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

January 3, 2020

Via Hand Delivery

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

Re: **Docket No. 482 – Application of Cellco Partnership d/b/a Verizon Wireless for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance and Operation of a Wireless Telecommunications Facility Located at 917 Exeter Road, Lebanon, Connecticut**

Development and Management Plan Submission

Dear Ms. Bachman:

Enclosed please find fifteen (15) copies of the following:

1. Final Development and Management ("D&M") Plans prepared by All-Points Technology Corporation for the approved telecommunications facility at 917 Exeter Road in Lebanon, Connecticut, incorporating the Council's conditions of approval. Also enclosed are three (3) full size (24" x 36") sets of D&M plans.

2. Tower and Foundation design drawings and calculations dated December 11, 2019 and Slab Foundation design calculations dated December 13, 2019, prepared by Valmont Structures.

3. Geotechnical Engineering Report prepared by Down To Earth Consulting, LLC dated June 3, 2019.

Robinson+Cole

Together, this information constitutes the final D&M Plan submission for the approved telecommunications facility at 917 Exeter Road in Lebanon, Connecticut.

We respectfully request that this information be reviewed and this matter be placed on the next available Siting Council agenda for approval. Please feel free to contact me if you have any questions or require additional information. Thank you.

Sincerely,

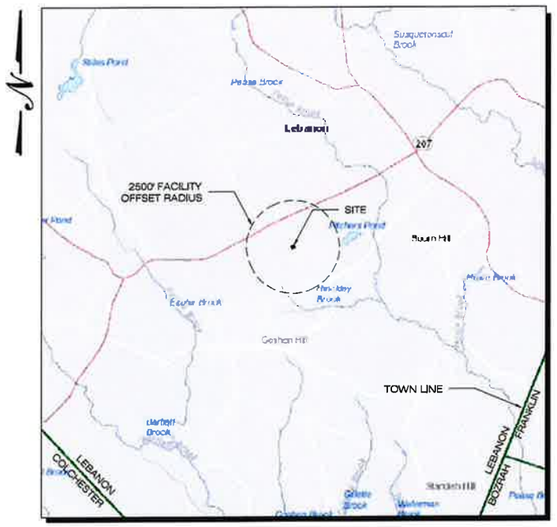
Kenneth C. Baldwin

KCB/kmd
Enclosures
Copy to:
Betsy Petrie, Lebanon First Selectman
Andy Candiello (w/o enc.)
Aleksey Tyurin (w/o enc.)

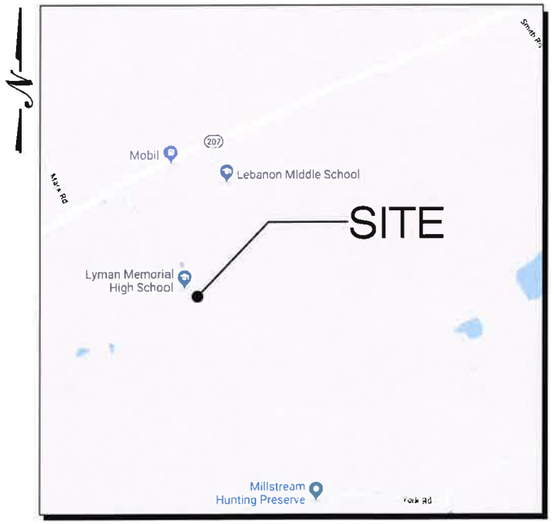
CELLCO PARTNERSHIP d/b/a

verizon WIRELESS

LEBANON CENTER CT
DEVELOPMENT AND MANAGEMENT PLAN
917 EXETER ROAD
LEBANON, CT 06249
DOCKET NO. 482



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



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

SITE INFORMATION

SITE TYPE: NEW 150' AGL MONOPOLE

SCOPE OF WORK: PROPOSED RF EQUIPMENT ON NEW 150' AGL MONOPOLE W/ CORRESPONDING GROUND EQUIPMENT WITHIN A PROPOSED 50'x50' FENCED COMPOUND. EXISTING 80' AGL LATTICE TOWER TO BE REMOVED.

SITE NAME: LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD
LEBANON, CT 06249

ZONING JURISDICTION: CONNECTICUT SITING COUNCIL

COUNTY: WINDHAM

LATITUDE: 41° 37' 18.0495" N

LONGITUDE: 72° 14' 13.8816" W

GROUND ELEVATION: 506'± AMSL

PROPERTY OWNER: TOWN OF LEBANON
579 EXETER ROAD
LEBANON, CT 06249

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

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME:
LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

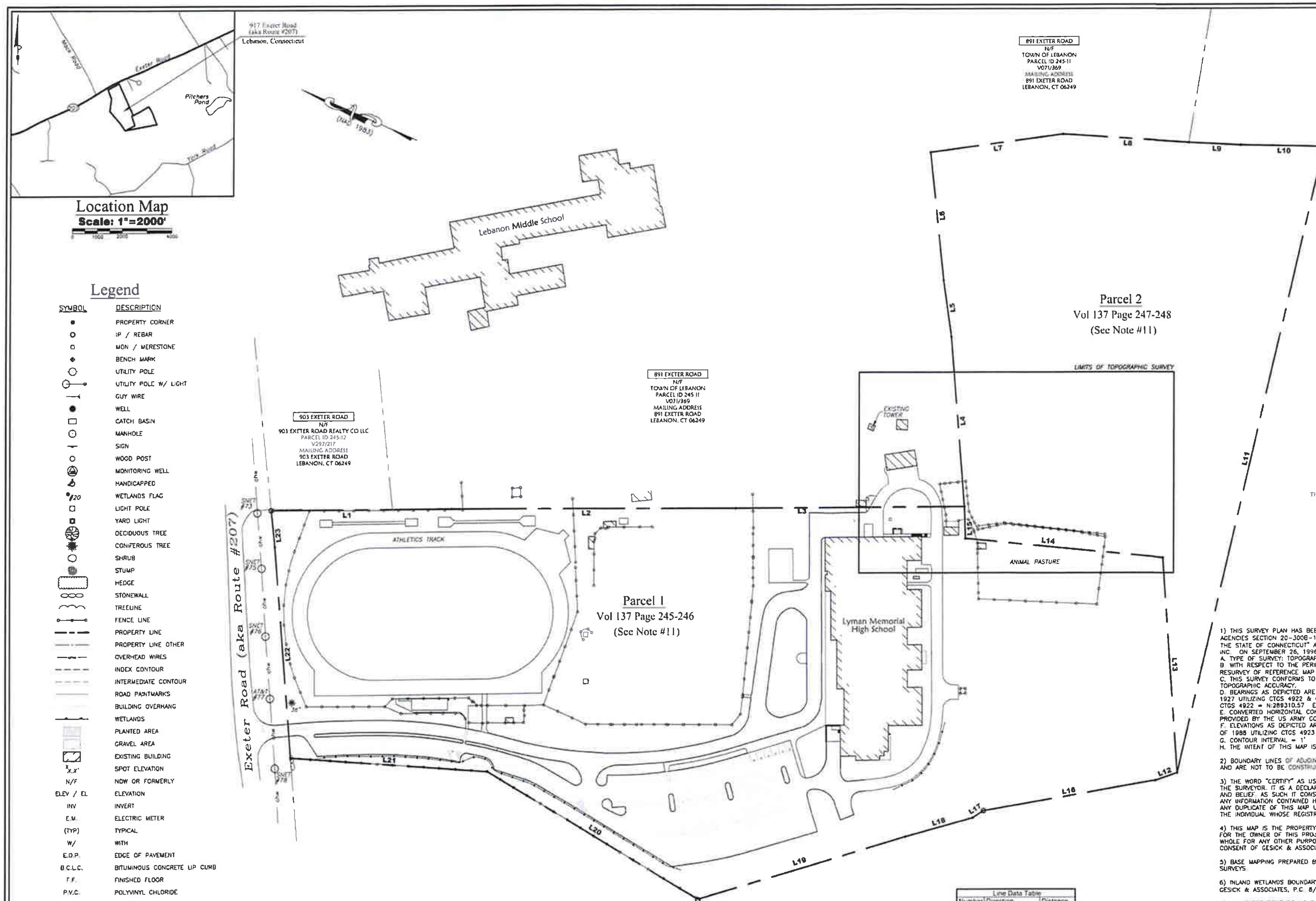
APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH

DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:
TITLE SHEET & INDEX

SHEET NUMBER:
T-1



Notes

1) 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, 1996.
A. TYPE OF SURVEY: TOPOGRAPHIC SURVEY
B. WITH RESPECT TO THE PERIMETER OF THE PROPERTY THE BOUNDARY DETERMINATION IS BASED UPON A RESURVEY OF REFERENCE MAP #2.
C. THIS SURVEY CONFORMS TO THE STANDARDS AND THE ACCURACY OF CLASS: A-2 HORIZONTAL & T-2 TOPOGRAPHIC ACCURACY.
D. BEARINGS AS DEPICTED ARE BASED UPON THE CONNECTICUT GRID SYSTEM, NORTH AMERICAN DATUM OF 1927 UTILIZING CTGS 4922 & CTGS 4923 WITH THE FOLLOWING PUBLISHED COORDINATES:
CTGS 4922 = N:289310.57 E:739837.77 & CTGS 4923 = N:288738.54 E:738469.49
E. CONVERTED HORIZONTAL CONTROL INFORMATION FROM NAD 1927 TO NAD 1983 WITH CORPSCON 6.0.1 PROVIDED BY THE US ARMY CORPS OF ENGINEERS
F. ELEVATIONS AS DEPICTED ARE BASED UPON THE CONNECTICUT GRID SYSTEM, NORTH AMERICAN DATUM OF 1988 UTILIZING CTGS 4923 WITH THE FOLLOWING PUBLISHED ELEVATION: 518.35'
G. CONTOUR INTERVAL = 1'
H. THE INTENT OF THIS MAP IS TO DEPICT THE EXISTING CONDITIONS OF THE PROPERTY

2) BOUNDARY LINES OF ADJOINING PROPERTIES ARE SHOWN FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSTRUED AS BEING ACCURATELY LOCATED OR DEPICTED.

3) 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.

4) 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.

5) BASE MAPPING PREPARED BY GESICK & ASSOCIATES P.C. FROM A 8/14/2017 THRU 8/22/2017 FIELD SURVEYS

6) INLAND WETLANDS BOUNDARY LIMITS DELINEATED BY MATTHEW GUSTAFSON AND FIELD LOCATED BY GESICK & ASSOCIATES, P.C. 8/22/2017.

7) THE FLOOD ZONE BOUNDARIES SHOWN WERE DERIVED UTILIZING FLOOD INSURANCE RATE MAPS. THE FLOOD ZONE BOUNDARIES WERE DIGITIZED AND ARE TO BE CONSIDERED AS APPROXIMATE ONLY AND FOR INFORMATIONAL PURPOSES ONLY.

8) 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.

9) TREES SHOWN ON THIS MAP WERE FIELD LOCATED BUT ARE NOT SHOWN TO SCALE

10) UNLESS OTHERWISE NOTED, BUILDING OFFSETS ARE TO BUILDING SIDING ABOVE THE FOUNDATION

11) TOWN OF LEBANON GIS WEBSITE & ASSESSOR CARD SHOW THIS PROPERTY AS ONE PARCEL. BUT THE DEEDS CALL OUT FOR TWO AS SHOWN IN VOLUME 137 PAGE 245 - 246 & VOLUME 137 PAGE 247 - 248 OF THE TOWN OF LEBANON LAND RECORDS.

Line Data Table		
Number	Direction	Distance
L1	S 24°16'26" E	365.00'
L2	S 23°57'27" E	575.81'
L3	S 24°15'35" E	463.68'
L4	N 61°28'08" E	343.46'
L5	N 58°05'58" E	115.60'
L6	N 60°06'36" E	259.01'
L7	S 31°41'30" E	270.18'
L8	S 20°05'20" E	256.10'
L9	S 20°57'43" E	104.90'
L10	S 22°34'23" E	168.70'
L11	S 79°10'23" W	1295.52'
L12	N 43°27'12" W	46.00'
L13	N 62°07'59" E	435.27'
L14	N 18°23'44" W	402.33'
L15	N 64°10'55" E	64.39'
L16	N 33°54'13" W	354.25'
L17	N 57°09'07" W	26.17'
L18	N 39°35'09" W	141.89'
L19	N 40°38'44" W	438.73'
L20	N 07°20'37" E	500.00'
L21	N 19°45'59" W	399.18'
L22	N 61°37'09" E	427.17'
L23	N 60°16'34" E	73.75'

953 EXETER ROAD
N/F
THE GEER FAMILY LIVING TRUST
PARCEL ID 252-14
V291/128
MAILING ADDRESS
P.O BOX 173
LEBANON, CT 06249

Subject Parcel Information

OWNER:	THE TOWN OF LEBANON
PARCEL ADDRESS:	917 EXETER ROAD LEBANON, CONNECTICUT 06249
MAILING ADDRESS:	579 EXETER ROAD LEBANON, CONNECTICUT 06249
PARCEL ID:	MAP 245 LOT 13
DEED:	VOLUME 137 PAGE 245 - 248
LAND USE ZONE:	RURAL AGRICULTURAL RESIDENCE
AREA PARCEL 1:	1088897.88 SQ. FT. ± OR 25.00 ACRES ±
AREA PARCEL 2:	573790.49 SQ. FT. ± OR 13.17 ACRES ±
FLOOD ZONE:	ZONE X PER FIRM MAP COMMUNITY PANEL #09011C0038G DATED JULY 18, 2011 (SEE NOTE #7)

Reference Maps

1. "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF LEBANON EXETER ROAD FROM THE COLCHESTER ROAD EASTERLY TO LEBANON CENTER ROUTE 207" PREPARED BY THE CONNECTICUT STATE HIGHWAY DEPARTMENT DATED DECEMBER 31, 1938 SCALE 1"=40' DRAWING 70-06 SHEETS 2-4 OF 6
2. "PROPERTY MAP LAND NOW OR FORMERLY OF HAROLD N. GEER & NORMA H. GEER TO BE COMBINED WITH LAND NOW OR FORMERLY OF THE TOWN OF LEBANON ROUTE 207 LEBANON CONNECTICUT" PREPARED BY DECARLO & DOLL INC. DATED MARCH 13, 1989 REVISED THRU SEPTEMBER 19, 1989 SCALE - VARIOUS TOWN CLERK MAPS #992A, #992B, #992C, #992D & #992E
3. "BOUNDARY LINE RECONFIGURATION PLAN #903 EXETER ROAD PREPARED FOR EDWARD D. KEFFE LEBANON, CONNECTICUT" PREPARED BY MEGSON, HEAGLE & FRIEND DATED AUGUST 20, 2014 SCALE 1"=40' TOWN CLERK MAP #1652
4. "SITE PLAN & NOTES LEBANON CENTER CT 917 EXETER ROAD LEBANON, CT 06249" PREPARED BY ALL POINTS TECHNOLOGY CORPORATION DATED JANUARY 26, 2017 SCALE 1"=60'

(Overview)
Scale: 1"=100'

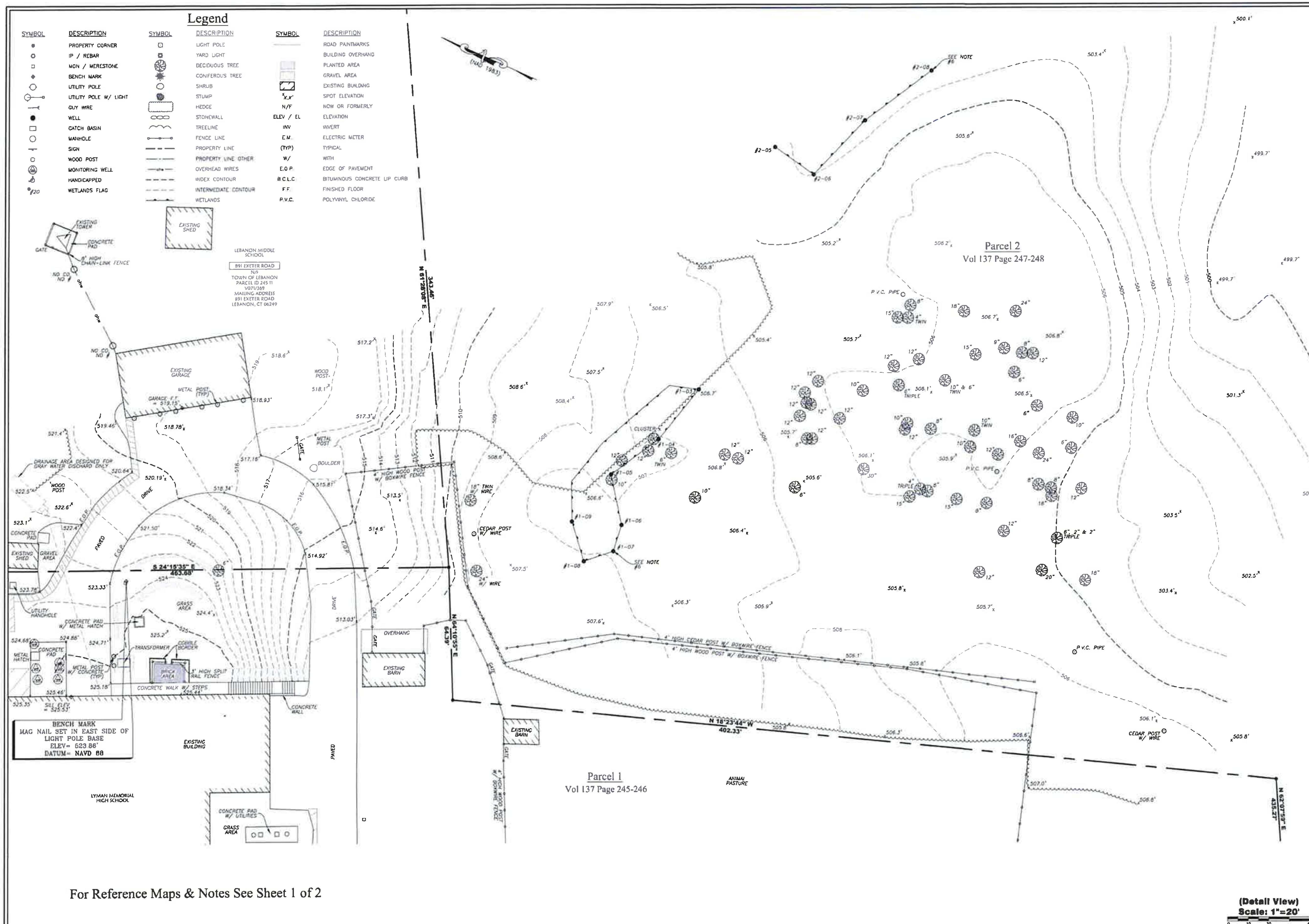
GESICK & ASSOCIATES, P.C.
SURVEYORS | MAPPERS | PLANNERS
19 CEDAR ISLAND AVE.
CLINTON, CONNECTICUT 06413
OFFICE: 860-669-7799 FAX: 860-669-5833
www.gesicksurveyors.com

(Overview)

Topographic Survey
(Partial)
of
917 Exeter Road (aka Route #207)
Lebanon, Connecticut
Prepared for
All-Points Technology Corporation, P.C.

Revisions
8/29/2017 - Wetlands Updated
12/18/2018 - Per Attorney Comments

Date: August 26, 2017
Drawing: 17-1224
Drawn: P.H.
Sheet: 1 OF 2



For Reference Maps & Notes See Sheet 1 of 2

Topographic Survey

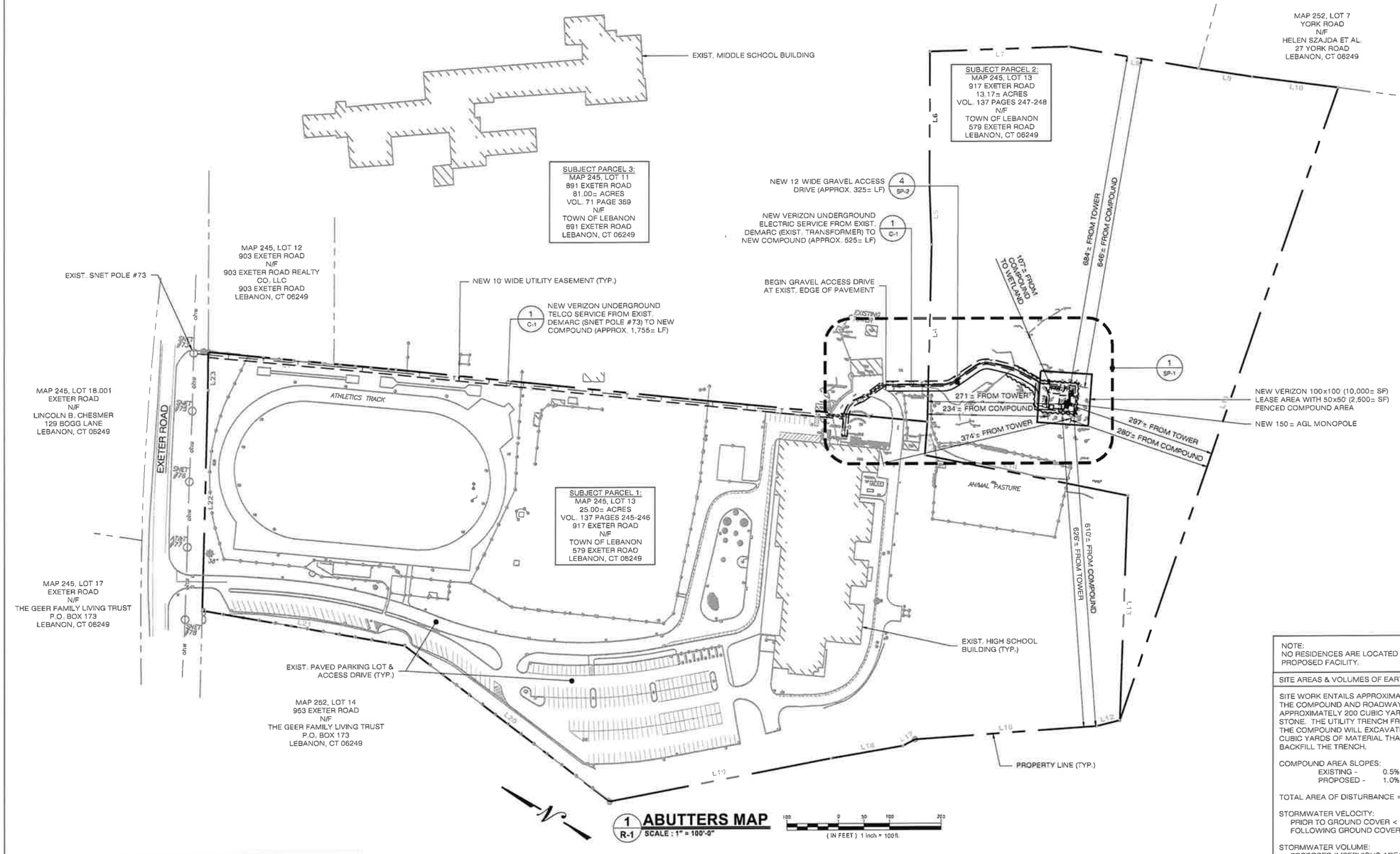
(Partial) of 917 Exeter Road (aka Route #207) Lebanon, Connecticut

Prepared for All-Points Technology Corporation, P.C.

GESICK & ASSOCIATES, P.C.
SURVEYORS | MAPPERS | PLANNERS
19 CEDAR ISLAND AVE.
CLINTON, CONNECTICUT 06413
OFFICE: 860-669-7799 FAX: 860-669-5833
www.gesicksurveyors.com

Revisions
8/29/2017 - Wetlands Updated
12/19/2010 - Per Attorney Comments

Date: August 28, 2017
Drawing: 17 1224
Drawn: P.H.
Sheet: 2 OF 2



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

1. "TOPOGRAPHIC SURVEY (PARTIAL) OF 917 EXETER ROAD (AKA ROUTE #207), LEBANON, CONNECTICUT, PREPARED FOR ALL-POINTS TECHNOLOGY CORPORATION, P.C.", PREPARED BY GESICK & ASSOCIATES, P.C., SURVEYORS|MAPPERS|PLANNERS|, 19 CEDAR ISLAND AVE., CLINTON, CONNECTICUT 06413, OFFICE: (860) 669-7799 FAX: (860) 669-5833, WWW.GESICKSURVEYORS.COM.
2. BASE MAPPING SUPPLEMENTED W/ FIELD MEASUREMENTS TAKEN BY ALL-POINTS TECHNOLOGY CORP. ON 04-21-2017.

NOTE:
NO RESIDENCES ARE LOCATED WITHIN 1,000' OF PROPOSED FACILITY.

SITE AREAS & VOLUMES OF EARTHWORK

SITE WORK ENTAILS APPROXIMATELY 60 CY OF FILL. THE COMPOUND AND ROADWAY WILL IMPORT APPROXIMATELY 200 CUBIC YARDS OF CLEAN BROKEN STONE. THE UTILITY TRENCH FROM THE DEMARC TO THE COMPOUND WILL EXCAVATE APPROXIMATELY 590 CUBIC YARDS OF MATERIAL THAT WILL BE USED TO BACKFILL THE TRENCH.

COMPOUND AREA SLOPES:
EXISTING - 0.5%-3%
PROPOSED - 1.0%

TOTAL AREA OF DISTURBANCE = 17,650± SF

STORMWATER VELOCITY:
PRIOR TO GROUND COVER < 3.0 FT/SEC
FOLLOWING GROUND COVER < 3.0 FT/SEC

STORMWATER VOLUME:
PROPOSED IMPERVIOUS AREA = 7,380 SF
WATER QUALITY STD VOLUME (1") = 615 CF
STORAGE VOLUME (6" DEPTH, 40% VOIDS) = 500 CF

GROUND COVER TO BE ESTABLISHED AS FOLLOWS (U.O.N):
- WHITE CLOVER @ 0.20#/- SF
- TALL FESCUE @ 0.45#/- SF
- RYEGRASS @ 0.10#/- SF

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME:
LEBANON CENTER CT

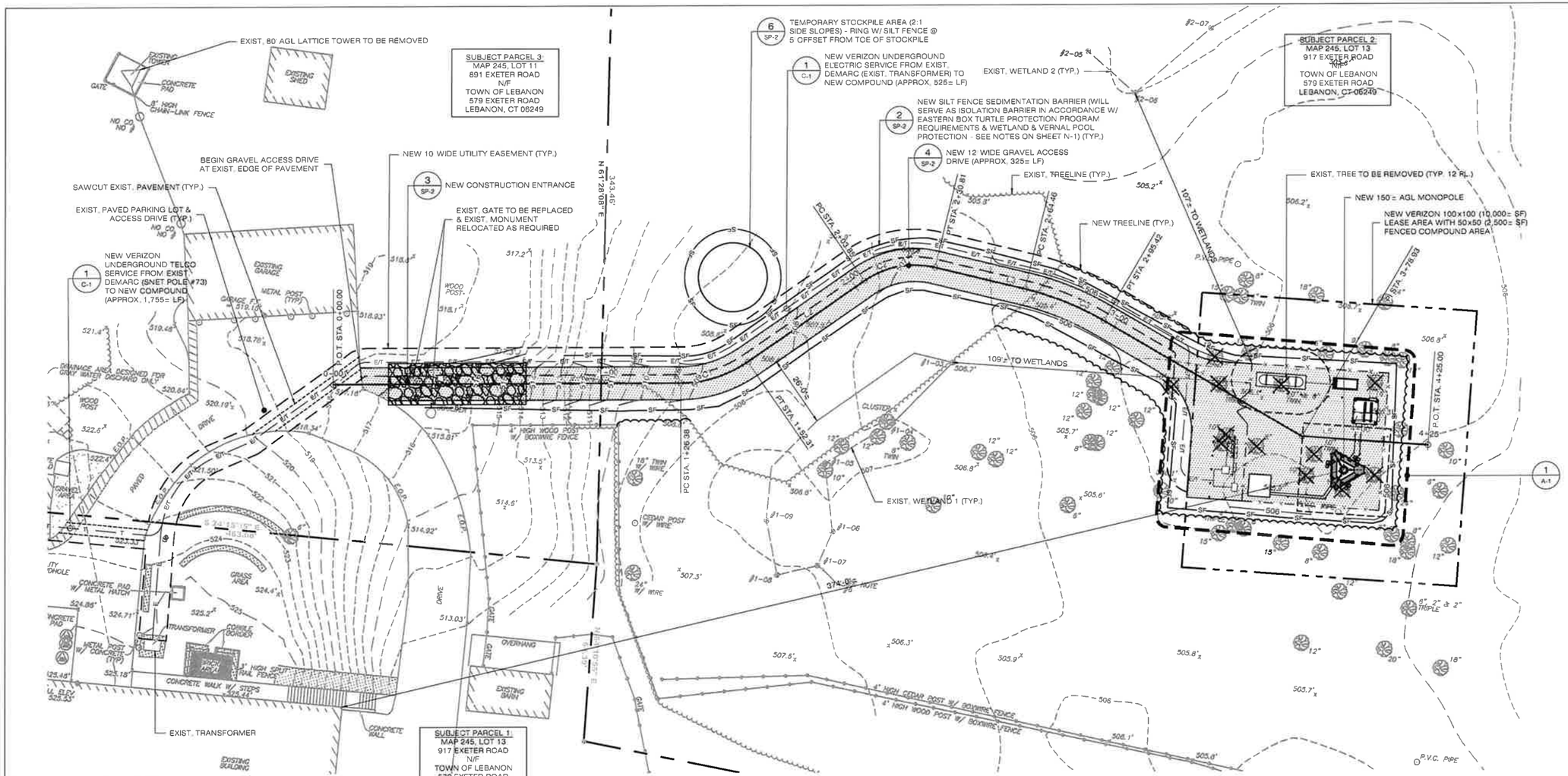
SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH
DATE: 12/18/19
CHECKED BY: RCB

SHEET TITLE:
ABUTTERS MAP

SHEET NUMBER:
R-1



ACCESS DRIVE					
NO.	BEARING	DELTA(Δ)	LENGTH	TANGENT	RADIUS
L1	S29°58'14.72"E		126.38'		
C1		34°32'41"	25.93'	13.37'	43.0'
L2	S64°30'55.55"E		51.55'		
C2		48°15'42"	26.95'	14.33'	32.0'
L3	S16°15'14.02"E		33.55'		
C3		16°44'22"	30.97'	15.60'	106.0'
L4	S0°29'07.67"W		83.50'		
L5	S25°44'17.30"E		46.07'		

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

1. "TOPOGRAPHIC SURVEY (PARTIAL) OF 917 EXETER ROAD (AKA ROUTE #207), LEBANON, CONNECTICUT, PREPARED FOR ALL-POINTS TECHNOLOGY CORPORATION, P.C.", PREPARED BY GESICK & ASSOCIATES, P.C., SURVEYORS|MAPPERS|PLANNERS|, 19 CEDAR ISLAND AVE., CLINTON, CONNECTICUT 06413, OFFICE: (860) 669-7799 FAX: (860) 669-5833, WWW.GESICKSURVEYORS.COM.
2. BASE MAPPING SUPPLEMENTED W/ FIELD MEASUREMENTS TAKEN BY ALL-POINTS TECHNOLOGY CORP. ON 04-21-2017.

