Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

April 22, 2016

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Notice of Exempt Modification: Existing Telecommunications Facility at 27 – 31 South Main Street, West Hartford

Dear Ms. Bachman:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, copies of this letter are being sent to the chief elected official of the municipality in which the affected cell site is located, the property owner of record, and the tower owner or operator.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical and environmental characteristics of the site will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not increase.

2. The proposed changes will not extend the site boundaries.

3. The proposed changes will not increase the noise level at the site boundary by six decibels or more, or to levels that exceed state and local criteria.

4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.

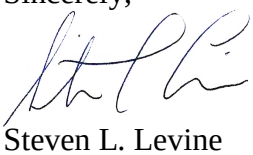
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The proposed changes will not impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

For the foregoing reasons, AT&T respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 830-0380 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

cc: TownCEO – Ronald F. Van Winkle, Town Manager, City of West Hartford
Property Owner of Record – Town Center West Associates LLC
Tower Owner / Operator – Crown Castle International (by email)

Attachments

NEW CINGULAR WIRELESS PCS, LLC

Equipment Modification

27-31 South Main Street (29 South Main St), West Hartford
Geographic Coordinates: N 41-45-36.5 W 72-44-35.4

AT&T Site CT5843

Prior CSC Approvals: Tower Sharing 1/03
Exempt Mods 6/06 & 8/12

Tower Owner/Manager: Crown Castle

Land Owner of Record: Town Center West Associates LLC

Original Permitting: The 29 South Main Street tower was approved by local P&Z authorities in 1997. Please see the attached zoning approval letter and corresponding site plan drawings. Subsequently, AT&T was approved to co-locate at the site in tower sharing application TS-ATT-155-021216. The Council's 2003 decision letter is attached along with site plan excerpts from the tower sharing application. The latter show AT&T's approved lease and equipment area which expanded the overall site footprint. A Town of West Hartford building/zoning permit was subsequently issued for the AT&T site plan (attached). There are no conditions in these approvals that would be violated by the present equipment modification proposals.

Lease Area: Comparison of the attached TS-ATT-155-021216 site plan with the attached proposed construction drawings indicates that the proposed modifications will not enlarge either the AT&T lease area or the overall site boundaries.

Equipment Configuration: Rooftop Self-Supporting Lattice Tower
on Parking Garage Penthouse: 103ft. a.g.l. Overall Ht.
(Penthouse Rooftop = 63 ft a.g.l. / Tower = 40 ft tall.)

Note: Centerlines in this section are measured a.g.l.

Current and/or approved:
T-Arm mounts @ 92 ft a.g.l.
Twelve PowerWave LGP21401 TMA's @ 92 ft
Six Ericsson RRUS-11 remote radio heads @ 92 f
Three PowerWave 7770 antennas @ 89 ft c.l.
One Andrew SBNH-1D6565C antenna @ 89 ft c.l.
One PowerWave P65-15-XLH-RR antenna @ 89ft c.l
One PowerWave P65E-17-XLH-RR antenna @ 89 ft c.l
One Raycap DC6-48-60-18-8F surge arrestor @ 89 ft
Six runs 1 5/8 inch coax
One fiber and two DC power cables
Outdoor equipment cabinets in fenced rooftop compound

Planned Modifications:
Replace existing T-Arm mounts at 92 ft with three 12 ft V-booms.
Remove six PowerWave LGP21401 TMA's.
Remove three Ericsson RRUS-11 remote radio heads.
Install three CCI TPA-LCUUUU-H8 antennas @ 89 ft c.l.
Install six Ericsson RRUS-32 remote radio heads @ 89 ft.
Install one additional Raycap DC6-48-60-18-8F surge arrestor @ 89 ft.
Replace two existing DC power cables with four new DC cables.

Power Density:

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 5.5 % of the standard adopted by the FCC. As depicted in the second and third tables below, the total radio frequency electromagnetic radiation power density in publicly accessible areas following proposed modifications would be approximately 9.6 % of the standard at 6 feet above ground level and 40.5 % of the standard at 6 feet above the upper parking level.

Existing– At Ground Level

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *							0.83
AT&T LTE *	92	734	1	1616	0.0786	0.4893	1.61
AT&T UMTS *	92	880	2	565	0.0549	0.5867	0.94
AT&T UMTS *	92	1900	2	875	0.0851	1.0000	0.85
AT&T GSM *	92	880	1	283	0.0138	0.5867	0.23
AT&T GSM *	92	1900	4	525	0.1021	1.0000	1.02
Total							**5.48%**

***** Per CSC records.

Proposed – At Ground Level

Carrier & Technology	Centerline Ht (feet)	Antennas (All Sectors)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *								0.83
AT&T LTE	89	PW P65 #1&2 Andrew #1	740	2	1476	0.1541	0.4933	3.12
AT&T LTE	89	CCI TPE #1, 2, 3	1900	2	2921	0.3050	1.0000	3.05
AT&T LTE	89	CCI TPE #1, 2, 3	2300	2	1285	0.1342	1.0000	1.34
AT&T UMTS	89	PW 7770 #1, 2, 3	880	2	293	0.0306	0.5867	0.52
AT&T UMTS	89	PW 7770 #1, 2, 3	1900	2	573	0.0598	1.0000	0.60
AT&T GSM	89	PW 7770 #1, 2, 3	880	1	149	0.0078	0.5867	0.13
Total								**9.60%**

***** Per CSC records.

Proposed – On Upper Parking Level

Carrier & Technology	Centerline Ht (feet)	Antennas (All Sectors)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Users *								2.77
AT&T LTE	46	PW P65 #1&2 Andrew #1	740	2	1476	0.6635	0.4933	13.45
AT&T LTE	46	CCI TPE #1, 2, 3	1900	2	2921	1.3131	1.0000	13.13
AT&T LTE	46	CCI TPE #1, 2, 3	2300	2	1285	0.5776	1.0000	5.78
AT&T UMTS	46	PW 7770 #1, 2, 3	880	2	293	0.1317	0.5867	2.24
AT&T UMTS	46	PW 7770 #1, 2, 3	1900	2	573	0.2576	1.0000	2.58
AT&T GSM	46	PW 7770 #1, 2, 3	880	1	149	0.0335	0.5867	0.57
Total								**40.52%**

***** Per CSC records.

Structural information:

The attached structural analysis demonstrates that the tower and foundation have adequate structural capacity to accommodate the proposed equipment modifications. (GPD Engineering, 4-18-16). Please note that structural modifications referenced in the analysis have already been installed and were considered in the analysis.

DEPARTMENT OF
COMMUNITY SERVICES

April 10, 1997

West Hartford Site Plan #809
29 South Main Street
Rooftop Stub Tower

Original P&Z Approval - 1997
&
Approved Zoning Drawings

Thomas A. Cookingham, AICP
SBA, Inc.
300 Research Parkway
Meriden, CT 06450

Subject: 29 South Main St.

Dear Mr. Cookingham:

Approval has been granted for the site plan application for the subject property. The approval is for the construction of a forty (40) foot stub tower with associated equipment on the penthouse of the parking garage.

The "associated equipment" is detailed on the two (2) sheet plan set. Specifically, one sheet is entitled "Zoning Drawing - rev. date: 11-3-96" sheet 2 entitled, "zoning elevations - rev. date 3-3-87."

Please submit to the Planning Office as soon as possible two (2) blueprint copies and one (1) mylar set of the approved plans, all signed and sealed by the professional responsible for preparing the plans.

If we can be of further assistance, please call me at 523-3123.

Very truly yours,

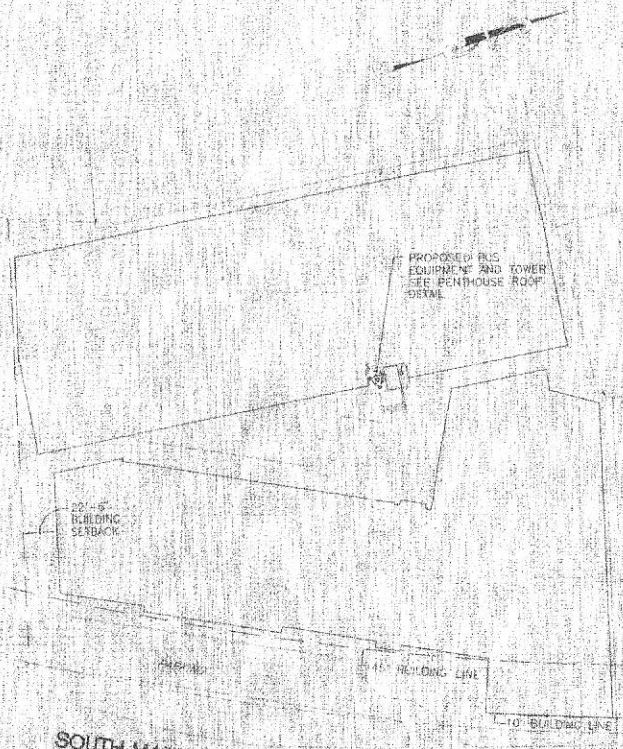
Mila Limson
Acting Town Planner

c: Ron Van Winklle, Director of Community Services
Don Foster, Town Planner

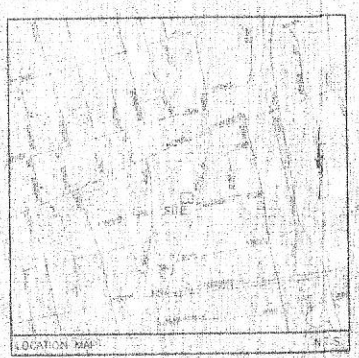
29SMain

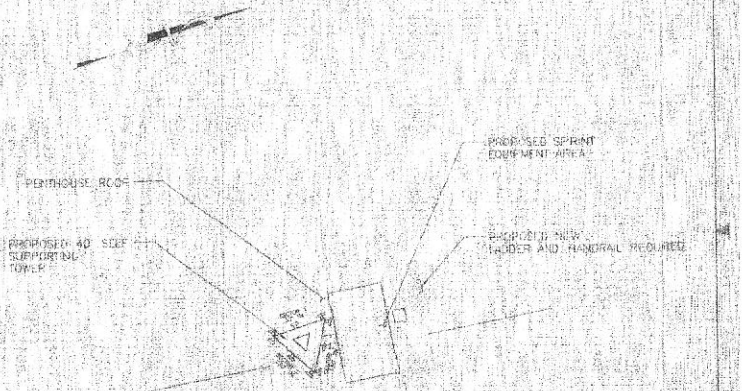
TOWN OF WEST HARTFORD

TOWN OF WEST HARTFORD 50 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107-2431
(860) 523-3123 FAX: (860) 523-3200



SITE PLAN





PENTHOUSE ROOF DETAIL

ZONING TABLE		
ZONING DISTRICT: BC — CENTRAL BUSINESS DISTRICT		
ITEM	REQ'D	PROVIDED
TOTAL GROSS BUILDING AREA (S.F.)	16,273 S.F.	N/A
FRONT YARD SETBACK	BL. LINE	N/A
SIDE YARD SETBACK TO RP ZONE — 1/2 BUILDING HEIGHT	22'-6"	N/A
PARKING REQUIRED FOR OFFICE	N/A	N/A
PARKING REQUIRED FOR RETAIL	N/A	N/A
LOADING SPACES	N/A	N/A

NOTES

1) THIS MAP WAS COMPILED FROM AN A-2 SURVEY ENTITLED "TOPOGRAPHIC SURVEY PREPARED FOR SEYBURN ASSOCIATES LIMITED PARTNERSHIP, 61 SOUTH MAIN STREET, WEST HARTFORD, CONNECTICUT" PREPARED BY F.A. HESKETH & ASSOCIATES, INC., LAST REVISION DATE: 8/27/97.

2. APPLICANT: SPRINT PCS
9 BARNES INDUSTRIAL ROAD
WALLINGFORD, CONN. 06492

OWNER: DOR 61 LIMITED PARTNERSHIP
433 SOUTH MAIN STREET
WEST HARTFORD, CT. 06110

SITE PLAN # 809
PLANNING DIVISION
WEST HARTFORD, CT
APPROVED April 10, 1998
TOWN PLANNER

URS Greiner, Inc. A-E-S
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

WEST HARTFORD PARKING GARAGE
29 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06110

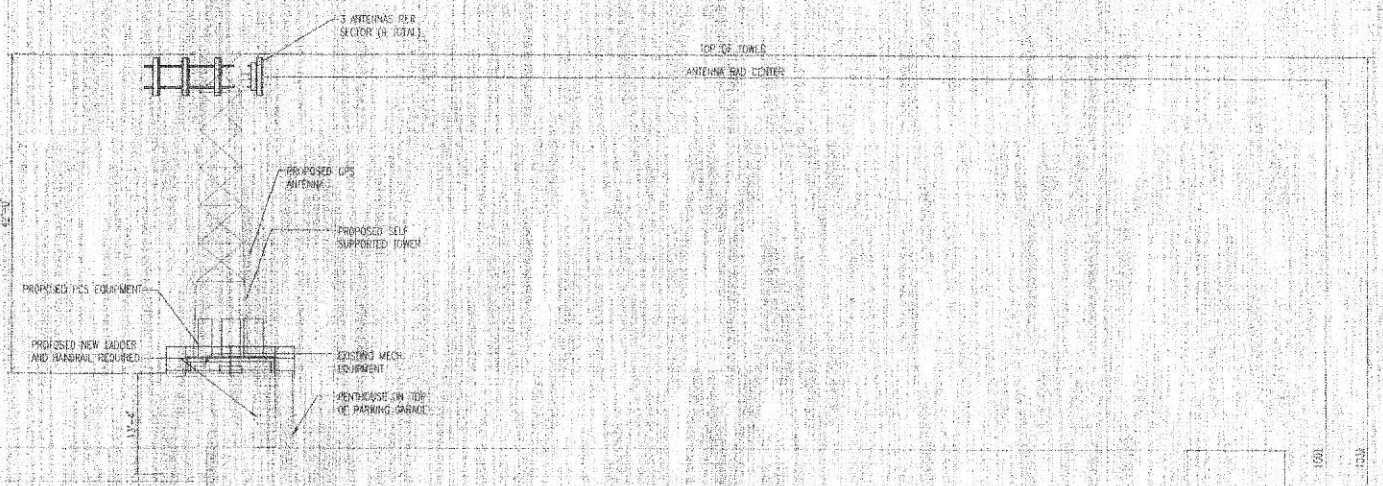
Sprint PCS
HARTFORD, MTA
SITE NO. CT03XC075H

A			
A1			
A2			
A3	1-13-98	EXISTING TOWER	WC
A4	WC	REVISIONS	BY
DRAWN	WC	DESIGNED	CHECKED

LUCENT TECHNOLOGIES/BECHTEL ALLIANCE
SITE PROJECT

ZONING DRAWING

JOB NO.	DRAWING NUMBER	REV
33524	11447521	A3



1/22 NORTH ELEVATION
SCALE: 1/8" = 1'-0"

URS Greiner, Inc. A-E-S
509 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

WEST HARTFORD PARKING GARAGE
20 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06110

Sprint PCS
HARTFORD CMTA
SITE NO. CT03XC075H

NO.	DATE	REVISION	BY	CK'D	APP'D
1	3-2-01	REVISED ANTENNA RAD CENTER	JOB	AP	DJB
2	12-28-00	REVISED TOWER	JOB	JAP	DJB
3	11-13-00	REVISED FOR ZONING	ATG	JAP	DJB
4					

SCALE: AS SHOWN | DESIGNED: JAP | DRAWN: JAB

LICENSED PROFESSIONAL ENGINEER #14488

LUCENT TECHNOLOGIES/BECHTEL ALLIANCE
SSLP PROJECT

ZONING
ELEVATION

JOB NO.	DRAWING NUMBER	REV.
43224	XHAG75ZD	2

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

TS-ATT-155-021216

CSC Approval
&
Site Plan Excerpts
from TS Application

January 10, 2003

Christopher B. Fisher, Esq.
Cuddy & Feder & Worby LLP
90 Maple Avenue
White Plains, NY 10601-5196

RE: **TS-AT&T-155-021216** - AT&T Wireless PCS LLC d/b/a AT&T Wireless request for an order to approve tower sharing at an existing telecommunications rooftop facility located at 29 South Main Street, West Hartford, Connecticut.

Dear Attorney Fisher:

At a public meeting held January 8, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated December 13, 2002.

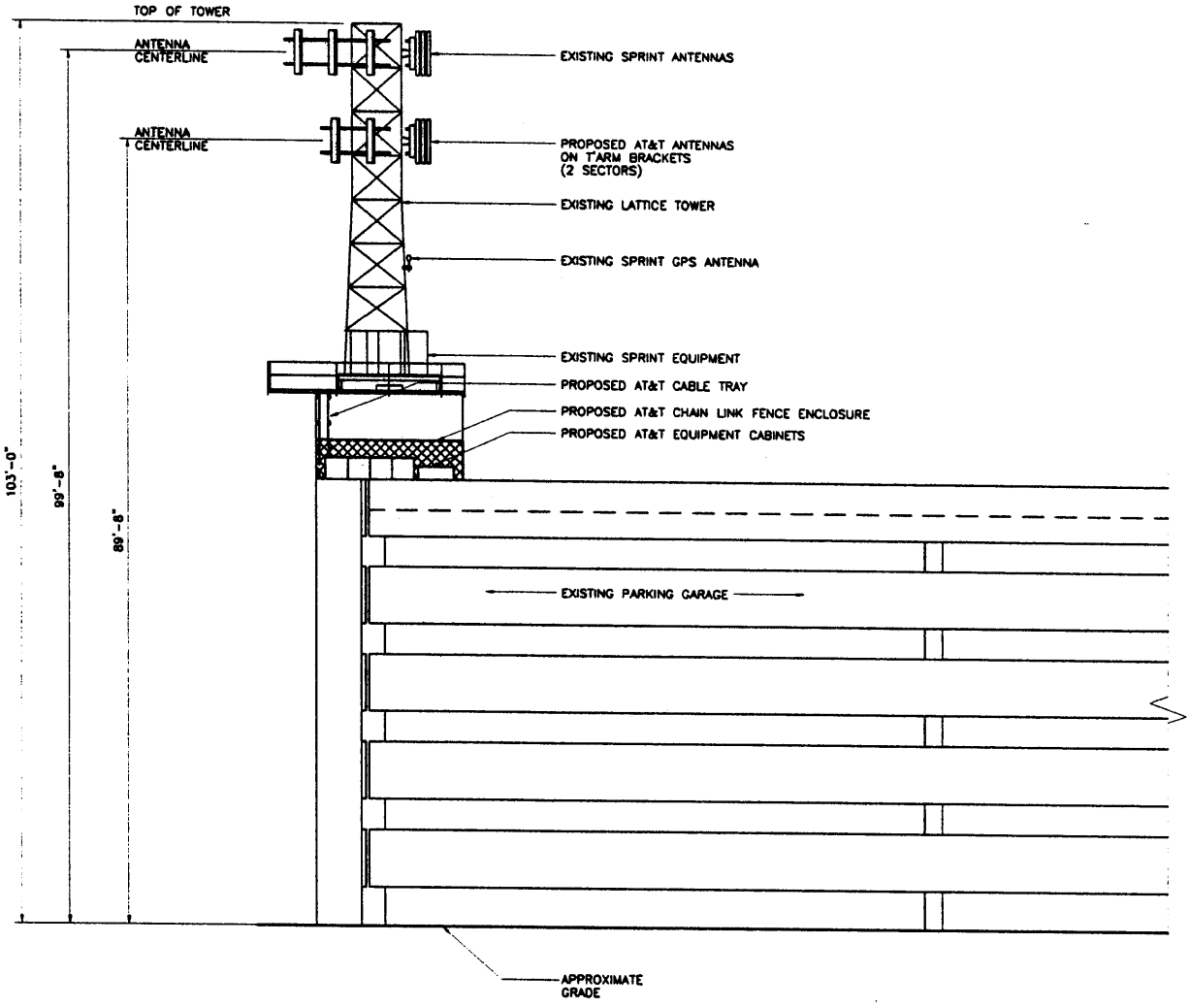
Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/laf

cc: Honorable Robert R. Bouvier, Mayor, Town of West Hartford
Barry M. Feldman, Town Manager, Town of West Hartford
Mila Fiorson, Senior Planner, Town of West Hartford
Christopher B. Fisher, Esq., Cuddy & Feder & Worby LLP
Julie Donaldson Kohler, Horwitz & Sagarin LLC



1 / LE-2 **PARTIAL ELEVATION**
SCALE: 1" = 20'-0"

0 10 20 40

ISSUED FOR LEASE

LATITUDE:	41.76014 (NAD 83)
LONGITUDE:	72.74312 (NAD 83)

URS
URS CORPORATION-AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CT. 06067
1-(860)-529-8882
1-(860)-529-5566 (FAX)

