Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts and New York

May 5, 2022

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

Re: **Notice of Exempt Modification – Facility Modification**
330 Bishop Street, Waterbury, Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains an existing wireless telecommunications facility at the above-referenced property address (the "Property"). The facility consists of eight (8) antennas inside concealment tubes on the roof of the building and remote radio heads on roof-top ballast mounted frames. Equipment associated with the antennas is also located on the roof of the building. The telecommunications facility was approved by the Siting Council ("Council") in October of 2015 (PE1133-VER-20150818). A copy of the Council's approval is included in Attachment 1.

Cellco now intends to modify its facility by removing four (4) existing antennas and installing two (2) NHH-65B-R2B antennas and two (2) MT6407-77A antennas. The two NHH-65B-R2B replacement antennas will be installed inside the existing concealment tubes. Due to the size of the MT6407-77A antennas and the need to maintain certain clearances around each MT6407-77A antennas, these new MT6407-77A antennas will not be installed inside a new concealment tube but will painted to match the color of the existing concealment tubes, similar to other antennas on the roof of the building. Cellco will also replace four (4) of its remote radio heads ("RRH's") in the same locations on the roof. A set of project plans showing Cellco's proposed facility modifications and the specifications for Cellco's new antennas and RRHs are included in Attachment 2.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance

with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Waterbury's Chief Elected Official and Land Use Officer.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be installed on the existing antenna pipe-mounts.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary. Cellco's associated equipment is inside the building's existing parking garage.

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

4. The installation of Cellco's new antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative power density calculations table for Cellco's modified facility is included in Attachment 3. The modified facility will be capable of providing Cellco's 5G wireless service.

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

6. According to the attached Structural Analysis and Design Report ("SA"), which includes an analysis of the existing antenna mounting systems, the existing building and antenna and RRH mounting systems can support Cellco's proposed facility modifications. A copy of the SA is included in Attachment 4.

A copy of the parcel map and Property owner information is included in Attachment 5. A Certificate of Mailing verifying that this filing was sent to municipal officials and the property owner is included in Attachment 6.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Neal O'Leary, Waterbury Mayor
Robert Nerney, City Planner
Waterbury Omega LLC, Property Owner
Karla Hanna, Verizon Wireless

ATTACHMENT 1

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@ct.gov
www.ct.gov/csc

October 2, 2015

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **PE1133-VER-20150818** – Cellco Partnership d/b/a Verizon Wireless sub-petition for a declaratory ruling for approval of an eligible facility request for modifications to an existing telecommunications facility located at 330 Bishop Street, Waterbury, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby approves your Eligible Facilities Request (EFR) to install antennas and associated equipment at the above-referenced facility pursuant to the Federal Communications Commission Wireless Infrastructure Report and Order, with the following conditions:

- Post-construction measurements of the cumulative percent maximum permissible exposure for power density shall be taken to demonstrate compliance at the site with applicable FCC maximum permissible exposure standards, and such measurements shall include, but not be limited to, measurements taken at ground level;
- Such report shall be submitted within 45 days of completion of construction;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;
- The validity of this action shall expire one year from the date of this letter; and
- The petitioner may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the EFR received August 18, 2015.

Thank you for your attention and cooperation.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/MP

c: Honorable Neil M. O'Leary, Mayor, City of Waterbury
James A. Sequin, AICP, City Planner, City of Waterbury

ATTACHMENT 2

verizon

WIRELESS COMMUNICATIONS FACILITY

WATERBURY FULTON CT
330 BISHOP STREET
WATERBURY, CT 06704

DRAWING INDEX

SITE DIRECTIONS

START: 20 ALEXANDER DRIVE
WALLINGFORD, CONNECTICUT 06492

END: 330 BISHOP STREET
WATERBURY, CT 06704

1.	HEAD SOUTH ON ALEXANDER DRIVE	279 FT
2.	SLIGHT RIGHT TOWARD ALEXANDER DRIVE	269 FT
3.	TURN RIGHT TOWARD ALEXANDER DRIVE	167 FT
4.	TURN RIGHT ONTO ALEXANDER DRIVE	0.3 MI
5.	TURN RIGHT ONTO BARNES INDUSTRIAL RD. S.	0.1 MI
6.	TURN LEFT AT FIRST CROSS STREET ONTO CT-68W	0.4 MI
7.	TURN RIGHT	0.2 MI
8.	TURN RIGHT ONTO N. COLONY ROAD	0.3 MI
9.	TURN RIGHT TO MERGE ONTO CT-15 N TOWARD HARTFORD	0.5 MI
10.	MERGE ONTO CT-15 N	3.1 MI
11.	USE MIDDLE LANE TO STAY ON CT-15 N	0.1 MI
12.	TAKE EXIT. 68 W TO MERGE ONTO I-691 W TOWARD MERIDEN /WATERBURY	7.9 MI
13.	USE THE LEFT 2 LANES TO TAKE EXIT 1 FOR I-84 W TOWARD MERIDEN/WATERBURY	1.0 MI
14.	MERGE ONTO I-84	6.4 MI
15.	TAKE EXIT 22 TOWARD DOWNTOWN	0.3 MI
16.	CONTINUE ONTO BRASS MILL DR.	0.2 MI
17.	TURN LEFT ONTO E. MAIN STREET	0.3 MI
18.	TURN RIGHT ONTO N. ELM STREET	0.4 MI
19.	TURN LEFT ONTO N. MAIN STREET	230 FT
20.	TURN RIGHT ONTO BISHOP ST. (DESTINATION WILL BE ON THE RIGHT)	0.5 MI

LOCATION MAP
SCALE : 1" = 1000'-0"

SITE INFORMATION

VZ SITE NAME: WATERBURY FULTON CT
VZ PROJ. FUZE I.D.: 16227630
VZ LOCATION CODE: 467741
VZ PROJECT CODE: 20202195130

LOCATION: 330 BISHOP STREET
WATERBURY, CT 06704

PROJECT SCOPE: REFER TO NOTES ON DRAWING C-1 FOR SCOPE OF WORK.

MAP/BLOCK/LOT: 0199-0714-0109

ZONING DISTRICT: RM (MODERATE DENSITY RESIDENTAIL DISTRICT)

LATITUDE: 41° 34' 0.286" N (41.5667461° N)
LONGITUDE: 73° 02' 17.670" W (73.0382972° W)
SITE COORDINATES AND GROUND ELEVATION OBTAINED FROM VERIZON RFDS & GOOGLE EARTH

GROUND ELEVATION: 490.0'± AMSL

PROPERTY OWNER: WATERBURY OMEGA LLC
330 BISHOP STREET #100
WATERBURY, CT 06704

APPLICANT: CELLCO PARTNERSHIP
d/b/a CELLCO PARTNERSHIP WIRELESS
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

LEGAL/REGULATORY COUNSEL: ROBINSON & COLE, LLP
KENNETH C. BALDWIN, ESQ.
280 TRUMBULL STREET
HARTFORD, CT 06103

ENGINEER CONTACT: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385
(860) 663-1697

Cellco Partnership d/b/a
verizon
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CONSTRUCTION DOCUMENTS

NO	DATE	REVISION
0	01/04/22	FOR REVIEW: JRM
1	01/05/22	REV. FOR REVIEW: JRM
2	02/10/22	REV. FOR FILING: JRM
3	04/26/22	REV. FOR FILING: JRM
4		
5		
6		

STATE OF CONNECTICUT
MICHAEL TRODDEN
33313
LICENSED
PROFESSIONAL ENGINEER

DESIGN PROFESSIONALS OF RECORD

PROF: MICHAEL S. TRODDEN P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

OWNER: WATERBURY OMEGA LLC
ADDRESS: 330 BISHOP STREET #100 WATERBURY, CT 06704

WATERBURY FULTON CT

SITE ADDRESS: 330 BISHOP STREET WATERBURY, CT 06704

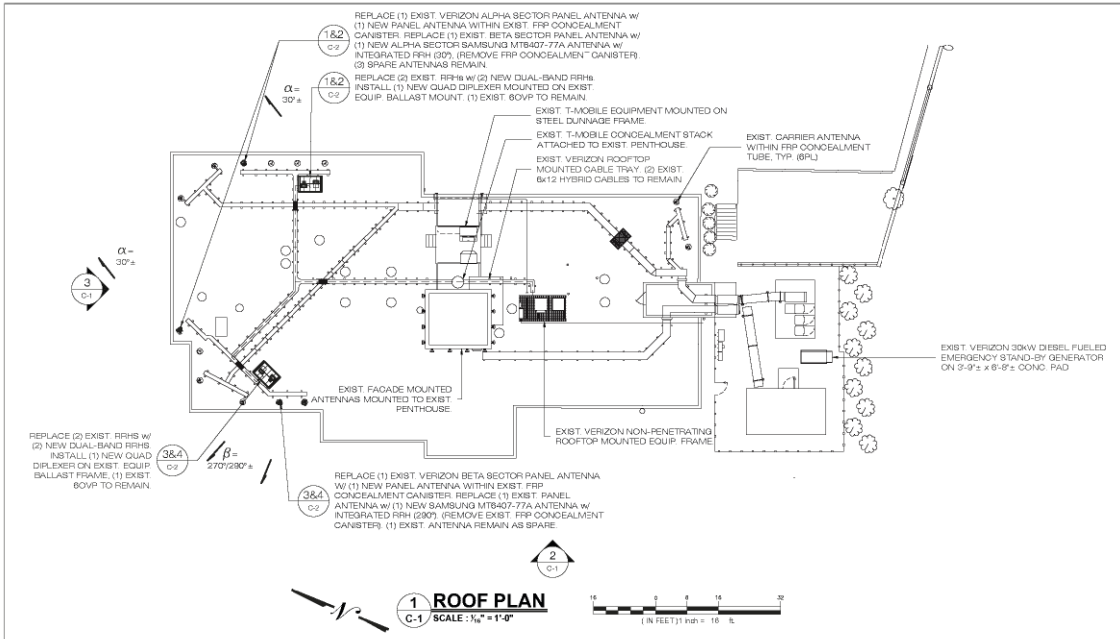
APT FILING NUMBER: CT141_11590

DRAWN BY: DRA
DATE: 01/04/22 CHECKED BY: JRM

VZ PROJECT CODE: 20202195130
VZ LOCATION CODE: 467741
VZ FUZE ID: 16227630

SHEET TITLE: TITLE SHEET

SHEET NUMBER: T-1



1 ROOF PLAN
C-1 SCALE : 1/16" = 1'-0"

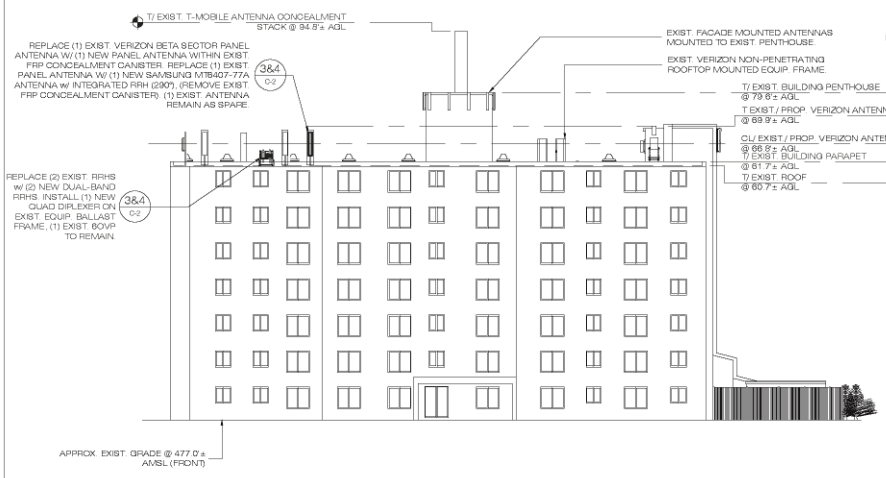
(IN FEET) 1 inch = 16 ft.

GENERAL ABBREVIATION LIST:

- ABP ABOVE BASE PLATE
- AGL ABOVE GROUND LEVEL
- AMSL ABOVE MEAN SEA LEVEL
- AWS ADVANCED WIRELESS SERVICE
- HDG HOT DIP GALVANIZED
- OVP OVER VOLTAGE PROTECTION
- RRH REMOTE RADIO HEAD
- V.I.F. VERIFY IN FIELD
- W.P. WORK POINT
- A.F.R. ABOVE FINISH ROOF

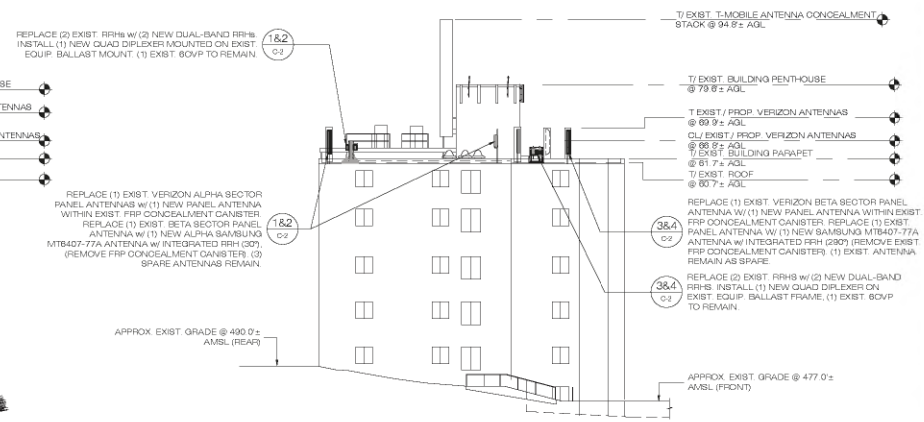
NOTES:

1. REFER TO MOUNT & STRUCTURAL ANALYSIS REPORT PREPARED BY ALL POINTS TECHNOLOGY CORPORATION, MARKED REV2 DATED APRIL 26, 2022 AVAILABLE UNDER SEPARATE COVER.
2. BASE MAPPING OBTAINED FROM FIELD MEASUREMENTS CONDUCTED BY ALL-POINTS TECHNOLOGY CORPORATION, P.C. ON 10/23/20.
3. PROJECT SCOPE INCLUDES THE FOLLOWING:
   - REPLACEMENT OF (4) EXIST. PANEL ANTENNAS w/ (2) NEW PANEL ANTENNAS & (2) NEW SAMSUNG MT8407-77A ANTENNAS w/ INTEGRATED RRHs
   - REPLACEMENT OF (4) EXIST. RRHs w/ (4) NEW DUAL-BAND RRHs
   - INSTALLATION OF (2) NEW QUAD DIPLEXERS.
   - REMOVAL OF (2) EXIST. FRP CONCEALMENT CANISTER AT NEW SAMSUNG MT8407-77A ANTENNA LOCATIONS
   - REMOVAL OF ALL UN-USED COAXIAL CABLE FEED-LINES.
4. ALL EXPOSED STEEL AND HARDWARE TO BE HOT DIP GALV. (HDG). PAINT TO MATCH EXIST. (WHERE APPLICABLE)
5. CAP & WEATHERPROOF ALL UN-USED CABLE ENTRY PORTS (WHERE APPLICABLE).
6. MOUNT & GROUND ALL NEW EQUIPMENT IN ACCORDANCE WITH NEC (NFPA-70), NEBC AND MANUFACTURERS SPECIFICATION.
7. SECURE ALL NEW ANTENNA CABLES PER MANUFACTURER RECOMMENDATIONS.
8. BOND NEW ANTENNA MOUNTING PIPES TO ANTENNA SECTOR GROUND BAR w/ # 2 AWG, BCW, (WHERE APPLICABLE).
9. ANTENNA CONFIGURATIONS SHOWN HEREIN ARE REAR ELEVATIONS (UNLESS NOTED OTHERWISE).
10. ANTENNA SPACING DIMENSIONS ARE TO THE CENTER OF THE EXIST. ANTENNA AND PROP. ANTENNA FACE.
11. REFER TO THE FINAL RFDS PROVIDED BY VERIZON FOR THE LATEST INFORMATION REGARDING EQUIPMENT MODELS, REQUIRED CABLING & DOWN-TILT INFORMATION.
12. PAINT ALL EXPOSED LSU86 ANTENNAS TO MATCH EXISTING STRUCTURE (WHERE APPLICABLE). COORDINATE W/ LSU86 MANUFACTURER INSTALLATION MANUAL REQUIREMENTS. VERIZON CONSTRUCTION MANAGER & OWNER.
13. PAINT ALL EXPOSED NEW NON LSU86 ANTENNAS & APPURTENANCES TO MATCH EXIST. STRUCTURE (WHERE APPLICABLE) COORDINATE W/ VERIZON CONSTRUCTION MANAGER & BUILDING OWNER.



2 WEST ELEVATION
C-1 SCALE : 1/16" = 1'-0"

(IN FEET) 1 inch = 16 ft.



3 NORTH ELEVATION
C-1 SCALE : 1/16" = 1'-0"

(IN FEET) 1 inch = 16 ft.

Cellco Partnership d/b/a
verizon
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CONSTRUCTION DOCUMENTS

NO	DATE	REVISION
0	01/04/22	FOR REVIEW: JRM
1	01/05/22	REV. FOR REVIEW: JRM
2	02/10/22	REV. FOR FILING: JRM
3	04/29/22	REV. FOR FILING: JRM
4		
5		
6		

STATE OF CONNECTICUT · MICHAEL TRODDEN · 33313 · LICENSED PROFESSIONAL ENGINEER

DESIGN PROFESSIONALS OF RECORD

PROF: MICHAEL S. TRODDEN P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

OWNER: WATERBURY OMEGA LLC
ADDRESS: 330 BISHOP STREET #100 WATERBURY, CT 06704

WATERBURY FULTON CT

SITE ADDRESS: 330 BISHOP STREET WATERBURY, CT 06704

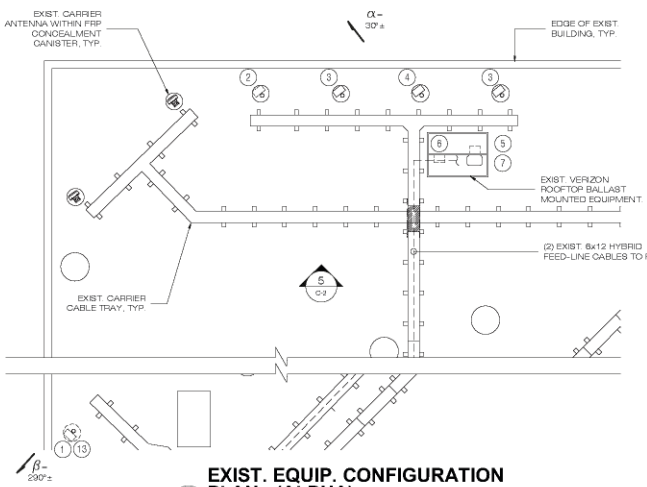
APT FILING NUMBER: CT141_11590

DRAWN BY: DRA
DATE: 01/04/22
CHECKED BY: JRM

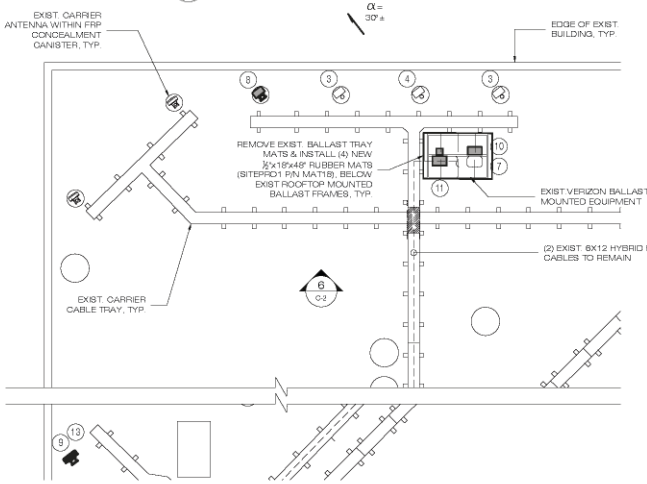
VZ PROJECT CODE: 20202195130
VZ LOCATION CODE: 467741
VZ FUZE ID: 16227630

SHEET TITLE:
ROOF PLAN, NORTH & WEST BLDG. ELEVATIONS & NOTES

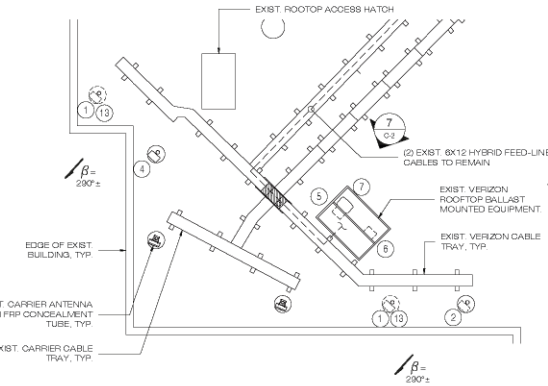
SHEET NUMBER:
C-1



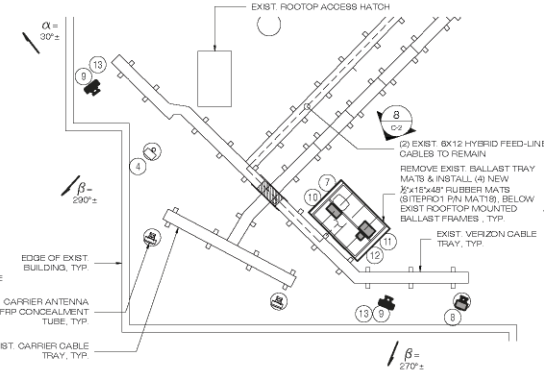
1 EXIST. EQUIP. CONFIGURATION PLAN - (ALPHA)
C-2 SCALE : 3/8" = 1'-0"



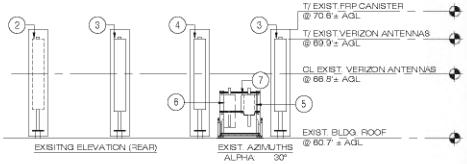
2 NEW EQUIP. CONFIGURATION PLAN - (ALPHA)
C-2 SCALE : 3/8" = 1'-0"



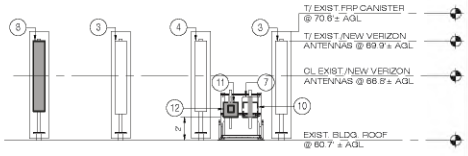
3 EXIST. EQUIP. CONFIGURATION PLAN - (BETA)
C-2 SCALE : 3/8" = 1'-0"



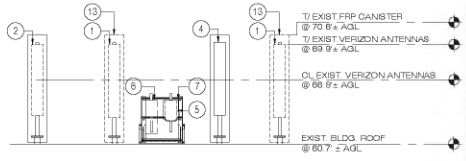
4 NEW EQUIP. CONFIGURATION PLAN - (BETA)
C-2 SCALE : 3/8" = 1'-0"



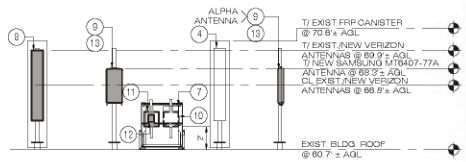
5 EXIST. EQUIP. MOUNTING CONFIG. (ALPHA)
C-2 SCALE : ¾" = 1'-0"



6 NEW EQUIP. MOUNTING CONFIG. (ALPHA)
C-2 SCALE : ¾" = 1'-0"



7 EXIST. EQUIP. MOUNTING CONFIG. (BETA)
C-2 SCALE : ¾" = 1'-0"



8 NEW EQUIP. MOUNTING CONFIG. (BETA)
C-2 SCALE : ¾" = 1'-0"

NOTES: (REFER TO C-1 FOR ADDITIONAL NOTES)

1. ANTENNA CONFIGURATIONS SHOWN HEREIN ARE REAR ELEVATIONS (UNLESS NOTED OTHERWISE).
2. ANTENNA SPACING DIMENSIONS ARE TO THE CENTER OF THE EXIST. ANTENNA AND PROP. ANTENNA FACE.
3. REFER TO THE FINAL RFDS PROVIDED BY VERIZON FOR THE LATEST INFORMATION REGARDING EQUIPMENT MODELS, REQUIRED CABLING & DOWN-TILT INFORMATION.
4. PAINT ALL EXPOSED LSU86 ANTENNAS TO MATCH EXISTING STRUCTURE (WHERE APPLICABLE). COORDINATE W/ LSU86 MANUFACTURER INSTALLATION MANUAL REQUIREMENTS, VERIZON CONSTRUCTION MANAGER & OWNER.
5. PAINT ALL EXPOSED NEW NON LSU86 ANTENNAS & APPURTENANCES TO MATCH EXIST. STRUCTURE (WHERE APPLICABLE) COORDINATE W/ VERIZON CONSTRUCTION MANAGER & BUILDING OWNER.