1 SP-1 PARTIAL SITE PLAN

SCALE : 1" = 20'-0"

20 0 10 20 40
(IN FEET) 1 inch = 20 ft.

NOTE: 12 TREES WILL BE REMOVED IN CONSTRUCTING THE FACILITY

ENGINEERING ANALYSIS AND CERTIFICATION

IN ACCORDANCE WITH THE 2016 CONNECTICUT STATE BUILDING CODE AND THE ELECTRONIC INDUSTRIES ASSOCIATION STANDARD EIA/TIA-222-G 'STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORT STRUCTURES' FOR NEW LONDON COUNTY, THE TOWER WOULD BE DESIGNED TO WITHSTAND PRESSURES EQUIVALENT TO A MAXIMUM 143 MPH ULTIMATE BASIC WIND SPEED EQUIVALENT TO 110 MPH NOMINAL BASIC WIND SPEED. THE FOUNDATION DESIGN WOULD BE BASED ON SOIL CONDITIONS AT THE SITE.

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME: LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

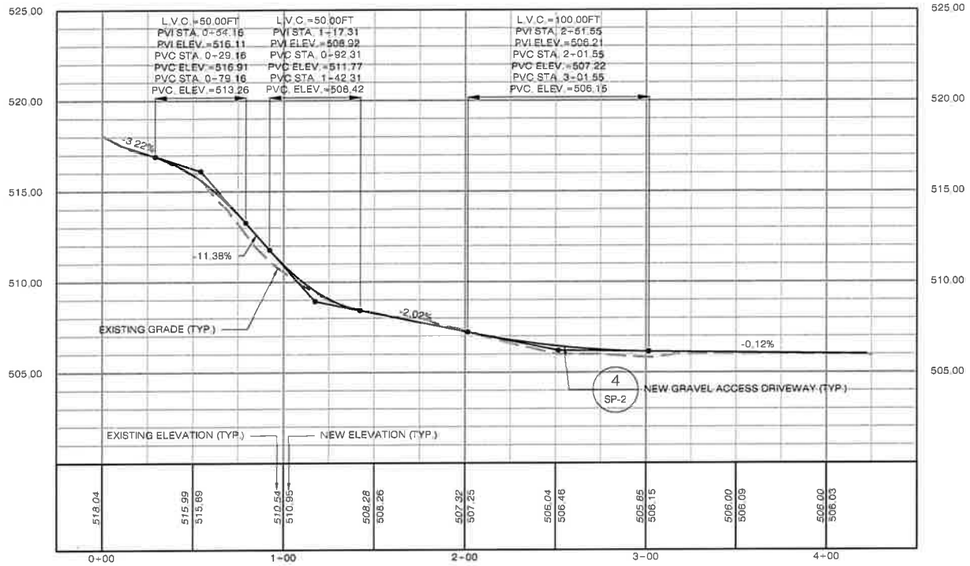
DRAWN BY: CSH
DATE: 12/18/19
CHECKED BY: RCB

SHEET TITLE:

PARTIAL SITE PLAN

SHEET NUMBER:

SP-1



NEW GRAVEL ACCESS DRIVEWAY PROFILE

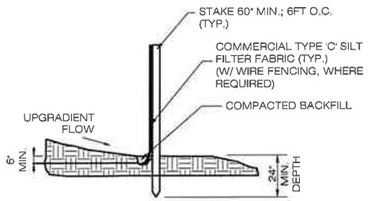
1 SP-2 SCALE : 1" = 40'-0" HORIZONTAL
1" = 4'-0" VERTICAL

CONSTRUCTION SEQUENCING

CONTRACTOR TO FOLLOW THE FOLLOWING CONSTRUCTION PHASING AS CLOSELY AS POSSIBLE:

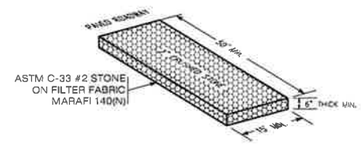
1. MOBILIZATION: BRING MATERIAL AND EQUIPMENT TO SITE. ALL CONSTRUCTION TRAFFIC AND ACTIVITIES MUST RESIDE INSIDE ACCESS PATH DELINEATED, WITHIN STAGING AND STOCKPILE AREA, OR WITHIN AREA WHERE NEW WORK IS BEING COMPLETED. THE CONTRACTOR IS TO PROTECT WETLANDS FROM DISTURBANCE AT ALL TIMES AND NO CONSTRUCTION ACTIVITIES OR DUMPING SHALL OCCUR IN THE WETLANDS. HOURS OF CONSTRUCTION ARE 8 AM - 5 PM, MONDAY - SATURDAY.
2. THE CONTRACTOR SHALL HOST AND ATTEND AN ENVIRONMENTAL EDUCATION SESSION AT THE PRE-CONSTRUCTION MEETING (SEE NOTES ON DRAWING N-1).
3. INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROL AND ISOLATION BARRIERS.
4. INSTALL CONSTRUCTION ENTRANCE.
5. CLEAR AND ROUGH GRADE ACCESS ROAD TO THE NEW EQUIPMENT COMPOUND.
6. CONSTRUCT NEW UTILITY TRENCH & SET CONDUITS & BACKFILL.
7. ROUGH GRADE COMPOUND AREA.
8. EXCAVATE FOR TOWER FOUNDATION & CONCRETE EQUIPMENT PADS AS REQUIRED.
9. FINALIZE ACCESS ROAD GRADES AND INSTALL WEARING COURSE.
10. PREPARE SUBGRADE AND INSTALL FORMS, STEEL REINFORCING, AND CONCRETE FOR TOWER FOUNDATION & EQUIPMENT PADS AS REQUIRED.
11. INSTALL BURIED GROUND RINGS, GROUND RODS, GROUND LEADS, UTILITY CONDUITS, AND UTILITY EQUIPMENT.
12. BACKFILL TOWER FOUNDATION & EQUIPMENT PADS.
13. ERECT MONOPOLE.
14. INSTALL TELECOMMUNICATIONS EQUIPMENT ON TOWER AND IN COMPOUND.
15. INSTALL COMPOUND GRAVEL SURFACES.
16. INSTALL FENCING.
17. CONNECT GROUNDING LEADS AND LIGHTENING PROTECTION.
18. FINAL GRADE AROUND COMPOUND.
19. LOAM AND SEED DISTURBED AREAS OUTSIDE COMPOUND, AS REQUIRED.
20. REMOVE TEMPORARY EROSION & SEDIMENTATION CONTROL BARRIER AFTER SEEDED AREAS HAVE ESTABLISHED VEGETATION.
21. FINAL CLEANUP AND EQUIPMENT TESTING.

THE ESTIMATED TIME FOR COMPLETION OF THE WORK IS APPROXIMATELY TWELVE (12) WEEKS. THE EXACT PROCESS MAY VARY DEPENDING ON THE CONTRACTORS AND SUBCONTRACTORS AVAILABILITY TO COMPLETE WORK AND WEATHER DELAYS.



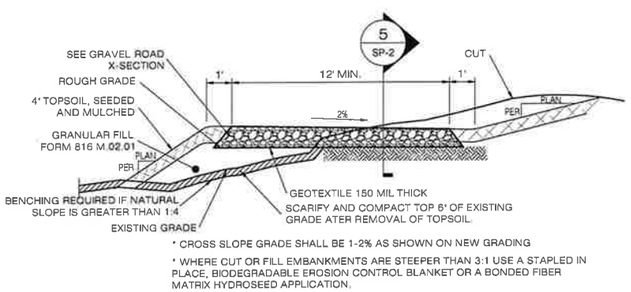
GEOTEXTILE SILT FENCE DETAIL

2 SP-2 SCALE : NTS



(CE) CONSTRUCTION ENTRANCE DETAIL

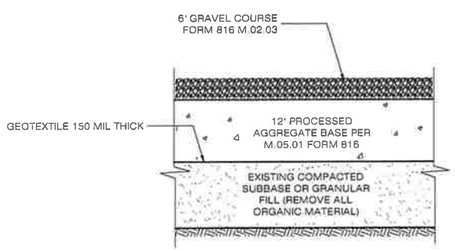
3 SP-2 SCALE : NTS



* CROSS SLOPE GRADE SHALL BE 1-2% AS SHOWN ON NEW GRADING
* WHERE CUT OR FILL EMBANKMENTS ARE STEEPER THAN 3:1 USE A STAPLED IN PLACE, BIODEGRADABLE EROSION CONTROL BLANKET OR A BONDED FIBER MATRIX HYDROSEED APPLICATION.

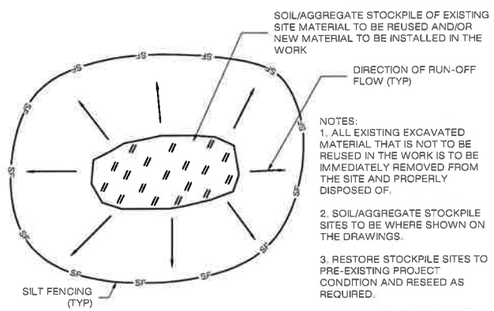
TYPICAL ROAD CROSS SECTION

4 SP-2 SCALE : NTS



GRAVEL ROAD SECTION

5 SP-2 SCALE : NTS



NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.
3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.
4. STOCKPILE HEIGHTS MUST NOT EXCEED 35. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

TEMPORARY STOCKPILE DETAIL

6 SP-2 SCALE : N.T.S.

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

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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME: LEBANON CENTER CT

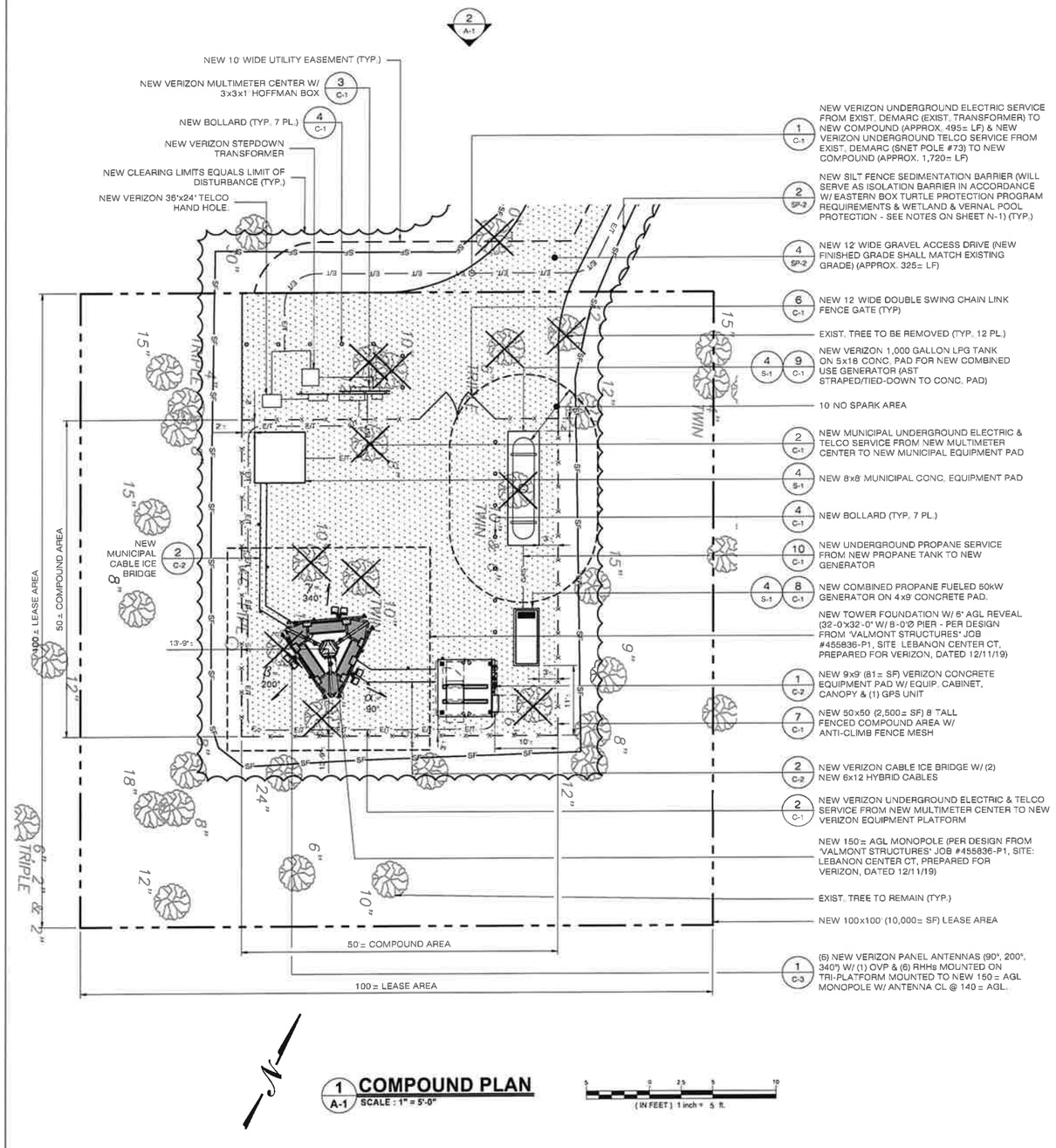
SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH
DATE: 12/18/19
CHECKED BY: RCB

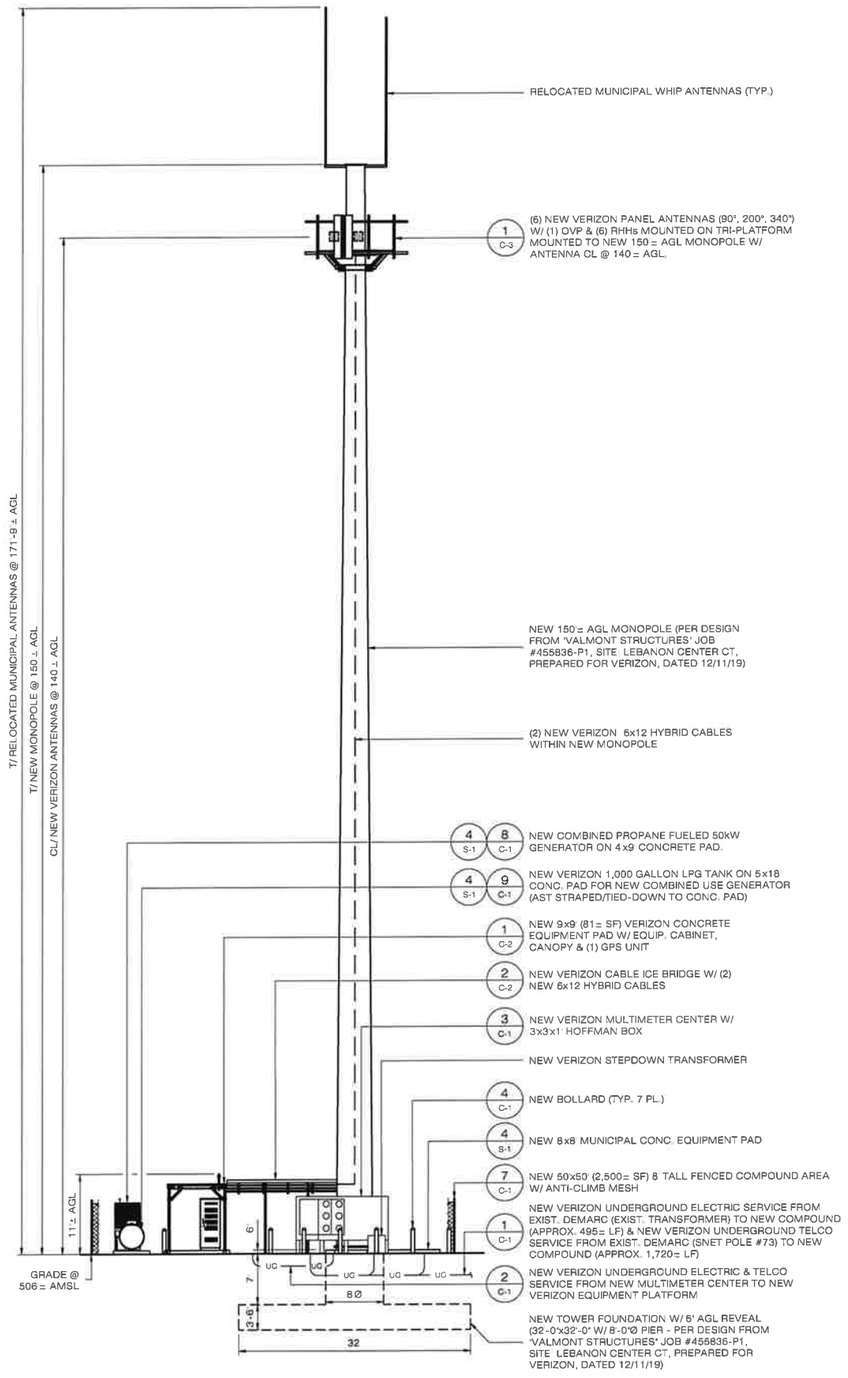
SHEET TITLE:
DRIVEWAY PROFILE, CONST. SEQUENCE & DETAILS

SHEET NUMBER:
SP-2



1 A-1 **COMPOUND PLAN**
SCALE : 1" = 5'-0"

5 0 2.5 5 10
(IN FEET) 1 inch = 5 ft.



2 A-1 **NORTH ELEVATION**
SCALE : 1" = 10'-0"

10 0 5 10 20
(IN FEET) 1 inch = 10 ft.

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME:
LEBANON CENTER CT

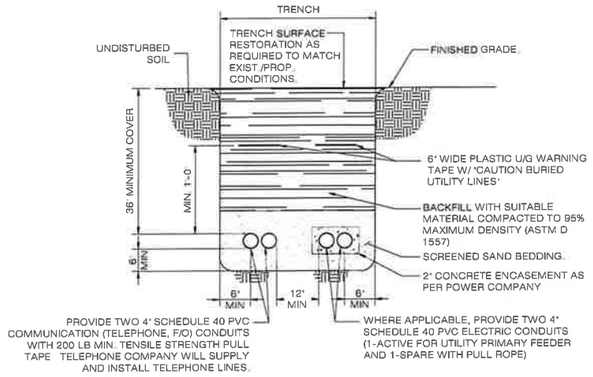
SITE ADDRESS: 917 EXETER ROAD
LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH
DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:
COMPOUND PLAN & TOWER ELEVATION

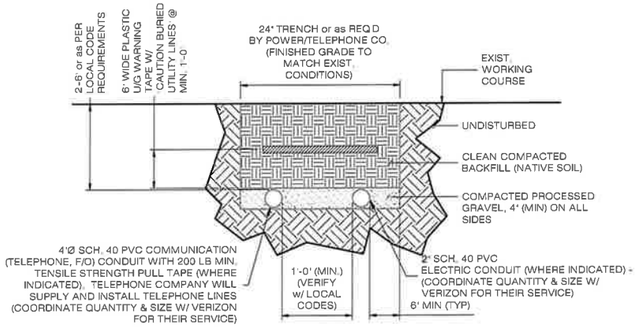
SHEET NUMBER:
A-1



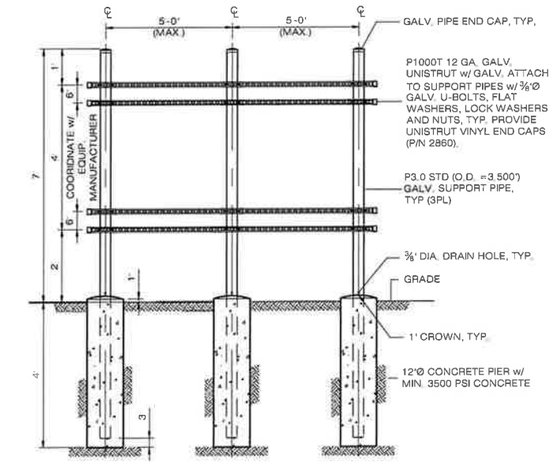
NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIES OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED.
2. CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. EXISTING PAVEMENT SHALL BE SAW-CUT PRIOR TO TRENCH EXCAVATION

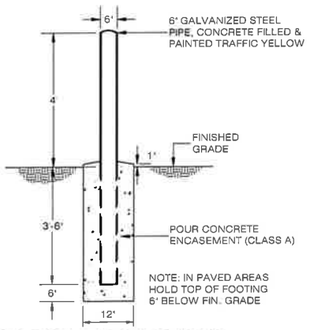
1 C-1 PRIMARY UTILITY TRENCH
SCALE : N.T.S.



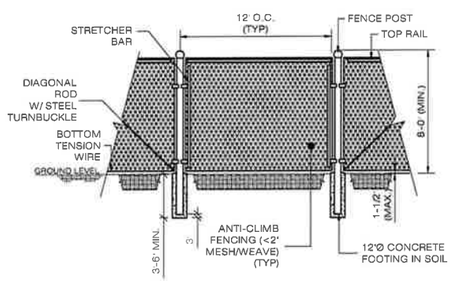
2 C-1 SECONDARY TRENCH DETAIL
SCALE : N.T.S.



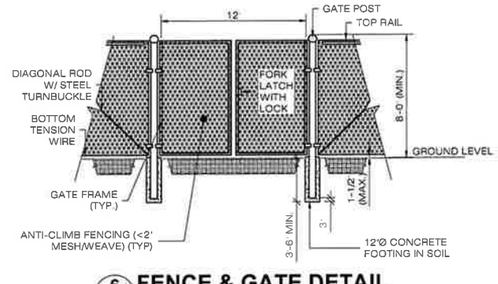
3 C-1 UTILITY BACKBOARD DETAIL
SCALE : NTS



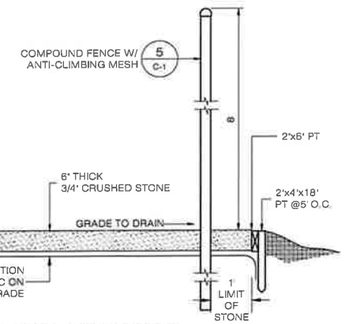
4 C-1 BOLLARD DETAIL
SCALE : NTS



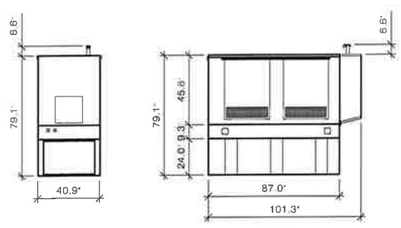
5 C-1 CHAIN-LINK FENCING DETAIL
SCALE : NTS



6 C-1 FENCE & GATE DETAIL
SCALE : N.T.S.

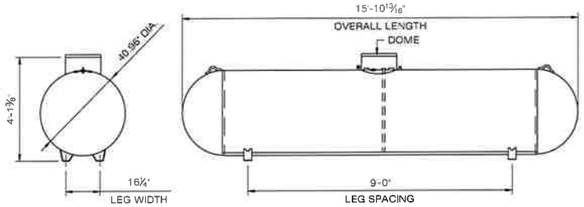


7 C-1 COMPOUND DETAIL
SCALE : NTS



KOHLER CO. POWER SYSTEMS
50kW PROPANE-POWERED GENERATOR
MODEL #KG50 W/ SOUND ENCLOSURE

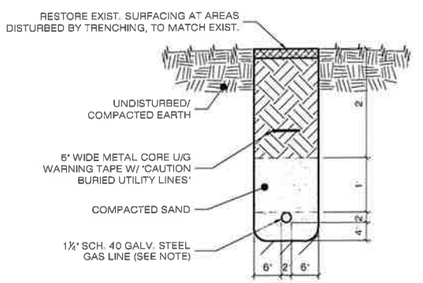
8 C-1 GENERATOR SCHEMATICS
SCALE : 1/4" = 1'-0"



1. 1,000 USWG AMSE VIII, DIV. 1 ABOVE GROUND LPG TANK AS MANUFACTURED BY TRINITY CONTAINERS, LLC -
   - WWW.TRINITYCONTAINERS.COM
   - PH: 1-866-558-8265
   - WEIGHT (EMPTY) = 1,729 lbs
   - COLOR: WHITE
2. LPG TANK TO BE BOLTED TO CONCRETE SLAB PER SUPPLIERS REQUIREMENTS.

NOTE
PROVIDE TANK MANUFACTURER SHOP DRAWING FOR REVIEW BY ENGINEER OF RECORD PRIOR TO PURCHASE

9 C-1 ABOVE GROUND PROPANE TANK DETAIL
SCALE : N.T.S.



NOTE
STEEL PIPE SHALL COMPLY WITH NFPA 54 CHAPTER 5 FOR DESIGN, MATERIALS & COMPONENTS, BE SUITABLE FOR DIRECT BURIAL & WITH AN ELECTRICALLY INSULATING & CORROSION RESISTANT MATERIAL ON ALL EXPOSED SURFACES APPLIED PER COATING MANUFACTURERS INSTRUCTION.

PIPE SIZING SHALL COMPLY WITH NFPA 54 CHAPTER 6 OR AS OTHERWISE NOTED.

PIPING INSTALLATION SHALL COMPLY WITH NFPA 54 CHAPTER 7 OR AS OTHERWISE NOTED AND SHALL HAVE A CATHODIC PROTECTION SYSTEM INSTALLED.

