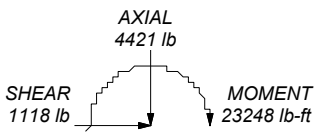
TYPE	ELEVATION	TYPE	ELEVATION
Side Arm Mount [SO 702-3]	61.5	RRUS 32 W/O SOLAR SHIELD	61
Miscellaneous [NA 507-1]	61.5	RRUS 32 W/O SOLAR SHIELD	61
800 10121 w/ Mount Pipe	61	RRUS 32 B2	61
800 10121 w/ Mount Pipe	61	RRUS 32 B2	61
800 10121 w/ Mount Pipe	61	RRUS 32 B2	61
QS66512-3 w/ Mount Pipe	61	TT19-08BP111-001	61
QS66512-3 w/ Mount Pipe	61	TT19-08BP111-001	61
QS66512-3 w/ Mount Pipe	61	TT19-08BP111-001	61
AM-X-CD-16-65-00T-RET w/ Mount Pipe	61	(2) LGP21901	61
AM-X-CD-16-65-00T-RET w/ Mount Pipe	61	(2) LGP21901	61
AM-X-CD-16-65-00T-RET w/ Mount Pipe	61	(2) LGP21901	61
RRUS 32 W/O SOLAR SHIELD	61	DC6-48-60-18-8F	61
		Side Arm Mount [SO 702-3]	57.5
		Miscellaneous [NA 507-1]	57.5

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi			

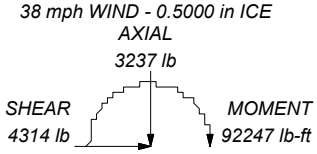
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. TOWER RATING: 99.1%



TORQUE 41 lb-ft

38 mph WIND - 0.5000 in ICE



TORQUE 167 lb-ft

REACTIONS - 85 mph WIND

Destek Engineering, LLC
1281 Kennestone Circle, Suite 100
Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: ***1529181***			
Project: ***CT2035 Mod Rev 1***			
Client: Com-Ex Consultants	Drawn by: Ahmet Coakoglu		App'd:
Code: TIA/EIA-222-F	Date: 08/11/16		Scale: NTS
Path: \\FILESERVER\Users\admin\Documents\2015\29 - Com-Ex Consultants\1529181 - CT2035\08-09-2016 Mod\RISA Tower\CT2035 Mod final.eri			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
√	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	63.50-58.50	5.00	P8.625x0.322	A500-42 (42 ksi)	
L2	58.50-56.00	2.50	P8.625x0.322	A500-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L3	56.00-51.00	5.00	P8.625x0.322	(42 ksi) A500-42 (42 ksi)	
L4	51.00-48.00	3.00	P8.625x0.322	A500-42 (42 ksi)	
L5	48.00-47.75	0.25	P8.625x1.147	A500-42 (42 ksi)	
L6	47.75-42.75	5.00	P8.625x1.147	A500-42 (42 ksi)	
L7	42.75-38.00	4.75	P8.625x1.147	A500-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 63.50-58.50				1	1	1			
L2 58.50-56.00				1	1	1			
L3 56.00-51.00				1	1	1			
L4 51.00-48.00				1	1	1			
L5 48.00-47.75				1	1	0.683878			
L6 47.75-42.75				1	1	0.683878			
L7 42.75-38.00				1	1	0.683878			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8)	A	No	CaAa (Out Of Face)	61.00 - 39.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
						2" Ice	0.60	10.54
						4" Ice	1.00	30.04
LDF7-50A(1-5/8)	A	No	CaAa (Out Of Face)	61.00 - 39.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
3/8" Fiber Cable	A	No	CaAa (Out Of Face)	61.00 - 39.00	3	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
						2" Ice	0.00	0.50
						4" Ice	0.00	0.50
3/8" Fiber Cable	A	No	CaAa (Out Of Face)	61.00 - 39.00	3	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
						2" Ice	0.00	0.50
						4" Ice	0.00	0.50
***								
5.5x0.5	C	No	CaAa (Out Of Face)	44.00 - 38.00	1	No Ice	0.08	0.00
						1/2" Ice	0.17	0.00
						1" Ice	0.25	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.42	0.00
						4" Ice	0.75	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	63.50-58.50	A	0.000	0.000	0.000	0.990	32.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	58.50-56.00	A	0.000	0.000	0.000	0.990	32.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	56.00-51.00	A	0.000	0.000	0.000	1.980	64.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L4	51.00-48.00	A	0.000	0.000	0.000	1.188	38.52
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L5	48.00-47.75	A	0.000	0.000	0.000	0.099	3.21
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L6	47.75-42.75	A	0.000	0.000	0.000	1.980	64.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.104	0.00
L7	42.75-38.00	A	0.000	0.000	0.000	1.485	48.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.396	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	63.50-58.50	A	0.538	0.000	0.000	0.000	1.528	40.49
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	58.50-56.00	A	0.534	0.000	0.000	0.000	1.524	40.40
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	56.00-51.00	A	0.530	0.000	0.000	0.000	3.040	80.62
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L4	51.00-48.00	A	0.525	0.000	0.000	0.000	1.818	48.25
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L5	48.00-47.75	A	0.523	0.000	0.000	0.000	0.151	4.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L6	47.75-42.75	A	0.519	0.000	0.000	0.000	3.019	80.17
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.212	0.00
L7	42.75-38.00	A	0.512	0.000	0.000	0.000	2.253	59.90
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		0.000	0.000	0.000	0.801	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	63.50-58.50	0.0000	-0.2329	0.0000	-0.2958
L2	58.50-56.00	0.0000	-0.3830	0.0000	-0.4637
L3	56.00-51.00	0.0000	-0.3830	0.0000	-0.4632
L4	51.00-48.00	0.0000	-0.3830	0.0000	-0.4626
L5	48.00-47.75	0.0000	-0.3830	0.0000	-0.4624
L6	47.75-42.75	-0.0171	-0.3661	-0.0273	-0.4326
L7	42.75-38.00	-0.0698	-0.2621	-0.1088	-0.2906

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Side Arm Mount [SO 702-3]	A	None		0.0000	57.50	No Ice	3.22	3.22	81.00
						1/2" Ice	4.15	4.15	114.00
						1" Ice	5.08	5.08	147.00
						2" Ice	6.94	6.94	213.00
						4" Ice	10.66	10.66	345.00
Miscellaneous [NA 507-1]	A	None		0.0000	57.50	No Ice	4.80	4.80	245.00
						1/2" Ice	6.70	6.70	294.00
						1" Ice	8.60	8.60	343.00
						2" Ice	12.40	12.40	441.00
						4" Ice	20.00	20.00	637.00
Side Arm Mount [SO 702-3]	B	None		0.0000	61.50	No Ice	3.22	3.22	81.00
						1/2" Ice	4.15	4.15	114.00
						1" Ice	5.08	5.08	147.00
						2" Ice	6.94	6.94	213.00
						4" Ice	10.66	10.66	345.00
Miscellaneous [NA 507-1]	B	None		0.0000	61.50	No Ice	4.80	4.80	245.00
						1/2" Ice	6.70	6.70	294.00
						1" Ice	8.60	8.60	343.00
						2" Ice	12.40	12.40	441.00
						4" Ice	20.00	20.00	637.00
800 10121 w/ Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice	5.69	4.60	66.50
						1/2" Ice	6.18	5.35	114.02
						1" Ice	6.68	6.05	167.89
						2" Ice	7.70	7.53	297.81
						4" Ice	9.86	10.83	675.28
800 10121 w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice	5.69	4.60	66.50
						1/2" Ice	6.18	5.35	114.02
						1" Ice	6.68	6.05	167.89

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	7.70	7.53	297.81
						4" Ice	9.86	10.83	675.28
800 10121 w/ Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.68 7.70 9.86	4.60 5.35 6.05 7.53 10.83	66.50 114.02 167.89 297.81 675.28
QS66512-3 w/ Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	8.46 9.66 10.62 12.61 16.81	130.55 206.24 290.07 485.79 1023.47
QS66512-3 w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	8.46 9.66 10.62 12.61 16.81	130.55 206.24 290.07 485.79 1023.47
QS66512-3 w/ Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	8.46 9.66 10.62 12.61 16.81	130.55 206.24 290.07 485.79 1023.47
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	74.05 139.04 211.91 384.96 874.27
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	74.05 139.04 211.91 384.96 874.27
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	74.05 139.04 211.91 384.96 874.27
RRUS 32 W/O SOLAR SHIELD	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.43 2.65 2.88 3.37 4.46	1.40 1.60 1.80 2.23 3.19	46.30 62.62 81.74 129.13 265.98
RRUS 32 W/O SOLAR SHIELD	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.43 2.65 2.88 3.37 4.46	1.40 1.60 1.80 2.23 3.19	46.30 62.62 81.74 129.13 265.98
RRUS 32 W/O SOLAR SHIELD	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.43 2.65 2.88 3.37 4.46	1.40 1.60 1.80 2.23 3.19	46.30 62.62 81.74 129.13 265.98
RRUS 32 B2	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.20 3.46 3.72 4.24 5.27	1.85 2.08 2.08 2.31 2.78	60.00 81.11 105.42 164.41 329.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRUS 32 B2	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.20 3.46 3.72 4.24 5.27	1.85 2.08 2.08 2.31 2.78	60.00 81.11 105.42 164.41 329.27
RRUS 32 B2	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.20 3.46 3.72 4.24 5.27	1.85 2.08 2.08 2.31 2.78	60.00 81.11 105.42 164.41 329.27
TT19-08BP111-001	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.64 0.76 0.88 1.14 1.78	0.52 0.62 0.74 0.99 1.59	16.00 21.80 29.22 49.70 118.66
TT19-08BP111-001	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.64 0.76 0.88 1.14 1.78	0.52 0.62 0.74 0.99 1.59	16.00 21.80 29.22 49.70 118.66
TT19-08BP111-001	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.64 0.76 0.88 1.14 1.78	0.52 0.62 0.74 0.99 1.59	16.00 21.80 29.22 49.70 118.66
(2) LGP21901	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	5.50 7.92 11.41 22.43 66.02
(2) LGP21901	B	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	5.50 7.92 11.41 22.43 66.02
(2) LGP21901	C	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.27 0.34 0.43 0.62 1.10	0.18 0.25 0.32 0.49 0.94	5.50 7.92 11.41 22.43 66.02
DC6-48-60-18-8F	A	From Face	3.00 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	18.90 34.02 51.47 93.99 213.80

Load Combinations

Comb. No.	Description
1	Dead Only

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	63.5 - 58.5	Pole	Max Tension	21	0.00	-0.00	0.00
			Max. Compression	14	-2646.84	103.61	74.79
			Max. Mx	11	-1596.18	8956.82	41.43
			Max. My	2	-1596.09	51.38	8945.23
			Max. Vy	11	-3497.89	8956.82	41.43
			Max. Vx	2	-3497.93	51.38	8945.23
			Max. Torque	9			-158.22
L2	58.5 - 56	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-3187.28	104.30	90.14
			Max. Mx	11	-2018.07	18253.89	54.11
			Max. My	2	-2017.97	52.97	18253.95
			Max. Vy	11	-3879.61	18253.89	54.11
			Max. Vx	2	-3879.66	52.97	18253.95
			Max. Torque	9			-159.40
L3	56 - 51	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-3440.44	105.22	120.31

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	11	-2255.98	37985.45	78.88
			Max. My	2	-2255.89	55.13	38008.82
			Max. Vy	11	-4014.15	37985.45	78.88
			Max. Vx	2	-4014.20	55.13	38008.82
			Max. Torque	9			-161.67
L4	51 - 48	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-3592.03	105.22	137.65
			Max. Mx	11	-2413.08	50123.49	93.23
			Max. My	2	-2413.01	55.69	50160.83
			Max. Vy	11	-4083.33	50123.49	93.23
			Max. Vx	2	-4083.37	55.69	50160.83
			Max. Torque	9			-162.98
L5	48 - 47.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-3613.18	105.22	139.09
			Max. Mx	11	-2439.31	51144.15	94.38
			Max. My	2	-2439.25	55.67	51182.65
			Max. Vy	11	-4086.37	51144.15	94.38
			Max. Vx	2	-4086.41	55.67	51182.65
			Max. Torque	9			-163.09
L6	47.75 - 42.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-4035.89	105.22	167.91
			Max. Mx	11	-2844.70	71898.26	117.97
			Max. My	2	-2844.66	56.19	71960.00
			Max. Vy	11	-4216.03	71898.26	117.97
			Max. Vx	2	-4216.06	56.19	71960.00
			Max. Torque	9			-165.41
L7	42.75 - 38	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-4420.82	105.22	189.43
			Max. Mx	11	-3230.68	92157.92	135.25
			Max. My	2	-3230.67	56.07	92237.02
			Max. Vy	11	-4318.89	92157.92	135.25
			Max. Vx	2	-4318.89	56.07	92237.02
			Max. Torque	9			-167.46

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	4420.82	558.80	967.88
	Max. H_x	11	3236.65	4314.41	0.00
	Max. H_z	2	3236.65	0.00	4314.41
	Max. M_x	2	92237.02	0.00	4314.41
	Max. M_z	5	92045.70	-4314.41	0.00
	Max. Torsion	3	167.45	-2157.21	3736.39
	Min. Vert	1	3236.65	0.00	0.00
	Min. H_x	5	3236.65	-4314.41	0.00
	Min. H_z	8	3236.65	0.00	-4314.41
	Min. M_x	8	-91966.60	0.00	-4314.41
	Min. M_z	11	-92157.92	4314.41	0.00
	Min. Torsion	9	-167.46	2157.21	-3736.39

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	3236.65	0.00	0.00	-133.49	55.16	0.00
Dead+Wind 0 deg - No Ice	3236.65	-0.00	-4314.41	-92237.02	56.01	-136.82
Dead+Wind 30 deg - No Ice	3236.65	2157.21	-3736.39	-79897.67	-45994.87	-167.45
Dead+Wind 60 deg - No Ice	3236.65	3736.39	-2157.21	-46186.07	-79706.43	-153.22
Dead+Wind 90 deg - No Ice	3236.65	4314.41	-0.00	-135.21	-92045.70	-97.93
Dead+Wind 120 deg - No Ice	3236.65	3736.39	2157.21	45915.65	-79706.43	-16.40
Dead+Wind 150 deg - No Ice	3236.65	2157.21	3736.39	79627.26	-45994.87	69.52
Dead+Wind 180 deg - No Ice	3236.65	-0.00	4314.41	91966.60	56.01	136.82
Dead+Wind 210 deg - No Ice	3236.65	-2157.21	3736.39	79627.34	46106.94	167.46
Dead+Wind 240 deg - No Ice	3236.65	-3736.39	2157.21	45915.74	79818.59	153.22
Dead+Wind 270 deg - No Ice	3236.65	-4314.41	-0.00	-135.21	92157.92	97.93
Dead+Wind 300 deg - No Ice	3236.65	-3736.39	-2157.21	-46186.16	79818.59	16.41
Dead+Wind 330 deg - No Ice	3236.65	-2157.21	-3736.39	-79897.76	46106.94	-69.52
Dead+Ice+Temp	4420.82	-0.00	-0.00	-189.43	105.22	0.00
Dead+Wind 0 deg+Ice+Temp	4420.82	-0.00	-1117.61	-23220.11	106.32	-31.95
Dead+Wind 30 deg+Ice+Temp	4420.82	558.80	-967.88	-20134.81	-11408.15	-41.26
Dead+Wind 60 deg+Ice+Temp	4420.82	967.88	-558.80	-11705.63	-19837.33	-39.51
Dead+Wind 90 deg+Ice+Temp	4420.82	1117.61	-0.00	-191.15	-22922.63	-27.17
Dead+Wind 120 deg+Ice+Temp	4420.82	967.88	558.80	11323.32	-19837.33	-7.55
Dead+Wind 150 deg+Ice+Temp	4420.82	558.80	967.88	19752.51	-11408.15	14.09
Dead+Wind 180 deg+Ice+Temp	4420.82	-0.00	1117.61	22837.80	106.32	31.96
Dead+Wind 210 deg+Ice+Temp	4420.82	-558.80	967.88	19752.51	11620.80	41.27
Dead+Wind 240 deg+Ice+Temp	4420.82	-967.88	558.80	11323.33	20049.99	39.52
Dead+Wind 270 deg+Ice+Temp	4420.82	-1117.61	-0.00	-191.15	23135.29	27.18
Dead+Wind 300 deg+Ice+Temp	4420.82	-967.88	-558.80	-11705.63	20049.99	7.56
Dead+Wind 330 deg+Ice+Temp	4420.82	-558.80	-967.88	-20134.81	11620.80	-14.09
Dead+Wind 0 deg - Service	3236.65	-0.00	-1616.25	-33591.24	56.22	-47.59
Dead+Wind 30 deg - Service	3236.65	808.13	-1399.72	-29109.00	-16671.71	-59.87
Dead+Wind 60 deg - Service	3236.65	1399.72	-808.13	-16863.30	-28917.40	-56.11
Dead+Wind 90 deg - Service	3236.65	1616.25	-0.00	-135.38	-33399.64	-37.31
Dead+Wind 120 deg - Service	3236.65	1399.72	808.13	16592.55	-28917.40	-8.52
Dead+Wind 150 deg - Service	3236.65	808.13	1399.72	28838.25	-16671.71	22.56
Dead+Wind 180 deg - Service	3236.65	-0.00	1616.25	33320.49	56.22	47.59
Dead+Wind 210 deg - Service	3236.65	-808.13	1399.72	28838.26	16784.15	59.87
Dead+Wind 240 deg - Service	3236.65	-1399.72	808.13	16592.56	29029.85	56.11
Dead+Wind 270 deg - Service	3236.65	-1616.25	-0.00	-135.38	33512.09	37.31
Dead+Wind 300 deg - Service	3236.65	-1399.72	-808.13	-16863.31	29029.85	8.52
Dead+Wind 330 deg - Service	3236.65	-808.13	-1399.72	-29109.01	16784.15	-22.56