AT&T
AT&T WIRELESS PCS LLC
12 OMEGA DRIVE
STAMFORD, CONNECTICUT 06902

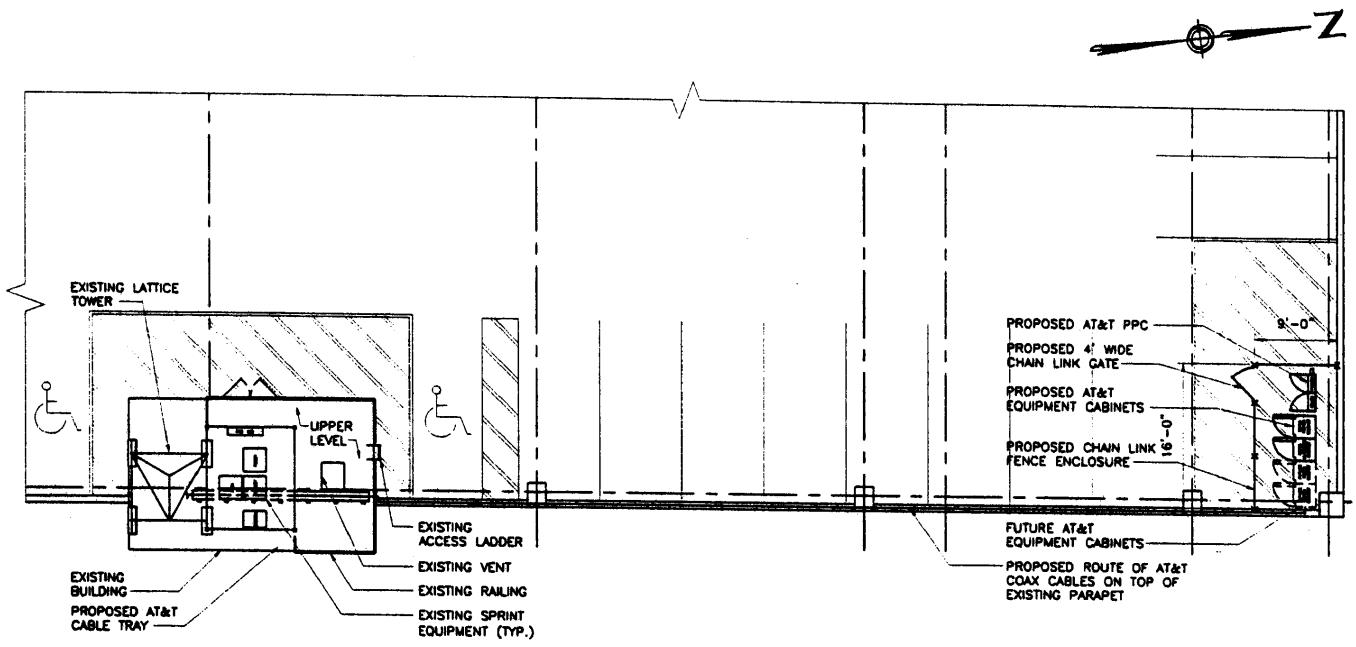
DRAWING TITLE: PARTIAL ELEVATION

PROJECT INFORMATION:
WEST HARTFORD - CENTRAL
CT-843
29 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107

PROPERTY OWNER:
J & S DEVELOPMENT AND MANAGEMENT CORP.
29 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107

DRAWING TITLE: 907-007-843A-LE2

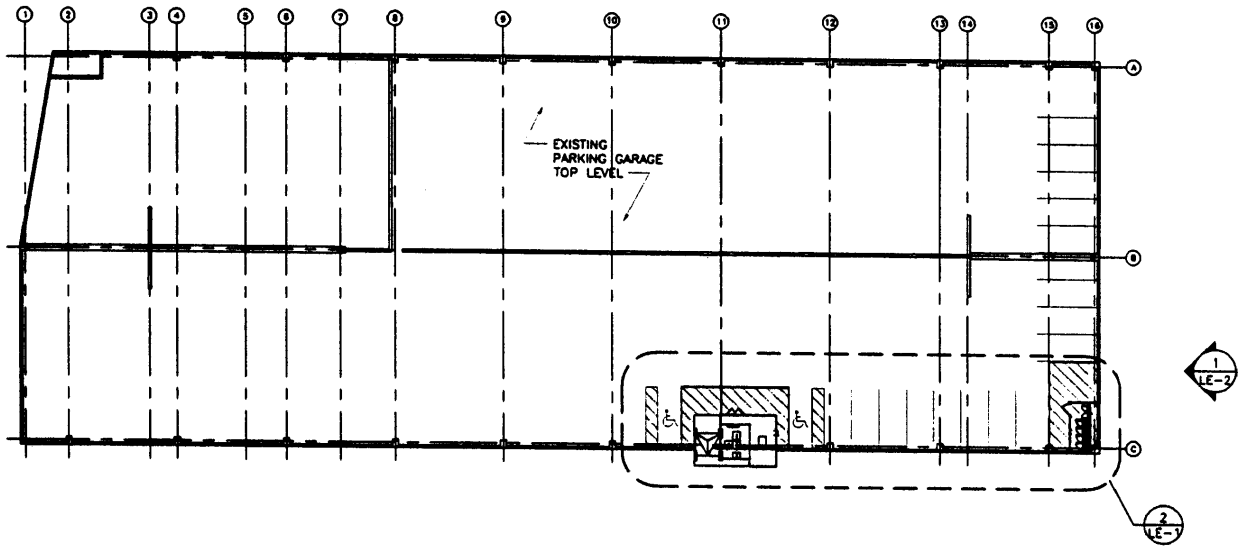
REVISION NO. 0	DRAWN BY: PD
DATE ISSUED: 11/13/02	CHECKED BY: JCF
SCALE: AS NOTED	APPROVED BY:
	SHEET NO. 2 OF 2
URS JOB NO.: F302224.47	



2 / LE-1 PARTIAL GARAGE TOP LEVEL PLAN

SCALE: 1" = 20'-0"

0 10 20 40



1 / LE-1 GARAGE TOP LEVEL PLAN

SCALE: 1" = 60'-0"

0 30 60 120

ISSUED FOR LEASE

LATITUDE:	41.76014 (NAD 83)
LONGITUDE:	72.74312 (NAD 83)

URS
URS CORPORATION-AES
795 BROOK STREET, BLDG 5
ROCKY HILL, CT. 06067
1-(860)-529-8882
1-(860)-529-5566 (FAX)

AT&T
AT&T WIRELESS PCS LLC
12 OMEGA DRIVE
STAMFORD, CONNECTICUT 06902

DRAWING TITLE: GARAGE TOP LEVEL PLAN

PROJECT INFORMATION:
WEST HARTFORD - CENTRAL
CT-843
29 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107

PROPERTY OWNER:
J & S DEVELOPMENT AND MANAGEMENT CORP.
29 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107

DRAWING TITLE: 907-007-843A-LE1

REVISION NO. 0	DRAWN BY: PD
DATE ISSUED: 11/13/02	CHECKED BY: JCF
SCALE: AS NOTED	APPROVED BY:
	SHEET NO. 1 OF 2

URS JOB NO.: F302224.47

2003 Town Permit for AT&T Co-Location

CT-843

TOWN OF WEST HARTFORD, CONN.

NO. 78913 BUILDING/ZONING PERMIT

DATE: 02/03/03

Est Cost.....$ 82000
Permit Fee.....$ 1245
State Fee.....$ 13.12
Work W/O Permit $ 0
Occupancy Fee...$ 0
Additional Fee..$ 0

APPLICANT: URS
PETER MAXWELL
795 BROOK STREET
PETER MAXWELL
ROCKY HILL CT 06067

LOCATION: 0029 SOUTH MAIN STREET
OWNER: LLC TOWN CENTER WEST ASSO

APPLICANT PHONE: 529-8882
FAX: 529-5566

WORK DESCRIPTION:
ADDING TELECOMMUNICATIONS ANTENNAS ONTO THE EXISTING LATTICE TOWER ON THE PARKING GARAGE AND PLACING EQUIPMENT CABINETS ON THE EXISTING PARKING GARAGE DECK AND ENCLOSING WITH FENCING PER DRAWINGS SUBMITTED

** **BUILDING, STREET, AND EACH SIDE LOT LINE TO BE IN ACCORDANCE WITH CERTIFIED ENGINEER'S PLOT PLAN ON FILE.**

NOTE: THE RECIPIENT OF THIS PERMIT ACCEPTS THIS PERMIT ON THE CONDITION THAT HE, THE OWNER OR REPRESENTING THE OWNER, AGREES TO COMPLY WITH ALL BUILDING AND ZONING ORDINANCES OF THE TOWN OF WEST HARTFORD AND THE STATE STATUTES OF CONNECTICUT REGARDING THE USE, OCCUPANCY AND TYPE OF BUILDING TO BE CONSTRUCTED.

CODE:32 Eva Espinosa ZONING ENFORCEMENT OFFICER 3-4-03 DATE _____ BUILDING OFFICIAL 2/4/03 DATE

SCANNED

PROJECT INFORMATION

SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE– 3C PROJECT 2016):
SITE ADDRESS:	29 SOUTH MAIN STREET WEST HARTFORD, CT 06107
LATITUDE:	41.76019 N 41° 45' 36.7" N
LONGITUDE:	72.74319 W 72° 44' 35.5" W
TYPE OF SITE:	ROOFTOP/LATTICE TOWER OUTDOOR EQUIPMENT
OVERALL BUILDING/LATTICE HEIGHT:	49'–6"± / 53'–7"±
RAD CENTER:	90'–0"±
JURISDICTION:	CONNECTICUT SITING COUNCIL
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT5843
SITE NAME: WEST HARTFORD CENTRAL
PROJECT: LTE 3C UPGRADE

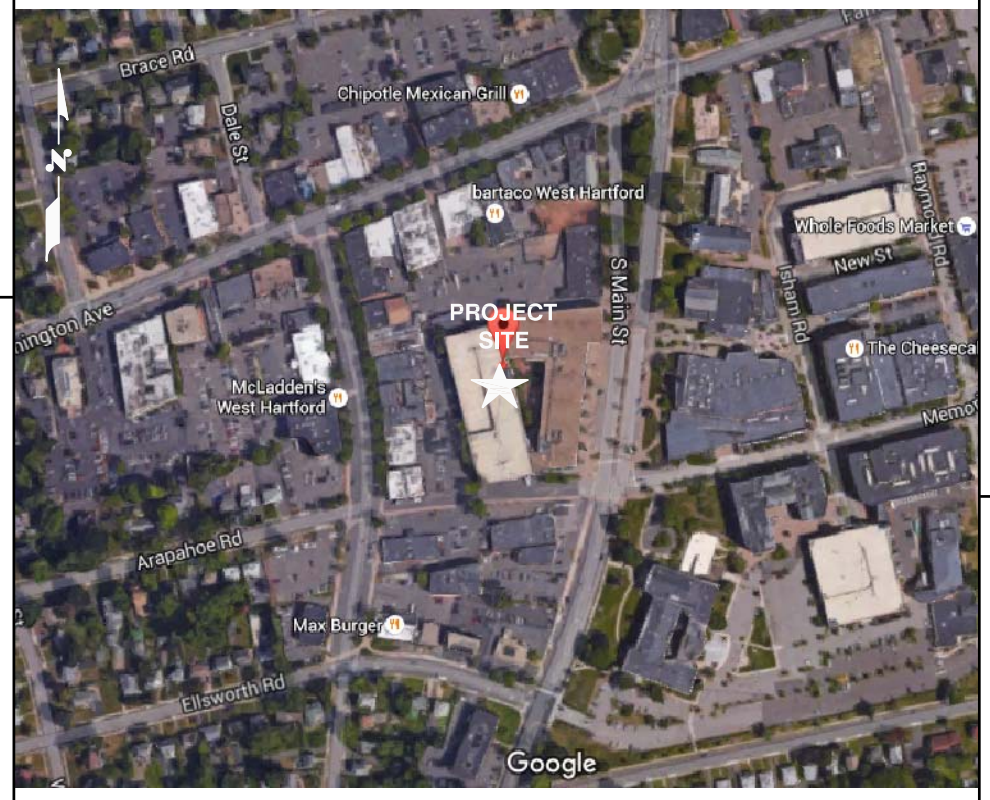
DRAWING INDEX

CROWN SITE ID: 876328

CROWN SITE NAME: WEST HARTFORD PARKING GARAGE

VICINITY MAP

DIRECTIONS:
START OUT GOING WEST ON COCHITUATE RD/RT–30 W TOWARD BURR ST. CONTINUE TO FOLLOW RT–30 W. 2.1 MI. STAY STRAIGHT TO GO ONTO RT–9 W/WORCESTER RD. 2.4 MI. MERGE ONTO I–90 W/MASSACHUSETTS TURNPIKE/MASS PIKE TOWARD SPRINGFIELD/WORCESTER (PORTIONS TOLL). 33.5 MI. MERGE ONTO I–84 W VIA EXIT 9 TOWARD US–20/HARTFORD/NEW YORK CITY (PORTIONS TOLL) (CROSSING INTO CONNECTICUT). 47.8 MI. TAKE THE PARK ROAD EXIT, EXIT 43, TOWARD W. HARTFORD CENTER. 0.5 MI. TURN LEFT ONTO PARK RD. 0.4 MI. TURN RIGHT ONTO S MAIN ST. SITE WILL BE LOCATED ON THE LEFT.



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.

72 HOURS

BEFORE YOU DIG

CALL TOLL FREE 800–922–4455

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5843
SITE NAME: WEST HARTFORD CENTRAL
CROWN CASTLE ID: 876328
29 SOUTH MAIN STREET
WEST HARTFORD, CT 06107
HARTFORD COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	04/11/16	ISSUED FOR CONSTRUCTION	SG	AT	DPH
1	01/05/16	ISSUED FOR REVIEW	RB	AT	DPH
0	12/24/15	ISSUED FOR REVIEW	EB	AT	DPH
A	11/12/15	ISSUED FOR REVIEW	EB	AT	DPH

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

STATE OF CONNECTICUT — DEREK S. GREASER — No. 23537 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE–3C)

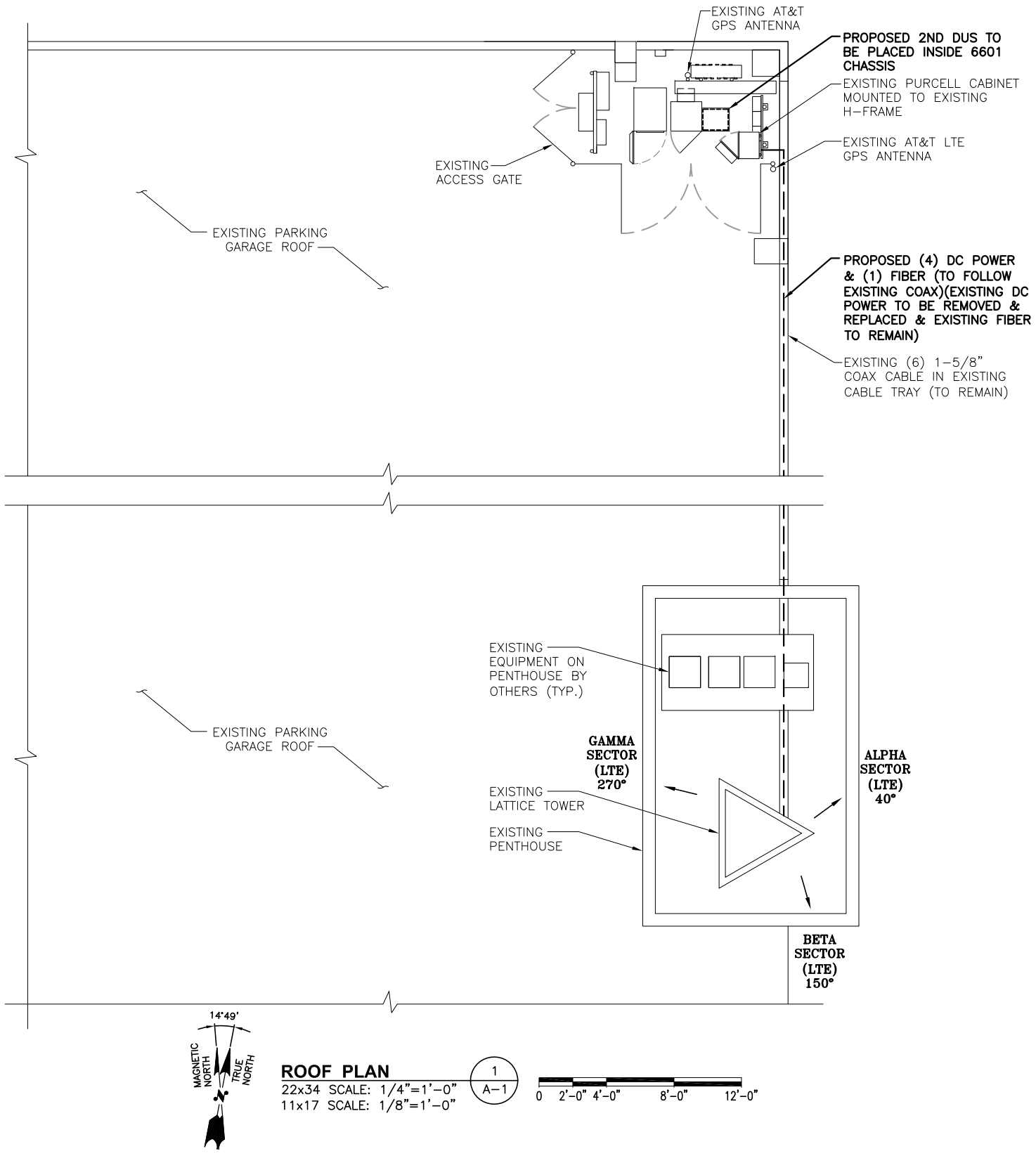
JOB NUMBER	DRAWING NUMBER	REV
5843.01	T–1	2

NOTE:

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

NOTE:

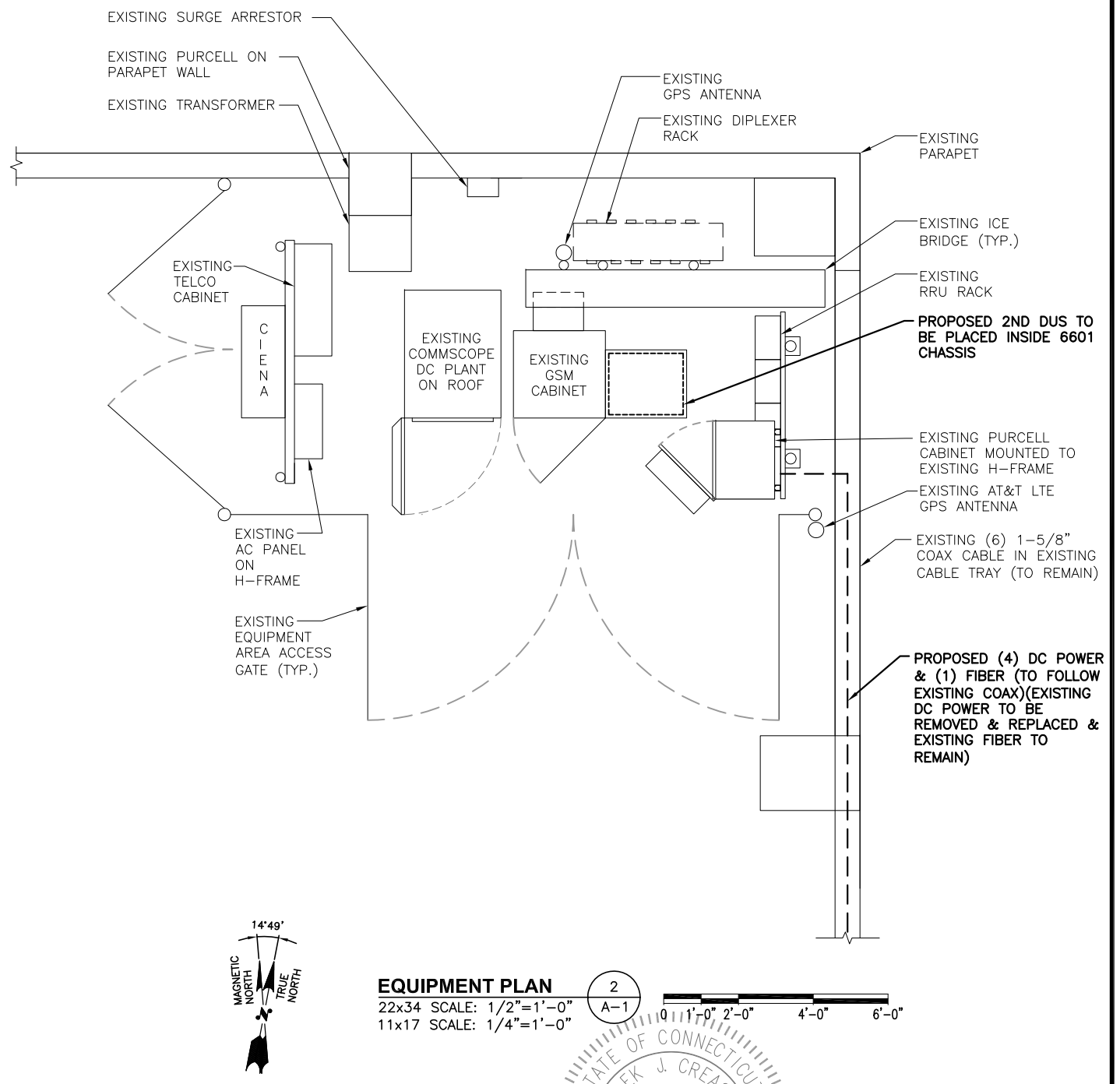
ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



ROOF PLAN

22x34 SCALE: 1/4"=1'-0" (1 / A-1)
11x17 SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"



EQUIPMENT PLAN

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

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

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT5843
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CROWN CASTLE ID: 876328
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

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

AT&T

ROOF AND EQUIPMENT PLAN
(LTE-3C)

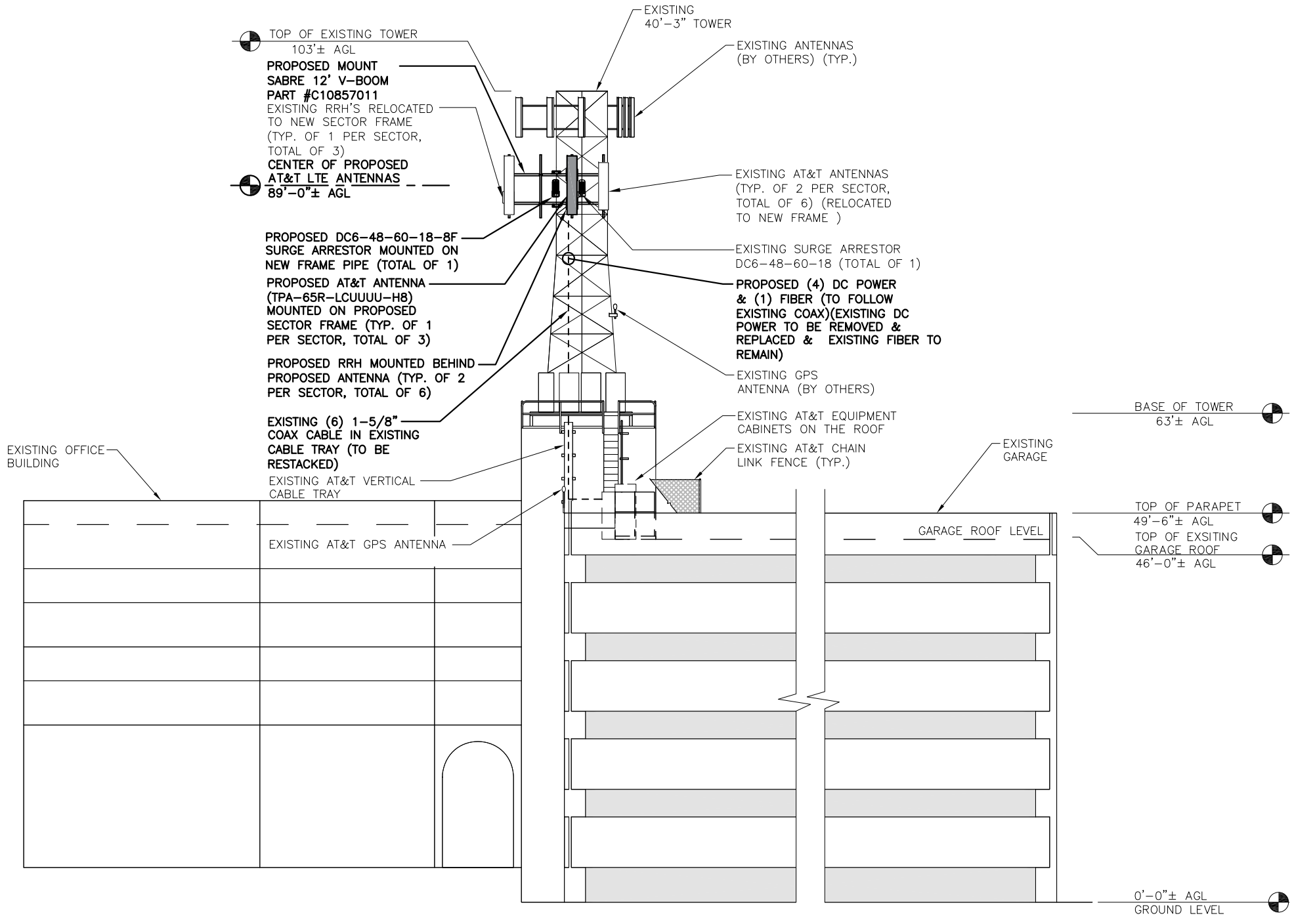
JOB NUMBER	DRAWING NUMBER	REV
5843.01	A-1	2

NOTE:

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

NOTE:

ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



NORTH ELEVATION (1 / A-2)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"

Hudson Design Group LLC
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N. ANDOVER, MA 01845
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SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

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CROWN CASTLE ID: 876328
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HARTFORD COUNTY