10 C-1 PROPANE GAS TRENCH
SCALE : N.T.S.

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

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE: (860)-663-1897
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME:
LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH

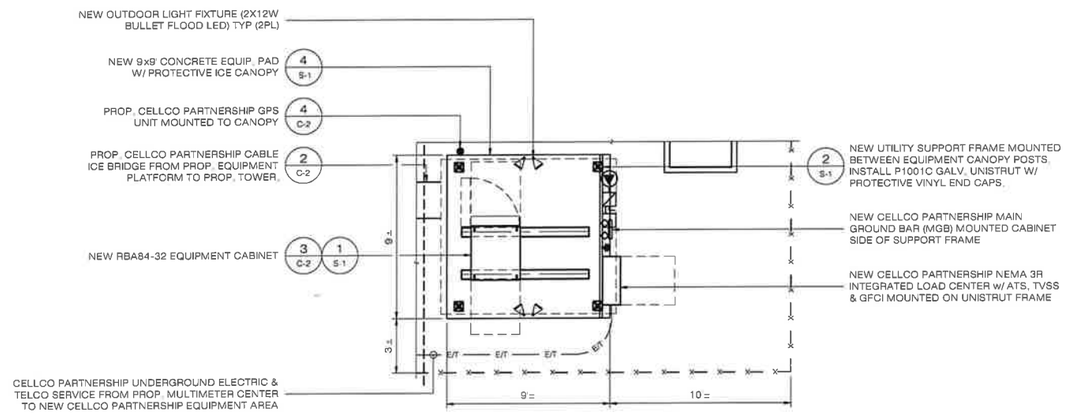
DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:

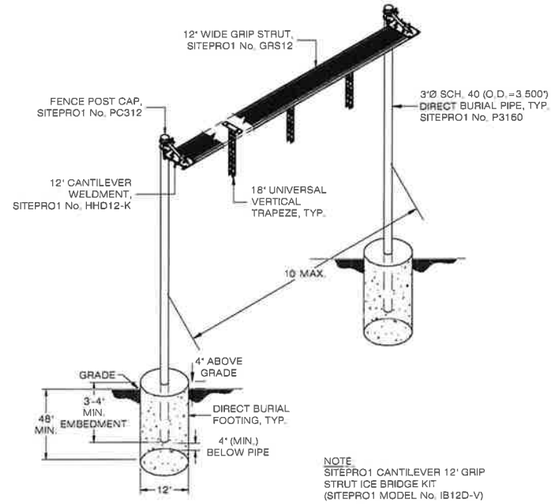
SITE DETAILS

SHEET NUMBER:

C-1

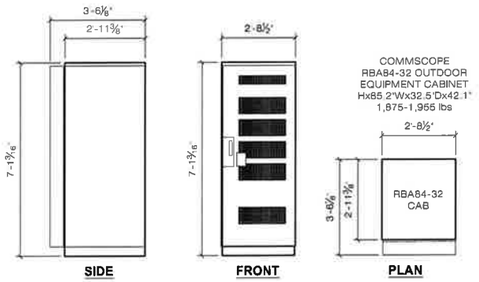


1 C-2 ENLARGED EQUIPMENT PLAN
SCALE : 1/4" = 1'-0"

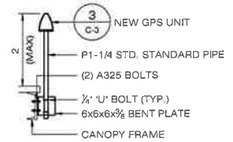


NOTE:
SITEPRO1 CANTILEVER 12' GRIP STRUT ICE BRIDGE KIT (SITEPRO1 MODEL No. IB12D-V)

2 C-2 CABLE BRIDGE & COAX HANGER DETAIL
SCALE : N.T.S.



3 C-2 OUTDOOR RBA84-32 EQUIPMENT CABINET
SCALE : 3/4" = 1'-0"



4 C-2 GPS MOUNT
SCALE : N.T.S.

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME:
LEBANON CENTER CT

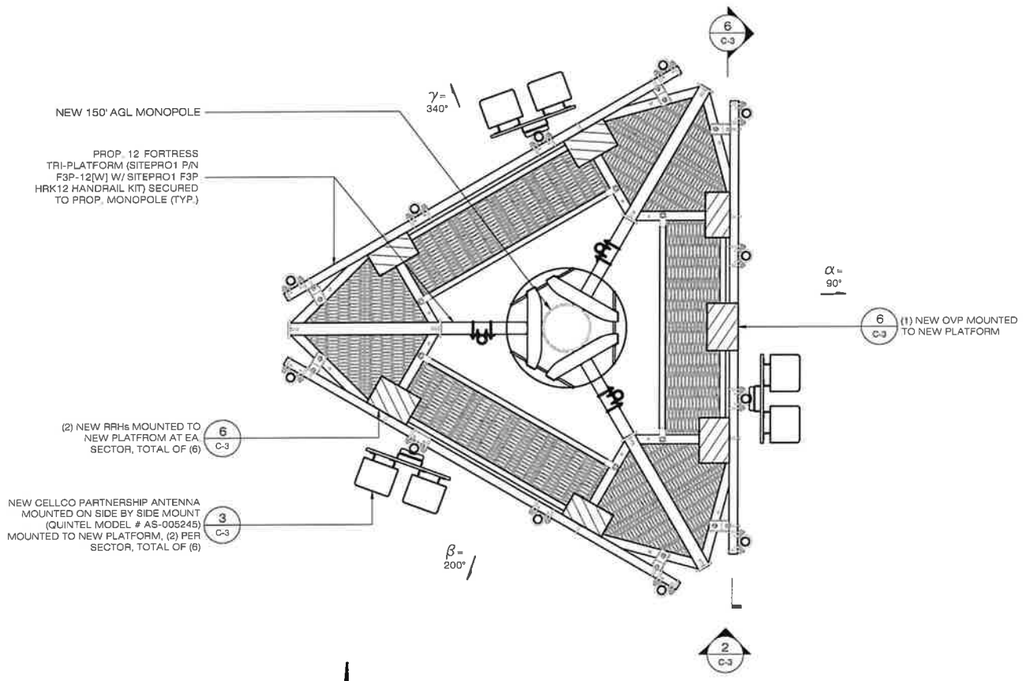
SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

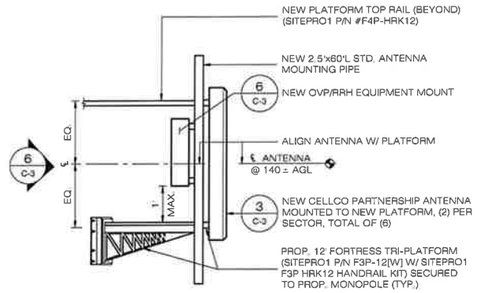
DRAWN BY: CSH
DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:
VERIZON EQUIPMENT PLAN & DETAILS

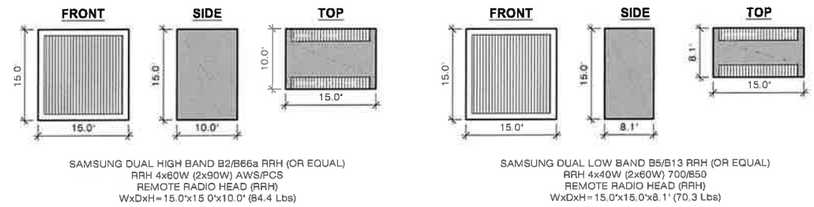
SHEET NUMBER:
C-2



1 C-3 ANTENNA PLAN
SCALE : ½" = 1'-0"

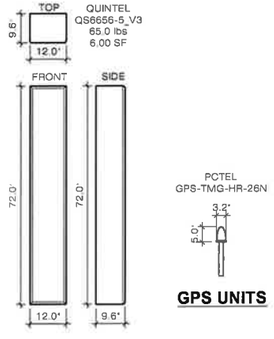


2 C-3 ANTENNA MOUNTING DETAIL
SCALE : N.T.S.



NOTE
1) RRH=REMOTE RADIO HEAD
2) MDB=MAIN DISTRIBUTION BOX

5 C-3 RRH EQUIPMENT
SCALE : 1" = 1'-0"

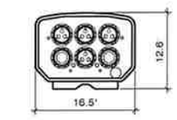


PANEL ANTENNAS

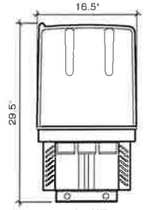
GPS UNITS

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

RAYCAP RxxDC-6627-PF-48
OVER VOLTAGE PROTECTION BOX (OVP)
WxDxH = 16.5'x12.6'x29.5' (32.0 Lbs)
(OR EQUAL)

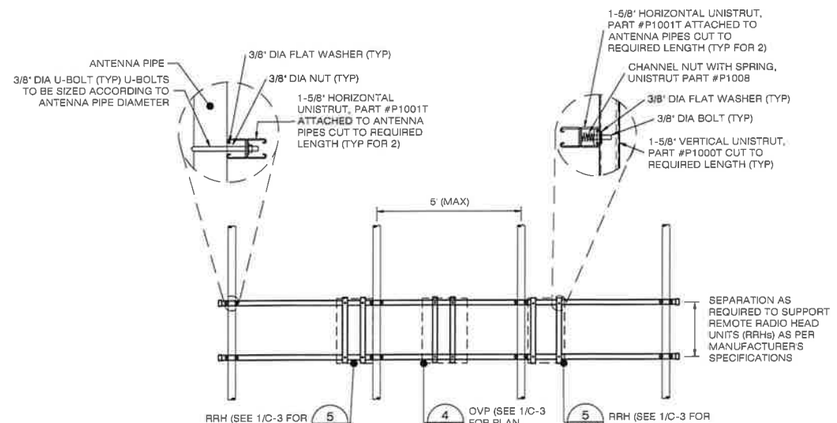


BOTTOM



FRONT

OVER VOLTAGE PROTECTION BOX (OVP)
4 C-3 SCALE : 1" = 1'-0"



NOTES
1. ALL EXPOSED UNISTRUT ENDS TO BE CAPPED WITH UNISTRUT CAP (MODEL #P2860-10)
2. ONLY 1-5/8" UNISTRUT TO BE USED FOR RACK CONSTRUCTION.
3. EXTEND UNISTRUT AS NEEDED BASED ON LENGTH OF ANTENNA SECTOR. DO NOT CANTILEVER UNISTRUT FOR MORE THAN 24" BEYOND ANTENNA MAST.

6 C-3 OVP/RRH EQUIPMENT ANTENNA MOUNT
SCALE : ½" = 1'-0"

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME: LEBANON CENTER CT

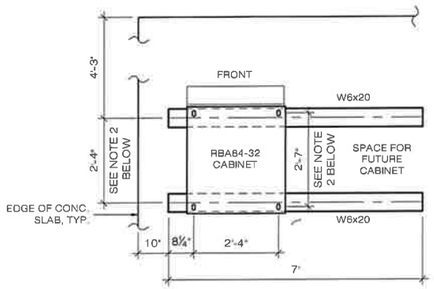
SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH
DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:
VERIZON ANTENNA PLAN & DETAILS

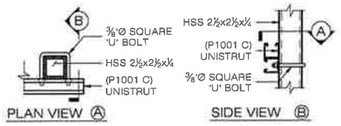
SHEET NUMBER:
C-3



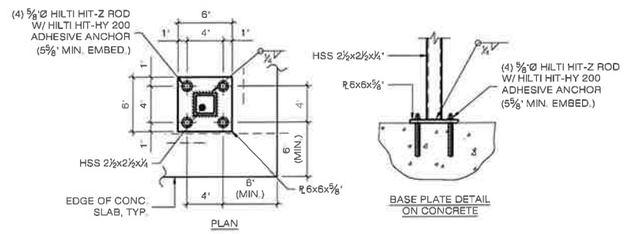
NOTES:
1. FASTEN W BEAMS TO CONCRETE PAD w/ ½"Ø HDG HILTI KWIK BOLT 3 w/ 2" EMBEDMENT @ 24" O.C. MAX, STAGGERED), MIN. 2" FROM W BEAM ENDS
2. COORDINATE W BEAM FLANGE SPACING W/ EQUIPMENT CABINET BOLTING PATTERN. MOUNT EQUIPMENT CABINETS TO DUNNAGE FRAME PER MANUFACTURER'S RECOMMENDATIONS

1 S-1 EQUIPMENT BOLTING PATTERN
SCALE : ½" = 1'-0"

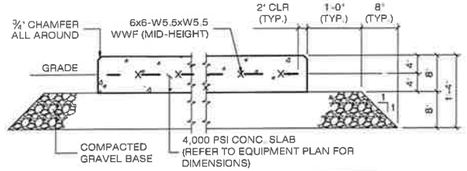
NOTE:
INSTALL PROTECTIVE VINYL END CAPS AT ALL UNISTRUT ENDS.



2 S-1 SUPPORT FRAME CONN. DETAIL
SCALE : 1½" = 1'-0"



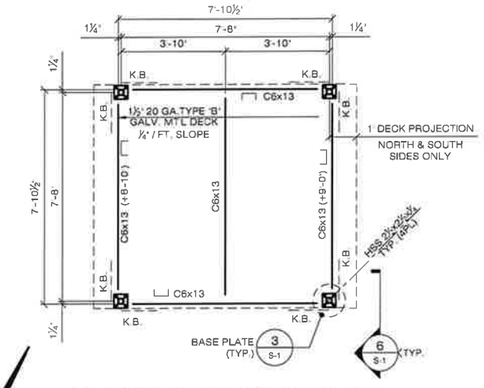
3 S-1 CANOPY POST BASE PLATE
SCALE : 1½" = 1'-0"



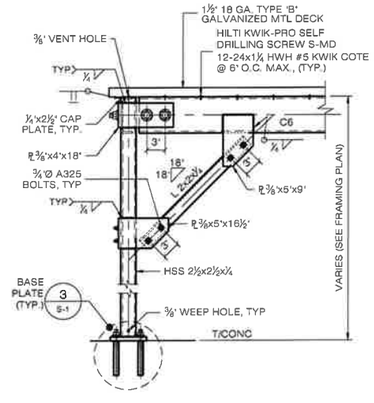
NOTES:
1. CONTRACTOR SHALL COORDINATE ALL SLAB DIMENSIONS & HOLD DOWN REQUIREMENTS W/ EQUIPMENT MANUFACTURER.
2. CONCRETE SLAB DESIGN IS BASED ON A MINIMUM ALLOWABLE SOIL BEARING PRESSURE (q_a) OF 3,000 PSF

4 S-1 CONCRETE PAD DETAIL
SCALE : N.T.S.

NOTE:
ALL EXPOSED STEEL TO BE GALVANIZED.



5 S-1 CANOPY FRAMING PLAN
SCALE : ⅜" = 1'-0"



6 S-1 CANOPY SUPPORT
SCALE : 1" = 1'-0"

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME: LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH
DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:
STRUCTURAL LAYOUT & DETAILS

SHEET NUMBER:
S-1

ENVIRONMENTAL NOTES

EASTERN BOX TURTLE PROTECTION PROGRAM

EASTERN BOX TURTLE, A STATE SPECIAL CONCERN SPECIES AFFORDED PROTECTION UNDER THE CONNECTICUT ENDANGERED SPECIES ACT, IS KNOWN TO OCCUR WITHIN THE VICINITY OF THE SITE. THE FOLLOWING RARE SPECIES PROTECTIVE MEASURES SATISFY REQUIREMENTS FROM THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION ("DEEP") WILDLIFE DIVISION IN ACCORDANCE WITH THEIR LETTER DATED NOVEMBER 8, 2017.

IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THE REQUIREMENT FOR IMPLEMENTATION OF THESE PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE. THIS PROTECTION PLAN SHALL BE IMPLEMENTED IF WORK WILL OCCUR DURING THE TURTLES ACTIVE PERIOD (APRIL 1ST TO OCTOBER 30TH). ALL-POINTS TECHNOLOGY CORPORATION, P.C. ("APT") WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT THESE PROTECTION MEASURES ARE IMPLEMENTED PROPERLY AND WILL PROVIDE AN EDUCATION SESSION ON RARE SPECIES THAT MAY BE ENCOUNTERED AND THE PROJECTS PROXIMITY TO SENSITIVE HABITAT PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR ENVIRONMENTAL SCIENTIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 663-1697 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THE PROPOSED PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS: EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PROTECTIVE MEASURES; PERIODIC INSPECTION OF THE CONSTRUCTION PROJECT; AND, REPORTING.

1. ISOLATION MEASURES & SEDIMENTATION AND EROSION CONTROLS

   A. PLASTIC NETTING USED IN A VARIETY OF EROSION CONTROL PRODUCTS (I.E., EROSION CONTROL BLANKETS, FIBER ROLLS (WATTLES), REINFORCED SILT FENCE) HAS BEEN FOUND TO ENTANGLE WILDLIFE, INCLUDING REPTILES, AMPHIBIANS, BIRDS AND SMALL MAMMALS, BUT PARTICULARLY SNAKES. NO PERMANENT EROSION CONTROL PRODUCTS OR REINFORCED SILT FENCE WILL BE USED ON THE VERIZON WIRELESS PROJECT. TEMPORARY EROSION CONTROL PRODUCTS WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NETLESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.

   B. INSTALLATION OF SEDIMENTATION AND EROSION CONTROLS, REQUIRED FOR EROSION CONTROL COMPLIANCE AND CREATION OF A BARRIER TO POSSIBLE MIGRATING/DISPERSING TURTLES, SHALL BE PERFORMED BY THE CONTRACTOR FOLLOWING CLEARING ACTIVITIES AND PRIOR TO ANY EARTHWORK. THE ENVIRONMENTAL MONITOR WILL INSPECT THE WORK ZONE AREA PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION TO ENSURE THE AREA IS FREE OF EASTERN BOX TURTLE AND DOCUMENT BARRIERS HAVE BEEN SATISFACTORILY INSTALLED. THE INTENT OF THE BARRIER IS TO SEGREGATE THE MAJORITY OF THE WORK ZONE AND ISOLATE IT FROM FORAGING/MIGRATING/DISPERSING TURTLES, SNAKES AND OTHER HERPETOFAUNA. OFTENTIMES COMPLETE ISOLATION OF A WORK ZONE IS NOT FEASIBLE DUE TO ACCESSIBILITY NEEDS AND LOCATIONS OF STAGING/MATERIAL STORAGE AREAS, ETC. ALTHOUGH THE BARRIERS MAY NOT COMPLETELY ISOLATE THE WORK ZONE, THEY WILL BE POSITIONED TO DEFLECT MIGRATING/DISPERSAL ROUTES AWAY FROM THE WORK ZONE TO MINIMIZE POTENTIAL ENCOUNTERS WITH TURTLES, SNAKES AND OTHER HERPETOFAUNA.

   C. THE CONTRACTOR IS RESPONSIBLE FOR DAILY INSPECTIONS OF THE SEDIMENTATION AND EROSION CONTROLS FOR TEARS OR BREECHES AND ACCUMULATION LEVELS OF SEDIMENT, PARTICULARLY FOLLOWING STORM EVENTS THAT GENERATE A DISCHARGE. APT WILL PROVIDE PERIODIC INSPECTIONS OF THE SEDIMENTATION AND EROSION CONTROLS THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES ONLY AS IT PERTAINS TO PROTECTION OF RARE SPECIES AND NEARBY WETLANDS. THIRD PARTY MONITORING OF SEDIMENTATION AND EROSION CONTROLS WILL BE PERFORMED BY OTHER PARTIES, AS NECESSARY, UNDER APPLICABLE LOCAL, STATE AND/OR FEDERAL REGULATIONS.

   D. THE EXTENT OF THE SEDIMENTATION AND EROSION CONTROLS WILL BE AS SHOWN ON THE SITE PLANS. THE CONTRACTOR SHALL HAVE ADDITIONAL SEDIMENTATION AND EROSION CONTROLS STOCKPILED ON SITE SHOULD FIELD OR CONSTRUCTION CONDITIONS WARRANT EXTENDING THE CONTROLS AS DIRECTED BY APT.

   E. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS SHALL BE STORED OUTSIDE OF THE SEDIMENTATION AND EROSION CONTROLS WITHIN 100 FEET OF WETLANDS OR WATERCOURSES.

   F. ALL SEDIMENTATION AND EROSION CONTROLS SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED.

2. CONTRACTOR EDUCATION

   A. PRIOR TO WORK ON SITE, THE CONTRACTOR SHALL ATTEND AN EDUCATIONAL SESSION AT THE PRE-CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF AN INTRODUCTORY MEETING WITH APT PROVIDING PHOTOS OF EASTERN BOX TURTLE EMPHASIZING THE NON-AGGRESSIVE NATURE OF THESE SPECIES, THE ABSENCE OF NEED TO DESTROY ANIMALS THAT MIGHT BE ENCOUNTERED AND THE NEED TO FOLLOW PROTECTIVE MEASURES AS DESCRIBED IN SECTION 4 BELOW. WORKERS WILL ALSO BE PROVIDED INFORMATION REGARDING THE IDENTIFICATION OF OTHER TURTLES, SNAKES AND COMMON HERPETOFAUNA SPECIES THAT COULD BE ENCOUNTERED.

   B. THE EDUCATION SESSION WILL ALSO FOCUS ON MEANS TO DISCRIMINATE BETWEEN THE SPECIES OF CONCERN AND OTHER NATIVE SPECIES TO AVOID UNNECESSARY "FALSE ALARMS". ENCOUNTERS WITH ANY SPECIES OF TURTLES OR SNAKES WILL BE DOCUMENTED.

   C. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH EASTERN BOX TURTLE OR OTHER SPECIES. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.

3. PETROLEUM MATERIALS STORAGE AND SPILL PREVENTION

   A. CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM MATERIALS, REFUEL AND CONTAIN AND PROPERLY CLEAN UP ANY INADVERTENT FUEL OR PETROLEUM (I.E., OIL, HYDRAULIC FLUID, ETC.) SPILL TO AVOID POSSIBLE IMPACT TO NEARBY HABITATS.

   B. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE CONTRACTOR AT THE CONSTRUCTION SITE THROUGHOUT THE DURATION OF THE PROJECT. IN ADDITION, A WASTE DRUM WILL BE KEPT ON SITE TO CONTAIN ANY USED ABSORBENT PADS/MATERIAL FOR PROPER AND TIMELY DISPOSAL OFF SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL LAWS.

   C. THE FOLLOWING PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING RESTRICTIONS AND SPILL RESPONSE PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.

   I. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING

      a. REFUELING OF VEHICLES OR MACHINERY SHALL OCCUR A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES AND SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.

      b. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT ON SITE SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES.

   II. INITIAL SPILL RESPONSE PROCEDURES

      a. STOP OPERATIONS AND SHUT OFF EQUIPMENT.

      b. REMOVE ANY SOURCES OF SPARK OR FLAME.

      c. CONTAIN THE SOURCE OF THE SPILL.

      d. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.

      e. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.

      f. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.

   III. SPILL CLEAN UP & CONTAINMENT

      a. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.

      b. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.

      c. ISOLATE AND ELIMINATE THE SPILL SOURCE.

      d. CONTACT THE APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.

      e. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

   IV. REPORTING

      a. COMPLETE AN INCIDENT REPORT.

      b. SUBMIT A COMPLETED INCIDENT REPORT TO THE APPROPRIATE TOWN OF CROMWELL, CONNECTICUT SITING COUNCIL AND OTHER APPLICABLE LOCAL, STATE AND FEDERAL OFFICIALS.

4. TURTLE PROTECTIVE MEASURES

   A. PRIOR TO THE START OF CONSTRUCTION EACH DAY, THE CONTRACTOR SHALL SEARCH THE ENTIRE WORK AREA FOR TURTLES.

   B. IF A TURTLE IS FOUND, IT SHALL BE IMMEDIATELY MOVED, UNHARMED, BY CAREFULLY GRASPED IN BOTH HANDS, ONE ON EACH SIDE OF THE SHELL, BETWEEN THE TURTLE'S FORELIMBS AND THE HIND LIMBS, AND PLACED JUST OUTSIDE OF THE ISOLATION BARRIER IN THE SAME APPROXIMATE DIRECTION IT WAS WALKING.

   C. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR DURING EARLY MORNING AND EVENING HOURS SO THAT POSSIBLE BASKING OR FORAGING TURTLES ARE NOT HARMED BY CONSTRUCTION ACTIVITIES.

5. HERBICIDE AND PESTICIDE RESTRICTIONS

   A. THE USE OF HERBICIDES AND PESTICIDES AT THE PROPOSED FACILITY SHALL BE AVOIDED WHEN POSSIBLE. IN THE EVENT HERBICIDES AND/OR PESTICIDES ARE REQUIRED AT THE PROPOSED FACILITY, THEIR USE WILL BE USED IN ACCORDANCE WITH INTEGRATED PEST MANAGEMENT ("IPM") PRINCIPLES WITH PARTICULAR ATTENTION TO MINIMIZE APPLICATIONS WITHIN 100 FEET OF WETLAND OR WATERCOURSE RESOURCES. NO APPLICATIONS OF HERBICIDES OR PESTICIDES ARE ALLOWED WITHIN ACTUAL WETLAND OR WATERCOURSE RESOURCES.

6. REPORTING

   A. DAILY COMPLIANCE MONITORING REPORTS (BRIEF NARRATIVE AND APPLICABLE PHOTOS) DOCUMENTING EACH APT INSPECTION WILL BE SUBMITTED BY APT TO VERIZON WIRELESS FOR COMPLIANCE VERIFICATION. ANY OBSERVATIONS OF TURTLES WILL BE INCLUDED IN THE REPORTS.

   B. FOLLOWING COMPLETION OF THE CONSTRUCTION PROJECT, APT WILL PROVIDE A COMPLIANCE MONITORING SUMMARY REPORT TO VERIZON WIRELESS DOCUMENTING IMPLEMENTATION OF THE RARE SPECIES AND WETLAND PROTECTION PROGRAM, MONITORING AND ANY SPECIES OBSERVATIONS. VERIZON WIRELESS WILL PROVIDE A COPY OF THE COMPLIANCE MONITORING SUMMARY REPORT TO THE CONNECTICUT SITING COUNCIL FOR COMPLIANCE VERIFICATION.

   C. ANY OBSERVATIONS OF EASTERN BOX TURTLE WILL BE REPORTED TO CTDEEP BY APT, WITH PHOTO-DOCUMENTATION (IF POSSIBLE) AND WITH SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.

WETLAND AND VERNAL POOL PROTECTION PLAN

AS A RESULT OF THE VERIZON WIRELESS PROJECT'S LOCATION IN THE VICINITY OF SENSITIVE WETLAND RESOURCES AND VERNAL POOL HABITAT, THE FOLLOWING BEST MANAGEMENT PRACTICES ("BMPS") SHALL BE IMPLEMENTED BY THE CONTRACTOR TO AVOID UNINTENTIONAL IMPACTS TO PROXIMATE WETLAND RESOURCES OR MORTALITY TO VERNAL POOL HERPETOFAUNA (I.E., WOOD FROG, SALAMANDERS, TURTLES, ETC.) DURING CONSTRUCTION ACTIVITIES. THE VERNAL POOL SPECIFIC BMPS SHALL BE IMPLEMENTED SHOULD CONSTRUCTION ACTIVITIES OCCUR DURING PEAK AMPHIBIAN MOVEMENT PERIODS (EARLY SPRING BREEDING (MARCH 1ST TO MAY 15TH) AND LATE SUMMER DISPERSAL (JULY 15TH TO SEPTEMBER 15TH)). BMPS ASSOCIATED WITH THE PROTECTION OF WETLANDS WILL BE IMPLEMENTED REGARDLESS OF THE TIME OF YEAR.

IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THE REQUIREMENT FOR THE INSTALLATION OF PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE. ALL POINTS TECHNOLOGY CORPORATION, P.C. ("APT") WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT THESE PROTECTION MEASURES ARE IMPLEMENTED PROPERLY AND WILL PROVIDE AN EDUCATION SESSION ON THE PROJECTS PROXIMITY TO SENSITIVE WETLAND RESOURCES AND ASSOCIATED HERPETOFAUNA PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR ENVIRONMENTAL SCIENTIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE PRE CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT 663-1697 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THE PROPOSED WETLAND AND VERNAL POOL PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS INCLUDING: INSTALLATION OF EROSION CONTROLS; PERIODIC INSPECTION AND MAINTENANCE OF ISOLATION STRUCTURES; HERPETOFAUNA SWEEPS; EDUCATION OF ALL CONTRACTORS AND SUB CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PROTECTIVE MEASURES; AND, REPORTING.

1. SEDIMENTATION AND EROSION CONTROLS

   A. PLASTIC NETTING USED IN A VARIETY OF EROSION CONTROL PRODUCTS (I.E., EROSION CONTROL BLANKETS, FIBER ROLLS [WATTLES], REINFORCED SILT FENCE) HAS BEEN FOUND TO ENTANGLE WILDLIFE, INCLUDING REPTILES, AMPHIBIANS, BIRDS AND SMALL MAMMALS. NO PERMANENT EROSION CONTROL PRODUCTS OR REINFORCED SILT FENCE WILL BE USED ON THE PROJECT. TEMPORARY EROSION CONTROL PRODUCTS THAT WILL BE EXPOSED AT THE GROUND SURFACE AND REPRESENT A POTENTIAL FOR WILDLIFE ENTANGLEMENT WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NETLESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.

   B. INSTALLATION OF EROSION AND SEDIMENTATION CONTROLS, REQUIRED FOR EROSION CONTROL COMPLIANCE AND CREATION OF A BARRIER TOO POSSIBLE MIGRATING/DISPERSING HERPETOFAUNA (ONLY APPLICABLE DURING THE SEASONAL RESTRICTION PERIOD AND WILL BE INSTALLED AT THE DISCRETION OF THE ENVIRONMENTAL MONITOR), SHALL BE PERFORMED BY THE CONTRACTOR IF ANY SOIL DISTURBANCE OCCURS OR HEAVY MACHINERY IS ANTICIPATED TO BE USED ON SLOPES. THE ENVIRONMENTAL MONITOR WILL INSPECT THE WORK ZONE AREA PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION. IN ADDITION, WORK ZONES IN PROXIMITY TO VERNAL POOL RESOURCES WILL BE INSPECTED PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION TO ENSURE THE AREA IS FREE OF HERPETOFAUNA AND SATISFACTORILY INSTALLED. THE INTENT OF THE BARRIER IS TO SEGREGATE THE MAJORITY OF THE WORK ZONE FROM MIGRATING/DISPERSING HERPETOFAUNA. OFTENTIMES COMPLETE ISOLATION OF A WORK ZONE IS NOT FEASIBLE DUE TO ACCESSIBILITY NEEDS AND LOCATIONS OF STAGING/MATERIAL STORAGE AREAS, ETC. IN THOSE CIRCUMSTANCES, THE BARRIERS WILL BE POSITIONED TO DEFLECT MIGRATING/DISPERSAL ROUTES AWAY FROM THE WORK ZONE TO MINIMIZE POTENTIAL ENCOUNTERS WITH HERPETOFAUNA AT THE DISCRETION OF THE ENVIRONMENTAL MONITOR.

   C. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS SHALL BE STORED WITHIN 100 FEET OF WETLAND RESOURCES.

   D. ALL SILT FENCING OR OTHER POTENTIAL BARRIERS TO SAFE HERPETOFAUNA MIGRATION SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED.

2. CONTRACTOR EDUCATION

   A. PRIOR TO WORK ON SITE AND INITIAL DEPLOYMENT/MOBILIZATION OF EQUIPMENT AND MATERIALS, THE CONTRACTOR SHALL ATTEND AN EDUCATIONAL SESSION AT THE PRE CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF INFORMATION SUCH AS, BUT NOT LIMITED TO: IDENTIFICATION OF WETLAND RESOURCES PROXIMATE TO WORK AREAS, REPRESENTATIVE PHOTOGRAPHS OF TYPICAL HERPETOFAUNA THAT MAY BE ENCOUNTERED, CONNECTICUT AND FEDERAL LISTING STATUS OF SPECIES THAT COULD BE ENCOUNTERED, TYPICAL SPECIES BEHAVIOR, AND PROPER PROCEDURES IF SPECIES ARE ENCOUNTERED. THE MEETING WILL FURTHER EMPHASIZE THE NON AGGRESSIVE NATURE OF THESE SPECIES, THE ABSENCE OF NEED TO DESTROY SUCH ANIMALS AND THE NEED TO FOLLOW PROTECTIVE MEASURES AS DESCRIBED IN SECTION 4 BELOW. THE CONTRACTOR WILL DESIGNATE ONE OF ITS WORKERS AS THE "PROJECT MONITOR", WHO WILL RECEIVE MORE INTENSE TRAINING ON THE IDENTIFICATION AND PROTECTION OF HERPETOFAUNA.

   B. THE CONTRACTOR WILL DESIGNATE A MEMBER OF ITS CREW AS THE PROJECT MONITOR TO BE RESPONSIBLE FOR THE PERIODIC "SWEEPS" FOR HERPETOFAUNA WITHIN THE CONSTRUCTION ZONE EACH MORNING AND FOR ANY GROUND DISTURBANCE WORK. THIS INDIVIDUAL WILL RECEIVE MORE INTENSE TRAINING FROM APT ON THE IDENTIFICATION AND PROTECTION OF HERPETOFAUNA IN ORDER TO PERFORM SWEEPS. ANY HERPETOFAUNA DISCOVERED WOULD BE TRANSLOCATED OUTSIDE THE WORK ZONE IN THE GENERAL DIRECTION THE ANIMAL WAS ORIENTED.

   C. THE CONTRACTORS PROJECT MONITOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH HERPETOFAUNA. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.

   D. APT WILL ALSO POST CAUTION SIGNS THROUGHOUT THE PROJECT SITE FOR THE DURATION OF THE CONSTRUCTION PROJECT PROVIDING NOTICE OF THE ENVIRONMENTALLY SENSITIVE NATURE OF THE WORK AREA, THE POTENTIAL FOR ENCOUNTERING VARIOUS AMPHIBIANS AND REPTILES AND PRECAUTIONS TO BE TAKEN TO AVOID INJURY TO OR MORTALITY OF THESE ANIMALS

3. PETROLEUM MATERIALS STORAGE AND SPILL PREVENTION

   A. CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM MATERIALS, REFUEL AND CONTAIN AND PROPERLY CLEAN UP ANY INADVERTENT FUEL OR PETROLEUM (I.E., OIL, HYDRAULIC FLUID, ETC.) SPILL DUE TO THE PROJECTS LOCATION IN PROXIMITY TO WETLAND RESOURCES.

