

April 3, 2018

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

Re: **Request of Cellco Partnership d/b/a Verizon Wireless for an Order to Approve the Shared Use of an Existing Tower at 33 Mitchell Drive, Manchester, Connecticut**

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes (“C.G.S.”) §16-50aa, as amended, Cellco Partnership d/b/a Verizon Wireless (“Cellco”) hereby requests an order from the Connecticut Siting Council (“Council”) to approve the shared use by Cellco of an existing telecommunications tower on a 4.49-acre parcel at 33 Mitchell Drive in Manchester, Connecticut (the “Property”). The existing 170-foot tower is owned by Marcus Communications (“Marcus”). The Property is owned by Mitchell Drive LLC and is located in Manchester’s Industrial zone district. Cellco identifies this site as its “Manchester North Facility”.

Cellco requests that the Council find that the proposed shared use of the Marcus tower satisfies the criteria of C.G.S § 16-50aa and issue an order approving the proposed shared use. A copy of this filing is being sent to Scott Shanley, General Manager of the Town of Manchester; Gary Anderson, Manchester’s Director of Planning and Economic Development; Mitchell Drive LLC, the owner of the Property; and Marcus, the tower owner.

Background

On November 19, 2012, the Manchester Planning and Zoning Commission (“PZC”) approved a Special Exception application by Marcus to construct the existing tower on the

16854298-v1

Robinson + Cole

Melanie A. Bachman, Esq.

April 3, 2018

Page 2

Property. A copy of the PZC approval letter is included in Attachment 1.

Cellco is licensed by the Federal Communications Commission (“FCC”) to provide wireless services throughout the State of Connecticut. Cellco and Marcus have agreed to the proposed shared use of the 33 Mitchell Drive tower pursuant to mutually acceptable terms and conditions. Likewise, Marcus and Cellco have agreed to the proposed installation of equipment on the ground within an existing fenced compound area. Marcus has authorized Cellco to apply for all necessary permits and approvals that may be required to share the existing tower. (*See* Owner’s authorization letters included in Attachment 2).

Cellco proposes to install twelve (12) antennas and nine (9) remote radio heads (“RRHs”) on the tower at a height of 100 feet above ground level (“AGL”). Cellco’s radio equipment and a propane-fueled back-up generator will be located on a 9’-4” x 16’ steel equipment platform with a canopy roof installed near the base of the tower. The platform will support Cellco’s radio equipment and a 25 kW propane-fueled back-up generator. A 500 gallon propane tank will be installed adjacent to Cellco’s equipment platform. Included in Attachment 3 are Cellco’s project plans showing the location of all proposed site improvements. Attachment 4 contains specifications for Cellco’s proposed antennas, RRHs and backup generator.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, “if the council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such shared use.” Cellco respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing Marcus tower is structurally capable of supporting Cellco’s antennas, RRHs and related equipment. The proposed shared use of this tower is, therefore, technically feasible. A Structural Analysis Report (“Structural Report”) prepared for this project confirms that the tower can support all existing and Cellco’s proposed tower loading. A copy of the Structural Analysis Report is included in Attachment 5.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue orders approving the shared use of an existing tower such as the Marcus tower. This authority complements the Council’s prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council’s jurisdiction. In addition, § 16-50x(a) directs the Council to “give such consideration to other state laws and municipal regulations as it shall deem appropriate” in ruling on requests for the shared use of

Melanie A. Bachman, Esq.

April 3, 2018

Page 3

existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the Marcus tower would have minimal environmental effects, for the following reasons:

1. The proposed installation of twelve (12) antennas and nine (9) remote radio heads at a height of 100 feet AGL on the existing 170-foot tower in this industrial area would have an insignificant incremental visual impact on the area around the existing tower. Cellco's equipment cabinets and generator would be installed within a fenced compound. Cellco's shared use of this tower would therefore, not cause any significant change or alteration in the physical or environmental characteristics of the existing site.
2. There are no fans, motors, or other mechanical devices included as a part of Cellco's radio equipment that would create any noise from the Cellco facility. Noise associated with Cellco's emergency back-up generator is exempt from State and local noise standards.
3. Operation of Cellco's antennas at this site would not exceed the RF emissions standards adopted by the Federal Communications Commission ("FCC"). Included in Attachment 6 of this filing is a cumulative worst case General Power Density table that demonstrates that the facility will operate well within the FCC RF emissions safety standards.
4. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the Marcus facility other than periodic (monthly) maintenance visits to the cell site.

The proposed shared use of the Marcus tower would, therefore, have a minimal environmental effect, and is environmentally feasible.

Melanie A. Bachman, Esq.

April 3, 2018

Page 4

D. Economic Feasibility. As previously mentioned, Cellco has entered into an agreement with Marcus for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Cellco's antennas, RRHs and all related equipment. Cellco is not aware of any public safety concerns relative to the proposed sharing of the existing Marcus tower. In fact, the provision of new and improved wireless service through shared use of the existing tower is expected to enhance the safety and welfare of area residents and members of the general public traveling through the Town of Manchester.

Conclusion

For the reasons discussed above, the proposed shared use of the existing Marcus tower at 33 Mitchell Drive satisfies the criteria stated in C.G.S. § 16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Thank you for your consideration of this matter.

Very truly yours,



Kenneth C. Baldwin

Enclosures

Copy to:

Scott Shanley, General Manager

Gary Anderson, Director of Planning and Economic Development

Mitchell Drive LLC

Marcus Communications

Chuck Webberly

Shelby Docker



Certificate of Mailing — Firm

Name and Address of Sender

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

TOTAL NO. of Pieces Listed by Sender

3

TOTAL NO. of Pieces Received at Post Office™

Postmaster, per (name of receiving employee)

[Handwritten Signature]

OLD STATE HOUSE
 STATION 06103
 APR 03 2013
 USPS

neopost™
 04/03/2018
US POSTAGE \$002.38
 ZIP 06103
 041L12203380

Affix Stamp Here
 Postmark with Date of Receipt.

USPS® Tracking Number
 Firm-specific Identifier

Address
 (Name, Street, City, State, and ZIP Code™)

Fee

Special Handling

Parcel Airlift

1.

Scott Stanley, General Manager
 Town of Manchester
 41 Center Street
 Manchester, CT 06045

2.

Gary Anderson, AICP
 Director of Planning and Economic Development
 Lincoln Center, 2nd Floor
 494 Main Street
 Manchester, CT 06045

3.

Mitchell Drive LLC
 33 Mitchel Drive
 Manchester, CT 06042

4.

5.

6.

ATTACHMENT 1



SCOTT SHANLEY, GENERAL MANAGER

Town of Manchester

41 Center Street • P.O. Box 191
Manchester, Connecticut 06045-0191
www.manchesterct.gov

LEO V. DIANA, MAYOR
JAY MORAN, DEPUTY MAYOR
LISA P. O'NEILL, SECRETARY

DIRECTORS
STEVE GATES
SUSAN HOLMES
RUDY C. KISSMANN
CHERI A. PELLETIER
JOHN D. TOPPING
MARK D. TWEEDIE

CERTIFIED LETTER
November 21, 2012

Todd Stacy
Marcus Communications, LLC
33 Mitchell Drive
Manchester, CT 06045

Re: Marcus Communication, LLC – 33 Mitchell Drive & 184 Sheldon Road
Special Exception (2012-106)

Dear Mr. Stacy:

As agent for the applicant, please be advised that at its meeting of November 19, 2012, the Planning and Zoning Commission approved with modifications the above referenced application. The approval is for activities as shown on plans entitled, "SITE PLAN #33 MITCHELL DRIVE & #184 SHELDON ROAD, PREPARED FOR MARCUS COMMUNICATIONS, MANCHESTER, CONN", by Aeschliman Land Surveying, PC, Map No. 212007-1A, dated 08/27/2012, revised 11/09/2012.

The specific approval granted is as follows:

Special Exception (2012-106) – approved the special exception under Article II Section 16.15.02(o) to construct a 170' self-supporting telecommunications tower and related appurtenances with modifications as outlined in a memorandum from Derrick Gregor, Assistant Town Engineer to Renata Bertotti, Senior Planner, dated November 19, 2012.

All site work related to the above approvals must be completed by November 19, 2017 in accordance with the Connecticut General Statutes, Section 8-3. Failure to complete all work within the specified time period will result in automatic expiration of the approval.

Please submit one set of sealed and signed washoff or fixed line mylar plans and five (5) paper copies of the plans incorporating the modifications listed above, sealed and signed, to this office for stamping and signature.

To speed the endorsement of final plans staff requests the following block be added to the lower right of each page of the plans above or to the left of the title block: Please do not reduce this block to less than 2" X 3".



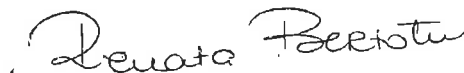
<p style="text-align: center;">A P P R O V E D</p> <p style="text-align: center;">PLANNING AND ZONING COMMISSION MANCHESTER, CT</p> <p>DATE: _____</p> <p>SIGNED: _____</p>

You are also required to submit a fee of \$50.00 for the above referenced plan to cover digital GIS conversion costs incurred by the Town. The payment for GIS conversion should accompany the final mylar and paper copies. A copy of the GIS Conversion Fee Requirement is enclosed.

A Certificate of Approval of this decision will be forwarded to you immediately following the expiration of the Superior Court appeal period (i.e., 15 days after the legal decision notice is published in the newspaper). Upon receipt, you must file the Certificate of Approval with the Town Clerk and pay the required recording fee. The approval of your petition by the Planning and Zoning Commission will not be effective until the Certificate has been recorded on the land records in the Town Clerk's office. You are hereby advised not to engage in any activity concerning your petition until the Certificate has been recorded. We also remind you to obtain a building permit for this work before you start construction.

NOTE: No changes to the approved site plans, or to the building elevations, materials or colors, are to be made until the proposed changes are submitted to the Planning Department and it is determined whether the changes can be approved administratively or will need Planning and Zoning Commission approval.

Sincerely,



Renata Bertotti, AICP
Senior Planner

RB/lg

R:\PLANNING\PZC\2012\11 - NOVEMBER 19\DECISION LETTERS\2012-106 MARCUS COMMUNICATIONS.DOC

Encls.

- cc: Engineering Department (w/out encl.)
John Rainaldi, Director of Assessment & Collection (w/out encl.)
James A. Davis, Zoning Enforcement Officer (w/out encl.)
Richard Gallacher, GIS Coordinator (w/out encl.)
Greg Smith, Chief Building Official (w/out encl.)

ATTACHMENT 2

Mitchell Drive, LLC

February 28, 2018

Sonya Baker, Sr. Real Estate Manager
Cellco Partnership d/b/a Verizon Wireless
20 Alexander Drive, 2nd Floor
Wallingford, CT 06492

Re: Cellco Partnership d/b/a Verizon Wireless
Proposed Telecommunications Facility at
33 Mitchell Drive, Manchester, CT 06045

Dear Ms. Baker:

Mitchell Drive LLC is the owner of the existing tower and property at 33 Mitchell Drive, Manchester, Connecticut (the "Property"). This letter authorizes Verizon Wireless and/or its authorized agent to file for all necessary federal, state or local permits and approvals for the proposed wireless telecommunication facility at the Property.