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

STATE OF CONNECTICUT
DEREK J. CREASEY
No. 23581
LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATION
(LTE-3C)

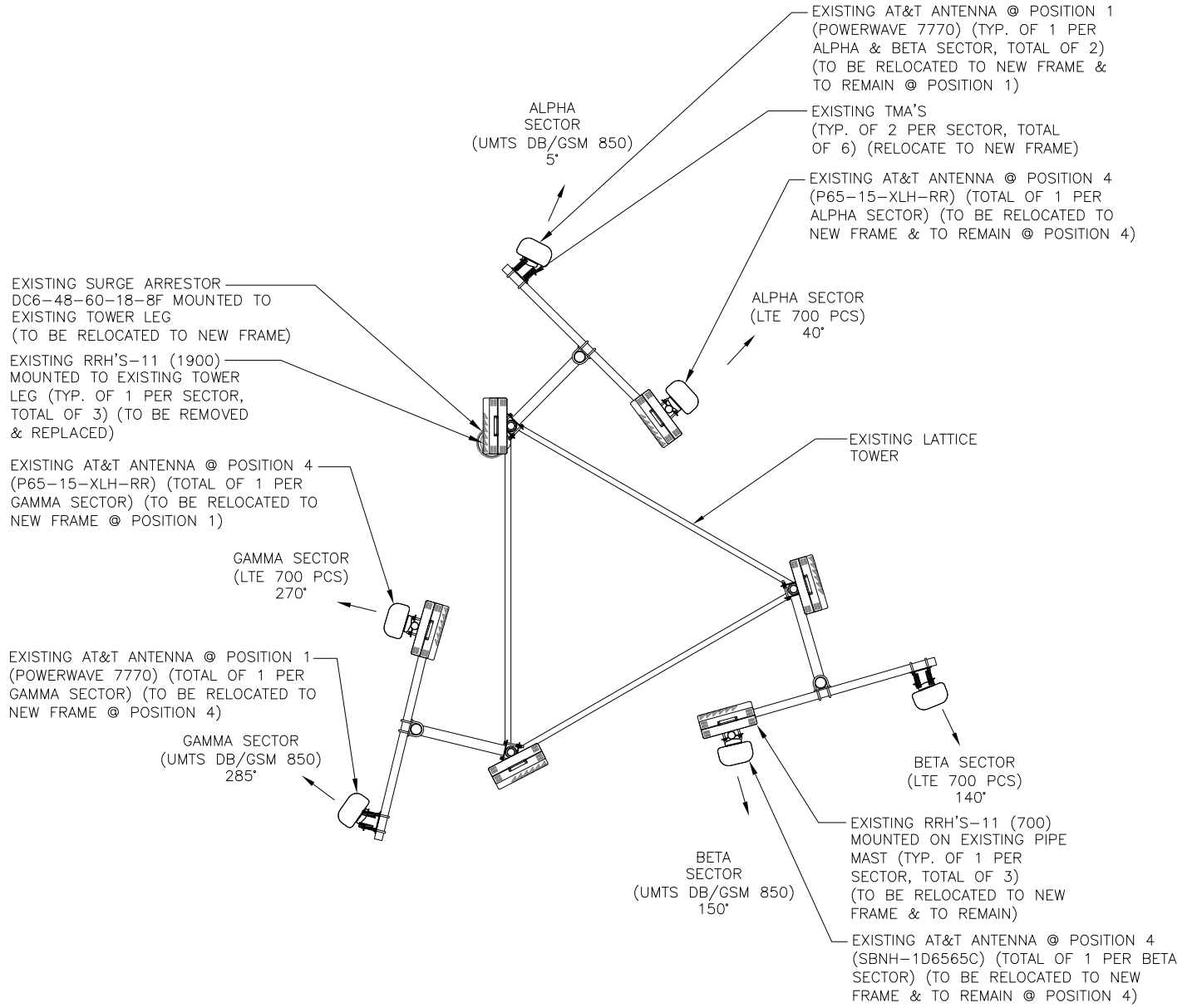
JOB NUMBER	DRAWING NUMBER	REV
5843.01	A-2	2

NOTE:

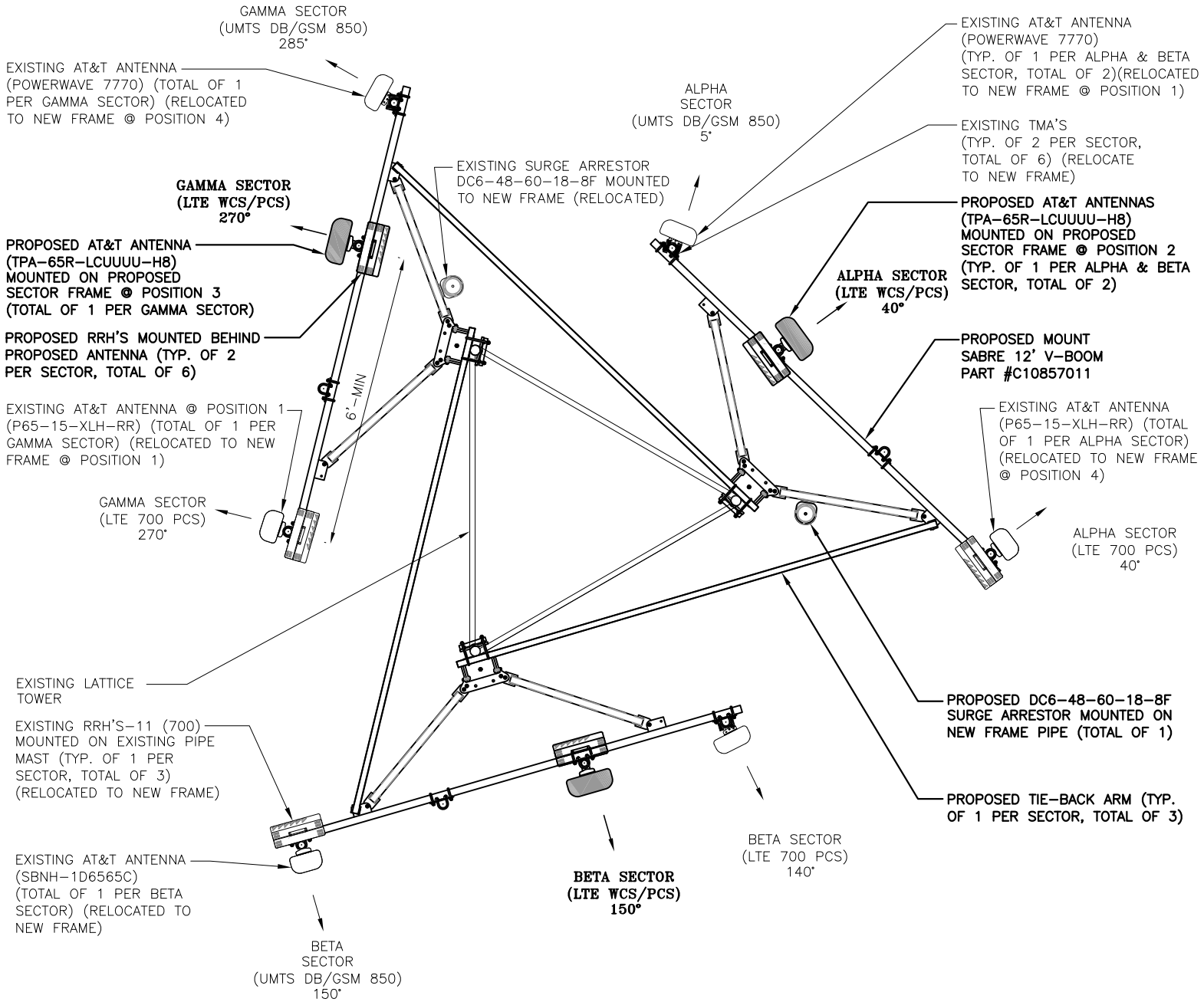
ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

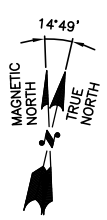
NOTE:

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



EXISTING ANTENNA LAYOUT (1 / A-3)
SCALE: N.T.S





PROPOSED ANTENNA LAYOUT (2 / A-3)
SCALE: N.T.S

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: EB

STATE OF CONNECTICUT
DEREK J. CREASEY
NO. 23551
LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS
(LTE-3C)

JOB NUMBER	DRAWING NUMBER	REV
5843.01	A-3	2

Date: April 18, 2016

GPD Engineering and Architecture
Professional Corporation
520 South Main Street, Ste 2531
Akron, OH 44311
(216) 927-8663
dpalkovic@gpdgroup.com

Charles McGuirt
Crown Castle.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5843
	Carrier Site Name:	AWE West Hartford Central
Crown Castle Designation:	**Crown Castle BU Number:**	876328
	Crown Castle Site Name:	WEST HARTFORD PARKING GARAGE
	Crown Castle JDE Job Number:	372963
	Crown Castle Work Order Number:	1222590
	Crown Castle Application Number:	341859 Rev. 2
Engineering Firm Designation:	**GPD Project Number:**	2016777.876328.15
Site Data:	**27-31 South Main St., West Hartford, CT 06110, Hartford County** **Latitude *41° 45' 36.41"*, Longitude *-72° 44' 35.25"*** **40.25 Foot - Self Support and Modified Parking Garage Structural Analysis**	

Dear Charles McGuirt,

GPD is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 893292, in accordance with application 341859, revision 2.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

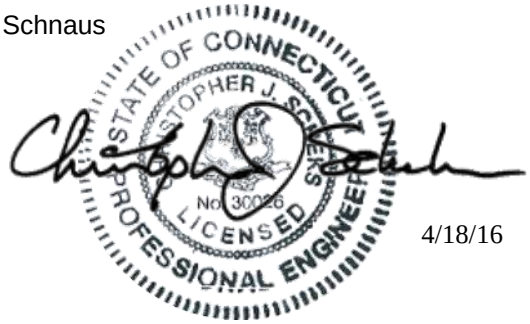
The analysis has been performed in accordance with the 2013 Connecticut State Building Code and the 2003 IBC based upon a 3-second gust wind speed of 100 mph as well as the guidelines stated in TIA/EIA-222-F based upon a fastest mile wind speed of 80 mph.

We at *GPD* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural Analysis prepared by: Eric Schnaus

Respectfully submitted,

Christopher J. Scheks, P.E.
Connecticut #: 0030026



4/18/16

1) INTRODUCTION

The tower is supported on three legs and has two major sections. It has a triangular cross section made of bolted connections, with an "X" frame configuration. The tower is fabricated with pipe legs and angle diagonals. The tower is galvanized and has no tower lightning.

This tower is a 40.25 ft Self Support tower designed by ROHN in April of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E. The tower base connects to an I-Beam frame that is anchored to the parking garage deck. The base of the tower frame is 65' above grade.

Modifications designed by GPD (Project #: 2015777.876328.08, dated 6/3/2015) consist of installing extension plates to the tower base frame connections and extension plates to the existing stair well walls at varying elevations. These modifications have been installed and were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2013 Connecticut State Building Code and the 2003 IBC based upon a 3-second gust wind speed of 100 mph as well as the guidelines stated in TIA/EIA-222-F based upon a fastest mile wind speed of 80 mph. Additionally a 28 mph fastest-mile with 1.00 inch ice thickness (in accordance with ASCE 7-05) and 50 mph under service loads per the TIA/EIA-222-F.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
92.0	92.0	3	Sabre	C10857011 12' V-Boom	2 1	3/4 3/8	1
	89.0	3	CCI Antennas	TPA-65R-LCUUUU-H8			
		3	Ericsson	RRUS 32 B30			
		1	Raycap	DC6-48-60-18-8F			
		3	Ericsson	WCS RRUS-32-B30			

Notes:
1) See Appendix B for the proposed coax layout.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
102.0	103.0	3	RFS Celwave	APXVTM14-C-120	1	5/8	1
		3	Alcatel Lucent	TD-RRH8x20-25			
		1	RFS Celwave	APXV9ERR18-C-A20	3	1-1/4	
		2	RFS Celwave	APXVSPP18-C-A20			
		2	Alcatel Lucent	1900MHz RRH (65MHz)			
		1	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
	102.0	1	Alcatel Lucent	1900MHz RRH (65MHz)			
		2	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		1		Sector Mount [SM 502-3]			
92.0	92.0	1		T-Arm Mount [TA 702-3]			2
		3	Ericsson	RRUS-11			
		6	Powerwave Tech	LGP2140X			
		6	Powerwave Tech	LGP2140X			4
		3	Ericsson	RRUS-11			
	89.0	3	Powerwave Tech	7770.00	6 2 1	1-5/8 3/4 3/8	3
		1	Powerwave Tech	P65-15-XLH-RR			
		1	Andrew	SBNH-1D6565C			
		1	Powerwave Tech	P65E-17-XLH-RR			
		3	Powerwave Tech	7020.00			
		1	Raycap	DC6-48-60-18-8F			
75.0	77.0	1	Lucent	KS24019-L112A	1	1/2	
	75.0	1		Side Arm Mount [SO 302-1]			

Notes:
1) Reserved Equipment.
2) Equipment to be removed, not considered in this analysis.
3) Equipment to be relocated onto the proposed mount with a centerline of 89'.
4) Equipment to be relocated onto the proposed mount with a centerline of 92'.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
105	105	12		DB980H90	12	1-5/8
		3		Leg Mounting Frame		
		1		GPS Antenna		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings	Rohn Eng. File#: 345895W, Dated: 4/15/1997	1440544	CCIsites
Tower Mapping	GPD Project #: 2014777.876328.03, Dated: 3/04/2014	1440544	CCIsites
Base Frame Design	Greiner Project #: F101508.60, Dated: 2/20/1997	5460756	CCIsites
Parking Garage Design	Unistress Project: Towne Center Garage, Rev. 4, Dated: 10/31/1988	5460756	CCIsites
Parking Garage Modifications Passing Analysis	GPD Project #: 2015777.876328.08, Dated: 6/3/2015	5735731	CCIsites
Parking Garage Modifications	GPD Project #: 2015777.876328.08, Dated: 6/3/2015	5735691	CCIsites
Modification Inspection Report	GPD Project #: 2015777.876328.10, Dated 1/27/2016	6076906	CCIsites

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	105.25 - 85.125	Leg	ROHN 2.5 STD	3	-14.60	54.96	26.6	Pass
T2	85.125 - 65	Leg	ROHN 2.5 STD	38	-37.89	50.20	75.5	Pass
T1	105.25 - 85.125	Diagonal	L1-1/2x1-1/2x1/8	9	-3.31	3.35	98.7	Pass
T2	85.125 - 65	Diagonal	L1-3/4x1-3/4x3/16	46	-3.06	4.49	68.2	Pass
T1	105.25 - 85.125	Top Girt	L2x2x1/8	5	-0.36	2.83	12.7	Pass
T2	85.125 - 65	Top Girt	L2x2x1/8	41	-0.14	2.83	5.1 6.0 (b)	Pass
						Summary	ELC:	LC7
						Leg (T2)	75.5	Pass
						Diagonal (T1)	98.7	Pass
						Top Girt (T1)	12.7	Pass
						Bolt Checks	96.6	Pass
						Rating =	98.7	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Frame and Parking Garage	Varies	78.2	Pass

Structure Rating (max from all components) =	98.7%

Notes:
1) The base frame and parking garage capacity was determined based on reaction comparison from the previous modification design passing analysis (GPD Project #: 2015777.876328.08, dated 6/3/2015). See Appendix C for the reaction comparison and Appendix D for the referenced design and previous calculations.

4.1) Recommendations

The design of the existing tower is sufficient for the proposed loading and will not require modifications.

The design of the modified parking garage is sufficient for the proposed loading and will not require additional modifications.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

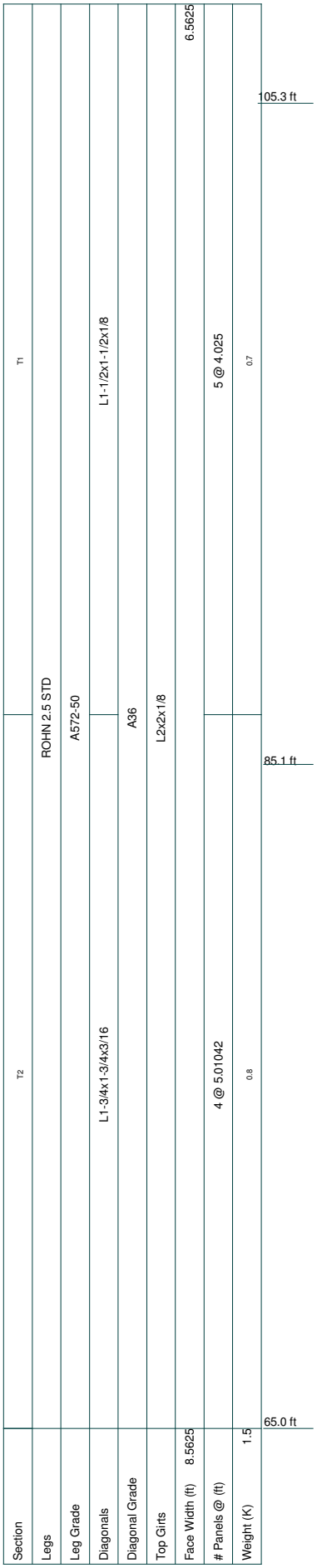
It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.



DESIGNED APPURTENANCE LOADING

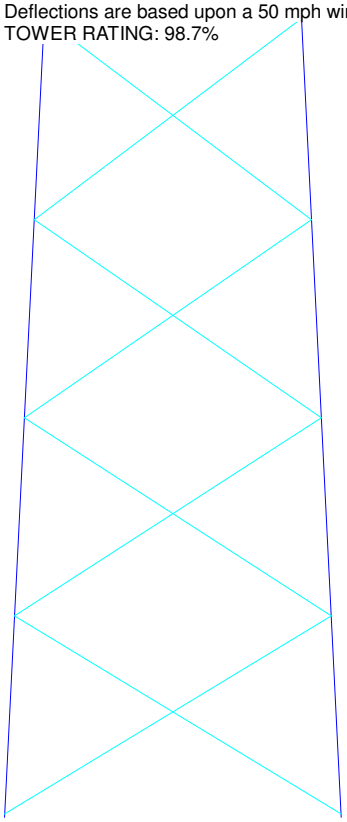
TYPE	ELEVATION	TYPE	ELEVATION
Sector Mount [SM 502-3]	102	7770.00 w/ Mount Pipe	92
APXVSPP18-C-A20 w/ Mount Pipe	102	7770.00 w/ Mount Pipe	92
APXVSPP18-C-A20 w/ Mount Pipe	102	P65-15-XLH-RR w/ Mount Pipe	92
APXV9ERR18-C-A20 w/ Mount Pipe	102	SBNH-1D6565C w/ Mount Pipe	92
APXVTM14-C-120 w/ Mount Pipe	102	P65E-17-XLH-RR w/ Mount Pipe	92
APXVTM14-C-120 w/ Mount Pipe	102	RRUS 32 B30	92
APXVTM14-C-120 w/ Mount Pipe	102	RRUS 32 B30	92
1900MHz RRH (65MHz)	102	RRUS 32 B30	92
1900MHz RRH (65MHz)	102	WCS RRUS-32-B30	92
1900MHz RRH (65MHz)	102	WCS RRUS-32-B30	92
800MHz 2X50W RRH W/FILTER	102	WCS RRUS-32-B30	92
800MHz 2X50W RRH W/FILTER	102	(2) LGP2140X	92
800MHz 2X50W RRH W/FILTER	102	(2) LGP2140X	92
TD-RRH8x20-25	102	(2) LGP2140X	92
TD-RRH8x20-25	102	7020.00	92
TD-RRH8x20-25	102	7020.00	92
8' x 2" Mount Pipe	102	7020.00	92
8' x 2" Mount Pipe	102	RRUS-11	92
8' x 2" Mount Pipe	102	RRUS-11	92
Sabre C10857011 12' V-Boom (3)	92	RRUS-11	92
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	(2) DC6-48-60-18-8F Surge Suppression Unit	92
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92		
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	Side Arm Mount [SO 302-1]	75
7770.00 w/ Mount Pipe	92	KS24019-L112A	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.7%



MAX. CORNER REACTIONS AT BASE:
DOWN: 41 K
SHEAR: 6 K

UPLIFT: -34 K
SHEAR: 6 K

AXIAL
20 K

SHEAR
2 K

MOMENT
57 kip-ft

TORQUE 0 kip-ft
28 mph WIND - 1.0000 in ICE

AXIAL
8 K

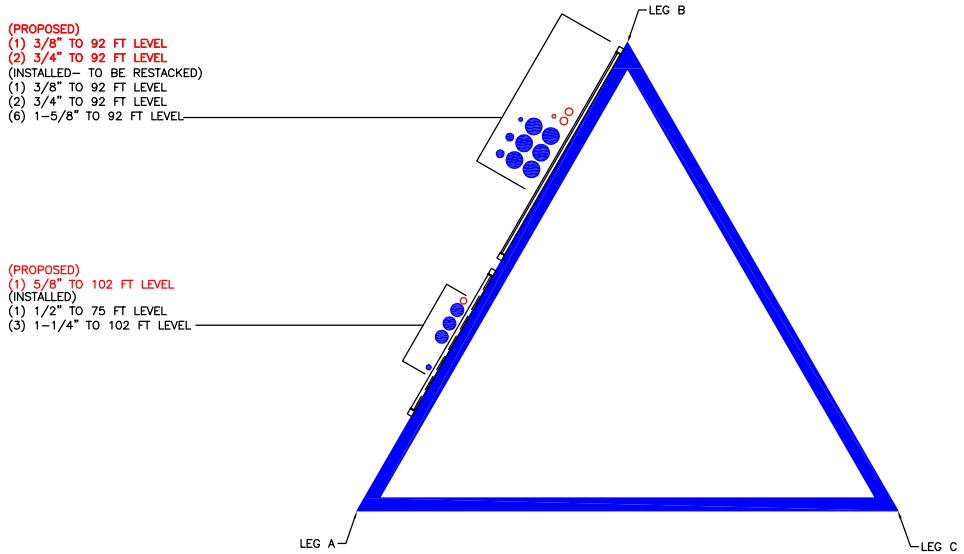
SHEAR
11 K

MOMENT
281 kip-ft

TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: **BU #: 876328 / WEST HARTFORD PARKING GARAGE**			
Project: **2016777.876328.15**			
Client: Crown Castle	Drawn by: ESchnaus	App'd:	
Code: TIA/EIA-222-F	Date: 04/18/16	Scale: NTS	
Path: T:\Crown\876328\15\tnx\876328.eri		Dwg No. E-1	



BUSINESS UNIT: 876328 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

SCALE: N.T.S.