   B. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE CONTRACTOR AT THE CONSTRUCTION SITE THROUGHOUT THE DURATION OF THE PROJECT. IN ADDITION, A WASTE DRUM WILL BE KEPT ON SITE TO CONTAIN ANY USED ABSORBENT PADS/MATERIAL FOR PROPER AND TIMELY DISPOSAL OFF SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL LAWS.

   C. THE FOLLOWING PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING RESTRICTIONS AND SPILL RESPONSE PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.

   I. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING

      a. REFUELING OF VEHICLES OR MACHINERY SHALL OCCUR A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES AND SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.

      b. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT ON SITE SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES.

   II. INITIAL SPILL RESPONSE PROCEDURES

      a. STOP OPERATIONS AND SHUT OFF EQUIPMENT.

      b. REMOVE ANY SOURCES OF SPARK OR FLAME.

      c. CONTAIN THE SOURCE OF THE SPILL.

      d. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.

      e. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.

      f. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.

   III. SPILL CLEAN UP & CONTAINMENT

      a. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.

      b. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.

      c. ISOLATE AND ELIMINATE THE SPILL SOURCE.

      d. CONTACT THE APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.

      e. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

   IV. REPORTING

      a. COMPLETE AN INCIDENT REPORT.

      b. SUBMIT A COMPLETED INCIDENT REPORT TO THE APPROPRIATE TOWN OF CROMWELL, CONNECTICUT SITING COUNCIL AND OTHER APPLICABLE LOCAL, STATE AND FEDERAL OFFICIALS.

4. PROTECTIVE MEASURES

   A. A THOROUGH COVER SEARCH OF THE CONSTRUCTION AREA WILL BE PERFORMED BY APT'S ENVIRONMENTAL MONITOR FOR HERPETOFAUNA PRIOR TO AND FOLLOWING INSTALLATION OF THE SILT FENCING BARRIER TO REMOVE ANY SPECIES FROM THE WORK ZONE PRIOR TO THE INITIATION OF CONSTRUCTION ACTIVITIES. ANY HERPETOFAUNA DISCOVERED WOULD BE TRANSLOCATED OUTSIDE THE WORK ZONE IN THE GENERAL DIRECTION THE ANIMAL WAS ORIENTED. PERIODIC INSPECTIONS WILL BE PERFORMED BY APT'S ENVIRONMENTAL MONITOR THROUGHOUT THE DURATION OF THE CONSTRUCTION.

   B. ANY STORMWATER MANAGEMENT FEATURES, RUTS OR ARTIFICIAL DEPRESSIONS THAT COULD HOLD WATER CREATED INTENTIONALLY OR UNINTENTIONALLY BY SITE CLEARING/CONSTRUCTION ACTIVITIES WILL BE PROPERLY FILLED IN AND PERMANENTLY STABILIZED WITH VEGETATION TO AVOID THE CREATION OF VERNAL POOL "DECOY POOLS" THAT COULD INTERCEPT AMPHIBIANS MOVING TOWARD THE VERNAL POOLS. STORMWATER MANAGEMENT FEATURES SUCH AS LEVEL SPREADERS WILL BE CAREFULLY REVIEWED IN THE FIELD TO ENSURE THAT STANDING WATER DOES NOT ENDURE FOR MORE THAN A 24 HOUR PERIOD TO AVOID CREATION OF DECOY POOLS AND MAY BE SUBJECT TO FIELD DESIGN CHANGES. ANY SUCH PROPOSED DESIGN CHANGES WILL BE REVIEWED BY THE DESIGN ENGINEER TO ENSURE STORMWATER MANAGEMENT FUNCTIONS ARE MAINTAINED.

   C. EROSION CONTROL MEASURES WILL BE REMOVED NO LATER THAN 30 DAYS FOLLOWING FINAL SITE STABILIZATION SO AS NOT TO IMPEDE MIGRATION OF HERPETOFAUNA OR OTHER WILDLIFE.

5. HERBICIDE AND PESTICIDE RESTRICTIONS

   A. CONTRACTORS WILL AVOID THE USE OF HERBICIDES AND PESTICIDES AT THE FACILITY.

6. REPORTING

   A. A COMPLIANCE MONITORING REPORT (BRIEF NARRATIVE AND APPLICABLE PHOTOS) DOCUMENTING EACH OF APT'S INSPECTION WILL BE SUBMITTED TO VERIZON WIRELESS FOR COMPLIANCE VERIFICATION.

   B. FOLLOWING COMPLETION OF THE CONSTRUCTION PROJECT, APT WILL PROVIDE A COMPLIANCE MONITORING SUMMARY REPORT TO VERIZON WIRELESS DOCUMENTING IMPLEMENTATION OF THE WETLAND AND VERNAL POOL PROTECTION PROGRAM AND MONITORING OBSERVATIONS. VERIZON WIRELESS WILL PROVIDE A COPY OF THE COMPLIANCE MONITORING SUMMARY REPORT TO THE CONNECTICUT SITING COUNCIL FOR COMPLIANCE VERIFICATION.

   C. ANY OBSERVATIONS OF RARE SPECIES WILL BE REPORTED TO CTDEEP BY APT, WITH PHOTO DOCUMENTATION (IF POSSIBLE) AND WITH SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.

Cellco Partnership d/b/a
verizon WIRELESS
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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME:
LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH

DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE:
ENVIRONMENTAL NOTES

SHEET NUMBER:
N-1

DESIGN BASIS

GOVERNING CODE & DESIGN STANDARDS
- 2015 IBC/2018 CONNECTICUT STATE BUILDING CODE/ASCE 7-10
- TIA-222-G

DESIGN CRITERIA

RISK CATEGORY/ STRUCT. OCCUPANCY	II	(2015 IBC TABLE 1604.5)

SNOW LOAD

GROUND, P_g	30 PSF	(2018 CSBC APPENDIX N)
MINIMUM FLAT ROOF, $P_{f,min}$	30 PSF	(2018 CSBC SECT. 1608.1.1)

WIND LOADS

ULTIMATE BASIC WIND SPEED, V_{ULT} (3-SECOND GUST)	125 MPH	(2018 CSBC APPENDIX N)
NOMINAL BASIC WIND SPEED, V_{ASD} (3-SECOND GUST)	100-120 MPH	(TIA-222G, ANNEX B)
EXPOSURE CATEGORY	C	(2015 IBC SECT. 1609.4)
WIND IMPORTANCE FACTOR, I_w	1.0	(TIA-222G, TABLE 2-3)

ICE LOADS

ICE THICKNESS, t_i	0.75	(TIA-222G, ANNEX B)
ICE THICKNESS IMPORTANCE FACTOR, I_i	1.0	(TIA-222G, TABLE 2-3)
NOMINAL BASIC WIND SPEED W/ ICE, V_i (3-SECOND GUST)	50 MPH	(TIA-222G, ANNEX B)

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 PROPERLY 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. PROPER 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 PROPERLY 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 PROPERTY.

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.

04 CONCRETE

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

ALL CONCRETE CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE (ACI) CODES 301 & 318 LATEST REVISION.

ALL CONCRETE USED SHALL BE 4000 PSI (28 DAY COMP. STRENGTH). THE CONCRETE MIX SHALL BE BASED ON USING THE FOLLOWING MATERIALS AND PARAMETERS:

PORTLAND CEMENT	ASTM C150, 11
AGGREGATE	ASTM C33, 1 INCH MAX
WATER	POTABLE
ADMIXTURE	NON-CHLORIDE
AIR	6%*
SLUMP	4 INCH

*ALL CONCRETE EXPOSED TO FREEZING WEATHER SHALL CONTAIN ENTRAINED AIR PER ACI 211 TABLE 4.2.1 OF ACI 318-05.

ALL REINFORCING STEEL SHALL BE ASTM A615, GR 60 (DEFORMED). WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC. SPLICES SHALL BE CLASS B AND ALL HOOKS SHALL BE ACI STANDARD UNO. REINFORCING BARS SHALL BE COLD BENT WHERE REQUIRED AND TIED (NOT WELDED).

THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL:
- CONCRETE CAST AGAINST EARTH = 3 IN
- CONCRETE EXPOSED TO EARTH OR WEATHER:
  - #6 AND LARGER = 2 IN
  - #5 AND SMALLER = 1 1/2 IN
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
  - SLAB AND WALL = 3/4 IN
  - BEAMS AND COLUMNS = 1 1/2 IN

A 3/4 IN. CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

CONCRETE SHALL BE PLACED IN A UNIFORM MANNER AND CONSOLIDATED IN PLACE.

CONCRETE FOOTINGS SHALL BE CAST AGAINST LEVEL, COMPACTED, NON-FROZEN BASE SOIL FREE OF STANDING WATER.

05 ANCHORS

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

EXPANSION ANCHORS SHALL BE USED WHERE ATTACHING TO CONCRETE. MASONRY MOUNTS SHALL HAVE INJECTION ADHESIVE ANCHORING.

EXPANSION BOLTS SHALL BE HILTI KWIK BOLT 3 OR EQUAL. MINIMUM EMBEDMENT 4 INCHES.

INJECTION ADHESIVE ANCHORING IN MASONRY WITH VOIDS SHALL BE HILTI HIT HY-70 OR EQUAL WITH THREADED ROD AND SCREEN TUBES. ANCHORING IN BRICKS WITH HOLES SHALL HAVE ANCHORS SPACED 2 COMPLETE BRICKS APART MINIMUM, SHALL MAINTAIN 2 COMPLETE BRICKS OR 16 INCHES FROM FREE EDGES (WHICHEVER IS LESS), AND SHALL BE EMBEDDED 3 1/2 INCHES MINIMUM. ANCHORING IN HOLLOW CONCRETE BLOCK SHALL USE 50% MORE ANCHORS THAN SHOWN IN DETAIL, SHALL LIMIT ONE ANCHOR MAXIMUM PER BLOCK CELL, SHALL MAINTAIN 12" SPACING FROM FREE EDGES, AND SHALL BE EMBEDDED THROUGH FACE.

INJECTION ADHESIVE ANCHORING IN SOLID MASONRY AND GROUT FILLED BLOCK SHALL BE HILTI HIT HY-200 OR EQUAL WITH THREADED ROD. MAINTAIN 12 INCHES BETWEEN ANCHORS AND ALL FREE EDGES. MINIMUM SPACING BETWEEN ANCHORS IS 8 INCHES.

ANCHORS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND SHALL NOT BE INSTALLED IN MORTAR JOINTS. GRATING SHALL BE ATTACHED USING FOUR GRATING CLAMPS OR 1/4 FILLET WELDS PER SECTION.

05 POST-INSTALLED ANCHORS

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

EXCEPT WHERE INDICATED ON THE DRAWINGS, POST INSTALLED ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES AND INSTALLED IN ACCORDANCE WITH THEIR RESPECTIVE ICC ES REPORT AND MANUFACTURERS PUBLISHED INSTALLATION INSTRUCTIONS.

APPLICATION	ANCHORING SYSTEM
CONCRETE	HILTI HY 200 ADHESIVE WITH SAFE SET (HDB) SYSTEM
REBAR DOWELING	HILTI RE 500V3 ADHESIVE WITH SAFE SET (HDB) SYSTEM
SOLID GROUTED MASONRY	HILTI HY 70 ADHESIVE WITH SCREEN TUBE
HOLLOW / MULTI WIDTH MASONRY	HILTI HY 70 ADHESIVE WITH HILTI HY 70 ADHESIVE WITH SCREEN TUBE

ANCHOR CAPACITY USED IN DESIGN SHALL BE BASED ON THE TECHNICAL DATA PUBLISHED BY HILTI OR SUCH OTHER METHOD AS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD. SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERFORMANCE VALUES OF THE SPECIFIED PRODUCT INCLUDING AN ICC ES REPORT SHOWING COMPLIANCE WITH THE RELEVANT BUILDING CODE, SEISMIC USE, LOAD RESISTANCE, INSTALLATION CATEGORY, IN SERVICE TEMPERATURE, INSTALLATION TEMPERATURE, ETC.

ADHESIVE ANCHORS INSTALLED IN A HORIZONTALLY OR UPWARDLY INCLINED ORIENTATION INTO CONCRETE AND SUPPORTING A SUSTAINED TENSION LOAD SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER, PER SECTION 9.2.2 OF ACI 318-14. INSTALLER SHALL BE CERTIFIED THROUGH THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM.

ANCHORS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND SHALL NOT TO BE INSTALLED IN MORTAR JOINTS.

AS PER OSHA 29 CFR 1926.1153 SILICA DUST CONTROL REGULATIONS, DRILLED HOLES FOR POST INSTALLED ANCHORS IN CONCRETE AND MASONRY SHALL BE INSTALLED USING HILTI SAFE SET INSTALLATION SYSTEM WHICH COMPRISES OF A CODE APPROVED HILTI HOLLOW DRILL BIT AND VACUUM. ALTERNATE INSTALLATION METHODS ARE ALSO ALLOWED WITH AN APPROVED DUSTLESS SYSTEM THAT MAINTAINS SILICA DUST EMISSION BELOW THE PERMISSIBLE LEVELS.

CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURERS REPRESENTATIVE TO PROVIDE ON SITE ANCHOR INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. CONTRACTOR SHALL SUBMIT DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTORS PERSONNEL INSTALLING ANCHORS HAVE RECEIVED THE REQUIRED TRAINING PRIOR TO THE COMMENCEMENT OF WORK.

CONTINUOUS OR PERIODIC SPECIAL INSPECTION FOR POST INSTALLED ANCHORS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 4.3/4.4 OF THE ICC ES REPORT FOR THE INDIVIDUAL ANCHOR. SPECIAL INSPECTOR SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK TO COORDINATE INSPECTION EFFORTS.

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 CONTRACTORS 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.

07 THERMAL & MOISTURE PROTECTION

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

FIRE STOP ALL PENETRATIONS THROUGH BUILDING WALLS, FLOORS, AND CEILINGS, WITH LISTED AND ACCEPTED MATERIALS TO MAINTAIN THE FIRE RATING OF THE EXISTING ASSEMBLY. ALL FILL MATERIAL SHALL BE SHAPED, FITTED, AND PERMANENTLY SECURED IN PLACE. FIRESTOPPING SHALL BE INSTALLED IN ACCORD WITH ASTM E814.

HILTI CP620 FIRE FOAM OR 3M FIRE BARRIER PRODUCTS, OR EQUAL, SHALL BE USED TO FILL ALL VOIDS AND CAVITIES AND SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND ASSOCIATED UL SYSTEM NUMBER.

FIRESTOPPING SHALL BE APPLIED AS SOON AS PRACTICABLE AFTER PENETRATIONS ARE MADE AND EQUIPMENT INSTALLED.

FIRESTOPPED PENETRATIONS SHALL BE LEFT EXPOSED AND MADE AVAILABLE FOR INSPECTION BEFORE APPLYING FINISHES THAT MAY CONCEAL SUCH PENETRATION. FIRESTOPPING MATERIAL CERTIFICATES SHALL BE MADE AVAILABLE AT THE TIME OF INSPECTION.

ANY BUILDING ROOF PENETRATION OR RESTORATION SHALL BE PERFORMED SO THAT ROOF WARRANTY IN PLACE IS NOT COMPROMISED. CONTRACTOR SHALL ARRANGE FOR OWNER'S ROOFING CONTRACTOR TO PERFORM ANY AND ALL ROOFING WORK IF SO REQUIRED BY EXISTING ROOF WARRANTY. OTHERWISE, ROOF SHALL BE MADE WATERTIGHT WITH LIKE CONSTRUCTION AS SOON AS PRACTICABLE AND AT COMPLETION OF CONSTRUCTION.

ALL PENETRATIONS INTO OR THROUGH BUILDING, SHELTER, EQUIPMENT, CABINET, AND SIMILAR ENCLOSURE EXTERIOR WALLS, SHALL BE SEALED WITH SILICONE SEALER.

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 PROPERLY 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 PROPERLY 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 PROPERLY 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 PROPORTIONATELY 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 CONDUCTORS 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 EGR 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 RADIALS LENGTH SHALL BE MIN 20 FT, MAX 80 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 PROPER 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.

31 EXCAVATION & FILL

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

CONTRACTOR SHALL GRADE ONLY AREAS SHOWN TO BE MODIFIED AS A PART OF THIS WORK AND ONLY TO THE EXTENT REQUIRED TO SHED OVERLAND WATER FLOW AWAY FROM SITE. ALL MADE SLOPES SHALL NOT BE STEEPER THAN 3:1 (HORIZONTAL:VERTICAL). SEDIMENTATION AND EROSION CONTROLS SHOWN AND SPECIFIED SHALL BE ESTABLISHED BEFORE STRIPPING EXISTING VEGETATION.

ORGANIC MATERIAL AND DEBRIS SHALL BE STRIPPED AND STOCKPILED BEFORE ADDING FILL MATERIAL.

NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

ALL FILL SHALL BE PLACED IN ONE FOOT LIFTS AND COMPACTED IN PLACE. STRUCTURAL FILL SHALL BE COMPACTED TO 95% OF ITS MAXIMUM DRY UNIT WEIGHT TESTED IN ACCORDANCE WITH ASTM D1557.

EXCAVATIONS FOR FOOTINGS SHALL BE CUT LEVEL TO THE REQUIRED DEPTH AND TO UNDISTURBED SOIL. REPORT UNSUITABLE SOIL CONDITIONS TO THE CONSTRUCTION MANAGER.

TRENCH EXCAVATIONS SHALL BE BACKFILLED AT THE END OF EACH DAY.

TOWER FOUNDATION EXCAVATION, BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH TOWER MANUFACTURERS DESIGNS AND SPECIFICATIONS.

NATIVE GRAVEL MATERIAL MAY BE USED FOR TRENCH BACKFILL WHERE SELECT MATERIAL IS NOT SPECIFIED. GRAVEL MATERIAL FOR CONDUIT TRENCH BACKFILL SHALL NOT CONTAIN ROCK GREATER THAN 2 INCHES IN DIAMETER.

BANK OR CRUSHED GRAVEL SHALL CONSIST OF TOUGH, DURABLE PARTICLES OF CRUSHED OR UNCRUSHED GRAVEL FREE OF SOFT, THIN ELONGATED OR LAMINATED PIECES AND MEET THE SPECIFIED GRADATION.

PROCESSED AGGREGATE BASE SHALL CONSIST OF COURSE AND FINE AGGREGATES COMBINED AND MIXED SO THAT THE RESULTING MATERIAL CONFORMS TO THE GRADATION. COURSE AGGREGATE SHALL BE EITHER GRAVEL OR BROKEN STONE AND FINE AGGREGATE SHALL CONSIST OF SAND.

BANK GRAVEL FILL SHALL PASS WITH THE FOLLOWING SIZE SQUARE MESH SIEVES:

25-60% WITH PASS 1/4"
15-45% WITH PASS #10
2-25% WITH PASS #40
0-10% WITH PASS #100
0-5% WITH PASS #200

BANK GRAVEL BASE SHALL PASS WITH THE FOLLOWING SIZE SQUARE MESH SIEVES:

100%	WITH PASS 5"
100%	WITH PASS 3-1/2"
100%	WITH PASS 2-1/4"
95-100%	WITH PASS 2"
55-100%	WITH PASS 1-1/2"
25-60%	WITH PASS 1/4"
15-45%	WITH PASS #10
5-25%	WITH PASS #40
0-10%	WITH PASS #100
0-5%	WITH PASS #200

PROCESSED AGG BASE SHALL PASS WITH THE FOLLOWING SIZE SQUARE MESH SIEVES:

90-100%	WITH PASS 3-1/2"
55-95%	WITH PASS 1-1/2"
50-75%	WITH PASS 3/4"
25-45%	WITH PASS 1/4"
5-20%	WITH PASS #40
2-12%	WITH PASS #100

FILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, ICE, TRASH AND DEBRIS. REFER TO GEOTECHNICAL ENGINEERING AS APPLICABLE FOR ALL FILL MATERIAL REQUIREMENTS.

31 SEDIMENTATION & EROSION CONTROL

THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND AS DIRECTED BY THE TOWN OF PERMITTEE AND/OR SWPCP MONITOR.

THESE SPECIFICATIONS SHALL INCLUDE THE GENERAL SPECIFICATIONS HEREIN.

CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXIST. SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENTATION CONTROL.

LIMITS OF CLEARING AND GRUBBING SHALL BE CLEARLY MARKED BEFORE COMMENCING WITH SUCH WORK.

SEDIMENTATION AND EROSION CONTROL (SEC) MEASURES SHOWN SHALL BE INSTALLED PRIOR TO LAND CLEARING, EXCAVATION OR GRADING OPERATIONS. REQUIREMENTS OF LOCAL WETLAND AGENCY SHALL BE MET PRIOR TO EARTHWORK OPERATIONS.

IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN SEC MEASURES THROUGHOUT DURATION OF PROJECT UNTIL DISTURBED LAND IS THOROUGHLY VEGETATED.

FAILURE OF THE SEC SYSTEMS SHALL BE CORRECTED IMMEDIATELY AND SUPPLEMENTED WITH ADDITIONAL MEASURES AS NEEDED.

TOPSOIL SHALL BE SPREAD TO FINISH GRADES AND SEEDED AS SOON AS FINISHED GRADES ARE ESTABLISHED. STRAW MULCH, JUTE NETTING OR MATS SHALL BE USED WHERE THE NEW SEED IS PLACED.

VEGETATIVE SEEDING:
- AREA TO BE SEEDED SHALL BE LOOSE AND FRIABLE TO A DEPTH OF 3". TOPSOIL SHALL BE LOOSENED BY RAKING OR DISKING BEFORE SEEDING. APPLY 50 Lbs. OF DOLOMITIC LIMESTONE AND 25 Lbs. OF 10-10-10 FERTILIZER PER 1000 SF. HARROW LIME AND FERTILIZER INTO LOOSE SOIL.
- APPLY COMMON BERMUDA AND RYE GRASS AT 50 LBS PER ACRE. USE CYCLONE SEED DRILL, CULTIPACKER SEEDER OR HYDROSEEDER (SEED & FERTILIZER SLURRY) FOR STEEP SLOPES. IRRIGATE UNTIL VEGETATION IS COMPLETELY ESTABLISHED.

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

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

DEVELOPMENT & MANAGEMENT PLANS

NO	DATE	REVISION
0	12/18/19	FOR REVIEW: RCB
1	12/19/19	ATTORNEY REVS: RCB
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

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

SITE NAME: LEBANON CENTER CT

SITE ADDRESS: 917 EXETER ROAD LEBANON, CT 06249

APT FILING NUMBER: NY141NB7950

DRAWN BY: CSH
DATE: 12/18/19 CHECKED BY: RCB

SHEET TITLE: NOTES & SPECIFICATIONS

SHEET NUMBER: N-2

valmont
STRUCTURES

Valmont Microflect
3575 25th St. SE
Salem, Oregon 97302 USA
1-800-547-2151

Communication Structure Calculations
for
Structure Consulting
Lebanon Center, CT
455836-P1 Rev B

Wednesday, 11 December 2019

Digitally signed by Barry N Sladek
Date: 2019-12-13 13:43-06:00

Prepared By:
James Ahlgren

Reviewed By:
Nathan Ross

valmont
STRUCTURES

Valmont Microflect
3575 25th St. SE
Salem, Oregon 97302 USA
1-800-547-2151

Table Of Contents

Valmont Industries, Inc.
Project Summary
Structure Consulting
455836

			Anchor Bolts			Shaft Diameters			Weight (lb)								Global Base Reactions For Pole Shaft Governing Load Case				
Structure Identifier	Pole Height (ft)	Emb. Length (ft)	Max Bolt Circle (in)	Anchor Bolt Length (in)	Qty	Base (in)	Ground Line (in)	Top (in)	Sect A	Sect B	Sect C	Sect D	Sect E	Sect F	Base Plate	Anchor Bolts	Load Case Identifier	Moment (in-kip)	Shear (kips)	Axial (kips)	Max Defl (in)
455836R3	169.00	----	69.25	66	32	62.50	62.50	22.00	11407	10255	10082	4721	1625	----	2557	2029	WIND	100512	63.9	70.2	177

Valmont Industries, Inc.
Project Summary
Structure Consulting
455836

Structure Identifier	Shaft Yield Stress (ksi)	Shaft Taper (in/ft)	Shaft Shape	Anchor Bolt Diameter (in)	Base Plate Width/ Length (in)	Base Plate Thickness (in)	Camber (in)	Length (ft)						Thickness (in)					
								Sect A	Sect B	Sect C	Sect D	Sect E	Sect F	Sect A	Sect B	Sect C	Sect D	Sect E	Sect F
455836R3	65	0.254	18	1.75	74.76	2.75	0.0	37.00	37.58	50.83	43.50	20.00	----	0.500	0.500	0.438	0.313	0.313	----

Valmont Industries, Inc.
Project Summary
Structure Consulting
455836

	Section Data																
Structure Identifier	"A" Base Diameter (in)	"A" Top Diameter (in)	"B" Base Diameter (in)	"B" Top Diameter (in)	"C" Base Diameter (in)	"C" Top Diameter (in)	"D" Base Diameter (in)	"D" Top Diameter (in)	"E" Base Diameter (in)	"E" Top Diameter (in)	"F" Base Diameter (in)	"F" Top Diameter (in)	"A"-"B" Joint Type	"B"-"C" Joint Type	"C"-"D" Joint Type	"D"-"E" Joint Type	"E"-"F" Joint Type
455836R3	62.50	53.09	56.02	46.45	49.07	36.13	38.16	27.09	27.09	22.00	----	----	Slip Joint	Slip Joint	Slip Joint	Flange	

Valmont Industries, Inc.
Engineering Data

*** OVERVIEW ***

1. Structure design conforms to TIA-222-G Addendum 2 including:
   101 mph Wind Speed (3 second gust, 50 year return period)
   50 mph Ice Wind (50 year return period)
   0.75 in ice thickness
   60.0 mph Basic Wind Speed with no ice for twist and sway
   Exposure Category C
   Structure Classification II
   Topographic Category 1
   Spectral response acceleration at short periods and 1 sec.: Ss = 0.17 & S1 = 0.06
   Site class = C
2. Feedlines are assumed to be placed interior to the pole
3. All microwave assumed to be 2 GHz unless otherwise noted
4. Total pole height is 170.0 ft agl
5. Elevations are measured from top of base plate (approximately 1.0 ft agl)
6. 150 FT POLE EXTENDABLE TO 170 FT.

*** Structure Anchorage Information ***

Pole Height (ft):	169.0	Number of Anchor Bolts:	32
Bolt Circle (in):	69.25	Diameter of Anchor Bolts (in):	1.75
Base Shear (lbs):	63850	Length of Anchor Bolts (in):	66.00
Base Vertical (lbs):	72802	Projection Length (in):	9.75
Base Moment (in-kips):	100512	Template OD (in):	72.75

*** Loading Data***

			Without Ice		With Ice	
Qty	Description	ABP Height (ft)	EPA (ft^2)	Weight (lbs)	EPA (ft^2)	Weight (lbs)
1	SP1 F3P-12[W] + F3P-HRK12	137.50	30.90	2404	43.97	3568
6	RRU (15"X15"X10")	137.50	7.50	228	9.24	354
1	SP1 F4P-12[W] + F4P-HRK12	157.50	44.27	3143	62.45	4753
12	PANEL ANTENNA (96"X18"X8") (W/PM)	157.50	134.76	1311	167.64	3722
12	RRU (15"X15"X10")	157.50	15.00	456	18.48	708
1	SP1 F4P-12[W] + F4P-HRK12	147.00	44.27	3143	62.45	4753
12	PANEL ANTENNA (96"X18"X8") (W/PM)	147.00	134.76	1311	167.52	3714
12	RRU (15"X15"X10")	147.00	15.00	456	18.48	708
1	SP1 F4P-12[W] + F4P-HRK12	127.50	44.27	3143	62.45	4753
12	PANEL ANTENNA (96"X18"X8") (W/PM)	127.50	134.76	1311	167.28	3697
12	RRU (15"X15"X10")	127.50	15.00	456	18.48	708
1	21' LRE WITH 7'-6" LIGHTNING ROD (ARM=11.5')	169.00	6.98	151	19.53	535
2	WHIP (3" X 22')	167.00	13.20	120	28.84	586
2	36" STANDOFF	167.00	6.56	74	11.60	311
12	QUINTEL QS6656-5 (W/PM)	137.50	82.44	1131	106.20	4577
1	RAYCAP RXXDC-3315-PF-48	137.50	2.01	32	2.53	121
3	RAYCAP RXXDC-3315-PF-48	157.50	4.98	96	6.45	367
3	RAYCAP RXXDC-3315-PF-48	147.00	4.98	96	6.45	365
3	RAYCAP RXXDC-3315-PF-48	127.50	4.98	96	6.42	361

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3

*** SUMMARY ***

Design Code: TIA-222-G Addendum 2

---------- DESIGN SUMMARY ----------

Height Above Base Plate (ft)	169.00	Ground Line Diameter (in)	62.500	Pole Shaft Weight (lbs)	38090
		Top Diameter (in)	21.999		
		Pole Taper (in/ft)	0.25444	Shape:	18 Sides

Connections Between Sections	/First/	/Second/	/Third/	/Fourth/
Height Above Ground (ft)	37.00	67.00	111.00	149.00
Type	Slip Joint	Slip Joint	Slip Joint	Flange Joint
Overlap Length (in)	91	82	66	0
Maximum Axial Force (lbs)	88931	73067	56785	16064

Section Characteristics	/First/	/Second/	/Third/	/Fourth/	/Fifth/
Base Diameter (in)	62.500	56.015	49.066	38.157	27.088
Top Diameter (in)	53.086	46.453	36.132	27.089	21.999
Thickness (in)	0.50000	0.50000	0.43750	0.31250	0.31250
Length (ft)	37.000	37.583	50.833	43.500	20.000
Weight (lbs)	11407	10255	10082	4721	1625
Yield Strength (ksi)	65.00	65.00	65.00	65.00	65.00
Section Shape	18 Sides	18 Sides	18 Sides	18 Sides	18 Sides

---------- ANALYSIS SUMMARY ----------

	Pt. of Fixity	Governing Level Sec.1	Governing Level Sec.2	Governing Level Sec.3	Governing Level Sec.4	Governing Level Sec.5	Pole Top
Governing Load Case	WIND	WIND	WIND	WIND	WIND	WIND	WIND
Height (ft)	0.00	0.00	37.00	67.00	111.00	149.00	169.00
Resultant Moment (in-kips)	100512	100512	72722	51266	21882	2347	79
Shear Force (lbs)	63974	63974	61134	57998	53293	16521	462
Axial Force (lbs)	70132	70132	51632	38312	24306	6084	108
Effective Yield Strength (ksi)	77.55	77.55	81.04	81.04	79.08	82.55	82.55
Combined Interaction Value	0.97	0.97	0.90	0.95	0.97	0.19	0.01
Total Deflection (in)	0.00	0.00	7.59	25.72	74.53	139.03	177.34

Note: Diameters are outside, measured across the flats
Forces and moments are reported in the local element coordinate system

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3

SUMMARY OF SECTION DIMENSIONS AS DETAILED

Height Above Base Plate (ft) 169.00 Ground Line Diameter (in) 62.500 Pole Shaft Weight (lbs) 38090

Top Diameter (in) 21.999

Pole Taper (in/ft) 0.25444 Shape: 18 Sides

Connections Between Sections	/First/	/Second/	/Third/	/Fourth/
Height Above Ground (ft)	37.00	67.00	111.00	149.00
Type	Slip Joint	Slip Joint	Slip Joint	Flange Joint
Flange Thickness (in)				2.000
Weld Root Gap (in)				0.250

Theoretical Design Section Dimension	/First/	/Second/	/Third/	/Fourth/	/Fifth/
Base Diameter (in)	62.500	56.015	49.066	38.157	27.088
Top Diameter (in)	53.086	46.453	36.132	27.089	21.999
Thickness (in)	0.50000	0.50000	0.43750	0.31250	0.31250
Length (ft)	37.000	37.583	50.833	43.500	20.000

As Detailed Section Characteristic	/First/	/Second/	/Third/	/Fourth/	/Fifth/
Base Diameter (in)	62.500	56.015	49.066	38.157	27.040
Top Diameter (in)	53.086	46.453	36.132	27.136	21.999
Thickness (in)	0.50000	0.50000	0.43750	0.31250	0.31250
Length (ft)	37.000	37.583	50.833	43.313	19.813

Note: Diameter are outside, measured across the flats

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3

*** POLE SHAFT POINT OF FIXITY REACTIONS ***

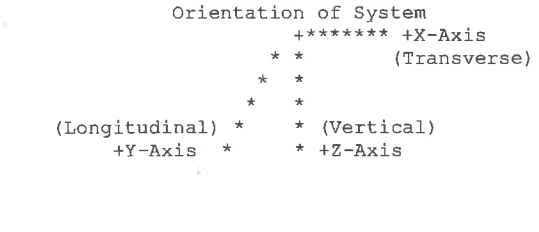
Loading Case Identifier	Moments About X-Axis (in-kips)	Moments About Y-Axis (in-kips)	Moments Resultant (X & Y) (in-kips)	Moments Torsional (in-kips)	Vertical Force (lbs)	Shear In X-Direction (lbs)	Shear In Y-Direction (lbs)	Shear Resultant (X & Y) (lbs)	Notes
WIND	76997	-64608	100512	36	70245	41042	48912	63850	
ICE + WIND	28967	-24306	37814	19	110835	15394	18345	23948	
T+S	15153	-12715	19781	7	57308	8121	9678	12634	
Seismic	1834	-1539	2394	1	68697	1037	1236	1614	

Note: Positive vertical force is downward.
Reactions are considered in the global coordinate system.