GENERAL ABBREVIATION LIST:

ABP	ABOVE BASE PLATE
AGL	ABOVE GROUND LEVEL
AMSL	ABOVE MEAN SEA LEVEL
AWS	ADVANCED WIRELESS SERVICE
HDG	HOT DIP GALVANIZED
OVP	OVER VOLTAGE PROTECTION
RRH	REMOTE RADIO HEAD
V.I.F.	VERIFY IN FIELD
W.P.	WORK POINT
A.F.R.	ABOVE FINISH ROOF

SCOPE OF WORK (ALL) SECTORS

1. EXIST. ANTENNA (TO BE REPLACED) MODEL: ANTEL HBXX-6517DS-A2M
2. EXIST. ANTENNA (TO BE REPLACED) MODEL: ANTEL LNX-6514DS-A1M
3. EXIST. ANTENNA (TO REMAIN AS SPARE) MODEL: ANTEL HBXX-6517DS-A2M
4. EXIST. ANTENNA (TO REMAIN AS SPARE) MODEL: A'NTEL LNX-6514DS-A1M
5. EXIST. RRH (TO BE REPLACED) MODEL: NOKIA B13 4x30W 700 RRH
6. EXIST. RRH (TO BE REPLACED) MODEL: NOKIA B66A RRH 4x45 AWS RRH
7. EXIST. 6 OVP (TO REMAIN) MODEL: RAYCAP RRFDC-3315-PF-48 (V.I.F.)
8. NEW ANTENNA MODEL: COMMSCOPE NHH-65B-R2B
9. NEW ANTENNA MODEL: SAMSUNG MT6407-77A w/ INTEGRATED RRH
10. NEW DUAL BAND RRH MODEL: SAMSUNG B13/B5 RRH (RF4440d-13A)
11. NEW DUAL BAND RRH MODEL: SAMSUNG B66/B2A RRH (RF4439d-25A)
12. NEW QUAD DIPLEXER MODEL: COMMSCOPE SDX1926Q-43
13. EXIST. 20' Ø FRP CANISTER TO BE REMOVED

Cellco Partnership d/b/a
verizon
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CONSTRUCTION DOCUMENTS

NO	DATE	REVISION
0	01/04/22	FOR REVIEW: JRM
1	01/05/22	REV. FOR REVIEW: JRM
2	02/10/22	REV. FOR FILING: JRM
3	04/29/22	REV. FOR FILING: JRM
4		
5		
6		

STATE OF CONNECTICUT
MICHAEL TRODDEN
33313
LICENSED
PROFESSIONAL ENGINEER

DESIGN PROFESSIONALS OF RECORD

PROF: MICHAEL S. TRODDEN P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

OWNER: WATERBURY OMEGA LLC
ADDRESS: 330 BISHOP STREET #100 WATERBURY, CT 06704

WATERBURY FULTON CT

SITE ADDRESS: 330 BISHOP STREET WATERBURY, CT 06704

APT FILING NUMBER: CT141_11590

DRAWN BY: DRA
DATE: 01/04/22 CHECKED BY: JRM

VZ PROJECT CODE: 20202195130
VZ LOCATION CODE: 467741
VZ FUZE ID: 16227630

SHEET TITLE:
EXIST. & NEW EQUIPMENT MOUNTING PLANS & ELEVATIONS

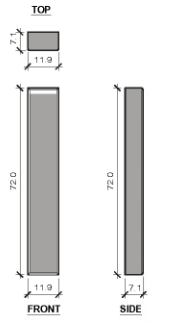
SHEET NUMBER:
C-2

EQUIPMENT DATA

EQUIPMENT SPECIFICATIONS

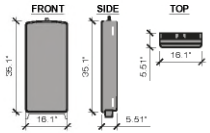
SECTOR	ANTENNA MAKE/MODEL	QTY	AZIMUTH	EQUIPMENT STATUS	HEIGHT (IN)	WIDTH (IN)	DEPTH (IN)	WEIGHT (LBS)
ALPHA	700/850/1900/2100 COMMSCOPE NHH-65B-R2B	1	30°	NEW	72.0	11.9	7.1	43.7(2)
	SPARE ANDREW HBX-6517DS-A2M	1	30°	ETR	75.0	12.0	6.5	40.8(2)
	SPARE ANDREW LNX-6514-A1M	1	30°	ETR	72.9	11.9	7.1	31.3(2)
	SPARE ANDREW HBX-6517DS-A2M	1	30°	ETR	75.0	12.0	6.5	40.8(2)
BETA	700/850/1900/2100 COMMSCOPE NHH-65B-R2B	1	290°	ETR	72.0	11.9	7.1	43.7(2)
	SAMSUNG MTB407-77A	1	290°	NEW	35.1(5)	16.1(5)	5.51(5)	67.1(2)(5)
	SPARE ANDREW LNX-6514-A1M	1	290°	NEW	72.9	11.9	7.1	31.3(2)
ALPHA	SAMSUNG MTB407-77A	1	290°	NEW	35.1(5)	16.1(5)	5.51(5)	67.1(2)(5)
	APPURTENANCE MAKE/MODEL							
	SAMSUNG B2/B66A RRH (RF4439d-25A)	2	-	NEW	15.0	15.0	10.1	97.5
	SAMSUNG B5/B13 RRH (RF4440d-13A)	2	-	NEW	15.0	15.0	9.1	82.0
	COMMSCOPE SDX1928Q-43 QUAD DIPLEXER	2	-	NEW	4.2	7.0	3.0	6.2
	RAYCAP RHSDC-3315-PF-48	2	-	ETR	19.8	15.73	10.25	32

(1) 'ETR' DENOTES EXIST. TO REMAIN
(2) WEIGHT WITHOUT MOUNTING BRACKET
(3) ANTENNA DATA BASED ON LATEST VERIZON RFDS
(4) EQUIPMENT CONFIGURATION INDICATED ABOVE VIEWED FROM BEHIND.
(5) NOT TO EXCEED



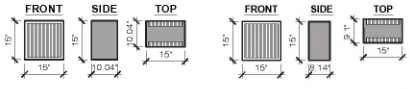
COMMSCOPE NHH-65B-R2B
HxWxD=72.0"x11.9x7.1 43.7 Lbs)

2 NEW ANTENNA DETAIL
B-1 SCALE : ½" = 1'-0"



SAMSUNG MTB407-77A ANTENNA
HxWxD=35.1"x16.1"x5.51"
WT=67.1 Lbs
(NOT TO EXCEED)

3 NEW ANTENNA DETAIL
B-1 SCALE : ½" = 1'-0"

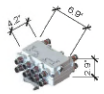


SAMSUNG DUAL HIGH BAND B2/B66A
(RF4439d-25A) RRH PCS/AWS
REMOTE RADIO HEAD (RRH)
WxDxH=15.0"x15.0"x10.1" (97.5 Lbs)

SAMSUNG DUAL LOW BAND B5/B13
(RF4440d-13A) RRH 850/700
REMOTE RADIO HEAD (RRH)
WxDxH=15.0"x15.0"x9.1" (82.0 Lbs)

NOTE: WEIGHTS INCLUDE SOLAR SHEILD & MOUNTING BRACKET

4 RRH EQUIPMENT DETAILS
B-1 SCALE : ½" = 1'-0"



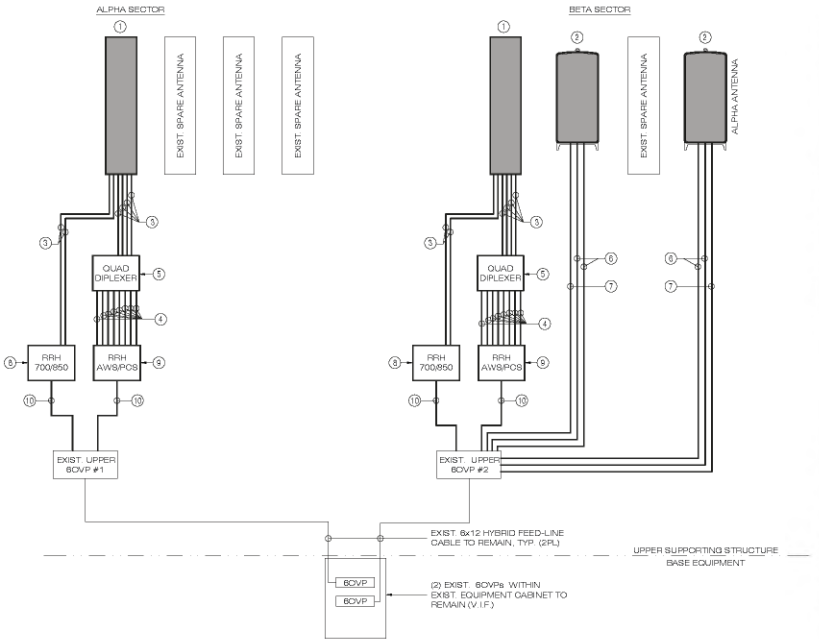
COMMSCOPE SDX1928Q-43
QUAD DIPLEXER
HxWxD=4.2"x8.9"x2.9" (6.2 Lbs)

5 QUAD DIPLEXER
B-1 SCALE: 1" = 1'-0"

BILL OF MATERIALS

	EQUIPMENT DESCRIPTION	QUANTITY	LENGTH	COMMENTS
(1)	700/850/1900/2100	2		(COMMSCOPE NHH-65B-R2B) MOUNTED TO EXIST. PIPE MASTS
(2)	LSU66 ANTENNA w/ INTEGRATED RRH	2		SAMSUNG MTB407-77A
(3)	1/2" JUMPER CABLE	12	15 FT	ROUTE FROM RRH TO ANTENNAS
(4)	1/2" JUMPER CABLE	18	5 FT	ROUTE FROM RRH TO DIPLEXER
(5)	QUAD DIPLEXER	2		COMMSCOPE SDX1928Q-43
(6)	ANTENNA LINK CABLES	4	15 M	ROUTE FROM UPPER OVP TO ANTENNAS
(7)	ANTENNA POWER CABLES	2	15 M	PROPIETARY POWER CABLE FROM EXIST. OVP TO ANTENNAS
(8)	700/850 RRH	2		SAMSUNG B5/B13 RRH (RF4440d-13A)
(9)	AWS/PCS RRH	2		SAMSUNG B2/B66 RRH (RF4439d-5A)
(10)	RRH CABLES	4	15M	PROPIETARY POWER & FIBER CABLES

NOTES:
1. INFORMATION SHOWN HEREON IS FOR USE BY VERIZON EQUIPMENT OPERATIONS
2. INFORMATION IS BASED ON LATEST VERIZON RFDS
3. * DENOTES EQUIPMENT DESIGNATED "FOR LEASING ONLY" (WHERE APPLICABLE)
4. INSTALL ALARM BOARDS AT ALL OVPs WHERE REQUIRED. COORDINATE w/ VERIZON EQUIPMENT ENGINEERING.
5. INSTALL UP-CONVERTER(S) LOCATED AT BASE OVPs WHERE REQUIRED. COORDINATE w/ VERIZON EQUIPMENT ENGINEERING AS NECESSARY.
6. COORDINATE ANTENNA CABLING REQUIREMENTS WITH VERIZON ENGINEERING.
7. CONTRACTOR SHALL INSTALL NEW SIDE-BY-SIDE & DUAL-MOUNT BRACKETS PER ANTENNA MOUNT MANUFACTURER RECOMMENDATIONS, INCLUDING VERIFICATION OF MINIMUM PIPE MAST DIAMETER REQUIRED TO INSTALL NEW MOUNT BRACKETS. CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD SHOULD EXIST. PIPE MAST REQUIRE REPLACEMENT TO SUPPORT THE NEW MOUNT BRACKETS.



1 PLUMBUNG DIAGRAM
B-1 SCALE : N.T.S.

NOTE: EQUIPMENT CONFIGURATION AS VIEWED FROM BEHIND.

Cellco Partnership d/b/a
verizon
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CONSTRUCTION DOCUMENTS

NO	DATE	REVISION
0	01/04/22	FOR REVIEW: JRM
1	01/05/22	REV. FOR REVIEW: JRM
2	02/10/22	REV. FOR FILING: JRM
3	04/29/22	REV. FOR FILING: JRM
4		
5		
6		

STATE OF CONNECTICUT
MICHAEL TRODDEN
33313
LICENSED
PROFESSIONAL ENGINEER

DESIGN PROFESSIONALS OF RECORD

PROF: MICHAEL S. TRODDEN P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

OWNER: WATERBURY OMEGA LLC
ADDRESS: 330 BISHOP STREET #100 WATERBURY, CT 06704

WATERBURY FULTON CT

SITE ADDRESS: 330 BISHOP STREET WATERBURY, CT 06704

APT FILING NUMBER: CT141_11590

DRAWN BY: DRA
DATE: 01/04/22 CHECKED BY: JRM

VZ PROJECT CODE: 20202195130
VZ LOCATION CODE: 467741
VZ FUZE ID: 16227630

SHEET TITLE:
RF BILL OF MATERIALS, MECHANICAL SPECIFICATIONS & EQUIPMENT DETAILS

SHEET NUMBER:
B-1

DESIGN BASIS:

GOVERNING CODES/DESIGN STANDARDS:

2015 INTERNATIONAL BUILDING CODE (IBC) AS AMENDED BY THE 2018 CONNECTICUT STATE BUILDING CODE
ASCE 7-10
TIA-222-H

DESIGN CRITERIA:

RISK CATEGORY (BLDG.):	II	(IBC 2015 TABLE 1604.5)
RISK CATEGORY (MOUNTS):	II	(TIA-222-H, TABLE 2-1)

WIND LOADS:

ULTIMATE BASIC WIND SPEED, V_{ULT}: (3-SECOND GUST)	125 MPH	(2018 CSBC APPENDIX N)
EXPOSURE CATEGORY	B	(2015 IBC SEC. 1609.4.3)

ICE LOAD

BASIC WIND SPEED (V_i) = W/ ICE 3-SEC GUST	50 MPH	(TIA-222-H, ANNEX B)
DESIGN ICE THICKNESS (T_i) =	1.00"	(TIA-222-H, ANNEX B)

LIVE LOAD

ROOF LIVE LOAD, (LLR)	20 PSF	(IBC 2015 TABLE 1607.1)

SNOW LOAD

GROUND SNOW LOAD (P_g) =	35 PSF	(2018 CSBC APPENDIX N)
ROOF SNOW LOAD (P_f) =	30 PSF	(MIN. PER 2018 CSBC ADD 1608.1.1) (ASCE 7-10 EQ. 7.3-1, SEC 7.3.4)

SEISMIC LOAD:

REFER TO SECTION 1613 OF THE 2015 IBC/2018 CONNECTICUT STATE BUILDING CODE FOR SEISMIC CLASSIFICATION AND LOADING DETERMINATION.

01 GENERAL:

ABBREVIATIONS USED IN THESE SPECIFICATIONS INCLUDE THE FOLLOWING:

ACI	AMERICAN CONCRETE INSTITUTE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AWS	AMERICAN WELDING SOCIETY
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	AMERICAN STANDARDS AND TESTING METHODS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
ICC-ES	INTERNATIONAL CODE COUNCIL EVALUATION SERVICE
TIA	TELECOMMUNICATIONS INDUSTRY ASSOCIATION
UL	UNDERWRITERS LABORATORIES
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

EVERY INDIVIDUAL TRADE, DISCIPLINE, AND CONTRACTOR SHALL INCLUDE THESE GENERAL SPECIFICATIONS.

THE ENGINEER IS NOT RESPONSIBLE FOR NOR A GUARANTOR OF THE INSTALLING CONTRACTORS WORK, ADEQUACY OF ANY SITE COMPONENT, SUPERVISION OF ANY WORK, AND SAFETY IN, ON, OR ABOUT THE WORK SITE.

ANY REFERENCE HEREIN TO AN OR EQUAL ITEM, THAT EQUAL ITEM SHALL BE PRE-APPROVED BY THE CONSTRUCTION MANAGER BEFORE INSTALLATION.

ALL TRADES SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES AND OTHER WORK AND CONDITIONS AS APPROPRIATE OR REQUIRED TO AVOID CONFLICTS. RESOLVE AND COORDINATE ALL CONFLICTS WITH ALL AFFECTED WORK AND SITE OPERATIONS. COORDINATION WITH THE SITE SHALL BE WITH THE OWNER, OR OWNERS SPECIFIED REPRESENTATIVE, FOR EVERYTHING RELATED TO THE INSTALLATION OF THIS PROJECT.

ALL WORK SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE EDITIONS OF ALL APPLICABLE CODES AND SHALL BE ACCEPTABLE TO ALL AUTHORITIES HAVING JURISDICTION (AHJ). WHERE A CONFLICT EXISTS BETWEEN CODES, PLANS, SPECIFICATIONS, AND/OR AHJ, THE MORE STRINGENT AUTHORITY SHALL APPLY. WHERE CONFLICT EXISTS BETWEEN PLANS AND SPECIFICATIONS, PLAN SHALL APPLY. WHERE CONFLICT EXISTS BETWEEN PLAN SHEETS, CONSTRUCTION MANAGER SHALL BE CONSULTED PRIOR TO COMMENCING ANY WORK.

CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND NEWLY OPERATIVE AND USABLE SYSTEM THROUGHOUT AND AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN AND/OR OTHERWISE REQUIRED.

CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, INSTALLATIONS, AND EQUIPMENT IN THE FIELD PRIOR TO BID, FABRICATION, AND INSTALLATION OF ANY WORK.

CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. THE ENGINEER SHALL BE NOTIFIED FOR INSPECTIONS PRIOR TO CLOSING PENETRATIONS AND OF ANY CONDITIONS WHICH PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

CONTRACTOR SHALL VISIT THE SITE TO MANAGE AND GAIN APPROVAL FOR ALL TENANT DISRUPTIONS, POWER OUTAGES, WORK SCHEDULES, DEFINITION OF WORK AREA AND WORK STORAGE, NEWER BUILDING/SITE ACCESS, NOISE AND CLEANLINESS REQUIREMENTS WITH THE BUILDING/SITE MANAGEMENT PRIOR TO ALL WORK. ANY DISRUPTIONS SHALL BE KEPT TO A MINIMUM AND SHALL BE IMPLEMENTED ONLY UPON WRITTEN APPROVAL OF THE OWNER.

THE CONTRACTOR SHALL SAFEGUARD AGAINST CREATING ANY HAZARD AFFECTING TENANT EGRESS OR COMPROMISING SITE SECURITY MEASURES.

PRIOR TO ALL BELOW-GRADE WORK AND ANY SURFACE WORK IN A NEW AREA FOR STRUCTURES OR VEHICLES, CONTRACTOR SHALL ENGAGE A MARKOUT SERVICE TO IDENTIFY ANY UNDERGROUND STRUCTURES, CONDUITS, AND PIPELINES IN THE AREA. ALL EXISTING SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, AND OTHER UNDERGROUND UTILITIES IDENTIFIED OR ENCOUNTERED, SHALL BE PROTECTED AT ALL TIMES. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN DIGGING OR EXCAVATING IN ANY MANNER AROUND OR NEAR SUCH UTILITIES. CONTRACTOR IS RESPONSIBLE FOR REPAIRS, REPLACEMENT, AND ALL DAMAGES DUE TO DAMAGE OF UTILITIES BY HIS OPERATIONS.

ALL EXISTING AND NEW EQUIPMENT AND MATERIAL LOCATIONS, ROUTING, ORIENTATION, MOUNTING, SPECIFICATIONS AND GENERAL INSTALLED CHARACTERISTICS SHALL BE CONSIDERED DIAGRAMMATIC ON THE PLANS. EXACT CONDITIONS SHALL BE DETERMINED IN THE FIELD PRIOR TO ANY INSTALLATION. ANY DIFFERENCES THAT MAY CAUSE SCHEDULE, COST, OR QUALITY SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER OR ENGINEER PRIOR TO ANY WORK.

ALL REFERENCES HEREIN TO VERIFICATION OF ANY CONDITION OF SITE, FIELD, PLANS, OR SPECIFICATIONS PRIOR TO ANY WORK SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR. ANY AND ALL ADDITIONS, MODIFICATIONS, CHANGES, REPAIR, OR DEMOLITION AS A RESULT OF FAILURE TO BRING ANY EXISTING CONDITION NEWLY TO THE ATTENTION OF THE OWNER OR ENGINEER SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR WITHOUT DELAY, COST, OR CHANGES IN QUALITY.

ALL NOTES THIS SHEET SHALL APPLY UNLESS SPECIFICALLY NOTED OTHERWISE ON THE INCLUDED DRAWINGS OR IN SEPARATE PROJECT SPECIFICATIONS AS APPLICABLE. ALL SPECIFICATIONS SHALL BE CONSIDERED REQUIRED UNLESS APPROVED EQUAL BY THE OWNER, CONSTRUCTION MANAGER, OR ENGINEER AS APPLICABLE.

THE WORDS "PROVIDE" OR "INSTALL" SHALL MEAN FURNISH AND INSTALL.

CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING AS REQUIRED FOR THE INSTALLATION OF HIS WORK. ANY PATCHING SHALL MATCH EXISTING SURROUNDING AREA IN ALL RESPECTS. ALL REMOVED MATERIAL SHALL BE REMOVED FROM THE PREMISES DAILY IN AN APPROVED SAFE MANNER.

ALL SURPLUS MATERIAL SHALL BE REMOVED FROM THE SITE PROMPTLY WHEN DEEMED TO BE SURPLUS.

EVERY CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF HIS WORK AND NEWLY INSTALLED OR EXISTING WORK, INCLUDING PROTECTION OF THE SITE, ALL STRUCTURES, AND ALL OCCUPANTS. FURNISH, INSTALL, MAINTAIN, AND REMOVE AS APPROPRIATE, ALL APPROPRIATE BARRIERS, SAFETY GUARDS, SIGNAGE, AND SECURITY AS REQUIRED.

EVERY CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR RESPECTIVE FEES, PERMITS, INSPECTIONS, TESTING, CERTIFICATES, AND ALL MANAGEMENT OF SAME REQUIRED FOR COMPLETION OF AND LEGAL OCCUPANCY OF THE FINISHED PROJECT.

ALL CONTRACTORS SHALL PROVIDE ALL NECESSARY TOOLS, FIXTURES, SERVICES, MATERIALS, JOB AIDS, AND PERSONNEL REQUIRED FOR THE EXECUTION OF THEIR WORK.