1

PLOT DATE: 4/14/2016 FILE NAME: 876328 BASELEVEL.dwg

Xref R:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STD-VER 5.1.dwg

CROWN REGION ADDRESS

USA

05/02/13	UPDATED PER WORK ORDER # 573421	NJH
02/01/14	APPLICATION ADDED PER WORK ORDER # 686194	KT
22/01/14	UPDATED PER WORK ORDER # 696541	AJJ
11/02/14	UPDATED PER WORK ORDER # 711452	TDC
15/08/14	UPDATED PER WORK ORDER # 913577	BDH
4/1/2016	UPDATED PER WORK ORDER 1173166	BMH
10/02/16	UPDATED PER WORK ORDER 1193255	SAT
17/03/16	UPDATED PER WORK ORDER 1210485	AMT
14/04/16	UPDATED PER WORK ORDER 1222586	ARR

DRAWN BY: **RMK**
CHECKED BY: **LWW**
DRAWING DATE: **18/1/08**

SITE NUMBER:
SITE NAME:

SITE NAME

WEST HARTFORD PARKING GARAGE

BUSINESS UNIT NUMBER

876328

SITE ADDRESS

27-31 SOUTH MAIN ST
WEST HARTFORD, CT 06110
HARTFORD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

April 22, 2016

Ronald F. Van Winkle, Town Manager
Town of West Hartford
Town Hall 50 S. Main St., Rm. 313
West Hartford, Connecticut 06107

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 29 South Main Street, West Hartford (Owners, Crown Castle and Town Center West Associates LLC)

Dear Mr. Van Winkle:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

Centek Engineering, Inc.
3-2 North Branford Road
Branford, Connecticut 06405
Phone: (203) 488-0580
Fax: (203) 488-8587

Steven L. Levine
Real Estate Consultant

April 22, 2016

Town Center West Associates LLC
433 South Main Street
West Hartford, Connecticut 06110

Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing tele-communications facility located at 29 South Main Street, West Hartford (Owners, Crown Castle and Town Center West Associates LLC)

To Whom It May Concern:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

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The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact either your tenant Crown Castle International; the undersigned at 860-830-0380; or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935..

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

Date: April 18, 2016

GPD Engineering and Architecture
Professional Corporation
520 South Main Street, Ste 2531
Akron, OH 44311
(216) 927-8663
dpalkovic@gpdgroup.com

Charles McGuirt
Crown Castle.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5843
	Carrier Site Name:	AWE West Hartford Central
Crown Castle Designation:	**Crown Castle BU Number:**	876328
	Crown Castle Site Name:	WEST HARTFORD PARKING GARAGE
	Crown Castle JDE Job Number:	372963
	Crown Castle Work Order Number:	1222590
	Crown Castle Application Number:	341859 Rev. 2
Engineering Firm Designation:	**GPD Project Number:**	2016777.876328.15
Site Data:	**27-31 South Main St., West Hartford, CT 06110, Hartford County** **Latitude *41° 45' 36.41"*, Longitude *-72° 44' 35.25"*** **40.25 Foot - Self Support and Modified Parking Garage Structural Analysis**	

Dear Charles McGuirt,

GPD is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 893292, in accordance with application 341859, revision 2.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

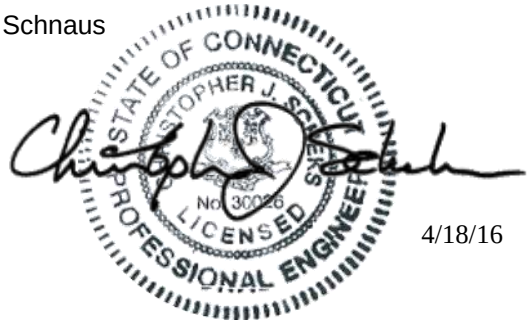
The analysis has been performed in accordance with the 2013 Connecticut State Building Code and the 2003 IBC based upon a 3-second gust wind speed of 100 mph as well as the guidelines stated in TIA/EIA-222-F based upon a fastest mile wind speed of 80 mph.

We at *GPD* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural Analysis prepared by: Eric Schnaus

Respectfully submitted,

Christopher J. Scheks, P.E.
Connecticut #: 0030026



4/18/16

TABLE OF CONTENTS

1) INTRODUCTION

The tower is supported on three legs and has two major sections. It has a triangular cross section made of bolted connections, with an "X" frame configuration. The tower is fabricated with pipe legs and angle diagonals. The tower is galvanized and has no tower lightning.

This tower is a 40.25 ft Self Support tower designed by ROHN in April of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E. The tower base connects to an I-Beam frame that is anchored to the parking garage deck. The base of the tower frame is 65' above grade.

Modifications designed by GPD (Project #: 2015777.876328.08, dated 6/3/2015) consist of installing extension plates to the tower base frame connections and extension plates to the existing stair well walls at varying elevations. These modifications have been installed and were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2013 Connecticut State Building Code and the 2003 IBC based upon a 3-second gust wind speed of 100 mph as well as the guidelines stated in TIA/EIA-222-F based upon a fastest mile wind speed of 80 mph. Additionally a 28 mph fastest-mile with 1.00 inch ice thickness (in accordance with ASCE 7-05) and 50 mph under service loads per the TIA/EIA-222-F.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
92.0	92.0	3	Sabre	C10857011 12' V-Boom	2 1	3/4 3/8	1
	89.0	3	CCI Antennas	TPA-65R-LCUUUU-H8			
		3	Ericsson	RRUS 32 B30			
		1	Raycap	DC6-48-60-18-8F			
		3	Ericsson	WCS RRUS-32-B30			

Notes:
1) See Appendix B for the proposed coax layout.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
102.0	103.0	3	RFS Celwave	APXVTM14-C-120	1	5/8	1
		3	Alcatel Lucent	TD-RRH8x20-25			
		1	RFS Celwave	APXV9ERR18-C-A20	3	1-1/4	
		2	RFS Celwave	APXVSPP18-C-A20			
		2	Alcatel Lucent	1900MHz RRH (65MHz)			
		1	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
	102.0	1	Alcatel Lucent	1900MHz RRH (65MHz)			
		2	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		1		Sector Mount [SM 502-3]			
92.0	92.0	1		T-Arm Mount [TA 702-3]			2
		3	Ericsson	RRUS-11			
		6	Powerwave Tech	LGP2140X			
		6	Powerwave Tech	LGP2140X			4
		3	Ericsson	RRUS-11			
	89.0	3	Powerwave Tech	7770.00	6 2 1	1-5/8 3/4 3/8	3
		1	Powerwave Tech	P65-15-XLH-RR			
		1	Andrew	SBNH-1D6565C			
		1	Powerwave Tech	P65E-17-XLH-RR			
		3	Powerwave Tech	7020.00			
		1	Raycap	DC6-48-60-18-8F			
75.0	77.0	1	Lucent	KS24019-L112A	1	1/2	
	75.0	1		Side Arm Mount [SO 302-1]			

Notes:
1) Reserved Equipment.
2) Equipment to be removed, not considered in this analysis.
3) Equipment to be relocated onto the proposed mount with a centerline of 89'.
4) Equipment to be relocated onto the proposed mount with a centerline of 92'.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
105	105	12		DB980H90	12	1-5/8
		3		Leg Mounting Frame		
		1		GPS Antenna		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings	Rohn Eng. File#: 345895W, Dated: 4/15/1997	1440544	CCIsites
Tower Mapping	GPD Project #: 2014777.876328.03, Dated: 3/04/2014	1440544	CCIsites
Base Frame Design	Greiner Project #: F101508.60, Dated: 2/20/1997	5460756	CCIsites
Parking Garage Design	Unistress Project: Towne Center Garage, Rev. 4, Dated: 10/31/1988	5460756	CCIsites
Parking Garage Modifications Passing Analysis	GPD Project #: 2015777.876328.08, Dated: 6/3/2015	5735731	CCIsites
Parking Garage Modifications	GPD Project #: 2015777.876328.08, Dated: 6/3/2015	5735691	CCIsites
Modification Inspection Report	GPD Project #: 2015777.876328.10, Dated 1/27/2016	6076906	CCIsites

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	105.25 - 85.125	Leg	ROHN 2.5 STD	3	-14.60	54.96	26.6	Pass
T2	85.125 - 65	Leg	ROHN 2.5 STD	38	-37.89	50.20	75.5	Pass
T1	105.25 - 85.125	Diagonal	L1-1/2x1-1/2x1/8	9	-3.31	3.35	98.7	Pass
T2	85.125 - 65	Diagonal	L1-3/4x1-3/4x3/16	46	-3.06	4.49	68.2	Pass
T1	105.25 - 85.125	Top Girt	L2x2x1/8	5	-0.36	2.83	12.7	Pass
T2	85.125 - 65	Top Girt	L2x2x1/8	41	-0.14	2.83	5.1 6.0 (b)	Pass
						Summary	ELC:	LC7
						Leg (T2)	75.5	Pass
						Diagonal (T1)	98.7	Pass
						Top Girt (T1)	12.7	Pass
						Bolt Checks	96.6	Pass
						Rating =	98.7	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Frame and Parking Garage	Varies	78.2	Pass

Structure Rating (max from all components) =	98.7%

Notes:
1) The base frame and parking garage capacity was determined based on reaction comparison from the previous modification design passing analysis (GPD Project #: 2015777.876328.08, dated 6/3/2015). See Appendix C for the reaction comparison and Appendix D for the referenced design and previous calculations.

4.1) Recommendations

The design of the existing tower is sufficient for the proposed loading and will not require modifications.

The design of the modified parking garage is sufficient for the proposed loading and will not require additional modifications.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

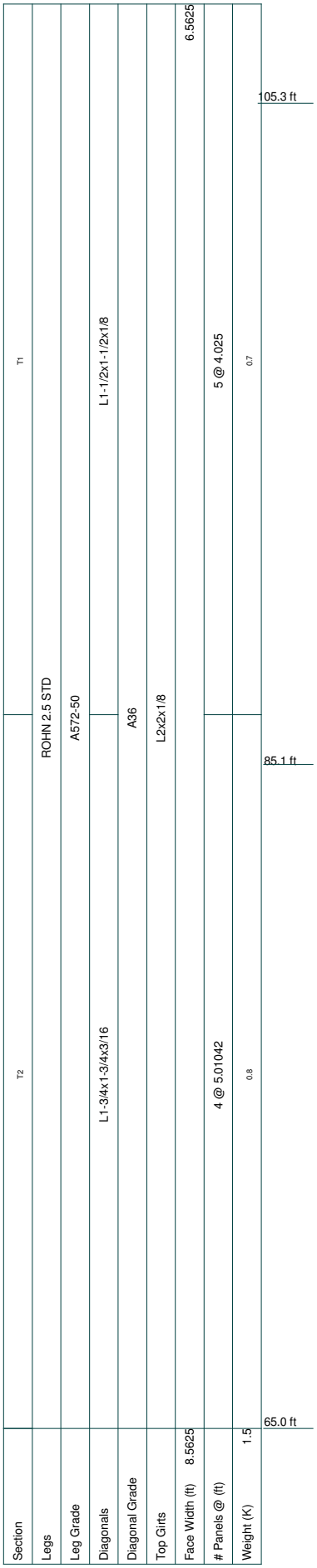
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

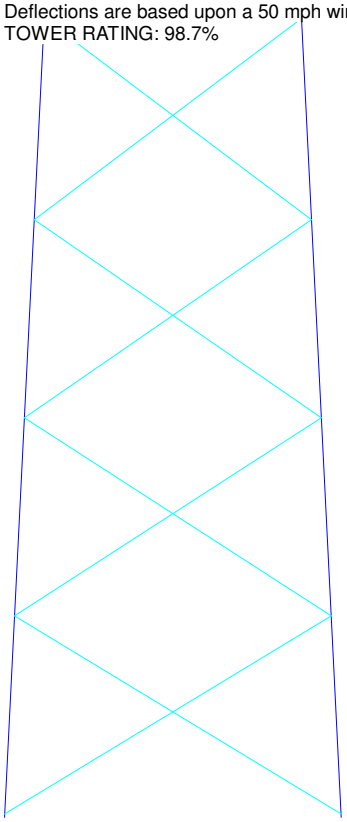
TYPE	ELEVATION	TYPE	ELEVATION
Sector Mount [SM 502-3]	102	7770.00 w/ Mount Pipe	92
APXVSPP18-C-A20 w/ Mount Pipe	102	7770.00 w/ Mount Pipe	92
APXVSPP18-C-A20 w/ Mount Pipe	102	P65-15-XLH-RR w/ Mount Pipe	92
APXV9ERR18-C-A20 w/ Mount Pipe	102	SBNH-1D6565C w/ Mount Pipe	92
APXVTM14-C-120 w/ Mount Pipe	102	P65E-17-XLH-RR w/ Mount Pipe	92
APXVTM14-C-120 w/ Mount Pipe	102	RRUS 32 B30	92
APXVTM14-C-120 w/ Mount Pipe	102	RRUS 32 B30	92
1900MHz RRH (65MHz)	102	RRUS 32 B30	92
1900MHz RRH (65MHz)	102	WCS RRUS-32-B30	92
1900MHz RRH (65MHz)	102	WCS RRUS-32-B30	92
800MHz 2X50W RRH W/FILTER	102	WCS RRUS-32-B30	92
800MHz 2X50W RRH W/FILTER	102	(2) LGP2140X	92
800MHz 2X50W RRH W/FILTER	102	(2) LGP2140X	92
TD-RRH8x20-25	102	(2) LGP2140X	92
TD-RRH8x20-25	102	7020.00	92
TD-RRH8x20-25	102	7020.00	92
8' x 2" Mount Pipe	102	7020.00	92
8' x 2" Mount Pipe	102	RRUS-11	92
8' x 2" Mount Pipe	102	RRUS-11	92
Sabre C10857011 12' V-Boom (3)	92	RRUS-11	92
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	(2) DC6-48-60-18-8F Surge Suppression Unit	92
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92		
TPA-65R-LCUUUU-H8 w/ Mount Pipe	92	Side Arm Mount [SO 302-1]	75
7770.00 w/ Mount Pipe	92	KS24019-L112A	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.7%



MAX. CORNER REACTIONS AT BASE:
DOWN: 41 K
SHEAR: 6 K

UPLIFT: -34 K
SHEAR: 6 K

AXIAL
20 K

SHEAR
2 K

MOMENT
57 kip-ft

TORQUE 0 kip-ft
28 mph WIND - 1.0000 in ICE

AXIAL
8 K

SHEAR
11 K

MOMENT
281 kip-ft

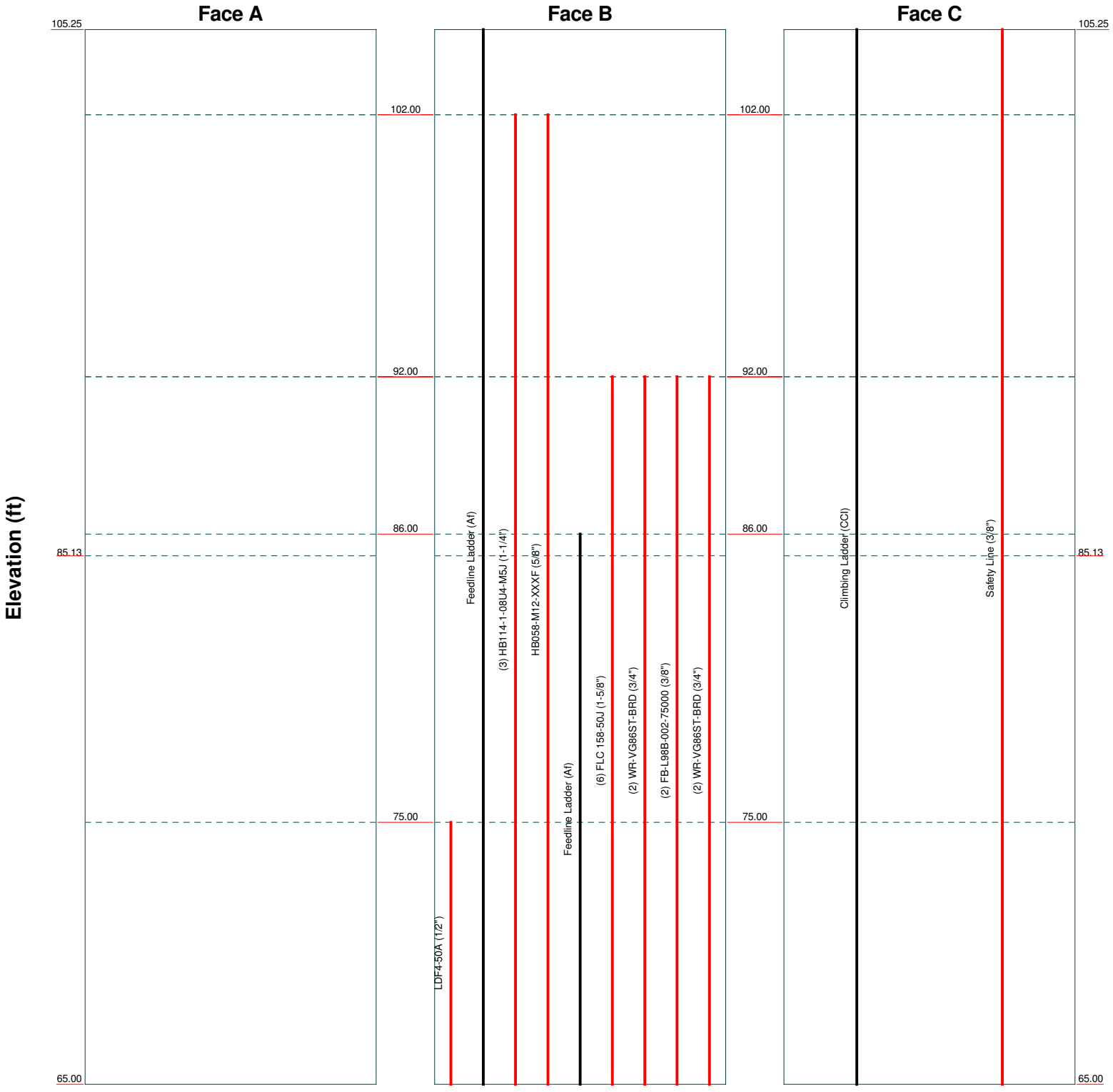
TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: **BU #: 876328 / WEST HARTFORD PARKING GARAGE**			
Project: **2016777.876328.15**			
Client: Crown Castle	Drawn by: ESchnaus	App'd:	
Code: TIA/EIA-222-F	Date: 04/18/16	Scale: NTS	
Path: T:\Crown\876328\15\tnx\876328.eri		Dwg No. E-1	

Feed Line Distribution Chart
65' - 105'3"

Round | Flat | App In Face | App Out Face | Truss Leg



GPD

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: ***BU #: 876328 / WEST HARTFORD PARKING GARAGE***			
Project: ***2016777.876328.15***			
Client: Crown Castle	Drawn by: ESchnaus	App'd:	
Code: TIA/EIA-222-F	Date: 04/18/16	Scale: NTS	
Path: T:\Crown\876328\15\tnx\876328.eri		Dwg No. E-7	

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 105.25 ft above the ground line.
The base of the tower is set at an elevation of 65.00 ft above the ground line.
The face width of the tower is 6.56 ft at the top and 8.56 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 28 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member 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				

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	105.25-85.13			6.56	1	20.13
T2	85.13-65.00			6.56	1	20.13

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	105.25-85.13	4.03	X Brace	No	No	0.0000	0.0000
T2	85.13-65.00	5.01	X Brace	No	No	0.0000	1.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 105.25-85.13	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1-1/2x1-1/2x1/8	A36 (36 ksi)
T2 85.13-65.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1-3/4x1-3/4x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 105.25-85.13	Equal Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 85.13-65.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 105.25-85.13	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	0.0000
T2 85.13-65.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1
105.25-85.13				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
85.13-65.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 105.25-85.13	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 85.13-65.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 105.25-85.13	Flange	0.6250 A325N	4	0.5000 A325X	1	0.5000 A325X	1	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0
T2 85.13-65.00	Flange	0.0000 A325N	0	0.5000 A325X	1	0.5000 A325X	1	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF4-50A (1/2")	B	Yes	Ar (CfAe)	75.00 - 65.00	0.0000	-0.25	1	1	0.0000	0.6300		0.15
Feedline Ladder (Af)	B	Yes	Af (CfAe)	105.25 - 65.00	0.0000	-0.2	1	1	0.0000	3.0000	12.0000	8.40
HB114-1-08U4-M5J (1-1/4")	B	Yes	Ar (CfAe)	102.00 - 65.00	0.0000	-0.2	3	3	0.7500 0.0000	1.5400		1.08
HB058-M12-XXXF (5/8")	B	Yes	Ar (CfAe)	102.00 - 65.00	0.0000	-0.15	1	1	0.0000	0.8400		0.24
Feedline Ladder (Af)	B	Yes	Af (CfAe)	86.00 - 65.00	0.0000	0.38	1	1	0.0000	3.0000	12.0000	8.40
FLC 158-50J (1-5/8")	B	Yes	Ar (CfAe)	92.00 - 65.00	0.0000	0.38	6	3	0.7500 0.0000	2.0150		0.92
WR-VG86ST-BRD (3/4")	B	Yes	Ar (CfAe)	92.00 - 65.00	3.0000	0.4	2	2	0.7500	0.7950		0.60
FB-L98B-002-75000 (3/8")	B	Yes	Ar (CfAe)	92.00 - 65.00	3.0000	0.4	2	2	0.0000	0.0000		0.06
WR-VG86ST-BRD (3/4")	B	Yes	Ar (CfAe)	92.00 - 65.00	0.0000	0.4	2	2	0.0000	0.0000		0.60
Climbing Ladder (CCI)	C	Yes	Af (CfAe)	105.25 - 65.00	-2.0000	0	1	1	0.0000	3.0000	13.0000	4.81
Safety Line (3/8")	C	Yes	Ar (CaAa)	105.25 - 65.00	-2.0000	0	1	1	0.0000	0.3750		0.22