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2
Loading Case WIND

Basic Wind Velocity is 101.00 mph Ice Thickness 0.00
Wind Orientation is 50.0 Degrees Clockwise From +X Axis
Structure Weight Overload Factor is 1.200
Exposure C, Gust Factor 1.10
Structure Category 2, Topographic Category 1, Crest Height 0.00 ft
Orientations are Measured Clockwise From +X Axis
Positive Y Axis is 90 Degrees Clockwise From +X Axis
Foundation Rotation of 0.00 Degrees
Elevation of structure base above surrounding terrain = 1.00 ft



Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	137.50	139.00	0.00	50.00	1178	1404	2885	30.90	1-SP1 F3P-12[
2	137.50	139.00	0.00	50.00	286	341	274	7.50	6-RRU (15"X15
3	157.50	159.00	0.00	50.00	1736	2069	3772	44.27	1-SP1 F4P-12[
4	157.50	159.00	0.00	50.00	5285	6298	1573	134.76	12-PANEL ANTEN
5	157.50	159.00	0.00	50.00	588	701	547	15.00	12-RRU (15"X15
6	147.00	149.00	0.00	50.00	1713	2041	3772	44.27	1-SP1 F4P-12[
7	147.00	149.00	0.00	50.00	5213	6213	1573	134.76	12-PANEL ANTEN
8	147.00	149.00	0.00	50.00	580	692	547	15.00	12-RRU (15"X15
9	127.50	129.00	0.00	50.00	1662	1980	3772	44.27	1-SP1 F4P-12[
10	127.50	129.00	0.00	50.00	5059	6029	1573	134.76	12-PANEL ANTEN
11	127.50	129.00	0.00	50.00	563	671	547	15.00	12-RRU (15"X15
12	169.00	183.25	0.00	50.00	282	336	181	6.98	1-21' LRE wit
13	167.00	178.00	3.00	50.00	530	632	144	13.20	2-WHIP (3" X
14	167.00	167.00	1.50	50.00	260	310	89	6.56	2-36" Standof
15	137.50	139.00	0.00	50.00	3143	3746	1357	82.44	12-Quintel QS6
16	137.50	139.00	0.00	50.00	77	91	38	2.01	1-Raycap RxxD
17	157.50	159.00	0.00	50.00	195	233	115	4.98	3-Raycap RxxD

*** INPUT LOADS ***

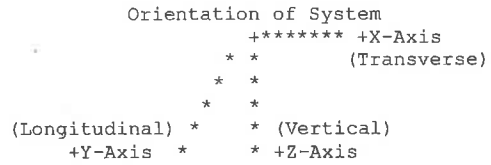
Loading Case WIND - Continued

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	Orientation of System
									3-Raycap RxxD
									3-Raycap RxxD
									3-Raycap RxxD
18	147.00	149.00	0.00	50.00	193	230	115	4.98	3-Raycap RxxD
19	127.50	129.00	0.00	50.00	187	223	115	4.98	3-Raycap RxxD

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2
Loading Case ICE + WIND

Basic Wind Velocity is 50.00 mph Ice Thickness 0.75
Wind Orientation is 50.0 Degrees Clockwise From +X Axis
Structure Weight Overload Factor is 1.200
Exposure C, Gust Factor 1.10
Structure Category 2, Topographic Category 1, Crest Height 0.00 ft
Orientations are Measured Clockwise From +X Axis
Positive Y Axis is 90 Degrees Clockwise From +X Axis
Foundation Rotation of 0.00 Degrees
Elevation of structure base above surrounding terrain = 1.00 ft



Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	137.50	139.00	0.00	50.00	411	490	4282	43.97	1-SP1 F3P-12[
2	137.50	139.00	0.00	50.00	86	103	425	9.24	6-RRU (15"X15
3	157.50	159.00	0.00	50.00	600	715	5704	62.45	1-SP1 F4P-12[
4	157.50	159.00	0.00	50.00	1611	1920	4466	167.64	12-PANEL ANTEN
5	157.50	159.00	0.00	50.00	178	212	850	18.48	12-RRU (15"X15
6	147.00	149.00	0.00	50.00	592	706	5704	62.45	1-SP1 F4P-12[
7	147.00	149.00	0.00	50.00	1588	1893	4457	167.52	12-PANEL ANTEN
8	147.00	149.00	0.00	50.00	175	209	850	18.48	12-RRU (15"X15
9	127.50	129.00	0.00	50.00	575	685	5704	62.45	1-SP1 F4P-12[
10	127.50	129.00	0.00	50.00	1539	1834	4437	167.28	12-PANEL ANTEN
11	127.50	129.00	0.00	50.00	170	203	850	18.48	12-RRU (15"X15
12	169.00	183.25	0.00	50.00	193	230	642	19.53	1-21' LRE wit
13	167.00	178.00	3.00	50.00	284	338	703	28.84	2-WHIP (3" X
14	167.00	167.00	1.50	50.00	113	134	373	11.60	2-36" Standof
15	137.50	139.00	0.00	50.00	992	1183	5493	106.20	12-Quintel QS6
16	137.50	139.00	0.00	50.00	24	28	145	2.53	1-Raycap RxxD
17	157.50	159.00	0.00	50.00	62	74	440	6.45	3-Raycap RxxD

*** INPUT LOADS ***

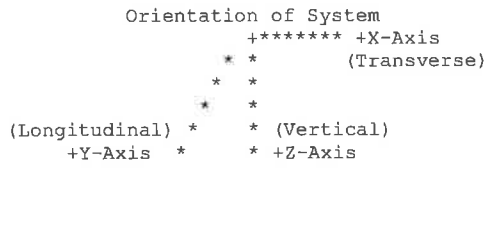
Loading Case ICE + WIND - Continued

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	Orientation of System
18	147.00	149.00	0.00	50.00	61	73	438	6.45	3-Raycap RxxD 3-Raycap RxxD 3-Raycap RxxD
19	127.50	129.00	0.00	50.00	59	70	433	6.42	3-Raycap RxxD

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2
Loading Case T+S

Basic Wind Velocity is 60.00 mph Ice Thickness 0.00
Wind Orientation is 50.0 Degrees Clockwise From +X Axis
Structure Weight Overload Factor is 1.000
Exposure C, Gust Factor 1.10
Structure Category 2, Topographic Category 1, Crest Height 0.00 ft
Orientations are Measured Clockwise From +X Axis
Positive Y Axis is 90 Degrees Clockwise From +X Axis
Foundation Rotation of 0.00 Degrees
Elevation of structure base above surrounding terrain = 1.00 ft



Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	137.50	139.00	0.00	50.00	233	277	2404	30.90	1-SP1 F3P-12[
2	137.50	139.00	0.00	50.00	56	67	228	7.50	6-RRU (15"X15
3	157.50	159.00	0.00	50.00	343	408	3143	44.27	1-SP1 F4P-12[
4	157.50	159.00	0.00	50.00	1043	1243	1311	134.76	12-PANEL ANTEN
5	157.50	159.00	0.00	50.00	116	138	456	15.00	12-RRU (15"X15
6	147.00	149.00	0.00	50.00	338	403	3143	44.27	1-SP1 F4P-12[
7	147.00	149.00	0.00	50.00	1029	1226	1311	134.76	12-PANEL ANTEN
8	147.00	149.00	0.00	50.00	115	136	456	15.00	12-RRU (15"X15
9	127.50	129.00	0.00	50.00	328	391	3143	44.27	1-SP1 F4P-12[
10	127.50	129.00	0.00	50.00	998	1190	1311	134.76	12-PANEL ANTEN
11	127.50	129.00	0.00	50.00	111	132	456	15.00	12-RRU (15"X15
12	169.00	183.25	0.00	50.00	56	66	151	6.98	1-21' LRE wit
13	167.00	178.00	3.00	50.00	105	125	120	13.20	2-WHIP (3" X
14	167.00	167.00	1.50	50.00	51	61	74	6.56	2-36" Standof
15	137.50	139.00	0.00	50.00	620	739	1131	82.44	12-Quintel QS6
16	137.50	139.00	0.00	50.00	15	18	32	2.01	1-Raycap RxxD
17	157.50	159.00	0.00	50.00	39	46	96	4.98	3-Raycap RxxD

*** INPUT LOADS ***

Loading Case T+S - Continued

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	Orientation of System
									3-Raycap RxxD
									3-Raycap RxxD
									3-Raycap RxxD
18	147.00	149.00	0.00	50.00	38	45	96	4.98	3-Raycap RxxD
19	127.50	129.00	0.00	50.00	37	44	96	4.98	3-Raycap RxxD

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3

*** INPUT LOADS ***

Design Code TIA-222-G Addendum 2
Loading Case Seismic
Seismic analysis following the Equivalent Modal Analysis Procedure
Structure Category: 2
Site Class: C
Response Acceleration at short periods: 0.17
Response Acceleration at one second: 0.06
The above are used to obtain the acceleration and velocity based site coefficients Fa and Fv
Foundation Rotation of 0.00 Degrees
Elevation of structure base above surrounding terrain = 1.00 ft

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	137.50	139.00	0.00	50.00	0	0	2885	30.90	1-SP1 F3P-12[
2	137.50	139.00	0.00	50.00	0	0	274	7.50	6-RRU (15"X15
3	157.50	159.00	0.00	50.00	0	0	3772	44.27	1-SP1 F4P-12[
4	157.50	159.00	0.00	50.00	0	0	1573	134.76	12-PANEL ANTEN
5	157.50	159.00	0.00	50.00	0	0	547	15.00	12-RRU (15"X15
6	147.00	149.00	0.00	50.00	0	0	3772	44.27	1-SP1 F4P-12[
7	147.00	149.00	0.00	50.00	0	0	1573	134.76	12-PANEL ANTEN
8	147.00	149.00	0.00	50.00	0	0	547	15.00	12-RRU (15"X15
9	127.50	129.00	0.00	50.00	0	0	3772	44.27	1-SP1 F4P-12[
10	127.50	129.00	0.00	50.00	0	0	1573	134.76	12-PANEL ANTEN
11	127.50	129.00	0.00	50.00	0	0	547	15.00	12-RRU (15"X15
12	169.00	183.25	0.00	50.00	0	0	181	6.98	1-21' LRE wit
13	167.00	178.00	3.00	50.00	0	0	144	13.20	2-WHIP (3" X
14	167.00	167.00	1.50	50.00	0	0	89	6.56	2-36" Standof
15	137.50	139.00	0.00	50.00	0	0	1357	82.44	12-Quintel QS6
16	137.50	139.00	0.00	50.00	0	0	38	2.01	1-Raycap RxxD
17	157.50	159.00	0.00	50.00	0	0	115	4.98	3-Raycap RxxD
18	147.00	149.00	0.00	50.00	0	0	115	4.98	3-Raycap RxxD

*** INPUT LOADS ***

Loading Case Seismic - Continued

Load Number	Mounting Height (ft)	Load Height (ft)	Load Eccentricity (ft)	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	Orientation of System
19	127.50	129.00	0.00	50.00	0	0	115	4.98	3-Raycap RxxD 3-Raycap RxxD 3-Raycap RxxD

*** Properties ***

Connection Locations	Distance From Base (ft)	Diameter Across Flats (in)	Wall Thickness (in)	D/t Across Flats	w/t Across Flats	Moments of Inertia (in^4)	Area (in^2)
Top of Sect 5	169.00	21.999	0.3125	70.40	10.65	1278	21.51
	167.00	22.508	0.3125	72.03	10.94	1370	22.01
	164.00	23.271	0.3125	74.47	11.37	1516	22.77
	159.00	24.543	0.3125	78.54	12.09	1782	24.03
	157.50	24.925	0.3125	79.76	12.30	1868	24.41
	154.00	25.816	0.3125	82.61	12.80	2078	25.29
	149.00	27.088	0.3125	86.68	13.52	2405	26.56
Top of Sect 4	149.00	27.089	0.3125	86.68	13.52	2405	26.56
	147.00	27.598	0.3125	88.31	13.81	2545	27.06
	144.00	28.361	0.3125	90.76	14.24	2764	27.82
	139.00	29.633	0.3125	94.83	14.96	3158	29.08
	137.50	30.015	0.3125	96.05	15.17	3283	29.46
	134.00	30.905	0.3125	98.90	15.67	3587	30.34
	129.00	32.178	0.3125	102.97	16.39	4053	31.60
	127.50	32.559	0.3125	104.19	16.61	4200	31.98
	124.00	33.450	0.3125	107.04	17.11	4558	32.87
	119.00	34.722	0.3125	111.11	17.83	5104	34.13
	114.00	35.994	0.3125	115.18	18.55	5691	35.39
	111.00	36.757	0.3125	117.62	18.98	6064	36.15
Top of Sect 3	111.00	36.132	0.4375	82.59	12.80	7976	49.57
	109.00	36.641	0.4375	83.75	13.00	8322	50.27
Base of Sect 4	105.50	37.532	0.4375	85.79	13.36	8952	51.51
	104.00	37.913	0.4375	86.66	13.52	9231	52.04
	99.00	39.186	0.4375	89.57	14.03	10203	53.80
	94.00	40.458	0.4375	92.48	14.54	11241	55.57
	89.00	41.730	0.4375	95.38	15.06	12348	57.34
	84.00	43.002	0.4375	98.29	15.57	13525	59.10
	79.00	44.274	0.4375	101.20	16.08	14774	60.87
	74.00	45.547	0.4375	104.11	16.59	16098	62.64
	69.00	46.819	0.4375	107.01	17.11	17498	64.40
	67.00	47.328	0.4375	108.18	17.31	18081	65.11
Top of Sect 2	67.00	46.453	0.5000	92.91	14.62	19449	72.92
	64.00	47.216	0.5000	94.43	14.89	20434	74.14
Base of Sect 3	60.17	48.191	0.5000	96.38	15.23	21741	75.68
	59.00	48.488	0.5000	96.98	15.34	22150	76.15
	54.00	49.760	0.5000	99.52	15.78	23958	78.17
	49.00	51.033	0.5000	102.07	16.23	25863	80.19

*** Properties ***

Connection Locations	Distance From Base (ft)	Diameter Across Flats (in)	Wall Thickness (in)	D/t Across Flats	w/t Across Flats	Moments of Inertia (in^4)	Area (in^2)
	44.00	52.305	0.5000	104.61	16.68	27866	82.21
	39.00	53.577	0.5000	107.15	17.13	29969	84.23
	37.00	54.086	0.5000	108.17	17.31	30840	85.04
Top of Sect 1	37.00	53.086	0.5000	106.17	16.96	29145	83.45
	34.00	53.849	0.5000	107.70	17.23	30433	84.66
Base of Sect 2	29.42	55.015	0.5000	110.03	17.64	32473	86.51
	29.00	55.121	0.5000	110.24	17.68	32662	86.68
	24.00	56.393	0.5000	112.79	18.12	34998	88.70
	19.00	57.666	0.5000	115.33	18.57	37443	90.72
	14.00	58.938	0.5000	117.88	19.02	39998	92.74
	9.00	60.210	0.5000	120.42	19.47	42668	94.76
	4.00	61.482	0.5000	122.96	19.92	45454	96.78
Pt of Fixity	0.00	62.500	0.5000	125.00	20.28	47768	98.39

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case WIND

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
169.00	60	-51	79	0	297	354	462	108
167.00	71	-59	92	0	407	484	633	283
167.00	164	-130	209	36	1211	1442	1883	315
164.00	220	-177	282	36	1380	1643	2145	585
159.00	329	-268	424	36	1673	1993	2602	1054
157.50	366	-299	472	36	1764	2101	2744	1200
157.50	544	-449	705	36	10087	12013	15687	5196
154.00	1054	-877	1371	36	10300	12268	16018	5564
149.00	1802	-1505	2347	36	10623	12652	16521	6084
149.00	1802	-1505	2347	36	10618	12647	16513	6105
147.00	2107	-1761	2746	36	10751	12805	16720	6320
147.00	2342	-1958	3053	36	18954	22577	29478	10410
144.00	3159	-2644	4120	36	19139	22799	29767	10818
139.00	4539	-3803	5922	36	19472	23196	30285	11460
137.50	4958	-4155	6469	36	19580	23324	30453	11636
137.50	5067	-4246	6611	36	24631	29343	38310	15122
134.00	6306	-5286	8228	36	24845	29598	38643	15701
129.00	8095	-6788	10564	36	25184	30003	39171	16456
127.50	8636	-7242	11271	36	25298	30139	39350	16648
127.50	8806	-7385	11493	36	33201	39555	51642	21103
124.00	10475	-8785	13671	36	33398	39790	51949	21837
119.00	12876	-10801	16806	36	33694	40145	52411	22868
114.00	15299	-12835	19970	36	34013	40525	52907	23873
111.00	16764	-14064	21882	36	34260	40821	53293	24306
111.00	16764	-14064	21882	36	34208	40758	53211	24484
109.00	17745	-14887	23162	36	34353	40932	53438	25351
105.50	19473	-16337	25418	36	34651	41288	53902	26752
104.00	20217	-16962	26390	36	34716	41365	54002	27275
99.00	22715	-19058	29651	36	35050	41765	54523	28671
94.00	25237	-21175	32944	36	35385	42164	55045	30111
89.00	27783	-23312	36268	36	35720	42564	55566	31591
84.00	30354	-25469	39623	36	36054	42962	56086	33109
79.00	32948	-27646	43010	36	36387	43360	56605	34666
74.00	35567	-29843	46428	36	36720	43757	57122	36259
69.00	38209	-32060	49878	36	37093	44201	57703	37786
67.00	39273	-32953	51266	36	37283	44428	57998	38312
67.00	39273	-32953	51266	36	37213	44345	57891	38474
64.00	40876	-34298	53359	36	37440	44616	58244	40384
60.17	42940	-36030	56053	36	37778	45019	58769	42747
59.00	43571	-36560	56877	36	37798	45043	58801	43298

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case WIND

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
54.00	46291	-38842	60428	36	38122	45430	59306	45174
49.00	49033	-41143	64008	36	38442	45811	59804	47089
44.00	51799	-43464	67618	36	38756	46186	60292	49042
39.00	54587	-45803	71258	36	39111	46609	60845	50944
37.00	55708	-46744	72722	36	39297	46830	61134	51632
37.00	55708	-46744	72722	36	39213	46731	61003	51786
34.00	57397	-48161	74926	36	39378	46928	61261	54092
29.42	59992	-50339	78314	36	39733	47351	61813	57467
29.00	60229	-50538	78624	36	39671	47277	61716	57779
24.00	63082	-52932	82347	36	39921	47575	62105	59865
19.00	65951	-55339	86093	36	40155	47855	62470	61988
14.00	68837	-57761	89860	36	40371	48111	62805	64146
9.00	71738	-60195	93647	36	40575	48355	63123	66341
4.00	74654	-62642	97453	36	40799	48623	63472	68544
0.00	76997	-64608	100512	36	41121	49007	63974	70132

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case WIND

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
169.00	114.0	135.9	177.3	10.6	9.24	0.00	0.01	0.00	0.00	0.01	82.55
167.00	111.5	132.9	173.5	10.3	9.24	0.00	0.01	0.00	0.00	0.01	82.55
167.00	111.5	132.9	173.5	10.3	9.24	0.00	0.02	0.01	0.01	0.02	82.55
164.00	107.8	128.5	167.7	9.8	9.23	0.00	0.03	0.01	0.00	0.03	82.55
159.00	101.6	121.1	158.1	9.1	9.20	0.00	0.04	0.01	0.00	0.04	82.55
157.50	99.8	118.9	155.2	8.8	9.20	0.00	0.04	0.01	0.00	0.04	82.55
157.50	99.8	118.9	155.2	8.8	9.20	0.00	0.06	0.04	0.00	0.07	82.55
154.00	95.5	113.8	148.5	8.3	9.15	0.00	0.12	0.04	0.00	0.12	82.55
149.00	89.4	106.5	139.0	7.5	9.05	0.00	0.18	0.04	0.00	0.19	82.55
149.00	89.4	106.5	139.0	7.5	9.05	0.00	0.18	0.04	0.00	0.19	82.55
147.00	86.9	103.6	135.3	7.2	9.00	0.00	0.20	0.04	0.00	0.21	82.55
147.00	86.9	103.6	135.3	7.2	9.00	0.01	0.23	0.07	0.00	0.24	82.55
144.00	83.3	99.3	129.7	6.8	8.91	0.01	0.29	0.07	0.00	0.30	82.55
139.00	77.4	92.3	120.5	6.1	8.71	0.01	0.38	0.07	0.00	0.39	82.55
137.50	75.7	90.2	117.7	5.9	8.64	0.01	0.40	0.07	0.00	0.42	82.55
137.50	75.7	90.2	117.7	5.9	8.64	0.01	0.41	0.09	0.00	0.43	82.55
134.00	71.7	85.4	111.5	5.4	8.46	0.01	0.48	0.09	0.00	0.50	82.55
129.00	66.1	78.8	102.8	4.8	8.17	0.01	0.58	0.09	0.00	0.59	82.12
127.50	64.5	76.8	100.3	4.6	8.07	0.01	0.60	0.08	0.00	0.62	81.87
127.50	64.5	76.8	100.3	4.6	8.07	0.01	0.61	0.11	0.00	0.64	81.87
124.00	60.7	72.4	94.5	4.2	7.84	0.01	0.70	0.11	0.00	0.72	81.28
119.00	55.6	66.2	86.5	3.7	7.46	0.01	0.80	0.11	0.00	0.82	80.43
114.00	50.7	60.4	78.9	3.2	7.06	0.01	0.90	0.10	0.00	0.92	79.59
111.00	47.9	57.1	74.5	2.9	6.80	0.01	0.95	0.10	0.00	0.97	79.08
111.00	47.9	57.1	74.5	2.9	6.80	0.01	0.68	0.07	0.00	0.69	82.55
109.00	46.1	54.9	71.7	2.7	6.67	0.01	0.70	0.07	0.00	0.71	82.55
105.50	43.0	51.3	66.9	2.5	6.44	0.01	0.73	0.07	0.00	0.74	82.55
104.00	41.7	49.7	64.9	2.4	6.34	0.01	0.74	0.07	0.00	0.75	82.55
99.00	37.6	44.8	58.5	2.0	6.00	0.01	0.78	0.07	0.00	0.79	82.55
94.00	33.7	40.1	52.4	1.7	5.65	0.01	0.81	0.07	0.00	0.82	82.55
89.00	30.0	35.7	46.6	1.4	5.30	0.01	0.84	0.07	0.00	0.85	82.55
84.00	26.5	31.6	41.3	1.2	4.96	0.01	0.86	0.07	0.00	0.87	82.55
79.00	23.3	27.8	36.3	1.0	4.61	0.01	0.88	0.06	0.00	0.89	82.49
74.00	20.3	24.2	31.6	0.8	4.27	0.01	0.91	0.06	0.00	0.92	81.88
69.00	17.6	20.9	27.3	0.6	3.93	0.01	0.93	0.06	0.00	0.94	81.28
67.00	16.5	19.7	25.7	0.6	3.79	0.01	0.93	0.06	0.00	0.95	81.04
67.00	16.5	19.7	25.7	0.6	3.79	0.01	0.84	0.05	0.00	0.85	82.55
64.00	15.0	17.9	23.4	0.5	3.61	0.01	0.84	0.05	0.00	0.85	82.55
60.17	13.2	15.8	20.6	0.4	3.37	0.01	0.85	0.05	0.00	0.86	82.55

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case WIND *** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
59.00	12.7	15.2	19.8	0.4	3.30	0.01	0.85	0.05	0.00	0.86	82.55
54.00	10.6	12.6	16.5	0.3	3.00	0.01	0.86	0.05	0.00	0.87	82.55
49.00	8.7	10.3	13.5	0.2	2.70	0.01	0.87	0.05	0.00	0.88	82.31
44.00	7.0	8.3	10.8	0.2	2.41	0.01	0.88	0.05	0.00	0.89	81.78
39.00	5.4	6.5	8.5	0.1	2.13	0.01	0.88	0.05	0.00	0.90	81.25
37.00	4.9	5.8	7.6	0.1	2.01	0.01	0.89	0.05	0.00	0.90	81.04
37.00	4.9	5.8	7.6	0.1	2.01	0.01	0.92	0.05	0.00	0.93	81.46
34.00	4.1	4.9	6.4	0.1	1.84	0.01	0.92	0.05	0.00	0.93	81.14
29.42	3.0	3.6	4.7	0.1	1.57	0.01	0.93	0.05	0.00	0.94	80.66
29.00	3.0	3.5	4.6	0.0	1.55	0.01	0.93	0.05	0.00	0.94	80.61
24.00	2.0	2.4	3.1	0.0	1.27	0.01	0.93	0.05	0.00	0.95	80.08
19.00	1.3	1.5	1.9	0.0	0.99	0.01	0.94	0.05	0.00	0.95	79.56
14.00	0.7	0.8	1.0	0.0	0.72	0.01	0.95	0.05	0.00	0.96	79.03
9.00	0.3	0.3	0.4	0.0	0.46	0.01	0.95	0.05	0.00	0.96	78.50
4.00	0.1	0.1	0.1	0.0	0.20	0.01	0.95	0.05	0.00	0.97	77.97
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.96	0.04	0.00	0.97	77.55

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case ICE + WIND

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
169.00	45	-37	58	0	219	260	340	622
167.00	52	-43	67	0	280	334	436	912
167.00	126	-104	163	19	719	856	1118	1948
164.00	159	-132	206	19	813	968	1264	2395
159.00	223	-185	290	19	975	1162	1517	3174
157.50	244	-203	318	19	1026	1222	1595	3415
157.50	306	-256	399	19	3923	4674	6102	14621
154.00	506	-423	659	19	4036	4809	6278	15203
149.00	800	-670	1044	19	4212	5018	6552	16064
149.00	800	-670	1044	19	4206	5011	6543	16067
147.00	922	-772	1202	19	4278	5097	6655	16423
147.00	1003	-841	1309	19	7123	8487	11080	27631
144.00	1311	-1099	1711	19	7214	8595	11221	28189
139.00	1834	-1537	2393	19	7383	8797	11485	29143
137.50	1993	-1671	2600	19	7440	8865	11574	29433
137.50	2033	-1705	2653	19	9312	11095	14485	39638
134.00	2502	-2099	3266	19	9405	11206	14630	40354
129.00	3182	-2669	4153	19	9567	11400	14882	41398
127.50	3388	-2842	4422	19	9627	11471	14976	41713
127.50	3446	-2891	4498	19	12322	14683	19168	52945
124.00	4067	-3411	5308	19	12464	14852	19389	53695
119.00	4960	-4161	6474	19	12598	15012	19598	54840
114.00	5862	-4918	7651	19	12716	15152	19781	56036
111.00	6406	-5375	8363	19	12764	15209	19855	56785
111.00	6406	-5375	8363	19	12717	15154	19783	56811
109.00	6771	-5681	8839	19	12772	15220	19869	57845
105.50	7415	-6222	9679	19	12907	15380	20078	59669
104.00	7693	-6454	10042	19	12916	15392	20093	60153
99.00	8624	-7236	11258	19	13050	15551	20301	61744
94.00	9565	-8026	12486	19	13182	15709	20507	63387
89.00	10516	-8824	13727	19	13314	15866	20712	65078
84.00	11476	-9629	14981	19	13446	16023	20917	66819
79.00	12446	-10443	16247	19	13577	16179	21121	68609
74.00	13425	-11265	17525	19	13707	16335	21324	70447
69.00	14413	-12094	18815	19	13867	16526	21573	72319
67.00	14811	-12428	19335	19	13960	16637	21718	73067
67.00	14811	-12428	19335	19	13911	16577	21641	73090
64.00	15412	-12932	20118	19	14001	16686	21782	75441
60.17	16185	-13580	21127	19	14152	16865	22016	78479
59.00	16421	-13779	21436	19	14143	16855	22003	78997