EACH CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP BY THEM TO BE FREE OF DEFECTS AND MAINTAINED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF THE INSTALLATION BY THE OWNER AND ENGINEER.

ALL WORK SHALL BE PERFORMED BY LICENSED CONTRACTORS IN THE TRADE HAVING JURISDICTION.

ANY DEVIATION, MODIFICATION, ADDITION, OR CHANGE IN DESIGN SHALL NOT BE MADE WITHOUT WRITTEN APPROVAL OF THE OWNER OR ENGINEER.

ALL CONTRACTORS SHALL SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT AND MATERIALS TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION AND INSTALLATION, AND SHALL NOT PROCEED UNTIL ENGINEER APPROVAL IN WRITING IS RETURNED. EACH CONTRACTOR SHALL MAINTAIN ON JOB SITE A COMPLETE SET OF SHOP DRAWINGS WITH ANY DEVIATIONS FROM THE ORIGINAL DESIGN SHALL BE NOTED.

ALL MATERIALS AND EQUIPMENT SHALL BE NEW, WITHOUT BLEMISH OR DEFECT, AND SUITABLE AND LISTED FOR THE INSTALLATION AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS OR SPECIFICATIONS. ALL ITEMS OF EQUIPMENT OR MATERIAL THAT ARE OF ONE GENERIC TYPE SHALL BE ONE MANUFACTURER THROUGHOUT.

ALL MATERIALS, EQUIPMENT, TOOLS, AND ITEMS UNDER THE CONTRACTORS RESPONSIBILITY ON THE JOBSITE SHALL BE ADEQUATELY SECURED, MAINTAINED, AND PROTECTED, SO AS NOT TO BECOME DAMAGED OR CREATE ANY HAZARD TO PERSONNEL OR NEWERTY.

THE CONTRACTORS HOURS OF WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES AND BE APPROVED BY THE OWNER.

CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR ALL OF HIS CREW AND INSURE THAT EVERY CREW MEMBER FOLLOWS SAVE WORK PRACTICES. SAFETY TRAINING SHALL INCLUDE, BUT NOT BE LIMITED TO, FALL PROTECTION, CONFINED SPACE ENTRY, ELECTRICAL SAFETY, AND TRENCHING/EXCAVATION SAFETY WHERE SUCH WORK IS EXECUTED OR ENCOUNTERED.

ALL TEMPORARY WORK REQUIRED OR SPECIFIED AS A PART OF THIS WORK, SHALL MEET ALL OF THE SAME REQUIREMENTS AS PERMANENT INSTALLATIONS, SHALL MEET ALL APPLICABLE CODE REQUIREMENTS, AND SHALL BE COMPLETELY REMOVED AFTER ITS PURPOSES HAVE BEEN SERVED.

ANY EXISTING UTILITY, SERVICE, STRUCTURE, EQUIPMENT, OR FIXTURE OBSTRUCTING THE WORK SHALL BE REMOVED AND/OR RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER.

IF ASBESTOS IS ENCOUNTERED DURING WORK EXECUTION, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER AND CEASE ALL ACTIVITIES IN AFFECTED AREAS UNTIL NOTIFIED BY THE CONSTRUCTION TO RESUME OPERATIONS.

EXIST. ELECTRICAL AND MECHANICAL FIXTURES, PIPING, WIRING AND EQUIPMENT OBSTRUCTING THE WORK SHALL BE REMOVED AND/OR RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER. TEMPORARY SERVICE INTERRUPTIONS MUST BE COORDINATED WITH OWNER.

05 STEEL:

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

MATERIALS:

WIDE FLANGE	ASTM A992, GR 50
TUBING	ASTM A500, GR B
PIPE	ASTM A53, GR B
BOLTS	ASTM A325
GRATING	TYPE GW-2 (1-1/4"X3/16" BARS)
EXISTING METALS	ASTM A36

PROVIDE CERTIFICATION THAT WELDERS TO BE USED IN WORK ARE LICENSED AND HAVE SATISFACTORILY PASSED AWS QUALIFICATION TEST UNDER THE PROVISIONS OF APPENDIX D, PARTS II AND III OF THE AWS CODE FOR WELDING IN BUILDING CONSTRUCTION.

ALL BUILDING CONNECTION POINTS TO BE CENTERED ON EXISTING STRUCTURAL BEARING POINTS AND THE LOCATIONS ARE TO BE VERIFIED IN FIELD PRIOR TO THE FABRICATION OF STEEL.

DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF AISC SPECIFICATION FOR *"THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS"*.

NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIAMETER GALVANIZED ASTM A 307 BOLTS UNLESS OTHERWISE NOTED.

ALL STEEL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIPPED GALVANIZED) COATINGS" ON IRON AND STEEL PRODUCTS WITH A COATING WEIGHT OF 2 OZ/SF.

ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE EXPOSED TO WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE."

DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY TOUCHING UP ALL DAMAGED GALVANIZED STEEL WITH COLD ZINC, "GALVANOX", "DRY GALV", OR "ZINC IT", IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH UP DAMAGED NON-GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW. FIELD CUTTING OF STRUCTURAL STEEL IS NOT PERMITTED EXCEPT WITH THE PRIOR APPROVAL OF THE ENGINEER.

CONTRACTOR TO REMOVE AND RE-INSTALL ALL FIRE PROOFING AS REQUIRED DURING CONSTRUCTION.

THE STEEL STRUCTURE SHALL BE DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER COMPLETION. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.

ALL STEEL ELEMENTS SHALL BE INSTALLED PLUMB AND LEVEL.

TOWER MANUFACTURERS DESIGNS SHALL PREVAIL FOR TOWER.

CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC *"MANUAL OF STEEL CONSTRUCTION"*. CONNECTIONS SHALL BE PROVIDED TO CONFORM TO THE REQUIREMENTS OF TYPE 2 CONSTRUCTION.

STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE MINIMUM 3/4" DIAMETER AND EACH CONNECTION SHALL HAVE MINIMUM TWO BOLTS. LOCK WASHERS ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES. IF TENSION CONTROL BOLTS ARE USED, CONNECTIONS SHALL BE DESIGNED FOR SLIP CRITICAL BOLT ALLOWABLE LOAD VALUES.

DESIGN CONNECTIONS AT BEAM ENDS FOR 10 KIPS (MIN).

ALL U-BOLTED CONNECTIONS SHALL BE COMPLETED WITH DOUBLE NUTS OR A LOCK WASHER.

CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS *"STANDARD QUALIFICATION PROCEDURES"*. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND SHALL CONFORM TO AISC AND D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE LARGER OF 1/4" FILLET OR MINIMUM SIZE PER TABLE J2.4 IN THE AISC *"MANUAL OF STEEL CONSTRUCTION"*. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED. SEE NOTE REGARDING DAMAGED GALVANIZED SURFACES.

ALL ARC AND GAS WELDING SHALL BE DONE BY A LICENSED AND CERTIFIED WELDER IN ACCORDANCE WITH AWS.

SEAL ALL PENETRATIONS AND SEAMS BETWEEN MASONRY AND STEEL WITH DOW CORNING 790 SILICONE BUILDING SEALANT OR EQUAL.

26 ELECTRICAL:

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

ALL ELECTRICAL CONDUCTORS:

- INSULATION SHALL BE MINIMUM 600V TYPE THHN, THWN-2, OR XHHW.
- BRANCH CIRCUIT CONDUCTORS SHALL BE SOFT DRAWN 98% MINIMUM CONDUCTIVITY NEWLY REFINED COPPER.
- FEEDER CIRCUIT CONDUCTORS SHALL BE EITHER COPPER OR ALUMINUM OF THE APPROPRIATE SIZE FOR THE APPLICATION, OR AS SPECIFICALLY NOTED.
- PERMANENTLY LABEL OR TAG ALL CONDUCTORS WITH THEIR CIRCUIT DESIGNATION AT ALL TERMINATION ENDS, SPLICES, AND VISIBLE AS PASS-THROUGH IN ALL ENCLOSURES.

ALL CONDUIT, RACEWAY, WIREWAYS, DUCTS, ETC. SHALL BE LISTED AND SUITABLE FOR THE APPLICATION. ONLY THE FOLLOWING CONDUITS AS APPROVED AND LISTED FOR THE APPLICATION SHALL BE ACCEPTABLE:

- ELECTRICAL METALLIC TUBING (EMT).
- COMPRESSION COUPLINGS AND CONNECTORS ONLY MADE UP WRENCH TIGHT.
- FLEXIBLE METAL CONDUIT (FMC) AND LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC).
- FINAL CONNECTIONS TO VIBRATING OR ADJUSTABLE EQUIPMENT INCLUDING, BUT NOT LIMITED TO, LIGHT FIXTURES, HVAC UNITS, TRANSFORMERS, MOTORS, ETC. OR WHERE EQUIPMENT IS PLACED UPON SLAB ON-GRADE.
- RIGID GALVANIZED STEEL (RGS).
- ALL FITTINGS, CONNECTORS, AND COUPLINGS SHALL BE THREADED MADE UP WRENCH TIGHT.
- RIGID POLYVINYL CHLORIDE (PVC) SCHEDULE 40 OR SCHEDULE 80.
- MAY BE USED FOR SERVICES, EXTERIOR, BELOW GRADE, AND WET LOCATIONS.
- SHALL NOT BE USED IN CONCRETE SLABS NOR EXPOSED WITHIN A BUILDING OR STRUCTURE.
- METAL-CLAD CABLE (MC).
- CONCEALED INSTALLATIONS ONLY.
- WITHIN A DUCT WITH SMOOTH OR CORRUGATED METAL JACKET AND NO OUTER COVERING OVER THE METAL JACKET.

IN FINISHED SPACES, ALL CONDUITS SHALL BE CONCEALED EXCEPT TO MAKE A FINAL CONNECTION TO EQUIPMENT NOT MOUNTED IN OR AGAINST FINISH MATERIAL.

ALL FEEDER AND BRANCH CIRCUITS SHALL HAVE A SEPARATE NEWLY SIZED AND MARKED GROUNDING CONDUCTOR, PER APPLICABLE CODES, THAT BONDS ALL ENCLOSURES, BOXES, ETC. CONDUIT SHALL NOT BE USED AS A GROUNDING OR BONDING CONDUCTOR.

IF EXISTING ELECTRIC SERVICE IS TO REMAIN, CONTRACTOR SHALL BE VERIFY THAT IT MEETS PROJECT REQUIREMENTS WITHOUT MODIFICATION. IF IT IS TO BE ADDED OR REPLACED AS A PART OF THIS WORK, CONTRACTOR SHALL ORDER FROM, COORDINATE WITH, AND GAIN APPROVAL FROM THE ELECTRICAL UTILITY. ALL ELECTRICAL EQUIPMENT SHALL BE AS SPECIFIED AND AS APPROVED BY THE LOCAL UTILITY WHERE APPLICABLE.

ALL EQUIPMENT, ENCLOSURES, ETC. SHALL BE SUITABLE FOR THE INSTALLED ENVIRONMENT, MINIMUM NEMA 3R FOR ALL EXTERIOR INSTALLATIONS.

WIRING DEVICES SHALL BE SPECIFICATION GRADE AND WIRING DEVICE COVER PLATES SHALL BE PLASTIC WITH ENGRAVING AS SPECIFIED. COLOR SHALL BE IVORY. ALL DEVICES AND COVER PLATES SHALL BE OF THE SAME MANUFACTURER.

ALL FIRE-RATED PENETRATIONS SHALL BE SEALED USING A SUITABLE AND LISTED FIRE SEALING DEVICE OR GROUT THAT WILL MAINTAIN THE FIRE RATING OF THE STRUCTURE PENETRATED.

PROVIDE PERMANENTLY AFFIXED ENGRAVED NAMEPLATES FOR ALL CODE REQUIRED LABELING AND ON ALL PANELS, METERING, DISCONNECTS, AND ELECTRICAL EQUIPMENT THAT IDENTIFIES EQUIPMENT SERVED, ELECTRICAL SOURCE WITH CIRCUIT IDENTIFICATION, AND VOLTAGES WITHIN.

ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL FINAL TERMINATIONS TO ALL EQUIPMENT.

ALL ELECTRICAL APPURTENANCES THAT ARE DISCONNECTED SHALL BE COMPLETELY REMOVED WITH EXISTING STRUCTURES TO REMAIN, REPAIRED, FINISHED, FILLED, PAINTED, ETC. ALL PANEL SCHEDULES, EQUIPMENT LABELING, AND CODE-REQUIRED LABELING, SHALL BE VERIFIED AND NEWLY COMPLETED TO MATCH THE INSTALLATION.

26 GROUNDING:

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

GROUND ALL SYSTEMS AND EQUIPMENT IN ACCORDANCE WITH BEST INDUSTRY PRACTICE, THE REQUIREMENTS OF THE NFPA 70 NATIONAL ELECTRICAL CODE (NEC), AND ALL OTHER APPLICABLE CODES AND REGULATIONS.

ALL GROUNDING ELECTRODES PRESENT AT EACH SERVICE LOCATION SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM.

ALL EQUIPMENT ENCLOSURES, DEVICES, AND CONDUITS SHALL BE GROUNDED BY THE INSTALLATION OF A SEPARATE GROUNDING CONDUCTOR FOR ALL FEEDER AND BRANCH CIRCUITS THAT IS SIZED PER CODE OR IS OF THE SIZE INDICATED ON THE DRAWINGS, SHALL BE CONTINUOUS IN LENGTH, AND SHALL BE BONDED TO EACH ENCLOSURE PASSED THROUGH. CONDUIT SHALL NOT BE USED AS A GROUNDING OR BONDING WIRE OR CIRCUIT.

BOND ALL METALLIC CONDUITS TOGETHER THAT ARE CONNECTED TO NON-METALLIC ENCLOSURES, IN-GROUND BOXES, AND TO AN ENCLOSURE WHERE A GROUND BUS IS SPECIFIED OR SUPPLIED. ACCOMPLISH THIS BOND WITH GROUNDING CONDUCTORS MINIMUM SIZED TO THE LARGEST GROUNDING CONDUCTOR PRESENT IN THE ENCLOSURE CONNECTED TO A GROUNDING TYPE BUSHING EQUALLY SIZED OR MAXIMUM GROUND WIRE ACCOMMODATION AVAILABLE IN STANDARD MANUFACTURE FOR THE CONDUIT SIZE, WHICHEVER IS LESS.

EQUIPMENT GROUNDING AND LOAD SIDE BONDING CONDUCTORS SHALL BE SIZED PER THE CIRCUITS OVER-CURRENT PROTECTIVE DEVICE (OCPD) SIZE. WHERE THE UNGROUNDED CONDUCTORS ARE INCREASED IN SIZE ABOVE THE STANDARD FOR THE CIRCUITS OCPD, INCREASE THE GROUNDING CONDUCTOR NEWORTIONATELY TO THE CROSS-SECTIONAL AREA OF THE UNGROUNDED CONDUCTORS.

SERVICE MAIN BONDING JUMPERS AND GROUNDING ELECTRODE CONDUCTORS SHALL BE SIZED AND INSTALLED PER THE MINIMUM OF ALL APPLICABLE CODES AND REGULATIONS.

26 LIGHTNING PROTECTION:

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS AND THE GROUNDING SPECIFICATIONS HEREIN.

THE LIGHTNING PROTECTION GROUNDING SYSTEM (LPGS) SHALL CONSIST OF BONDING ALL EQUIPMENT AND CONDUCTIVE STRUCTURES TO LOCALIZED SINGLE-POINT GROUNDING CONNECTIONS (TYPICALLY GROUND BARS) WHICH ARE BONDED TOGETHER AND TO AN IN-GROUND SYSTEM. IF THE LPGS IS ON A BUILDING, IT SHALL BE EFFECTIVELY BONDED TO THE ELECTRICAL SERVICE MAIN BONDING JUMPER AND TO ADDITIONAL IN-GROUND ELECTRODES AS MAY BE REQUIRED OR INDICATED. IF THE LPGS IS ON A DEDICATED COMMUNICATION SITE, ALL EQUIPMENT AREAS AND TOWERS SHALL EACH HAVE THEIR OWN IN-GROUND RING WITH EVERY RING BONDED TOGETHER, AND ALL CONDUCTIVE STRUCTURES IN CLOSE PROXIMITY (FENCES, ICE BRIDGES, ISOLATED EQUIPMENT, ETC.) ALSO BONDED TO PROVIDE A COMMON ELECTRICAL EQUIPOTENTIAL SYSTEM FOR ALL CONDUCTIVE ELEMENTS AND STRUCTURES.

CONDUCTORS:

- MIN #2 AWG SOLID BARE TINNED COPPER (SBTC) FOR ALL IN-GROUND CONDUCTORS.
- MIN #2 AWG COPPER GREEN STRANDED FOR BONDING STRUCTURES, AND FOR INTER-SYSTEM BONDING OF INDIVIDUAL ELEMENTS SUCH AS GROUND BAR TO GROUND BAR.
- MIN #6 AWG COPPER GREEN STRANDED OR ALL EQUIPMENT BONDING.
- INSTALL ALL IN-GROUND CONDUCTORS IN THE SAME HORIZONTAL PLANE OR IN A DOWNWARD DIRECTION AWAY FROM THE TOWER AND EQUIPMENT AREAS.
- AVOID LONG RUNS. MAKE DIRECT RUNS AS MUCH AS POSSIBLE.
- PLACE THROUGH NON-METALLIC SLEEVES WHEN PASSING THROUGH FLOORS, WALLS, CEILINGS, AND SIMILAR STRUCTURES.
- MAKE ALL CONNECTIONS IN CONTACT WITH EARTH WITH EXOTHERMIC WELDING. MAKE ALL OTHER CONNECTIONS WITH EXOTHERMIC WELDING, IRREVERSIBLE COMPRESSION CONNECTORS, OR LISTED COMPRESSION TWO-HOLE LUGS.
- INSTALL ALL CONDUCTORS WITH A MINIMUM 18 INCH BEND RADIUS AND NO BEND LONGER THAN A 90 DEGREE ARC. ALL BENDS SHALL BE HORIZONTAL, OR DOWNWARD TOWARDS EARTH.
- ALL CONDUCTORS PASSING FROM ABOVE-GROUND TO IN-GROUND CONNECTIONS, WHERE EXPOSED, SHALL BE COVERED AND PROTECTED WITH A NON-METALLIC CONDUIT SEALED AT BOTH ENDS.
- IF 2 OR MORE IN-GROUND CONDUCTOS ARE IN THE SAME PATH (2 RINGS OVERLAPPING, BONDING FOLLOWING ANOTHER RING OR RADIAL, OR SIMILAR), COMBINE WITH A SHARED SINGLE CONDUCTOR.

EQUIPMENT AND TOWER GROUND RINGS SHALL BE:

- BONDED TO ANY CONDUCTIVE OBJECT OR STRUCTURE WITHIN 5 FEET OF EQUIPMENT GROUND RINGS AND WITHIN 20 FEET OF TOWER GROUND RINGS.
- INSTALLED MINIMUM 18 INCHES FROM FOUNDATIONS, FOOTINGS, AND SIMILAR.

INSTALL ALL IN-GROUND RINGS, RADIALS, BONDS CONNECTING THEM, AND ALL SIMILAR GROUNDING:

- MIN 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE, WHICHEVER IS GREATER DEPTH.
- MIN 2 FEET FROM FOUNDATIONS, FOOTINGS, OTHER GROUNDING SYSTEMS, AND SIMILAR STRUCTURES, EXCEPT WHEN MAKING A BOND TO ANY OF THESE STRUCTURES. DO NOT BOND TO FOUNDATION INTERNAL REINFORCEMENT.

ALL EQUIPMENT GROUPED IN A COMMON AREA, COMPOUND, STRUCTURE, OR SIMILAR SHALL BE BONDED TO A SINGLE-POINT GROUND, PREFERABLY AN ISOLATED GROUND BAR. BOND THE GROUND BAR TO THE SYSTEM WITH MINIMUM SINGLE BONDING CONDUCTOR. IF BONDING TO AN IN-GROUND RING, INSTALL 2 BONDING CONDUCTORS MINIMUM WITH EACH CONDUCTOR INSTALLED DIRECTIONALLY AWAY FROM EACH OTHER AND PARALLEL TO THE IN-GROUND CONDUCTOR, WITH NO TEE CONNECTIONS.

TOWER GROUNDING:

- EACH TOWER LEG SHALL BE BONDED TO ITS RING. SINGLE-LEGGED TOWERS, OR MONOPOLES, SHALL HAVE 2 BONDS ON OPPOSITE SIDES.
- BOND TO TOWER BASE, NOT TO VERTICAL TOWER STRUCTURE, AWAY FROM TOWER MOUNTING HARDWARE.
- EACH BOND SHALL HAVE A CORRESPONDING GROUND ROD ON THE RING.
- EACH BOND SHALL CONSIST OF 2 CONDUCTORS FROM THE TOWER TO ITS RING WITH EACH CONDUCTOR DIRECTED IN OPPOSITE DIRECTIONS WITH A PARALLEL CONNECTION ON THE RING ON OPPOSITE SIDES OF THE GROUND ROD.

EQUIPMENT AREA GROUNDING:

- COMMUNICATION AREAS ON EARTH SHALL HAVE A GROUND RING.
- BOND ALL EQUIPMENT TO A SINGLE-POINT GROUND (GROUND BAR).
- BOND THE EQIPMENT SINGLE-POINT GROUND TO THE EQUIPMENT GROUND RING WITH MINIMUM 2 CONDUCTORS DIRECTED IN OPPOSITE DIRECTIONS WITH PARALLEL CONNECTIONS ON THE RING.
- IF EQUIPMENT IS ENCLOSED IN A SHELTER:
- IF THE SHELTER IS CONSIDERED TO BE EXPOSED TO A DIRECT LIGHTNING STRIKE, INSTALL A BUILDING LIGHTNING PROTECTION SYSTEM PER APPLICABLE VERSION OF NFPA 780.
- BOND ALL FIXED CONDUCTIVE BUILDING COMPONENTS TOGETHER AND TO THE BUILDING RING GROUND AT THE CORNERS. THIS IS TYPICALLY CALLED THE HALO GROUND. DO NOT BOND EQUIPMENT TO THE HALO GROUND.
- BOND ALL EQUIPMENT TOGETHER TO A SINGLE-POINT OR INTERIOR EQUIPMENT RING GROUND (IEGR). BOND THE SINGLE-POINT OR IEGR TO THE EXTERNAL EQUIPMENT RING GROUND.
- PLACE GROUND RODS AT THE EQUIPMENT GROUND RING CORNERS.

GROUND RODS:

- SEPARATION SPACE BETWEEN ANY 2 GROUND RODS SHALL BE NO CLOSER THAN THEIR DEPTH. THIS APPLIES TO ALL RODS IN THE COMPLETE SYSTEM.
- DRIVE VERTICALLY IN UNDISTURBED SOIL WITH THE TOP AT SAME DEPTH AS THE IN-GROUND CONDUCTOR. IF NOT POSSIBLE TO INSTALL VERTICALLY, PLACE AS CLOSE TO VERTICAL AS POSSIBLE AND IN A DIRECTION AWAY FROM THE NEAREST ABOVE-GROUND CONDUCTIVE ELEMENT (TOWER, EQUIPMENT, ETC.).