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-3236.65	0.00	0.00	3236.65	0.00	0.000%
2	0.00	-3236.65	-4314.41	0.00	3236.65	4314.41	0.000%
3	2157.21	-3236.65	-3736.39	-2157.21	3236.65	3736.39	0.000%
4	3736.39	-3236.65	-2157.21	-3736.39	3236.65	2157.21	0.000%
5	4314.41	-3236.65	0.00	-4314.41	3236.65	0.00	0.000%
6	3736.39	-3236.65	2157.21	-3736.39	3236.65	-2157.21	0.000%
7	2157.21	-3236.65	3736.39	-2157.21	3236.65	-3736.39	0.000%
8	0.00	-3236.65	4314.41	0.00	3236.65	-4314.41	0.000%
9	-2157.21	-3236.65	3736.39	2157.21	3236.65	-3736.39	0.000%
10	-3736.39	-3236.65	2157.21	3736.39	3236.65	-2157.21	0.000%
11	-4314.41	-3236.65	0.00	4314.41	3236.65	0.00	0.000%
12	-3736.39	-3236.65	-2157.21	3736.39	3236.65	2157.21	0.000%
13	-2157.21	-3236.65	-3736.39	2157.21	3236.65	3736.39	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
14	0.00	-4420.82	0.00	0.00	4420.82	0.00	0.000%
15	0.00	-4420.82	-1117.61	0.00	4420.82	1117.61	0.000%
16	558.80	-4420.82	-967.88	-558.80	4420.82	967.88	0.000%
17	967.88	-4420.82	-558.80	-967.88	4420.82	558.80	0.000%
18	1117.61	-4420.82	0.00	-1117.61	4420.82	0.00	0.000%
19	967.88	-4420.82	558.80	-967.88	4420.82	-558.80	0.000%
20	558.80	-4420.82	967.88	-558.80	4420.82	-967.88	0.000%
21	0.00	-4420.82	1117.61	0.00	4420.82	-1117.61	0.000%
22	-558.80	-4420.82	967.88	558.80	4420.82	-967.88	0.000%
23	-967.88	-4420.82	558.80	967.88	4420.82	-558.80	0.000%
24	-1117.61	-4420.82	0.00	1117.61	4420.82	0.00	0.000%
25	-967.88	-4420.82	-558.80	967.88	4420.82	558.80	0.000%
26	-558.80	-4420.82	-967.88	558.80	4420.82	967.88	0.000%
27	0.00	-3236.65	-1616.25	0.00	3236.65	1616.25	0.000%
28	808.13	-3236.65	-1399.72	-808.13	3236.65	1399.72	0.000%
29	1399.72	-3236.65	-808.13	-1399.72	3236.65	808.13	0.000%
30	1616.25	-3236.65	0.00	-1616.25	3236.65	0.00	0.000%
31	1399.72	-3236.65	808.13	-1399.72	3236.65	-808.13	0.000%
32	808.13	-3236.65	1399.72	-808.13	3236.65	-1399.72	0.000%
33	0.00	-3236.65	1616.25	0.00	3236.65	-1616.25	0.000%
34	-808.13	-3236.65	1399.72	808.13	3236.65	-1399.72	0.000%
35	-1399.72	-3236.65	808.13	1399.72	3236.65	-808.13	0.000%
36	-1616.25	-3236.65	0.00	1616.25	3236.65	0.00	0.000%
37	-1399.72	-3236.65	-808.13	1399.72	3236.65	808.13	0.000%
38	-808.13	-3236.65	-1399.72	808.13	3236.65	1399.72	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00007639
3	Yes	4	0.00000001	0.00021838
4	Yes	4	0.00000001	0.00029953
5	Yes	4	0.00000001	0.00005258
6	Yes	4	0.00000001	0.00024351
7	Yes	4	0.00000001	0.00022961
8	Yes	4	0.00000001	0.00007616
9	Yes	4	0.00000001	0.00030515
10	Yes	4	0.00000001	0.00021893
11	Yes	4	0.00000001	0.00005268
12	Yes	4	0.00000001	0.00025316
13	Yes	4	0.00000001	0.00027226
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00032623
16	Yes	4	0.00000001	0.00033213
17	Yes	4	0.00000001	0.00033045
18	Yes	4	0.00000001	0.00031965
19	Yes	4	0.00000001	0.00032567
20	Yes	4	0.00000001	0.00032542
21	Yes	4	0.00000001	0.00031895
22	Yes	4	0.00000001	0.00032933
23	Yes	4	0.00000001	0.00033093
24	Yes	4	0.00000001	0.00032538
25	Yes	4	0.00000001	0.00033509
26	Yes	4	0.00000001	0.00033542
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001

30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
L1	63.5 - 62.5	P8.625x0.322	5.00	0.00	0.0	25.200	8.3993	-34.04	211661.00	0.000
	62.5 - 61.5					25.200	8.3993	-68.09	211661.00	0.000
	61.5 - 60.5					25.200	8.3993	-1526.13	211661.00	0.007
	60.5 - 59.5					25.200	8.3993	-1560.67	211661.00	0.007
	59.5 - 58.5					25.200	8.3993	-1596.03	211661.00	0.008
L2	58.5 - 57.25	P8.625x0.322	2.50	0.00	0.0	25.200	8.3993	-1963.15	211661.00	0.009
	57.25 - 56					25.200	8.3993	-2017.92	211661.00	0.010
L3	56 - 55	P8.625x0.322	5.00	0.00	0.0	25.200	8.3993	-2063.61	211661.00	0.010
	55 - 54					25.200	8.3993	-2109.91	211661.00	0.010
	54 - 53					25.200	8.3993	-2157.37	211661.00	0.010
	53 - 52					25.200	8.3993	-2206.01	211661.00	0.010
	52 - 51					25.200	8.3993	-2255.87	211661.00	0.011
L4	51 - 50	P8.625x0.322	3.00	0.00	0.0	25.200	8.3993	-2306.97	211661.00	0.011
	50 - 49					25.200	8.3993	-2359.34	211661.00	0.011
	49 - 48					25.200	8.3993	-2412.99	211661.00	0.011
L5	48 - 47.75 (5)	P8.625x1.147	0.25	0.00	0.0	25.200	26.9463	-2439.24	679046.00	0.004
L6	47.75 - 46.75	P8.625x1.147	5.00	0.00	0.0	25.200	26.9463	-2517.71	679046.00	0.004
	46.75 - 45.75					25.200	26.9463	-2598.65	679046.00	0.004
	45.75 - 44.75					25.200	26.9463	-2680.11	679046.00	0.004
	44.75 - 43.75					25.200	26.9463	-2762.11	679046.00	0.004
	43.75 - 42.75					25.200	26.9463	-2844.65	679046.00	0.004
L7	42.75 - 41.5625	P8.625x1.147	4.75	0.00	0.0	25.200	26.9463	-2939.43	679046.00	0.004
	41.5625 - 40.375					25.200	26.9463	-3035.71	679046.00	0.004
	40.375 - 39.1875					25.200	26.9463	-3132.78	679046.00	0.005
	39.1875 - 38					25.200	26.9463	-3230.67	679046.00	0.005

Pole Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		lb-ft	ksi	ksi		lb-ft	ksi	ksi	
L1	63.5 - 62.5	P8.625x0.322	14.58	0.010	27.720	0.000	0.00	0.000	27.720	0.000
	62.5 - 61.5		53.73	0.038	27.720	0.001	0.00	0.000	27.720	0.000
	61.5 - 60.5		2015.74	1.439	27.720	0.052	0.00	0.000	27.720	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	60.5 - 59.5		5479.36	3.912	27.720	0.141	0.00	0.000	27.720	0.000
	59.5 - 58.5		8967.00	6.402	27.720	0.231	0.00	0.000	27.720	0.000
L2	58.5 - 57.25	P8.625x0.322	13444.25	9.598	27.720	0.346	0.00	0.000	27.720	0.000
	57.25 - 56		18274.25	13.046	27.720	0.471	0.00	0.000	27.720	0.000
L3	56 - 55	P8.625x0.322	22170.58	15.828	27.720	0.571	0.00	0.000	27.720	0.000
	55 - 54		26094.67	18.629	27.720	0.672	0.00	0.000	27.720	0.000
	54 - 53		30045.75	21.450	27.720	0.774	0.00	0.000	27.720	0.000
	53 - 52		34023.17	24.289	27.720	0.876	0.00	0.000	27.720	0.000
	52 - 51		38026.08	27.147	27.720	0.979	0.00	0.000	27.720	0.000
L4	51 - 50	P8.625x0.322	42053.33	30.022	27.720	1.083	0.00	0.000	27.720	0.000
	50 - 49		46103.75	32.913	27.720	1.187	0.00	0.000	27.720	0.000
	49 - 48		50176.33	35.821	27.720	1.292	0.00	0.000	27.720	0.000
L5	48 - 47.75 (5)	P8.625x1.147	51198.00	13.743	27.720	0.496	0.00	0.000	27.720	0.000
L6	47.75 - 46.75	P8.625x1.147	55301.25	14.845	27.720	0.536	0.00	0.000	27.720	0.000
	46.75 - 45.75		59430.92	15.953	27.720	0.576	0.00	0.000	27.720	0.000
	45.75 - 44.75		63586.25	17.069	27.720	0.616	0.00	0.000	27.720	0.000
	44.75 - 43.75		67766.92	18.191	27.720	0.656	0.00	0.000	27.720	0.000
	43.75 - 42.75		71972.25	19.320	27.720	0.697	0.00	0.000	27.720	0.000
L7	42.75 - 41.5625	P8.625x1.147	76995.42	20.668	27.720	0.746	0.00	0.000	27.720	0.000
	41.5625 - 40.375		82049.67	22.025	27.720	0.795	0.00	0.000	27.720	0.000
	40.375 - 39.1875		87134.17	23.389	27.720	0.844	0.00	0.000	27.720	0.000
	39.1875 - 38		92246.67	24.762	27.720	0.893	0.00	0.000	27.720	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	63.5 - 62.5	P8.625x0.322	24.56	0.006	16.800	0.000	0.00	0.000	16.800	0.000
	62.5 - 61.5		49.12	0.012	16.800	0.001	0.00	0.000	16.800	0.000
	61.5 - 60.5		3449.68	0.821	16.800	0.049	77.88	0.028	16.800	0.002
	60.5 - 59.5		3474.02	0.827	16.800	0.049	77.87	0.028	16.800	0.002
	59.5 - 58.5		3497.97	0.833	16.800	0.050	77.65	0.028	16.800	0.002
L2	58.5 - 57.25	P8.625x0.322	3842.54	0.915	16.800	0.054	77.42	0.028	16.800	0.002
	57.25 - 56		3879.70	0.924	16.800	0.055	76.82	0.027	16.800	0.002
L3	56 - 55	P8.625x0.322	3907.82	0.931	16.800	0.055	76.22	0.027	16.800	0.002

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	55 - 54		3935.53	0.937	16.800	0.056	75.74	0.027	16.800	0.002
	54 - 53		3962.53	0.944	16.800	0.056	75.26	0.027	16.800	0.002
	53 - 52		3988.78	0.950	16.800	0.057	74.79	0.027	16.800	0.002
	52 - 51		4014.22	0.956	16.800	0.057	74.31	0.027	16.800	0.002
L4	51 - 50	P8.625x0.322	4038.18	0.962	16.800	0.057	73.83	0.026	16.800	0.002
	50 - 49		4061.25	0.967	16.800	0.058	73.36	0.026	16.800	0.002
	49 - 48		4083.38	0.972	16.800	0.058	72.89	0.026	16.800	0.002
L5	48 - 47.75 (5)	P8.625x1.147	4086.47	0.303	16.800	0.018	72.43	0.010	16.800	0.001
L6	47.75 - 46.75	P8.625x1.147	4114.29	0.305	16.800	0.018	72.31	0.010	16.800	0.001
	46.75 - 45.75		4140.52	0.307	16.800	0.018	71.91	0.010	16.800	0.001
	45.75 - 44.75		4166.25	0.309	16.800	0.018	71.50	0.010	16.800	0.001
	44.75 - 43.75		4191.44	0.311	16.800	0.019	71.10	0.010	16.800	0.001
	43.75 - 42.75		4216.06	0.313	16.800	0.019	70.69	0.009	16.800	0.001
L7	42.75 - 41.5625	P8.625x1.147	4243.47	0.315	16.800	0.019	70.29	0.009	16.800	0.001
	41.5625 - 40.375		4269.54	0.317	16.800	0.019	70.09	0.009	16.800	0.001
	40.375 - 39.1875		4294.70	0.319	16.800	0.019	69.90	0.009	16.800	0.001
	39.1875 - 38		4318.89	0.321	16.800	0.019	69.71	0.009	16.800	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	63.5 - 62.5	0.000	0.000	0.000	0.000	0.000	0.001 ✔	1.333	H1-3+VT ✔
	62.5 - 61.5	0.000	0.001	0.000	0.001	0.000	0.002 ✔	1.333	H1-3+VT ✔
	61.5 - 60.5	0.007	0.052	0.000	0.049	0.002	0.062 ✔	1.333	H1-3+VT ✔
	60.5 - 59.5	0.007	0.141	0.000	0.049	0.002	0.151 ✔	1.333	H1-3+VT ✔
	59.5 - 58.5	0.008	0.231	0.000	0.050	0.002	0.241 ✔	1.333	H1-3+VT ✔
L2	58.5 - 57.25	0.009	0.346	0.000	0.054	0.002	0.359 ✔	1.333	H1-3+VT ✔
	57.25 - 56	0.010	0.471	0.000	0.055	0.002	0.483 ✔	1.333	H1-3+VT ✔
L3	56 - 55	0.010	0.571	0.000	0.055	0.002	0.584 ✔	1.333	H1-3+VT ✔
	55 - 54	0.010	0.672	0.000	0.056	0.002	0.685 ✔	1.333	H1-3+VT ✔
	54 - 53	0.010	0.774	0.000	0.056	0.002	0.787 ✔	1.333	H1-3+VT ✔
	53 - 52	0.010	0.876	0.000	0.057	0.002	0.890 ✔	1.333	H1-3+VT ✔
	52 - 51	0.011	0.979	0.000	0.057	0.002	0.993 ✔	1.333	H1-3+VT ✔
L4	51 - 50	0.011	1.083	0.000	0.057	0.002	1.097 ✔	1.333	H1-3+VT ✔
	50 - 49	0.011	1.187	0.000	0.058	0.002	1.202	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	49 - 48	0.011	1.292	0.000	0.058	0.002	1.307 ✔	1.333	H1-3+VT ✔
L5	48 - 47.75 (5)	0.004	0.496	0.000	0.018	0.001	0.500 ✔	1.333	H1-3+VT ✔
L6	47.75 - 46.75	0.004	0.536	0.000	0.018	0.001	0.540 ✔	1.333	H1-3+VT ✔
	46.75 - 45.75	0.004	0.576	0.000	0.018	0.001	0.580 ✔	1.333	H1-3+VT ✔
	45.75 - 44.75	0.004	0.616	0.000	0.018	0.001	0.620 ✔	1.333	H1-3+VT ✔
	44.75 - 43.75	0.004	0.656	0.000	0.019	0.001	0.661 ✔	1.333	H1-3+VT ✔
	43.75 - 42.75	0.004	0.697	0.000	0.019	0.001	0.702 ✔	1.333	H1-3+VT ✔
L7	42.75 - 41.5625	0.004	0.746	0.000	0.019	0.001	0.750 ✔	1.333	H1-3+VT ✔
	41.5625 - 40.375	0.004	0.795	0.000	0.019	0.001	0.799 ✔	1.333	H1-3+VT ✔
	40.375 - 39.1875	0.005	0.844	0.000	0.019	0.001	0.849 ✔	1.333	H1-3+VT ✔
	39.1875 - 38	0.005	0.893	0.000	0.019	0.001	0.898 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	63.5 - 58.5	Pole	P8.625x0.322	1	-1596.03	282144.10	18.1	Pass
L2	58.5 - 56	Pole	P8.625x0.322	2	-2017.92	282144.10	36.3	Pass
L3	56 - 51	Pole	P8.625x0.322	3	-2255.87	282144.10	74.5	Pass
L4	51 - 48	Pole	P8.625x0.322	4	-2412.99	282144.10	98.1	Pass
L5	48 - 47.75	Pole	P8.625x1.147	5	-2439.24	905168.28	37.5	Pass
L6	47.75 - 42.75	Pole	P8.625x1.147	6	-2844.65	905168.28	52.6	Pass
L7	42.75 - 38	Pole	P8.625x1.147	7	-3230.67	905168.28	67.4	Pass
							Summary	
						Pole (L4)	98.1	Pass
						RATING =	**98.1***	**Pass**

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

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

TIA Rev F

Site Data

BU#:	
Site Name:	*CT2035 Rev. 2*
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	92.2	ft-kips
Axial:	3.2	kips
Shear:	4.3	kips

Anchor Rod Data		
Qty:	8	
Diam:	1	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	113	ksi
Bolt Circle:	12.17	in

Plate Data		
Diam:	16	in
Thick:	1.5	in
Grade:	36	ksi
Single-Rod B-eff:	3.40	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3.5	in
Height:	6	in
Thick:	0.325	in
Notch:	0	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	8.67	in
Thick:	0.322	in
Grade:	50	ksi
# of Sides:	0	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

Maximum Rod Tension:	45.1 Kips	Rigid
Allowable Tension:	51.8 Kips	Service, ASD
Anchor Rod Stress Ratio:	86.9% **Pass**	Fty*ASIF