Sincerely,

A handwritten signature in cursive script that reads "Bruce S. Marcus". The signature is written in dark ink and is positioned above a horizontal line.

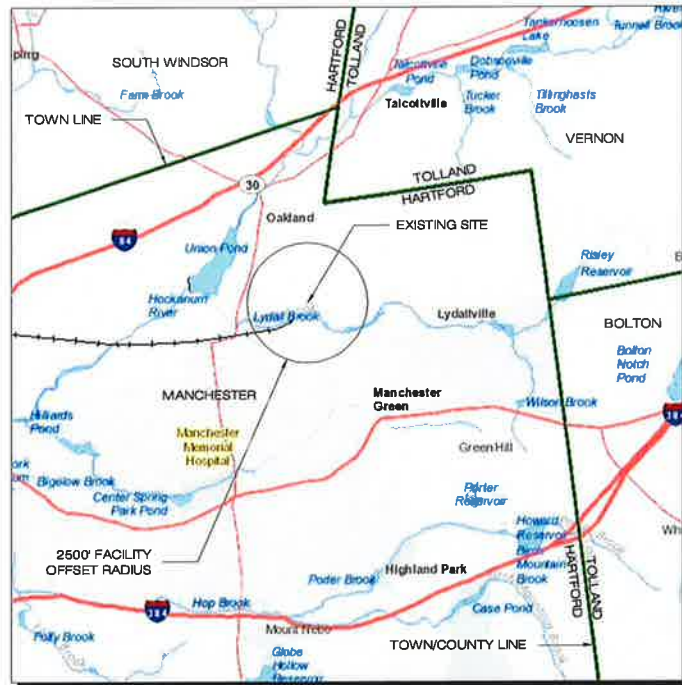
Bruce S. Marcus, Owner

ATTACHMENT 3

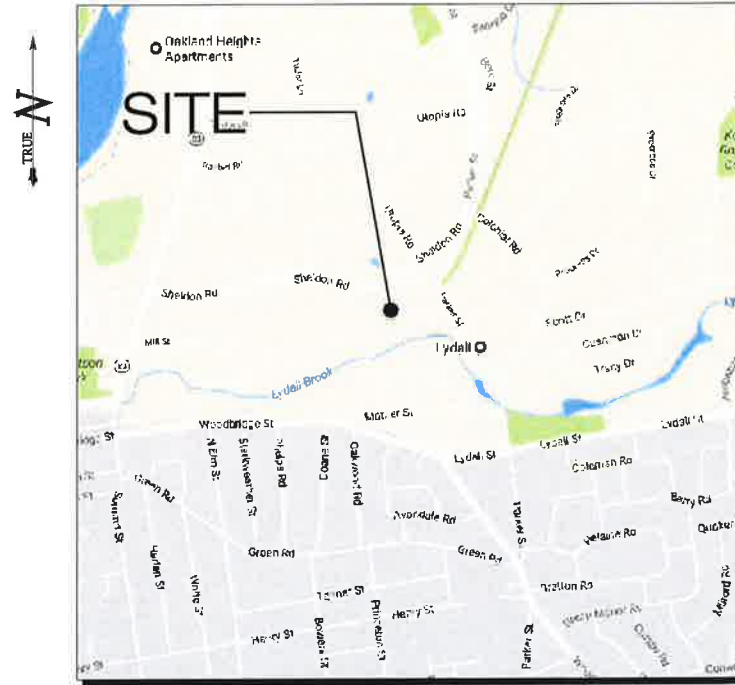
verizon

WIRELESS SERVICES FACILITY

**MANCHESTER N CT
33 MITCHELL DRIVE
MANCHESTER, CT 06045**



MUNICIPAL NOTIFICATION LIMIT MAP
SCALE: 1" = 4000'-0"



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

SITE INFORMATION

SITE TYPE: EXIST. 170.8± AGL LATTICE TOWER
SCOPE OF WORK: PROPOSED RF EQUIPMENT ON EXIST. 170.8± AGL LATTICE TOWER W/ CORRESPONDING GROUND EQUIPMENT WITHIN A PENDING IRREGULARLY SHAPED FENCED COMPOUND
SITE NAME: MANCHESTER N CT
SITE ADDRESS: 33 MITCHELL DRIVE
MANCHESTER, CT 06045
ZONING JURISDICTION: CONNECTICUT SITING COUNCIL
COUNTY: HARTFORD
ASSESSOR'S TAX ID#: MAP: 90, BLOCK 4000, LOT: 33
ZONING DISTRICT: "I" (INDUSTRIAL)
LATITUDE: 41° 47' 50.174" N (41.79727° N)
LONGITUDE: 72° 30' 42.919" W (72.51192° W)
GROUND ELEVATION: 229± AMSL
PROPERTY OWNER: MITCHELL DRIVE, LLC
P.O. BOX 1498
MANCHESTER, CT 06045
APPLICANT: CELLCO PARTNERSHIP
d/b/a VERIZON WIRELESS
20 ALEXANDER DRIVE
WALLINGFORD, CT 06492
LEGAL: ROBINSON & COLE, LLP
KENNETH C. BALDWIN
280 TRUMBULL STREET
HARTFORD, CT 06103
SITE ENGINEER: ALL-POINTS TECHNOLOGY CORP., P.C.
3 SADDLEBROOK DRIVE
KILLINGWORTH, CT 06419
(860) 663-1697

LIST OF DRAWINGS

- T-1 TITLE SHEET & INDEX**
- 1 OF 1 TOPOGRAPHIC SURVEY**
- R-1 ABUTTERS MAP**
- A-1 COMPOUND PLAN, TOWER ELEVATION & PLATFORM DETAILS**

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

ALL-POINTS
TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

PERMITTING DOCUMENTS		
NO	DATE	REVISION
0	07/19/17	FOR REVIEW: RCB
1	10/25/17	ATTORNEY REVISIONS: RCB
2	04/02/18	CLIENT REVISIONS: RCB
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD
PROF: SCOTT M. CHASSE P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 3 SADDLEBROOK DRIVE
KILLINGWORTH, CT 06419

**VERIZON AT
MANCHESTER N CT**
SITE 33 MITCHELL DRIVE
ADDRESS: MANCHESTER, CT 06045
APT FILING NUMBER: CT141NB9160
DRAWN BY: CSH
DATE: 07/19/17 **CHECKED BY:** RCB

SHEET TITLE:
TITLE SHEET & INDEX

SHEET NUMBER:
T-1

Notes

- THIS SURVEY PLAN HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTION 20-300B-1 THROUGH 20-300B-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF THE LAND SURVEYORS, INC. ON SEPTEMBER 26, 1998.
 - TYPE OF SURVEY: TOPOGRAPHIC SURVEY
 - WITH RESPECT TO THE PERIMETER OF THE PROPERTY THE BOUNDARY DETERMINATION IS BASED UPON A RESURVEY OF REFERENCE MAP #9.
 - THIS SURVEY CONFORMS TO THE STANDARDS AND THE ACCURACY OF CLASS: A-2 HORIZONTAL & T-2 TOPOGRAPHIC ACCURACY.
 - BEARINGS ARE DEPICTED AND BASED UPON THE CONNECTICUT GRID SYSTEM, NORTH AMERICAN DATUM OF 1988 UTILIZING TM17 & TM18 WITH THE FOLLOWING PUBLISHED COORDINATES: TM17 = N852843.42 E1085937.84 TM18 = N85233.19 E1086458.75
 - ELEVATIONS BASED UPON NORTH AMERICAN VERTICAL DATUM 1988 UTILIZING TM17 WITH THE FOLLOWING PUBLISHED ELEVATION: 225.9'
 - CONTOUR INTERVAL = 1'
 - THE INTENT OF THIS MAP IS TO DEPICT THE EXISTING CONDITIONS OF THE PROPERTY
- BOUNDARY LINES OF ADJOINING PROPERTIES ARE SHOWN FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSTRUED AS BEING ACCURATELY LOCATED OR DEPICTED.
- THE WORD "CERTIFY" AS USED IS UNDERSTOOD TO BE AN EXPRESSION OF PROFESSIONAL OPINION BY THE SURVEYOR. IT IS A DECLARATORY STATEMENT, WHICH IS BASED ON HIS BEST KNOWLEDGE, INFORMATION AND BELIEF. AS SUCH IT CONSTITUTES NEITHER GUARANTEE NOR WARRANTY, EXPRESSED OR IMPLIED, OF ANY INFORMATION CONTAINED HEREON. NO CERTIFICATION IS EXPRESSED OR IMPLIED ON ANY ORIGINAL OR ANY DUPLICATE OF THIS MAP UNLESS IT BEARS AN ORIGINAL STAMP OR SEAL AND ORIGINAL SIGNATURE OF THE INDIVIDUAL WHOSE REGISTRATION NUMBER APPEARS HEREON.
- THIS MAP IS THE PROPERTY OF GESICK & ASSOCIATES P.C. AND HAS BEEN SPECIFICALLY PREPARED FOR THE OWNER OF THIS PROJECT OR PROPERTY. IT IS NOT TO BE DUPLICATED OR USED IN PART OR WHOLE FOR ANY OTHER PURPOSE, PROJECT, LOCATION, OR OWNER WITHOUT THE EXPRESS WRITTEN CONSENT OF GESICK & ASSOCIATES P.C.
- BASE MAPPING PREPARED BY GESICK & ASSOCIATES P.C. FROM A 6/28/2017 THRU 7/5/2017 FIELD SURVEYS.
- THE FLOOD ZONE BOUNDARIES SHOWN WERE DERIVED UTILIZING FLOOD INSURANCE RATE MAPS. THE FLOOD ZONE BOUNDARIES SHOWN ARE TO BE CONSIDERED AS APPROXIMATE ONLY AND FOR INFORMATIONAL PURPOSES ONLY. (DATUM = NAVD 1988)
- UNDERGROUND UTILITY, STRUCTURE AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON HAVE BEEN COMPILED, IN PART, FROM RECORD MAPPING AND LIMITED FIELD MEASUREMENTS. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO GESICK & ASSOCIATES, P.C. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG 1-800-922-4455.
- TREES SHOWN ON THIS MAP WERE FIELD LOCATED BUT ARE NOT SHOWN TO SCALE
- UNLESS OTHERWISE NOTED, BUILDING OFFSETS ARE TO BUILDING SIDING ABOVE THE FOUNDATION
- PARCEL IS SUBJECT TO A RIGHT OF WAY IN FAVOR OF THE CONNECTICUT POWER COMPANY OF WETHERSFIELD AS SHOWN IN VOLUME 318 PAGE 373 OF THE TOWN OF MANCHESTER LAND RECORDS.