RADIALS (TYP. NEW DEDICATED COMMUNICATION SITES):

- WHERE FEASIBLE WITH ENOUGH SPACE AVAILABLE, INSTALL A MINIMUM OF 4, MAXIMUM 10 RING RADIALS.
- EACH RADIAL'S LENGTH SHALL BE MIN 20 FT, MAX 50 FT.
- EXTEND RADIALS PERPENDICULAR FROM RINGS IN AS STRAIGHT LINE AS POSSIBLE, AWAY FROM OTHER RING GROUNDS, RADIALS, BONDS, AND SIMILAR.
- A COMMON PRACTICE IS TO PLACE 4 RADIALS FROM THE TOWER RING TO THE 4 CORNERS OF THE AVAILABLE AREA.

AT A MINIMUM, BOND ALL COMPOUND CONDUCTIVE FENCE CORNER POSTS AND GATE POSTS TO THE LPGS. PREFERABLY, INSTALL A GROUND RING THAT FOLLOWS THE FENCE LINE, BONDING ALL POSTS TO THE RING.

27 ANTENNAS & CABLES:

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRANSMISSION CABLES, JUMPERS, CONNECTORS, GROUNDING STRAPS, ANTENNAS, MOUNT AND HARDWARE. ALL MATERIALS SHALL BE INSPECTED BY THE CONTRACTOR FOR DAMAGE UPON DELIVERY. JUMPERS SHALL BE SUPPLIED AT ANTENNAS AND EQUIPMENT INSIDE SHELTER. COORDINATE LENGTH OF JUMPER CABLES WITH OWNER. COORDINATE AND VERIFY ALL OF THE MATERIALS TO BE PROVIDED WITH OWNER PRIOR TO SUBMITTING BID AND ORDERING MATERIALS.

AFTER INSTALLATION, THE TRANSMISSION LINE SYSTEM SHALL BE PIM / SWEEP TESTED FOR NEWER INSTALLATION AND DAMAGE WITH ANTENNAS CONNECTED. CONTRACTOR SHALL OBTAIN AND USE LATEST TESTING PROCEDURES FROM OWNER OR MANUFACTURER PRIOR TO BIDDING.

ANTENNA CABLES SHALL BE UNIQUELY COLOR-CODED AT THE ANTENNAS, BOTH SIDES OF EQUIPMENT SHELTER WALL, AND JUMPER CABLES AT THE EQUIPMENT.

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL CONNECTORS, ASSOCIATED CABLE MOUNTING AND GROUNDING HARDWARE, WALL MOUNTS, STANDOFFS, AND ALL ASSOCIATED HARDWARE TO INSTALL ALL CABLES AND ANTENNAS TO THE MANUFACTURERS AND OWNERS SPECIFICATIONS.

ANTENNA CABLES SHALL BE FOAM DIELECTRIC COAXIAL CABLES AS FOLLOWS:

- BASE STATION ANTENNAS:
  - 7/8" DIAMETER FOR CABLE LENGTHS UP TO 100 FT.
  - 1-5/8" DIAMETER FOR CABLE LENGTHS GREATER THAN 100 FT.
  - GPS ANTENNAS:
  - 7/8" DIAMETER FOR CABLE LENGTHS UP TO 200 FT.
  - 1-5/8" DIAMETER FOR CABLE LENGTHS GREATER THAN 200 FT.

MINIMUM BENDING RADIUS FOR COAXIAL CABLES SHALL BE:

- 15 FT FOR 7/8" COAXIAL CABLES.
- 25 FT FOR 1-5/8" COAXIAL CABLES.

CABLE SHALL BE INSTALLED WITH A MINIMUM NUMBER OF BENDS WHERE POSSIBLE. CABLE SHALL NOT BE LEFT UNTERMINATED AND SHALL BE SEALED IMMEDIATELY AFTER BEING INSTALLED.

ALL EXTERIOR CABLE CONNECTIONS SHALL BE COVERED WITH A WATERPROOF SPLICING KIT.

CONTRACTOR SHALL VERIFY EXACT LENGTH AND DIRECTION OF TRAVEL IN FIELD PRIOR TO CONSTRUCTION.

CABLE SHALL BE FURNISHED AND INSTALLED WITHOUT SPLICES AND WITH CONNECTORS AT EACH END.

27 CABLE TRAY:

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

CABLE TRAY SHALL BE MADE OF EITHER CORROSION RESISTANT METAL OR WITH A CORROSION RESISTANT FINISH.

CABLE TRAY SHALL BE OF LADDER TRAY TYPE WITH FLAT COVER CLAMPED TO SIDE RAILS.

CABLE LADDER SHALL BE SIZED TO FIT ALL CABLES IN ACCORDANCE WITH NEC AND NEMA 11-15-84.

CABLE LADDER TRAYS SHALL BE NEMA CLASS 12A BY PW INDUSTRIES, INC. OR EQUAL.

CABLE LADDER TRAY SHALL BE SUPPORTED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

ALL WORKMANSHIP SHALL CONFORM TO THESE REQUIREMENTS AND ALL LOCAL CODES AND STANDARDS TO ENSURE SAFE AND ADEQUATE GROUNDING SYSTEM.

Cellco Partnership d/b/a
verizon
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CONSTRUCTION DOCUMENTS

NO	DATE	REVISION
0	01/04/22	FOR REVIEW: JRM
1	01/05/22	REV. FOR REVIEW: JRM
2	02/10/22	REV. FOR FILING: JRM
3	04/26/22	REV. FOR FILING: JRM
4		
5		
6		

STATE OF CONNECTICUT
MICHAEL TRODDEN
33313
LICENSED
PROFESSIONAL ENGINEER

DESIGN PROFESSIONALS OF RECORD

PROF: MICHAEL S. TRODDEN P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXT. SUITE 311 WATERFORD, CT 06385

OWNER: WATERBURY OMEGA LLC
ADDRESS: 330 BISHOP STREET #100 WATERBURY, CT 06704

WATERBURY FULTON CT

SITE ADDRESS: 330 BISHOP STREET WATERBURY, CT 06704

APT FILING NUMBER: CT141_11590

DRAWN BY: DRA

DATE: 01/04/22 CHECKED BY: JRM

VZ PROJECT CODE: 20202195130

VZ LOCATION CODE: 487741

VZ FUZE ID: 16227630

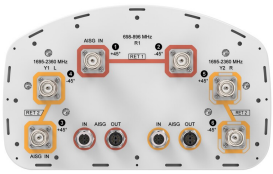
SHEET TITLE:

NOTES & SPECIFICATIONS

SHEET NUMBER:

N-1

NHH-65B-R2B



6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 65° HPBW, 2x RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- Separate RS-485 RET input/output for low and high band
- One RET for low band and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, low band	2
RF Connector Quantity, total	6

Remote Electrical Tilt (RET) Information

RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	2 female | 2 male
Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 3
Internal RET	High band (1) | Low band (1)
Power Consumption, idle state, maximum	2 W
Power Consumption, normal conditions, maximum	13 W

NHH-65B-R2B

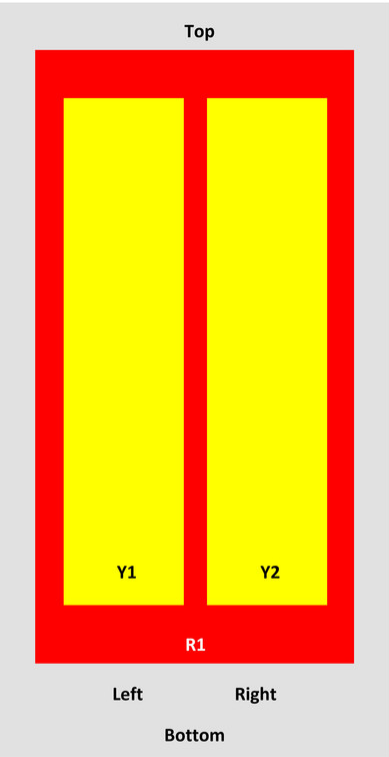
Protocol	3GPP/AISG 2.0 (Single RET)

Dimensions

Width	301 mm | 11.85 in
Depth	180 mm | 7.087 in
Length	1828 mm | 71.969 in
Net Weight, without mounting kit	19.8 kg | 43.651 lb

Array Layout

NHH



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-896	1-2	1	ANxxxxxxxxxxxxxxx1
Y1	1695-2360	3-4	2	ANxxxxxxxxxxxxxxx2
Y2	1695-2360	5-6		

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz

NHH-65B-R2B

Polarization	±45°
Total Input Power, maximum	900 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.9	15	17.7	17.9	18.4	18.7
Beamwidth, Horizontal, degrees	65	60	71	69	64	57
Beamwidth, Vertical, degrees	12.4	11.2	5.7	5.2	4.9	4.6
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	13	14	18	18	19	18
Front-to-Back Ratio at 180°, dB	30	29	31	30	29	31
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	300	300	300	300	300	300

Electrical Specifications, BASTA

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	14.5	17.3	17.7	18.1	18.5
Gain by all Beam Tilts Tolerance, dB	±0.6	±1.1	±0.4	±0.4	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.4 7 ° | 14.6 14 ° | 14.3	0 ° | 14.7 7 ° | 14.7 14 ° | 14.1	0 ° | 17.2 4 ° | 17.3 7 ° | 17.3	0 ° | 17.6 4 ° | 17.7 7 ° | 17.7	0 ° | 18.0 4 ° | 18.2 7 ° | 18.1	0 ° | 18.3 4 ° | 18.5 7 ° | 18.6
Beamwidth, Horizontal Tolerance, degrees	±2	±2.1	±3	±4.1	±6.5	±2.9
Beamwidth, Vertical Tolerance, degrees	±0.7	±0.7	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	13	14	16	16	17	15
Front-to-Back Total Power at 180° ± 30°, dB	23	22	27	27	25	25
CPR at Boresight, dB	22	21	23	23	22	19

CPR at Sector, dB	10	7	16	13	11	4

Mechanical Specifications

Effective Projective Area (EPA), frontal	0.26 m² | 2.799 ft²
Effective Projective Area (EPA), lateral	0.22 m² | 2.368 ft²
Wind Loading @ Velocity, frontal	278.0 N @ 150 km/h (62.5 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	230.0 N @ 150 km/h (51.7 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	537.0 N @ 150 km/h (120.7 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	282.0 N @ 150 km/h (63.4 lbf @ 150 km/h)
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

Width, packed	409 mm | 16.102 in
Depth, packed	299 mm | 11.772 in
Length, packed	1952 mm | 76.85 in
Weight, gross	32.3 kg | 71.209 lb

Regulatory Compliance/Certifications

Agency	**Classification**
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
ROHS	Compliant

Included Products

BSAMNT-3	–	Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

SAMSUNG

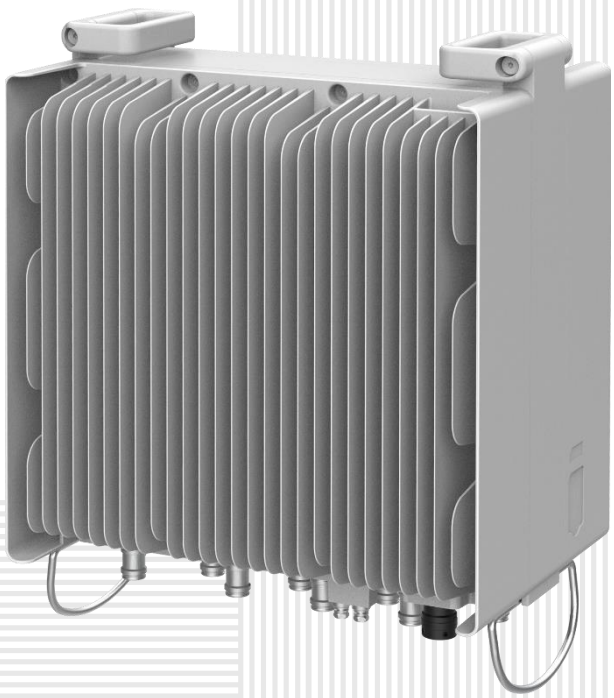
AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

57196

Model Code	RF4439d-25A



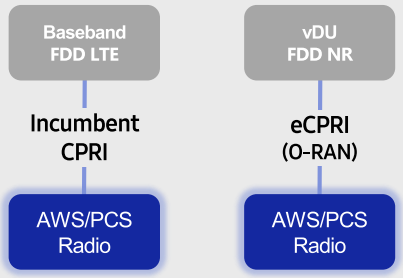
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

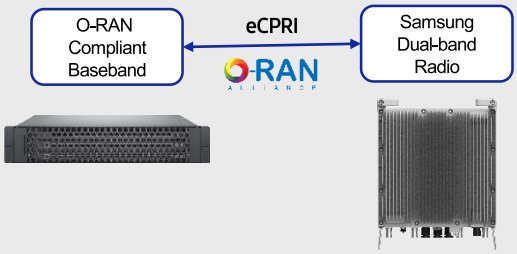
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

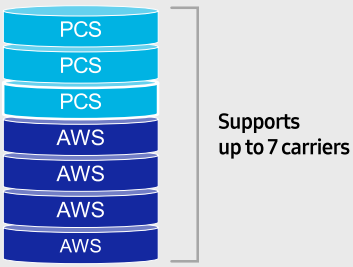
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

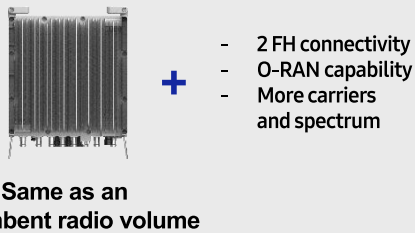
The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B25(PCS), B66(AWS)
Frequency Band	DL: 1930 – 1995MHz, UL: 1850 – 1915MHz DL: 2110 – 2200MHz, UL: 1710 – 1780MHz
RF Power	(B25) 4 × 40W or 2 × 60W (B66) 4 × 60W or 2 × 80W
IBW/OBW	(B25) 65MHz / 30MHz (B66) DL 90MHz, UL 70MHz / 60MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb

SAMSUNG

700/850MHZ MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This 700/850MHz 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code	RF4440d-13A

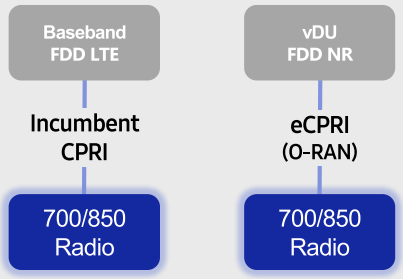
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

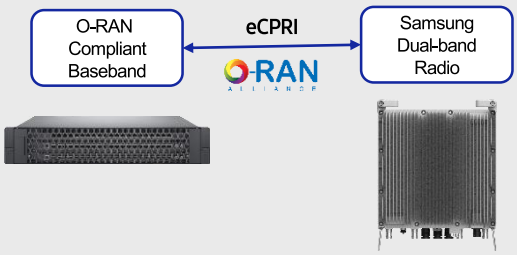
Samsung's 700/850MHz macro radio can support each incumbent CPRI interface as well as an advanced eCPRI interface. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help when implementing cost-effective networks because it is capable of sending more data without compromising additional investments.

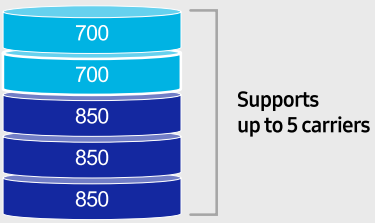
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

The number of required carriers varies according to site (region). The ability to support many carriers is essential for using all frequencies that the operator has available.

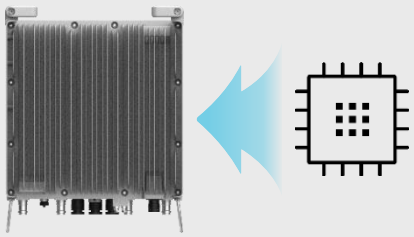
The new 700/850MHz dual-band radio can support up to 2 carriers in the B13 (700MHz) band and 3 carriers in the B5 (850MHz) band, respectively.



Secured Integrity

Access to sensitive data is allowed only to authorized software.

The Samsung radio's CPU can protect root of trust, which is credential information to verify SW integrity, and secure storage provides access control to sensitive data by using dedicated hardware (TPM).



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B13(700MHz), B5(850MHz)
Frequency Band	DL: 746 – 756MHz, UL: 777 – 787MHz DL: 869 – 894MHz, UL: 824 – 849MHz
RF Power	(B13) 4 × 40W or 2 × 60W (B5) 4 × 40W or 2 × 60W
IBW/OBW	(B13) 10MHz / 10MHz (B5) 25MHz / 25MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 9.05inch (33.2L) / 70.33 lb

SAMSUNG

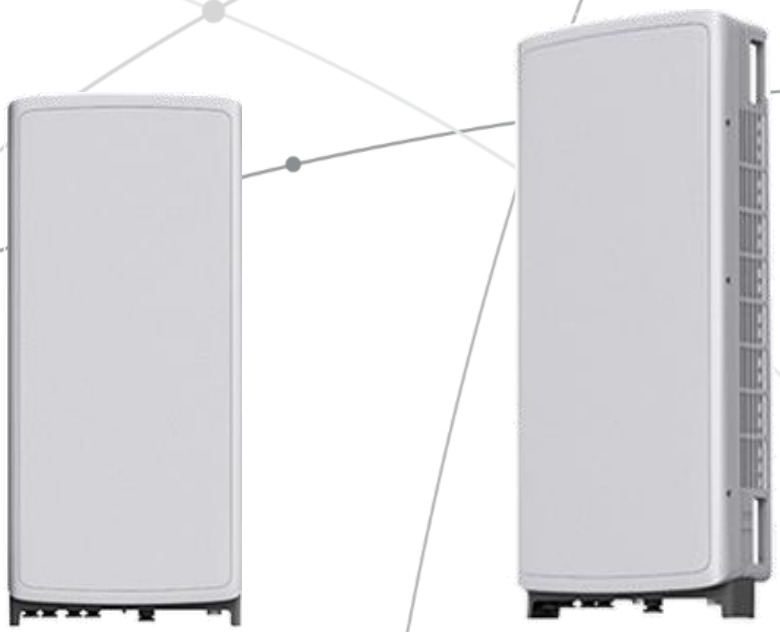
SAMSUNG

C-Band 64T64R Massive MIMO Radio

for High Capacity and Wide Coverage

Samsung C-Band 64T64R Massive MIMO Radio enables mobile operators to increase coverage range, boost data speeds and ultimately offer enriched 5G experiences to users in the U.S..

Model Code : MT6407-77A

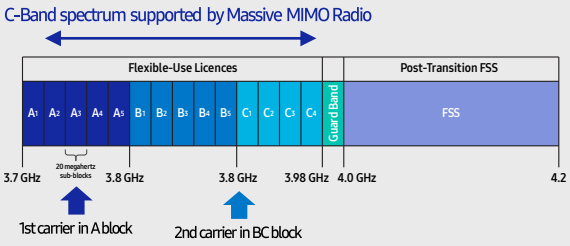


Points of Differentiation

Wide Bandwidth

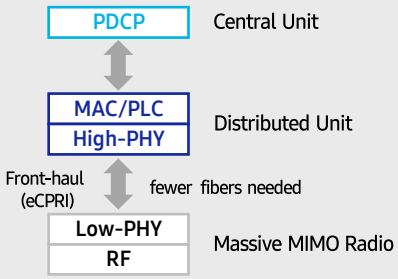
With capability to support up to 2 CC carrier configuration, Samsung C-Band massive MIMO Radio supports 200 MHz bandwidth in the C-Band spectrum.

Samsung C-Band massive MIMO Radio covers the entire C-Band 280 MHz spectrum, so it can meet the operator's needs in current A block and future B/C blocks



Future Proof Product

Samsung C-Band 64T64R Massive MIMO radio supports not only CPRI but also eCPRI as front-haul interface.
It enables operators can cut down on OPEX/CAPEX by reducing front-haul bandwidth through low layer split and using ethernet based higher efficient line.



Enhanced Performance

C-Band massive MIMO Radio creates sharp beams and extends networks' coverage on the critical mid-band spectrum using a large number of antenna elements and high output power to boost data speeds.

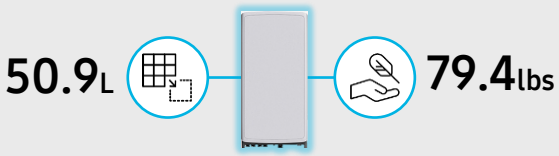
This helps operators reduce their CAPEX as they now need less products to cover the same area than before.

Furthermore, as C-Band massive MIMO Radio supports MU-MIMO(Multi-user MIMO) , it enables to increase user throughput by minimizing interference.

Well Matched Design

Samsung C-Band Massive MIMO radio utilizes 64 antennas, supports up to 280MHz bandwidth, and delivers a 200W output power. despite the above advanced performance, the Radio has a compact size of 50.9L and 79.4lbs. This makes it easy to install the Radio.

It is designed to look solid and compact, with a low profile appearance so that, when installed, harmonizes well with the surrounding environment..



Technical Specifications

Item	Specification
Tech	NR
Band	n77
Frequency Band	3700 - 3980 MHz
EIRP	78.5dBm (53.0 dBm+25.5 dBi)
IBW/OBW	280 MHz / 200 MHz
Installation	Pole/Wall
Size/ Weight	16.06 x 35.06 x 5.51 inch (50.86L)/ 79.4 lbs

SAMSUNG

About Samsung Electronics Co., Ltd.

Samsung inspires the world and shapes the future with transformative ideas and technologies. The company is redefining the worlds of TVs, smartphones, wearable devices, tablets, digital appliances, network systems, and memory, system LSI, foundry and LED solutions.

129 Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, Korea

ATTACHMENT 3

	General	Power	Density					
Site Name: Waterbury Fulton								
Tower Height: Verizon @ 66.8ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**FREQ.**	**CALC. POWER DENS**	**MAX. PERMISS.EXP.**	**FRACTION MPE**	**Total**
*T-Mobile	2	1310	96	2100	0.1163	1.0000	1.16%	
*T-Mobile	2	1325	96	1900	0.1177	1.0000	1.18%	
*T-Mobile	2	655	96	2100	0.0582	1.0000	0.58%	
*T-Mobile	4	662	96	1950	0.1176	1.0000	1.18%	
*T-Mobile	1	590	96	700	0.0262	0.4667	0.56%	
VZW 700	**2**	**1067**	**66.8**	**751**	**0.0172**	**0.5007**	**3.43%**	
VZW Cellular	**2**	**1084**	**66.8**	**874**	**0.0175**	**0.5827**	**3.00%**	
VZW PCS	**4**	**1455**	**66.8**	**1972.5**	**0.0469**	**1.0000**	**4.69%**	
VZW AWS	**4**	**1710**	**66.8**	**2120**	**0.0551**	**1.0000**	**5.51%**	
VZW CBAND	**2**	**21627**	**66.8**	**3730.08**	**0.3486**	**1.0000**	**34.86%**	
								56.15%
* Source: Siting Council								

ATTACHMENT 4

ALL-POINTS TECHNOLOGY CORPORATION

April 26, 2022 (Rev 2)

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

Re: Structural Analysis and Design Report - Proposed Equipment & Antenna Modification
Verizon Site Name: Waterbury Fulton CT
330 Bishop Street
Waterbury, CT 06704

Project/Location Code: 20202195130/467741
VZW FUZE I.D.: 16227630
APT Filing No.: CT141_11590

To Whom It May Concern,

All-Points Technology Corporation, P.C., a professional engineering corporation licensed in the State of Connecticut, has been retained by Verizon to assess the structural adequacy of the existing Verizon mounting assemblies, related connections, and the existing host structure under the proposed equipment upgrade. Reference can be made to the Construction Drawings prepared by this office, marked Rev 3, dated 04/26/2022.