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case ICE + WIND

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
54.00	17441	-14634	22767	19	14272	17008	22203	81177
49.00	18469	-15497	24110	19	14398	17159	22399	83407
44.00	19507	-16368	25465	19	14522	17306	22592	85687
39.00	20554	-17246	26831	19	14674	17487	22828	88003
37.00	20974	-17600	27380	19	14763	17594	22967	88931
37.00	20974	-17600	27380	19	14709	17529	22883	88952
34.00	21609	-18132	28208	19	14768	17599	22974	91772
29.42	22584	-18950	29481	19	14924	17786	23218	96115
29.00	22673	-19024	29597	19	14880	17733	23149	96335
24.00	23744	-19923	30996	19	14972	17843	23293	98759
19.00	24822	-20828	32403	19	15058	17945	23426	101226
14.00	25905	-21737	33817	19	15134	18036	23545	103730
9.00	26994	-22651	35239	19	15206	18122	23656	106267
4.00	28088	-23569	36667	19	15290	18221	23786	108819
0.00	28967	-24306	37814	19	15441	18401	24021	110820

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case ICE + WIND

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
169.00	43.3	51.6	67.4	1.6	3.56	0.00	0.01	0.00	0.00	0.01	82.55
167.00	42.4	50.5	65.9	1.6	3.55	0.00	0.01	0.00	0.00	0.01	82.55
167.00	42.4	50.5	65.9	1.6	3.55	0.00	0.02	0.00	0.00	0.02	82.55
164.00	40.9	48.8	63.7	1.5	3.54	0.00	0.02	0.00	0.00	0.02	82.55
159.00	38.5	45.9	60.0	1.4	3.53	0.00	0.03	0.00	0.00	0.03	82.55
157.50	37.8	45.1	58.9	1.3	3.52	0.00	0.03	0.00	0.00	0.03	82.55
157.50	37.8	45.1	58.9	1.3	3.52	0.01	0.04	0.02	0.00	0.05	82.55
154.00	36.2	43.1	56.3	1.3	3.50	0.01	0.06	0.02	0.00	0.06	82.55
149.00	33.8	40.3	52.6	1.1	3.45	0.01	0.08	0.02	0.00	0.09	82.55
149.00	33.8	40.3	52.6	1.1	3.45	0.01	0.08	0.02	0.00	0.09	82.55
147.00	32.9	39.2	51.2	1.1	3.43	0.01	0.09	0.02	0.00	0.10	82.55
147.00	32.9	39.2	51.2	1.1	3.43	0.01	0.10	0.03	0.00	0.11	82.55
144.00	31.5	37.6	49.1	1.0	3.39	0.01	0.12	0.03	0.00	0.14	82.55
139.00	29.3	34.9	45.6	0.9	3.31	0.01	0.15	0.03	0.00	0.17	82.55
137.50	28.6	34.1	44.5	0.9	3.28	0.01	0.16	0.03	0.00	0.18	82.55
137.50	28.6	34.1	44.5	0.9	3.28	0.02	0.17	0.03	0.00	0.19	82.55
134.00	27.1	32.3	42.1	0.8	3.21	0.02	0.19	0.03	0.00	0.21	82.55
129.00	25.0	29.7	38.8	0.7	3.10	0.02	0.23	0.03	0.00	0.25	82.12
127.50	24.3	29.0	37.9	0.7	3.06	0.02	0.24	0.03	0.00	0.26	81.87
127.50	24.3	29.0	37.9	0.7	3.06	0.02	0.24	0.04	0.00	0.27	81.87
124.00	22.9	27.3	35.7	0.7	2.97	0.02	0.27	0.04	0.00	0.30	81.28
119.00	21.0	25.0	32.6	0.6	2.82	0.02	0.31	0.04	0.00	0.33	80.43
114.00	19.1	22.8	29.8	0.5	2.67	0.02	0.34	0.04	0.00	0.37	79.59
111.00	18.1	21.5	28.1	0.5	2.57	0.02	0.36	0.04	0.00	0.39	79.08
111.00	18.1	21.5	28.1	0.5	2.57	0.02	0.26	0.03	0.00	0.28	82.55
109.00	17.4	20.7	27.0	0.4	2.52	0.02	0.27	0.03	0.00	0.28	82.55
105.50	16.2	19.3	25.2	0.4	2.43	0.02	0.28	0.03	0.00	0.29	82.55
104.00	15.7	18.7	24.5	0.4	2.39	0.02	0.28	0.03	0.00	0.30	82.55
99.00	14.2	16.9	22.0	0.3	2.26	0.02	0.30	0.03	0.00	0.31	82.55
94.00	12.7	15.1	19.7	0.3	2.13	0.02	0.31	0.03	0.00	0.32	82.55
89.00	11.3	13.5	17.6	0.2	2.00	0.02	0.32	0.02	0.00	0.33	82.55
84.00	10.0	11.9	15.5	0.2	1.87	0.02	0.33	0.02	0.00	0.34	82.55
79.00	8.8	10.5	13.7	0.2	1.74	0.02	0.33	0.02	0.00	0.35	82.49
74.00	7.7	9.1	11.9	0.1	1.61	0.02	0.34	0.02	0.00	0.36	81.88
69.00	6.6	7.9	10.3	0.1	1.48	0.02	0.35	0.02	0.00	0.37	81.28
67.00	6.2	7.4	9.7	0.1	1.43	0.02	0.35	0.02	0.00	0.37	81.04
67.00	6.2	7.4	9.7	0.1	1.43	0.01	0.32	0.02	0.00	0.33	82.55
64.00	5.7	6.7	8.8	0.1	1.36	0.01	0.32	0.02	0.00	0.33	82.55
60.17	5.0	5.9	7.8	0.1	1.27	0.01	0.32	0.02	0.00	0.34	82.55

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case ICE + WIND

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
59.00	4.8	5.7	7.4	0.1	1.24	0.01	0.32	0.02	0.00	0.34	82.55
54.00	4.0	4.8	6.2	0.1	1.13	0.01	0.32	0.02	0.00	0.34	82.55
49.00	3.3	3.9	5.1	0.1	1.02	0.01	0.33	0.02	0.00	0.34	82.31
44.00	2.6	3.1	4.1	0.0	0.91	0.01	0.33	0.02	0.00	0.35	81.78
39.00	2.0	2.4	3.2	0.0	0.80	0.02	0.33	0.02	0.00	0.35	81.25
37.00	1.8	2.2	2.9	0.0	0.76	0.02	0.33	0.02	0.00	0.35	81.04
37.00	1.8	2.2	2.9	0.0	0.76	0.02	0.35	0.02	0.00	0.36	81.46
34.00	1.5	1.8	2.4	0.0	0.69	0.02	0.35	0.02	0.00	0.36	81.14
29.42	1.1	1.4	1.8	0.0	0.59	0.02	0.35	0.02	0.00	0.37	80.66
29.00	1.1	1.3	1.7	0.0	0.58	0.02	0.35	0.02	0.00	0.37	80.61
24.00	0.8	0.9	1.2	0.0	0.48	0.02	0.35	0.02	0.00	0.37	80.08
19.00	0.5	0.6	0.7	0.0	0.37	0.02	0.35	0.02	0.00	0.37	79.56
14.00	0.3	0.3	0.4	0.0	0.27	0.02	0.36	0.02	0.00	0.37	79.03
9.00	0.1	0.1	0.2	0.0	0.17	0.02	0.36	0.02	0.00	0.37	78.50
4.00	0.0	0.0	0.0	0.0	0.08	0.02	0.36	0.02	0.00	0.38	77.97
0.00	0.0	0.0	0.0	0.0	0.00	0.02	0.36	0.02	0.00	0.38	77.55

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case T+S

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
169.00	12	-10	16	0	59	70	91	148
167.00	14	-12	18	0	80	95	124	295
167.00	35	-29	46	7	240	286	373	481
164.00	46	-39	60	7	273	325	424	708
159.00	68	-57	88	7	329	393	513	1104
157.50	75	-63	98	7	347	414	540	1226
157.50	110	-92	144	7	1988	2369	3093	6154
154.00	211	-177	275	7	2029	2418	3157	6449
149.00	358	-300	467	7	2092	2493	3254	6888
149.00	358	-300	467	7	2091	2491	3252	6888
147.00	418	-351	546	7	2117	2522	3292	7070
147.00	465	-390	606	7	3733	4448	5807	12001
144.00	626	-525	816	7	3769	4491	5863	12283
139.00	897	-753	1171	7	3833	4567	5962	12767
137.50	980	-822	1279	7	3854	4592	5995	12915
137.50	1001	-840	1307	7	4846	5774	7538	16669
134.00	1245	-1044	1625	7	4886	5823	7601	17029
129.00	1597	-1340	2085	7	4951	5900	7703	17559
127.50	1703	-1429	2223	7	4974	5927	7737	17720
127.50	1737	-1457	2267	7	6529	7780	10157	22666
124.00	2065	-1733	2696	7	6566	7824	10214	23061
119.00	2537	-2129	3312	7	6622	7892	10302	23642
114.00	3014	-2529	3934	7	6683	7965	10397	24242
111.00	3301	-2770	4309	7	6732	8022	10472	24606
111.00	3301	-2770	4309	7	6721	8010	10456	24613
109.00	3494	-2932	4561	7	6748	8042	10498	25204
105.50	3833	-3217	5004	7	6805	8109	10586	26252
104.00	3980	-3339	5195	7	6817	8124	10605	26523
99.00	4470	-3751	5835	7	6882	8201	10706	27432
94.00	4965	-4166	6482	7	6947	8279	10808	28371
89.00	5465	-4586	7134	7	7013	8358	10910	29339
84.00	5970	-5009	7793	7	7079	8437	11013	30339
79.00	6479	-5437	8458	7	7146	8516	11117	31368
74.00	6994	-5868	9130	7	7212	8595	11220	32427
69.00	7513	-6304	9807	7	7286	8684	11336	33513
67.00	7722	-6479	10080	7	7323	8727	11393	33952
67.00	7722	-6479	10080	7	7311	8713	11374	33958
64.00	8037	-6743	10491	7	7356	8767	11444	35381
60.17	8442	-7084	11020	7	7422	8845	11546	37228
59.00	8566	-7188	11182	7	7428	8852	11556	37536

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case T+S

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
54.00	9100	-7636	11880	7	7494	8931	11659	38855
49.00	9640	-8089	12584	7	7560	9010	11762	40208
44.00	10183	-8545	13294	7	7626	9088	11863	41596
39.00	10732	-9005	14010	7	7698	9174	11976	43015
37.00	10953	-9190	14298	7	7734	9217	12032	43589
37.00	10953	-9190	14298	7	7720	9200	12010	43594
34.00	11285	-9469	14732	7	7756	9243	12065	45329
29.42	11796	-9898	15399	7	7827	9327	12176	48020
29.00	11843	-9937	15460	7	7818	9317	12162	48148
24.00	12405	-10409	16194	7	7872	9382	12247	49647
19.00	12971	-10884	16932	7	7924	9444	12328	51179
14.00	13540	-11362	17676	7	7973	9502	12404	52746
9.00	14113	-11842	18423	7	8020	9558	12477	54346
4.00	14690	-12326	19176	7	8070	9618	12555	55980
0.00	15153	-12715	19781	7	8134	9694	12654	57304

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case T+S

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
169.00	22.5	26.8	35.0	0.4	1.82	0.00	0.00	0.00	0.00	0.01	82.55
167.00	22.0	26.2	34.2	0.4	1.82	0.00	0.00	0.00	0.00	0.01	82.55
167.00	22.0	26.2	34.2	0.4	1.82	0.00	0.01	0.00	0.00	0.01	82.55
164.00	21.3	25.3	33.1	0.4	1.82	0.00	0.01	0.00	0.00	0.01	82.55
159.00	20.0	23.9	31.2	0.4	1.81	0.00	0.01	0.00	0.00	0.01	82.55
157.50	19.7	23.4	30.6	0.4	1.81	0.00	0.01	0.00	0.00	0.01	82.55
157.50	19.7	23.4	30.6	0.4	1.81	0.00	0.01	0.01	0.00	0.02	82.55
154.00	18.8	22.4	29.3	0.4	1.80	0.00	0.02	0.01	0.00	0.03	82.55
149.00	17.6	21.0	27.4	0.3	1.78	0.00	0.04	0.01	0.00	0.04	82.55
149.00	17.6	21.0	27.4	0.3	1.78	0.00	0.04	0.01	0.00	0.04	82.55
147.00	17.1	20.4	26.7	0.3	1.77	0.00	0.04	0.01	0.00	0.04	82.55
147.00	17.1	20.4	26.7	0.3	1.77	0.01	0.04	0.01	0.00	0.05	82.55
144.00	16.4	19.6	25.6	0.3	1.75	0.01	0.06	0.01	0.00	0.06	82.55
139.00	15.3	18.2	23.7	0.3	1.71	0.01	0.08	0.01	0.00	0.08	82.55
137.50	14.9	17.8	23.2	0.3	1.70	0.01	0.08	0.01	0.00	0.09	82.55
137.50	14.9	17.8	23.2	0.3	1.70	0.01	0.08	0.02	0.00	0.09	82.55
134.00	14.1	16.8	22.0	0.2	1.66	0.01	0.10	0.02	0.00	0.10	82.55
129.00	13.0	15.5	20.3	0.2	1.61	0.01	0.11	0.02	0.00	0.12	82.12
127.50	12.7	15.1	19.8	0.2	1.59	0.01	0.12	0.02	0.00	0.13	81.87
124.00	12.0	14.3	18.6	0.2	1.54	0.01	0.14	0.02	0.00	0.15	81.28
119.00	10.9	13.0	17.0	0.2	1.47	0.01	0.16	0.02	0.00	0.17	80.43
114.00	10.0	11.9	15.5	0.1	1.39	0.01	0.18	0.02	0.00	0.19	79.59
111.00	9.4	11.2	14.7	0.1	1.34	0.01	0.19	0.02	0.00	0.20	79.08
111.00	9.4	11.2	14.7	0.1	1.34	0.01	0.13	0.01	0.00	0.14	82.55
109.00	9.1	10.8	14.1	0.1	1.31	0.01	0.14	0.01	0.00	0.14	82.55
105.50	8.5	10.1	13.2	0.1	1.27	0.01	0.14	0.01	0.00	0.15	82.55
104.00	8.2	9.8	12.8	0.1	1.25	0.01	0.15	0.01	0.00	0.15	82.55
99.00	7.4	8.8	11.5	0.1	1.18	0.01	0.15	0.01	0.00	0.16	82.55
94.00	6.6	7.9	10.3	0.1	1.11	0.01	0.16	0.01	0.00	0.17	82.55
89.00	5.9	7.0	9.2	0.1	1.04	0.01	0.16	0.01	0.00	0.17	82.55
84.00	5.2	6.2	8.1	0.1	0.97	0.01	0.17	0.01	0.00	0.18	82.55
79.00	4.6	5.5	7.1	0.1	0.91	0.01	0.17	0.01	0.00	0.18	82.49
74.00	4.0	4.8	6.2	0.0	0.84	0.01	0.18	0.01	0.00	0.19	81.88
69.00	3.5	4.1	5.4	0.0	0.77	0.01	0.18	0.01	0.00	0.19	81.28
67.00	3.3	3.9	5.1	0.0	0.75	0.01	0.18	0.01	0.00	0.19	81.04
67.00	3.3	3.9	5.1	0.0	0.75	0.01	0.16	0.01	0.00	0.17	82.55
64.00	3.0	3.5	4.6	0.0	0.71	0.01	0.17	0.01	0.00	0.17	82.55
60.17	2.6	3.1	4.1	0.0	0.66	0.01	0.17	0.01	0.00	0.17	82.55
59.00	2.5	3.0	3.9	0.0	0.65	0.01	0.17	0.01	0.00	0.17	82.55

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case T+S

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
54.00	2.1	2.5	3.2	0.0	0.59	0.01	0.17	0.01	0.00	0.18	82.55
49.00	1.7	2.0	2.7	0.0	0.53	0.01	0.17	0.01	0.00	0.18	82.31
44.00	1.4	1.6	2.1	0.0	0.47	0.01	0.17	0.01	0.00	0.18	81.78
39.00	1.1	1.3	1.7	0.0	0.42	0.01	0.17	0.01	0.00	0.18	81.25
37.00	1.0	1.1	1.5	0.0	0.40	0.01	0.17	0.01	0.00	0.18	81.04
37.00	1.0	1.1	1.5	0.0	0.40	0.01	0.18	0.01	0.00	0.19	81.46
34.00	0.8	1.0	1.3	0.0	0.36	0.01	0.18	0.01	0.00	0.19	81.14
29.42	0.6	0.7	0.9	0.0	0.31	0.01	0.18	0.01	0.00	0.19	80.66
29.00	0.6	0.7	0.9	0.0	0.30	0.01	0.18	0.01	0.00	0.19	80.61
24.00	0.4	0.5	0.6	0.0	0.25	0.01	0.18	0.01	0.00	0.19	80.08
19.00	0.2	0.3	0.4	0.0	0.19	0.01	0.18	0.01	0.00	0.19	79.56
14.00	0.1	0.2	0.2	0.0	0.14	0.01	0.19	0.01	0.00	0.19	79.03
9.00	0.1	0.1	0.1	0.0	0.09	0.01	0.19	0.01	0.00	0.20	78.50
4.00	0.0	0.0	0.0	0.0	0.04	0.01	0.19	0.01	0.00	0.20	77.97
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.19	0.01	0.00	0.20	77.55

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case Seismic

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
169.00	6	-5	7	0	28	33	43	181
167.00	7	-6	9	0	44	52	68	357
167.00	15	-12	19	1	70	84	109	590
164.00	18	-15	24	1	92	110	144	862
159.00	26	-22	34	1	125	149	194	1337
157.50	29	-24	38	1	134	159	208	1484
157.50	37	-31	48	1	498	593	775	7489
154.00	62	-52	81	1	516	615	802	7842
149.00	100	-84	130	1	537	640	835	8368
149.00	100	-84	130	1	536	639	834	8368
147.00	115	-97	150	1	543	647	845	8585
147.00	121	-101	158	1	745	887	1158	14591
144.00	153	-128	200	1	752	896	1170	14926
139.00	207	-174	270	1	761	907	1184	15503
137.50	224	-188	292	1	763	909	1187	15682
137.50	225	-189	293	1	820	977	1275	20235
134.00	266	-223	347	1	821	978	1277	20661
129.00	325	-272	424	1	819	976	1275	21290
127.50	342	-287	447	1	819	976	1274	21484
127.50	342	-287	446	1	803	957	1249	27491
124.00	382	-320	499	1	797	949	1239	27953
119.00	439	-368	573	1	786	937	1223	28634
114.00	495	-415	646	1	773	921	1203	29341
111.00	528	-443	689	1	767	914	1193	29777
111.00	528	-443	689	1	765	912	1190	29777
109.00	549	-461	717	1	753	897	1171	30479
105.50	587	-492	766	1	733	873	1140	31731
104.00	602	-505	786	1	726	865	1129	32046
99.00	654	-548	853	1	708	844	1102	33122
94.00	704	-591	919	1	694	827	1080	34233
89.00	753	-632	983	1	685	816	1065	35381
84.00	802	-673	1047	1	682	812	1060	36564
79.00	851	-714	1111	1	685	816	1065	37784
74.00	901	-756	1176	1	693	826	1079	39039
69.00	951	-798	1241	1	707	843	1100	40331
67.00	971	-815	1268	1	715	852	1112	40858
67.00	971	-815	1268	1	713	850	1109	40858
64.00	1002	-841	1308	1	736	877	1145	42556
60.17	1044	-876	1362	1	769	917	1197	44765
59.00	1057	-887	1379	1	773	921	1202	45126

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Forces and Moments for Pole in the Local Element Coordinate System

Loading Case Seismic

Dist. From Base (ft)	Mx (in-kips)	My (in-kips)	Resultant Mx & My (in-kips)	Torsion (in-kips)	Shear X-Dir. (lbs)	Shear Y-Dir. (lbs)	Resultant Shear (lbs)	Axial (lbs)
54.00	1113	-934	1453	1	794	946	1236	46695
49.00	1170	-982	1528	1	816	973	1270	48305
44.00	1230	-1032	1605	1	838	999	1304	49956
39.00	1291	-1083	1685	1	862	1027	1341	51649
37.00	1315	-1104	1717	1	872	1039	1357	52337
37.00	1315	-1104	1717	1	870	1037	1354	52337
34.00	1353	-1136	1767	1	898	1070	1397	54408
29.42	1414	-1186	1846	1	943	1123	1466	57630
29.00	1419	-1191	1853	1	942	1123	1466	57777
24.00	1488	-1248	1942	1	963	1148	1498	59560
19.00	1557	-1307	2033	1	984	1172	1530	61386
14.00	1629	-1367	2126	1	1003	1196	1561	63252
9.00	1701	-1427	2221	1	1020	1216	1587	65160
4.00	1775	-1489	2317	1	1033	1231	1607	67108
0.00	1834	-1539	2394	1	1039	1239	1617	68697

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case Seismic

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
169.00	3.0	3.6	4.7	0.0	0.27	0.00	0.00	0.00	0.00	0.01	82.55
167.00	2.9	3.5	4.6	0.0	0.27	0.00	0.00	0.00	0.00	0.01	82.55
164.00	2.8	3.4	4.4	0.0	0.27	0.00	0.00	0.00	0.00	0.01	82.55
159.00	2.6	3.2	4.1	0.0	0.27	0.00	0.00	0.00	0.00	0.01	82.55
157.50	2.6	3.1	4.0	0.0	0.27	0.00	0.00	0.00	0.00	0.01	82.55
154.00	2.5	2.9	3.8	0.0	0.27	0.00	0.01	0.00	0.00	0.01	82.55
149.00	2.3	2.7	3.6	0.0	0.26	0.00	0.01	0.00	0.00	0.01	82.55
149.00	2.3	2.7	3.6	0.0	0.26	0.00	0.01	0.00	0.00	0.01	82.55
147.00	2.2	2.6	3.5	0.0	0.26	0.00	0.01	0.00	0.00	0.02	82.55
147.00	2.2	2.6	3.5	0.0	0.26	0.01	0.01	0.00	0.00	0.02	82.55
144.00	2.1	2.5	3.3	0.0	0.25	0.01	0.01	0.00	0.00	0.02	82.55
139.00	2.0	2.3	3.0	0.0	0.24	0.01	0.02	0.00	0.00	0.02	82.55
137.50	1.9	2.3	3.0	0.0	0.24	0.01	0.02	0.00	0.00	0.03	82.55
134.00	1.8	2.1	2.8	0.0	0.23	0.01	0.02	0.00	0.00	0.03	82.55
129.00	1.6	2.0	2.6	0.0	0.22	0.01	0.02	0.00	0.00	0.03	82.12
127.50	1.6	1.9	2.5	0.0	0.22	0.01	0.02	0.00	0.00	0.03	81.87
127.50	1.6	1.9	2.5	0.0	0.22	0.01	0.02	0.00	0.00	0.04	81.87
124.00	1.5	1.8	2.3	0.0	0.21	0.01	0.03	0.00	0.00	0.04	81.28
119.00	1.4	1.6	2.1	0.0	0.19	0.01	0.03	0.00	0.00	0.04	80.43
114.00	1.2	1.5	1.9	0.0	0.18	0.01	0.03	0.00	0.00	0.04	79.59
111.00	1.2	1.4	1.8	0.0	0.17	0.01	0.03	0.00	0.00	0.04	79.08
111.00	1.2	1.4	1.8	0.0	0.17	0.01	0.02	0.00	0.00	0.03	82.55
109.00	1.1	1.3	1.7	0.0	0.17	0.01	0.02	0.00	0.00	0.03	82.55
105.50	1.0	1.2	1.6	0.0	0.16	0.01	0.02	0.00	0.00	0.03	82.55
104.00	1.0	1.2	1.6	0.0	0.16	0.01	0.02	0.00	0.00	0.03	82.55
99.00	0.9	1.1	1.4	0.0	0.15	0.01	0.02	0.00	0.00	0.03	82.55
94.00	0.8	1.0	1.3	0.0	0.14	0.01	0.02	0.00	0.00	0.03	82.55
89.00	0.7	0.9	1.1	0.0	0.13	0.01	0.02	0.00	0.00	0.03	82.55
84.00	0.6	0.8	1.0	0.0	0.12	0.01	0.02	0.00	0.00	0.03	82.55
79.00	0.6	0.7	0.9	0.0	0.11	0.01	0.02	0.00	0.00	0.03	82.49
74.00	0.5	0.6	0.8	0.0	0.10	0.01	0.02	0.00	0.00	0.03	81.88
69.00	0.4	0.5	0.6	0.0	0.09	0.01	0.02	0.00	0.00	0.03	81.28
67.00	0.4	0.5	0.6	0.0	0.09	0.01	0.02	0.00	0.00	0.03	81.04
67.00	0.4	0.5	0.6	0.0	0.09	0.01	0.02	0.00	0.00	0.03	82.55
64.00	0.4	0.4	0.6	0.0	0.09	0.01	0.02	0.00	0.00	0.03	82.55
60.17	0.3	0.4	0.5	0.0	0.08	0.01	0.02	0.00	0.00	0.03	82.55
59.00	0.3	0.4	0.5	0.0	0.08	0.01	0.02	0.00	0.00	0.03	82.55
54.00	0.3	0.3	0.4	0.0	0.07	0.01	0.02	0.00	0.00	0.03	82.55
49.00	0.2	0.2	0.3	0.0	0.06	0.01	0.02	0.00	0.00	0.03	82.31

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3
Deflections and Stresses for Pole

Loading Case Seismic

*** Deflections and Stresses ***

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction	Effective Yield Strength (ksi)
44.00	0.2	0.2	0.3	0.0	0.06	0.01	0.02	0.00	0.00	0.03	81.78
39.00	0.1	0.2	0.2	0.0	0.05	0.01	0.02	0.00	0.00	0.03	81.25
37.00	0.1	0.1	0.2	0.0	0.05	0.01	0.02	0.00	0.00	0.03	81.04
37.00	0.1	0.1	0.2	0.0	0.05	0.01	0.02	0.00	0.00	0.03	81.46
34.00	0.1	0.1	0.2	0.0	0.04	0.01	0.02	0.00	0.00	0.03	81.14
29.42	0.1	0.1	0.1	0.0	0.04	0.01	0.02	0.00	0.00	0.03	80.66
29.00	0.1	0.1	0.1	0.0	0.04	0.01	0.02	0.00	0.00	0.03	80.61
24.00	0.0	0.1	0.1	0.0	0.03	0.01	0.02	0.00	0.00	0.03	80.08
19.00	0.0	0.0	0.0	0.0	0.02	0.01	0.02	0.00	0.00	0.03	79.56
14.00	0.0	0.0	0.0	0.0	0.02	0.01	0.02	0.00	0.00	0.03	79.03
9.00	0.0	0.0	0.0	0.0	0.01	0.01	0.02	0.00	0.00	0.03	78.50
4.00	0.0	0.0	0.0	0.0	0.00	0.01	0.02	0.00	0.00	0.03	77.97
0.00	0.0	0.0	0.0	0.0	0.00	0.01	0.02	0.00	0.00	0.03	77.55

MINIMUM DEFLECTION RATIO // DEFLECTION LIMIT / DEFLECTION // IS

BY VALMONT INDUSTRIES FOR: STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT DATE 12/11/2019
Design Id: 455836R3 IMPAX 22.5.10.3

F L A N G E A N A L Y S I S

FLANGE FOR THE D - E JOINT : SIZED FOR SHAFT MOMENT CAPACITY

Input Data

Applied Reactions

Resultant Moment	=	14,656	in-kips
Torsion	=	0	in-kips
Resultant Shear	=	0	lbs
Axial	=	0	lbs

Bolts

Number of Bolts	=	20	
Bolt Diameter	=	1.50	in
Bolt Material	=	A325	
Bolt Circle	=	31.88	in

Flange

Outside Diameter	=	35.63	in
Thickness	=	2.000	in
Yield Strength	=	50	ksi
Tensile Strength	=	65	ksi
Valmont Material Spec.	=	S-56	

Tube

No. of sides	=	18	
Design Diameter	=	27.089	in
Detailed "D" Sect. Dia	=	27.136	in
Detailed "E" Sect. Dia	=	27.041	in
Thickness	=	0.3125	in
Thickness for M. Cap.	=	0.3125	in
Yield	=	65	ksi

Results

Bolts

Maximum Bolt Axial Force	=	91,942	lbs
Maximum Bolt Shear	=	940	lbs
Tensile Strength	=	105	ksi
Axial Capacity	=	111,038	lbs
Axial Stress	=	65,207	psi
Shear Capacity	=	76,540	lbs
Shear Stress	=	0	psi
Combined Stress Ratio	=	0.69	

Flange

Weight	=	376	lbs
Controlling Stress	=	Bending	
Maximum Stress Ratio	=	0.49	
Bending Stress Ratio	=	0.49	
Shear Stress Ratio	=	0.41	
Bearing Stress Ratio	=	0.01	

*** BOLT COORDINATES ***

BOLT NO.	X-COORD	Y-COORD		BOLT NO.	X-COORD	Y-COORD
1	15.94	0.00	*	2	15.16	4.93
3	12.90	9.37	*	4	9.37	12.90
5	4.93	15.16	*	6	0.00	15.94

NUMBER OF BOLTS	DIAMETER (IN.)	LENGTH (IN.)	WEIGHT (KIPS)	SHIPPED AS	PROJECTION LENGTH (IN.)	GALVANIZED LENGTH (IN.)	THREAD SIZE
32	1.750	66.00	2.03	BOLTS, TEMPLATES	9.75	66.00	5-UNC-2A

STEEL SPEC. VALMONT	STEEL SPECIF.	MAXIMUM BOLT FORCE (KIPS)	MAXIMUM BOLT SHEAR FORCE (KIPS)	FACTORED NOMINAL TENS. STRENGTH (KIPS)	STRESS AREA (SQ. IN.)	INTERACTION VALUE	CONFIGURATION OF BOTTOM END
S23	A615	144.77	2.00	152.00	1.90	0.98	THREADED WITH HEAVY HEX HEAD NUT

NOTE: BOLT INTERACTION VALUE WAS CALCULATED BY DIVIDING SHEAR FORCE BY FACTOR RELATED TO DETAIL TYPE d) IN EIA-G SPECS.