Reference Maps

- "PROPERTY OF HILPATRICK IRON WORKS MITCHELL DRIVE MANCHESTER, CONNECTICUT PREPARED BY HAYDEN BRISWOLD DATED MARCH 2, 1959 SCALE 1"=100"
- TOWN OF MANCHESTER, CONNECTICUT, DEPARTMENT OF PUBLIC WORKS NORTH MANCHESTER INTERCEPTOR PLAN & PROFILE PREPARED BY GRISWOLD ENGINEERING, INC. DATED NOVEMBER, 1988 SCALE 1"=40' SHEETS 19 & 20 OF 26 (MANCHESTER TOWN CLERK MAP # 53-2)
- "PROPERTY ACQUISITION, TOWN OF MANCHESTER, CONNECTICUT DEPARTMENT OF PUBLIC WORKS, MANCHESTER STRUCTURAL STEEL TO THE TOWN OF MANCHESTER PREPARED BY GRISWOLD ENGINEERING, INC. DATED MARCH, 1970 SCALE 1"=40' (MANCHESTER TOWN CLERK MAP # 13-8)
- "SUBDIVISION PLAN SURVEY PREPARED FOR C.R. BURR & CO. INC. SHELDON ROAD MANCHESTER, CONNECTICUT PREPARED BY GRISWOLD & FUSS, INC. DATED AUGUST 2, 1971 REVISED THRU AUGUST 9, 1971 SCALE 1"=100"
- "SUBDIVISION MAP FOR MANCHESTER SEWAGE ENTERPRISES, INC. SHELDON ROAD MITCHELL DRIVE MANCHESTER, CONNECTICUT PREPARED BY FUSS & O'NEILL, INC. DATED FEBRUARY 1, 1983 REVISED THRU MARCH 28, 1983 SCALE 1"=40' (MANCHESTER TOWN CLERK MAP # 194 & #194-3)
- "RESUBDIVISION PLAN PREPARED FOR WILLIAM G. MCKINNEY MITCHELL DRIVE MANCHESTER, CONNECTICUT PREPARED BY FUSS & O'NEILL, INC. DATED MAY 2, 1985 REVISED THRU AUGUST 23, 1995 SCALE 1"=20' (MANCHESTER TOWN CLERK MAP # 33-3)
- "SUBJECT AREA - ENVIRONMENTAL LAND USE RESTRICTION SUMITOMO BAKELITE NORTH AMERICA INC. 24 MILL STREET, MANCHESTER, CONNECTICUT PREPARED BY FUSS & O'NEILL, INC. DATED JULY 1, 2006 REVISED THRU OCTOBER 17, 2006 SCALE 1"=40' SHEETS 1 & 2 OF 2 (MANCHESTER TOWN CLERK MAP # 194 & #194-3)
- "PROPERTY SURVEY PREPARED FOR ERNEST STARSIAK SHELDON ROAD & MILL STREET MANCHESTER, CONNECTICUT PREPARED BY GARDNER & PETERSON ASSOCIATES, LLC DATED FEBRUARY 1, 2012 SCALE 1"=40' (MANCHESTER TOWN CLERK MAP # 198-2)
- "MAP PREPARED BY MARCUS COMMUNICATIONS" PREPARED BY MARCUS COMMUNICATIONS DATED FEBRUARY 1, 2012 SCALE 1"=40' (NOT ON FILE)

Subject Parcel Information

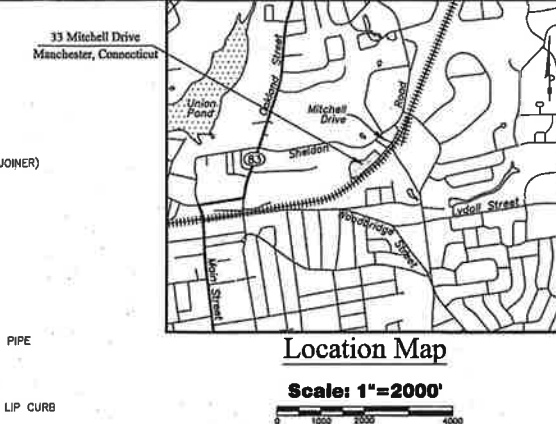
OWNER: MITCHELL DRIVE LLC
 PARCEL ADDRESS: 33 MITCHELL DRIVE MANCHESTER, CONNECTICUT 06045
 MAILING ADDRESS: P.O. BOX 1498 MANCHESTER, CONNECTICUT 06045-1498
 PARCEL ID: MAP 90 BLOCK 4000 LOT 33
 DEED: VOLUME 3918 PAGE 222
 LAND USE ZONE: IND
 AREA: 195447.37 SQ. FT. ± OR 4.49 ACRES ±
 FLOOD ZONE: ZONE X & ZONE AE (FLOODWAY) PER FIRM MAP COMMUNITY PANEL #090030392F DATED SEPTEMBER 26, 2008 (SEE NOTE #6)

- SYMBOL**
- PROPERTY CORNER
 - IP / REBAR
 - MON / MERESTONE
 - ⊕ BENCH MARK
 - UTILITY POLE
 - UTILITY POLE W/ LIGHT
 - GAS WIRE
 - GAS VALVE
 - WATER VALVE
 - FIRE HYDRANT
 - CATCH BASIN
 - MANHOLE
 - SIGN
 - WOOD POST
 - FLAGPOLE
 - MONITORING WELL
 - WATER METER
 - HANDICAPPED
 - MAILBOX

- DESCRIPTION**
- LIGHT POLE
 - YARD LIGHT
 - DECIDUOUS TREE
 - CONIFEROUS TREE
 - SHRUB
 - STUMP
 - HEDGE
 - STONEWALL
 - TREELINE
 - FENCE LINE
 - PROPERTY LINE
 - PROPERTY LINE OTHER
 - INDEX CONTOUR
 - INTERMEDIATE CONTOUR
 - FEMA ZONE LINE
 - EASEMENT LINE
 - OVERHEAD WIRES
 - PAINT MARK WATER
 - PAINT MARK GAS

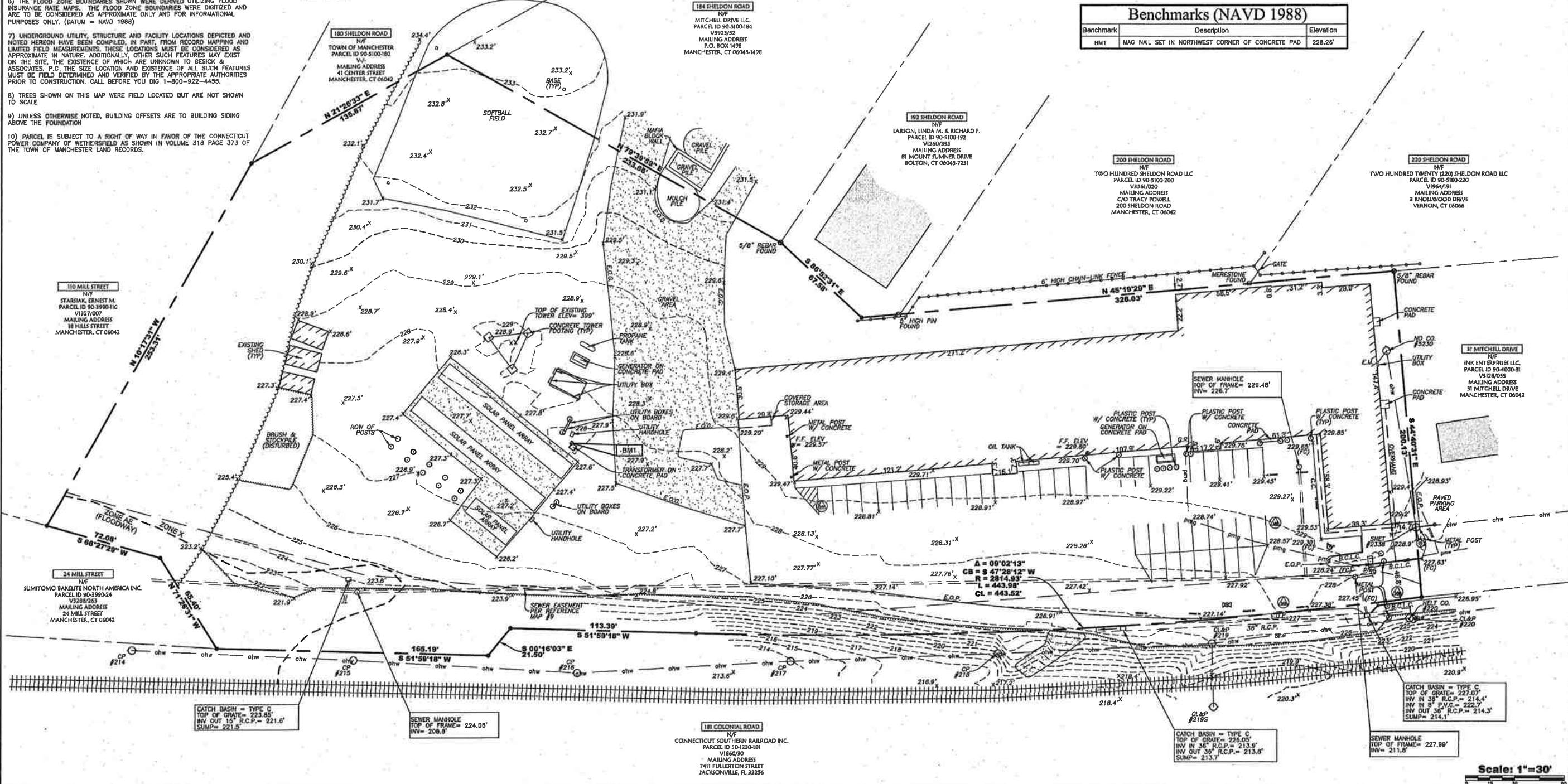
Legend

- SYMBOL**
- +++++ RAILROAD TRACKS
 - ROAD PAINT MARK
 - ▨ PLANTED AREA
 - ▨ GRAVEL AREA
 - ▨ EXISTING BUILDING (ADJOINER)
 - X X SPOT ELEVATION
 - N/F NOW OR FORMERLY
 - ELEV / EL ELEVATION
 - INV INERT
 - E.M. ELECTRIC METER
 - (TYP) TYPICAL
 - (FC) FACE OF CURB
 - R.C.P. REINFORCED CONCRETE PIPE
 - P.V.C. POLYVINYL CHLORIDE
 - E.O.P. EDGE OF PAVEMENT
 - B.C.L.C. BITUMINOUS CONCRETE LIP CURB
 - C.C. CONCRETE CURB
 - W/ WITH
 - CO. COMPANY
 - F.F. FINISHED FLOOR
 - E.O.G. EDGE OF GRAVEL



Benchmarks (NAVD 1988)

Benchmark	Description	Elevation
BM1	MAG NAIL SET IN NORTHWEST CORNER OF CONCRETE PAD	228.26'



GESICK & ASSOCIATES, P.C.
 SURVEYORS & MAPPERS & PLANNERS
 19 CEDAR ISLAND AVE.
 CLINTON, CONNECTICUT 06413
 OFFICE: 860-668-7799 FAX: 860-668-5833
 www.gesicksurveyors.com

Topographic Survey (Partial)
 of
 33 Mitchell Drive
 Manchester, Connecticut
 Prepared for
All Points Technology Corporation