The following table summarizes the mounting assembly usages under the proposed equipment loading utilizing the local design criteria:

Mount Usage[1]	
Mounting Members	0.18
Connection	0.47
Ballasted Mount	0.40

Host Structure Comparison[2]	
Gravity	+2.6%
Lateral	0.0%

Notes:
1. Usage values noted above compared to unity (i.e. < 1.0) are deemed adequate.
2. Usage value depicts the net change (%) in loading as compared to the original design loading. Values under 5% for gravity loading and 10% for lateral loading are deemed adequate per Section 807 of the 2015 IEBC as amended by the 2018 Connecticut State Building Code.

If there are any further questions regarding this project or if we may be of further assistance, please do not hesitate to call.

Sincerely,
All-Points Technology Corp., P.C

Michael S. Trodden, P.E.
Senior Structural Engineer

STATE OF CONNECTICUT · MICHAEL TRODDEN · 33313 · LICENSED PROFESSIONAL ENGINEER

Structural Analysis and Design Report
Waterbury, Connecticut
prepared for
Verizon Wireless

INTRODUCTION:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis and design for the purpose of a proposed antenna installation, located at 330 Bishop Street, Waterbury, Connecticut.

The proposed scope of work includes the replacement of four (4) existing panel antennas with two (2) proposed panel antennas & two (2) antennas with integrated remote radio heads (RRHs), four (4) existing RRHs with four (4) proposed RRHs, the installation of two (2) proposed quad diplexers and the removal of two (2) existing FRP concealment canisters. Reference can be made to the Construction Drawings prepared by this office, marked Rev 3, dated 04/26/2022.

REFERENCES:

The following information was utilized in the preparation of this analysis:

- Rooftop mapping obtained from field measurements and site observations conducted by APT during October 2020.
- Manufacturer's Specifications, Drawings, etc. (Refer to Appendix C)
- Construction Drawings prepared by CENTEK, marked Rev 1, dated 08/03/2016.

STRUCTURAL ANALYSIS:

The analysis of the existing antenna mounting assemblies & host structure evaluation has been prepared in accordance with the following design codes & standards:

- ANSI/TIA-222-H-2018 – Structural Standards for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures.
- ASCE/SEI 7-10 – Minimum Design Loads for Buildings and Other Structures.
- AISC – Manual of Steel Construction, 15th Edition.
- 2015 International Building Code (IBC) as amended by the 2018 Connecticut State Building Code.

DESIGN CRITERIA FOR STRUCTURAL ANALYSIS:

The analysis of the modified antenna mount assembly was prepared utilizing the following design criteria:

- 125 mph (3-second gust) Ultimate Design Wind Speed.
- Structure Class II
- Exposure Category B
- Ground Snow Load, P_g = 30 psf.
- Roof Live Load, LL_r = 20 psf.

Equipment Summary:

The proposed Verizon antenna/appurtenance and mount assembly loading consists of the following equipment (proposed equipment shown in **bold** text):

Antenna and Appurtenance Make/Model	Quantity	Status	Mount Type	Elevation
Commscope NHH-65B-R2B panel antennas	**2**	**P**	Eight (8) existing single pipe mounts with FRP concealment canisters. **Remove two (2) existing FRP concealment canisters.**	66.8 ft± AGL
Samsung MT6407-77A antennas w/ integrated RRHs	**2**	**P**		
Andrew HBXX-6517DS-A2M panel antennas	2	ETR		
Andrew LNX-6514-A1M panel antennas	2	ETR		
Samsung B5/B13 RRH (RF440d-13A) Remote Radio Heads (RRHs)	**2**	**P**	Two (2) existing SitePro1 RT-RRU5HD rooftop ballasted mounting frames. **Add four (4) SitePRO1 MAT18 rubber mats per mounting frame.**	n/a
Samsung B2/B66a RRH-BR049 (RF4439d-25A) Remote Radio Heads (RRHs)	**2**	**P**		
Commscope SDX1926Q-43 Quad Diplexers	**2**	**P**		
Raycap RHSDC-3315-PF-48 6 OVP	2	ETR		
6x12 Hybrid cables	2	ETR	n/a	n/a

Notes:
1. ETR = Existing to Remain/to be Relocated; P = Proposed.

Conclusions and Recommendations:

In conclusion, our analysis indicates that the existing mounting assemblies and all related connections are structurally adequate under the imposed design loading. Furthermore, based upon our evaluation, it is our professional opinion that the proposed installation will not adversely affect the structural integrity of the existing host structure.

The findings of this report are based upon a review of the physical characteristics of the mount assembly as documented by mount mapping at rooftop conducted by APT. This letter assumes that the mounting assemblies' structural components and connections are in good condition and have been properly maintained since erection. The contractor shall inspect the condition of the existing antenna support structure in its entirety prior to the installation of the equipment modification.

This report does not imply or guarantee the existing Verizon site has been originally designed and constructed in accordance with the applicable local or state codes. Furthermore, it is assumed that the existing host structure was correctly analyzed and deemed structurally adequate at the time of the original construction.

Sincerely,
All-Points Technology Corp., P.C.

Michael S. Trodden, P.E.
Sr. Structural Engineer

Appendix A

Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS												
				Wind Design Parameters								
Municipality	**Ground Snow Load** (psf)	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)			**Wind-Borne Debris Regions**[1]		**Hurricane-Prone Regions**
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Simsbury	35	0.179	0.064	110	120	130	85	93	101			Yes
Somers	35	0.174	0.064	115	125	135	89	97	105			Yes
Southbury	35	0.198	0.065	110	120	130	85	93	101			Yes
Southington	30	0.185	0.064	115	125	135	89	97	105			Yes
South Windsor	30	0.178	0.064	115	125	135	89	97	105			Yes
Sprague	30	0.171	0.061	120	130	140	93	101	108		Type A	Yes
Stafford	35	0.173	0.064	115	125	135	89	97	105			Yes
Stamford	30	0.249	0.069	110	120	130	85	93	101			Yes
Sterling	35	0.170	0.061	125	135	145	97	105	112		Type A	Yes
Stonington	30	0.159	0.058	125	140	150	97	108	116	Type B	Type A	Yes
Stratford	30	0.201	0.064	115	125	135	89	97	105		Type B	Yes
Suffield	35	0.176	0.065	110	120	130	85	93	101			Yes
Thomaston	35	0.186	0.064	110	120	130	85	93	101			Yes
Thompson	40	0.172	0.063	120	130	140	93	101	108			Yes
Tolland	35	0.175	0.064	115	125	135	89	97	105			Yes
Torrington	40	0.182	0.065	110	120	125	85	93	97			Yes
Trumbull	30	0.207	0.065	115	125	135	89	97	105			Yes
Union	40	0.172	0.064	115	125	135	89	97	105			Yes
Vernon	30	0.177	0.064	115	125	135	89	97	105			Yes
Voluntown	30	0.168	0.060	125	135	145	97	105	112		Type A	Yes
Wallingford	30	0.183	0.063	115	125	135	89	97	105			Yes
Warren	40	0.186	0.065	105	115	125	81	89	97			
~~Washington~~	~~35~~	~~0.192~~	~~0.065~~	~~105~~	~~120~~	~~125~~	~~81~~	~~93~~	~~97~~			~~Yes~~
Waterbury	35	0.189	0.064	110	125	130	85	97	101			Yes
~~Waterford~~	~~30~~	~~0.161~~	~~0.058~~	~~125~~	~~135~~	~~145~~	~~97~~	~~105~~	~~112~~	~~Type B~~	~~Type A~~	~~Yes~~
Watertown	35	0.189	0.064	110	120	130	85	93	101			Yes
Westbrook	30	0.167	0.059	120	135	145	93	105	112	Type B	Type A	Yes
West Hartford	30	0.181	0.064	115	125	135	89	97	105			Yes
West Haven	30	0.188	0.062	115	125	135	89	97	105		Type B	Yes
Weston	30	0.224	0.067	110	120	130	85	93	101			Yes
Westport	30	0.226	0.067	110	120	130	85	93	101		Type B	Yes
Wethersfield	30	0.181	0.064	115	125	135	89	97	105			Yes
Willington	35	0.174	0.063	115	125	135	89	97	105			Yes
Wilton	30	0.231	0.068	110	120	130	85	93	101			Yes
Winchester	40	0.177	0.065	105	120	125	81	93	97			Yes
Windham	30	0.173	0.062	120	130	140	93	101	108			Yes
Windsor	35	0.179	0.064	115	125	135	89	97	105			Yes
Windsor Locks	35	0.177	0.064	110	125	130	85	97	101			Yes
Wolcott	35	0.187	0.064	110	125	130	85	97	101			Yes
Woodbridge	30	0.191	0.063	115	125	135	89	97	105			Yes
Woodbury	35	0.194	0.065	110	120	130	85	93	101			Yes
Woodstock	40	0.172	0.063	120	130	140	93	101	108			Yes

Appendix B

Antenna Mount Analysis

Project ID:	CT141_11590
Site Name:	Waterbury Fulton CT
Date:	1/5/2022

(Based on ANSI/TIA-222-H-2018)

Site Name:	Waterbury Fulton CT
Site Address:	330 Bishop Street Waterbury, CT 06704
Site County:	New Haven

Design Criteria:

Risk Category =	II		*Table 1.5-1*
Exposure Category =	B		*Section 26.7.3*
Ultimate Design Wind Speed, V =	125	mph	*2018 CTSBC, Appendix N*

Building Information:

Antenna Centerline, z =	66.8	ft., +/-
Host Structure Height, H =	60.7	ft., +/-
Bulkhead/Parapet Height, H_{ppt} =	1.00	ft., +/-
Largest Windward Face of Structure, W_s =	136.0	ft., +/-

Wind Pressure Analysis:

$q_z = 0.00256 K_z K_{zt} K_s K_e K_d V^2$ *Section 2.6.11.6*

K_z :	**See Next Sheet**			
	z_g =	1200		*Table 26.9-1*
	α =	7		*Table 26.9-1*
	K_{zmin} =	0.7		*Table 26.9-1*
K_{zt} :	**K_{zt} =**	**1.00**		*Section 2.6.6*
K_s :	**K_s =**	**1.00**		*Section 2.6.7*
K_e :	**K_e =**	**1.00**		*Section 2.6.8*
K_d :	**K_d =**	**0.95**		*Section 16.6*
	q_z' =	**38.00**	**psf**	
	q_{zi}' =	**6.08**	**psf**	

$F = q_z G_h (EPA)_A = q_z G_h K_a [(EPA)_N \cos^2(\Theta) + (EPA)_T \sin^2(\Theta)]$ *Section 2.6.11.2*

G_h =	1.00	*Section 16.6*
K_a =	0.90	*Section 16.6*

ALL-POINTS TECHNOLOGY CORPORATION

(Based on ANSI/TIA-222-H-2018)

Project ID: CT141_11590
Site Name: Waterbury Fulton CT
Date: 1/5/2022

Design Criteria: *(From Previous Sheet)*

$q_z' =$ **38.00 psf** $G_h =$ 1.00 *Section 16.6* $K_a =$ 0.90 *Section 16.6*

Description	#/Sector	Elev. z, ft	K_z	q_z, psf	Dimensions Height, in	Width, in	Depth, in	Wght., lbs	Flat Panel Front Coefficient Area, ft^2	Aspect Ratio	Ca	C_aA_a	Flat Panel Side Coefficient Area, ft^2	Aspect Ratio	Ca	C_aA_a	Front Wind Force, lbs	Side Wind Force, lbs	Weight, lbs
MT6407-77A	1.0	66.8	0.881	33.46	35.1	16.1	5.5	87.1	3.92	2.180	1.20	4.71	1.341	6.382	1.37	1.840	142.0	56.0	87.1
Exist. Enclosure	3.0	65.8	0.877	33.31	108.0	20.0	20.0	60.0	15.00	5.400	0.76	11.47	15.000	5.400	0.76	11.467	344.0	344.0	60.0
NHH-65B-R2B	1.0	66.8	0.881	33.46	72.0	11.9	7.1	57.4	5.95	6.050	1.36	8.08	3.550	10.141	1.50	5.342	244.0	161.0	57.4
HBXX-6517DS-A2M	1.0	66.8	0.881	33.46	75.0	12.0	6.5	54.5	6.25	6.250	1.37	8.54	3.385	11.538	1.55	5.252	258.0	159.0	54.5
LNX-6514-A1M	1.0	66.8	0.881	33.46	72.9	11.9	7.1	45.0	6.02	6.126	1.36	8.20	3.594	10.268	1.51	5.424	247.0	164.0	45.0
B2/B66A RRH (RF4439d-25A)	1.0	64.7	0.873	33.16	15.0	15.0	10.1	97.5	1.56	1.000	1.20	1.88	1.052	1.485	1.20	1.263	56.0	38.0	97.5
B5/B13 RRH (RF4400d-13A)	1.0	64.7	0.873	33.16	15.0	15.0	9.1	82.0	1.56	1.000	1.20	1.88	0.948	1.648	1.20	1.138	56.0	34.0	82.0
SDX1926Q-43	1.0	64.7	0.873	33.16	4.2	7.0	3.0	6.2	0.20	0.600	1.20	0.25	0.088	1.400	1.20	0.105	8.0	4.0	6.2
6OVP	1.0	64.7	0.873	33.16	19.8	15.7	10.3	32.0	2.16	1.259	1.20	2.60	1.409	1.932	1.20	1.691	78.0	51.0	32.0

ALL-POINTS TECHNOLOGY CORPORATION

Project ID: CT141_11590
Site Name: Waterbury Fulton CT
Date: 1/5/2022

(Based on ANSI/TIA-222-H-2018)

Design Criteria: *(From Previous Sheet)*

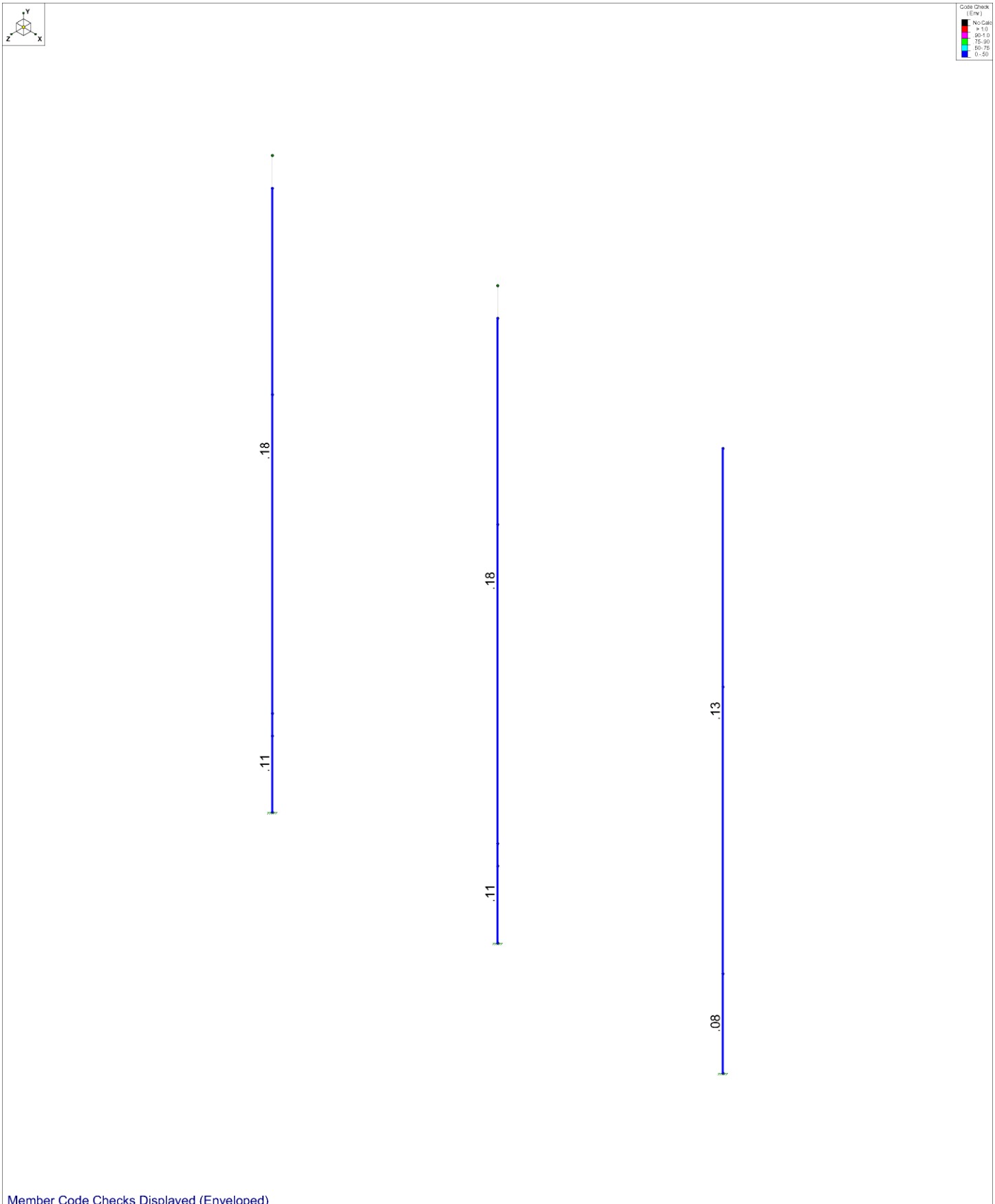
q_z' = 38.00 psf

G_h = 1.00 *Section 16.6*

K_a = 0.90 *Section 16.6*

Description	Elev. z, ft	K_z	q_{zi}, psf	Dimensions: Width or Dia, in	Dimensions: Depth, in	Dimensions: Weight, lbs/ft	Loading: Flat or Round	Loading: Ca	Loading: Wind, lbs/ft
5.0" STD	66.8	0.881	5.35	5.560	5.560	14.60	Round	1.20	16.7
3.5" STD	66.8	0.881	5.35	4.000	4.000	9.12	Round	1.20	12.0

APT		
MST	ALL MOUNTS	
Waterbury Fulton	NODE & MEMBER LABELS	ALL SECTORS.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

APT		
MST	ALL MOUNTS	
Waterbury Fulton	BENDING STRESSES	ALL SECTORS.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
8	FRP	2600	450	.3	.65	.121	30	1.5	30	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	5.0" STD	PIPE_5.0	Column	Pipe	A53 Gr.B	Typical	4.01	14.3	14.3	28.6
2	3.5" STD	PIPE_3.5	Column	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	3.5" STD	96.875									Lateral
2	M2	5.0" STD	18.25									Lateral
3	M3	3.5" STD	96.875									Lateral
4	M4	5.0" STD	18.25									Lateral
5	M6	3.5" STD	96.875									Lateral
6	M7	5.0" STD	18.25									Lateral

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Memb...	Surfac...
1	DL	DL		-1.05		3		6		
2	WLX	WLX				1		10		
3	WLZ	WLZ				1		10		

Load Combinations

	Description	S...	PDelta	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		DL	1.4																		
2																								
3	1.2DL + WLX	Yes	Y		DL	1.2	WLX	1																
4	1.2DL + 0.75WLX + 0.25...	Yes	Y		DL	1.2	WLX	.75	WLZ	.25														
5	1.2DL + 0.25WLX + 0.75...	Yes	Y		DL	1.2	WLX	.25	WLZ	.75														
6	1.2DL + WLZ	Yes	Y		DL	1.2	WLZ	1																
7	1.2DL + 0.25WL-X + 0.7...	Yes	Y		DL	1.2	WLX	-.25	WLZ	.75														
8	1.2DL + 0.75WL-X + 0.2...	Yes	Y		DL	1.2	WLX	-.75	WLZ	.25														
9	1.2DL + WL-X	Yes	Y		DL	1.2	WLX	-1																
10	1.2DL + 0.75WL-X + 0.2...	Yes	Y		DL	1.2	WLX	-.75	WLZ	-.25														
11	1.2DL + 0.25WL-X + 0.7...	Yes	Y		DL	1.2	WLX	-.25	WLZ	-.75														
12	1.2DL + WL-Z	Yes	Y		DL	1.2	WLZ	-1																
13	1.2DL + 0.25WLX + 0.75...	Yes	Y		DL	1.2	WLX	.25	WLZ	-.75														
14	1.2DL + 0.75WLX + 0.25...	Yes	Y		DL	1.2	WLX	.75	WLZ	-.25														
15																								
16	DL		Y		DL	1																		
17																								
18	DL + 0.6WLX		Y		DL	1	WLX	.6																
19	DL + 0.6(.75WLX + 0.25...		Y		DL	1	WLX	.45	WLZ	.15														

Load Combinations (Continued)

	Description	S...	PDelta	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
20	DL + 0.6(0.25WLX + 0.7...		Y		DL	1	WLX	.15	WLZ	.45														
21	DL + 0.6WLZ		Y		DL	1	WLZ	.6																
22	DL + 0.6(0.25WL-X + 0.7...		Y		DL	1	WLX	-.15	WLZ	.45														
23	DL + 0.6(0.75WL-X + 0.2...		Y		DL	1	WLX	-.45	WLZ	.15														
24	DL + 0.6WL-X		Y		DL	1	WLX	-.6																
25	DL + 0.6(0.75WL-X + 0.2...		Y		DL	1	WLX	-.45	WLZ	-.15														
26	DL + 0.6(0.25WL-X + 0.7...		Y		DL	1	WLX	-.15	WLZ	-.45														
27	DL + 0.6WL-Z		Y		DL	1	WLZ	.6																
28	DL + 0.6(0.25WLX + 0.7...		Y		DL	1	WLX	.15	WLZ	-.45														
29	DL + 0.6(0.75WLX + 0.2...		Y		DL	1	WLX	.45	WLZ	-.15														
30			Y																					
31	DL		Y		DL	1																		
32	WLX		Y		WLX	1																		
33	WLZ		Y		WLZ	1																		

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	1	max	345.24	3	295.83	1	345.24	6	1931.12	6	0	1	1931.12	9
2		min	-345.24	9	253.57	3	-345.24	12	-1931.12	12	0	1	-1931.12	3
3	6	max	106.79	3	273.2	3	248.79	6	1394.7	6	0	1	551.21	9
4		min	-106.79	9	161.2	9	-248.79	12	-1394.7	12	0	1	-551.8	3
5	11	max	345.24	3	288.97	1	345.24	6	1930.99	6	0	1	1930.99	9
6		min	-345.24	9	247.69	3	-345.24	12	-1930.99	12	0	1	-1930.99	3
7	Totals:	max	797.27	3	838.2	1	939.27	6						
8		min	-797.27	9	662.46	9	-939.27	12						

Joint Reactions

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
1	1	1	0	295.83	0	0	0	0
2	1	6	0	253.4	0	0	0	0
3	1	11	0	288.97	0	0	0	0
4	1	Totals:	0	838.2	0			
5	1	COG (in):	X: -2.04	Y: 63.15	Z: 0			
6	3	1	345.24	253.57	0	0	0	-1931.12
7	3	6	106.79	273.2	0	0	0	-551.8
8	3	11	345.24	247.69	0	0	0	-1930.99
9	3	Totals:	797.27	774.46	0			
10	3	COG (in):	X: 1.58	Y: 63.73	Z: 0			
11	4	1	258.93	253.57	86.31	482.78	0	-1448.34
12	4	6	80.09	259.2	62.2	348.81	0	-413.79
13	4	11	258.93	247.69	86.31	482.75	0	-1448.24
14	4	Totals:	597.95	760.46	234.82			
15	4	COG (in):	X: .73	Y: 63.59	Z: 0			
16	5	1	86.31	253.57	258.93	1448.34	0	-482.78
17	5	6	26.7	231.2	186.59	1046.16	0	-137.89
18	5	11	86.31	247.69	258.93	1448.24	0	-482.75
19	5	Totals:	199.32	732.46	704.45			
20	5	COG (in):	X: -1.08	Y: 63.3	Z: 0			
21	6	1	0	253.57	345.24	1931.12	0	0
22	6	6	0	217.2	248.79	1394.7	0	0
23	6	11	0	247.69	345.24	1930.99	0	0
24	6	Totals:	0	718.46	939.27			
25	6	COG (in):	X: -2.04	Y: 63.15	Z: 0			
26	7	1	-86.31	253.57	258.93	1448.34	0	482.78