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Sector Mount [SM 502-3]	C	None		0.0000	102.00	No Ice	33.02	33.02	1.67
						1/2" Ice	47.36	47.36	2.22
						1" Ice	61.70	61.70	2.77
						2" Ice	90.38	90.38	3.88
						4" Ice	147.74	147.74	6.08
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	6.71 7.66 8.49 10.20 13.98	0.08 0.14 0.22 0.39 0.87
APXV9ERR18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.73 9.49 10.21 11.60 14.51	7.18 8.46 9.60 11.53 15.77	0.08 0.15 0.23 0.41 0.94
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
1900MHz RRH (65MHz)	A	From Leg	1.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
1900MHz RRH (65MHz)	B	From Leg	1.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
1900MHz RRH (65MHz)	C	From Leg	1.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 2.94 3.18 3.70 4.85	2.77 3.01 3.26 3.78 4.93	0.06 0.08 0.11 0.18 0.35
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.40 2.61 2.83 3.30	2.25 2.46 2.68 3.13	0.06 0.09 0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.40 2.61 2.83 3.30	2.25 2.46 2.68 3.13	0.06 0.09 0.11 0.17
						4" Ice	4.34	4.15	0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.40 2.61 2.83 3.30	2.25 2.46 2.68 3.13	0.06 0.09 0.11 0.17
						4" Ice	4.34	4.15	0.34
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.72 5.01 5.32 5.95	1.70 1.92 2.15 2.62	0.07 0.10 0.13 0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.72 5.01 5.32 5.95	1.70 1.92 2.15 2.62	0.07 0.10 0.13 0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 1.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.72 5.01 5.32 5.95	1.70 1.92 2.15 2.62	0.07 0.10 0.13 0.20
						4" Ice	7.31	3.68	0.40
8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.04 0.05 0.07 0.12
						4" Ice	6.50	6.50	0.31
8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.04 0.05 0.07 0.12
						4" Ice	6.50	6.50	0.31
8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.04 0.05 0.07 0.12
						4" Ice	6.50	6.50	0.31
Sabre C10857011 12' V-Boom (3)	C	None		0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice	33.64 48.17 62.70 91.76	33.64 48.17 62.70 91.76	1.50 2.00 2.51 3.51
						4" Ice	149.88	149.88	5.52
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.68 14.50 15.33 16.94	10.96 12.49 14.04 16.39	0.11 0.22 0.33 0.59
						4" Ice	20.27	21.28	1.30
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.68 14.50 15.33 16.94	10.96 12.49 14.04 16.39	0.11 0.22 0.33 0.59
						4" Ice	20.27	21.28	1.30
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00	0.0000	92.00	No Ice	13.68	10.96	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	14.50	12.49	0.22
			-3.00			1" Ice	15.33	14.04	0.33
						2" Ice	16.94	16.39	0.59
						4" Ice	20.27	21.28	1.30
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	92.00	No Ice	6.22	4.35	0.06
			0.00			1/2" Ice	6.77	5.20	0.11
			-3.00			1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.29
						4" Ice	10.69	10.76	0.68
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	92.00	No Ice	6.22	4.35	0.06
			0.00			1/2" Ice	6.77	5.20	0.11
			-3.00			1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.29
						4" Ice	10.69	10.76	0.68
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	92.00	No Ice	6.22	4.35	0.06
			0.00			1/2" Ice	6.77	5.20	0.11
			-3.00			1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.29
						4" Ice	10.69	10.76	0.68
P65-15-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0.0000	92.00	No Ice	6.55	4.38	0.06
			0.00			1/2" Ice	7.36	5.51	0.11
			-3.00			1" Ice	8.10	6.50	0.17
						2" Ice	9.42	8.17	0.31
						4" Ice	12.24	11.86	0.72
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00	0.0000	92.00	No Ice	11.45	9.36	0.09
			0.00			1/2" Ice	12.06	10.68	0.17
			-3.00			1" Ice	12.69	11.71	0.26
						2" Ice	14.03	13.82	0.48
						4" Ice	17.05	18.22	1.09
P65E-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.0000	92.00	No Ice	11.47	8.70	0.10
			0.00			1/2" Ice	12.08	10.11	0.18
			-3.00			1" Ice	12.71	11.38	0.27
						2" Ice	14.07	13.58	0.49
						4" Ice	17.08	18.18	1.10
RRUS 32 B30	A	From Leg	4.00	0.0000	92.00	No Ice	1.57	1.74	0.06
			0.00			1/2" Ice	1.70	1.96	0.08
			-3.00			1" Ice	1.83	2.19	0.10
						2" Ice	2.08	2.67	0.16
						4" Ice	2.59	3.75	0.32
RRUS 32 B30	B	From Leg	4.00	0.0000	92.00	No Ice	1.57	1.74	0.06
			0.00			1/2" Ice	1.70	1.96	0.08
			-3.00			1" Ice	1.83	2.19	0.10
						2" Ice	2.08	2.67	0.16
						4" Ice	2.59	3.75	0.32
RRUS 32 B30	C	From Leg	4.00	0.0000	92.00	No Ice	1.57	1.74	0.06
			0.00			1/2" Ice	1.70	1.96	0.08
			-3.00			1" Ice	1.83	2.19	0.10
						2" Ice	2.08	2.67	0.16
						4" Ice	2.59	3.75	0.32
WCS RRUS-32-B30	A	From Leg	4.00	0.0000	92.00	No Ice	1.93	2.76	0.08
			0.00			1/2" Ice	2.08	3.02	0.10
			-3.00			1" Ice	2.22	3.29	0.14
						2" Ice	2.50	3.85	0.21
						4" Ice	3.07	5.08	0.41
WCS RRUS-32-B30	B	From Leg	4.00	0.0000	92.00	No Ice	1.93	2.76	0.08
			0.00			1/2" Ice	2.08	3.02	0.10
			-3.00			1" Ice	2.22	3.29	0.14

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 K
						2" Ice	2.50	3.85	0.21
						4" Ice	3.07	5.08	0.41
WCS RRUS-32-B30	C	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.93 2.08 2.22 2.50 3.07	2.76 3.02 3.29 3.85 5.08	0.08 0.10 0.14 0.21 0.41
(2) LGP2140X	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
(2) LGP2140X	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
(2) LGP2140X	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.38 0.49 0.62 0.89 1.54	0.01 0.02 0.03 0.05 0.13
7020.00	A	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
7020.00	B	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
7020.00	C	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
RRUS-11	A	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
RRUS-11	B	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
RRUS-11	C	From Leg	4.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
(2) DC6-48-60-18-8F Surge Suppression Unit	A	From Leg	4.00 0.00 -3.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.02 0.04 0.06 0.11 0.24

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Side Arm Mount [SO 302-1]	A	From Leg	2.00 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.67 2.51 3.35 5.03 8.39	3.27 4.99 6.71 10.15 17.03	0.06 0.09 0.12 0.19 0.32
KS24019-L112A	A	From Leg	4.00 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	105.25 - 85.125	0.460	31	0.0665	0.0044
T2	85.125 - 65	0.158	31	0.0540	0.0031

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Sector Mount [SM 502-3]	31	0.405	0.0661	0.0042	89998
92.00	Sabre C10857011 12' V-Boom (3)	31	0.247	0.0621	0.0037	33961
75.00	Side Arm Mount [SO 302-1]	31	0.065	0.0307	0.0017	44999

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	105.25 - 85.125	1.171	6	0.1692	0.0112
T2	85.125 - 65	0.401	6	0.1373	0.0080

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
102.00	Sector Mount [SM 502-3]	6	1.032	0.1682	0.0108	35372
92.00	Sabre C10857011 12' V-Boom (3)	6	0.630	0.1580	0.0095	13348
75.00	Side Arm Mount [SO 302-1]	6	0.165	0.0781	0.0044	17686

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	105.25	Leg	A325N	0.6250	4	2.48	13.50	0.184 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.5000	1	3.27	2.54	1.287 ✔	1.333	Member Block Shear
		Top Girt	A325X	0.5000	1	0.36	2.72	0.131 ✔	1.333	Member Bearing
T2	85.125	Diagonal	A325X	0.5000	1	3.03	4.08	0.742 ✔	1.333	Member Bearing
		Top Girt	A325X	0.5000	1	0.22	2.72	0.079 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	105.25 - 85.125	ROHN 2.5 STD	20.13	4.02	51.0 K=1.00	24.197	1.7040	-14.60	41.23	0.354 ✔
T2	85.125 - 65	ROHN 2.5 STD	20.16	5.02	63.6 K=1.00	22.099	1.7040	-37.89	37.66	1.006 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	105.25 - 85.125	L1-1/2x1-1/2x1/8	7.70	3.60	146.0 K=1.00	7.002	0.3594	-3.31	2.52	1.316 ✔
T2	85.125 - 65	L1-3/4x1-3/4x3/16	9.70	4.75	166.0 K=1.00	5.418	0.6211	-3.06	3.36	0.910 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	105.25 - 85.125	L2x2x1/8	6.56	6.11	184.6 K=1.00	4.384	0.4844	-0.36	2.12	0.170 ✔
T2	85.125 - 65	L2x2x1/8	6.56	6.11	184.6 K=1.00	4.384	0.4844	-0.14	2.12	0.068 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	105.25 - 85.125	ROHN 2.5 STD	20.13	4.02	51.0	30.000	1.7040	9.92	51.12	0.194 ✔
T2	85.125 - 65	ROHN 2.5 STD	20.16	0.08	1.1	30.000	1.7040	34.39	51.12	0.673 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	105.25 - 85.125	L1-1/2x1-1/2x1/8	7.70	3.60	95.7	29.000	0.2109	3.27	6.12	0.534 ✔
T2	85.125 - 65	L1-3/4x1-3/4x3/16	9.70	4.75	108.5	29.000	0.3779	3.03	10.96	0.276 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	105.25 - 85.125	L2x2x1/8	6.56	6.11	121.2	29.000	0.3047	0.36	8.84	0.040 ✔
T2	85.125 - 65	L2x2x1/8	6.56	6.11	121.2	29.000	0.3047	0.22	8.84	0.024* ✔

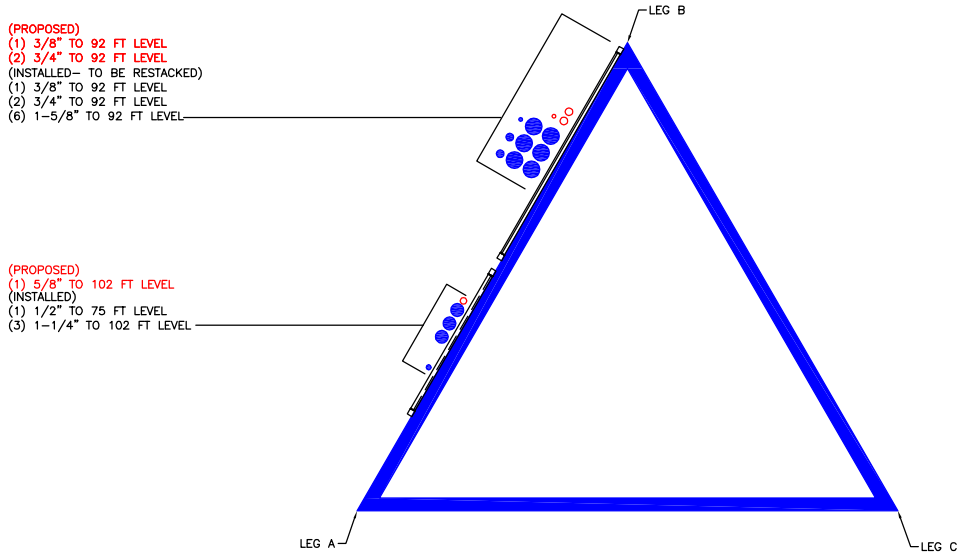
* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	105.25 - 85.125	Leg	ROHN 2.5 STD	3	-14.60	54.96	26.6	Pass
T2	85.125 - 65	Leg	ROHN 2.5 STD	38	-37.89	50.20	75.5	Pass
T1	105.25 - 85.125	Diagonal	L1-1/2x1-1/2x1/8	9	-3.31	3.35	98.7	Pass
T2	85.125 - 65	Diagonal	L1-3/4x1-3/4x3/16	46	-3.06	4.49	68.2	Pass
T1	105.25 - 85.125	Top Girt	L2x2x1/8	5	-0.36	2.83	12.7	Pass
T2	85.125 - 65	Top Girt	L2x2x1/8	41	-0.14	2.83	5.1 6.0 (b)	Pass
						Summary	ELC:	LC7
						Leg (T2)	75.5	Pass
						Diagonal (T1)	98.7	Pass
						Top Girt (T1)	12.7	Pass
						Bolt Checks	96.6	Pass
						Rating =	98.7	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876328 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

SCALE: N.T.S.

1

PLOT DATE: 4/14/2016 FILE NAME: 876328 BASELEVEL.dwg

Xref R:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STD-VER 5.1.dwg

CROWN REGION ADDRESS

USA

05/02/13	UPDATED PER WORK ORDER # 573421	NJH
02/01/14	APPLICATION ADDED PER WORK ORDER # 686194	KT
22/01/14	UPDATED PER WORK ORDER # 696541	AJJ
11/02/14	UPDATED PER WORK ORDER # 711452	TDC
15/08/14	UPDATED PER WORK ORDER # 913577	BDH
4/1/2016	UPDATED PER WORK ORDER 1173166	BMH
10/02/16	UPDATED PER WORK ORDER 1193255	SAT
17/03/16	UPDATED PER WORK ORDER 1210485	AMT
14/04/16	UPDATED PER WORK ORDER 1222586	ARR

DRAWN BY: RMK
CHECKED BY: LWW
DRAWING DATE: 18/1/08

SITE NUMBER:
SITE NAME:

SITE NAME

WEST HARTFORD PARKING GARAGE

BUSINESS UNIT NUMBER

876328

SITE ADDRESS

27-31 SOUTH MAIN ST
WEST HARTFORD, CT 06110
HARTFORD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

ADDITIONAL CALCULATIONS

GPD Engineering and Architecture
Professional Corporation

Client:	Crown Castle	Job No.:	2016777.876328.15		
Site Name:	WEST HARTFORD PARKING GARAGE	Sheet No:	1	Of	1
Site ID:	876328	Made By:	EWS	Date:	4/18/2016
Location:	Hartford County	Chk'd By:	IM	Date:	4/18/2016
Loading Type:	Wind	Code:	G		

Sources

Modified Design: GPD, Project #: 2015777.876328.08, dated 6/3/2015

Modified tnxTower Design Reactions			**tnxTower Output Reactions**		
Uplift	44	k-ft	Uplift	34.12	k-ft
Compression	52	k-ft	Compression	40.65	k-ft

$$\frac{\text{tnxTower Output}}{\text{Original Design}} = 78.2\%$$

APPENDIX D

INSTALLED MODIFICATION DESIGN CALCULATIONS

Date: June 3, 2015

GPD Engineering and Architecture
Professional Corporation
520 South Main Street, Ste 2531
Akron, OH 44311
(330) 572-1200
dpalkovic@gpdgroup.com

George Finley
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6611

Subject:	**Structural Modification Report**	
Carrier Designation:	***Sprint* Co-Locate**	
	Carrier Site Number:	CT03XC075
	Carrier Site Name:	WEST HARTFORD PARKING GARAGE
Crown Castle Designation:	**Crown Castle BU Number:**	876328
	Crown Castle Site Name:	WEST HARTFORD PARKING GARAGE
	Crown Castle Work Order Number:	1057233
	Crown Castle Application Number:	205590
Engineering Firm Designation:	**GPD Group Project Number:**	2014777.876328.08
Site Data:	**27-31 South Main St., West Hartford, Hartford County, CT 06110** **Latitude *41° 45' 36.41"*, Longitude *-72° 44' 35.25"*** **40.25 Foot - Self Support Tower on Rooftop**	

Dear Mr. Finley,

GPD Group is pleased to submit this structural modification of the parking garage supporting the self-support tower at the aforementioned address. The modification design was completed to increase the capacity of the parking garage in serving as a foundation structure for the existing tower and its loading as specified in Table 1 of this document. This design is consistent with the guidelines stated in the 2013 Connecticut State Building Code and the 2003 IBC based upon a 3-second gust wind speed of 100 mph as well as the guidelines stated in TIA/EIA-222-F based upon a fastest mile wind speed of 80 mph.

This design assumes that the parking garage has been well maintained and is in good condition with no structural defects. This is not a condition assessment of the structure. It is only an analysis based on the building drawings by Unistress Corporation (Job #: 8717, dated 8/30/1988), the previous structural analysis by GPD Group (Job #: 2014777.786328.04), the base frame design by Greiner (Project #: F101508.60, dated 1/30/1997), and the modification design presented in Appendix B. Due to the limited information presented in the provided building drawings, assumptions had to be made regarding the amount and distribution of the existing concrete reinforcement as well as the structural function of existing building members.

Initial calculations were performed to determine the design load forces resisted by the building's shear wall system for various loading conditions as specified by local code requirements. The additional loading produced by the tower and its existing loading configuration was then evaluated against these original design loads to determine the tower's impact on the global building system. The modified supporting stairwell wall panels were then evaluated for their ability to transfer all lateral loads into the building diaphragm and their ability to resist the uplift resulting from the tower's overturning forces.

Based upon the information provided and the results of the subsequent analysis we have determined that the global building structure is adequate to support the existing tower forces. Based on our evaluation of the modified stairwell and its capacity to resist the tower uplift forces, it was determined that the **parking garage structure is sufficient** for the existing tower and its loading.

In order for the results of this analysis to be valid, the modifications referenced in the design drawings by GPD (Project #: 2015777.876328.08, dated 6/3/2015) must be installed.

We at the GPD Group appreciate the opportunity of providing our continuing professional services to you. If you have any questions, or would like to discuss any of this information further, please feel free to contact Dan Palkovic on my behalf at 614-859-1607.

Respectfully submitted,

John N. Kabak, P.E.
Connecticut #: 28336

6/3/15

Table 1 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
102.0	103.0	3	Alcatel Lucent	TD-RRH8x20-25	1	5/8	1
		3	RFS Celwave	APXVTM14-C-120			
		1	RFS Celwave	APXV9ERR18-C-A20	3	1-1/4	
		2	RFS Celwave	APXVSPP18-C-A20			
		2	Alcatel Lucent	1900MHz RRH (65MHz)			
		1	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
	102.0	1	Alcatel Lucent	1900MHz RRH (65MHz)			
		2	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		1		Sector Mount [SM 502-3]			
92.0	92.0	3	Communication Components Inc.	DTMABP7819VG12A	6 6 1	1-5/8 3/4 3/8	
		3	Ericsson	RRUS 11-700			
		6	Ericsson	RRUS 12-B2			
		3	Ericsson	RRUS E2 B29			
		3	Ericsson	RRUS-11 800MHz			
		3	Ericsson	WCS RRUS-32-B30			
		2	Raycap	DC6-48-60-18-8F			
		1	Commscope	MTC3615AD Sector Mounts			
	89.0	3	Andrew	SBNHH-1D65A			
		6	CCI Antennas	HPA-65R-BUU-H8			
		6	Ericsson	RRUS A2 MODULE			
		3	Powerwave Technologies	7770.00			
		1	Raycap	DC6-48-60-18-8F			
75.0	77.0	1	Lucent	KS24019-L112A	1	1/2	
	75.0	1		Side Arm Mount [SO 302-1]			

Notes:
1) Reserved Equipment

Table 2 – Tower/Building Anchorage Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Wall Bracket Plates	Varies	43.2	Pass
	Wall Bracket Bolts	Varies	56.2	Pass
	Floor Brackets Plates	Varies	76.5	Pass
	Floor Bracket Bolts	Varies	76.5	Pass
	Anchorage Extension Plates	Varies	65.2	Pass
	Anchorage Extension Bolts/Breakout	Varies	78.7	Pass

APPENDIX A

CALCULATIONS

Global Building Analysis Summary

Design Loads Per Building Drawings		
	Live Load	50 psf
	Roof Live Load	70 psf
Wind Pressures:	0-30	10 psf
	30-40	14 psf
	40+	15 psf

	Center of Mass		Center of Rigidity		Center of Geometry		Total Wind Forces$_{EW}$			Total Seismic Forces$_{EW}$			Total Wind Forces$_{NS}$			Total Seismic Forces$_{NS}$		
Diaphragm Elevation	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)	Shear (k)	Eccentricty (ft)	Moment in Diaphragm (k-ft)	Shear (k)	Eccentricty (ft)	Moment in Diaphragm (k-ft)	Shear (k)	Eccentricty (ft)	Moment in Diaphragm (k-ft)	Shear (k)	Eccentricty (ft)	Moment in Diaphragm (k-ft)
186'-2"	235	1.5	235	1.5	235	1.5	2.67	0.00	0	9.17	0.00	0	1.65	0.00	0	10.71	0.00	0
173'-0"	173.19	56.82	176.50	68.33	176.75	63.5	64.06	0.25	17.00	261.33	3.47	907.83	35.23	4.83	170.28	305.24	12.09	3690.63
163'-0"	170.85	59.92	176.50	68.33	176.75	63.5	121.54	0.25	30.38	484.74	5.93	2876.11	54.78	4.83	264.76	566.32	8.83	4999.95
153'-0"	170.85	59.92	176.50	68.33	176.75	63.5	171.49	0.25	42.87	652.30	5.93	3870.28	73.03	4.83	352.95	762.12	8.83	6728.72

		Maximum Forces - With Tower				Maximum Forces - Without Tower			
Wall Label	Top Elevation	Pu (k)	Vu (k)	Mu (k-ft)	Uplift (k)	Pu (k)	Vu (k)	Mu (k-ft)	Uplift (k)
7-1	186'-2"	7.21	4.37	57.53	0	7.21	1.53	20.12	0
	173'-0"	81.24	48.71	509.18	0	81.24	48.56	505.76	0
	163'-0"	156.71	90.31	1412.32	0	156.71	90.17	1407.47	0
	153'-0"	232.19	121.54	2627.73	0	232.19	121.40	2621.45	0
7-2	186'-2"	7.21	4.37	57.53	0	7.21	1.53	20.12	0
	173'-0"	78.01	48.71	509.18	0	78.01	48.56	505.76	0
	163'-0"	150.25	90.31	1412.32	0	150.25	90.17	1407.47	0
	153'-0"	222.50	121.54	2627.73	0	222.50	121.40	2621.45	0
Ha	186'-2"	77.27	6.02	79.27	-63.44	6.26	1.15	15.09	0
	173'-0"	94.69	0.00	79.27	-50.38	24.47	0.00	15.09	0
	163'-0"	109.17	0.00	79.27	-39.52	40.78	0.00	15.09	0
	153'-0"	123.66	0.00	79.27	-28.65	57.78	0.00	15.09	0
Hb	186'-2"	45.92	6.02	79.27	-39.31	2.51	1.15	15.09	0
	173'-0"	64.36	0.00	79.27	-25.48	29.98	0.00	15.09	0
	163'-0"	81.28	0.00	79.27	-12.79	56.92	0.00	15.09	0
	153'-0"	98.21	0.00	79.27	-0.09	83.85	0.00	15.09	0
Ja	186'-2"	79.56	6.02	79.27	-62.22	10.00	1.15	15.09	0
	173'-0"	92.37	0.00	79.27	-52.61	24.06	0.00	15.09	0
	163'-0"	102.95	0.00	79.27	-44.68	37.55	0.00	15.09	0
	153'-0"	113.52	0.00	79.27	-36.75	52.15	0.00	15.09	0
Jb	186'-2"	50.51	6.02	79.27	-36.85	10.00	1.15	15.09	0
	173'-0"	66.00	0.00	79.27	-25.24	26.74	0.00	15.09	0
	163'-0"	79.26	0.00	79.27	-15.29	42.92	0.00	15.09	0
	153'-0"	92.53	0.00	79.27	-5.34	60.21	0.00	15.09	0

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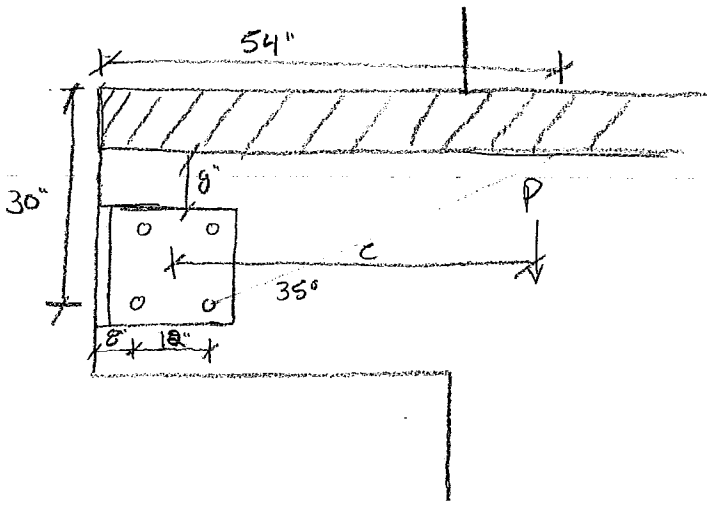
WALL - WALL CONNECTIONS

$P_{u\,required} = 21\,kips / 0.85_R = 24.71\,kips$



$t_w = 8"$

USE 1¼" F1554-55 RODS

$\phi V_{cbg} = 0.7 \frac{A_{vc}}{A_{vco}} \psi_{ec} \psi_{ed} \psi_c \psi_h V_b$