*** BOLT COORDINATES (IN.) ***

BOLT NO.	X-COORD	Y-COORD	*	BOLT NO.	X-COORD	Y-COORD
1	34.625	0.000	*	2	33.960	6.755
3	31.989	13.250	*	4	28.790	19.237
5	24.484	24.484	*	6	19.237	28.790
7	13.250	31.989	*	8	6.755	33.960
9	0.000	34.625	*			

MAX. BOLT CIRCLE = 69.25 IN. TEMPLATE DIAMETER = 72.75 IN.

*** BASE PLATE CHARACTERISTICS GOVERNED BY LOADING CASE WIND ***

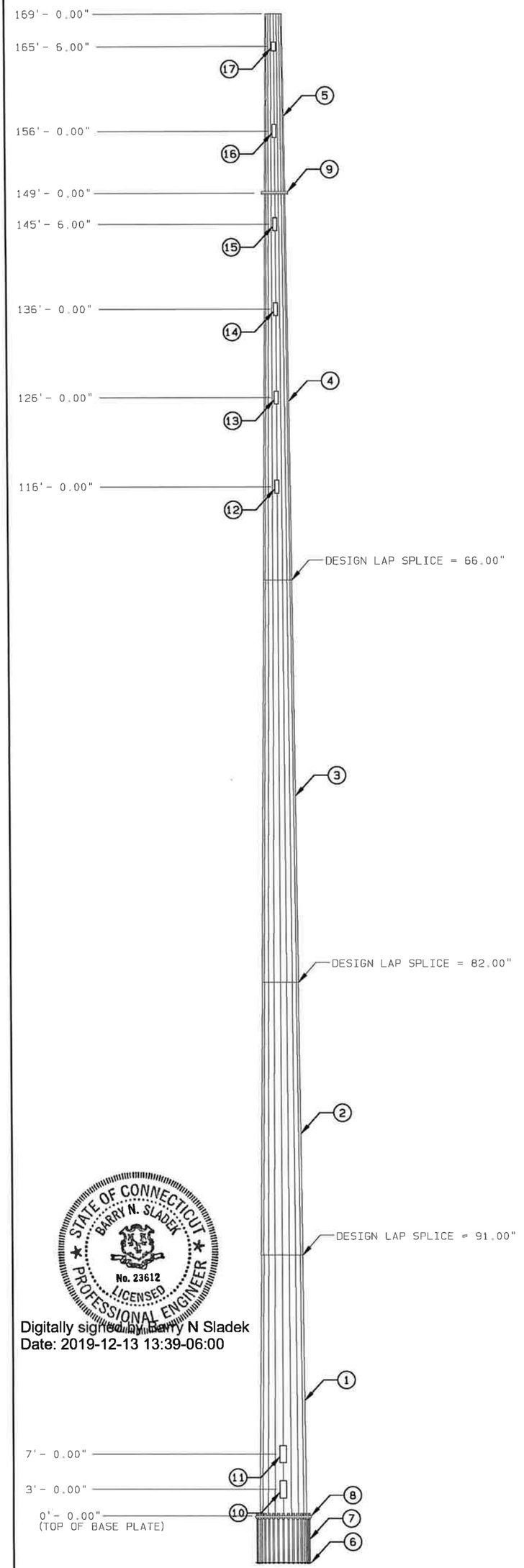
BASE PLATE DIAMETER (IN.)	BASE PLATE THICKNESS (IN.)	ACTUAL WEIGHT (KIPS)	RAW MATERIAL WEIGHT (KIPS)	POLE DIAM. (MAJOR DIAM.) (IN.)
74.76	2.75	2.56	4.29	62.50

EFFECTIVE PLATE WIDTH (IN.)	PLASTIC SECTION MOD. (CU. IN.)	MOMENT IN BASE PLATE (IN. -K)	PLASTIC MOMENT (IN. -K)	FACTORED RESISTING MOM. (IN. -K)
6.14	11.60	488.58	580.04	522.03

STEEL SPECIF. VALMONT	STEEL SPECIF. OTHER	EFFECTIVE YIELD STRESS (KSI)	STRESS RATIO
S56	A572	50	0.94

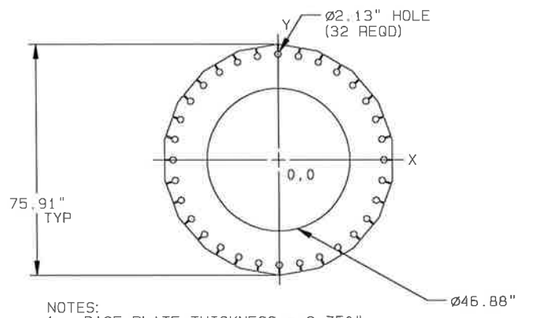
** LOADS AT POLE BASE IN THE GLOBAL COORDINATE SYSTEM ********** LOADING CASES **********

LOADING CASE IDENTIFICATION	WIND	ICE + WIND	T+S	Seismic	]MAX CRITERION-	LOAD CASE
MOMENT ABT. X-AXIS (IN-KIP)	76996	28967	15152	1833	]MOMENT ABT. X	WIND
MOMENT ABT. Y-AXIS (IN-KIP)	-64607	-24306	-12714	-1538	]MOMENT ABT. Y	WIND
SHEAR FORCE (LB.)	63850	23948	12634	1613	]RES. MOMENT	WIND
VERTICAL FORCE (LB.)	70244	110835	57308	68697	]SHEAR FORCE	WIND
					]BOLT FORCE	WIND
					]BOLT TENSION	WIND



ITEM ID	NO. REQD	FEATURES	UNIT WEIGHT (LBS)	WEIGHT (LBS)
1	1	SECTION A VALMONT S-22 0.500" THK (A572 GR65)	11,407	11,407
2	1	SECTION B VALMONT S-22 0.500" THK (A572 GR65)	10,255	10,255
3	1	SECTION C VALMONT S-22 0.438" THK (A572 GR65)	10,082	10,082
4	1	SECTION D VALMONT S-22 0.313" THK (A572 GR65)	4,721	4,721
5	1	SECTION E VALMONT S-22 0.313" THK (A572 GR65)	1,625	1,625
6	1	BOTTOM CAGE PLATE	137	137
7	32	1.75" ANCHOR BOLT, LENGTH=5.50' A615 GR75	64	2,029
8	1	BASE PLATE VALMONT S-56 2.750" THK (A572 GR50)	2,557	2,557
9	2	FLANGE PLATE	376	752
	1	TOP CAGE PLATE (REMOVE BEFORE SETTING POLE)	181	181
	20	BOLT 1.50" DIA		
	1	SAFETY CLIMBING CABLE (LENGTH = 159.00')	113	113
	3	GROUNDING LUG	2	6
		GALVANIZING	617	617
	126	STEP AND CLIP (VALMONT STANDARD)	1	63
10	2	HAND HOLE HVY (9" x 24")	66	132
11	2	HAND HOLE HVY (9" x 24")	66	132
12	3	HAND HOLE STD (6" x 18")	18	54
13	3	HAND HOLE STD (6" x 18")	18	54
14	3	HAND HOLE STD (6" x 18")	18	54
15	3	HAND HOLE STD (6" x 18")	18	54
16	3	HAND HOLE STD (6" x 18")	18	54
17	2	HAND HOLE STD (6" x 12")	22	44
	1	POLE CAP	25	25

HOLE COORDS (INCHES)	
X-COORD	Y-COORD
34.63	0.00
33.96	6.76
31.99	13.25
28.79	19.24
24.48	24.48
19.24	28.79
13.25	31.99
6.76	33.96
0.00	34.63



NOTES:
1. BASE PLATE THICKNESS = 2.750"
2. BASE PLATE ALLOWABLE STRESS (KSI) = 50
3. ANGLES ARE MEASURED CLOCKWISE FROM 0 DEGREES
4. BOLT CIRCLE DIAMETER = 69.25"
5. CAGE TEMPLATE DIAMETER = 72.75"

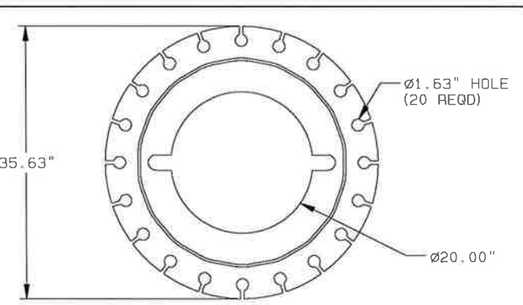
BASE PLATE / ANCHORAGE CHARACTERISTICS

NOTES:

1. FACTORED REACTIONS FOR FOUNDATION DESIGN.
   MOMENT = 100,512 IN-KIPS
   SHEAR = 63,850 #
   VERTICAL = 72,802 #
2. GALVANIZED PER ASTM A-123.
3. DESIGN CRITERIA: ANSI/TIA 222-G ADDENDUM 2
4. THIS STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING LOADING:
   EXPOSURE CATEGORY = C
   STRUCTURE CLASSIFICATION = 2
   TOPOGRAPHY CATEGORY = 1
   EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS Ss = 0.17
   EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT ONE SECOND S1 = 0.06
   EARTHQUAKE SITE CLASS = C
   WIND LOAD CASES ARE BASED ON 3 SECOND GUST AND 50 YEAR WIND RETURN PERIOD
   A. CASE 1: WIND = 101 MPH WIND SPEED
   B. CASE 2: WIND = 50 MPH ICE AND WIND SPEED
      DESIGN ICE THICKNESS = 0.75 INCH
   C. CASE 3: WIND = 60 MPH WIND SPEED
   D. CASE 4: SEISMIC
   E. EQUIPMENT

DESCRIPTION	ABP MTG HT. (FT)	ABP CENTROID HT. (FT)	WITHOUT ICE EPA (FT**2)	WITHOUT ICE WT (LBS)	WITH ICE EPA (FT**2)	WITH ICE WT (LBS)
1-SP1 F3P-12[W] + F3P-HRK12	137.50	139.00	30.90	2404	43.97	3568
6-RRU (15"X15"X10")	137.50	139.00	7.50	228	9.24	354
1-SP1 F4P-12[W] + F4P-HRK12	157.50	159.00	44.27	3143	62.45	4753
12-PANEL ANTENNA (96"X18"X8")	157.50	159.00	134.76	960	167.64	2520
12-RRU (15"X15"X10")	157.50	159.00	15.00	456	18.48	708
1-SP1 F4P-12[W] + F4P-HRK12	147.00	149.00	44.27	3143	62.45	4753
12-PANEL ANTENNA (96"X18"X8")	147.00	149.00	134.76	960	167.52	2520
12-RRU (15"X15"X10")	147.00	149.00	15.00	456	18.48	708
1-SP1 F4P-12[W] + F4P-HRK12	127.50	129.00	44.27	3143	62.45	4753
12-PANEL ANTENNA (96"X18"X8")	127.50	129.00	134.76	960	167.28	2520
12-RRU (15"X15"X10")	127.50	129.00	15.00	456	18.48	708
1-21' LRE WITH 7'-6" LIGHTNIN	169.00	183.25	6.98	151	19.53	535
2-WHIP (3" X 22')	167.00	178.00	13.20	120	28.84	586
2-36" STANDOFF	167.00	167.00	6.56	74	11.60	312
12-QUINTEL QS6656-5	137.50	139.00	82.44	1128	106.20	4584
1-RAYCAP RXXDC-3315-PF-48	137.50	139.00	2.01	32	2.53	121
3-RAYCAP RXXDC-3315-PF-48	157.50	159.00	4.98	96	6.45	366
3-RAYCAP RXXDC-3315-PF-48	147.00	149.00	4.98	96	6.45	366
3-RAYCAP RXXDC-3315-PF-48	127.50	129.00	4.98	96	6.42	360

5. FEEDLINES ARE PLACED INTERIOR TO POLE SHAFT (UNLESS NOTED OTHERWISE).
6. TOTAL POLE HEIGHT IS 170 FT AGL.
7. ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE (APPROX. 1 FT AGL).
8. 18 SIDED SHAFT
9. 150 FT POLE EXTENDABLE TO 170 FT.



NOTES:
1. TOP PLATE THICKNESS = 2.000"
2. TOP PLATE ALLOWABLE STRESS (KSI) = 65
3. (20) 1.5" BOLTS, F3125 A325 GR50
4. BOLT CIRCLE DIAMETER = 31.88"

TOP/BOTTOM FLANGE PLATES

STATE OF CONNECTICUT
BARRY N. SLADEK
No. 23612
LICENSED
PROFESSIONAL ENGINEER

Digitally signed by Barry N Sladek
Date: 2019-12-13 13:39:06:00

SECTION INFORMATION					
ITEM ID	LENGTH	BASE OD	TOP OD	THK	MATL
1	37'- 0.00"	62.50"	53.09"	0.500"	A572 65 KSI
2	37'- 7.00"	56.02"	46.45"	0.500"	A572 65 KSI
3	50'-10.00"	49.07"	36.13"	0.438"	A572 65 KSI
4	43'- 6.00"	38.16"	27.09"	0.313"	A572 65 KSI
5	20'- 0.00"	27.09"	22.00"	0.313"	A572 65 KSI

REV ID	DATE	REV BY	DESCRIPTION
B	12/09/19	JA70	ALL-POINTS INDEPENDENT REVIEW REVISIONS
A	08/12/19	JA70	REVISED LOADING

ORDER	PROJECT	FILE ID	SCALE	DATE	ENGR
455836		455836R3	NONE	12/11/19	JA70

DESCRIPTION
STRUCTURE CONSULTING 150 FT / 170 FT POLE SITE: LEBANON CENTER, CT

valmont

valmont
MICROFLECT

VALMONT/MICROFLECT
3575 25TH ST. SE – P.O. BOX 12985
SALEM, OR 97302-1190
PHONE: 1-800-547-2151
ENGINEER:JVA
Reviewed by:NAR

SLAB FOUNDATION DESIGN CALCULATIONS

Digitally signed by Barry N Sladek
Date: 2019-12-13 13:45-06:00

Valmont Order No.: 455836-P1
Customer: Structure Consulting
Site: Lebanon Center, CT
Pole Ht: 169 FT (170 FT AGL)

valmont MICROFLECT **Pole Foundation Mat Design**

SLAB DESIGN Date: 12/11/19 Time: 15:21
Project: 455836-P1 Run by: JVA
Input (Blue): Checked by: NAR

legs	1		1 = Pole \ 3 or 4 = Tower
otm_t	8376	k-ft	total pole overturning moment
sh_t	63.85	k	total pole shear
sh_l	63.85	k	
wt	54.60	k	total pole weight * 0.9
f_w	5.77	ft	anchor bolt circle dia
b	32.00	ft	slab width (rigid square slab only)
t	42.00	in	slab thickness
net_p_a	10.00	ksf	ultimate soil bearing pressure
s_f	1.00		allowable stress increase factor (rebar)
c_h	90.00	in	cap height above slab
c_s	96.00	in	cap dia
d_f	10.50	ft.	depth from final grade to bottom of footing
d_fl	84.00	in	depth of fill over slab
dens_c	0.086	kcf	density of concrete
dens_s	0.036	kcf	density of soil
dens_fl	0.036	kcf	density of fill over slab
f_c	4,500	psi	concrete compres. strength
c_type			concrete type
f_y	60,000	psi	rebar yield strength
u	1.00		soil factor of safety: qult/qall

Output Summary (see complete calculations below):

s_r	1.03		OK (overturning F.S. OK)
net_p	3.34	ksf	OK (net soil bearing pressure is OK)
vol_c	146.70	cu.yd.	Total volume of concrete.
slab two-way shear:			(punching shear ok)
slab beam shear:			(beam shear ok)

Slab Reinforcement (ASTM A615 Gr.60):

		Size	Quan. (E/W)	Len. (ft)	Spc. (in)	Total (lbs)	
	Top Bar	#4	72	31.50	5.32	3030	<---OK
	Options	#5	47	31.50	8.22	3088	<---OK
y		#6	33	31.50	11.81	3123	<---OK
	As>=14.32	#7	24	31.50	16.43	3091	<---OK
		#8	19	31.50	21.00	3196	
		#9	15	31.50	27.00	3213	
	Bot.Bar	#4	237	31.50	1.60	9974	
	Options	#5	153	31.50	2.49	10053	
		#6	108	31.50	3.53	10220	
	As>=47.38	#7	79	31.50	4.85	10173	<---OK
		#8	60	31.50	6.41	10093	<---OK
y		#9	48	31.50	8.04	10282	<---OK

(special design req'd for cap shear reinforcement)
(special design req'd for cap flexural/tensile reinforcement.)

VALMONT MICROFLECT
3575 25TH STREET SE
SALEM, OR 97302
PHONE: 1-800-547-2151

valmont MICROFLECT

Pole Foundation Mat Design Special Cap Reinforcement

Special Cap Reinforcement:

Projec 455836-P1
Date: 12/11/19

Vertical Reinforcement Size = #	**11**		
Quantity of vertical rebar =	**58**		
Total area of vert. rebar =	91.00	in2	>= 0.005*Acap = 36.19in2, OK
vertical rebar horiz. Spacing =	3.21	in	>= 1.5db and >= 1.5in, OK (ACI)
Factored max moment in cap = M + (V*h_{cap}) =	8870.8	ft-k	(conservatively neglect passive pressure of soil)
Section Modulus of rebar =	2015.1	in^3	
fb = M/S =	52.8	ksi	<=54ksi, OK
Req'd vert. bar dev. length = $(3d_b/40)*(f_y/f'_c{}^{0.5})*(1/2.5)$ =	36.90	in	provide min 37 in vert. rebar dev. length
concrete cover =	**4.00**	in	
length of vert rebar =	10.50	ft	
a =	126.00	in	> 37 in of vert. rebar dev. length OK
d* =	12.00	in	
b =	1.91	ft	
total wt of vert rebar=	3824	lbs	
radius of vert rebar =	42.67	in	
Shear tie rebar size = #	**5**		
vertical spacing =	**12.00**	in	
Factored max shear in cap =	63.9	k	
Concrete shear capacity = 0.85*2*sqrt(f'c)*bw*d =	1007.2	k, OK	
tie diameter (a) =	7.33	ft	
circumference =	23.04	ft	
# of ties =	12.00		
total wt of ties =	288	lbs	
d** =	2.50	in	
6db =	6.25	in	
Anchor Bolt Diameter =	**1.75**	in	
Length Of Anchor Bolts =	**66.00**	in	
Anchor Bolt Projection =	**9.75**	in	
Depth of Pocket to Accommodate Anchor Bolts =	-72.75	in	
Total Depth from Final Grade =	10.50	ft	
Pocket Vol =	0.00	ft^3	

Anchor Bolt Embedment Check

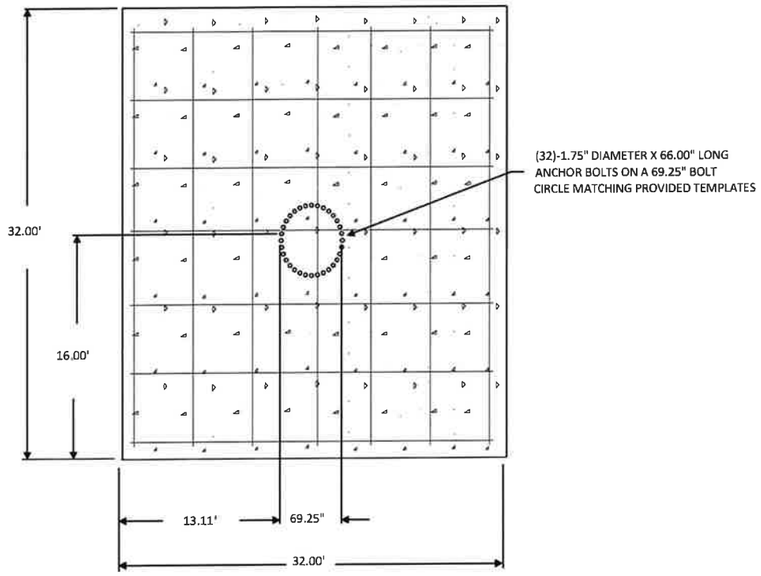
Bolt Length	>	Bolt Required Length
66 in	>	57.8 in ====> OK

REINFORCEMENT STEEL SCHEDULE

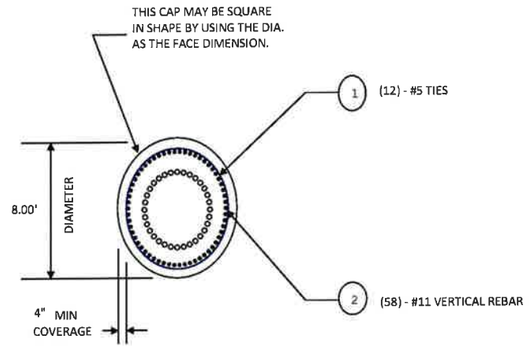
	Sym	Type	Rebar Size	Rebar Spacing	Dimensions a	b	c	d	(6db)	Weight (lbs)	Qty
CAP TIES	1	C	#5	EQUAL	7.33 ft			2.5 in	3.75 in	288	12
CAP VERTICAL REBAR	2	B	#11	-----	10.50 ft	1.91 ft		12 in		3824	58
SLAB TOP STEEL	3	A	#6	11.81 in	31.50 ft					3123	66
SLAB BOTTOM STEEL	4	A	#9	8.04 in	31.50 ft					#####	96
TOTAL STEEL WEIGHT FOR COMPLETE FOUNDATION INSTALLATION =										#####	

TOTAL VOLUME OF CONCRETE FOR FOUNDATION INSTALLATION = 146.70 yd^3

VALMONT MICROFLECT
3575 25TH STREET SE
SALEM, OR 97302
PHONE: 1-800-547-2151



SECTION A-A
No Scale



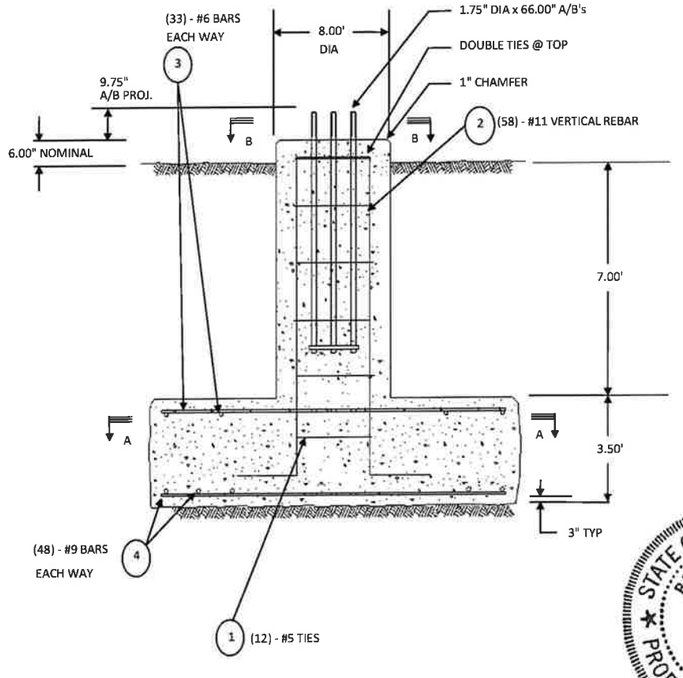
SECTION B-B
No Scale

GENERAL NOTES: SLAB FOUNDATION

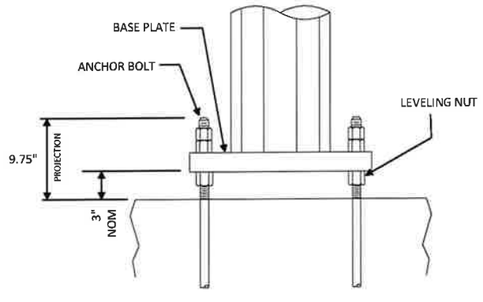
1. Prior to excavation, check the area for underground facilities.
2. All reinforcing shall be deformed bars conforming to ASTM A615 Grade 60 (60,000 psi min. yield) and shall be provided by the foundation contractor.
3. All concrete shall have a minimum compressive strength of 4500 psi @ 28 days. The requirement for the concrete shall be as given in the ACI "Building Code Requirements for Reinforced Concrete", ACI 318, the latest edition.
4. Trowel top of foundation smooth.
5. Concrete shall be placed against undisturbed soil to the depth indicated on the foundation drawing. The portion above grade shall be formed. If an area is excavated beyond the limits shown, this volume shall be filled with concrete or formed. After the forms are removed, the excess excavation shall be replaced and compacted.
6. The ground water was encountered at 1.5' below grade during boring.
7. Foundation design based on ultimate vert. bearing pressure of 10000 psf.
8. Concrete is assumed to weigh 150 pcf (reduced in calcs to account for groundwater).
9. Estimated concrete volume = **146.70 cubic yards total.**
10. Design Based on the following loads from installation drawing for order No: 455836-P1.

Factored Moment = 8376 FT-KIPS **Overturning Safety Factor = 1.03**
Factored Download = 54.6 KIPS **Max. Toe Bearing Pressure = 3.34 ksf**
Factored Shear = 63.9 KIPS

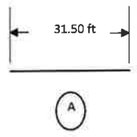
11. Backfill should be compacted to a density of 100 pcf (reduced in calcs to account for groundwater).
12. Anchor bolts to be ASTM A615, Gr. 75 ksi.
13. Reference: Down To Earth Consulting, LLC File No. 0032-006.00 Dated 6/3/19



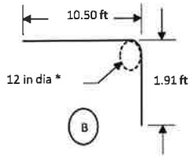
ELEVATION
No Scale

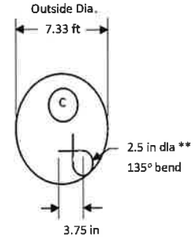


ANCHOR BOLT INSTALLATION
N.T.S.
EXTREME CARE SHOULD BE TAKEN TO ASSURE THAT ALL LEVELING NUTS ARE LEVEL WITH RESPECT TO EACH OTHER PRIOR TO ERECTION OF THE STRUCTURE



REINFORCEMENT STEEL SCHEDULE						
	Sym	Type	Rebar Size	Rebar Spacing	Weight (lbs)	Qty
CAP TIES	1	C	#5	EQUAL	288	12
CAP VERTICAL REBAR	2	B	#11	-----	3824	58
SLAB TOP STEEL	3	A	#6	11.81 in	3123	66
SLAB BOTTOM STEEL	4	A	#9	8.04 in	10282	96
TOTAL STEEL WEIGHT FOR COMPLETE FOUNDATION INSTALLATION =					17517	





Grade 60 Rebar

Size	Ask #	Wt/ft	6db (in)	d* (in)	d** (in)
#3	11-97203	0.38	2.25	2.25	1.50
#4	11-97204	0.67	3.00	3.00	2.00
#5	11-97205	1.04	3.75	3.75	2.50
#6	11-97200	1.50	4.50	4.50	4.50
#7	11-97207	2.04	5.25	5.25	4.25
#8	11-97208	2.67	6.00	6.00	6.00
#9	11-97209	3.40	6.77	9.50	-
#10	11-97210	4.30	7.62	10.75	-
#11	11-97211	5.31	8.46	12.00	-

* Refers to ACI standard hook detail chart
** Refers to ACI stirrup hook detail chart

Rebar Lap Splice

Rebar Size	Rebar Grade	Specified Concrete Strength	Overlap (inches) Vert & Ties	Bottom Horiz	Top Horiz
#3	60	4500 psi	13	15	21
#4	60	4500 psi	18	20	29
#5	60	4500 psi	22	26	36
#6	60	4500 psi	26	33	46
#7	60	4500 psi	38	45	62
#8	60	4500 psi	43	59	82
#9	60	4500 psi	49	74	104
#10	60	4500 psi	58	95	132
#11	60	4500 psi	71	116	163

Splicing is an alternative to specified material listed in rebar schedule.
Lap Splice may be used on ties when Seismic Hook not required.

STATE OF CONNECTICUT
BARRY N. SLADEK
No. 23612
LICENSED PROFESSIONAL ENGINEER

Digitally signed by Barry N Sladek
Date: 2019-12-13 13:44-06:00

Rev	Description	Date	By/Ck
B	Independent review revisions.	12/09/19	JVA
A	Revised loading.	08/12/19	JVA

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
X° - ± 1/16"
X.XX" - ± 1/10"
.XX" - ± 1/64"

valmont MICROFLECT
3575 25TH STREET SE SALEM, OR 97302
MAIN (503) 363-9267
FAX (503) 316-2040

By:	JVA
Check:	NAR
Date:	12/11/19

SLAB FOUNDATION LAYOUT
Customer Structure Consulting
Site Lebanon Center, CT

S.O. 455836-P1 | SIZE - B | **Dwg No. CT455836FS** | Sheet 1 of 1

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

GEOTECHNICAL ENGINEERING REPORT
PROPOSED TELECOMMUNICATIONS TOWER
LEBANON CENTER CT
917 EXETER ROAD, LEBANON, CONNECTICUT

Prepared for:

All-Points Technologies Corporation, P.C.
3 Saddlebrook Drive
Killingworth, Connecticut 06419

APT Filing No. NY141NB 7950

Prepared by:

Down To Earth Consulting, LLC
122 Church Street
Naugatuck, Connecticut 06770

File No. 0032-006.00
June 3, 2019

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

June 3, 2019
File No. 0032-006.00

Mr. Robert C. Burns
All-Points Technology Corporation
3 Saddlebrook Drive
Killingworth, Connecticut 06419

Via email: rburns@allpointstech.com

Re: Geotechnical Engineering Report
Proposed Telecommunications Tower
917 Exeter Road, Lebanon, Connecticut

Down To Earth Consulting, LLC (DTE) is pleased to submit this geotechnical engineering report for the proposed telecommunications tower on 917 Exeter Road, Lebanon, Connecticut (Site) for All-Points Technologies Corporation, P.C. (Client). Our services were completed in general accordance with our Master Services Agreement, dated January 22, 2018. We appreciate this opportunity to work with you. Please call if you have any questions.