Joint Reactions (Continued)

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
27	7	6	-26.7	203.2	186.59	1045.88	0	137.86
28	7	11	-86.31	247.69	258.93	1448.24	0	482.75
29	7	Totals:	-199.32	704.46	704.45			
30	7	COG (in):	X: -3.03	Y: 62.99	Z: 0			
31	8	1	-258.93	253.57	86.31	482.78	0	1448.34
32	8	6	-80.09	175.2	62.2	348.53	0	413.47
33	8	11	-258.93	247.69	86.31	482.75	0	1448.24
34	8	Totals:	-597.95	676.46	234.82			
35	8	COG (in):	X: -5.14	Y: 62.66	Z: 0			
36	9	1	-345.24	253.57	0	0	0	1931.12
37	9	6	-106.79	161.2	0	0	0	551.21
38	9	11	-345.24	247.69	0	0	0	1930.99
39	9	Totals:	-797.27	662.46	0			
40	9	COG (in):	X: -6.27	Y: 62.48	Z: 0			
41	10	1	-258.93	253.57	-86.31	-482.78	0	1448.34
42	10	6	-80.09	175.2	-62.2	-348.53	0	413.47
43	10	11	-258.93	247.69	-86.31	-482.75	0	1448.24
44	10	Totals:	-597.95	676.46	-234.82			
45	10	COG (in):	X: -5.14	Y: 62.66	Z: 0			
46	11	1	-86.31	253.57	-258.93	-1448.34	0	482.78
47	11	6	-26.7	203.2	-186.59	-1045.88	0	137.86
48	11	11	-86.31	247.69	-258.93	-1448.24	0	482.75
49	11	Totals:	-199.32	704.46	-704.45			
50	11	COG (in):	X: -3.03	Y: 62.99	Z: 0			
51	12	1	0	253.57	-345.24	-1931.12	0	0
52	12	6	0	217.2	-248.79	-1394.7	0	0
53	12	11	0	247.69	-345.24	-1930.99	0	0
54	12	Totals:	0	718.46	-939.27			
55	12	COG (in):	X: -2.04	Y: 63.15	Z: 0			
56	13	1	86.31	253.57	-258.93	-1448.34	0	-482.78
57	13	6	26.7	231.2	-186.59	-1046.16	0	-137.89
58	13	11	86.31	247.69	-258.93	-1448.24	0	-482.75
59	13	Totals:	199.32	732.46	-704.45			
60	13	COG (in):	X: -1.08	Y: 63.3	Z: 0			
61	14	1	258.93	253.57	-86.31	-482.78	0	-1448.34
62	14	6	80.09	259.2	-62.2	-348.81	0	-413.79
63	14	11	258.93	247.69	-86.31	-482.75	0	-1448.24
64	14	Totals:	597.95	760.46	-234.82			
65	14	COG (in):	X: .73	Y: 63.59	Z: 0			

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[i...	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn y-y...	phi*Mn z-z...	Cb	Eqn
1	M1	PIPE_3.5	.179	96.88	3	.014	96.88		3	60376.98	78750	7953.75	7953.75	2.22	H1-1b
2	M2	PIPE_5.0	.109	18.25	3	.009	7.22		3	125712....	126315	17928.75	17928.75	1.12	H1-1b
3	M3	PIPE_3.5	.130	96.88	6	.010	96.88		6	60376.98	78750	7953.75	7953.75	1	H1-1b
4	M4	PIPE_5.0	.079	18.25	6	.007	7.22		6	125712....	126315	17928.75	17928.75	1	H1-1b
5	M6	PIPE_3.5	.179	96.88	6	.014	96.88		6	60376.98	78750	7953.75	7953.75	1	H1-1b
6	M7	PIPE_5.0	.109	18.25	6	.009	7.22		6	125712....	126315	17928.75	17928.75	1	H1-1b

Load Combinations

	Description	S...	PDelta	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL		Y		DL	1.4																		
2																								
3	1.2DL + WLX		Y		DL	1.2	WLX	1																
4	1.2DL + 0.75WLX + 0.25...		Y		DL	1.2	WLX	.75	WLZ	.25														
5	1.2DL + 0.25WLX + 0.75...		Y		DL	1.2	WLX	.25	WLZ	.75														
6	1.2DL + WLZ		Y		DL	1.2	WLZ	1																
7	1.2DL + 0.25WL-X + 0.7...		Y		DL	1.2	WLX	-.25	WLZ	.75														
8	1.2DL + 0.75WL-X + 0.2...		Y		DL	1.2	WLX	-.75	WLZ	.25														
9	1.2DL + WL-X		Y		DL	1.2	WLX	-1																
10	1.2DL + 0.75WL-X + 0.2...		Y		DL	1.2	WLX	-.75	WLZ	-.25														
11	1.2DL + 0.25WL-X + 0.7...		Y		DL	1.2	WLX	-.25	WLZ	-.75														
12	1.2DL + WL-Z		Y		DL	1.2	WLZ	-1																
13	1.2DL + 0.25WLX + 0.75...		Y		DL	1.2	WLX	.25	WLZ	-.75														
14	1.2DL + 0.75WLX + 0.25...		Y		DL	1.2	WLX	.75	WLZ	-.25														
15																								
16	DL	Yes	Y		DL	1																		
17																								
18	DL + 0.6WLX	Yes	Y		DL	1	WLX	.6																
19	DL + 0.6(.75WLX + 0.25...	Yes	Y		DL	1	WLX	.45	WLZ	.15														
20	DL + 0.6(0.25WLX + 0.7...	Yes	Y		DL	1	WLX	.15	WLZ	.45														
21	DL + 0.6WLZ	Yes	Y		DL	1	WLZ	.6																
22	DL + 0.6(0.25WL-X + 0.7...	Yes	Y		DL	1	WLX	-.15	WLZ	.45														
23	DL + 0.6(0.75WL-X + 0.2...	Yes	Y		DL	1	WLX	-.45	WLZ	.15														
24	DL + 0.6WL-X	Yes	Y		DL	1	WLX	-.6																
25	DL + 0.6(0.75WL-X + 0.2...	Yes	Y		DL	1	WLX	-.45	WLZ	-.15														
26	DL + 0.6(0.25WL-X + 0.7...	Yes	Y		DL	1	WLX	-.15	WLZ	-.45														
27	DL + 0.6WL-Z	Yes	Y		DL	1	WLZ	.6																
28	DL + 0.6(0.25WLX + 0.7...	Yes	Y		DL	1	WLX	.15	WLZ	-.45														
29	DL + 0.6(0.75WLX + 0.2...	Yes	Y		DL	1	WLX	.45	WLZ	-.15														
30			Y																					
31	DL		Y		DL	1																		
32	WLX		Y		WLX	1																		
33	WLZ		Y		WLZ	1																		

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	1	max	207.14	18	211.31	16	207.14	21	1158.2	21	0	16	1158.2	24
2		min	-207.14	24	211.31	16	-155.36	26	-868.65	26	0	16	-1158.2	18
3	6	max	64.07	18	214.6	18	149.27	21	836.56	21	0	16	330.7	24
4		min	-64.07	24	147.4	24	-111.96	28	-627.47	28	0	16	-330.91	18
5	11	max	207.14	18	206.41	16	207.14	21	1158.14	21	0	16	1158.14	24
6		min	-207.14	24	206.41	16	-155.36	26	-868.6	26	0	16	-1158.14	18
7	Totals:	max	478.36	18	632.32	18	563.56	21						
8		min	-478.36	24	565.12	24	-422.67	28						

Joint Reactions

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
1	16	1	0	211.31	0	0	0	0
2	16	6	0	181	0	0	0	0
3	16	11	0	206.41	0	0	0	0
4	16	Totals:	0	598.72	0			
5	16	COG (in):	X: -2.04	Y: 63.15	Z: 0			
6	18	1	207.14	211.31	0	0	0	-1158.2

Joint Reactions (Continued)

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
7	18	6	64.07	214.6	0	0	0	-330.91
8	18	11	207.14	206.41	0	0	0	-1158.14
9	18	Totals:	478.36	632.32	0			
10	18	COG (in):	X: .62	Y: 63.58	Z: 0			
11	19	1	155.36	211.31	51.79	289.55	0	-868.65
12	19	6	48.06	206.2	37.32	209.19	0	-248.16
13	19	11	155.36	206.41	51.79	289.53	0	-868.6
14	19	Totals:	358.77	623.92	140.89			
15	19	COG (in):	X: -.02	Y: 63.47	Z: 0			
16	20	1	51.79	211.31	155.36	868.65	0	-289.55
17	20	6	16.02	189.4	111.96	627.47	0	-82.71
18	20	11	51.79	206.41	155.36	868.6	0	-289.53
19	20	Totals:	119.59	607.12	422.67			
20	20	COG (in):	X: -1.34	Y: 63.26	Z: 0			
21	21	1	0	211.31	207.14	1158.2	0	0
22	21	6	0	181	149.27	836.56	0	0
23	21	11	0	206.41	207.14	1158.14	0	0
24	21	Totals:	0	598.72	563.56			
25	21	COG (in):	X: -2.04	Y: 63.15	Z: 0			
26	22	1	-51.79	211.31	155.36	868.65	0	289.55
27	22	6	-16.02	172.6	111.96	627.37	0	82.69
28	22	11	-51.79	206.41	155.36	868.6	0	289.53
29	22	Totals:	-119.59	590.32	422.67			
30	22	COG (in):	X: -2.75	Y: 63.04	Z: 0			
31	23	1	-155.36	211.31	51.79	289.55	0	868.65
32	23	6	-48.06	155.8	37.32	209.09	0	248.04
33	23	11	-155.36	206.41	51.79	289.53	0	868.6
34	23	Totals:	-358.77	573.52	140.89			
35	23	COG (in):	X: -4.24	Y: 62.8	Z: 0			
36	24	1	-207.14	211.31	0	0	0	1158.2
37	24	6	-64.07	147.4	0	0	0	330.7
38	24	11	-207.14	206.41	0	0	0	1158.14
39	24	Totals:	-478.36	565.12	0			
40	24	COG (in):	X: -5.01	Y: 62.68	Z: 0			
41	25	1	-155.36	211.31	-51.79	-289.55	0	868.65
42	25	6	-48.06	155.8	-37.32	-209.09	0	248.04
43	25	11	-155.36	206.41	-51.79	-289.53	0	868.6
44	25	Totals:	-358.77	573.52	-140.89			
45	25	COG (in):	X: -4.24	Y: 62.8	Z: 0			
46	26	1	-51.79	211.31	-155.36	-868.65	0	289.55
47	26	6	-16.02	172.6	-111.96	-627.37	0	82.69
48	26	11	-51.79	206.41	-155.36	-868.6	0	289.53
49	26	Totals:	-119.59	590.32	-422.67			
50	26	COG (in):	X: -2.75	Y: 63.04	Z: 0			
51	27	1	0	211.31	207.14	1158.2	0	0
52	27	6	0	181	149.27	836.56	0	0
53	27	11	0	206.41	207.14	1158.14	0	0
54	27	Totals:	0	598.72	563.56			
55	27	COG (in):	X: -2.04	Y: 63.15	Z: 0			
56	28	1	51.79	211.31	-155.36	-868.65	0	-289.55
57	28	6	16.02	189.4	-111.96	-627.47	0	-82.71
58	28	11	51.79	206.41	-155.36	-868.6	0	-289.53
59	28	Totals:	119.59	607.12	-422.67			
60	28	COG (in):	X: -1.34	Y: 63.26	Z: 0			
61	29	1	155.36	211.31	-51.79	-289.55	0	-868.65
62	29	6	48.06	206.2	-37.32	-209.19	0	-248.16
63	29	11	155.36	206.41	-51.79	-289.53	0	-868.6

Joint Reactions (Continued)

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
64	29	Totals:	358.77	623.92	-140.89			
65	29	COG (in):	X: -.02	Y: 63.47	Z: 0			

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation...	LC	Z Rotation...	LC
1	1	max	0	24	0	16	0	26	0	26	0	16	0	18
2		min	0	18	0	16	0	21	0	21	0	16	0	24
3	2	max	0	24	0	16	0	26	4.96e-04	26	0	16	6.61e-04	18
4		min	0	18	0	16	0	21	-6.61e-04	21	0	16	-6.61e-04	24
5	3	max	.31	24	0	16	.23	26	2.98e-03	26	0	16	3.98e-03	18
6		min	-.31	18	0	16	-.31	21	-3.98e-03	21	0	16	-3.98e-03	24
7	4	max	.33	24	0	16	.25	26	2.98e-03	26	0	16	3.98e-03	18
8		min	-.33	18	0	16	-.33	21	-3.98e-03	21	0	16	-3.98e-03	24
9	5	max	0	24	0	16	0	26	3.97e-04	26	0	16	5.29e-04	18
10		min	0	18	0	16	0	21	-5.29e-04	21	0	16	-5.29e-04	24
11	6	max	0	24	0	24	0	28	0	28	0	16	0	18
12		min	0	18	0	18	0	21	0	21	0	16	0	24
13	7	max	0	24	0	24	0	28	3.58e-04	28	0	16	1.86e-04	18
14		min	0	18	0	18	0	21	-4.77e-04	21	0	16	-1.86e-04	24
15	8	max	.08	24	0	24	.15	28	1.86e-03	28	0	16	1.06e-03	18
16		min	-.08	18	0	18	-.2	21	-2.48e-03	21	0	16	-1.05e-03	24
17	9	max	.16	24	0	16	.12	26	2.79e-03	26	0	16	3.72e-03	18
18		min	-.16	18	0	16	-.16	21	-3.72e-03	21	0	16	-3.72e-03	24
19	10	max	.04	24	0	24	.07	28	1.8e-03	28	0	16	9.74e-04	18
20		min	-.04	18	0	18	-.1	21	-2.4e-03	21	0	16	-9.73e-04	24
21	11	max	0	24	0	16	0	26	0	26	0	16	0	18
22		min	0	18	0	16	0	21	0	21	0	16	0	24
23	12	max	0	24	0	16	0	26	4.96e-04	26	0	16	6.61e-04	18
24		min	0	18	0	16	0	21	-6.61e-04	21	0	16	-6.61e-04	24
25	13	max	.31	24	0	16	.23	26	2.98e-03	26	0	16	3.98e-03	18
26		min	-.31	18	0	16	-.31	21	-3.98e-03	21	0	16	-3.98e-03	24
27	14	max	.33	24	0	16	.25	26	2.98e-03	26	0	16	3.98e-03	18
28		min	-.33	18	0	16	-.33	21	-3.98e-03	21	0	16	-3.98e-03	24
29	15	max	0	24	0	16	0	26	3.97e-04	26	0	16	5.29e-04	18
30		min	0	18	0	16	0	21	-5.29e-04	21	0	16	-5.29e-04	24
31	16	max	.16	24	0	16	.12	26	2.79e-03	26	0	16	3.72e-03	18
32		min	-.16	18	0	16	-.16	21	-3.72e-03	21	0	16	-3.72e-03	24

ALL-POINTS TECHNOLOGY CORPORATION

Project ID: CT141_11590
Site Name: Waterbury Fulton CT
Date: 1/5/2022

Existing Mount w/ FRP canister.

EXISTING CONNECTION CHECK

>> Max Reactions per RISA Output: N11, LC3

	Fx =	345.2 lbs		Mx =	0.0 lbs-ft
(Uplift)	Fy =	-247.7 lbs		My =	0.0 lbs-ft
	Fz =	0.0 lbs		Mz =	1931.0 lbs-ft

>> Existing Connection:

	L, in		W, in			
Member Size =	5.56	x	5.56		(Exist. 5" Std. Pipe)	
	L, in		W, in		t, in	
Plate =	13	x	13	x	0.625	

Anchor Spac. = 11 in Fy = 36 ksi

Anchor Dia = 0.625 in Grade = Hilti Hit-HY200

# of Anchors = 4

>> Check Existing Anchors: *Per Exist. Drawings, 5/8" DIA threaded rods & Hilti Hit-HY 200 w/ 3.5" Emb. For analysis purposes, use allowable values for 3-1/8" embedment & assume 2500 psi concrete.*

Tall = 2440 lbs Vall = 5260 lbs

T_{My} =	0.0 lbs		
T_{Mz} =	1053.267 lbs	$V_{Fx/Fz}$ =	345.24 lbs
T_{Fa} =	-61.92 lbs	V_{Mx} =	0 lbs
Ft =	991.3 lbs	Fv =	345.24 lbs

>> Bolt Interaction:

0.406289 + 0.066 = 0.472 **< 1.0, OK**

>> Check Existing Plate:

Sx = 0.846354 in^3

Flange Arm = 2.72 in *(Face of Member to Centerline of Bolt)*

$f_{act.}$ = 6.37 ksi f_{all} = 32.40 ksi

>> Plate Interaction: 0.197 **< 1.0, OK**

ALL-POINTS TECHNOLOGY CORPORATION

Project ID: CT141_11590
Site Name: Waterbury Fulton CT
Date: 1/5/2022

Existing Mount w/ FRP canister & NHH-65B-R2B.

EXISTING CONNECTION CHECK

>> Max Reactions per RISA Output: N1, LC3

	Fx =	345.2 lbs		Mx =	0.0 lbs-ft
(Uplift)	Fy =	-253.6 lbs		My =	0.0 lbs-ft
	Fz =	0.0 lbs		Mz =	1931.1 lbs-ft

>> Existing Connection:

	L, in		W, in		
Member Size =	5.56	x	5.56	(Exist. 5" Std. Pipe)	
	L, in		W, in		t, in
Plate =	13	x	13	x	0.625

Anchor Spac. = 11 in Fy = 36 ksi

Anchor Dia = 0.625 in Grade = Hilti Hit-HY200

# of Anchors = 4

>> Check Existing Anchors: *Per Exist. Drawings, 5/8" DIA threaded rods & Hilti Hit-HY 200 w/ 3.5" Emb. For analysis purposes, use allowable values for 3-1/8" embedment & assume 2500 psi concrete.*

Tall = 2440 lbs Vall = 5260 lbs

T_{My} =	0.0 lbs		
T_{Mz} =	1053.338 lbs	$V_{Fx/Fz}$ =	345.24 lbs
T_{Fa} =	-63.39 lbs	V_{Mx} =	0 lbs
Ft =	989.9 lbs	Fv =	345.24 lbs

>> Bolt Interaction:

0.405715 + 0.066 = 0.471 **< 1.0, OK**

>> Check Existing Plate:

Sx = 0.846354 in^3

Flange Arm = 2.72 in *(Face of Member to Centerline of Bolt)*

$f_{act.}$ = 6.36 ksi f_{all} = 32.40 ksi

>> Plate Interaction: 0.196 **< 1.0, OK**

ALL-POINTS TECHNOLOGY CORPORATION

Project ID:	CT141_11590
Site Name:	Waterbury Fulton CT
Date:	1/5/2022

Existing Mount w/ MT6407-77A (no FRP canister).

EXISTING CONNECTION CHECK

>> Max Reactions per RISA Output: N6, LC6

	Fx =	217.2 lbs		Mx =	0.0 lbs-ft
(Uplift)	Fy =	-248.8 lbs		My =	0.0 lbs-ft
	Fz =	0.0 lbs		Mz =	1394.7 lbs-ft

>> Existing Connection:

	L, in		W, in			
Member Size =	5.56	x	5.56	(Exist. 5" Std. Pipe)		
	L, in		W, in		t, in	
Plate =	13	x	13	x	0.625	

Anchor Spac. = 11 in Fy = 36 ksi

Anchor Dia = 0.625 in Grade = Hilti Hit-HY200

# of Anchors = 4

>> Check Existing Anchors: *Per Exist. Drawings, 5/8" DIA threaded rods & Hilti Hit-HY 200 w/ 3.5" Emb. For analysis purposes, use allowable values for 3-1/8" embedment & assume 2500 psi concrete.*

Tall = 2440 lbs Vall = 5260 lbs

T_{My} =	0.0 lbs		
T_{Mz} =	760.7455 lbs	$V_{Fx/Fz}$ =	217.2 lbs
T_{Fa} =	-62.20 lbs	V_{Mx} =	0 lbs
Ft =	698.5 lbs	Fv =	217.2 lbs

>> Bolt Interaction:

0.28629 + 0.041 = 0.328 **< 1.0, OK**

>> Check Existing Plate:

Sx = 0.846 in^3

Flange Arm = 2.72 in *(Face of Member to Centerline of Bolt)*

$f_{act.}$ = 4.49 ksi f_{all} = 32.40 ksi

>> Plate Interaction: 0.139 **< 1.0, OK**

ALL-POINTS TECHNOLOGY CORPORATION

Project ID: CT141_11590
Site Name: Waterbury Fulton CT
Date: 1/5/2022

Existing Mount w/ FRP canister.