$l_e = t_w$

$d_a = 1¼"$

$f'_c = 6000psi$

$ca_1 = 30"$

$e = 36"$

$A_{vco} = 4.5(ca_1)^2 = 4050in^2$

$A_{vc} = 54" \times 8" = 432in^2$

$\psi_c = 1.0$

$\psi_{ec} = 1/(1+2e/3ca_1) = 0.58$

$\psi_{ed} = 0.7 + 0.3\left(\frac{c_{a,min}}{1.5h_{ef}}\right) = 0.8$

$\psi_h = \sqrt{\frac{1.5ca_1}{h_a}} = 2.37$

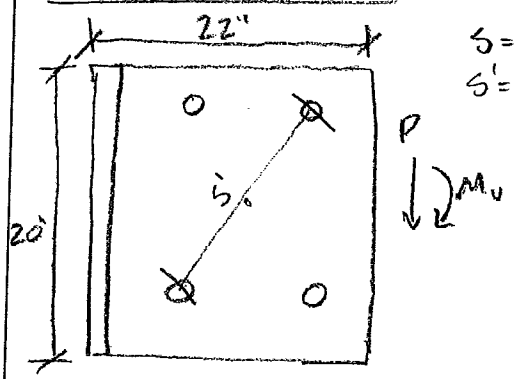
$V_b = \left[7\left(l_e/d_a\right)^{0.2}\sqrt{d_a}\right]\lambda\sqrt{f'_c}\,(ca_1)^{1.5} = 7\left(8/1.25\right)^{0.2}\sqrt{1.25}\sqrt{5000}\,(30)^{1.5} = 131.81\,kips$

$\phi V_{cbg} = 0.7\left(432in^2/4050in^2\right)(0.58)(0.8)(1.0)(2.37)131.81kips = 10.9\ kips/connection$

$P_u/\phi V_{cbg} \times n \Rightarrow n_{req} = 3$ connections

$P_u/\phi V_{cbg} = \frac{21kips}{10.9 \times 3} = 64.2\%$

PLATE / BOLT DESIGN



$\phi R_n = 31.1\,kips$

$M_{us} = P_u(e) = \frac{24.71kips}{3}\left(36"\right) = 296.5\,k\text{-}in$

$Max\ V = P/n + \frac{M_u}{2s'} = \frac{8.24kips}{4bolts} + \frac{296.5}{2 \times 12\sqrt{2}}$

$V_u = 10.8\,kips/bolt \rightarrow$ ALREADY HAS SF=.85

$V_u/\phi R_n = \frac{10.8kips \times .85}{31.1\,kips} = 29.4\%$

t_{req}: $M_{uPLATE} = P_u(e+e_p) = 8.24\text{kips}(36" + 14") = 412\ k\cdot in$ → w/ .85 SF

$$Z_{req} = \frac{M_{up}}{0.9F_y} = \frac{412\ k\cdot in}{.9\times 36 ksi} = 12.72\ in^3$$

$$t_{req} = \frac{Z_{req}\times 4}{d^2} = \frac{12.72\ in^3 \times 4}{(20in)^2} = .12 \Rightarrow \text{USE } 1/4" \text{ THICK}$$

CHECK BOLTS ON OTHER WALL: ASSUME (2) 1¼ F1554-55 BOLTS
FIND d_{req}

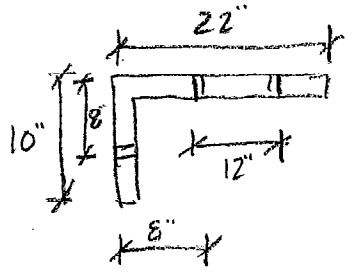
$V_b = P_u/2\text{bolts}$
$T_b = \frac{M_u}{d}$

$V_b = 8.24/2 = 4.12$ KIPS BOLT
$V_b/\phi V_n = 4.12/31.1\text{kips} = 13.2\% < 30\%$.
ONLY CHECK TENSION

$T_b = \frac{412\ k\cdot in}{d_{req}}$

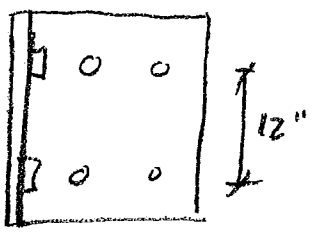
$\phi R_{n\,tension} = \phi F_n A_b$ $F_n = 0.75F_u = 0.75\times 75 ksi = 56.25 ksi$
$\phi R_n = 0.75\times 56.25 ksi \times 1.23 in^2 = 51.9$ KIPS

$51.9\text{kips} = \frac{412\ k\cdot in}{d_{req}}$ $\Rightarrow d_{req} = 8"$ → USE $d = 12"$



$t = 1/4"$

$\phi_b = 1\frac{1}{4}"$, F1554-55 ksi USE ¼" BACKER PLATES



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FRAME-WALL CONNECTIONS $\phi V_{cbg} = \frac{A_{vc}}{A_{vco}} \psi_6 \psi_{ec} \psi_{ed} \psi_{hv} V_b$

MAX PULLOUT CASES: $\psi_{ec} = \psi_{ed} = 1.0$ FOR ALL CASES

$f'_c = 5000$ psi
$d_a = 1\frac{1}{4}"$
$l_c = 8" = h_a$

$\psi_c = 1.2$ – GRABS SOME REBAR
d_b CAN BE < #4

WALL: H_a $\phi V_{cbg\,MAX} = 63$ kips
H_b $\phi V_{cbg\,MAX} = 32.4$ kips
J_a $\phi V_{cbg\,MAX} = 47.7$ kips
J_b $\phi V_{cbg\,MAX} = 47.7$ kips

UPLIFT REQUIRED:	H_a	H_b	J_a	J_b
186'-2	63.4	39.3	62.2	36.9
173'-0	50.4	25.5	52.6	25.24
163'-0	39.5	12.8	44.7	15.3
153'-0	28.7	.1	36.8	5.3 ← w/ .85 S.F, GO TO HERE FOR J_A
143'-0		—	28.81	—
133'-0		—	20.9	—

SAMPLE ϕV_{cbg}:

WALL J_b: USE $C_{a1} = 36"$

$\psi_{hv} = \sqrt{\frac{1.5\,c_{a1}}{h}} = \sqrt{\frac{1.5 \times 36"}{8}} = 2.6$

$V_b = 7\left(l_e/d_a\right)^{0.2}\sqrt{d_a}\sqrt{f'_c}\,(c_{a1})^{1.5} = 7\left(8/1.25\right)^{0.2}\sqrt{1\frac{1}{4}}\sqrt{5000}\,(36)^{1.5}$

$= 173.27$ kips

$A_{vc} = (36)^2 \times 4.5 = 5832\,in^2$

$A_{vco} = 92" \times 8" = 736\,in^2$

$\phi V_{cbg} = 0.7\left(\frac{5832\,in^2}{736\,in^2}\right) 1.0 \times 1.0 \times 1.2 \times 2.6 \times 173.27$ kips

$= 47.7$ kips

GPD GROUP
Gleus, Pyle, Schomer, Burns & DeHaven, Inc.

Job 2015777.876328.08
Sheet No. 2 of 2
Calculated by ACOURTNEY Date 6/3/15
Checked by _____ Date _____

ALL ANCHORS CAN STOP AT 173'-0" EXCEPT FOR J_A WHICH HAS A MUCH HIGHER $P_{UREQ}/\phi V_{cbg\,MAX}$

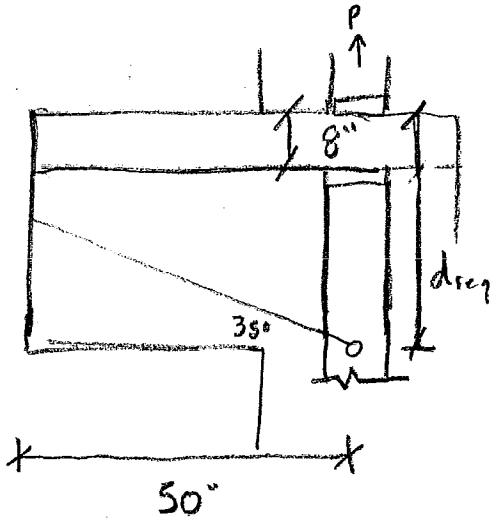
FOR J_A

THIS ANCHOR NEEDS TO GO DOWN TO JUST BELOW THE SPLIT @ 153'-0"

SO, ANCHORS THERE NEED TO DEVELOP 36.6 KIPS

ϕR_{nv} OF 1¼" FISS4-55 ksi = 31.1 KIPS

→ NEED AT LEAST (2) BELOW FLOOR AND NEED DEPTH TO ENGAGE FULL WIDTH OF WALL



$d_{req} = \frac{50"}{1.5} = 33.33"$

→ USE $d = 36"$ FOR TOP ANCHOR

& 6" SPACING BETWEEN

FOR OTHERS

NEED TO DEVELOP 63 KIPS MAX IN BOLTS

$63/\phi R_n =$ 3 BOLTS REQUIRED

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Sheet No. 1 of 2
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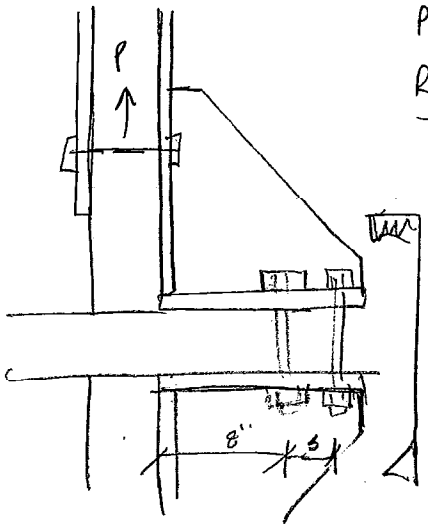
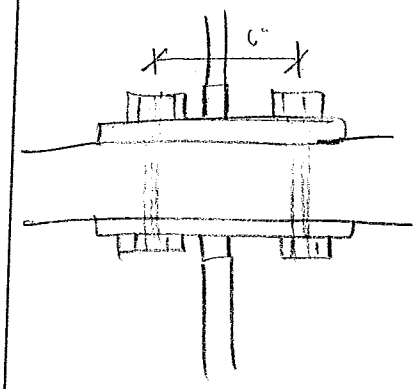
FLOOR-FLOOR CONNECTION – OPTION #2



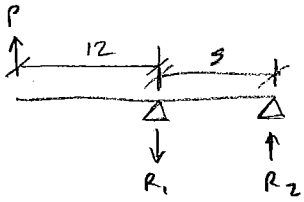


$P = 63.4$ kips

REQUIRED PLATE $A_g = \frac{P/0.85\,S.F}{\phi F_y} = \frac{63.4\text{ kips}/0.85}{0.9 \times 36\text{ ksi}}$

$A_g = 2.3\text{ in}^2$

$b = 6"$, $t_p = 0.383 \rightarrow$ USE 1/2" PLATE



DETERMINE s, SUCH THAT $R_1/R_2 < \phi R_n$ OF BOLT

$\phi R_n = 0.75 F_n A_b = 0.75 \times 0.75 F_u A_b$

USE FU54 – 105 ksi AND .85 S.F.

$0.85 \times \phi R_n$: 3/4"	= 26.4 kips	s_{req} = —
7/8"	= 35.9 kips	—
1"	= 46.9 kips	25 in
1-1/4"	= 73.3 kips	9.1 in
1-1/2	= 105.6 kips	5.15 in

$\Sigma M_{R_2} \Rightarrow P(12+s) = R_1(s)$

$12P + sP = sR_1$

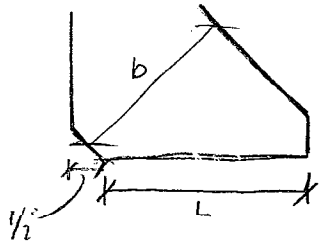
$12P = sR_1 - sP$

$12P = (R_1 - P)s$

$P_{@\ PLATE\ LEVEL} = 63.4 - 0.9(14.31) = 50.5$ kips

– USE (4) 1-1/2" BOLTS SPACED @ 6" w/ 2" EDGE DISTANCE

- (1) STIFFENER IN CENTER



$L = 15"$

$b = 10.9375"$

$M_u = P_e = 50.5\text{ kips}\left(8" + 5/2\right) = 555.7\text{ k-in}$

$Z_{req} = \frac{M_u}{\phi F_y} = 20.2\text{ in}^3$ (USING .85 S.F) $= \frac{tb^2}{4}$

→ USE 3/4" PLATE

% CAPACITY = 76.5%

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Job 2015777.876328.00
Sheet No. 2 of 2
Calculated by ACOURTNEY Date 6/3/15
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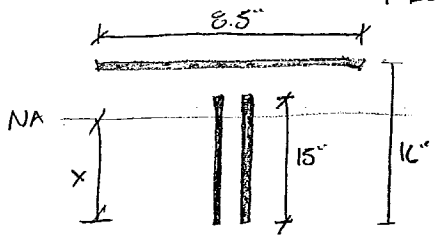
CHECK FORCE IN WELDS

DETERMINE WIDTH OF PLATE REQUIRED FOR CLEARANCE OF TIGHTENING

$= 3.75 \times 2 + t_g = 8.25"$ + EDGE DISTANCE → USE 12" PLATE



FIND N.A

$(8.5")(16-x) + 2(15-x)(15-x)/2 = 2(x)(x/2)$

$136 - 8.5x + x^2 - 30x + 225 = x^2$

$x = 9.38$ in

$$I = \Sigma[(bh^3/12) + bhd^2]$$

$$I = 2\left(\frac{w(15)^3}{12} + w(15)(9.38/2)^2\right) + \frac{8.5w^3}{12} + w\,8.5\,(16-9.38)^2$$

FOR 1/4" WELD
$I = 281.9\ in^4$
$A = 6.8\ in^2$

$\sigma_{TOTAL} = \sigma_{MOMENT} + \sigma_{AXIAL} = \frac{M_y}{I} + \frac{P}{A} = 32.5 ksi$

$w \times \sigma_{ALLOW} = \frac{\phi R_w}{L} = 0.75 \times 0.6 \times 70 ksi\,(1.5)(.707 \times 1/4") = 8.35$ k-ips/in

$= 68.8\%$

FOR VERTICAL WELD, 1.5 FACTOR NOT APPLICABLE TO P

CAPACITY = 78.7%

ACTUAL PLATE SIZE IS 12" LONG ∴ CAPACITY WILL BE LOWER.

APPENDIX B

MODIFICATION DRAWINGS

WEST HARTFORD PARKING GARAGE

BU #: 876328

MODIFICATION DESIGN
DRAWINGS PREPARED FOR:

CROWN CASTLE

STRUCTURAL INFORMATION:

STRUCTURE DOC/JOB #:	ROHN/FILE #: 345895
STRUCTURE HEIGHT/TYPE:	61' ROOFTOP
STRUCTURE LOCATION:	
LAT.:	41° 45' 36.41"
LONG.:	-72° 44' 35.25"
STREET ADDRESS:	27-31 SOUTH MAIN STREET
CITY, STATE ZIP:	WEST HARTFORD, CT 06110
COUNTY:	HARTFORD
STRUCTURAL DESIGN DRAWINGS:	CCI/WO #: 1057233
STRUCTURAL ANALYSIS REPORT:	GPD/WO #: 738067
STRUCTURAL ANALYSIS DATE:	03/09/15
APPLICATION ID #:	205590
CCI DOC ID #:	5587864

CODE COMPLIANCE:

GOVERNING CODES:	TIA/EIA-222-F, 2003 IBC,& 2013 CONNECTICUT BUILDING CODE
WIND SPEEDS: (PER TOWER DESIGN)	100 MPH 3-SECOND GUST (2013 CBC)
	80 MPH FASTEST MILE (TIA/EIA-222-F)
	38 MPH FASTEST MILE (W/ ICE)
ICE THICKNESS:	1"

SITE MAP:

CROWN PM:

MR. JOHN MCGEE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277
(704) 405-8253
JOHN.MCGEE @CROWNCASTLE.COM

SHEET INDEX:

GPD Engineering and Architecture
Professional Corporation
520 South Main Street
Akron, Ohio 44311
330.572.2100 Fax 330.572.2102

CROWN CASTLE

REV.	DATE	DESCRIPTION

CROWN CASTLE
27-31 SOUTH MAIN STREET
WEST HARTFORD, CT 06110

TITLE SHEET

ISSUED FOR:	
PERMIT	6/3/2015
BID	-
CONSTRUCTION	-
RECORD	-

ENGINEER	DESIGNER
AC	AC
PROJECT MANAGER	APPROVED BY
JS	JNK

JOB NO.
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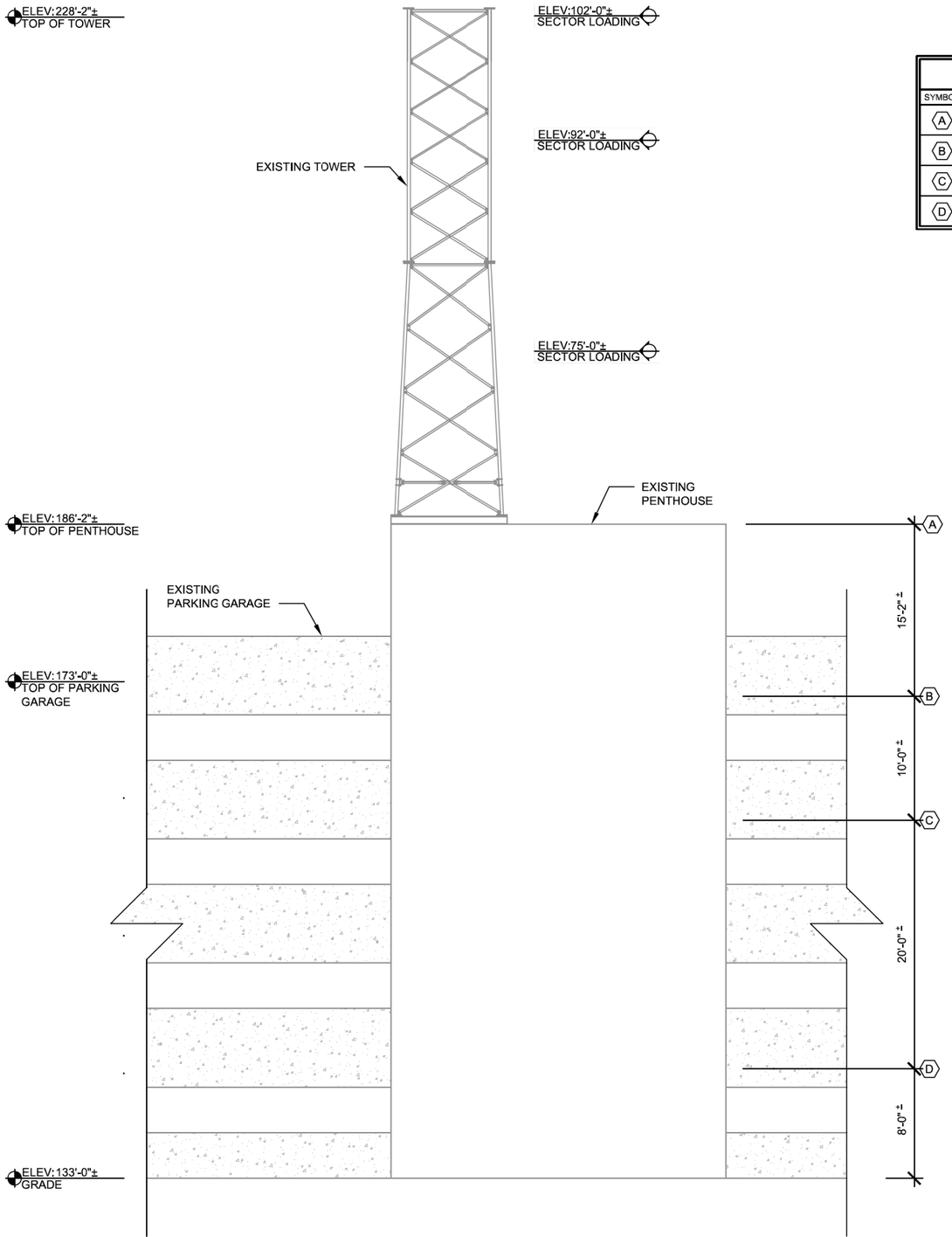
T-01



BUILDING ELEVATION (LOOKING WEST)

3/32"=1'-0"±

MODIFICATION SCHEDULE

SYMBOL	ELEVATION	MEMBER TYPE	EXISTING MEMBER	NEW MEMBER	NOTES
A	186'-2"±	ANCHOR EXTENSION PLATES	FRAME ANCHOR BRACKETS	1/2" THICK EXTENSION PLATES	INSTALL EXTENSION PLATES TO EXISTING TOWER BASE FRAME CONNECTIONS. SEE SHEETS S-02 THROUGH S-04 & S-07 FOR MORE INFORMATION.
B	171'-0"±	WALL CONNECTION BRACKET	-	1/2" THICK PLATES	INSTALL CONNECTION PLATES TO THE EXISTING STAIR WELL WALLS. SEE SHEET S-02 & S-06 FOR MORE INFORMATION.
C	161'-0"±	WALL CONNECTION BRACKET	-	1/2" THICK PLATES	INSTALL CONNECTION PLATES TO THE EXISTING STAIR WELL WALLS. SEE SHEET S-02 & S-06 FOR MORE INFORMATION.
D	141'-0"±	WALL CONNECTION BRACKET	-	1/2" THICK PLATES	INSTALL CONNECTION PLATES TO THE EXISTING STAIR WELL WALLS. SEE SHEET S-02 & S-06 FOR MORE INFORMATION.