Revisions

Date: July 10, 2017
 Drawing: 17-098
 Drawn: P.H.
 Sheet: 1 of 1

Cellco Partnership d/b/a



20 ALEXANDER DRIVE
WALLINGFORD, CT 06492



3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

PERMITTING DOCUMENTS

NO	DATE	REVISION
0	07/19/17	FOR REVIEW: RCB
1	10/25/17	ATTORNEY REVISIONS: RCB
2	04/02/18	CLIENT REVISIONS: RCB
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

PROF: SCOTT M. CHASSE P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 3 SADDLEBROOK DRIVE
KILLINGWORTH, CT 06419

VERIZON AT MANCHESTER N CT

SITE ADDRESS: 33 MITCHELL DRIVE
MANCHESTER, CT 06045

APT FILING NUMBER: CT141NB9160

DRAWN BY: CSH

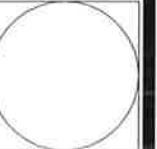
DATE: 07/19/17 CHECKED BY: RCB

SHEET TITLE:

ABUTTERS MAP

SHEET NUMBER:

R-1



MAP 90, BLOCK 5100, LOT 180
180 SHELDON ROAD
N/F
TOWN OF MANCHESTER
41 CENTER STREET
MANCHESTER, CT 06042

MAP 90, BLOCK 5100, LOT 184
184 SHELDON ROAD
N/F
MITCHELL DRIVE LLC,
P.O. BOX 1498
MANCHESTER, CT 06045-1498

MAP 90, BLOCK 5100, LOT 192
192 SHELDON ROAD
N/F
LINDA M. & RICHARD F. LARSON,
81 MOUNT SUMNER DRIVE
BOLTON, CT 06043-7231

MAP 90, BLOCK 5100, LOT 200
200 SHELDON ROAD
N/F
TWO HUNDRED SHELDON
ROAD LLC
C/O TRACY POWELL
200 SHELDON ROAD
MANCHESTER, CT 06042

MAP 90, BLOCK 5100, LOT 220
220 SHELDON ROAD
N/F
TWO HUNDRED TWENTY (220)
SHELDON ROAD LLC
3 KNOLLWOOD DRIVE
VERNON, CT 06066

MAP 90, BLOCK 4000, LOT 31
31 MITCHELL DRIVE
N/F
INK ENTERPRISES LLC
31 MITCHELL DRIVE
MANCHESTER, CT 06042

SUBJECT PARCEL:
MAP 90, BLOCK 4000, LOT 33
33 MITCHELL DRIVE
N/F
MITCHELL DRIVE LLC
P.O. BOX 1498
MANCHESTER, CT 06045

MAP 50, BLOCK 1230, LOT 181
181 COLONIAL ROAD
N/F
CONNECTICUT SOUTHERN
RAILROAD INC.
7411 FULLERTON STREET
JACKSONVILLE, FL 32256

PROP. CELCO PARTNERSHIP 20x32'
(640± SF) LEASE AREA WITH IN
PENDING CHAIN LINK FENCED
COMPOUND

EXISTING 170.8± AGL LATTICE TOWER

PROP. CELCO PARTNERSHIP
UNDERGROUND ELEC. & TELCO FROM
EXIST. DEMARC (MULTIMETER CENTER)
TO PROP. EQUIPMENT PLATFORM
(APPROX. 120± LF)

MAP 90, BLOCK 3990, LOT 110
110 MILL STREET
N/F
ERNEST M. STARSIAK
18 HILLS STREET
MANCHESTER, CT 06042

PROPERTY LINE (TYP.)

EXIST. SOLAR FIELD

MAP 90, BLOCK 3990, LOT 24
24 MILL STREET
N/F
SUMITOMO BAKELITE NORTH
AMERICA INC.
24 MILL STREET
MANCHESTER, CT 06042

PENDING 80'x60' FENCED
COMPOUND AREA (BY OTHERS)

EXIST. MULTIMETER CENTER

EXIST. GRAVEL ACCESS DRIVE (TYP.)

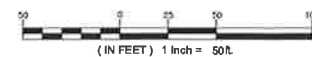
EXIST. PAVED PARKING LOT

ROUTE OF PROP. CELCO
PARTNERSHIP ACCESS TO SITE

EXIST. BUILDING (TYP.)

MITCHELL DRIVE

Δ = 09°02'13"
CB = 3 47'20"12" W
R = 2814.93'
T = 443.90'
CL = 443.92'



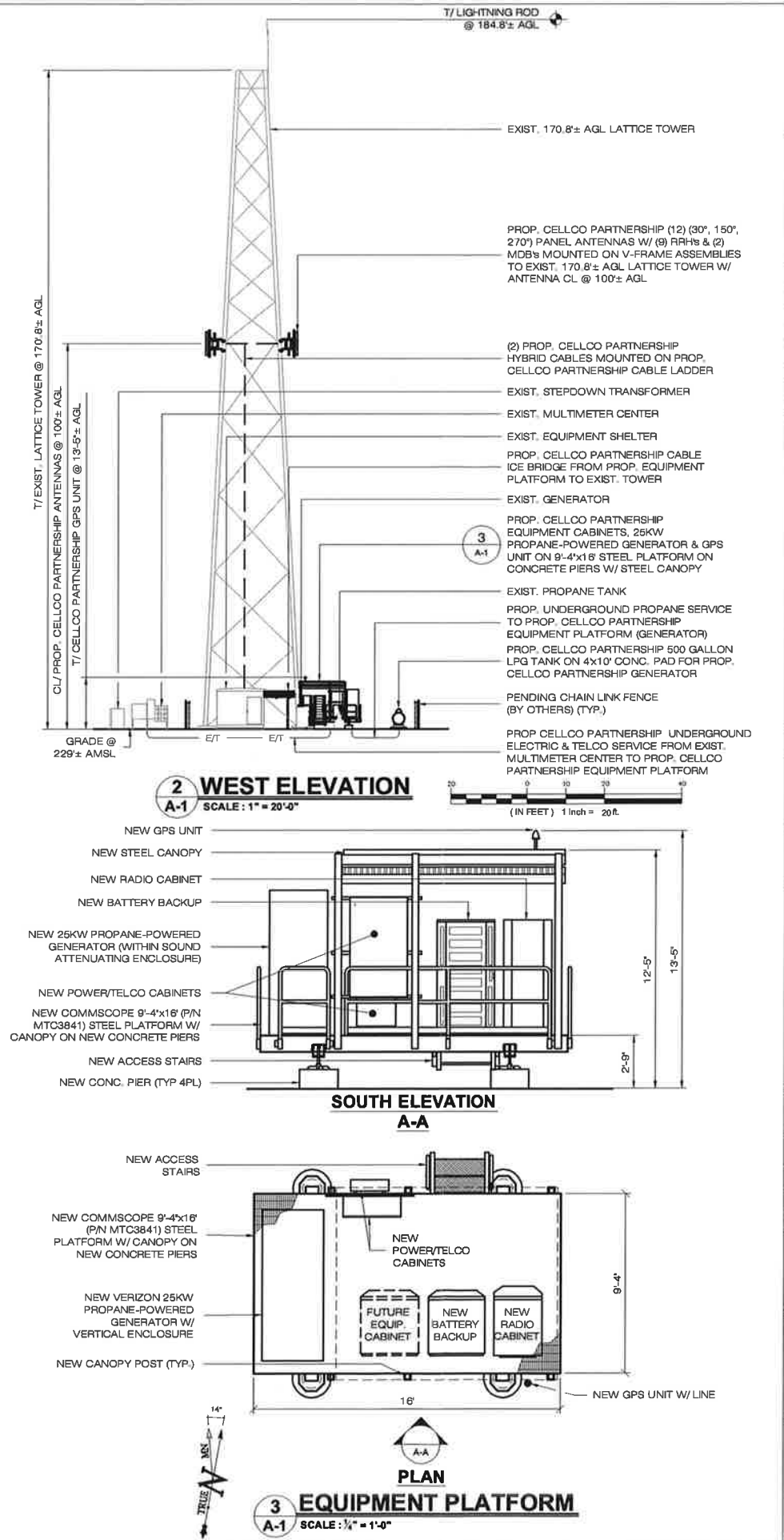
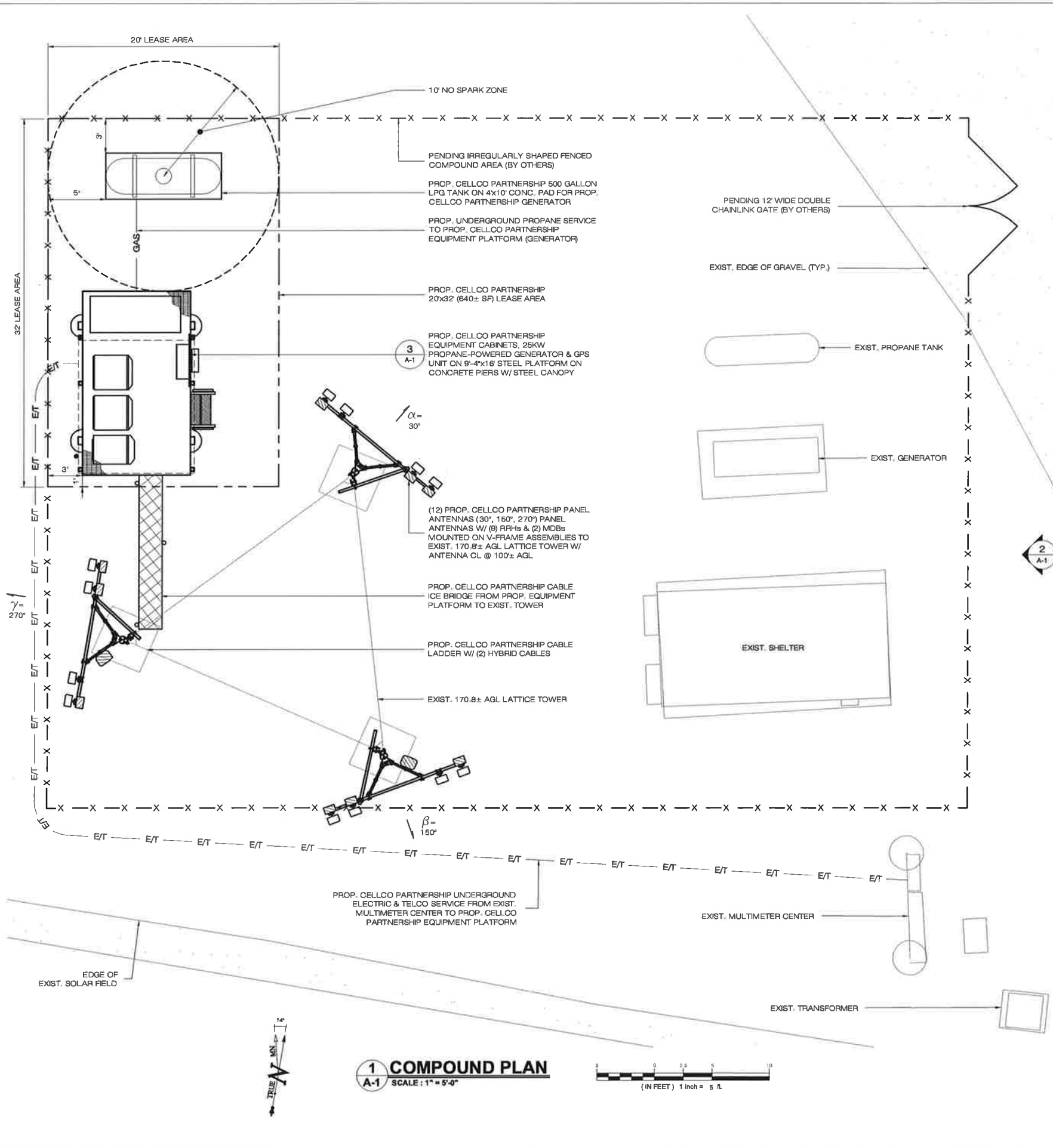
(IN FEET) 1 inch = 50'



1 ABUTTERS MAP
R-1 SCALE: 1" = 50'-0"

BASE MAPPING FOR SHEETS A-1 & SP-1 FROM:

1. PLAN ENTITLED "TOPOGRAPHIC SURVEY (PARTIAL) OF 33 MITCHELL DRIVE, MANCHESTER, CONNECTICUT" PREPARED BY: GESICK & ASSOCIATES, P.C., 19 CEDAR ISLAND AVE., CLINTON, CT 06413, DATED JULY 10, 2017
2. BASE MAPPING SUPPLEMENTED W/ FIELD MEASUREMENTS TAKEN BY ALL-POINTS TECHNOLOGY CORP. ON 12-19-2016.