EXISTING CONNECTION CHECK

>> Max Reactions per RISA Output: M6, LC6

	Fx =	328.7 lbs		Mx =	0.0 lbs-ft
(Uplift)	Fy =	-218.8 lbs		My =	0.0 lbs-ft
	Fz =	0.0 lbs		Mz =	1409.9 lbs-ft

>> Existing Connection:

	L, in		W, in			
Member Size =	4	x	4	(Exist. 3.5" Std. Pipe)		
	L, in		W, in		t, in	
Plate =	12	x	12	x	0.625	
Bolt Spac. =	11 in			Fy =	36	ksi
Bolt Dia =	0.5 in			Grade =	A325	
# of Bolts =	4					

>> Check Existing Bolts:

Per Exist. Drawings, 1/2" dia. A325 bolts

Tall =	9585 lbs	Vall =	6936 lbs
T_{My} =	0.0 lbs		
T_{Mz} =	769.0582 lbs	$V_{Fx/Fz}$ =	328.66 lbs
T_{Fa} =	-54.69 lbs	V_{Mx} =	0 lbs
Ft =	714.4 lbs	Fv =	328.66 lbs

>> Bolt Interaction:

0.07453 + 0.047 = 0.122 **< 1.0, OK**

>> Check Existing Plate:

Sx = 0.78125 in^3

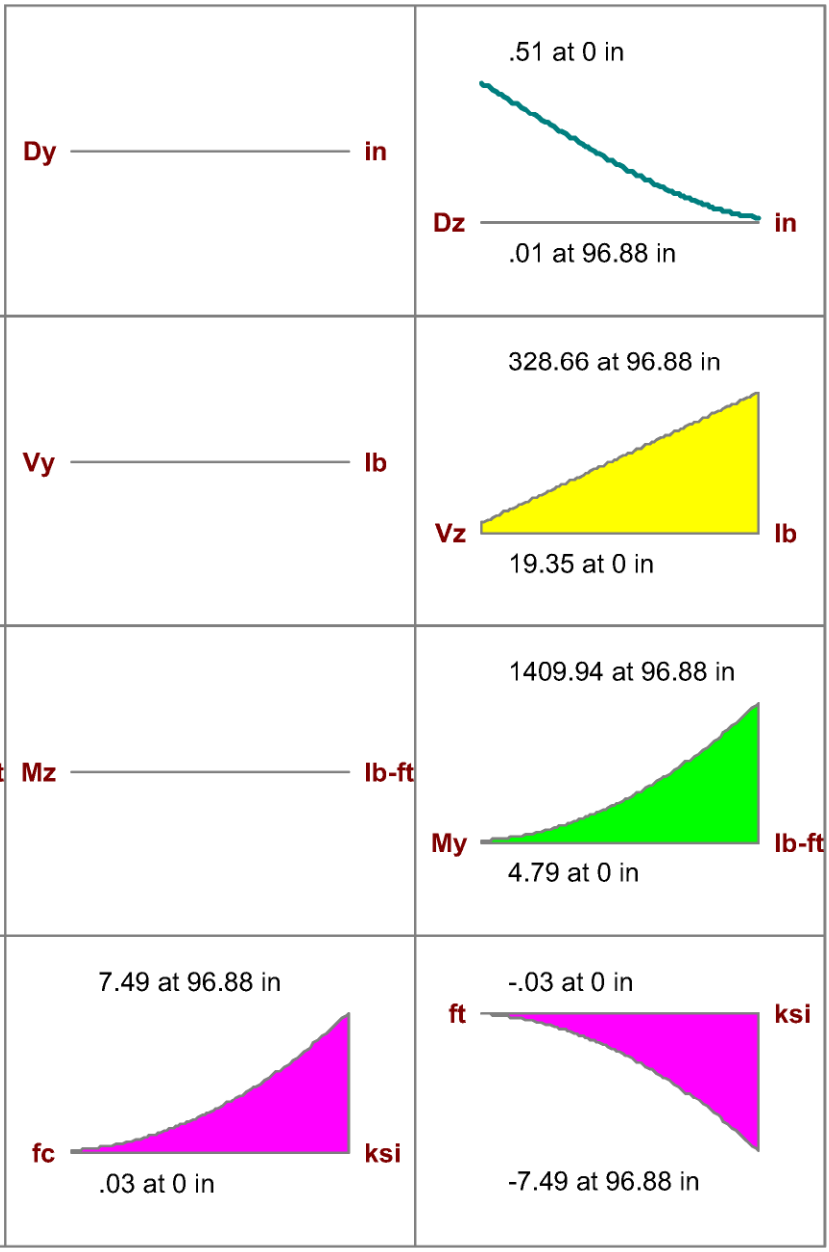
Flange Arm = 3.50 in *(Face of Member to Centerline of Bolt)*

$f_{act.}$ = 6.40 ksi f_{all} = 32.40 ksi

>> Plate Interaction: 0.198 **< 1.0, OK**

Column: ***M6***

Shape: **PIPE_3.5**
Material: **A53 Gr.B**
Length: **96.88 in**
I Joint: **13**
J Joint: **12**
LC 6: 1.2DL + WLZ
Code Check: **0.179 (bending)**
Report Based On 97 Sections



AISC 14th(360-10): LRFD Code Check

Direct Analysis Method

Max Bending Check	**0.179**	Max Shear Check	**0.014 (s)**
Location	**96.88 in**	Location	**96.88 in**
Equation	**H1-1b**	Max Defl Ratio	**L/193**

Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**35 ksi**	Lb	**96.88 in**	**96.88 in**
phi*Pnc	**60376.98 lb**	KL/r	**72.05**	**72.05**
phi*Pnt	**78750 lb**			
phi*Mny	**7953.75 lb-ft**	L Comp Flange	**96.88 in**	
phi*Mnz	**7953.75 lb-ft**	L-torque	**96.88 in**	
phi*Vny	**23625 lb**	Tau_b	**1**	
phi*Vnz	**23625 lb**			
phi*Tn	**7494.32 lb-ft**			
Cb	**1**			

ALL-POINTS TECHNOLOGY CORPORATION

Project ID:	CT141_11590
Site Name:	Waterbury Fulton CT
Date:	1/5/2022

Existing Mount w/ FRP canister & NHH-65B-R2B.

EXISTING CONNECTION CHECK

>> Max Reactions per RISA Output: M1, LC6

	Fx =	328.7 lbs	Mx =	0.0 lbs-ft	
(Uplift)	Fy =	-224.7 lbs	My =	0.0 lbs-ft	
	Fz =	0.0 lbs	Mz =	1410.1 lbs-ft	

>> Existing Connection:

	L, in		W, in		t, in	
Member Size =	4	x	4		(Exist. 3.5" Std. Pipe)	
Plate =	12	x	12	x	0.625	
Bolt Spac. =	11 in			Fy =	36	ksi
Bolt Dia =	0.5 in			Grade =	A325	
# of Bolts =	4					

>> Check Existing Bolts:

Per Exist. Drawings, 1/2" dia. A325 bolts

Tall =	9585 lbs	Vall =	6936 lbs
T_{My} =	0.0 lbs		
T_{Mz} =	769.1291 lbs	$V_{Fx/Fz}$ =	328.68 lbs
T_{Fa} =	-56.16 lbs	V_{Mx} =	0 lbs
Ft =	713.0 lbs	Fv =	328.68 lbs

>> Bolt Interaction:

0.074384 + 0.047 = 0.122 **< 1.0, OK**

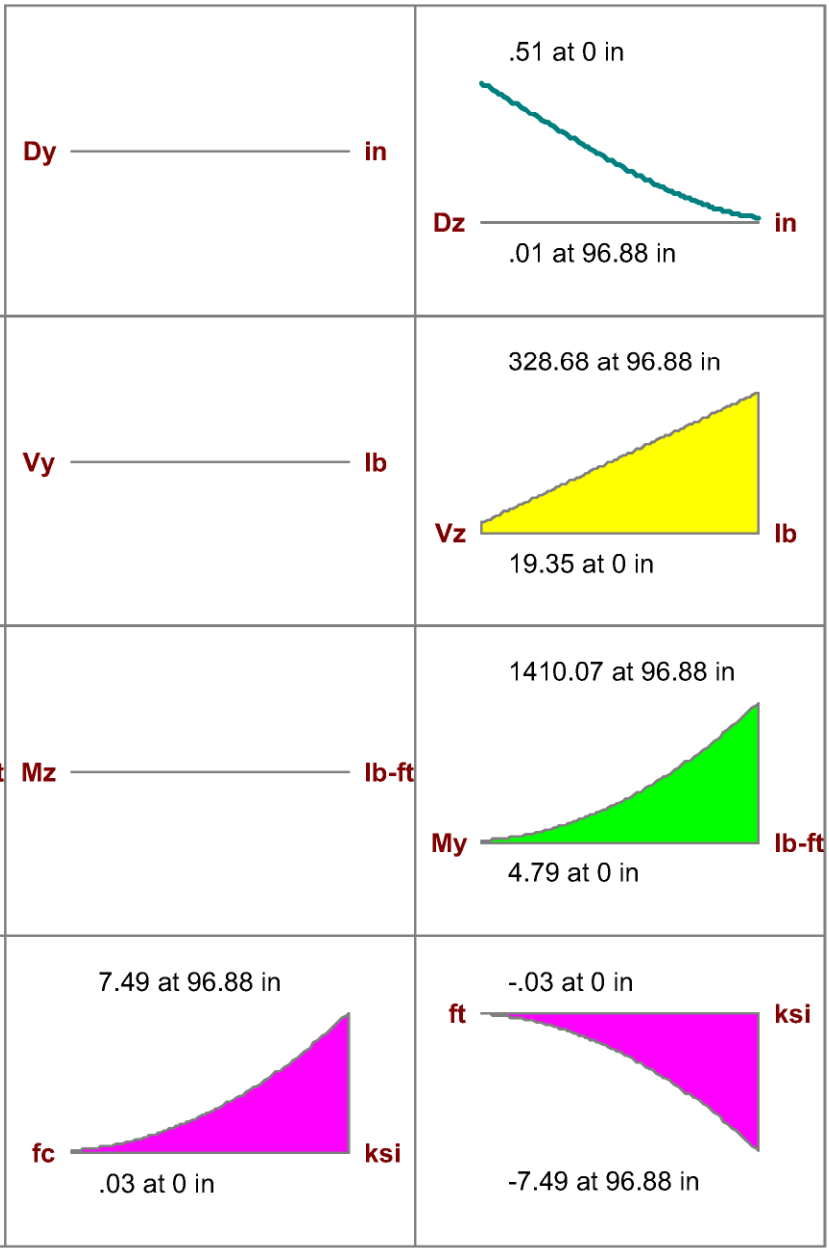
>> Check Existing Plate:

Sx =	0.78125 in^3		
Flange Arm =	3.50 in	*(Face of Member to Centerline of Bolt)*	
$f_{act.}$ =	6.39 ksi	f_{all} =	32.40 ksi

>> Plate Interaction: 0.197 **< 1.0, OK**

Column: ***M1***

Shape: **PIPE_3.5**
Material: **A53 Gr.B**
Length: **96.88 in**
I Joint: **3**
J Joint: **2**
LC 6: 1.2DL + WLZ
Code Check: **0.179 (bending)**
Report Based On 97 Sections



AISC 14th(360-10): LRFD Code Check

Direct Analysis Method

Max Bending Check	**0.179**	Max Shear Check	**0.014 (s)**
Location	**96.88 in**	Location	**96.88 in**
Equation	**H1-1b**	Max Defl Ratio	**L/193**

Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**35 ksi**	Lb	**96.88 in**	**96.88 in**
phi*Pnc	**60376.98 lb**	KL/r	**72.05**	**72.05**
phi*Pnt	**78750 lb**			
phi*Mny	**7953.75 lb-ft**	L Comp Flange	**96.88 in**	
phi*Mnz	**7953.75 lb-ft**	L-torque	**96.88 in**	
phi*Vny	**23625 lb**	Tau_b	**1**	
phi*Vnz	**23625 lb**			
phi*Tn	**7494.32 lb-ft**			
Cb	**1**			

ALL-POINTS TECHNOLOGY CORPORATION

Project ID:	CT141_11590
Site Name:	Waterbury Fulton CT
Date:	1/5/2022

Existing Mount w/ MT6407-77A (no FRP canister).

EXISTING CONNECTION CHECK

>> Max Reactions per RISA Output: M3, LC6

	Fx =	239.4 lbs		Mx =	0.0 lbs-ft
(Uplift)	Fy =	-191.1 lbs		My =	0.0 lbs-ft
	Fz =	0.0 lbs		Mz =	1019.1 lbs-ft

>> Existing Connection:

	L, in		W, in			
Member Size =	4	x	4	(Exist. 3.5" Std. Pipe)		
	L, in		W, in		t, in	
Plate =	12	x	12	x	0.625	
Bolt Spac. =	11 in			Fy =	36	ksi
Bolt Dia =	0.5 in			Grade =	A325	
# of Bolts =	4					

>> Check Existing Bolts:

Per Exist. Drawings, 1/2" dia. A325 bolts

Tall =	9585 lbs	Vall =	6936 lbs
T_{My} =	0.0 lbs		
T_{Mz} =	555.8945 lbs	$V_{Fx/Fz}$ =	239.36 lbs
T_{Fa} =	-47.76 lbs	V_{Mx} =	0 lbs
Ft =	508.1 lbs	Fv =	239.36 lbs

>> Bolt Interaction:

0.053013 + 0.035 = 0.088 **< 1.0, OK**

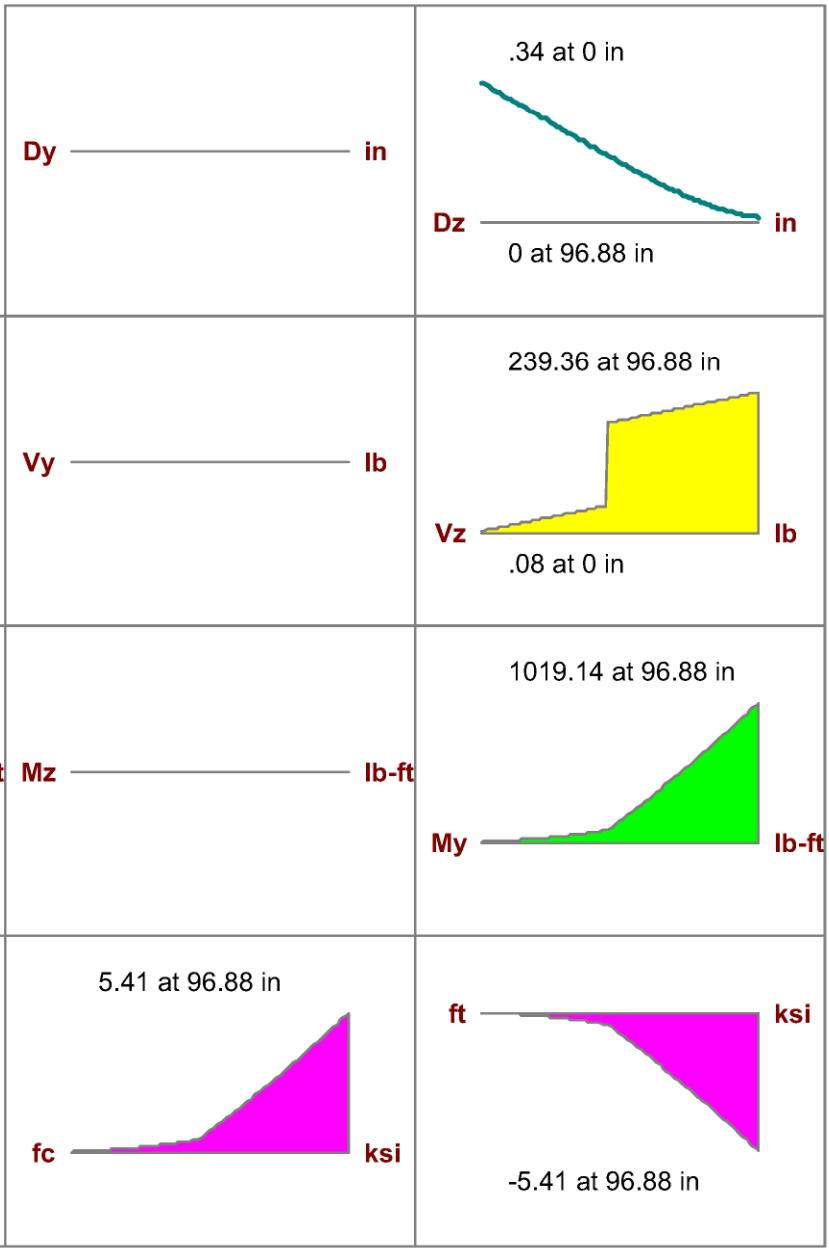
>> Check Existing Plate:

Sx =	0.781 in^3		
Flange Arm =	3.50 in	*(Face of Member to Centerline of Bolt)*	
$f_{act.}$ =	4.55 ksi	f_{all} =	32.40 ksi

>> Plate Interaction: 0.141 **< 1.0, OK**

Column: ***M3***

Shape: **PIPE_3.5**
Material: **A53 Gr.B**
Length: **96.88 in**
I Joint: **8**
J Joint: **7**
LC 6: 1.2DL + WLZ
Code Check: **0.130 (bending)**
Report Based On 97 Sections



AISC 14th(360-10): LRFD Code Check

Direct Analysis Method

Max Bending Check	**0.130**	Max Shear Check	**0.010 (s)**
Location	**96.88 in**	Location	**96.88 in**
Equation	**H1-1b**	Max Defl Ratio	**L/290**

Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**35 ksi**	Lb	**96.88 in**	**96.88 in**
phi*Pnc	**60376.98 lb**	KL/r	**72.05**	**72.05**
phi*Pnt	**78750 lb**			
phi*Mny	**7953.75 lb-ft**	L Comp Flange	**96.88 in**	
phi*Mnz	**7953.75 lb-ft**	L-torque	**96.88 in**	
phi*Vny	**23625 lb**	Tau_b	**1**	
phi*Vnz	**23625 lb**			
phi*Tn	**7494.32 lb-ft**			
Cb	**1**			

ALL-POINTS TECHNOLOGY CORPORATION

Project ID:	CT141_11590
Site Name:	Waterbury Fulton CT
Date:	1/5/2022

Antenna/Appurtenance Loading:

Quant.	Description	ASD Factor	Wind Load, lbs EA.	Wind Load, lbs (Tot.)	Centerline Height,ft.	$M_{overturn}$, lbs-ft	Weight, lbs EA.	Weight, lbs (Tot.)
1	B5/B13 RRH	0.6	56.0	33.6	4.0	134.4	82.0	82.0
1	B2/B66A RRH	0.6	56.0	33.6	4.0	134.4	97.5	97.5
1	OVP	0.6	78.0	46.8	4.0	187.2	32.0	32.0
1	SDX1926Q-43	0.6	8.0	4.8	4.0	19.2	33.0	6.2
				118.8		**475.2**		**217.7**

Mount Capacity Check:

Per SitePRO1 Mount Capacity Letter (dated March 18, 2015) for the RT-RRU5HD:

Total Mount Load (Normal) =	118.8	lbs	/	1120.0	lbs (@ 4'H)	**10.6%**	**OK**
Total Mount Load (Tangential) =	129.0	lbs	/	800.0	lbs (@ 4'H)	**16.1%**	**OK**
Total Mount Load (Dead) =	217.7	lbs	/	560.0	lbs (@ 4'H)	**38.9%**	**OK**

Ballast Weights:

Solid 4"x8"x16" Block 33 lbs/block

	Quant.	Weight, lbs	Moment Arm, ft	M_{resist}, lbs-ft
Front Tray:	5	165.0	0.75	123.8
Back Tray:	5	165.0	4.50	742.5
		330.0		**866.3**

	DL Reduction Factor	Weight, lbs	Moment Arm, ft	M_{resist}, lbs-ft
Equip:	0.6	130.6	2.625	342.9
		131		**342.9**

ALL-POINTS TECHNOLOGY CORPORATION

Project ID:	CT141_11590
Site Name:	Waterbury Fulton CT
Date:	1/5/2022

Sliding Resistance:

Weight =	460.6 lbs		
$F_{resist.}$ =	**322.4 lbs**	μ =	0.7
F_{wind} =	**118.8 lbs**		
Safety Factor =	0.37 < 1.0	**OK**	

Overturning Resistance:

$M_{resist.}$ =	**1209.1 lbs-ft**	
$M_{overturn.}$ =	**475.2 lbs-ft**	
Safety Factor =	0.39 < 1.0	**OK**

Roof Pressure Check:

>> Add four (4) SitePRO1 MAT18 Rubber Mats (48"x18"x1/2")

Weight of Mounting Frame =	282.1 lbs	
Mat Area =	24.0 ft^2	
Mat Weight =	2.125 psf	
Roof Pressure =	**36.70 psf**	

>> Compare against roof pressure applied per CENTEK CDs:

Weight of Mounting Frame =	161.8 lbs	*(Andrew RR-TFS spec sheet)*			
Est. Equipment Weight =	182.0 lbs	*(3) - 50 lbs RRH, (1) - 32 lbs OVP*			
Ballast Weight =	200.0 lbs	*(Per CDs)*			
Base Area =	12.8 ft^2	*(Total Area of mat, Per CDs)*			
Mat Weight =	2.125 psf				
Roof Pressure =	**44.68 psf**		>	**36.70**	**psf, OK**

Appendix C

References

A valmont COMPANY

March 18, 2015

RE: ANSI/TIA-222-G Mount Capacity
Valmont / Site Pro 1 Mount: 5' Rooftop RRU Frame

Part No. RT-RRU5HD

The 5' Rooftop RRU Frame referenced above has been analyzed in accordance with ANSI/TIA-222-G-2005 standard using the following design criteria.

Mount Design Criteria

Structure Height	300'	
Basic Wind Speed	140 mph	
Ice Wind Speed	60 mph	
Structure Class	II	
Exposure Category	B	
Topographic Category	I	
Factored Ice Thickness	2.49"	
Wind Direction Factor	0.95	Tubular Pole Structures, Lattice Structures with other than triangular, square or rectangular cross-sections, strength design of appurtenances
Gust Effect Factor	1.0	Appurtenances

Modeling & Applied Appurtenance Loading

The mount was analyzed for four (4) mounting locations on each side of the vertical face (8 locations total) evenly spaced across each face of the mount. Based on a 4' mounting height "H", and the Design Criteria above, the maximum allowable force per mounting location is described in the table below:

(Individual location load)		
Normal Wind Load	= factored 224 lbs	= non-factored 140 lbs (560 ft-lbs)
Tangential Wind Load	= factored 160 lbs	= non-factored 100 lbs (400 ft-lbs)
Dead Load	= factored 84 lbs	= non-factored 70 lbs
Normal Wind Load w/ Ice	= N/A	= non-factored 76 lbs
Tangential Wind Load w/ Ice	= N/A	= non-factored 76 lbs
Ice Load	= N/A	= non-factored 240 lbs

(Total mount load)		
Normal Wind Load	= factored 1792 lbs	= non-factored 1120 lbs (4480 ft-lbs)
Tangential Wind Load	= factored 1280 lbs	= non-factored 800 lbs (3200 ft-lbs)
Dead Load	= factored 672 lbs	= non-factored 560 lbs
Normal Wind Load w/ Ice	= N/A	= non-factored 608 lbs
Tangential Wind Load w/ Ice	= N/A	= non-factored 608 lbs
Ice Load	= N/A	= non-factored 1920 lbs

PiROD
MICROFLECT
Valmont Site Pro 1
2400 Walter Glaub Drive Plymouth, Indiana 46563-4005 USA
574-936-4221 Fax 574-936-8925 www.sitepro1.com

A valmont COMPANY

Non-Penetrating Ballast Requirement

Non-penetrating ballasted Roof Mount enables installation of wireless equipment. This mount, with various mast sizes, is secured to the roof using concrete-block ballast (not included).
A nominal 4 x 8 x 16 solid concrete block weighs approximately 20-30 lbs. Verify weight with local supplier. The ballast should be evenly distributed on each ballast trays. The required ballast can be calculated using one of two equations shown below.