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CROWN CASTLE

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27-31 SOUTH MAIN STREET
WEST HARTFORD, CT 06110

BUILDING ELEVATION & MODIFICATION SCHEDULE

ISSUED FOR:	
PERMIT	6/3/2015
BID	-
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RECORD	-

ENGINEER	DESIGNER
AC	AC
PROJECT MANAGER	APPROVED BY
JS	JNK

JOB NO.
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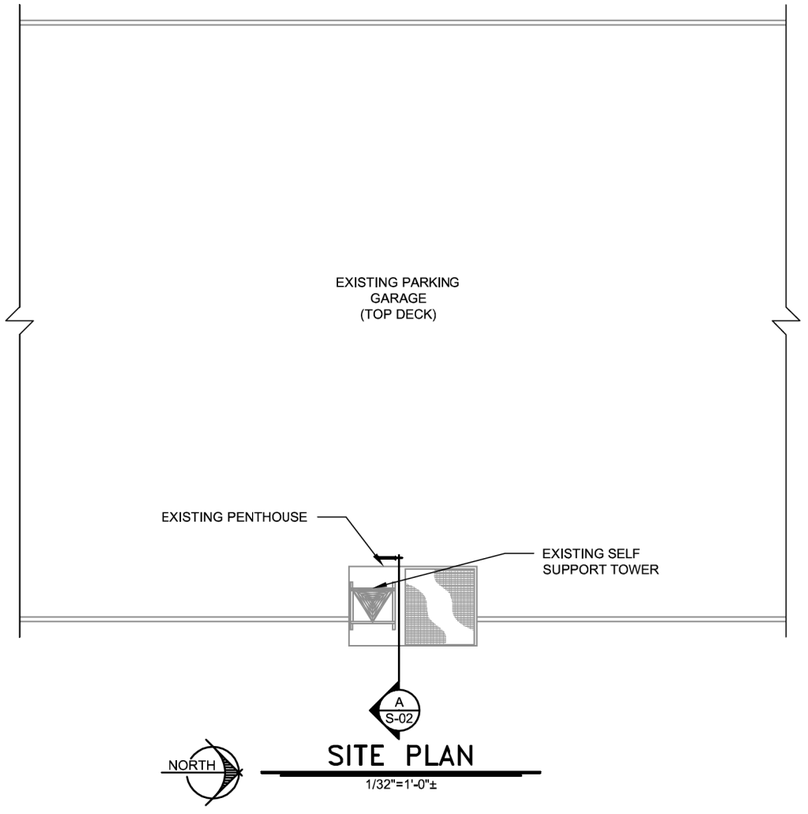
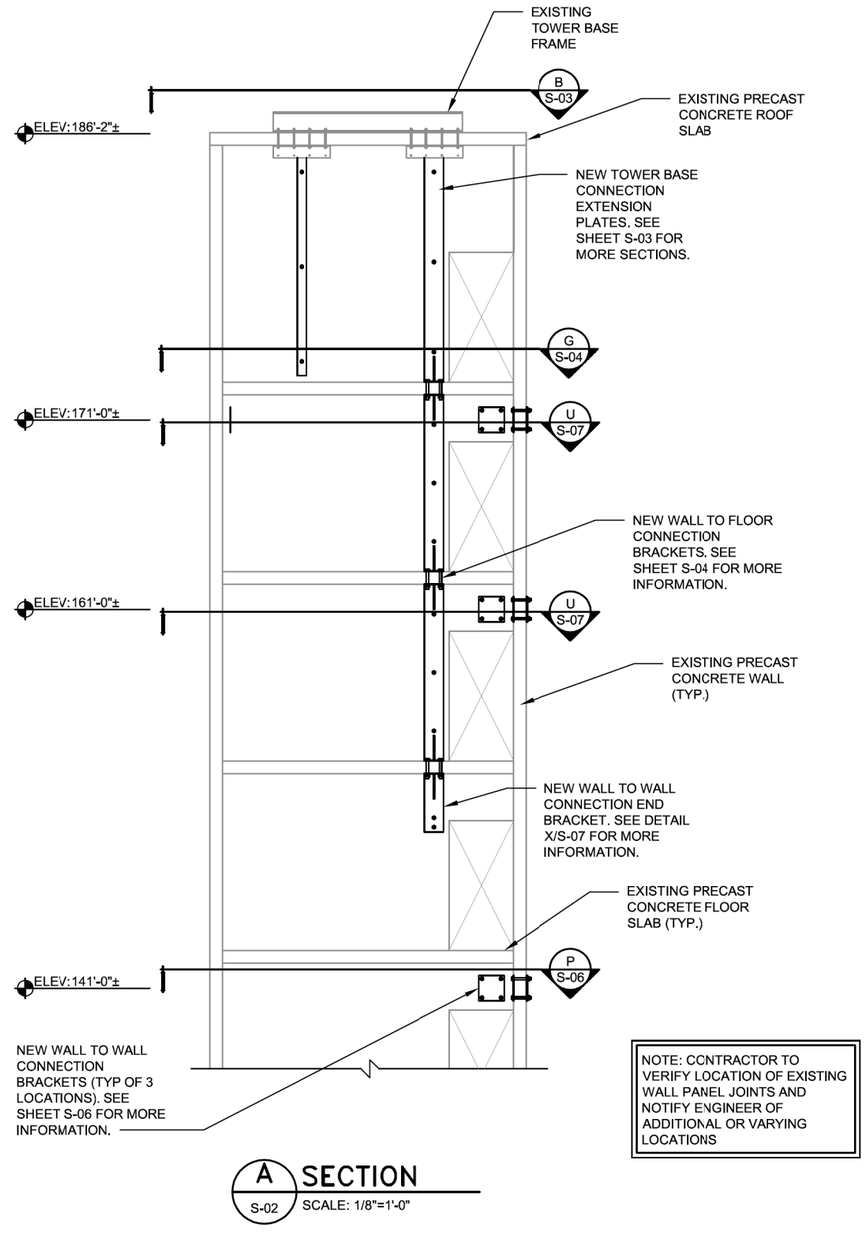
S-01



SITE PLAN

1/32"=1'-0"±



NOTE: CONTRACTOR TO VERIFY LOCATION OF EXISTING WALL PANEL JOINTS AND NOTIFY ENGINEER OF ADDITIONAL OR VARYING LOCATIONS

A SECTION

A / S-02

SCALE: 1/8"=1'-0"

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CROWN CASTLE

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SITE PLAN &
& SECTIONS

ISSUED FOR:	
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RECORD	-

ENGINEER	DESIGNER
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PROJECT MANAGER	APPROVED BY
JS	JNK

JOB NO.
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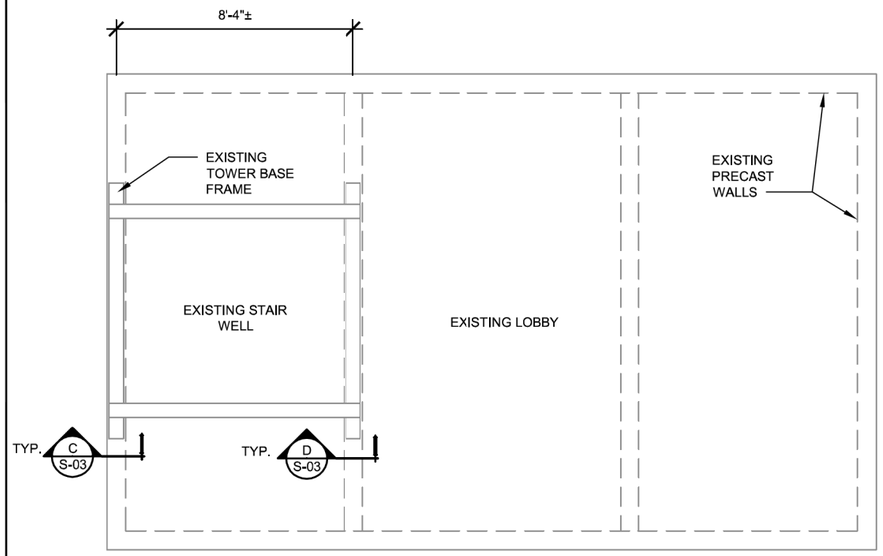
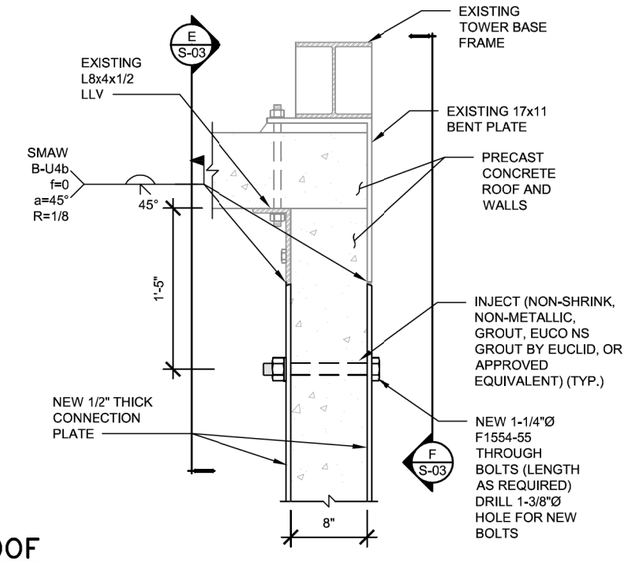
S-02



B ENLARGED FRAMING PLAN AT PENTHOUSE ROOF

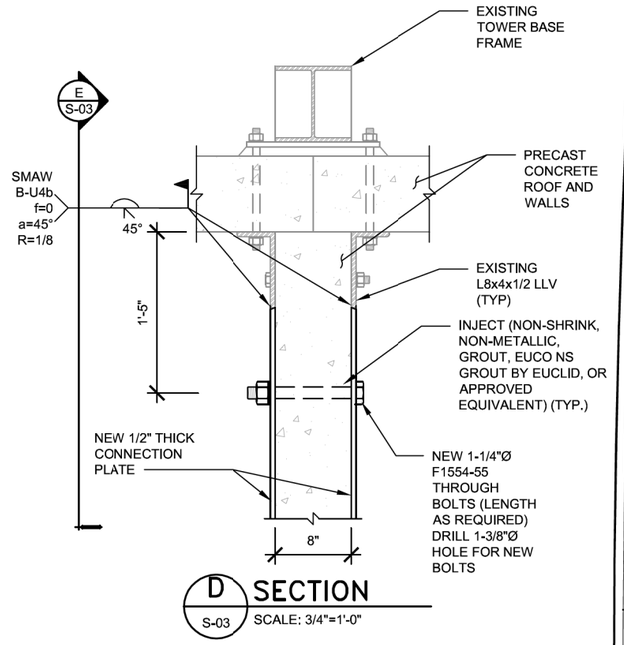
B S-03 SCALE: 3/16"=1'-0"

NORTH



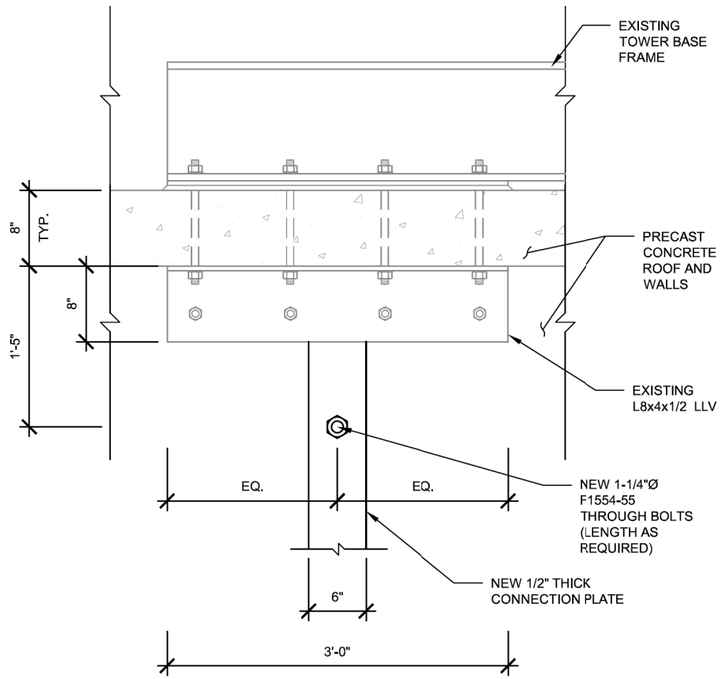
C SECTION

C S-03 SCALE: 3/4"=1'-0"



D SECTION

D S-03 SCALE: 3/4"=1'-0"



E SECTION

E S-03 SCALE: 3/4"=1'-0"

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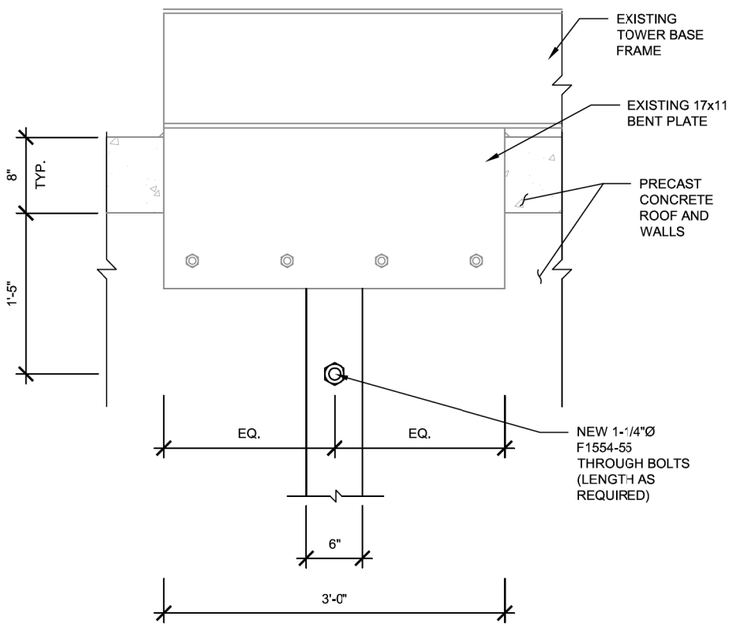
NOTE: CONTRACTOR TO FIELD VERIFY LOCATION OF ALL EXISTING REBAR AND PRECAST PANEL CONNECTION PLATES PRIOR TO DRILLING AND FABRICATING HARDWARE. CONTRACTOR SHALL NOT DRILL THROUGH ANY EXISTING REBAR OR CONNECTIONS PLATES.



F SECTION

F S-03 SCALE: 3/4"=1'-0"

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CROWN CASTLE

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WEST HARTFORD, CT 06110

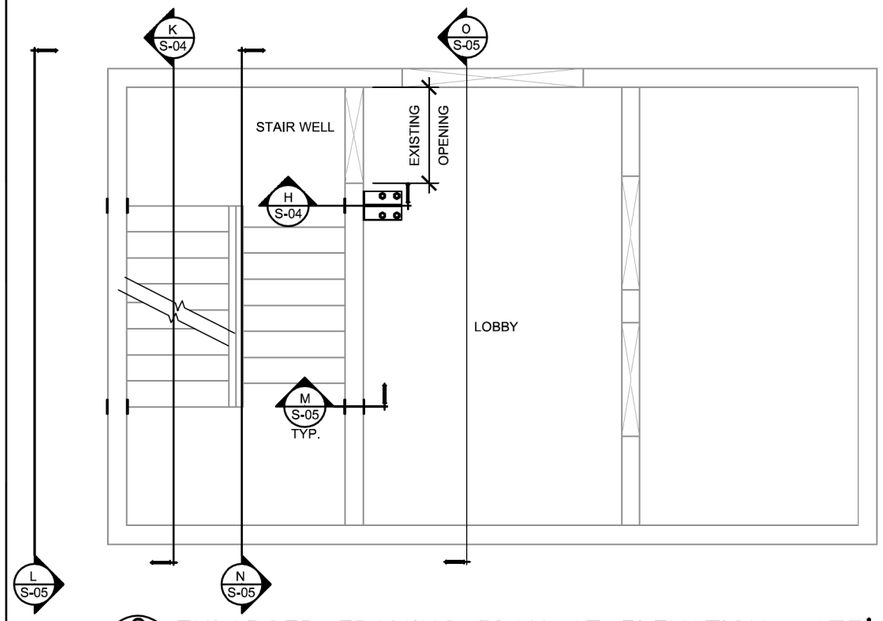
MODIFICATION SECTIONS

ISSUED FOR:	
PERMIT	6/3/2015
BID	-
CONSTRUCTION	-
RECORD	-

ENGINEER	DESIGNER
AC	AC
PROJECT MANAGER	APPROVED BY
JS	JNK

JOB NO.
2015777.876328.08

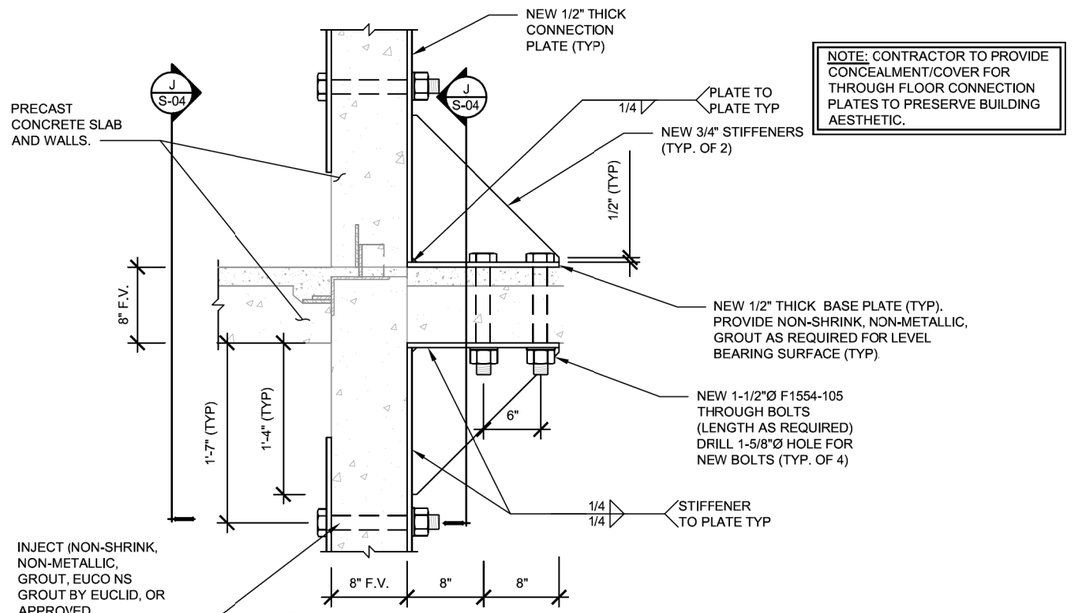
S-03



G S-04 ENLARGED FRAMING PLAN AT ELEVATION +173'-0"

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

NORTH



NOTE: CONTRACTOR TO PROVIDE CONCEALMENT/COVER FOR THROUGH FLOOR CONNECTION PLATES TO PRESERVE BUILDING AESTHETIC.

H S-04 SECTION

SCALE: 3/4"=1'-0"

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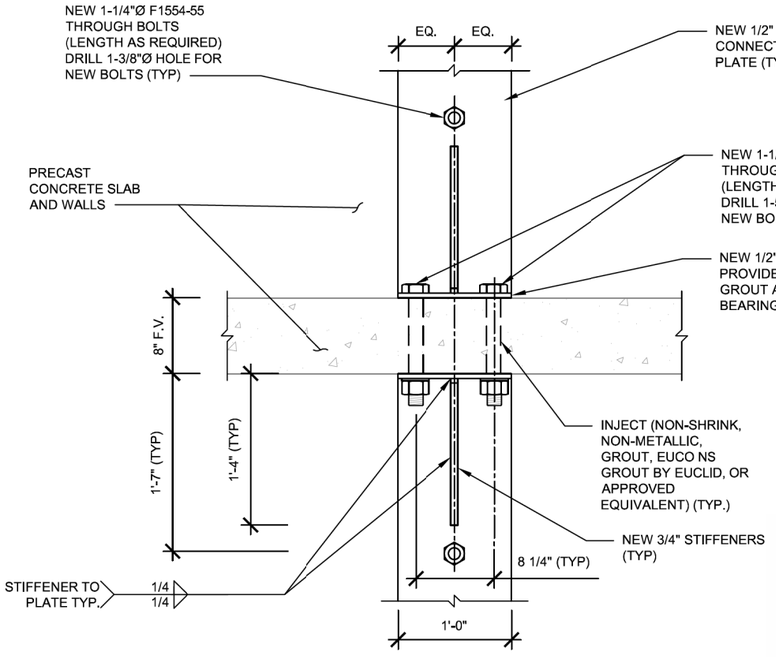

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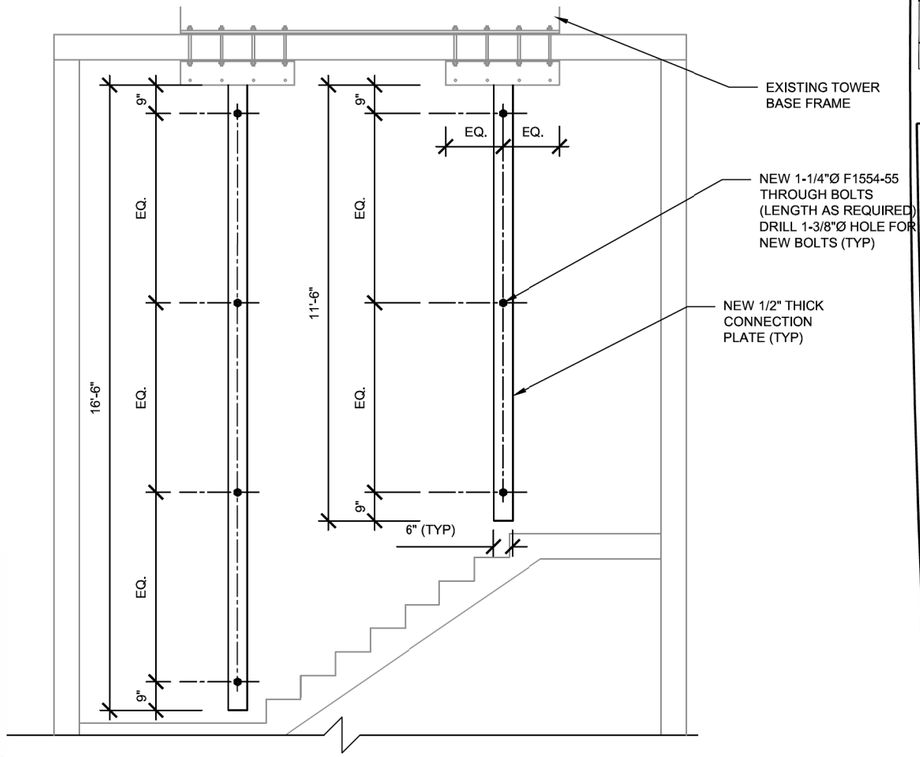
J S-04 SECTION

SCALE: 3/4"=1'-0"



K S-04 ELEVATION

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

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CROWN CASTLE

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ADDITIONAL SECTIONS

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PERMIT	6/3/2015
BID	-
CONSTRUCTION	-
RECORD	-

ENGINEER	DESIGNER
AC	AC
PROJECT MANAGER	APPROVED BY
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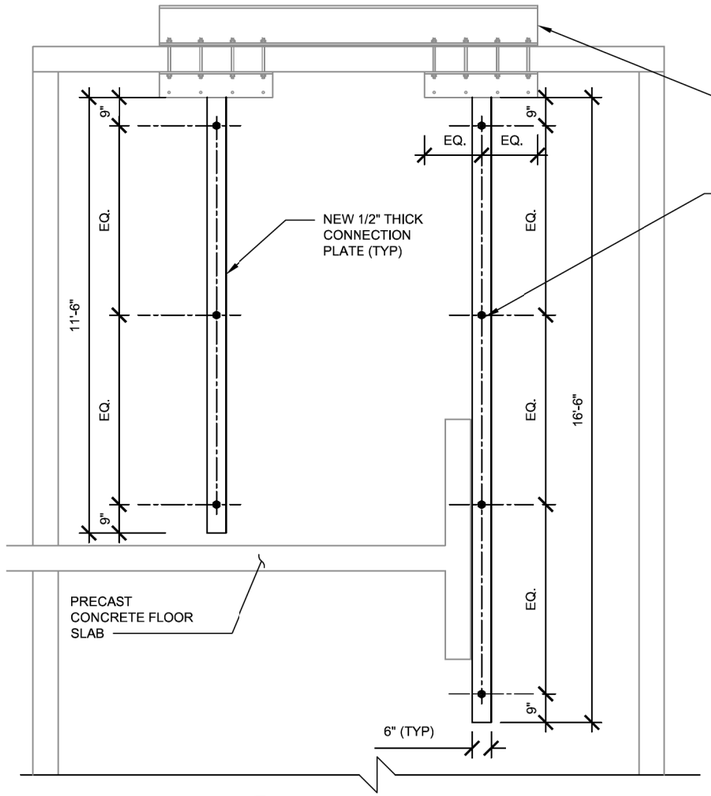
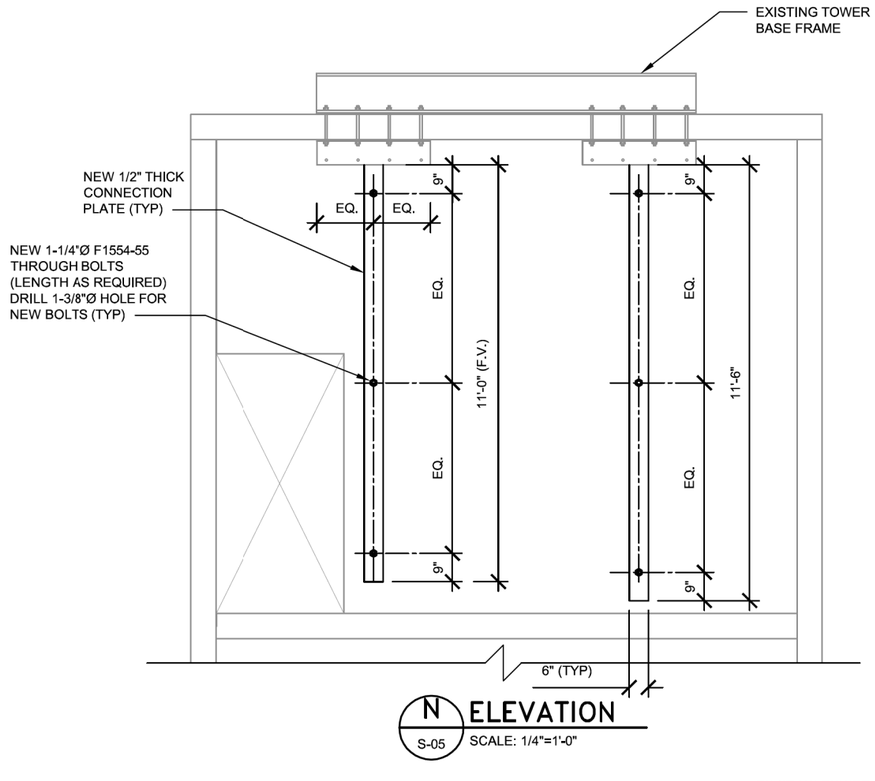
S-04