Base Plate Results

Base Plate Stress:	34.1 ksi	Rigid
Allowable Plate Stress:	36.0 ksi	Service ASD
Base Plate Stress Ratio:	94.7% **Pass**	0.75*Fy*ASIF
	Flexural Check	Y.L. Length: 8.54

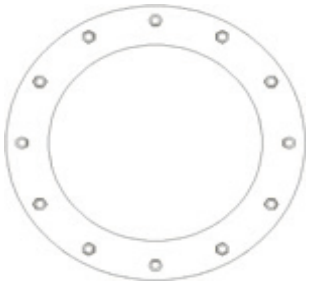
n/a

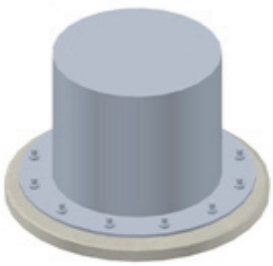
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a





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

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

Additional Calculations

CCIpole

per TIA-222- F

Site BU: CT2035

Work Order:

CROWN CASTLE

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	25.5	7.5		0	8.625	8.625	0.322	n/a	A500-42
2	18	18		0	8.63	8.625	0.322	n/a	A500-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	10	plate	HSS 10" x 0.625"	3	0	120	240															
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.7537	0.581	3.3428997	0.2905	n/a	n/a	12.000	3.343	0.0000	A53-B-42

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	25.5 - 20.5	5		0	8.625	8.625	0.322	A500-42	1.000
2	20.5 - 18	2.5	0	0	8.625	8.625	0.322	A500-42	1.000
3	18 - 13	5		0	8.625	8.625	0.322	A500-42	1.000
4	13 - 10	3		0	8.625	8.625	0.322	A500-42	1.000
5	10 - 9.75	0.25		0	8.625	8.625	1.147	A500-42	0.684
6	9.75 - 4.75	5		0	8.625	8.625	1.147	A500-42	0.684
7	4.75 - 0	4.75		0	8.625	8.625	1.147	A500-42	0.684

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	25.5 - 20.5	1.5961	8.9712	3.498
2	20.5 - 18	2.0179	18.274	3.8797
3	18 - 13	2.2559	38.026	4.0142
4	13 - 10	2.413	50.176	4.0834
5	10 - 9.75	2.4392	51.198	4.0865
6	9.75 - 4.75	2.8447	71.972	4.2161
7	4.75 - 0	3.2307	92.247	4.3189

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
25.5 - 20.5	Pole	TP8.625x8.625x0.322	Pole	17.8%	Pass
20.5 - 18	Pole	TP8.625x8.625x0.322	Pole	35.9%	Pass
18 - 13	Pole	TP8.625x8.625x0.322	Pole	74.2%	Pass
13 - 10	Pole	TP8.625x8.625x0.322	Pole	97.7%	Pass
10 - 9.75	Pole + Reinf.	TP8.625x8.625x1.147	Reinf. 1 Compression	55.1%	Pass
9.75 - 4.75	Pole + Reinf.	TP8.625x8.625x1.147	Reinf. 1 Compression	77.4%	Pass
4.75 - 0	Pole + Reinf.	TP8.625x8.625x1.147	Reinf. 1 Compression	99.1%	Pass
				Summary	
			Pole	97.7%	Pass
			Reinforcement	99.1%	Pass
			Overall	99.1%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
25.5 - 20.5	72	n/a	72	8.40	n/a	8.40	17.8%	
20.5 - 18	72	n/a	72	8.40	n/a	8.40	35.9%	
18 - 13	72	n/a	72	8.40	n/a	8.40	74.2%	
13 - 10	72	n/a	72	8.40	n/a	8.40	97.7%	
10 - 9.75	72	120	193	8.40	10.03	18.43	37.6%	55.1%
9.75 - 4.75	72	120	193	8.40	10.03	18.43	52.8%	77.4%
4.75 - 0	72	120	193	8.40	10.03	18.43	67.6%	99.1%

Note: Section capacity checked in 5 degree increments.

CALCULATION SHEET

PURPOSE

The purpose of this analysis is to evaluate the structural capacity of the existing installation located in the roof of the building at 975 Mix Avenue, Hamden, CT 06514, to support the existing monopole with the proposed additions and alterations proposed by AT&T Mobility.

All calculations in accordance with 2005 Connecticut Building Code with all adopted addendums and supplements.

Wind Load

ASCE 7 Reference

Input:

Location: Hamden, CT - New Haven County

Classification: II — Table 1-1 pg 4

Platform Height (AGL): $z := 38$ ft

Exposure category: $Exp := "C"$ — Section 6.5.6.2 pg 28

$$z_g := \begin{cases} 1200 & \text{if } Exp = "B" \\ 900 & \text{if } Exp = "C" \\ 700 & \text{if } Exp = "D" \end{cases} = 900 \qquad \alpha := \begin{cases} 7.0 & \text{if } Exp = "B" \\ 9.5 & \text{if } Exp = "C" \\ 11.5 & \text{if } Exp = "D" \end{cases} = 9.5$$

Velocity pressure exposure coefficient: $K_z := 2.01 \cdot \left(\frac{z}{z_g}\right)^{\frac{2}{\alpha}} = 1.032$ — Table 6-3 pg 75

Topographic factor: $K_{zt} := 1.0$ — Section 6.5.7.2 pg 30

Wind directional factor: $K_d := 0.85$ — Table 6-4 pg 76

Basic wind speed: $V := 110$ mph — Appendix K of 2009 Amendment

Importance factor: $I := 1.00$ — Table 6-1 pg 73

Gust response factor: $G := 0.85$ — Section 6.5.8 pg 30

Velocity Pressure: $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot psf$ — Equation (6-15) pg 31

$$q_z = 27.18 \cdot psf$$

Force Coefficients: — Figure (6-21), pg 69

$$C_{F\_flat} := \begin{pmatrix} 1 & 1.3 \\ 7 & 1.4 \\ 25 & 2 \end{pmatrix} \qquad C_{F\_round} := \begin{pmatrix} 1 & 0.7 \\ 7 & 0.8 \\ 25 & 1.2 \end{pmatrix}$$

Loads on Existing RRUS-11

Dimensions : $H := 19.69in$ $W := 16.97in$ $D := 7.17in$ $W_{rru3} := 50.7lbf$

Front: $Area := H \cdot W = 2.32\,ft^2$

$C_f := linterp\left(C_{F\_flat}^{\langle 0 \rangle}, C_{F\_flat}^{\langle 1 \rangle}, \frac{H}{W}\right) = 1.303$ Figure (6-19), Pg 69

$F_{rru3\_front} := q_z \cdot G \cdot C_f \cdot Area = 69.839\,lbf$ Equation (6-15) Pg 31

Side: $Area := H \cdot D = 0.98\,ft^2$

$C_f := linterp\left(C_{F\_flat}^{\langle 0 \rangle}, C_{F\_flat}^{\langle 1 \rangle}, \frac{H}{D}\right) = 1.329$ Figure (6-19), Pg 69

$F_{rru3\_side} := q_z \cdot G \cdot C_f \cdot Area = 30.107\,lbf$ Equation (6-15) Pg 31

Loads on Existing & Proposed DC/Fiber Squid - DC6-48-60-18-8F

Dimensions : $H := 24in$ $W := 11in$ $D := 11in$ $W_{dc6} := 18.9lbf$

Front: $Area := H \cdot W = 1.833\,ft^2$

$C_f := linterp\left(C_{F\_flat}^{\langle 0 \rangle}, C_{F\_flat}^{\langle 1 \rangle}, \frac{H}{W}\right) = 1.32$ Figure (6-19), Pg 69

$F_{dc6\_front} := q_z \cdot G \cdot C_f \cdot Area = 55.9\,lbf$ Equation (6-15) Pg 31

Side: $Area := H \cdot D = 1.833\,ft^2$

$C_f := linterp\left(C_{F\_flat}^{\langle 0 \rangle}, C_{F\_flat}^{\langle 1 \rangle}, \frac{H}{D}\right) = 1.32$ Figure (6-19), Pg 69

$F_{dc6\_side} := q_z \cdot G \cdot C_f \cdot Area = 55.9\,lbf$ Equation (6-15) Pg 31

Loads on W10x100:

$H := 11.125in$ $Length := 16ft$

$C_f := \min\left[\left(\text{linterp}\left(C_{F\_flat}^{\langle 0\rangle}, C_{F\_flat}^{\langle 1\rangle}, \frac{Length}{H}\right)\right), 2.0\right] = 1.742$ Figure (6-19), Pg 69

$F_{W10} := q_z \cdot G \cdot C_f \cdot H = 37.312 \cdot plf$ Equation (6-15)

Loads on HSS4x4x1/4:

$H := 4in$ $Length := 14in$

$C_f := \min\left[\left(\text{linterp}\left(C_{F\_flat}^{\langle 0\rangle}, C_{F\_flat}^{\langle 1\rangle}, \frac{Length}{H}\right)\right), 2.0\right] = 1.342$ Figure (6-19), Pg 69

$F_{HSS4} := q_z \cdot G \cdot C_f \cdot H = 10.333 \cdot plf$ Equation (6-15)

Loads on L3x3x1/4:

$H := 3in$ $Length := 27in$

$C_f := \min\left[\left(\text{linterp}\left(C_{F\_flat}^{\langle 0\rangle}, C_{F\_flat}^{\langle 1\rangle}, \frac{Length}{H}\right)\right), 2.0\right] = 1.467$ Figure (6-19), Pg 69

$F_{L3} := q_z \cdot G \cdot C_f \cdot H = 8.472 \cdot plf$ Equation (6-15)

Loads on P1000 Unistrut:

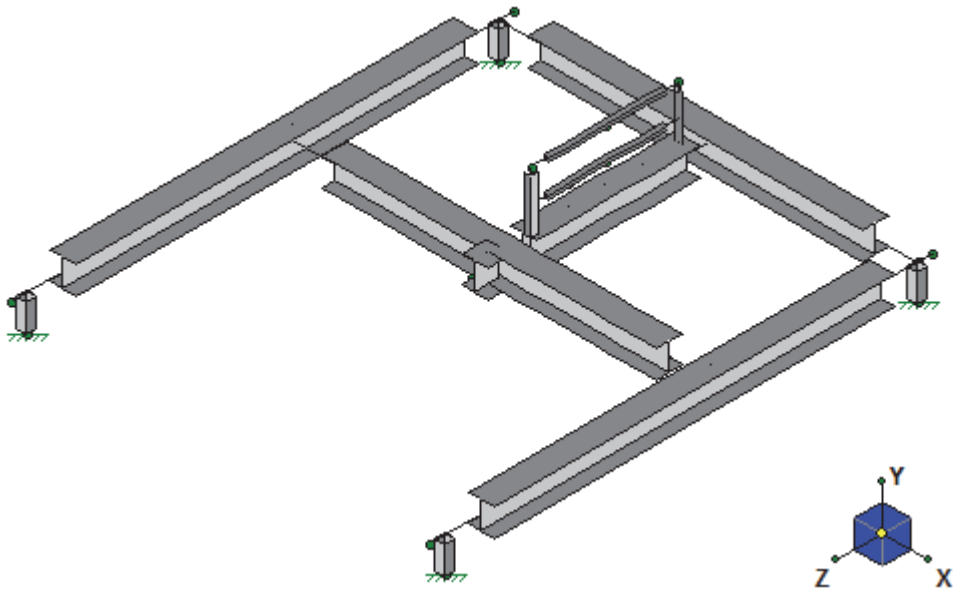
$H := 1.625in$ $Length := 72in$

$C_f := \min\left[\left(\text{linterp}\left(C_{F\_flat}^{\langle 0\rangle}, C_{F\_flat}^{\langle 1\rangle}, \frac{Length}{H}\right)\right), 2.0\right] = 2$ Figure (6-19), Pg 69

$F_{P1000} := q_z \cdot G \cdot C_f \cdot H = 6.258 \cdot plf$ Equation (6-15)

Monopole Support Platform:

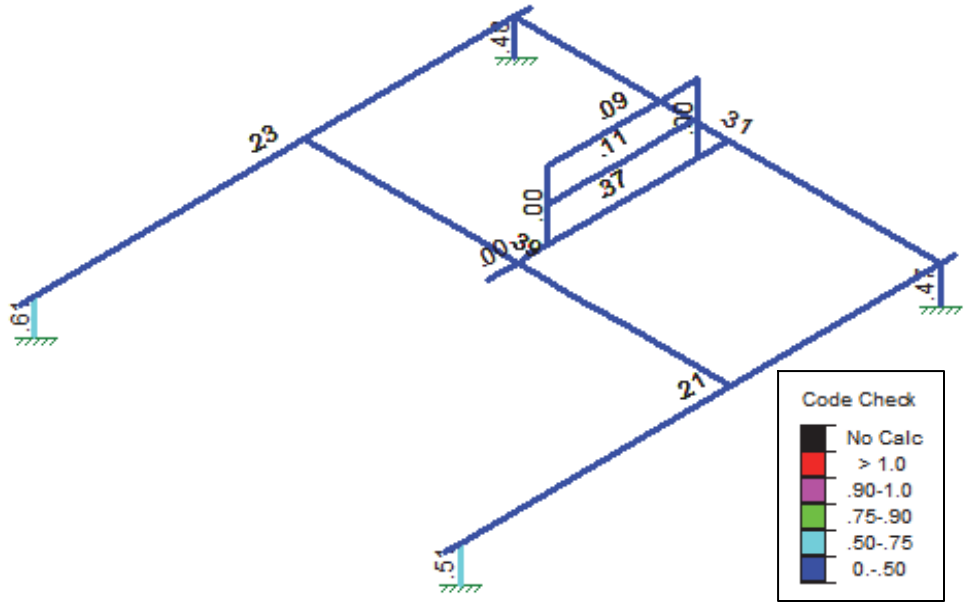
CALCULATION SHEET



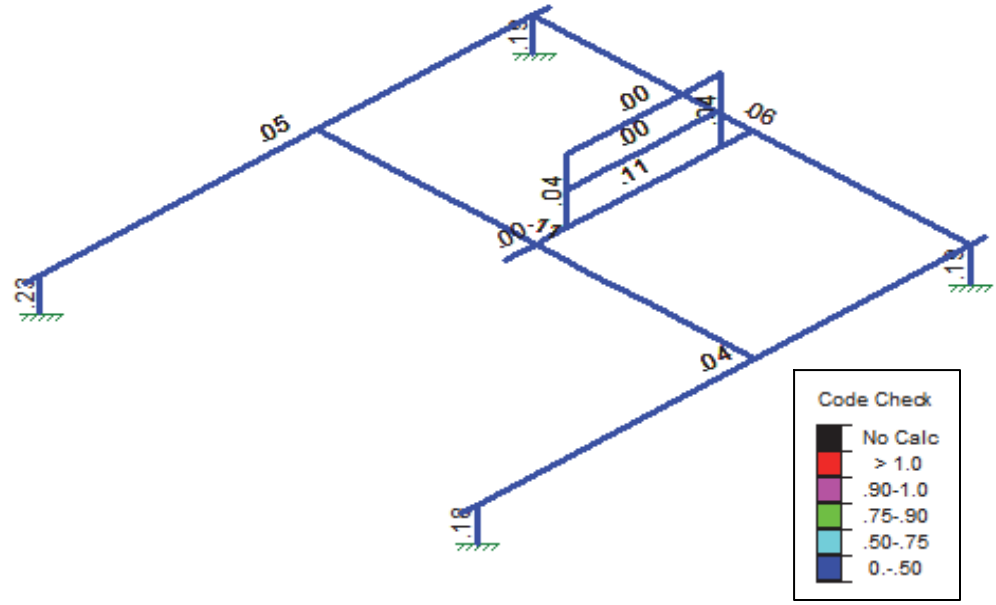
CALCULATION SHEET

Capacity Checks:

Axial & Bending:

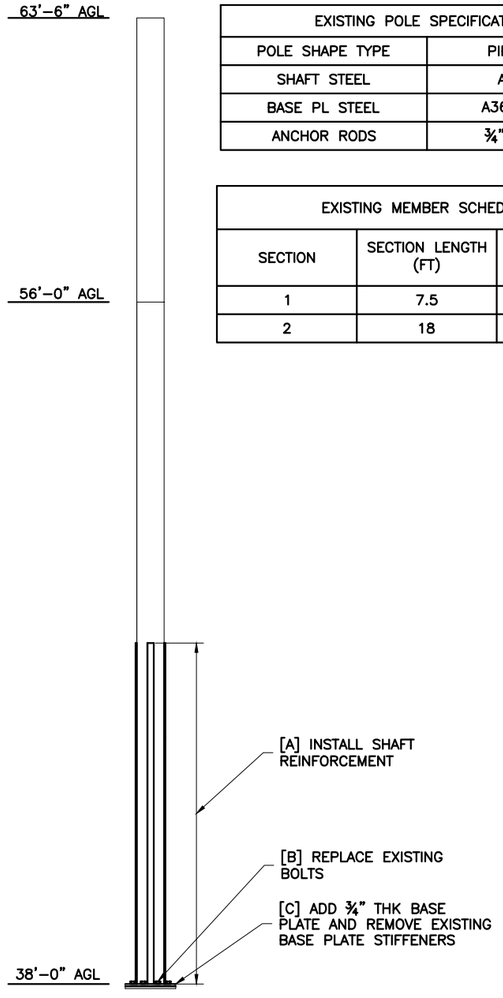


Shear:



As a maximum, the structural members are stressed to 61% of their capacity

APPENDIX C
TOWER UPGRADE DRAWINGS



EXISTING POLE SPECIFICATIONS	
POLE SHAPE TYPE	PIPE 8 STD
SHAFT STEEL	A500-42
BASE PL STEEL	A36 (36 KSI)
ANCHOR RODS	¾" ø A325

EXISTING MEMBER SCHEDULE		
SECTION	SECTION LENGTH (FT)	MEMBER
1	7.5	8 STD
2	18	8 STD

NOTES:

1. UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN DESTEK ANALYSIS REPORT DATED 08/12/2016. CONTRACTOR TO REVIEW AND SHOULD ADHERE TO THE REPORT.

2. CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AS NEEDED.

3. ALL DIMENSIONS ARE BASED ON A PREVIOUS STRUCTURAL REPORT PREPARED BY HUDSON DESIGN GROUP, LLC, DATED 03/07/2012.

4. CONTRACTOR TO FIELD VERIFY EXISTING TOWER MEMBER SIZES AND TOWER DIMENSIONS IN THE VICINITY OF THE UPGRADE, BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO DESTEK IMMEDIATELY FOR FURTHER EVALUATION.

5. DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 20 MPH AT THE GROUND LEVEL.

6. NEW TOWER REACTIONS:
   SHAFT MOMENT: 92.2 KIPS-FT
   SHAFT SHEAR: 4.3 KIPS
   SHAFT COMPRESSION: 3.2 KIPS

7. CONTRACTOR TO HAVE THE SAFETY CLIMB INTACT AND FUNCTIONAL AFTER WORK IS COMPLETE.

8. TOWER WILL BECOME UNSTABLE WHEN MEMBERS ARE DISCONNECTED OR BEING REPLACED. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER DURING WORK AND SHOULD CONSULT WITH AN ENGINEER.

9. DESTEK DISCLAIMS ANY LIABILITY ARISING FROM THE ORIGINAL MATERIAL, FABRICATION OR ERECTION OF THE TOWER.

10. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

POLE MODIFICATION SCHEDULE			
	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	38'-0" TO 48'-0"	INSTALL SHAFT REINFORCEMENT	S-2 & S-3
B	38'-0"	REPLACE EXISTING ANCHOR BOLTS WITH 1"ø A490 (ENLARGE EXISTING BOLT HOLES AS NECESSARY)	S-2
C	38'-0"	ADD ¾" THK A36 BASE PLATE AND REMOVE EXISTING BASE PLATE STIFFENERS	S-3
D	-	PROPOSED COAX LAYOUT	S-3

HSS (42 KSI) REINFORCING		
ELEVATION (FT)	FLAT / DEGREES	HSS SIZE
38'-0" TO 48'-0"	0°,120°,240°	SEE S-3

1. DESIGN INFORMATION AND GENERAL REQUIREMENTS

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

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

2. STRUCTURAL STEEL

2.1 MATERIALS
a. STRUCTURAL STEEL . . . . . ASTM A992
ANGLE & PLATE . . . . . ASTM A36 U.N.O.
PIPE . . . . . ASTM A53 GRADE B (OR Fy>35KSI) U.N.O.
HSS ROUND . . . . . ASTM A500 GRADE B (Fy>42KSI) U.N.O.
BARS (SOLID RODS) . . . . . ASTM A36 U.N.O
b. BOLTS . . . . . ASTM A325X U.N.O.
c. WELDING ELECTRODES . . . . . AWS A5.1 (E70XX)
d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 335-89s1"
e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR RE-DRILLING WILL NOT BE PERMITTED.

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

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

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

AHMET COLAKOGLU, PE
CT License No: 27057

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

PREPARED FOR:
COMMEX Consultants

NUM	DATE	DESCRIPTION:
A	08/11/2016	ISSUED FOR CONSTRUCTION
B	08/12/2016	REVISION 1

SITE ADDRESS: 975 MIX AVENUE HAMDEN, CT 06514

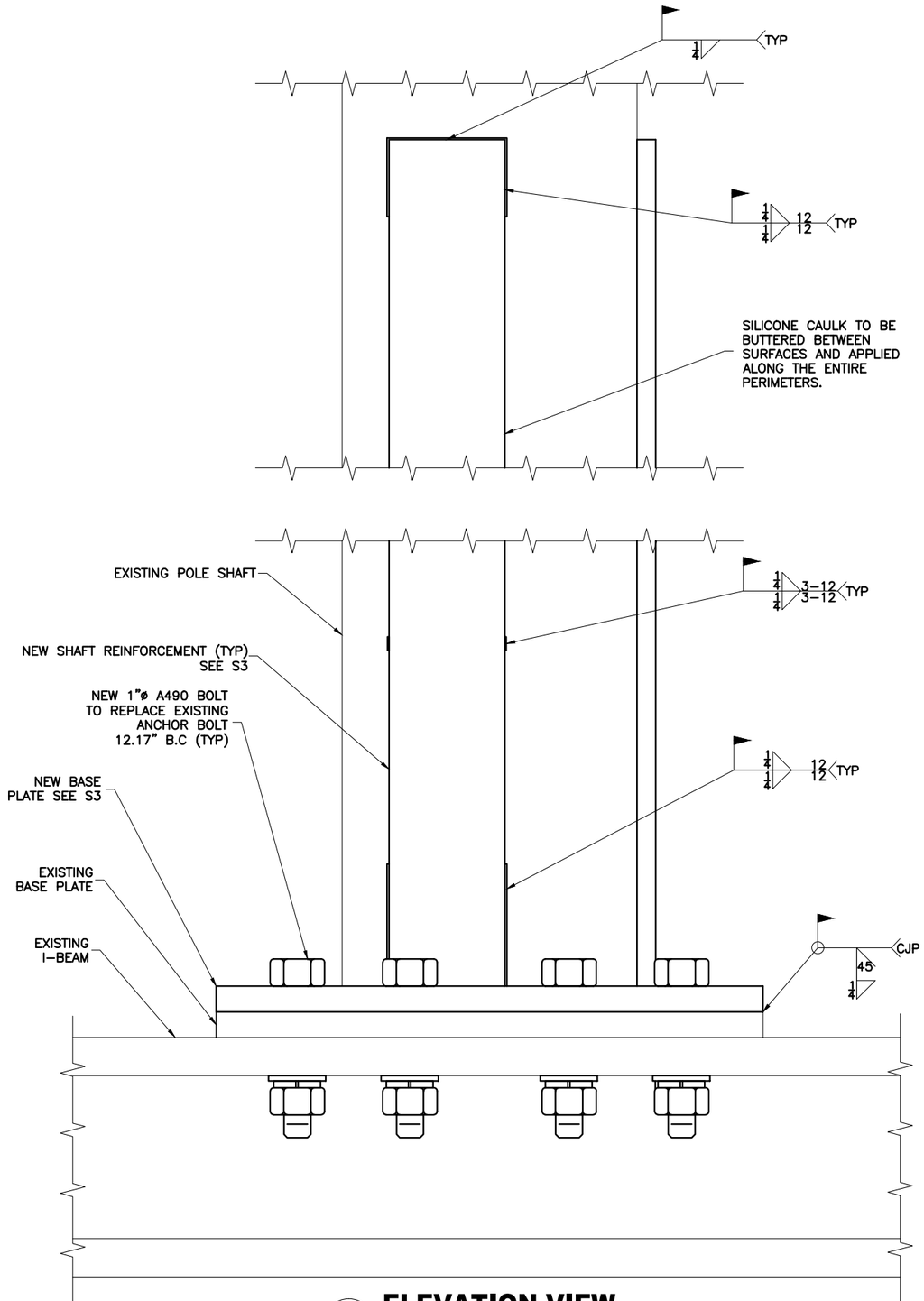
CARRIER DESIGNATION:
CARRIER: AT&T
SITE ID: CT2035
SITE NAME: HAMDEN

TOWER INFORMATION:
FA NUMBER: 10035036

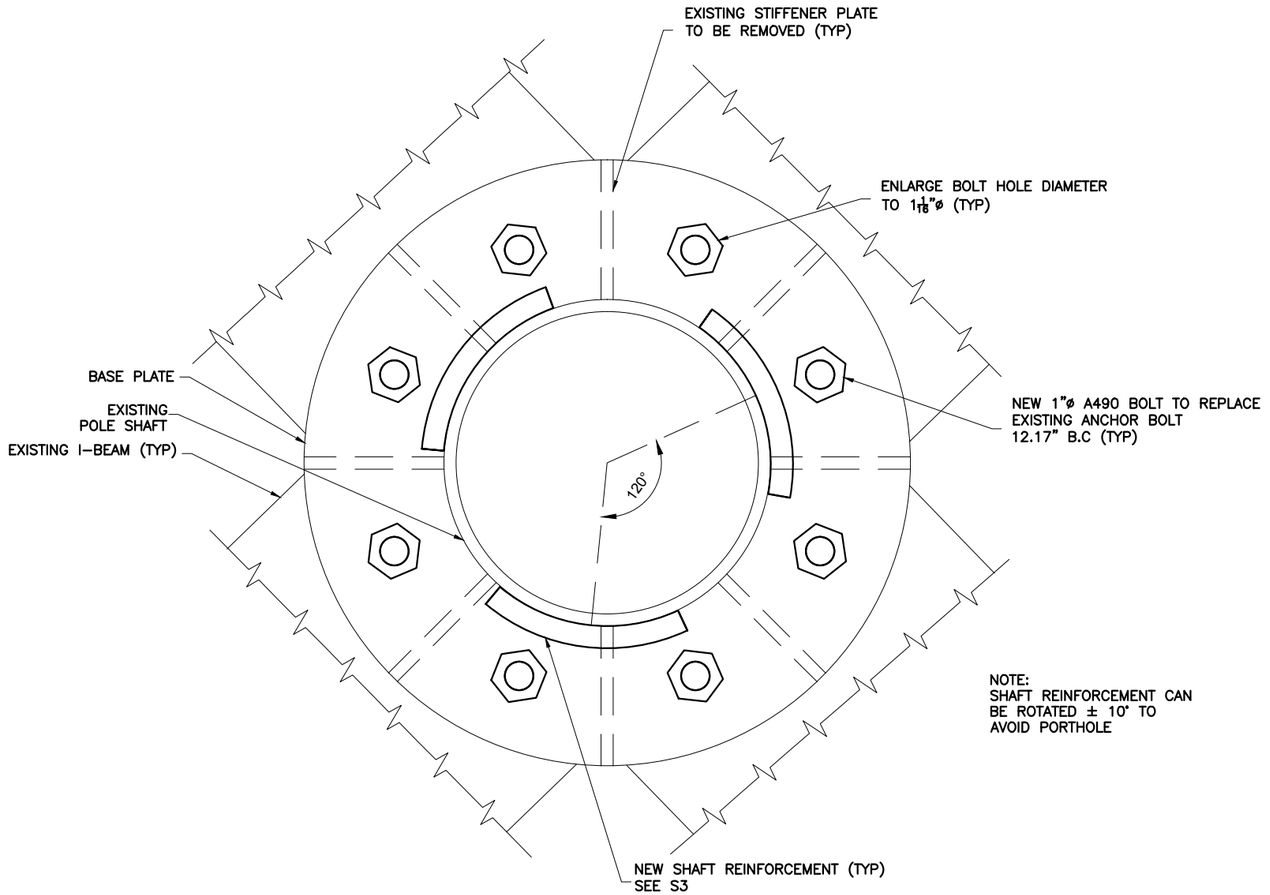
DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1529181

S1
SCOPE OF MODIFICATION



1/S2 **ELEVATION VIEW**
N.T.S.



NOTE:
SHAFT REINFORCEMENT CAN BE ROTATED ± 10° TO AVOID PORTHOLE

2/S2 **TOWER SECTION**
N.T.S.

AHMET COLAKOGLU, PE
CT License No: 27057

PREPARED BY:

DESTEK ENGINEERING

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

PREPARED FOR:

COMEX Consultants

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HAMDEN, CT 06514

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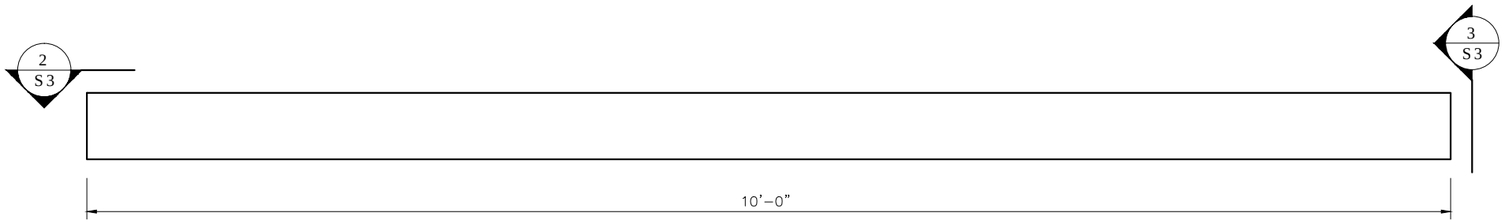
CHECKED: RP

JOB #: 1529181

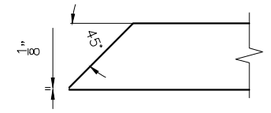
S2
STRUCTURAL DETAILS



1 S3 HSS REINFORCEMENT

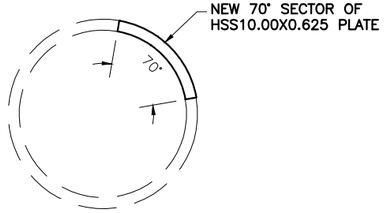
N.T.S.

NOTE: TYPICAL OF 3



2 S3 HSS END DETAIL

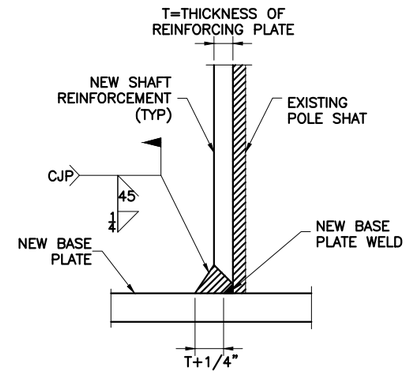
N.T.S.



3 S3 HSS PLATE SECTION

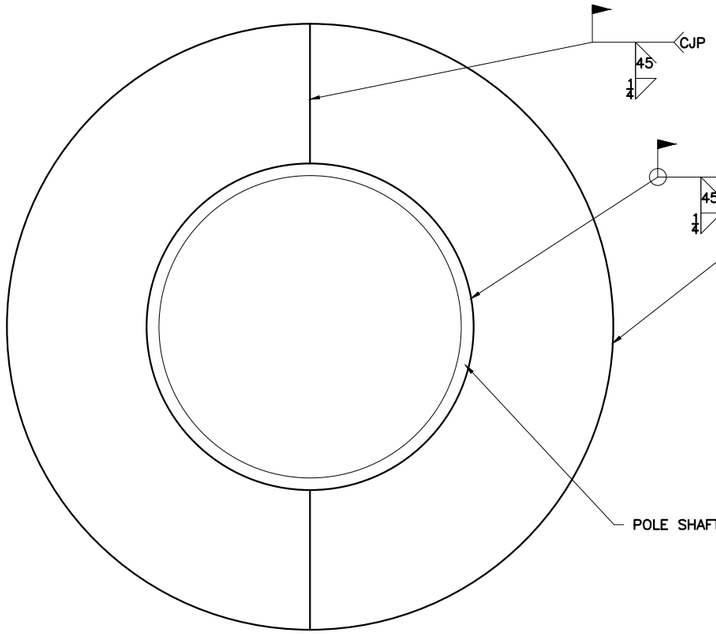
N.T.S.

NOTE: TYPICAL OF 3



4 S3 PLATE BOTTOM CONNECTION WELD DETAIL

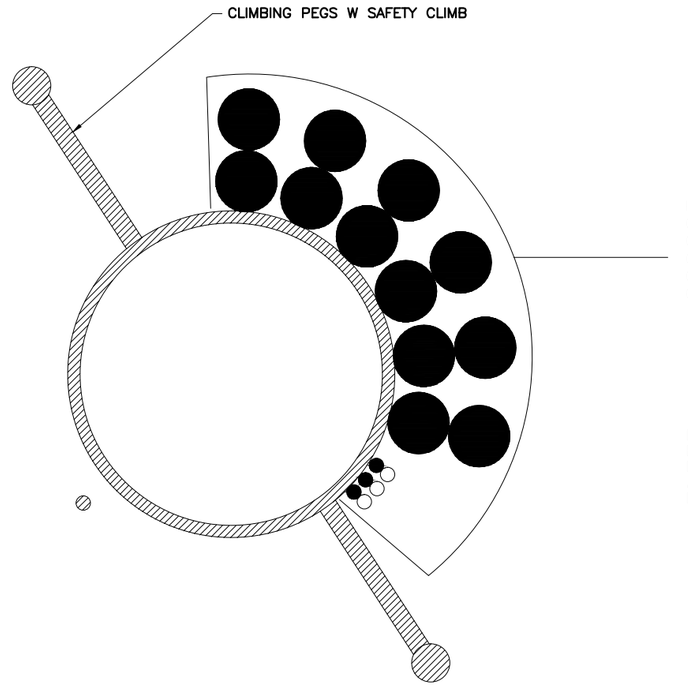
N.T.S.



NOTES:
1. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER WHEN INSTALLING THE NEW BASE PLATE.
2. ANCHOR BOLTS AND REINFORCEMENT NOT SHOWN FOR CLARITY.

5 S3 BASE PLATE SECTION

N.T.S.



PROPOSED
(2) DC CABLES
(1) FIBER CABLE
(INSTALLED)
(3) 3/8" TO 61 FT LEVEL
(12) 1-5/8" TO 61 FT LEVEL

NOTE:
PLEASE NOTIFY DESTEK IMMEDIATELY IF COAX SIZES AND NUMBER DOES NOT MATCH FIELD CONDITON.