Cellco Partnership d/b/a
verizon

20 ALEXANDER DRIVE
WALLINGFORD, CT 06492

ALL-POINTS
TECHNOLOGY CORPORATION

3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

PERMITTING DOCUMENTS

NO	DATE	REVISION
0	07/19/17	FOR REVIEW: RCB
1	10/25/17	ATTORNEY REVISIONS: RCB
2	04/02/18	CLIENT REVISIONS: RCB
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

PROF. SCOTT M. CHASSE P.E.
COMP. ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 3 SADDLEBROOK DRIVE
KILLINGWORTH, CT 06419

VERIZON AT MANCHESTER N CT

SITE ADDRESS: 33 MITCHELL DRIVE
MANCHESTER, CT 06045

APT FILING NUMBER: CT141NB9160

DRAWN BY: CSH
DATE: 07/19/17
CHECKED BY: RCB

SHEET TITLE:
COMPOUND PLAN, TOWER ELEVATION & PLATFORM DETAILS

SHEET NUMBER:
A-1

ATTACHMENT 4



SBNHH-1D65B

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

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, 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, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

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	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
	0° 14.6	0° 14.5	0° 17.4	0° 17.8	0° 18.1	0° 18.2
Gain by Beam Tilt, average, dBi	7° 14.6	7° 14.4	3° 17.5	3° 17.9	3° 18.3	3° 18.4
	14° 14.2	14° 13.6	7° 17.4	7° 17.9	7° 18.2	7° 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

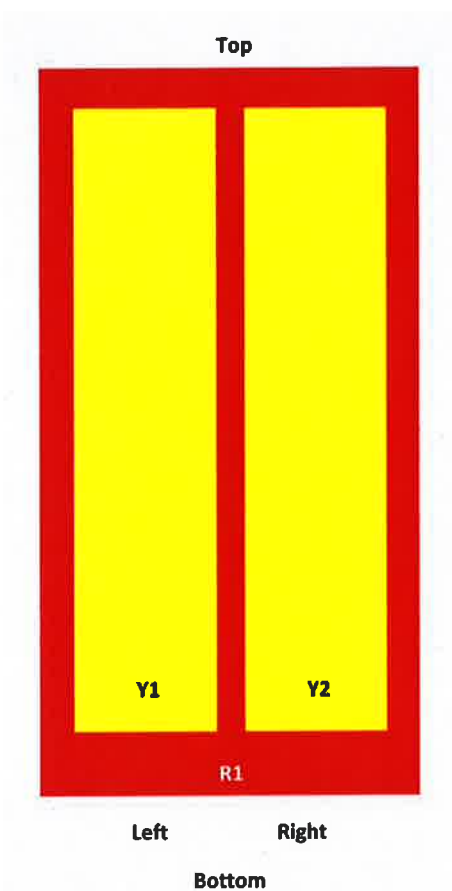
* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs.](#)

Array Layout

SBNHH-1D65B

SBNHH 65

Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	ANXXXXXXXXXXXXX.1
Y1	1695-2360	3-4	2	ANXXXXXXXXXXXXX.2
Y2	1695-2360	5-6		



View from the front of the antenna
 (Sizes of colored boxes are not true depictions of array sizes)

General Specifications

Operating Frequency Band	1695 – 2360 MHz 698 – 896 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	6
RF Connector Quantity, low band	2
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female

SBNHH-1D65B

Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Length	1851.0 mm 72.9 in
Width	301.0 mm 11.9 in
Depth	180.0 mm 7.1 in
Net Weight, without mounting kit	18.4 kg 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (1) Low band (1)
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	1 female 1 male

Packed Dimensions

Length	2025.0 mm 79.7 in
Width	390.0 mm 15.4 in
Depth	296.0 mm 11.7 in
Shipping Weight	31.0 kg 68.3 lb

Regulatory Compliance/Certifications

Agency

RoHS 2011/65/EU
China RoHS SJ/T 11364-2006
ISO 9001:2008

Classification

Compliant by Exemption
Above Maximum Concentration Value (MCV)
Designed, manufactured and/or distributed under this quality management system



SBNHH-1D65B

Included Products

BSAMNT-1 — 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

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

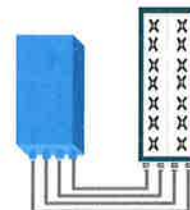


FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

Can be switched between modes via SW w/o site visit

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)
Volume in L	38 (with solar shield)
Weight in kg (lb) (w/o mounting HW)	26 (57.2) (with solar shield)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) IP65
Wind load (@150km/h or 93mph)	Frontal: <200N / Lateral : <150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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ALCATEL-LUCENT B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

Its compactness and slim design makes the Alcatel-Lucent B25 RRH4x30 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

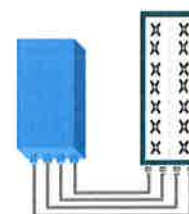


FEATURES

- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options (Pole or Wall)



4x30W with 4T4R
or
2x60W with 2T4R
Can be switched between
modes via SW w/o site
visit

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2)	2.0 dB typ. (<2.5 dB max)
RX Diversity scheme	2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.)	538 x 304 x 182 (21.2" x 12.0" x 7.2")
Volume (w/ solar shield) in L	30
Weight (w/ solar shield) in kg (lb)	24 (53)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	580W typical @100% RF load
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) IP65
Wind load (@150km/h or 93mph)	Frontal:<200N / Lateral :<150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 4 RF Tx & 4 RF Rx monitor ports 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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ALCATEL-LUCENT B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.



The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

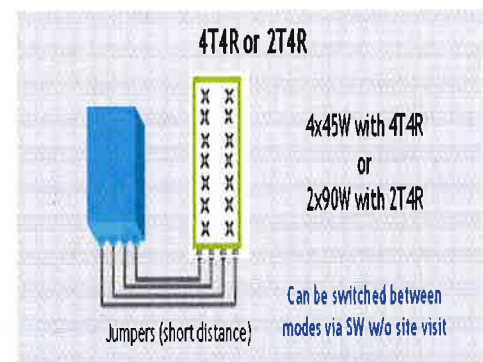
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



TECHNICAL SPECIFICATIONS

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (In 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield)
Volume in Liters	35.5 (with solar shield) 29.7 (without solar shield)
Weight in kg (lb) (w/o mounting HW)	25.8kg (56.8lb) (with solar shield)
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	750W typical @100% RF load (In 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) UL50E Type 4 Enclosure
Wind load (@150km/h or 93mph)	250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

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QT025A

Liquid Cooled Gas Engine Generator Sets

Standby Power Rating
25 kW 60 Hz



GENERAC 2.4L ENGINE

Naturally Aspirated
Gaseous Fueled
QT025A
Meets EPA Emission Regulations

STANDARD EQUIPMENT

- All input connections in one single area
- High coolant temperature shutdown
- Low oil pressure shutdown
- Low coolant level automatic shutdown
- Overspeed automatic shutdown
- Crank timer
- Exercise timer
- Oil drain extension
- Cool flow radiator
- Closed coolant recovery system
- UV/Ozone resistant hoses
- Watertight state of the art electrical connectors
- Mainline circuit breaker
- Radiator drain extension
- Battery charge alternator
- 10 Amp static battery charger
- Battery and battery cables
- Battery rack
- Fan and belt guards
- Isochronous governor
- Flex fuel line
- Coolant heater

FEATURES

- Innovative design and fully prototype tested
- UL2200 Listed
- Solid state frequency compensated voltage regulator
- Dynamic and static battery charger
- Sound attenuated acoustically designed enclosure
- Quiet test for low noise level exercise
- Acoustically designed engine cooling system
- High flow low noise factory engineered exhaust system
- State of the art digital control system with H100 digital control panel
- Watertight electrical connectors
- Rodent proof construction
- High efficiency, low distortion Generac designed alternator
- Vibration isolated from mounting base
- Matching Generac transfer switches engineered and tested to work as a system
- All components easily accessible for maintenance
- Electrostatically applied powder paint

GENERAC®

APPLICATION & ENGINEERING DATA

QT025A

GENERATOR SPECIFICATIONS

TYPE	Synchronous
ROTOR INSULATION	Class H
STATOR INSULATION	Class H
TOTAL HARMONIC DISTORTION	<5%
TELEPHONE INTERFERENCE FACTOR (TIF)	<50
ALTERNATOR OUTPUT LEADS 3 PHASE	4 wire
BEARINGS	Sealed Ball
COUPLING	Flexible Disc
LOAD CAPACITY (STANDBY RATING)	25 kW
EXCITATION SYSTEM	Direct

NOTE: Generator rating and performance in accordance with ISO8528-5, BS5514, SAE J1349, ISO3046, and DIN6271 standards.