L ELEVATION
S-05 SCALE: 1/4"=1'-0"



N ELEVATION
S-05 SCALE: 1/4"=1'-0"

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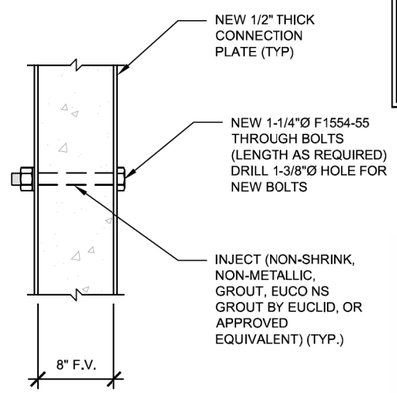
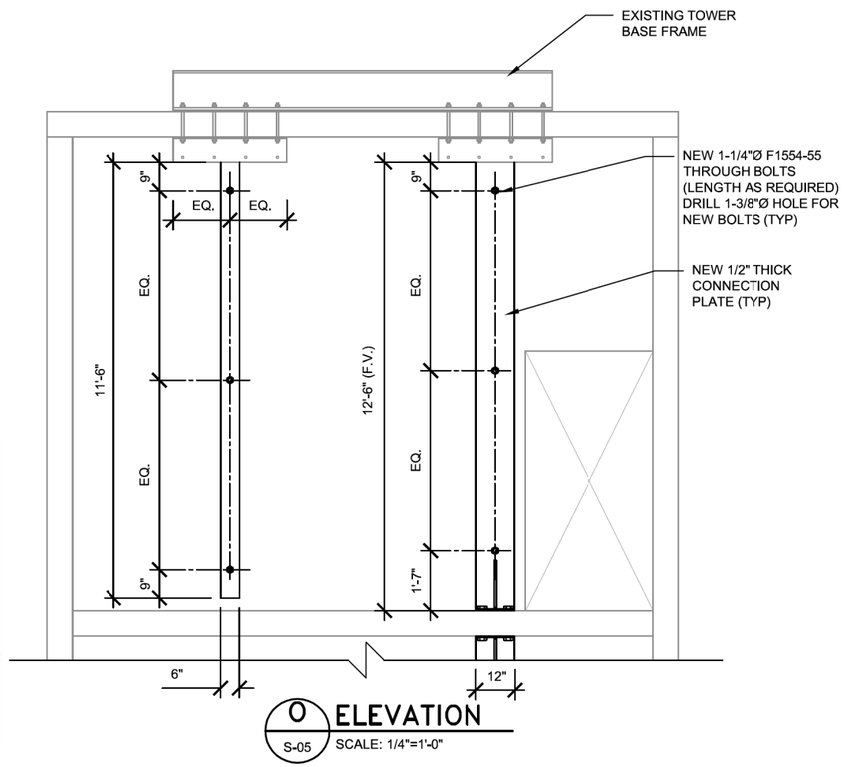


M SECTION
S-05 SCALE: 3/4"=1'-0"



O ELEVATION
S-05 SCALE: 1/4"=1'-0"

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CROWN CASTLE

REV	DATE	DESCRIPTION

CROWN CASTLE
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WEST HARTFORD, CT 06110

ADDITIONAL SECTIONS

ISSUED FOR:	
PERMIT	6/3/2015
BID	-
CONSTRUCTION	-
RECORD	-

ENGINEER	DESIGNER
AC	AC
PROJECT MANAGER	APPROVED BY
JS	JNK

JOB NO.
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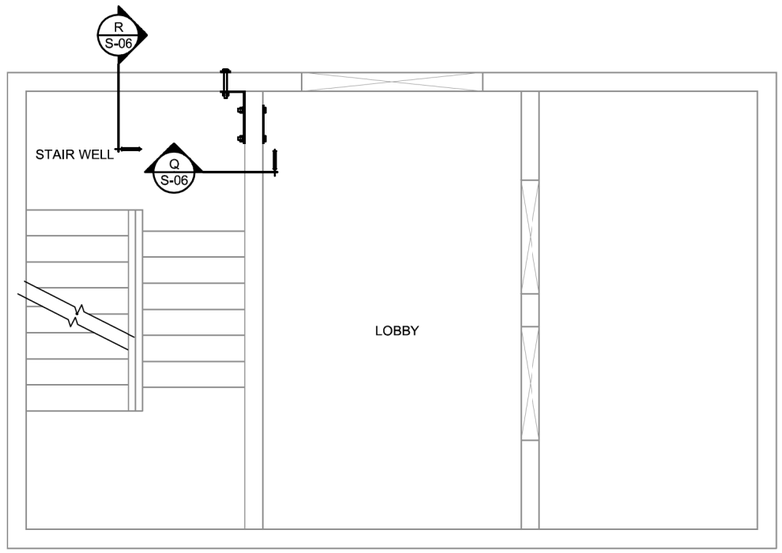
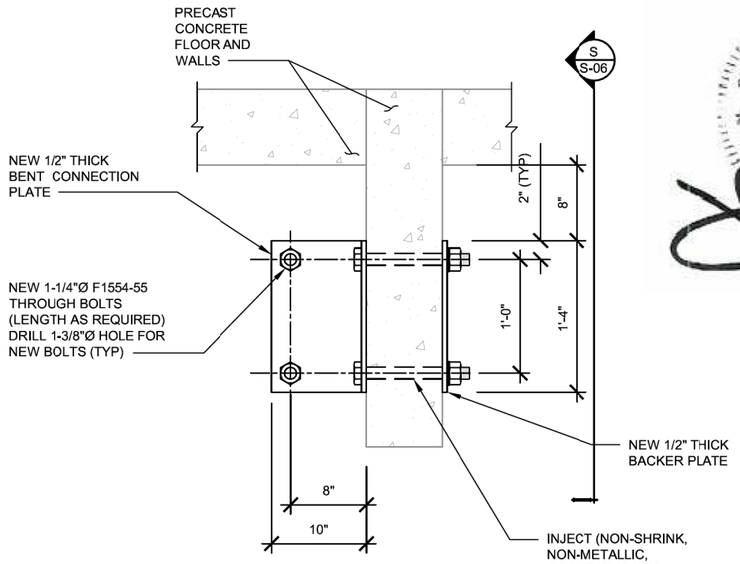
S-05



P ENLARGED FRAMING PLAN

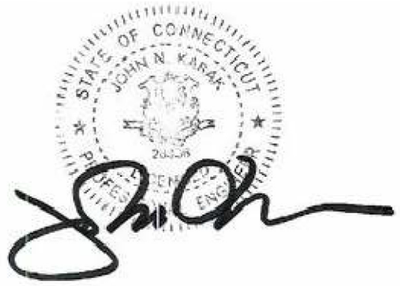
P S-06 SCALE: 3/16"=1'-0"

NORTH



Q SECTION

Q S-06 SCALE: 3/4"=1'-0"



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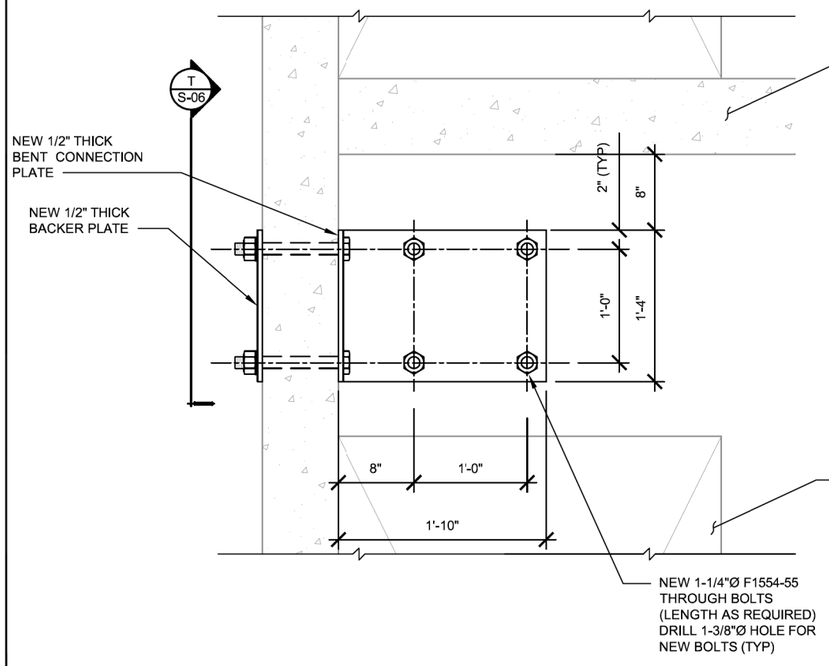
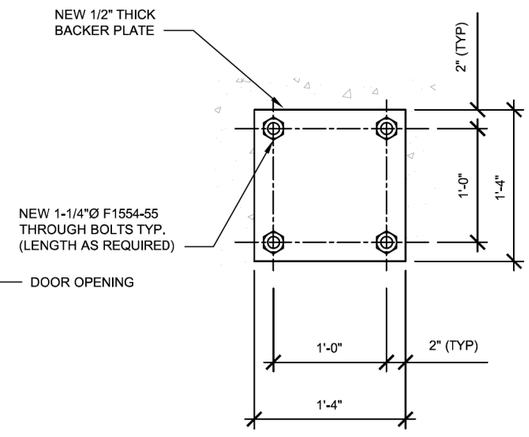


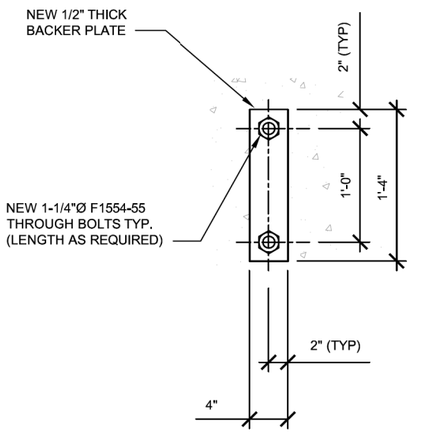
R SECTION

R S-06 SCALE: 3/4"=1'-0"



S SECTION

S S-06 SCALE: 3/4"=1'-0"



T SECTION

T S-06 SCALE: 3/4"=1'-0"

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CROWN CASTLE

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WEST HARTFORD, CT 06110

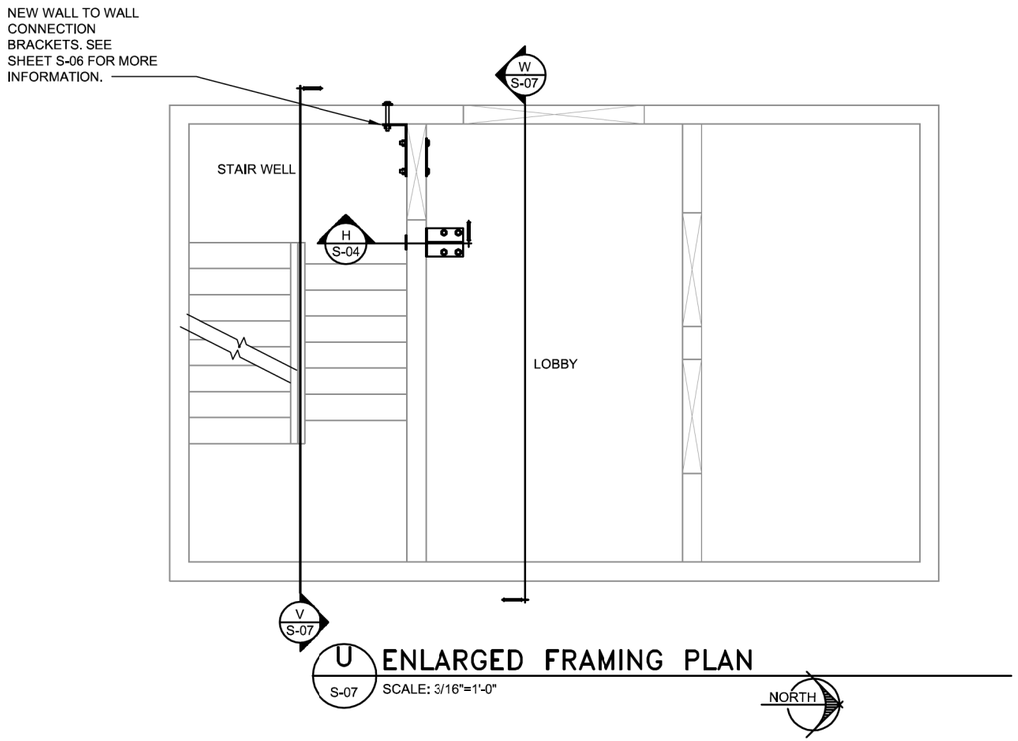
ADDITIONAL SECTIONS

ISSUED FOR:	
PERMIT	6/3/2015
BID	-
CONSTRUCTION	-
RECORD	-

ENGINEER	DESIGNER
AC	AC
PROJECT MANAGER	APPROVED BY
JS	JNK

JOB NO.
2015777.876328.08

S-06



U S-07 ENLARGED FRAMING PLAN
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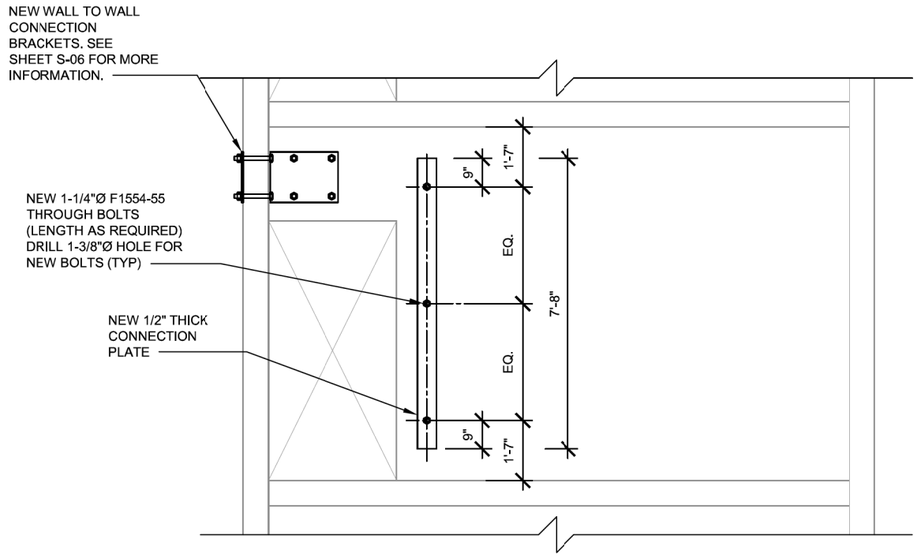
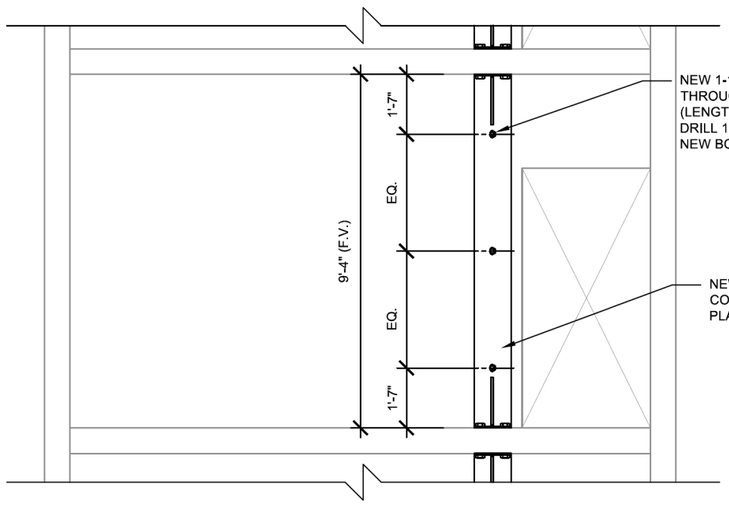


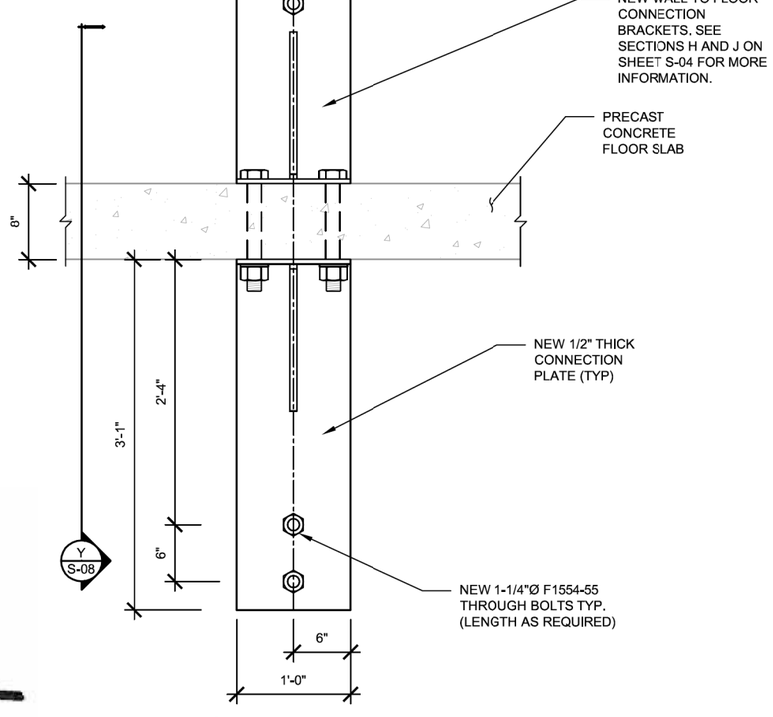
V S-07 ELEVATION
SCALE: 1/4"=1'-0"

NOTE: CONTRACTOR TO FIELD VERIFY LOCATION OF ALL EXISTING REBAR AND PRECAST PANEL CONNECTION PLATES PRIOR TO DRILLING AND FABRICATING HARDWARE. CONTRACTOR SHALL NOT DRILL THROUGH ANY EXISTING REBAR OR CONNECTIONS PLATES.

NOTE: ALL NEW STEEL SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123, ASTM A153/A153M, OR ASTM A653 G90, AS APPLICABLE FOR FULL WEATHER PROTECTION AND PAINTED TO MATCH EXISTING BUILDING.



W S-07 ELEVATION
SCALE: 1/4"=1'-0"



X S-07 DETAIL
SCALE: 3/4"=1'-0"

GPD Engineering and Architecture Professional Corporation
520 South Main Street
Akron, Ohio 44311
330.572.2100 Fax 330.572.2102

CROWN CASTLE

REV	DATE	DESCRIPTION

CROWN CASTLE
27-31 SOUTH MAIN STREET
WEST HARTFORD, CT 06110

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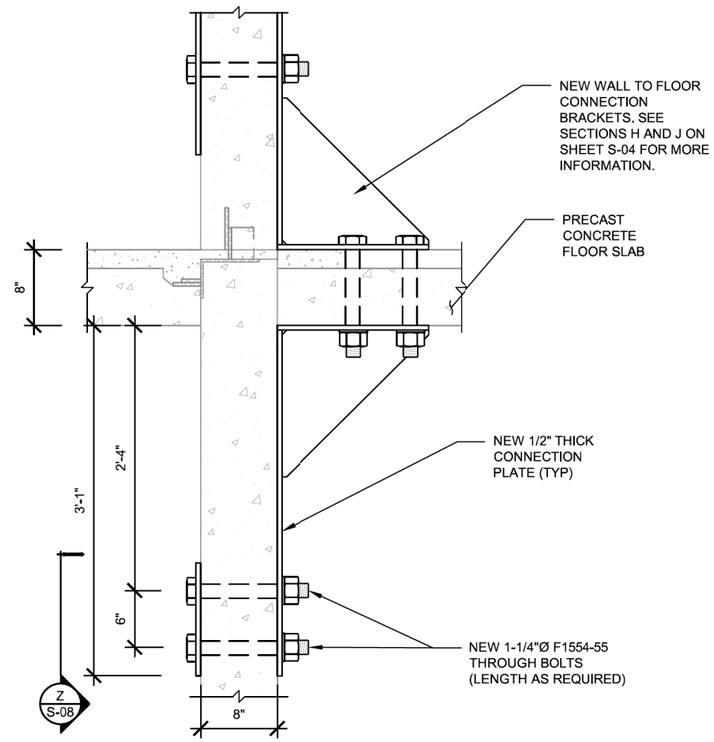
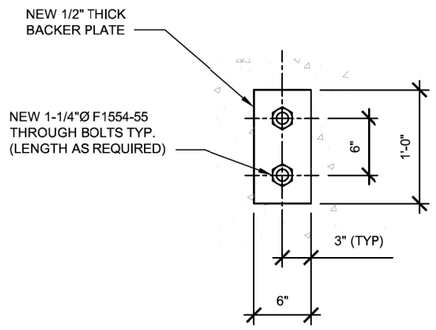


Y DETAIL
S-08 SCALE: 3/4"=1'-0"



Z DETAIL
S-08 SCALE: 3/4"=1'-0"

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S-08

MODIFICATION INSPECTION NOTES

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF STRUCTURE MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE CROWN ENG-BUL-10173, "APPROVED MI VENDORS".

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO CROWN ENG-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND CROWN ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL STRUCTURE MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW THE FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY, NOR FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT AN MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON STRUCTURE MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH CROWN ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

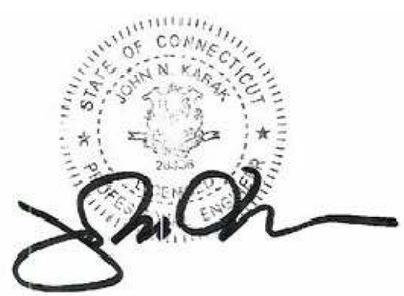
REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO CROWN ENG-SOW-10007.



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MODIFICATION INSPECTION CHECKLIST

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