6 S3 PROPOSED COAX LAYOUT

N.T.S.

STATE OF CONNECTICUT
AHMET COLAKOGLU
8-12-16
PEN. 27057
LICENSED PROFESSIONAL ENGINEER

AHMET COLAKOGLU, PE
CT License No: 27057

PREPARED BY:
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PREPARED FOR:
COMEX Consultants

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DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1529181

S3
STRUCTURAL
DETAILS

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

AT&T Existing Facility

Site ID: CT2035

Hamden
975 Mix Avenue
Hamden, CT 06514

November 11, 2015

EBI Project Number: 6215005552

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	26.16 %

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November 11, 2015

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

Emissions Analysis for Site: **CT2035 – Hamden**

EBI Consulting was directed to analyze the proposed AT&T facility located at **975 Mix Avenue, Hamden, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **975 Mix Avenue, Hamden, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 4 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 4 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 60 Watts

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **Kathrein 800-10121** for 1900 MHz (PCS) and 850 MHz channels, the **CCI OPA-65R-LCUU-H6** for and 850 MHz and 2300 MHz (WCS) and the **KMW AM-X-CD-16-65-00T-RET** for 1900 MHz (PCS) and 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The maximum gain values for these antennas are listed in the following Site Inventory and Power Data table. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **61 feet** above ground level (AGL).

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves. Per the CSC database there are no additional carriers at this location.

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

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AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.5 / 14.4 dBd	Gain:	11.5 / 14.4 dBd	Gain:	11.5 / 14.4 dBd
Height (AGL):	61 feet	Height (AGL):	61 feet	Height (AGL):	61 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	8	Channel Count	8	# PCS Channels:	8
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	5,000.12	ERP (W):	5,000.12	ERP (W):	5,000.12
Antenna A1 MPE%	**7.48**	Antenna B1 MPE%	**7.48**	Antenna C1 MPE%	**7.48**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H8
Gain:	12.5 dBd / 15.5 dBd	Gain:	12.5 dBd / 15.5 dBd	Gain:	12.5 dBd / 15.5 dBd
Height (AGL):	61 feet	Height (AGL):	61 feet	Height (AGL):	61 feet
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	180	Total TX Power:	180	Total TX Power:	180
ERP (W):	5,324.73	ERP (W):	5,324.73	ERP (W):	5,324.73
Antenna A2 MPE%	**7.30**	Antenna B2 MPE%	**7.30**	Antenna C2 MPE%	**7.30**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	Powerwave P65-17-XLH-RR
Gain:	13.35 / 15.25 dBd	Gain:	13.35 / 15.25 dBd	Gain:	14.3 / 15.1 dBd
Height (AGL):	61 feet	Height (AGL):	61 feet	Height (AGL):	61 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	240	Total TX Power:	240	Total TX Power:	240
ERP (W):	6,614.85	ERP (W):	6,614.85	ERP (W):	6,614.85
Antenna A3 MPE%	**11.38**	Antenna B3 MPE%	**11.38**	Antenna C3 MPE%	**11.38**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**26.16**
No Additional Carriers On Site Per CSC Database	NA
Site Total MPE %:	**26.16 %**

AT&T Sector 1 Total:	26.16 %
AT&T Sector 2 Total:	26.16 %
AT&T Sector 3 Total:	26.16 %
Site Total:	26.16 %

AT&T _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	**4**	**423.76**	**61**	**20.14**	**850**	**567**	**3.55 %**
AT&T 1900 MHz (PCS) UMTS	**4**	**826.27**	**61**	**39.28**	**1900**	**1000**	**3.93 %**
AT&T 850 MHz GSM	**2**	**533.48**	**61**	**12.68**	**1900**	**567**	**2.24 %**
AT&T 2300 MHz (WCS) LTE	**2**	**2128.88**	**61**	**50.60**	**2300**	**1000**	**5.06 %**
AT&T 700 MHz LTE	**2**	**1297.63**	**61**	**30.84**	**700**	**467**	**6.60 %**
AT&T 1900 MHz (PCS) LTE	**2**	**2009.79**	**61**	**47.77**	**1900**	**1000**	**4.78 %**
						Total:	**26.16 %**

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Summary

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

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

AT&T Sector	Power Density Value (%)
Sector 1:	26.16 %
Sector 2:	26.16 %
Sector 3 :	26.16 %
AT&T Maximum Total (per sector):	26.16 %
Site Total:	26.16 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **26.16%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

PROJECT INFORMATION

SCOPE OF WORK:

- REMOVE (1) EXISTING GSM ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- NEW AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW ANTENNAS; (6) EXISTING UMTS/LTE ANTENNAS TO REMAIN (2 PER SECTOR)
- REMOVE (1) TMA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) EXISTING TMAs TO BE REMOVED. (1) EXISTING TMA PER SECTOR TO REMIAN FOR A TOTAL OF (3) EXISTING TMAs
- AT&T RRUs: (2) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) NEW RRUs; (2) EXISTING RRU PER SECTOR TO REMAIN, FOR A TOTAL OF (6) EXISTING RRUs.

SITE ADDRESS:	975 MIX AVENUE HAMDEN, CT 06514
LATITUDE:	41.3785200 41°-22'-42.672"W
LONGITUDE:	-72.9179161 72°-55'-04.497"W
USID:	61166
TOWER OWNER:	975 MIX AVENUE HAMDEN, CT 06514
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT
MONOPOLE HEIGHT:	65'-0"±
RAD CENTER:	61'-0"±
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

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APPROVALS

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

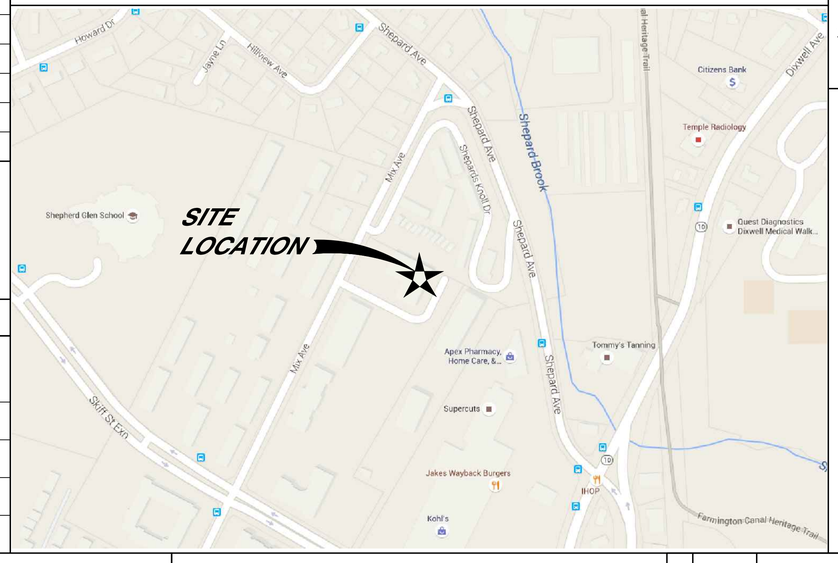
DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035036
SITE NUMBER: CT2035
SITE NAME: HAMDEN

VICINITY MAP

1. TAKE RAMP LEFT FOR I-91 SOUTH, 9.7MI. 2. AT EXIT 17, TAKE RAMP RIGHT FOR CT-15 SOUTH TOWARD W. CROSS PKWY / E. MAIN ST., 14.6MI. 3. AT EXIT 60, TAKE RAMP RIGHT FOR CT-10 TOWARD NEW HAVEN / HAMDEN, 0.2MI. 4. TURN LEFT ONTO CT-10 / DIXWELL AVE., 0.7MI. 5. TURN LEFT ONTO SKIFF ST., 0.3MI. 6. TURN RIGHT ONTO MIX AVE., 0.2MI. ARRIVE AT 975 MIX AVE, HAMDEN, CT 06514.



PROJECT TEAM

CLIENT REPRESENTATIVE
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CONSTRUCTION MANAGEMENT:
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GENERAL NOTES

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

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP! CALL BEFORE YOU DIG!

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

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FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2035
SITE NAME: HAMDEN
975 MIX AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/12/16	REVISED PER SCOPE CHANGE	KCD	NDB	NDB
0	08/03/16	ISSUED AS FINAL	KCD	NDB	NDB

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

SEAL: STATE OF CONNECTICUT, NICHOLAS D. BARILE, No. 28643, REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	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. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR – EMPIRE TELECOM
   - SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   - OWNER – AT&T MOBILITY
   - OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.
22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2035
SITE NAME: HAMDEN
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HAMDEN, CT 06514
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/12/16	REVISED PER SCOPE CHANGE	KCD	NDB	NDB
0	08/03/16	ISSUED AS FINAL	KCD	NDB	NDB

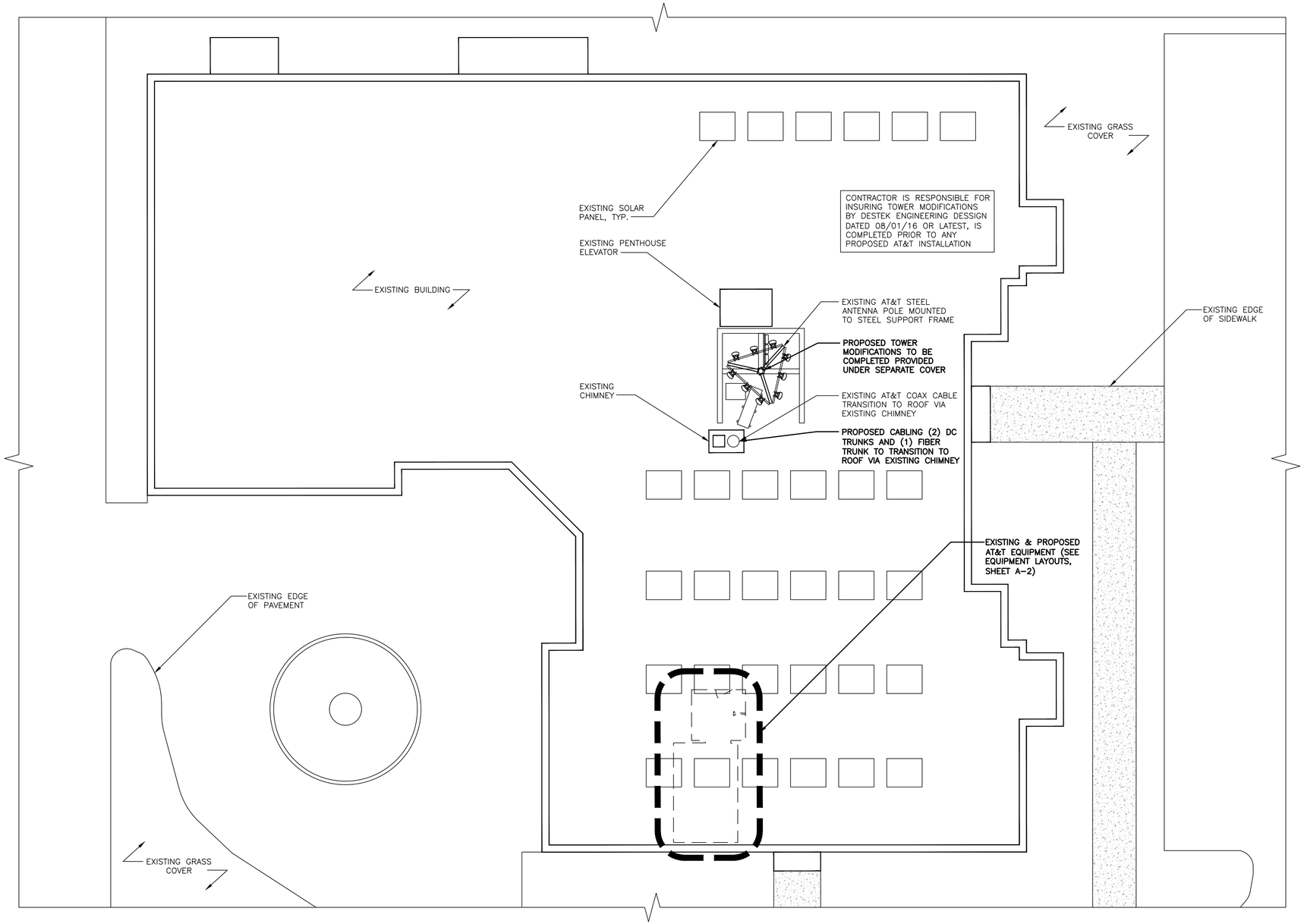
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL: STATE OF CONNECTICUT, NICHOLAS D. BARILE, No. 28643, LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LIC. No. 28643

AT&T

DRAWING TITLE: GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	GN-1	1



NORTH

COMPOUND LAYOUT

SCALE: 1" = 8'-0"

8 0 4 8 16 32

(IN FEET)

1/8 Inch = 1 Foot

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

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

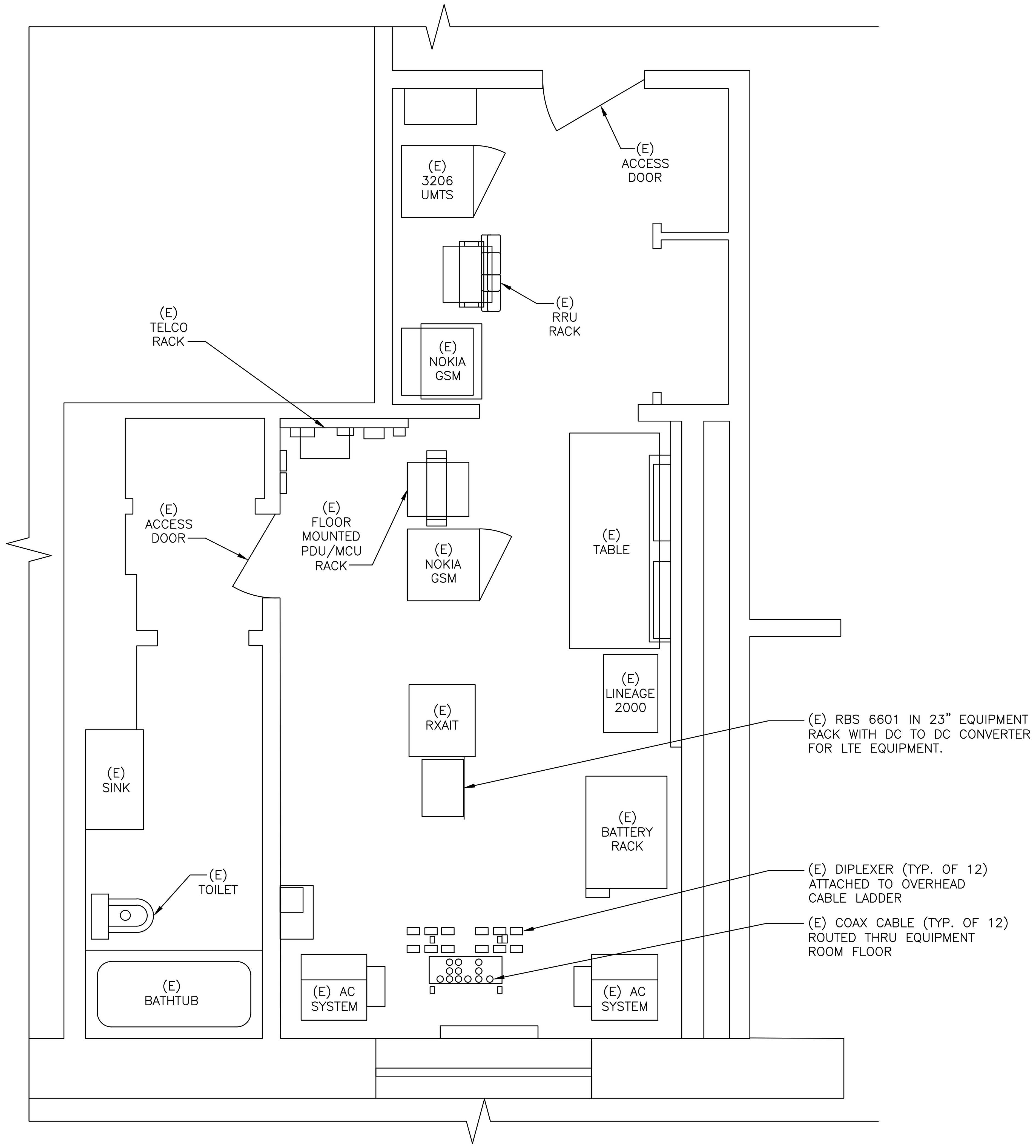
SEAL: STATE OF CONNECTICUT — DOUGLAS B. BAILEY — No. 28643 — REGISTERED PROFESSIONAL ENGINEER

PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	A-1	1

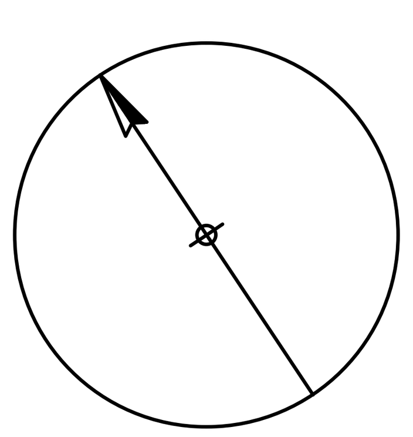


EXISTING EQUIPMENT LAYOUT

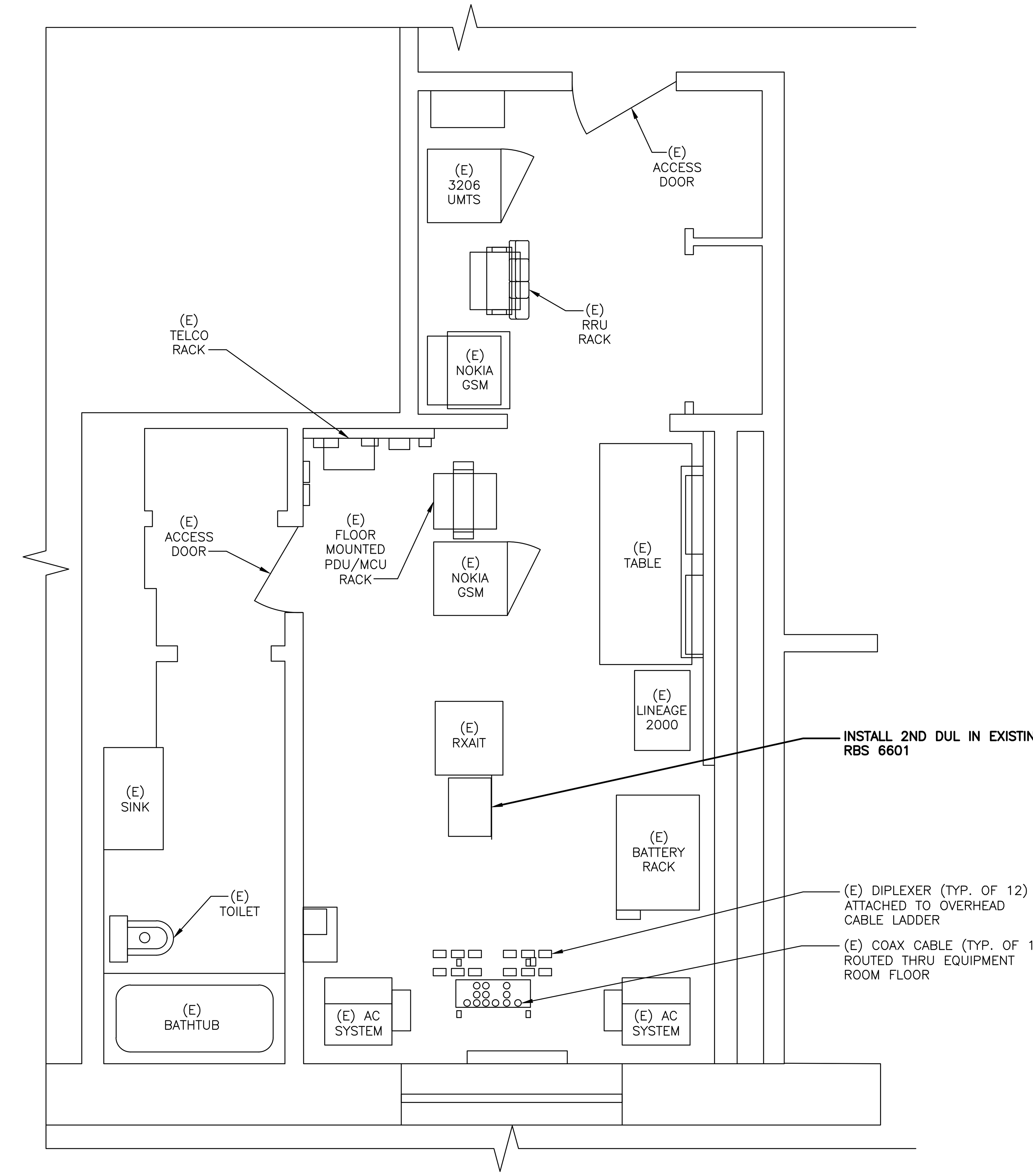
SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



NORTH

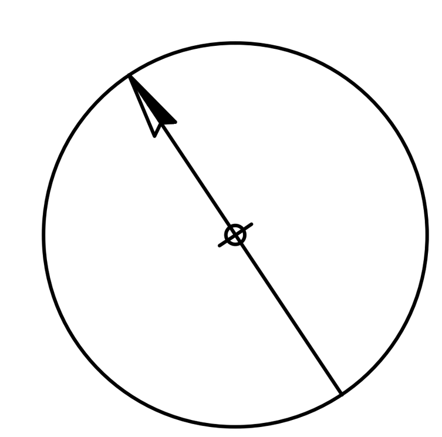


PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



NORTH

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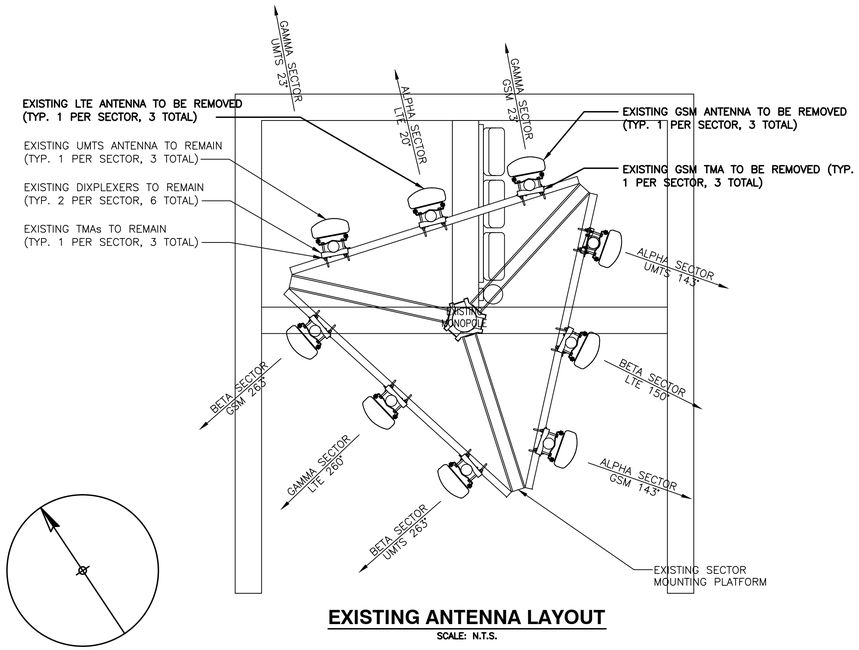
SEAL: STATE OF CONNECTICUT NICHOLAS D. BARILE No. 28643 LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE No. 28643

AT&T

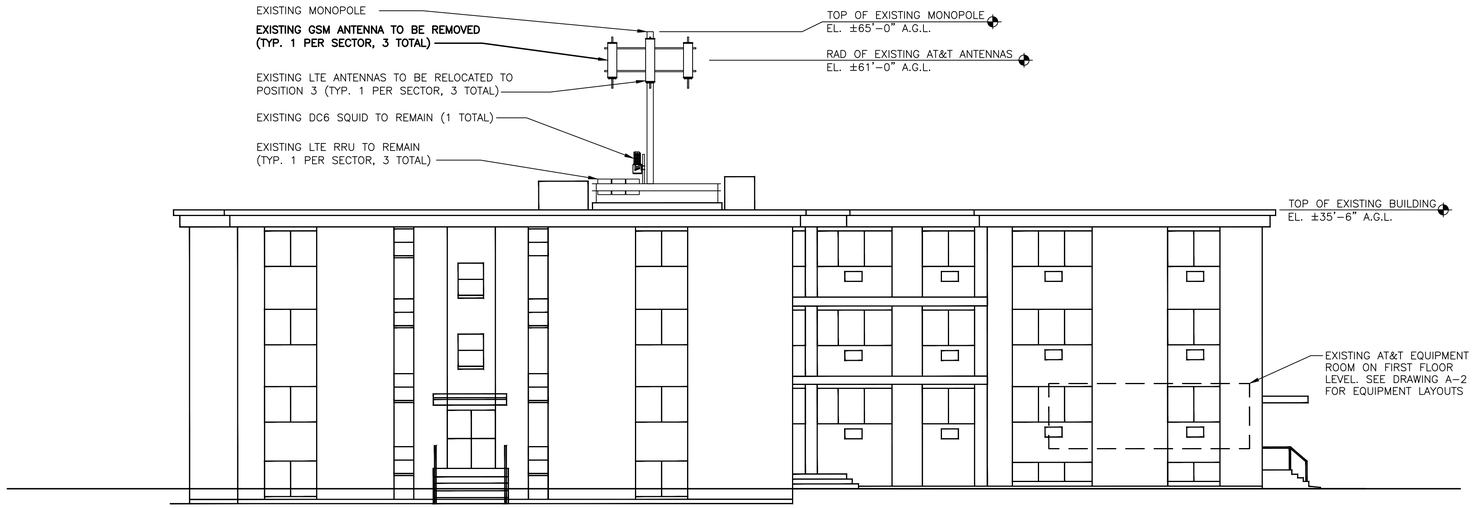
DRAWING TITLE:
EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	A-2	1



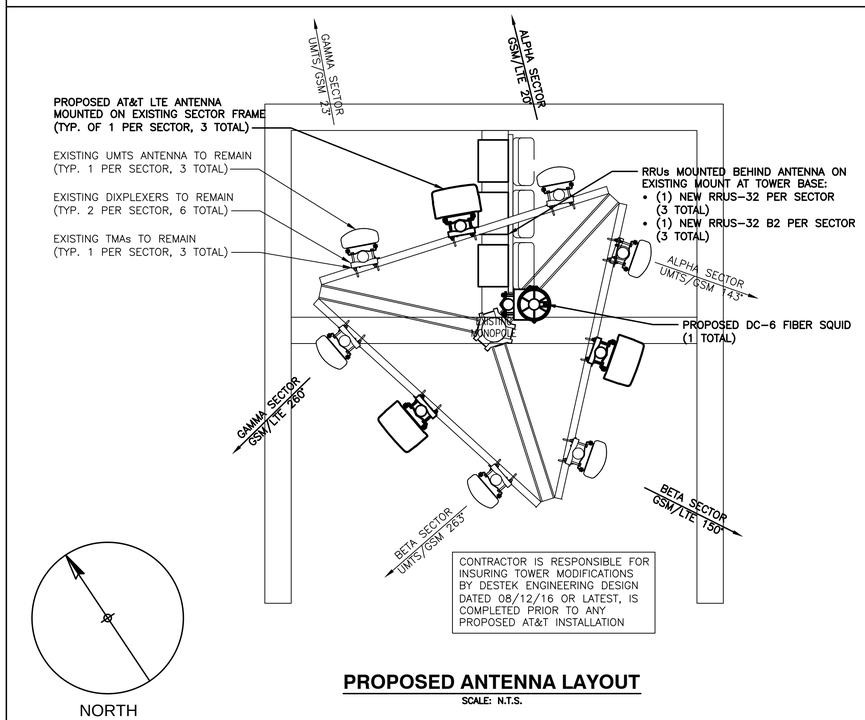
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



EXISTING TOWER ELEVATION

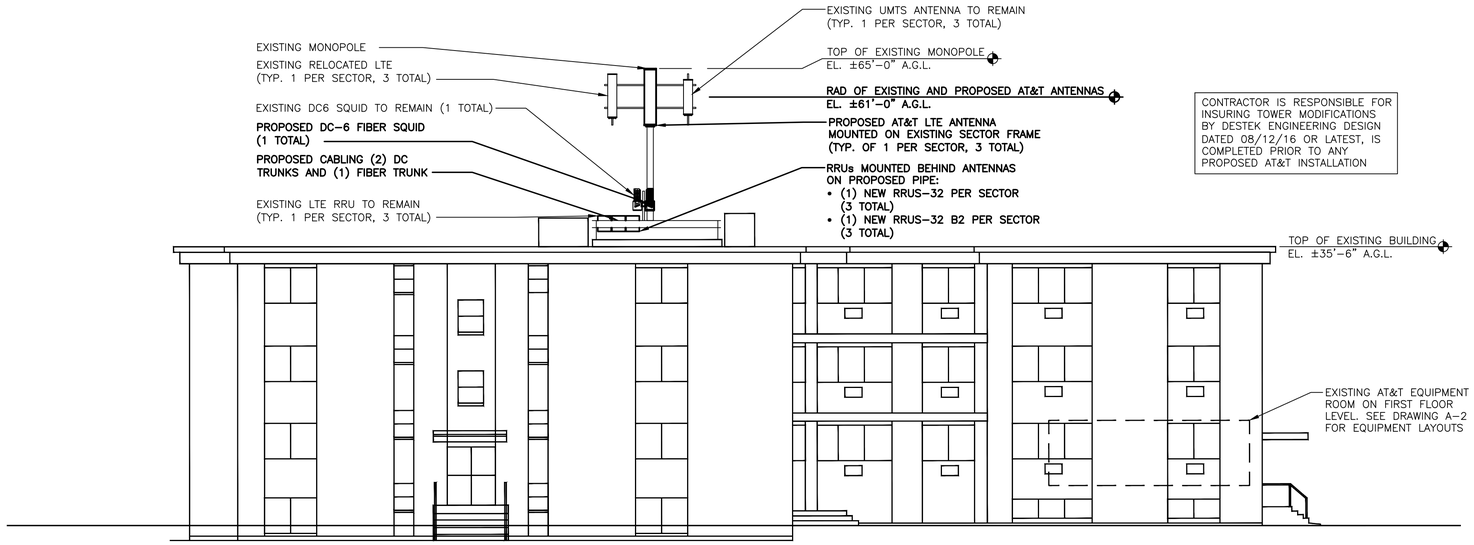
SCALE: NTS



CONTRACTOR IS RESPONSIBLE FOR INSURING TOWER MODIFICATIONS BY DESTEK ENGINEERING DESIGN DATED 08/12/16 OR LATEST, IS COMPLETED PRIOR TO ANY PROPOSED AT&T INSTALLATION

PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



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PROPOSED TOWER ELEVATION

SCALE: NTS

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

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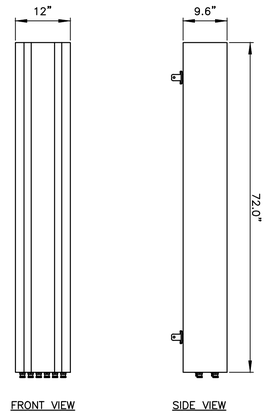
SEAL: STATE OF CONNECTICUT — NICHOLAS G. BARILE — No. 28643 — REGISTERED PROFESSIONAL ENGINEER

NICHOLAS G. BARILE
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	A-3	1



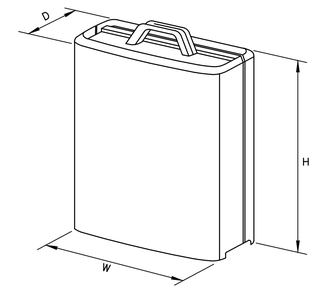
FRONT VIEW SIDE VIEW

BOTTOM VIEW

MANUFACTURER	QUINTEL
MODEL	QS66512-3
WEIGHT	105 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-32 B2	27.2" x 12.1" x 7"	60 LBS

*DENOTES EXISTING

RRUS DETAIL

SCALE: N.T.S.

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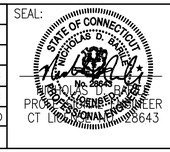
SEAL:

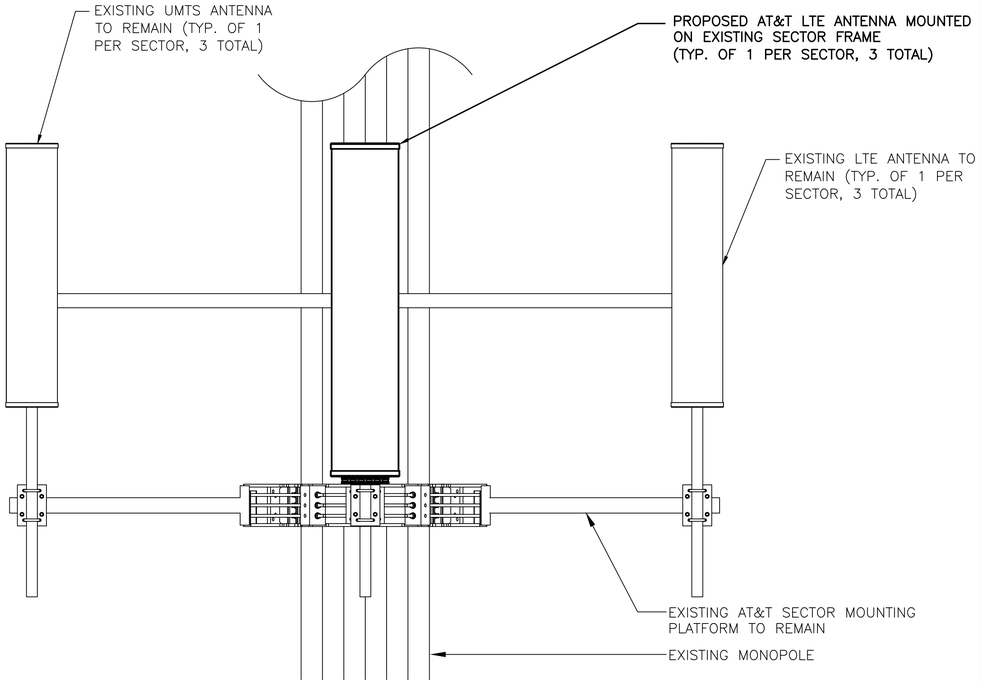


PROFESSIONAL ENGINEER
CT LIC. NO. 28643

AT&T

DRAWING TITLE:
DETAILS

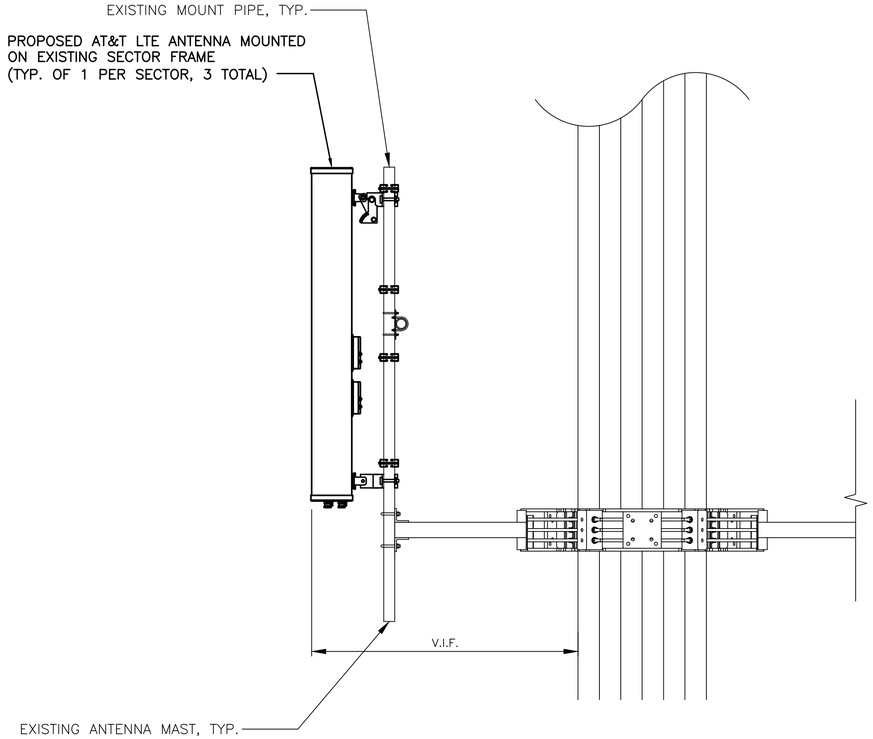
JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	A-4	1



PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)

SCALE: N.T.S.