VOLTAGE REGULATOR

TYPE	Full Digital
SENSING	3 Phase
REGULATION	± 1/4%
FEATURES	Built into H-100 Control Panel V/F Adjustable Adjustable Voltage and Gain

GENERATOR FEATURES

- Revolving field heavy duty generator
- Directly connected to the engine
- Operating temperature rise 120 °C above a 40 °C ambient
- Insulation is Class H rated at 150 °C rise
- All prototype models have passed three phase short circuit testing

CONTROL PANEL FEATURES

- TWO FOUR LINE LCD DISPLAYS READ:
 - Voltage (all phases)
 - Power factor
 - kVAR
 - Engine speed
 - Run hours
 - Fault history
 - Coolant temperature
 - Low oil pressure shutdown
 - Overvoltage
 - Low coolant level
 - Not in auto position (flashing light)
 - Transfer SW type
 - Current (all phases)
 - kW
 - Transfer switch status
 - Low fuel pressure
 - Service reminders
 - Oil pressure
 - Time and date
 - High coolant temperature shutdown
 - Overspeed
 - Low coolant level
 - Exercise speed
- INTERNAL FUNCTIONS:
 - I²T function for alternator protection from line to neutral and line to line short circuits
 - Emergency stop
 - Programmable auto crank function
 - 2 wire start for any transfer switch
 - Communicates with the Generac HTS transfer switch
 - Built-in 7 day exerciser
 - Adjustable engine speed at exerciser
 - RS232 port for GenLink® control
 - RS485 port remote communication
 - Canbus addressable
 - Governor controller and voltage regulator are built into the master control board
 - Temperature range -40 °C to 70 °C

ENGINE SPECIFICATIONS

MAKE	Generac
MODEL	Inline 4
CYLINDERS	4
DISPLACEMENT	2.4 Liter
BORE	3.41
STROKE	3.94
COMPRESSION RATIO	8.5:1
INTAKE AIR SYSTEM	Naturally Aspirated
VALVE SEATS	Hardened
LIFTER TYPE	Hydraulic

GOVERNOR SPECIFICATIONS

TYPE	Electronic
FREQUENCY REGULATION	Isochronous
STEADY STATE REGULATION	± 0.25
ADJUSTMENTS FOR:	
Speed	Yes
Droop	Yes

ENGINE LUBRICATION SYSTEM

OIL PUMP	Gear
OIL FILTER	Full flow spin-on cartridge
CRANKCASE CAPACITY	4 Quarts

ENGINE COOLING SYSTEM

TYPE	Closed
WATER PUMP	Belt driven
FAN SPEED	2150
FAN DIAMETER	18 inches
FAN MODE	Pusher
COOLANT HEATER	1500W 120V

FUEL SYSTEM

FUEL TYPE	Natural gas, propane vapor
CARBURETOR	Down Draft
SECONDARY FUEL REGULATOR	Standard
FUEL SHUT OFF SOLENOID	Standard
OPERATING FUEL PRESSURE	5" - 14" H ₂ O

ELECTRICAL SYSTEM

BATTERY CHARGE ALTERNATOR	12V 30 Amp
STATIC BATTERY CHARGER	10 Amp
RECOMMENDED BATTERY	Group 26, 525CCA
SYSTEM VOLTAGE	12 Volts

Rating definitions - Standby: Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. (All ratings in accordance with BS5514, ISO3046, ISO8528 and DIN6271).

QT025A

OPERATING DATA

		QT025A		
KW RATING		25		
ENGINE SIZE		2.4 Liter 4 cylinder		
GENERATOR OUTPUT VOLTAGE/KW - 60Hz		KW	AMP	CB Size
120/240V, 1-phase, 1.0 pf		25	104	125
120/208V, 3-phase, 0.8 pf		25	87	100
277/480V, 3-phase, 0.8 pf		25	38	40
120/240V, 3-phase, 0.8 pf		25	75	80
GENERATOR LOCKED ROTOR KVA AVAILABLE @ VOLTAGE DIP OF 35%				
Single phase or 208 3-phase		43		
480V 3-phase		57		
ENGINE FUEL CONSUMPTION (Natural Gas) (Propane)		Natural Gas	Propane	
		(ft ³ /hr.)	(gal/hr.)	cu ft/hr
Exercise cycle		60	0.65	24
25% of rated load		140	1.53	56
50% of rated load		220	2.40	87
75% of rated load		300	3.27	119
100% of rated load*		380	4.15	151
ENGINE COOLING				
Air flow (inlet air including alternator and combustion air) ft ³ /min.		1,500		
System coolant capacity US gal.		2.5		
Heat rejection to coolant BTU/hr.		95,000		
Max. operating air temp. on radiator °C (°F)		60 (150)		
Max. ambient temperature °C (°F)		50 (140)		
COMBUSTION AIR REQUIREMENTS				
Flow at rated power 60 Hz cfm		70		
SOUND EMISSIONS IN DBA				
Exercising at 7 meters		54		
Normal operation at 7 meters		60		
EXHAUST				
Exhaust flow at rated output 60 Hz cfm		220		
Exhaust temp. at muffler outlet °F		975		
ENGINE PARAMETERS				
Rated synchronous RPM 60 Hz		1800		
HP at rated KW** 60 Hz		40		
POWER ADJUSTMENT FOR AMBIENT CONDITIONS				
Temperature Deration				
3% for every 10 °C above - °C		25		
1.65% for every 10 °F above - °F		77		
Altitude Deration				
1% for every 100 m above - m		183		
3% for every 1000 ft. above - ft.		600		

* Refer to "Emissions Data Sheets" for maximum fuel flow for EPA and SCAQMD permitting purposes.

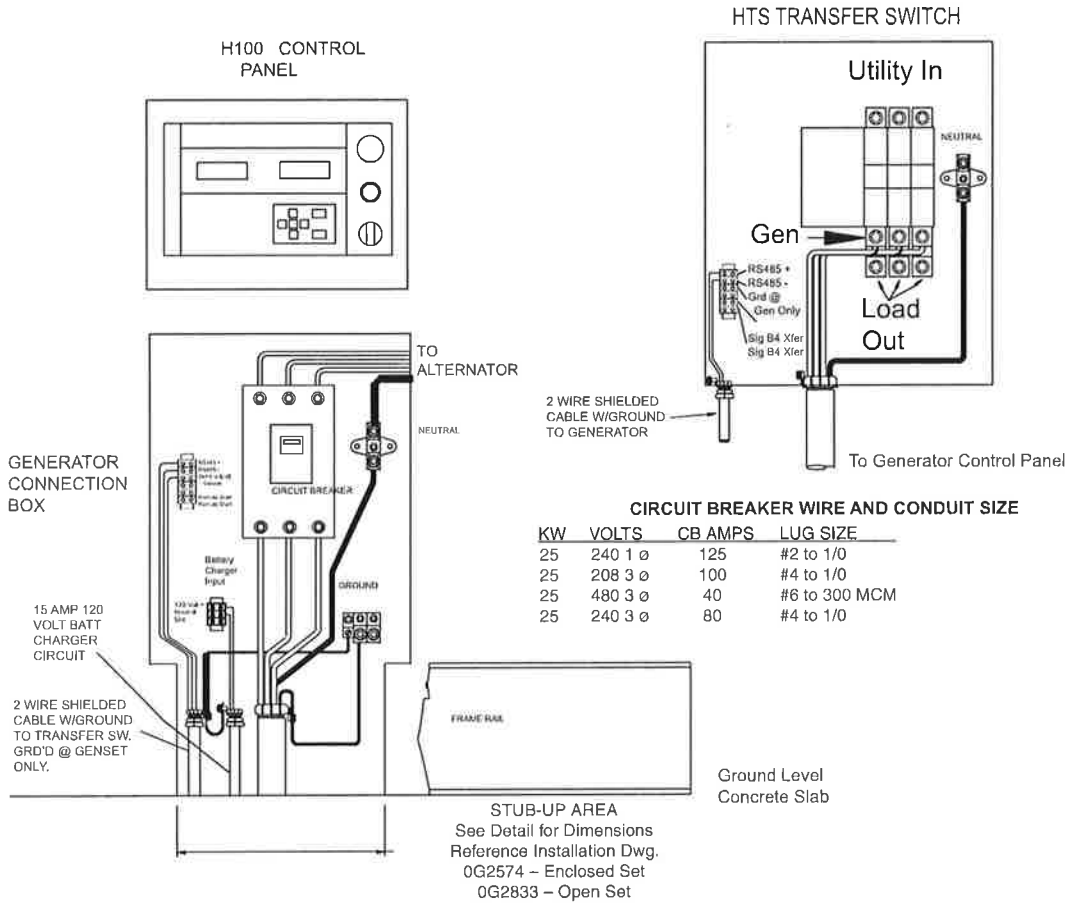
** Refer to "Emissions Data Sheets" for maximum bHP for EPA and SCAQMD permitting purposes.

RATING: All three phases units are rated at 0.8 power factor. All single phase units are rated at 1.0 power factor. STANDBY RATING: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046-1. Design and specifications are subject to change without notice.

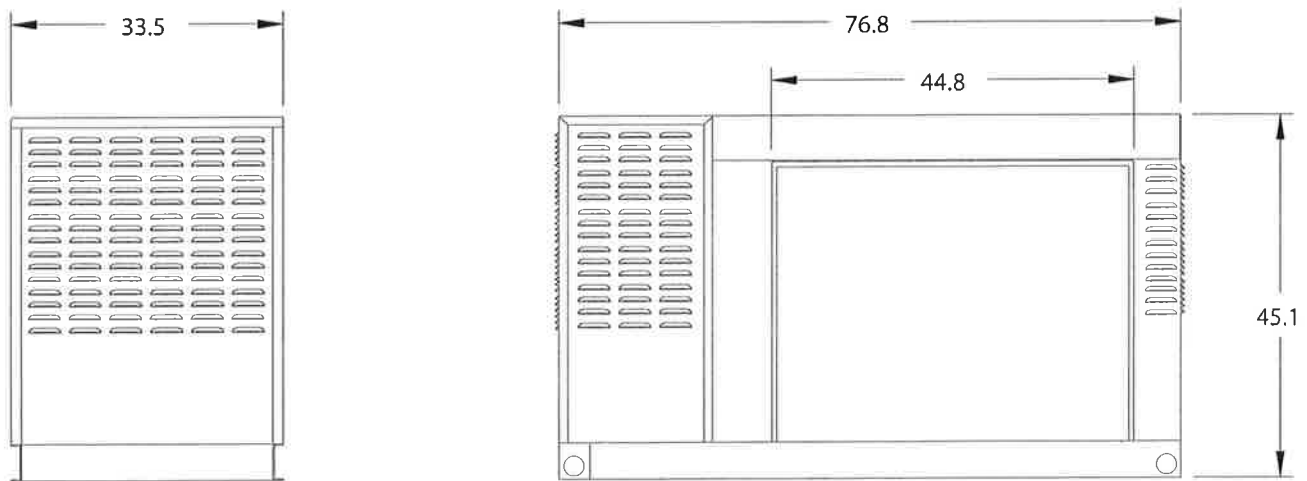
KW rating is based on LPG Fuel and may derate with natural gas.

INTERCONNECTIONS

QT025A



INSTALLATION LAYOUT



Generac Power Systems, Inc. • S45 W29290 HWY. 59, Waukesha, WI 53189 • generac.com

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ATTACHMENT 5



**STRUCTURAL ANALYSIS REPORT
170' SELF-SUPPORTING TOWER
MANCHESTER, CONNECTICUT**

Prepared for
Verizon Wireless

Verizon Site: Manchester North

October 4, 2017



APT Project #CT141NB9160

**STRUCTURAL ANALYSIS REPORT
170' SELF-SUPPORTING TOWER
MANCHESTER, CONNECTICUT**

**prepared for
Verizon Wireless**

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of this 170-foot self-supporting tower. The analysis was performed for Verizon Wireless's proposed installation of twelve panel antennas, nine remote radio heads (RRHs) and two power/fiber distribution boxes (MDBs) at 100', fed by two 1-5/8" hybrid power/fiber lines. The equipment is to be installed on three 12' sector mounts, assumed to be SirePro1 model VFA12-HD or equivalent.

Our analysis indicates the tower and foundation meet the requirements of the Connecticut State Building Code with the proposed equipment.