Ballast Equation Information

A_L	= Total Antenna / Equipment wind load (non-factored) (lbs)
A_w	= Total Antenna / Equipment weight (non-factored) (lbs)
H	= Height from rooftop (ft)
W_T	= Total ballast weight (lbs)
W	= Ballast weight per tray (lbs)

Ballast equation with 1.5 safety factor:

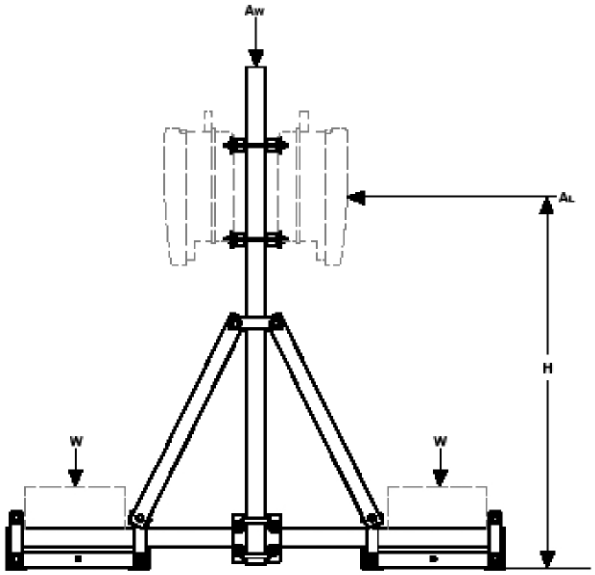
$$W = \frac{(A_L * H * 1.5) - (A_w * 2.625)}{4.5}$$

$$W_T = W * 2$$

Ballast equation with Rev G loading:

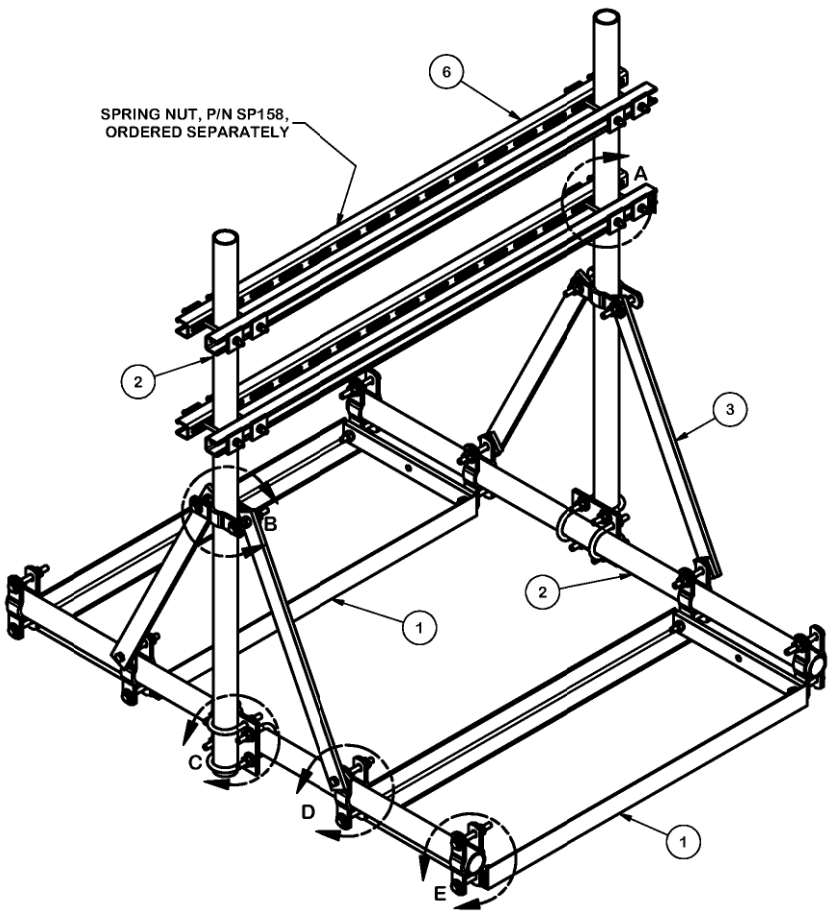
$$W = \frac{(A_L * H * 1.6) - (A_w * 2.625)}{4.5(0.9)}$$

$$W_T = W * 2$$

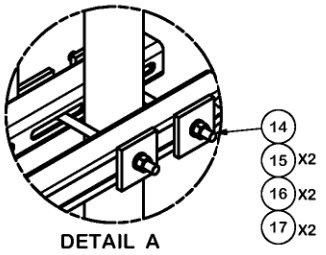


PIROD
MICROFLECT

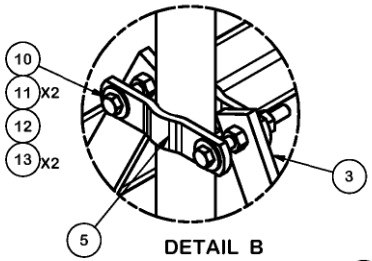
Valmont Site Pro 1
2400 Walter Glaub Drive Plymouth, Indiana 46563-4005 USA
574-936-4221 Fax 574-936-8925 www.sitepro1.com



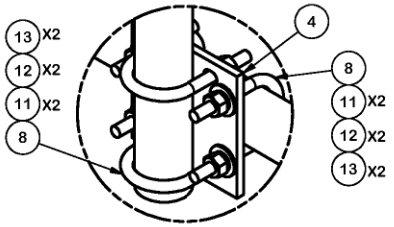
PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-251012	BALLAST TRAY WELDMENT - SITE PRO 1		36.46	72.92
2	4	P263	2-3/8" X 63"SCH 40 GALVANIZED PIPE	63 in	20.18	80.74
3	4	X-232698	TRPD-HD SUPPORT PLATE - SITE PRO 1		8.72	34.89
4	2	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"		3.71	7.42
5	20	X-115765	5" V-CLAMP		1.03	20.51
6	4	UNT5	UNISTRUT		10.19	40.76
7	4	X-124312	1/2" X 2" X 2" ANGLE SPACER; WITH 9/16" HOLE		0.53	2.13
8	8	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	5.85
9	4	G1205	1/2" x 5" HDG HEX BOLT GR5 FULL THREAD	5 in	0.33	1.30
10	16	G12045	1/2" x 4.5" HDG HEX BOLT GR5 FULL THREAD	4 1/2 in	0.30	4.77
11	44	G12FW	1/2" HDG USS FLATWASHER		0.03	1.50
12	36	G12LW	1/2" HDG LOCKWASHER		0.01	0.50
13	40	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	2.87
14	8	SS38R-8	3/8" X 8" THREADED ROD (STAINLESS STEEL)		0.25	2.01
15	16	SQW38	3/8" SQUARE WASHER (GALV.)	2 in	0.27	4.37
16	16	SS38LW	3/8" SS LOCKWASHER		0.01	0.11
17	16	SS38NUT	3/8" SS HEX NUT		0.02	0.29
					TOTAL WT. #	282.07



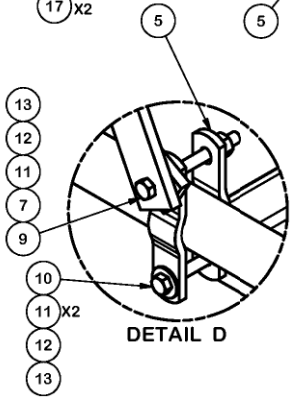
DETAIL A



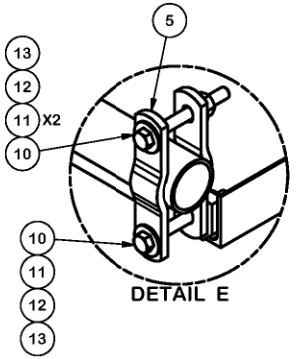
DETAIL B



DETAIL C



DETAIL D



DETAIL E

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

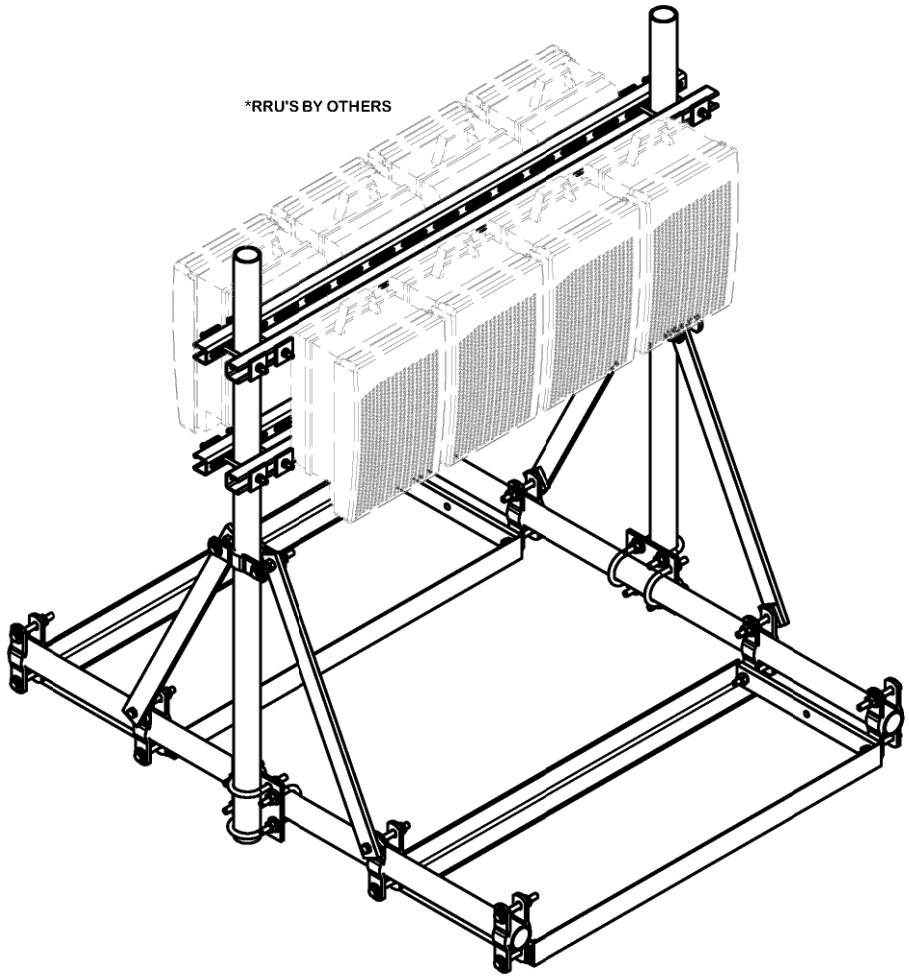
DESCRIPTION
5' HEAVY DUTY ROOFTOP
FOR REMOTE RADIO UNITS

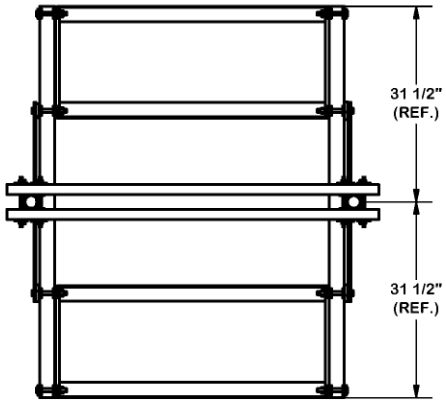
SITE PRO 1
A valmont COMPANY

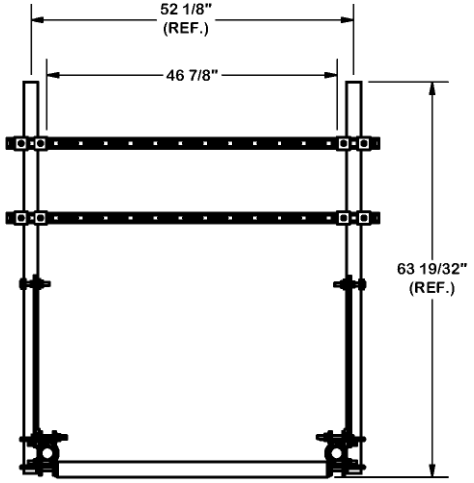
Engineering Support Team:
1-888-753-7446

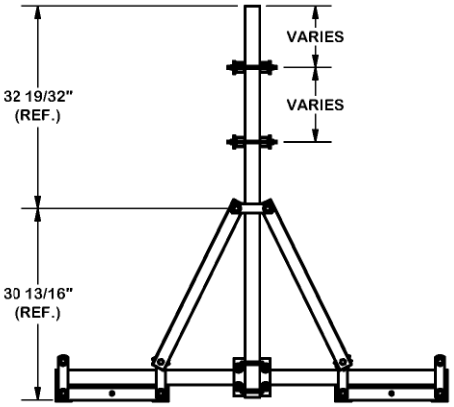
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 3/16/2015		RT-RRU5HD	1 OF 3
CLASS / SUB	DRAWING USAGE	CHECKED BY	DWG. NO.	
81 / 02	CUSTOMER	BMC 3/16/2015	RT-RRU5HD	









TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: 5' HEAVY DUTY ROOFTOP FOR REMOTE RADIO UNITS

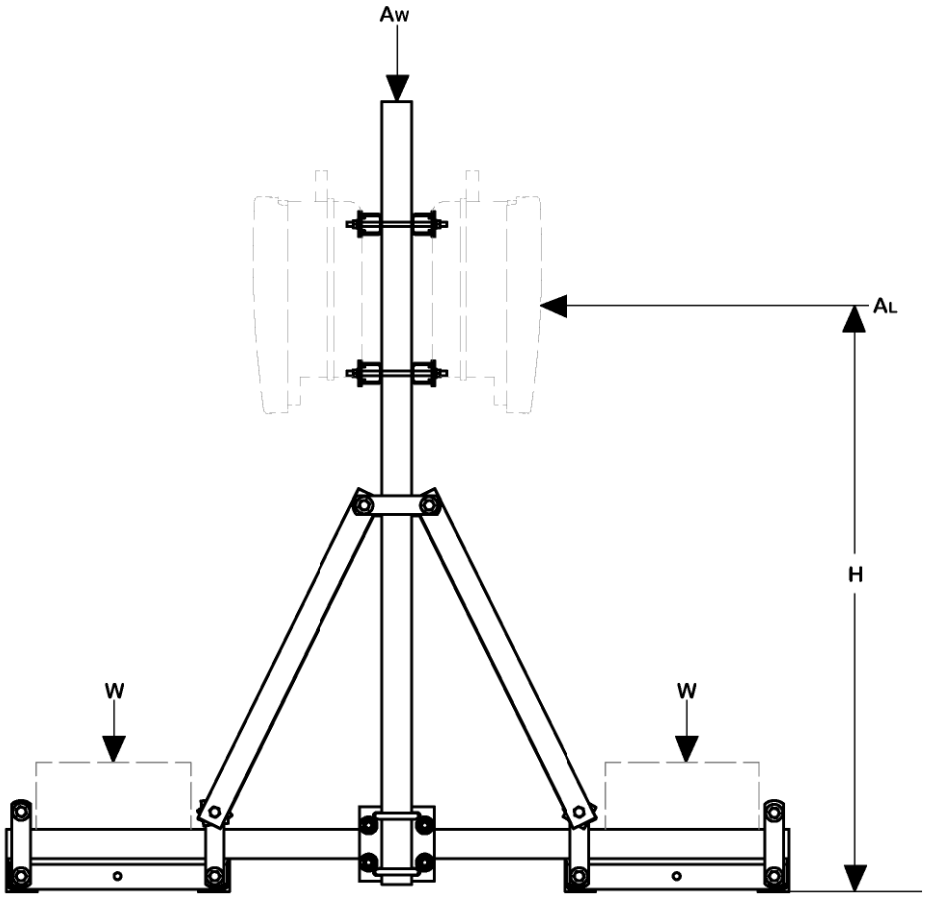
SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 3/16/2015		RT-RRU5HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 3/16/2015	RT-RRU5HD



BALLAST EQUATION WITH 1.5 SAFETY FACTOR:

$$W = \frac{(A_L * H * 1.5) - (A_W * 2.625)}{4.5}$$

$$W_T = W * 2$$

BALLAST EQUATION WITH REV. G LOADING:

$$W = \frac{(A_L * H * 1.6) - (A_W * 2.625)}{4.5\ (0.9)}$$

$$W_T = W * 2$$

A_L	= TOTAL ANTENNA / EQUIPMENT WIND LOAD (NON-FACTORED)	lbs
A_W	= TOTAL ANTENNA / EQUIPMENT WEIGHT (NON-FACTORED)	lbs
H	= HEIGHT FROM ROOFTOP	ft
W_T	= TOTAL BALLAST WEIGHT	lbs
W	= BALLAST WEIGHT PER TRAY	lbs

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: 5' HEAVY DUTY ROOFTOP FOR REMOTE RADIO UNITS

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 3/16/2015		RT-RRU5HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 3/16/2015	RT-RRU5HD

MAT18: Rubber Mats

Features:

- Manufactured from UV-resistant 1/2” thick rubber
- Six mats required for use with Non-Penetrating Tripods
- Four mats required for use with Non-Penetrating Roof-Top Frames

Part #	Size
MAT18	1/2” x 18” x 48”

SITE PRO 1
A valmont COMPANY

MAT18: Rubber Mats

Product Class: Rubber

Property	Test Method	Result		Unit
Density	ASTM D297	.64 min		g/cm³
Tensile Strength	ASTM D412, Die C	71 min		PSI
Elongation	ASTM D412, Die C	30 min		Percent
Compression	ASTM F36		Recovery	
100 psi		25 - 35	85 min	Percent
200 psi		40 - 50	85 min	Percent
300 psi		50 - 60	85 min	Percent
400 psi		60 - 70	85 min	Percent
Shore A Hardness	ASTM D2240	20 - 60		Points
Tear Strength	ASTM D624, Die C	20 min		PPI
Flexibility	ASTM F147	1 max		Factor
Compression Set B	ASTM D395			
25% deflection, 22 hrs. 158°F		20 - 30		Percent
Compression Set (Foam)	ASTM D3676			
50% deflection, 22 hrs 158°F		20 - 30		Percent

This material has a shelf life of 5 years from date of manufacture when protected from environmental extremes.

The values shown represent current production and may vary under different conditions.

ecore™

6510

Product Class: Rubber

Property	Test Method	Typical Result
Density	ASTM D297	51 lbs./ft^3 (0.82 g/cm^3)
Tensile Strength	ASTM D412, Die C	100 lbs./in^2 (690 kPa)
Elongation	ASTM D412, Die C	80%
Tear Strength	ASTM D624, Die C	38 lbs./in. (6.7 N/mm)
Shore A Hardness	ASTM D2240	48
Flexibility	ASTM F147	1
Compression @ 100 psi	ASTM F36	25%
Recovery		92%
Compression Set B	ASTM D395	40% max.
25% deflection, 22 hrs. 158°F		

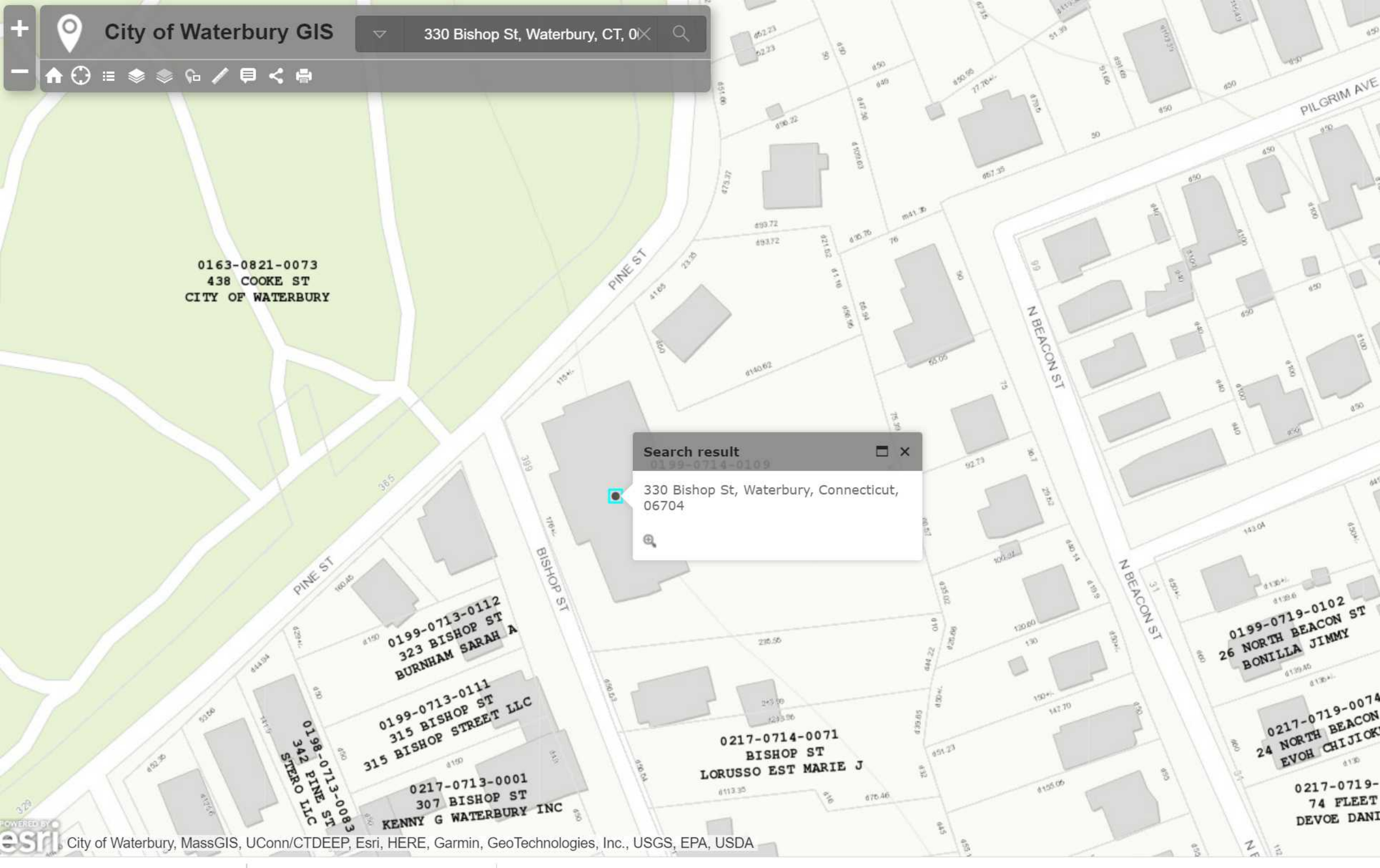
This material has a shelf life of 5 years from date of manufacture when protected from environmental extremes.

The values shown represent current production and may vary under different conditions.

PS-150 6510 (8012 & 8014)
REV 101015
WMW

715 Fountain Avenue, Lancaster, PA 17601 phone: 717.295.3400

ATTACHMENT 5


City of Waterbury GIS
330 Bishop St, Waterbury, CT, 0
0163-0821-0073
438 COOKE ST
CITY OF WATERBURY
PINE ST
BISHOP ST
N BEACON ST
PILGRIM AVE
Search result
330 Bishop St, Waterbury, Connecticut, 06704
0199-0714-0109
0199-0713-0112
323 BISHOP ST
BURNHAM SARAH A
0199-0713-0111
315 BISHOP ST
315 BISHOP STREET LLC
0198-0713-0083
342 PINE ST
SITERO LLC
0217-0713-0001
307 BISHOP ST
KENNY G WATERBURY INC
0217-0714-0071
BISHOP ST
LORUSSO EST MARIE J
0199-0719-0102
26 NORTH BEACON ST
BONILLA JIMMY
0217-0719-0074
24 NORTH BEACON
EVOH CHIJIOK
0217-0719-
74 FLEET
DEVOE DANI
City of Waterbury, MassGIS, UConn/CTDEEP, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA, USDA

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2017.

CITY OF WATERBURY

Information on the Property Records for the Municipality of Waterbury was last updated on 5/4/2022.

Property Summary Information

Parcel Data And Values | Building | Outbuildings | Sales | Permits

Parcel Information

Location:	330 BISHOP ST	Property Use:	Multifamily	Primary Use:	Apt - High Rise
Unique ID:	019907140109	Map Block Lot:	0199-0714-0109	Acres:	1.09
490 Acres:	0.00	Zone:	RM	Volume / Page:	4254/ 142
Developers Map / Lot:		Census:			

Value Information

	Appraised Value	Assessed Value
Land	170,313	119,220
Buildings	1,916,731	1,341,710
Detached Outbuildings	23,096	16,170
Total	2,110,140	1,477,100

Owner's Information

Owner's Data
WATERBURY OMEGA LLC 330 BISHOP ST #100 WATERBURY, CT 06704

ATTACHMENT 6

UNITED STATES POSTAL SERVICE®

WATERBURY FULTON

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here ***Postmark with Date of Receipt.***
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3		neopost 05/05/2022 US POSTAGE $002.99 ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Neil O'Leary, Mayor City of Waterbury 235 Grand Street Waterbury, CT 06702				
2.	Robert Nerney, City Planner City of Waterbury 185 South Main Street Waterbury, CT 06706				
3.	Waterbury Omega LLC 330 Bishop Street #100 Waterbury, CT 06704				
4.					
5.					
6.					

USPS MAY - 5 2022 06103 OLD STATE HOUSE STATION