CONTRACTOR IS RESPONSIBLE FOR INSURING TOWER MODIFICATIONS BY DESTEK ENGINEERING DESIGN DATED 08/12/16 OR LATEST, IS COMPLETED PRIOR TO ANY PROPOSED AT&T INSTALLATION



PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)

SCALE: N.T.S.

CONTRACTOR IS RESPONSIBLE FOR INSURING TOWER MODIFICATIONS BY DESTEK ENGINEERING DESIGN DATED 08/12/16 OR LATEST, IS COMPLETED PRIOR TO ANY PROPOSED AT&T INSTALLATION

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	KATHREIN	800-10121	54.5"x10.3"x5.9"
BETA	B1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	KATHREIN	800-10121	54.5"x10.3"x5.9"
GAMMA	G1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	G2	–	–	–
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	KATHREIN	800-10121	54.5"x10.3"x5.9"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	A2	**QUINTEL**	**QS66512-3**	**72"X12"X9.6"**
	A3	KMW	AM-X-CD-16-65-00T-RET	72"X11.8"X5.9"
	A4		–	–
BETA	B1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	B2	**QUINTEL**	**QS66512-3**	**72"X12"X9.6"**–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"X11.8"X5.9"
	B4	–	–	–
GAMMA	G1	KATHREIN	800-10121	54.5"x10.3"x5.9"
	G2	**QUINTEL**	**QS66512-3**	**72"X12"X9.6"**
	G3	KMW	AM-X-CD-16-65-00T-RET	72"X11.8"X5.9"
	G4	–	–	–

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
	ERICSSON	**RRUS-32 B2**	**27.2"x12.1"x7"**		
BETA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
	ERICSSON	**RRUS-32 B2**	**27.2"X12.1"X7"**		
GAMMA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
	ERICSSON	**RRUS-32 B2**	**27.2"X12.1"X7"**		

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

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0	08/03/16	ISSUED AS FINAL	KCD	NDB	NDB

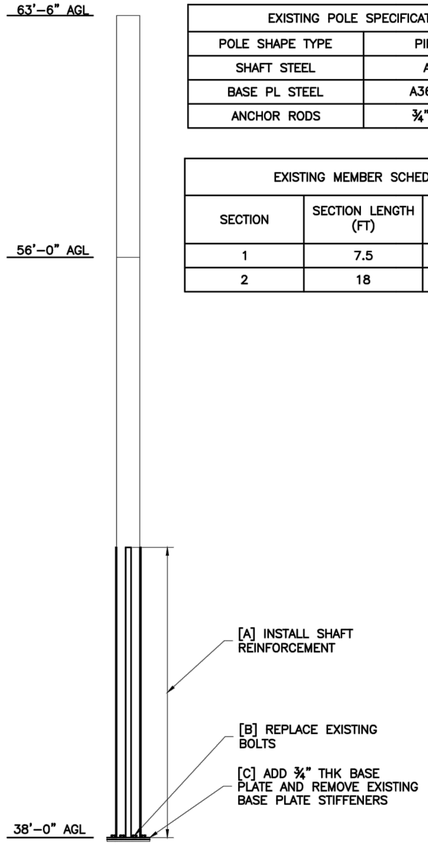
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BARILE
No. 28643
REGISTERED
PROFESSIONAL ENGINEER
CT LIC. No. 28643

AT&T

DRAWING TITLE:
ANTENNA MOUNTING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	A-5	1



EXISTING POLE SPECIFICATIONS	
POLE SHAPE TYPE	PIPE 8 STD
SHAFT STEEL	A500-42
BASE PL STEEL	A36 (36 KSI)
ANCHOR RODS	¾" ø A325

EXISTING MEMBER SCHEDULE		
SECTION	SECTION LENGTH (FT)	MEMBER
1	7.5	8 STD
2	18	8 STD

NOTES:

1. UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN DESTEK ANALYSIS REPORT DATED 08/12/2016. CONTRACTOR TO REVIEW AND SHOULD ADHERE TO THE REPORT.

2. CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AS NEEDED.

3. ALL DIMENSIONS ARE BASED ON A PREVIOUS STRUCTURAL REPORT PREPARED BY HUDSON DESIGN GROUP, LLC, DATED 03/07/2012.

4. CONTRACTOR TO FIELD VERIFY EXISTING TOWER MEMBER SIZES AND TOWER DIMENSIONS IN THE VICINITY OF THE UPGRADE, BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO DESTEK IMMEDIATELY FOR FURTHER EVALUATION.

5. DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 20 MPH AT THE GROUND LEVEL.

6. NEW TOWER REACTIONS:
   SHAFT MOMENT: 92.2 KIPS-FT
   SHAFT SHEAR: 4.3 KIPS
   SHAFT COMPRESSION: 3.2 KIPS

7. CONTRACTOR TO HAVE THE SAFETY CLIMB INTACT AND FUNCTIONAL AFTER WORK IS COMPLETE.

8. TOWER WILL BECOME UNSTABLE WHEN MEMBERS ARE DISCONNECTED OR BEING REPLACED. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER DURING WORK AND SHOULD CONSULT WITH AN ENGINEER.

9. DESTEK DISCLAIMS ANY LIABILITY ARISING FROM THE ORIGINAL MATERIAL, FABRICATION OR ERECTION OF THE TOWER.

10. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

POLE MODIFICATION SCHEDULE			
	ELEVATION (FT)	MODIFICATION	REFERENCE SHEET
A	38'-0" TO 48'-0"	INSTALL SHAFT REINFORCEMENT	S-2 & S-3
B	38'-0"	REPLACE EXISTING ANCHOR BOLTS WITH 1"ø A490 (ENLARGE EXISTING BOLT HOLES AS NECESSARY)	S-2
C	38'-0"	ADD ¾" THK A36 BASE PLATE AND REMOVE EXISTING BASE PLATE STIFFENERS	S-3
D	-	PROPOSED COAX LAYOUT	S-3

HSS (42 KSI) REINFORCING		
ELEVATION (FT)	FLAT / DEGREES	HSS SIZE
38'-0" TO 48'-0"	0°,120°,240°	SEE S-3

1. DESIGN INFORMATION AND GENERAL REQUIREMENTS

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

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

2. STRUCTURAL STEEL

2.1 MATERIALS
a. STRUCTURAL STEEL . . . . . ASTM A992
ANGLE & PLATE . . . . . ASTM A36 U.N.O.
PIPE . . . . . ASTM A53 GRADE B (OR Fy>35KSI) U.N.O.
HSS ROUND . . . . . ASTM A500 GRADE B (Fy>42KSI) U.N.O.
BARS (SOLID RODS) . . . . . ASTM A36 U.N.O
b. BOLTS . . . . . ASTM A325X U.N.O.
c. WELDING ELECTRODES . . . . . AWS A5.1 (E70XX)
d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 335-89s1"
e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR RE-DRILLING WILL NOT BE PERMITTED.

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

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

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

AHMET COLAKOGLU, PE
CT License No: 27057

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

PREPARED FOR:
COM-EX Consultants

NUM	DATE	DESCRIPTION:
A	08/11/2016	ISSUED FOR CONSTRUCTION
B	08/12/2016	REVISION 1

SITE ADDRESS: 975 MIX AVENUE HAMDEN, CT 06514

CARRIER DESIGNATION:
CARRIER: AT&T
SITE ID: CT2035
SITE NAME: HAMDEN

TOWER INFORMATION:
FA NUMBER: 10035036

DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1529181

S1
SCOPE OF MODIFICATION

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

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

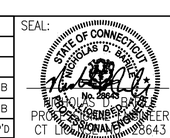
SITE NUMBER: CT2035
SITE NAME: HAMDEN

975 MIX AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/12/16	REVISED PER SCOPE CHANGE	KCD	NDB	NDB
0	08/03/16	ISSUED AS FINAL	KCD	NDB	NDB

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

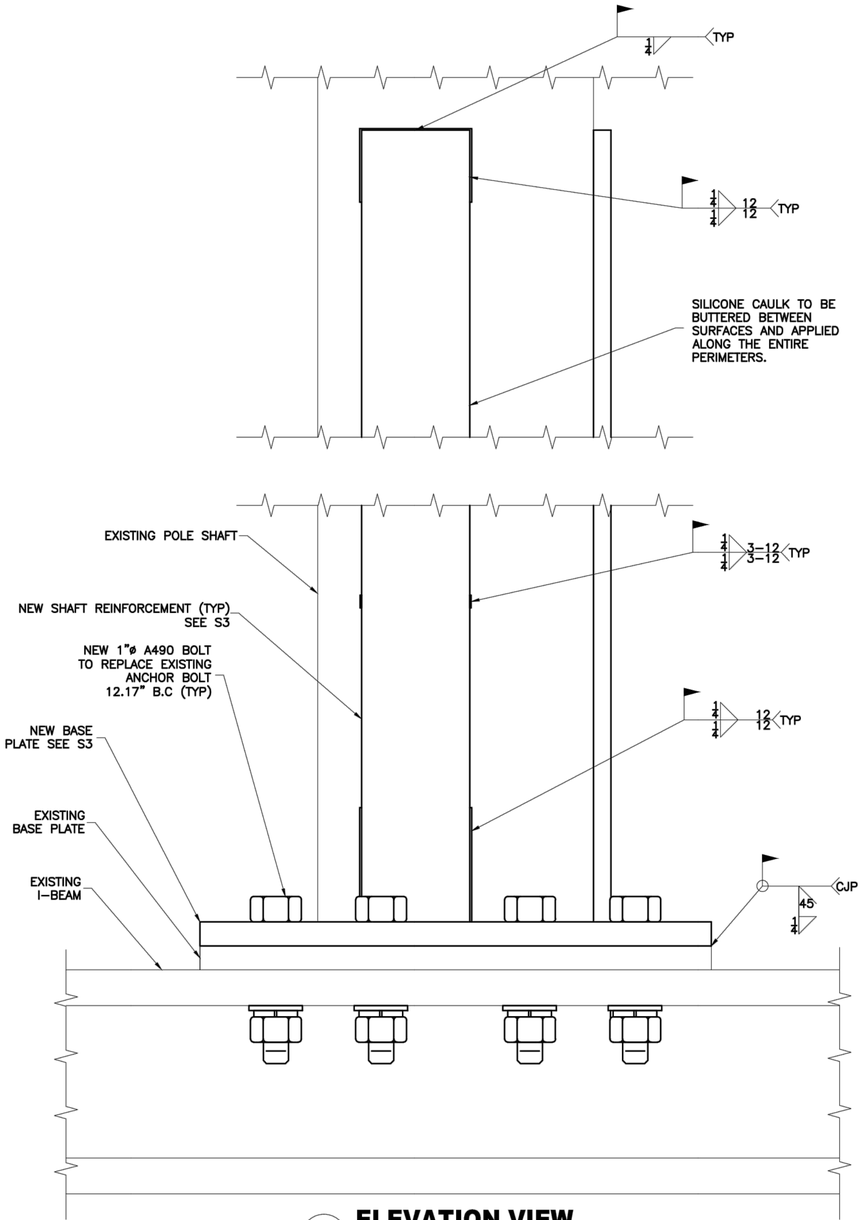
SEAL:


NICHOLAS D. BARLOW
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

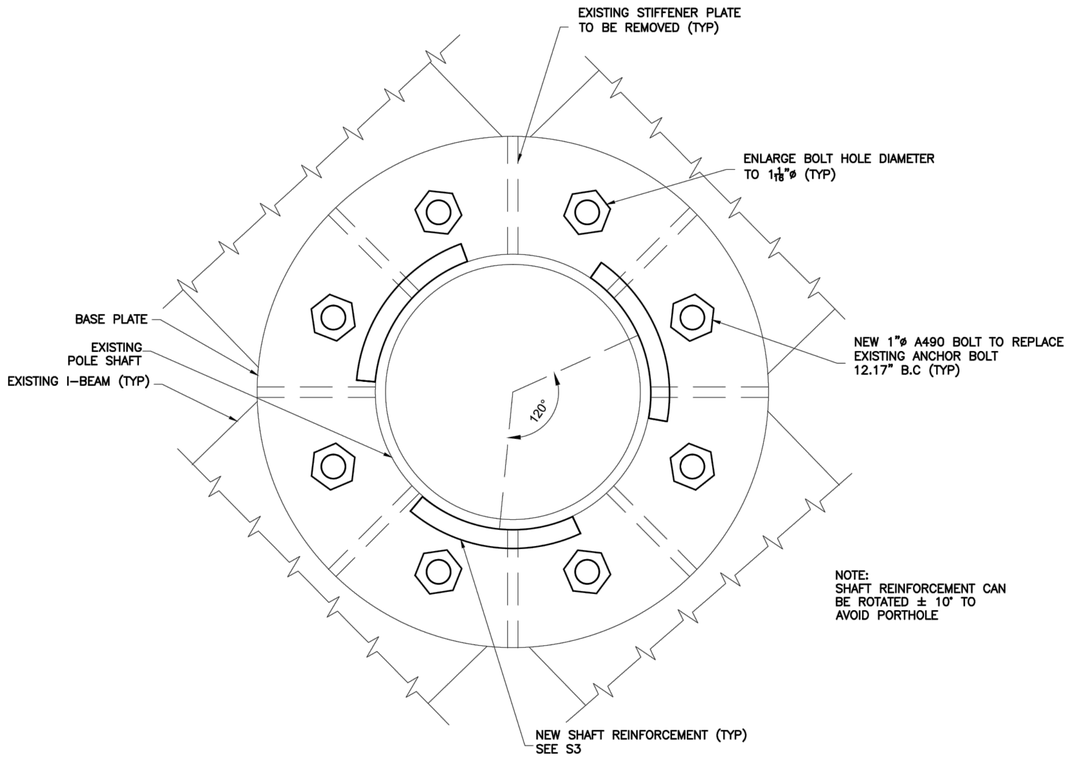
AT&T

DRAWING TITLE:
GROUNDING, ONE-LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV.
15043-EMP	G-1	1



1 S2 ELEVATION VIEW
N.T.S.



NOTE:
SHAFT REINFORCEMENT CAN BE ROTATED ± 10° TO AVOID PORTHOLE

2 S2 TOWER SECTION
N.T.S.

PREPARED BY:

DESTEK ENGINEERING

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

PREPARED FOR:

COM-EX Consultants

NUM	DATE	DESCRIPTION:
A	08/11/2016	ISSUED FOR CONSTRUCTION
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975 MIX AVENUE
HAMDEN, CT 06514

CARRIER DESIGNATION:
CARRIER: AT&T
SITE ID: CT2035
SITE NAME: HAMDEN

TOWER INFORMATION:
FA NUMBER: 10035036

DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1529181

S2 STRUCTURAL DETAILS

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED PROFESSIONAL ENGINEER
8-12-16

AHMET COLAKOGLU, PE
CT License No: 27057

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

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2035
SITE NAME: HAMDEN

975 MIX AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
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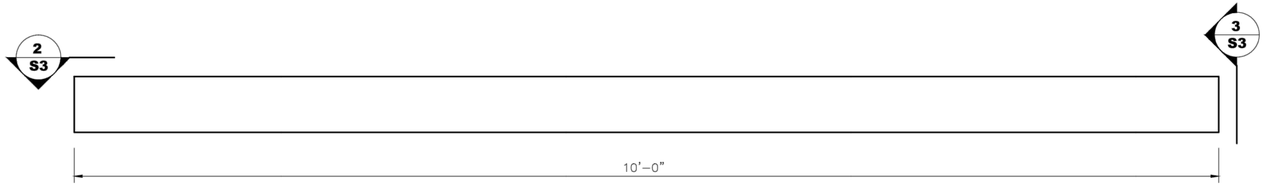
SCALE: AS SHOWN | DESIGNED BY: AM | DRAWN BY: AM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BAILEY
No. 28643
REGISTERED PROFESSIONAL ENGINEER
PROJECT ENGINEER
CT LIC. NO. 28643

AT&T

DRAWING TITLE:
GROUNDING, ONE-LINE DIAGRAM & DETAILS

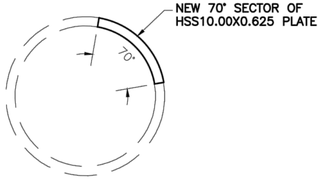
JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	G-1	1



1/S3 HSS REINFORCEMENT

N.T.S.