INTRODUCTION:

A structural analysis was performed on the above-mentioned communications tower by APT for Verizon Wireless. The tower is located at 33 Mitchell Drive in Manchester, Connecticut.

APT did not visit the site to conduct this structural analysis. The analysis relied solely on information provided by others, which included design drawings and calculations by Valmont, Eng. File No. A-175553 dated September 20, 2012; a structural analysis by Centek Engineering, Inc., Project #15117.000 dated November 13, 2015; and draft construction drawings prepared by APT, Project #CT141NB9160 dated July 2017.

The analysis was performed in accordance with the Connecticut State Building Code and TIA-222-G using the following equipment inventory (proposed equipment shown in **bold** text):

Carrier	Appurtenance	Elev.	Mount	Feed lines
	Lightning rod	180'	15' pipe mount	N.A.
Verizon	(12) SBNHH-1D65B panels, (3) RRH2x60-700 RRHs, (3) RRN2x60-PCS RRHs, (3) RRH2x90-AWS RRHs, (2) DB-T1-6Z-8AB-0Z MDBs	100'	(3) VFA12-HD sector mounts or equal	(2) 1-5/8" hybrid

All-Points Technology Corporation

116 Grandview Road
Conway, NH 03818
(603) 496-5853

3 Saddlebrook Drive
Killingworth, CT 06419
(860) 663-1697

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with the Connecticut State Building Code and TIA-222, Revision G (TIA), Structural Standard for Antenna Supporting Structures and Antennas.

The analysis was conducted using a 3-second gust wind speed of 100 miles per hour with no ice and 40-mph with 1" radial ice in accordance with the TIA-222-G standard for this location in Hartford County, Connecticut. The following additional design criteria were used:

Structure Class: II
Topographic Category: 1
Exposure Category: B

Analysis Results:

Analysis of the tower was conducted in accordance with the criteria outlined herein with equipment loading as previously described. The following table summarizes the results of the analysis based on stresses of individual leg and bracing members:

Elevation	Legs	Bracing
160'-170'	6%	4%
140'-160'	5%	16%
120'-140'	7%	16%
100'-120'	9%	18%
80'-100'	25%	32%
60'-80'	17%	35%
40'-60'	17%	39%
20'-40'	21%	21%
0'-20'	20%	25%

Bracing, Splice and Anchor Bolts:

Connection bolts were evaluated under the proposed loading. All bolts were found to be adequately sized to support the proposed loads.

Base Foundation:

Evaluation of the base foundations was performed from original design drawings. Reactions imposed by the proposed additions are within the design capacity of the foundation.

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Factored base reactions imposed with the equipment changes were calculated as follows:

Compression:	121.0 kips
Uplift:	85.9 kips
Shear:	15.5 kips
Overturning Moment:	2188 ft-kips

CONCLUSIONS AND RECOMMENDATIONS:

Our structural analysis indicates that the 170-foot self-supporting tower and foundation located at 33 Mitchell Drive in Manchester, Connecticut meet the requirements of the Connecticut State Building Code with Verizon Wireless's proposed equipment.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in an undeteriorated condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

All-Points Technology Corporation, P.C. (APT) is not responsible for modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating torque arms or guys.
4. Installing antenna mounting gates or side arms.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which is contrary to that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

All-Points Technology Corporation

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Appendix A

Tower Schematic

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Generic Lightning Rod 4' copper	180	ALU RRH2x60-PCS w/bracket	100
15' x 3.5" pipe	170	ALU RRH2x90-AWS w/bracket	100
(4) SBNHH-1D65B	100	ALU RRH2x90-AWS w/bracket	100
(4) SBNHH-1D65B	100	ALU RRH2x90-AWS w/bracket	100
(4) SBNHH-1D65B	100	RFS DB-T1-6Z-8AB-0Z D-box	100
ALU RRH2x60-700 w/bracket	100	RFS DB-T1-6Z-8AB-0Z D-box	100
ALU RRH2x60-700 w/bracket	100	SitePro VFA12-HD	100
ALU RRH2x60-700 w/bracket	100	SitePro VFA12-HD	100
ALU RRH2x60-PCS w/bracket	100	SitePro VFA12-HD	100
ALU RRH2x60-PCS w/bracket	100		

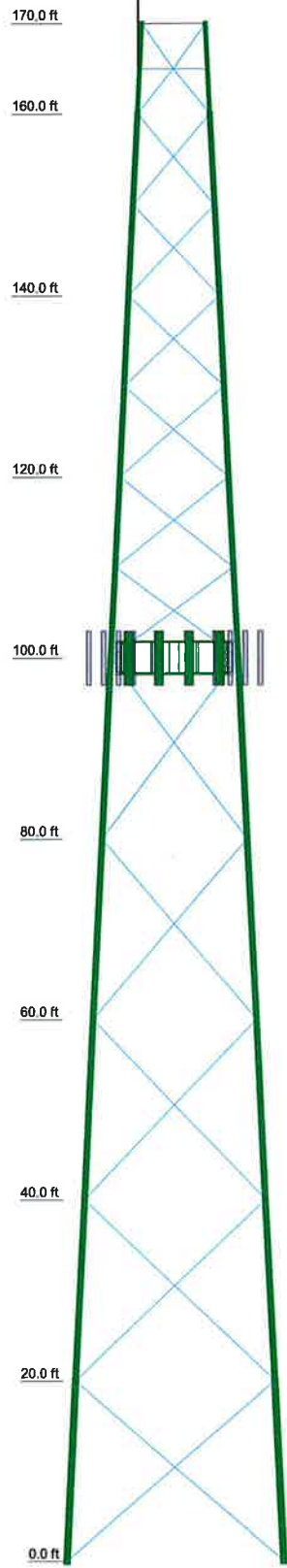
SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

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

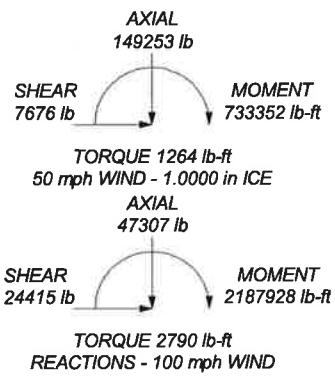
Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (lb) 35970 2'
T1	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	22	6 @ 10	2458.4
T2	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	20	5 @ 20	5904.1
T3	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	18	5 @ 20	5004.1
T4	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	16	5 @ 20	4489.2
T5	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	14	5 @ 20	4430.9
T6	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	12	6 @ 10	3422.1
T7	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	10	6 @ 10	2458.4
T8	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	8	6 @ 10	2458.4
T9	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	6	6 @ 10	2458.4
T10	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	4	6 @ 10	2458.4
T11	Valmont #12 x 2.5	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	2	6 @ 10	2458.4



ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 121035 lb
SHEAR: 15487 lb

UPLIFT: -85933 lb
SHEAR: 12161 lb



<p>All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124</p>	<p>Job: U24.0 x 170' Valmont</p>
	<p>Project: CT141NB9160 Manchester North</p>
	<p>Client: Verizon Wireless Drawn by: Rob Adair App'd:</p>
	<p>Code: TIA-222-G Date: 10/04/17 Scale: N</p>
	<p>Path: _____ Dwg No. _____</p>

Appendix B

Calculations



[ASCE 7 Windspeed](#)
 [ASCE 7 Ground Snow Load](#)
 [Related Resources](#)
 [Sponsors](#)
 [About ATC](#)
 [Contact](#)

Search Results

Query Date: Wed Oct 04 2017

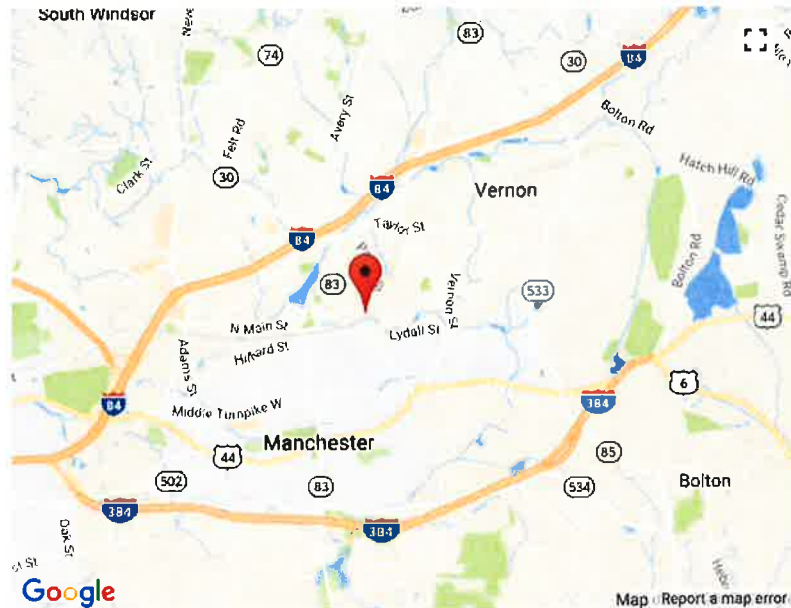
Latitude: 41.7978

Longitude: -72.5108

**ASCE 7-10 Windspeeds
(3-sec peak gust in mph*):**

Risk Category I: 113
Risk Category II: 124
Risk Category III-IV: 134
MRI 10-Year:** 77
MRI 25-Year:** 87
MRI 50-Year:** 94
MRI 100-Year:** 100

ASCE 7-05 Windspeed:
 100 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
 81 (fastest mile in mph)



*Miles per hour

**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.



[Print your results](#)

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tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job U24.0 x 170' Valmont	Page 1 of 4
	Project CT141NB9160 Manchester North	Date 10:03:45 10/04/17
	Client Verizon Wireless	Designed by Rob Adair

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 170.00 ft above the ground line.