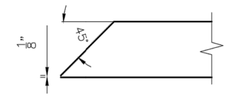
NOTE: TYPICAL OF 3



3/S3 HSS PLATE SECTION

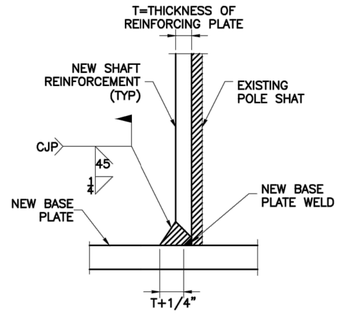
N.T.S.

NOTE: TYPICAL OF 3



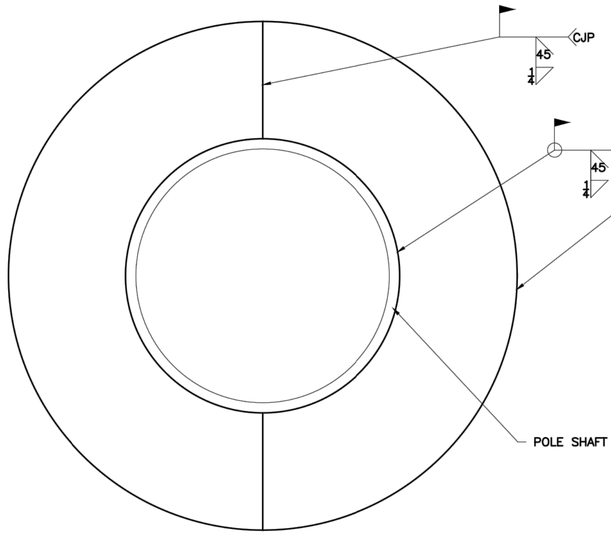
2/S3 HSS END DETAIL

N.T.S.



4/S3 PLATE BOTTOM CONNECTION WELD DETAIL

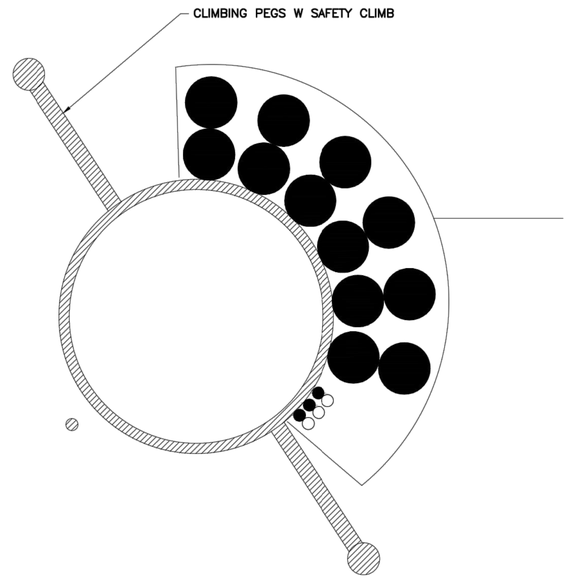
N.T.S.



NOTES:
1. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER WHEN INSTALLING THE NEW BASE PLATE.
2. ANCHOR BOLTS AND REINFORCEMENT NOT SHOWN FOR CLARITY.

5/S3 BASE PLATE SECTION

N.T.S.



6/S3 PROPOSED COAX LAYOUT

N.T.S.

NOTE:
PLEASE NOTIFY DESTEK IMMEDIATELY IF COAX SIZES AND NUMBER DOES NOT MATCH FIELD CONDITON.

AHMET COLAKOGLU, PE
CT License No: 27057

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PREPARED FOR:
COM-EX Consultants

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HAMDEN, CT 06514

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SITE ID: CT2035
SITE NAME: HAMDEN

TOWER INFORMATION:
FA NUMBER: 10035036

DESIGNED: DC
DRAWN: DC
CHECKED: RP

JOB #: 1529181

S3 STRUCTURAL DETAILS

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

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2035
SITE NAME: HAMDEN

975 MIX AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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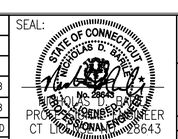

PROFESSIONAL ENGINEER
CT LICENSE NO: 28643

AT&T

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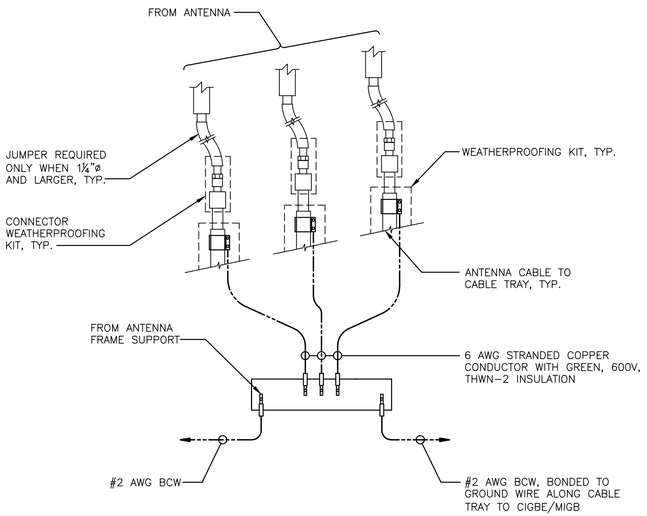
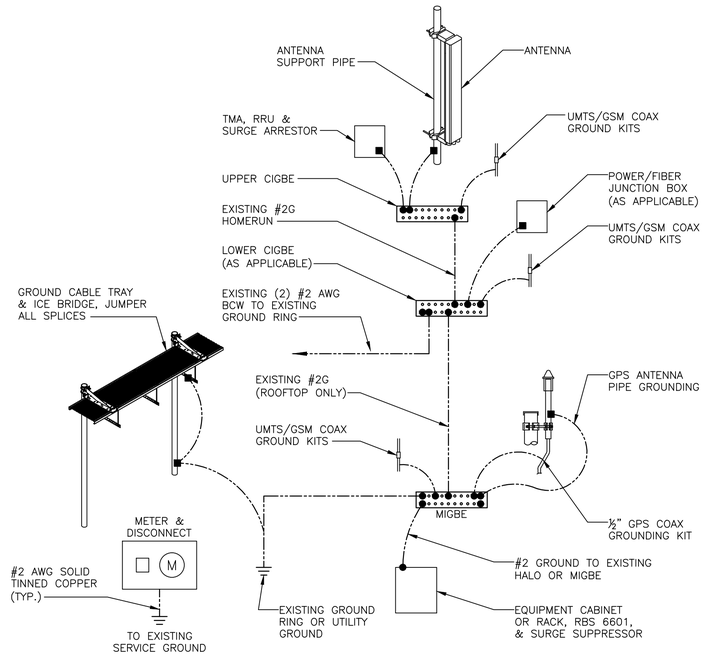
15043-EMP	G-1	1



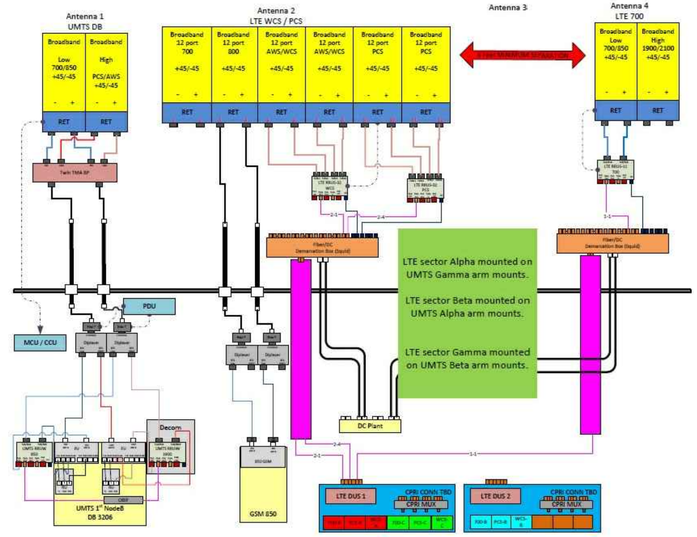
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



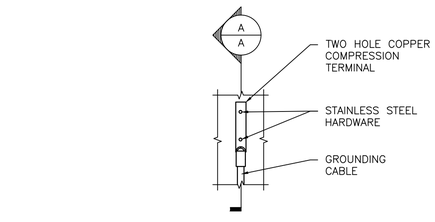
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

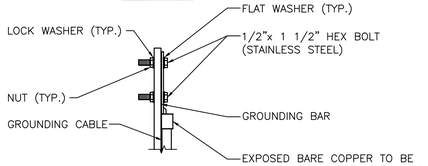


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



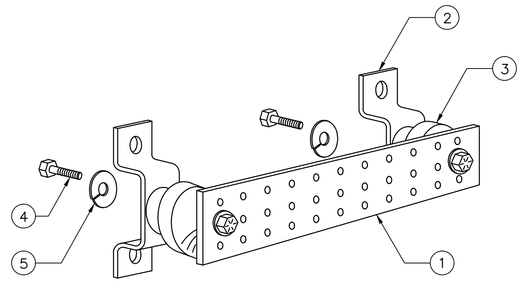
SECTION "A–A"

NOTE:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

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

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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

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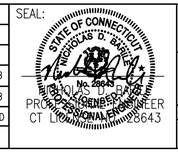


NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

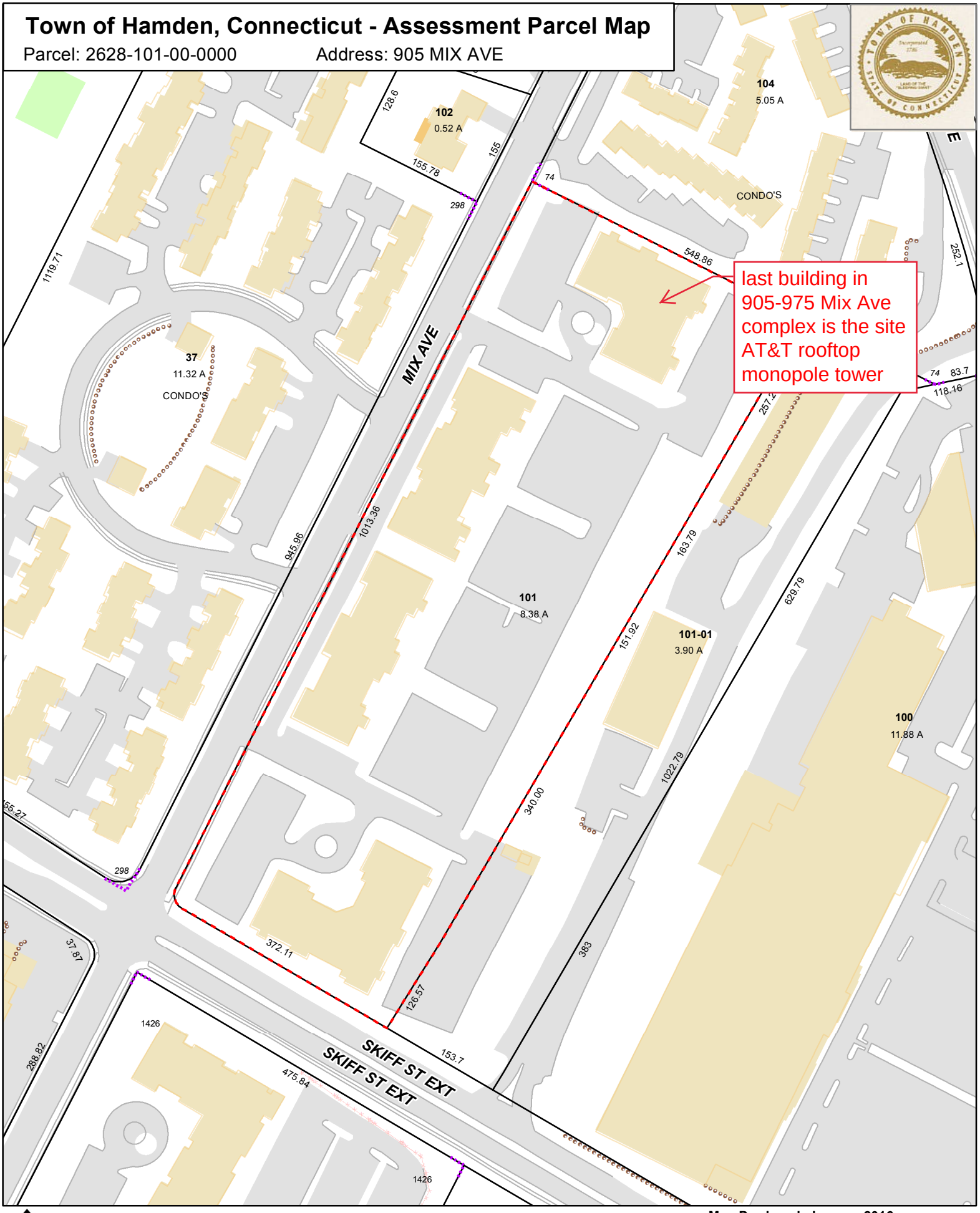
AT&T

DRAWING TITLE:
GROUNDING, ONE-LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15043-EMP	G-1	1

Town of Hamden, Connecticut - Assessment Parcel Map

Parcel: 2628-101-00-0000 Address: 905 MIX AVE



N

Approximate Scale: **1 inch = 150 feet**

0 75 150 225 300 Feet

Map Produced: January 2016

TOWN OF HAMDEN, CONNECTICUT
GEOGRAPHIC & PROPERTY INFORMATION NETWORK

2750 DIXWELL AVENUE
HAMDEN, CT 06518
203-287-2500
E-MAIL: GENERAL INFORMATION

PROPERTY INFO DATA UPDATED
Nightly
CURRENT PARCEL COUNT
16,800 +/-

SUMMARY PARCEL INFORMATION & MAP DOCUMENTS

Detailed Parcel Information

Parcel No
2628-101-00-0000

Unique ID
100226

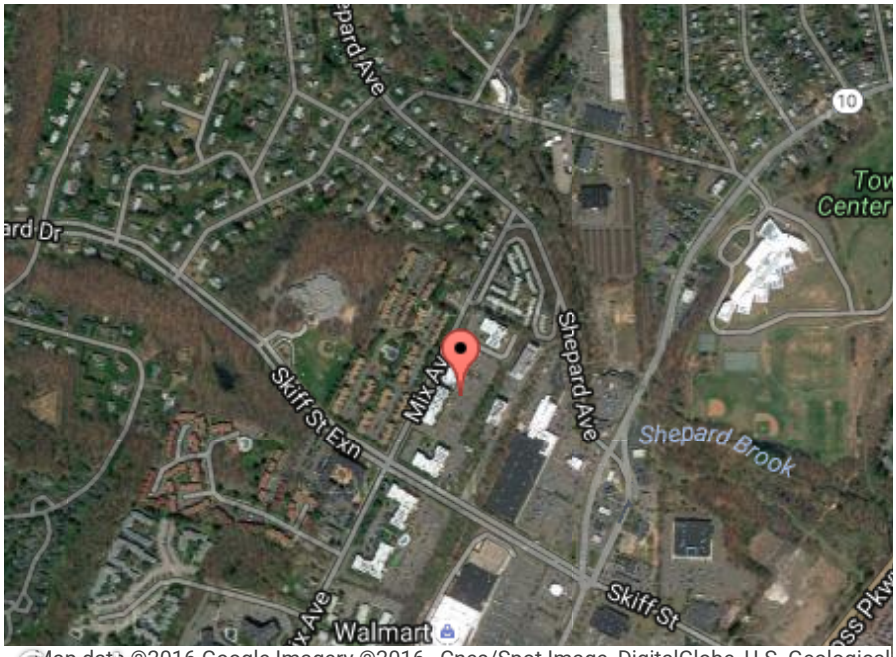
Account
100226

Owner
CHESTNUT HILL NORTH LLC

Location
905 MIX AVE

MAILING ADDRESS
1621 STATE ST
NEW HAVEN CT 06511

Scroll Down For Complete Property Detail



Map data ©2016 Google Imagery ©2016 , Cnes/Spot Image, DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency

Click on the Google logo to go to Google Maps

Parcel Documents

Create Parcel Map | Property Summary Card

Full Size Assessor Maps

Full Assessor Map

Interactive GIS Maps of Property

GO TO VIRTUAL EARTH BIRDS EYE!

GO TO INTERACTIVE MAP!

Once in Interactive Map, Select Parcel and enter Abutters distance.

PARCEL VALUATIONS

	Appraised Value	Assessed Value
Buildings	10109200	7076440
Outbuildings	406600	284620
Improvements	10639800	7447860
Extra Features	124000	86800
Land	5845500	4091850
TOTAL:	16485300	11539710

PROPERTY INFORMATION

Land Acres	9.09
Land Use	APT Over 8
Land Class	C
Zoning	R5
Neighborhood	100
Lot Description	Rolling
Lot Setting	Urban
Lot Utilities	All Public
Street Description	Paved

SALE INFORMATION

Sale Date	8/26/2015
Sale Price	
Book / Page	4249/ 165

BUILDING AREA

Gross Building Area	
Total Living Area	0

CONSTRUCTION DETAILS

Building Style	Apartments

Building Use	Comm/Ind
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Veneer
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	Central
Building Style	Apartments
Building Use	Comm/Ind
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Veneer
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	None
Building Style	Apartments
Building Use	Comm/Ind
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Masonry
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas

Air Conditioning Type	None
Building Style	Apartments
Building Use	Comm/Ind
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Veneer
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	Central

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