The face width of the tower is 7.00 ft at the top and 24.00 ft at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 100 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Deflections calculated using a wind speed of 60 mph.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	# Per Row	#	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1.57" Hybrid fiber-power cable	A	No	Ar (CaAa)	100.00 - 8.00	-6.0000	0.5	2	2	0.5000	1.5700		0.66

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	C _{AA}	Weight plf	
3/8" safety cable	A	No	CaAa (In Face)	170.00 - 8.00	4.0000	0.5	1	No Ice	0.04	0.22
								1/2" Ice	0.14	0.83
								1" Ice	0.24	1.98

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	Placement ft	C _{AA} Front	C _{AA} Side	Weight lb
Generic Lightning Rod 4' copper	C	From Leg	0.50	0.0000	180.00	No Ice	0.50	0.00
			0.00			1/2" Ice	1.00	0.00
			0.00			1" Ice	1.50	0.00
15' x 3.5" pipe	C	From Leg	0.50	0.0000	170.00	No Ice	5.25	115.00
			0.00			1/2" Ice	6.79	152.17
			2.50			1" Ice	8.34	199.01
(4) SBNHH-1D65B	A	From Face	4.00	0.0000	100.00	No Ice	8.08	45.00
			0.00			1/2" Ice	8.53	95.05
			0.00			1" Ice	9.00	151.20
(4) SBNHH-1D65B	B	From Face	4.00	0.0000	100.00	No Ice	8.08	45.00
			0.00			1/2" Ice	8.53	95.05
			0.00			1" Ice	9.00	151.20
(4) SBNHH-1D65B	C	From Face	4.00	0.0000	100.00	No Ice	8.08	45.00

tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job	U24.0 x 170' Valmont	Page	2 of 4
	Project	CT141NB9160 Manchester North	Date	10:03:45 10/04/17
	Client	Verizon Wireless	Designed by	Rob Adair

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
			0.00			1/2" Ice	8.53	5.79	95.05
			0.00			1" Ice	9.00	6.26	151.20
ALU RRH2x60-700 w/bracket	A	From Face	3.50		0.0000	No Ice	3.35	2.02	60.00
			0.00			1/2" Ice	3.60	2.25	83.19
			0.00			1" Ice	3.87	2.49	110.02
ALU RRH2x60-700 w/bracket	B	From Face	3.50		0.0000	No Ice	3.35	2.02	60.00
			0.00			1/2" Ice	3.60	2.25	83.19
			0.00			1" Ice	3.87	2.49	110.02
ALU RRH2x60-700 w/bracket	C	From Face	3.50		0.0000	No Ice	3.35	2.02	60.00
			0.00			1/2" Ice	3.60	2.25	83.19
			0.00			1" Ice	3.87	2.49	110.02
ALU RRH2x60-PCS w/bracket	A	From Face	3.50		0.0000	No Ice	2.14	1.36	60.00
			0.00			1/2" Ice	2.33	1.51	77.80
			0.00			1" Ice	2.53	1.68	98.44
ALU RRH2x60-PCS w/bracket	B	From Face	3.50		0.0000	No Ice	2.14	1.36	60.00
			0.00			1/2" Ice	2.33	1.51	77.80
			0.00			1" Ice	2.53	1.68	98.44
ALU RRH2x60-PCS w/bracket	C	From Face	3.50		0.0000	No Ice	2.14	1.36	60.00
			0.00			1/2" Ice	2.33	1.51	77.80
			0.00			1" Ice	2.53	1.68	98.44
ALU RRH2x90-AWS w/bracket	A	From Face	3.50		0.0000	No Ice	2.58	1.63	80.00
			0.00			1/2" Ice	2.79	1.81	100.47
			0.00			1" Ice	3.01	2.00	124.06
ALU RRH2x90-AWS w/bracket	B	From Face	3.50		0.0000	No Ice	2.58	1.63	80.00
			0.00			1/2" Ice	2.79	1.81	100.47
			0.00			1" Ice	3.01	2.00	124.06
ALU RRH2x90-AWS w/bracket	C	From Face	3.50		0.0000	No Ice	2.58	1.63	80.00
			0.00			1/2" Ice	2.79	1.81	100.47
			0.00			1" Ice	3.01	2.00	124.06
RFS DB-T1-6Z-8AB-0Z D-box	A	From Face	1.00		0.0000	No Ice	4.80	2.00	45.00
			0.00			1/2" Ice	5.07	2.19	81.13
			0.00			1" Ice	5.35	2.39	121.22
RFS DB-T1-6Z-8AB-0Z D-box	C	From Face	1.00		0.0000	No Ice	4.80	2.00	45.00
			0.00			1/2" Ice	5.07	2.19	81.13
			0.00			1" Ice	5.35	2.39	121.22
SitePro VFA12-HD	A	From Face	0.00		0.0000	No Ice	13.20	9.20	650.00
			0.00			1/2" Ice	19.50	14.60	800.00
			0.00			1" Ice	25.80	19.50	950.00
SitePro VFA12-HD	B	From Face	0.00		0.0000	No Ice	13.20	9.20	650.00
			0.00			1/2" Ice	19.50	14.60	800.00
			0.00			1" Ice	25.80	19.50	950.00
SitePro VFA12-HD	C	From Face	0.00		0.0000	No Ice	13.20	9.20	650.00
			0.00			1/2" Ice	19.50	14.60	800.00
			0.00			1" Ice	25.80	19.50	950.00

tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job	U24.0 x 170' Valmont	Page	3 of 4
	Project	CT141NB9160 Manchester North	Date	10:03:45 10/04/17
	Client	Verizon Wireless	Designed by	Rob Adair

Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 160	0.674	12	0.0280	0.0017
T2	160 - 140	0.614	12	0.0279	0.0013
T3	140 - 120	0.494	12	0.0270	0.0008
T4	120 - 100	0.380	12	0.0245	0.0005
T5	100 - 80	0.279	12	0.0214	0.0003
T6	80 - 60	0.184	12	0.0181	0.0003
T7	60 - 40	0.107	12	0.0135	0.0002
T8	40 - 20	0.050	12	0.0092	0.0001
T9	20 - 0	0.014	12	0.0042	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Generic Lightning Rod 4' copper	12	0.674	0.0280	0.0017	Inf
170.00	15' x 3.5" pipe	12	0.674	0.0280	0.0017	Inf
100.00	(4) SBNHH-1D65B	12	0.279	0.0214	0.0003	Inf

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria	
T1	170	Leg	A325N	1.0000	6	103.36	53014.40	0.002	✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	516.08	12723.80	0.041	✓	1	Member Bearing
T2	160	Leg	A325N	1.0000	6	655.61	53014.40	0.012	✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	1239.73	12723.80	0.097	✓	1	Member Bearing
T3	140	Leg	A325N	1.0000	12	852.74	53014.40	0.016	✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	1838.95	12723.80	0.145	✓	1	Member Bearing
T4	120	Leg	A325N	1.0000	12	1499.27	53014.40	0.028	✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	2525.52	26643.80	0.095	✓	1	Member Bearing
T5	100	Leg	A325N	1.0000	12	2292.64	53014.40	0.043	✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	5779.05	31972.50	0.181	✓	1	Member Bearing
T6	80	Leg	A325N	1.0000	12	3449.90	53014.40	0.065	✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	6104.78	31972.50	0.191	✓	1	Member Bearing
T7	60	Leg	A325N	1.0000	12	4598.39	53014.40	0.087	✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	5943.96	31972.50	0.186	✓	1	Member Bearing
T8	40	Leg	A325N	1.0000	12	5687.61	53014.40	0.107	✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	6169.42	42630.00	0.145	✓	1	Member Bearing
T9	20	Leg	A325N	1.0000	12	6687.79	53014.40	0.126	✓	1	Bolt Tension

tnxTower All-Points Technology Corporation 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	Job U24.0 x 170' Valmont	Page 4 of 4
	Project CT141NB9160 Manchester North	Date 10:03:45 10/04/17
	Client Verizon Wireless	Designed by Rob Adair

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	1.2500	1	6387.55	42630.00	0.150 ✓	1	Member Bearing

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
T1	170 - 160	Leg	Pirod 105244	1	-1344.70	142493.00	5.5	Pass	
		Diagonal	L3x3x3/16	14	-652.06	17853.70	3.7	Pass	
							4.1 (b)		
T2	160 - 140	Horizontal	L2 1/2x2 1/2x3/16	10	-149.16	21077.90	0.7	Pass	
		Top Girt	L2 1/2x2 1/2x3/16	6	-69.77	15619.30	0.8	Pass	
		Leg	Pirod 105217	22	-4510.45	214859.00	4.8	Pass	
T3	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	29	-1306.71	8118.15	16.1	Pass	
		Leg	Pirod 105217	39	-15541.50	214859.00	7.2	Pass	
T4	120 - 100	Diagonal	L3x3x3/16	41	-1869.67	11429.60	16.4	Pass	
		Leg	Pirod 105218	54	-26146.60	300681.00	8.7	Pass	
T5	100 - 80	Diagonal	L3x3x5/16	59	-2583.12	14801.00	17.5	Pass	
		Leg	Pirod 105219	69	-39523.50	356293.00	24.5	Pass	
T6	80 - 60	Diagonal	2L3x3x3/16x3/8	71	-6106.94	19287.30	31.7	Pass	
		Leg	Pirod 105219	78	-59017.10	356293.00	16.6	Pass	
T7	60 - 40	Diagonal	2L3x3x3/16x3/8	80	-6060.25	17497.10	34.6	Pass	
		Leg	Pirod 105220	87	-76854.50	451148.00	17.0	Pass	
T8	40 - 20	Diagonal	2L3x3x3/16x3/8	89	-6222.86	15842.70	39.3	Pass	
		Leg	Pirod 105220	96	-95152.80	451148.00	21.1	Pass	
T9	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4x3/8	98	-6234.23	29951.80	20.8	Pass	
		Leg	Valmont #12 x 2.5	105	-112381.00	557267.00	20.2	Pass	
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	107	-6692.17	27115.90	24.7	Pass	
							Summary		
							Leg (T5)	24.5	Pass
							Diagonal (T7)	39.3	Pass
							Horizontal (T1)	0.7	Pass
							Top Girt (T1)	0.8	Pass
							Bolt Checks	19.1	Pass
							RATING =	39.3	Pass

All-Points Technology Corp., P.C.

116 Grandview Road
Conway, NH 03818
(603) 496-5853

Client: **Verizon Wireless**
Job: **Manchester, CT**
Calculated By: **R. Adair**

Site: **Manchester N**
Job No.: **CT141NB9160**
Date: **04-Oct-17**

Mat Foundation Analysis

Program assumes:

Mat is square in plan view.
Water table is below bottom of mat.
Unit weight of concrete = 150 pcf
Unit weight of soil = 100 pcf
Self-supporting tower with 3 piers

Information to be provided:

Pier is round or square in plan dimension ("R" or "S")	Shape =	R
OTM = Overturning Moment to be resisted	OTM =	2188 ft-kips
H = Height from ground surface to top of mat (if buried)	H =	4.25 ft.
P _M = Projection of pier above mat	P _M =	4.75 ft.
y = Thickness of mat	y =	1.75 ft.
x = Width of mat	x =	32.00 ft.
d = Diameter of round pier	d =	4.5 ft.
S = Size of tension bars	S =	7

Mass of tower and appurtenances (below)

Results:

<u>Component</u>	<u>Mass</u>	<u>Moment Arm</u>	<u>Moment Resist.</u>
Pier	11.3 kips	16 ft.	181.3 ft-kips
Overburden	500.3 kips	16 ft.	8004.1 ft-kips
Mat	268.8 kips	16 ft.	4300.8 ft-kips

Overturning Moment Resistance : 12486.16 ft-kips
Factor of Safety = 5.71
Concrete Quantity = 74.8 c.y.

SATISFACTORY

ATTACHMENT 6

General Power Density

Site Name: Manchester N CT
 Cumulative Power Density

Operator	Operating Frequency (MHz)	Number of Trans.	ERP Per Trans. (watts)	Total ERP (watts)	Distance to Target (feet)	Calculated Power Density (mW/cm ²)	Maximum Permissible Exposure* (mW/cm ²)	Fraction of MPE (%)
VZW PCS	1970	1	5000	5000	100	0.1798	1.0	17.98%
VZW Cellular	869							
VZW AWS	2145	1	7400	7400	100	0.2661	1.0	26.61%
VZW 700	746	1	2200	2200	100	0.0791	0.497333333	15.91%

Total Percentage of Maximum Permissible Exposure

60.50%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:

1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.