Sincerely,

Down To Earth Consulting, LLC

Raymond P. Janeiro, P.E.
Principal

Daniel LaMesa, P.E.
Reviewer/Principal

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

Down To Earth Consulting, LLC, completed a subsurface exploration program and geotechnical engineering evaluation for the proposed telecommunications tower at the referenced Site. Our geotechnical engineering services included: reviewing project plans, observing test borings, obtaining soil resistivity measurements, characterizing subsurface conditions within the structure limits, performing geotechnical engineering analyses, and providing geotechnical design and construction recommendations for the project. Refer to Figure 1 and 2 (in Appendix 1) for an area plan and site plan, respectively.

Our services were performed in accordance with our July 17, 2018, email proposal, which was based in part on the provided drawings (*Verizon at Lebanon Center CT,* sheet numbers SP-1 and LE-2, prepared by the Client, revision dated 05/17/2017). We were also provided with a *Topographic Survey*, prepared by Gesick & Associates, P.C., dated August 28, 2017.

Elevations (El.) stated in this report are in feet and based on the North American Vertical Datum of 1988 (NAVD 88), unless otherwise noted. Our recommendations are based on allowable stress design methods and the 2018 Connecticut State Building Code which references the 2015 International Building Code.

2.0 BACKGROUND

The Site is located behind the Lyman Memorial High School building about 350 feet and is generally bordered by an animal pasture to the west, a small farm to the north, and undeveloped land to the south and east. Existing Site grades are relatively level at about El. 506+/-. Existing Site conditions in the area of proposed improvements generally consist of an undeveloped, forested area with surrounding wetlands.

The project consists of constructing a 150-foot monopole telecommunications tower and associated equipment cabinets within a 50-foot by 50-foot fenced compound with a gravel wearing surface. Tower and equipment platform loads were not provided to DTE at the time of writing this report. It's anticipated that nominal cuts and fills on the order of 1-foot or less will be needed to achieve design grades and that no significant slopes will be required. Refer to the Site and Exploration Location Plan (Figure 2) for additional proposed development details.

3.0 SUBSURFACE DATA

3.1 GENERAL SITE GEOLOGY

Published surficial and bedrock geological map data (*1:125,000 scale, Surficial Materials Map of Connecticut, Janet Radway Stone, 1992 and Bedrock Geological Map of Connecticut, John Rodgers, 1985*) was reviewed. The Site surficial material is mapped as glacial till consisting of a variable mixture of gravel, sand, silt, and clay that is intermixed with cobbles and boulders. The underlying bedrock is classified as gray, fine- to medium-grained schist (Scotland Formation).

3.2 EXPLORATIONS

We observed and logged one test boring (B-1) and two test probes (P-1 and P-2) drilled by our subcontractor New England Boring Contractors, Inc. on May 11, 2019. Exploration locations are depicted on Figure 2 (Appendix 1) and the logs are included in Appendix 2. Exploration locations were located in the field by taping/pacing from existing site features. The approximate ground surface elevation was estimated from the referenced topographic survey. Exploration locations and their elevations should be considered approximate.

The boring was drilled to explore the soil, bedrock, and groundwater conditions in the proposed tower area. Rotary drilling methods were used to advance the boring to a depth of approximately 16 feet (approximate El. 490) below existing grades. Upon encountering drilling refusal at a depth of approximately 11 feet bgs, a rock core sample was obtained to aid in bedrock confirmation and evaluating the type and quality of bedrock. The core samples were drilled using a five foot, double-barrel, NQ-size core barrel. The core times were recorded every foot of core length and rock quality was determined using visual classification.

Representative soil samples were obtained from the boring for soil classification by split barrel sampling procedures in general accordance with ASTM D-1586. The split-spoon sampling procedure utilizes a standard 2-inch O.D. split-barrel sampler that is driven into the bottom of the boring with a 140-pound hammer falling a distance of 30 inches. The number of blows required to advance the sampler the middle 12-inches of a normal 24-inch penetration is recorded as the Standard Penetration Resistance Value (N). The blows (i.e., "N-Value") are indicated on the boring logs at their depth of occurrence and provide an indication of the relative consistency of the material.

The test probes were advanced using 3-inch outside diameter solid-stem augers to a depth of 9 feet below grade. The objective of the probes was to asses soil consistency within the area of the proposed equipment pads.

Groundwater levels were measured using a weighted tape in open exploration holes during drilling.

4.0 SUBSURFACE CONDITIONS

4.1 SUBSURFACE PROFILE

The generalized subsurface profile in the area of the proposed telecommunications compound, as inferred from the subsurface exploration data, is summarized as follows:

- Subsoil: Loose, orange-brown, silty SAND, containing trace amounts of roots (SM)
  – 2 to 3 feet thick (to about El. 503 to 504); over

- Gravelly Sand: Dense, gray, well-graded SAND with gravel (SW)
  – about 8 feet thick in B-1 (to about El. 495); over

- Schist Bedrock - A core barrel was advanced within the Bedrock stratum in B-1 (to about El. 490). Bedrock was classified as hard, fresh, gray Schist. The core recovery and rock quality designation (RQD), was 93% and 70%, respectively, indicating a fair rock mass quality.

Visual classifications of soil samples, and conditions encountered at each exploration location can be found in the provided exploration logs, included as Appendix 2.

4.2 GROUNDWATER

Groundwater levels were measured in the explorations at the times and under the conditions stated on the logs. Groundwater was measured at about 1.5 to 3.5 feet (approximate El. 502.5 to 504.5) below existing grades. Water was measured at 1 foot below grade (El. 505+/-) in the standpipe at a former test pit excavation located about 15 feet west from B-1. Groundwater levels measured in the explorations may not have had sufficient time to stabilize and should be considered approximate.

Groundwater levels will vary depending on factors such as temperature, season, precipitation, construction activity, and other conditions, which may be different from those at the time of these measurements. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

4.3 SOIL RESISTIVITY TESTING

On May 11, 2019, DTE field personnel conducted in-situ soil resistivity testing in accordance with accepted engineering practices using the Wenner electrode configuration. Electrodes were spaced at 5, 10, 20, 30 and 40 feet. A set of two approximately perpendicular resistivity lines were completed in the general vicinity of the proposed tower location. The approximate locations and orientations of the resistivity lines are shown on the attached Figure 2.

The results of the resistivity tests are as follows:

	Resistivity (ohm-cm)	
Electrode Spacing (ft)	Line 1	Line 2
5	82,728	84,738
10	121,794	122,943
20	201,075	212,565
30	245,311	260,248
40	297,208	278,824

Field resistivity results may be influenced by boulders and shallow groundwater/bedrock. Resistivity results will also fluctuate depending on the degree of compaction, moisture content, constituent solubility, and temperature. Field resistivity values may also vary depending upon season, precipitation, and other conditions that may differ from those at the time of testing.

5.0 GEOTECHNICAL DESIGN AND CONSTRUCTION RECOMMENDATIONS

5.1 GEOTECHNICAL EVALUATION

Based on the results of our subsurface investigation, it is our opinion the proposed 150-foot steel monopole telecommunications tower may be supported on a monolithic mat or a pier-and-pad foundation bearing on undisturbed, natural Gravelly Sand Deposits, or on Structural Fill (hereinafter specified as Compacted Granular Fill (CGF)) or Crushed Stone placed over a prepared native Gravelly Sand subgrade. Alternatively, the telecommunications tower may be supported on a drilled shaft foundation extending into competent Bedrock.

Design recommendations and construction considerations for the recommended foundation systems are presented in the following sections.

5.2 SEISMIC DESIGN

Based on the standard penetration test results, visual soil classification, and design peak ground acceleration at this locale, the site soils are not susceptible to liquefaction.

We recommend using the following design parameters as defined by the Building Code:

- Site Class: C (Section 1613.3.2 of the IBC)
- MCE spectral response accelerations: S_s = 0.173g and S_1 = 0.062g (Building Code Appendix N)
- Site Coefficients: F_a = 1.2 and F_v = 1.7 (IBC Table 1613.3.3 (1 and 2))
- Seismic design parameters: S_{MS} = 0.208 and S_{M1} = 0.105 (IBC Equation 16-37 and 16-38); S_{DS} = 0.138 and S_{D1} = 0.070 (IBC Equation 16-39 and 16-40)

5.3 TOWER FOUNDATION DESIGN RECOMMENDATIONS

5.3.1 Shallow Foundation (Mat/Pad) Alternative

The proposed monopole telecommunications tower may be supported on a mat or pad-and-pier foundation bearing on proof-rolled Gravelly Sand, or CGF or Crushed Stone placed on above a proof-rolled Gravelly Sand subgrade. Crushed Stone, if used, should be separated from soil subgrades, excavation sidewalls and backfill using a geotextile separation fabric.

DTE recommends a maximum net allowable bearing pressure of 5 kips per square foot (ksf). Foundations should be embedded a minimum of 42 inches below final grades for frost protection. The total settlement is anticipated to be less than 1 inch and differential settlement to be less than 0.5 inches. Foundation settlement will depend on the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the foundation, the thickness of compacted fill, and the quality of earthwork operations.

We recommend an ultimate passive pressure coefficient (Kp) of 3.0. Calculated passive pressures should be reduced by a minimum factor of safety of 3, to reflect the amount of movement required to mobilize the passive resistance. We also recommend an ultimate coefficient of sliding friction of 0.5. A factor of safety of at least 1.5 should be applied to calculated sliding resistance.

To summarize, we recommend the following static design parameters:

DESCRIPTION	VALUE
Maximum Net Allowable Bearing Pressure	5 kips per square foot (ksf)
Minimum Foundation Width	Isolated Spread Footing/ Mat Foundation: 3 feet
Minimum Embedment Below Finished Grade	42 inches
Estimated Total Settlement	<1 inch
Estimated Differential Settlement	<½ inch
Total Soil Unit Weight	125 pounds per cubic foot
Ultimate Passive Pressure Coefficient, Kp	3.0
Ultimate Coefficient of Sliding Friction	0.5

Uplift resistance for the tower foundation may be computed as the sum of the weight of the foundation element and the weight of the soil overlying the foundation. We recommend using a soil unit weight of 100 pounds per cubic foot for CGF overlying the foundation.

5.3.2 Shallow Foundation (Mat/Pad) Construction Recommendations

The proposed mat/pad foundation and associated equipment areas should be cleared of existing vegetation and grubbed. Cobbles, boulders, and any deleterious materials should be removed. Existing fill (including re-worked parent materials), and other unsuitable materials, must be removed from beneath footing zones of influence to the top of firm, natural Gravelly Sand prior to construction. Over-excavation below foundations should include the zone of influence, defined as the area beneath 1 horizontal to 1 vertical (1H:1V) lines extending downward and outward from footing edges. Footings shall bear on a prepared subgrade of firm natural Gravelly Sand, or CGF or Crushed Stone (over firm natural Gravelly Sand). Refer to Section 6.0 - Materials and Compaction for material placement recommendations.

Earthwork should be performed in dry conditions so that disturbance to foundation subgrades is limited. During earthwork, the Contractor should be responsible for protecting subgrades from the elements and maintaining the soils in a suitable state until completion of the project. Backfill should not be placed over a subgrade with standing water or that is frozen. Standing water, if present, should be removed and any soft and yielding soil should be removed prior to backfill placement. Excavations to subgrade levels should be performed using a smooth-edged bucket to minimize possible disturbance to the in-place subgrade soils.

Soil subgrades should be proof-rolled under the observation of a qualified Geotechnical Engineer with at least four (4) passes of a smooth-drum vibratory roller (minimum 8,000 pounds, minimum centrifugal force of 12,500 pounds) or, where approved by the geotechnical engineer, a vibratory plate compactor with a minimum of 2,500 pounds of centrifugal force. Any soft or loose zones identified during proof-rolling should be excavated and replaced with CGF, as necessary, and as required by the Geotechnical Engineer.

5.3.3 Deep Foundation (Drilled Shaft) Alternative

DTE recommends the following static design parameters for a drilled shaft foundation alternative:

DESCRIPTION	VALUE
Maximum Net Allowable Bearing Capacity Bedrock	10 ksf
Allowable Bond Value[2] Bedrock	100 pounds per square inch (psi)
Coefficient of Lateral Subgrade Reaction[3] Gravelly Sand Bedrock	50 (z/d) kips per cubic foot (kcf) 100 (z/d) kcf
Angle of Internal Friction Gravelly Sand Bedrock	34 45
Total Soil Unit Weight Gravelly Sand Bedrock	125 pounds per cubic foot (pcf) 160 pcf
Minimum Drilled Shaft Diameter	Diameter of Monopole Base
Allowable Deflection at Top of Shaft	0.5 inch

1. The allowable end bearing capacity assumes that loose, disturbed soil/rock has been removed from the base of the shaft. End-bearing in a rock socket should be neglected for design due to the movement required to mobilize side resistance in a drilled shaft is less than the movement required to mobilize end-bearing resistance; therefore, ultimate bond values should be used to design the drilled shaft foundation.
2. Grout-to-ground values are provided (i.e., no permanent casing is assumed). Allowable values are based on a factor of safety of 2. Contribution to shaft capacity from soil above a depth of 3.5 feet should be ignored. The uplift capacity should be based on the dead weight of the shaft and side resistance provided by the subsurface soils. It's assumed that applied loading will not have a significant Poissons-effect on the shaft.
3. z = depth below ground surface (feet); d = diameter of shaft (feet).

We anticipate that the design length of the shaft will be primarily dependent on the embedment/lateral capacity required to resist live loading. The drilled shaft will be subject to tension loads and therefore should have reinforcing steel that extend through the entire length of the shaft.

5.3.4 Deep Foundation (Drilled Shaft) Construction Recommendations

Technical specifications should be prepared by the design team that require detailed material and construction submittals and proof of experience in drilled shaft installation by the specialty Contractor. The drilling method or combination of methods selected by the contractor should be submitted for review by the geotechnical engineer, prior to mobilization of drilling equipment.

A section of temporary casing is recommended to reduce the likelihood of caving of the side walls of the shaft hole. Concrete should be placed by directing the concrete down the center of the shaft to reduce the likelihood of hitting the reinforcing steel and segregating. Groundwater, if encountered in the shaft, should be removed prior to placing concrete; alternatively, concrete may be placed by tremie methods.

5.4 EQUIPMENT PLATFORM FOUNDATIONS

The proposed equipment cabinets and accessory structures may be designed as slabs-on-grade bearing on a base course of at least 12-inches of CGF or Crushed Stone overlying densified native soils as described in Section 5.3.2. Alternatively, the equipment platforms can be founded on drilled shaft foundations.

5.4.1 Equipment Platform Slab-on-Grade Foundations

We recommend a maximum net allowable bearing pressure of 2 kips per square foot (ksf) for slab design. Frost walls should be embedded a minimum of 42 inches below final grades for frost protection. Alternatively, dense insulation boards could be used under lightly loaded slabs-on-grade to reduce frost penetration.

The total settlement is expected to be less than 1 inch and differential settlement to be less than 0.5 inches. We recommend an ultimate coefficient of sliding friction of 0.5 (except if insulation boards are used to minimize frost penetration). A factor of safety of at least 1.5 should be applied to calculated sliding resistance.

The design subgrade modulus for the recommended subgrade and base course is 250 pounds per cubic inch.

5.4.2 Equipment Platform Drilled Shaft Foundations

We recommend a maximum allowable soil bearing capacity of 4 kips per square foot (ksf) for piers end bearing on Gravelly Sand. Based on anticipated loads and the recommended soil bearing capacity, the anticipated total and differential settlement is less than one inch and one-half inch, respectively. Bottom of piers must be constructed at a minimum depth of 42-inches below final site grades. We recommend a minimum pier diameter of 12 inches. Construction operations should be planned to mitigate disturbance to the final subgrade. The base of pier excavations should be free of water and loose soils prior to placing concrete.

6.0 MATERIALS RECOMMENDATIONS

6.1 ON-SITE MATERIALS

Based on our visual soil classifications, existing Site soils *may* satisfy the requirements for CGF. Excavated soils could also be reused as Common Fill during Site development. If during construction excavated materials are planned for reuse, gradation analyses and Modified Proctor Test (ASTM D-1577, Method C) should be performed on representative soil samples and the results submitted to the Geotechnical Engineer for review and approval.

6.2 COMPACTED GRANULAR FILL

Compacted Granular Fill (CGF) for use as structural fill shall consist of inorganic soil free of clay, loam, ice and snow, tree stumps, roots, and other organic matter; graded within the following limits:

Sieve Size	Percent finer by weight
3-inches	100%
1/2-inch	50 - 85
No. 4	40 - 75
No. 50	8 - 28
No. 200	0 – 12

6.3 CRUSHED STONE

Crushed Stone for use below foundations and slabs shall consist of sound, tough, durable, rock that is graded within the following:

Sieve Size	Percent finer by weight
5/8-inches	100%
1/2-inch	85 - 100
3/8 inch	15 - 45
No. 4	0 - 15
No. 8	0 - 5

6.4 COMMON FILL

Common Fill may be used for general site grading, and other areas as appropriate, or as directed by the Geotechnical Engineer or his/her representative. The material should not be used beneath sensitive structures. Common Fill should conform to the following gradation requirements:

Sieve Size	Percent finer by weight
6-inches	100%
No. 200	0 - 25

6.5 MATERIAL COMPACTION

CGF should be placed in loose lifts not exceeding 8 inches in depth and compacted to at least 95 percent of its maximum dry density (and within 2% of optimum moisture content) as determined by ASTM D1557, Method C (Modified Proctor).

Common Fill should also be placed in loose lifts not exceeding 8 inches in depth, and compacted to at least 92 percent of its maximum dry density.

Crushed Stone is considered to be "self-compacting" and would negate the need to run laboratory proctor testing and have field density testing of in-place lifts. The crushed stone should be plate compacted to "chink up" the working surface in lifts. We recommend placing Crushed Stone in maximum 12-inch lifts and compacting the lifts with a minimum of four passes with a vibratory plate compactor weighing a minimum of 1,000 pounds and with a minimum centrifugal force of 10,000 pounds.

6.6 GEOTEXTILE FABRIC

Geotextile fabric used as a separation fabric for crushed stone and soil material should meet the following criteria:

Property	Criteria	Test Method
Grab Strength	min. 80lbs	ASTM D4632
Static (CBR) Puncture	min. 50lbs	ASTM D6241
Trapezoid Tear	min. 25lbs	ASTM D4533
Apparent Opening Size	No. 70-100 U.S. Sieve Size	ASTM D4751

Fabric should be needle-punched non-woven material. Seams should be overlapped a minimum of six inches. During stone placement, the stone drop height should not exceed three feet and equipment traffic should be kept off the fabric until at least 6 to 12 inches of material is placed.

7.0 ADDITIONAL CONSTRUCTION RECOMMENDATIONS

Permanent slopes (though not anticipated) may be needed to develop the proposed compound area. We recommend slopes be constructed no steeper than 3 Horizontal to 1 Vertical (3H:1V). Permanent slope surfaces should be vegetated and protected with erosion mats until the vegetation is established. Grading should be designed to reduce the likelihood of water ponding near the proposed structures.

Based on information obtained from the subsurface exploration program, the proposed foundations and slabs-on-grade will be constructed at or below the groundwater table and construction dewatering should be anticipated. Stormwater runoff should not be permitted to accumulate on/within exposed subgrades and the runoff should be directed away from the exposed subgrade areas.

Where space permits and as needed, temporary slopes no steeper than 1.5H:1V appear to be appropriate. Excavation geometry should conform to OSHA excavation regulations contained in 29 CFR Part 1926. Temporary earth support is not anticipated for the excavations. If needed, temporary

earth support systems should be designed by a Professional Engineer registered in the State of Connecticut.

8.0 REVIEW OF FINAL DESIGN, PLANS, AND SPECIFICATIONS

When project plans are finalized, and specifications are available, they should be provided to DTE for review of conformance with our geotechnical recommendations. If any changes are made to the proposed structure locations or elevations, the recommendations provided in this report will need to be verified by DTE for applicability.

9.0 CONSTRUCTION QUALITY CONTROL

We further recommend that DTE be retained during earthwork construction to observe excavation to footing subgrade, subgrade preparation, and fill placement and compaction in accordance with Building Code requirements. The geotechnical engineer in the field should observe the work for compliance with the recommendations in this report, identify changes in subsurface conditions from those observed in the explorations should they become apparent, and assist in the development of design changes should subsurface conditions differ from those anticipated prior to the start of construction.

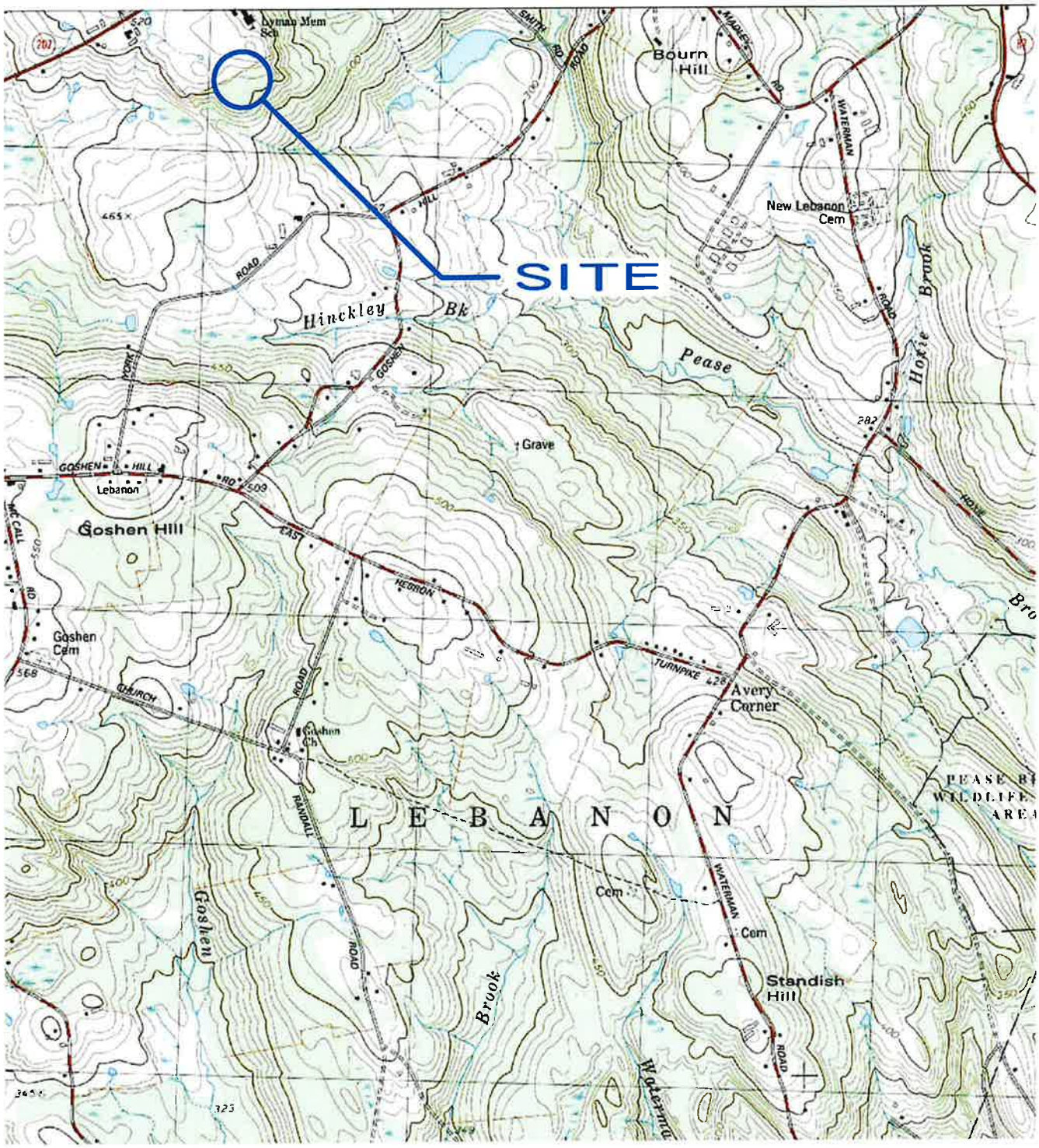
10.0 CLOSURE

We trust the information presented herein is sufficient for your use to progress design of the proposed telecommunications tower and compound equipment. We have enjoyed working with you on this project and look forward to our continued involvement. Please do not hesitate to call us if you have any questions.

This report is subject to the limitations included in Appendix 3.

APPENDIX 1 -

FIGURES



DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING
122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770

CONNECTICUT

QUADRANGLE LOCATION

AREA PLAN
LEBANON CENTER CT
917 EXETER ROAD
LEBANON, CONNECTICUT

REFERENCE:
USGS TOPOGRAPHIC QUADRANGLE: FITCHVILLE, CT

SCALE 1"= 2,000'

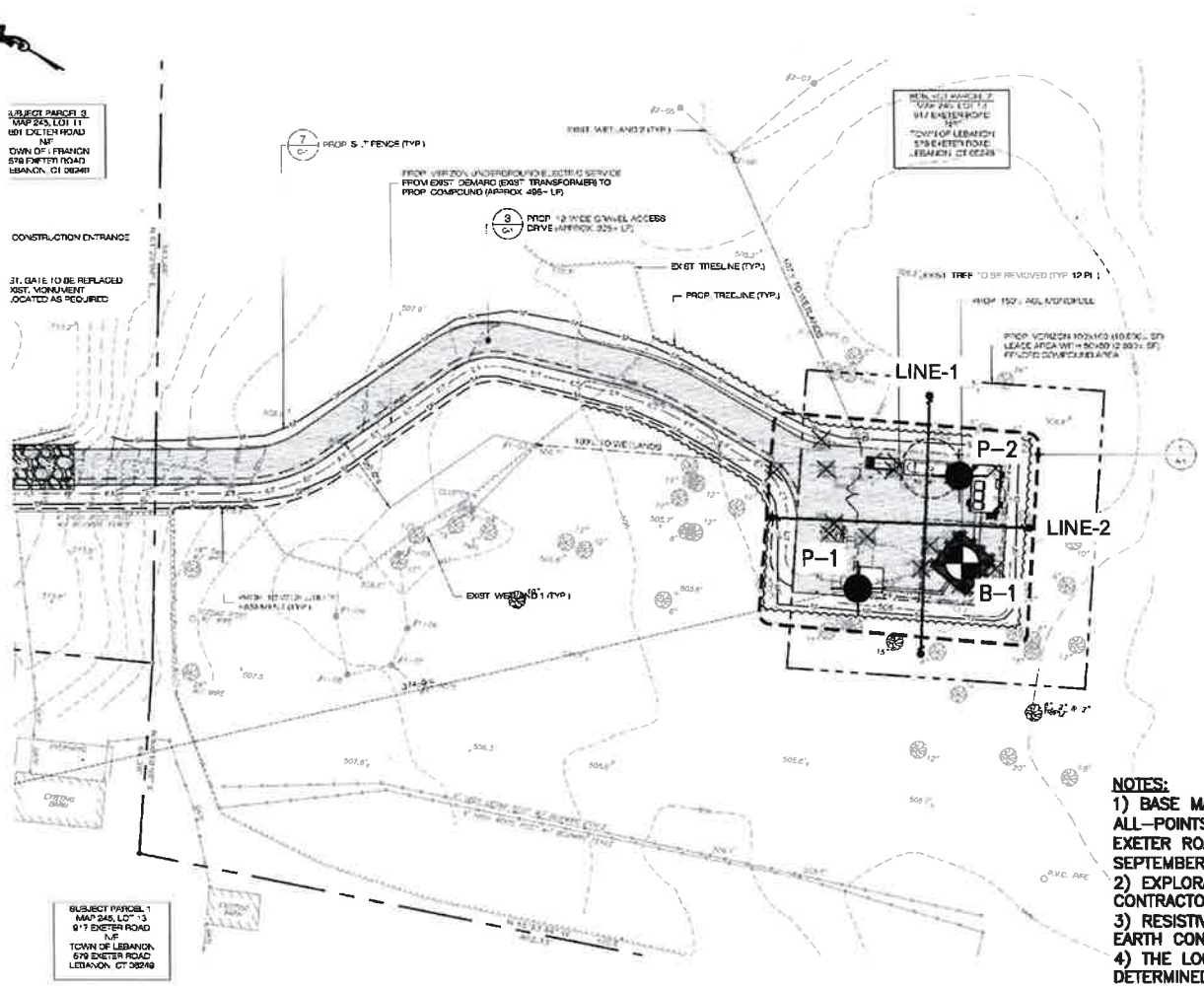
2,000' 1,000' 0 2,000'

PROJECT NO.	0032-006.00
DATE:	06/02/19
FIGURE NO.	1

DRAWN BY: RPJ

REVIEWED BY: RPJ

G:\My Drive\DTE Root Drive\Client Folders\0032 - All-Points Technology\006 - Proposed Monopole, Lebanon, CT\CADD\0032-006.00 AREA AND SITE PLAN.dwg



LEGEND

B-1 — TEST BORING NO. AND LOCATION OBSERVED BY DOWN TO EARTH CONSULTING

P-1 — TEST PROBE NO. AND LOCATION OBSERVED BY DOWN TO EARTH CONSULTING

LINE-1 — RESISTIVITY TEST LOCATION (TYP.)

NOTES:

1) BASE MAP DEVELOPED FROM AN ELECTRONIC FILE PREPARED BY ALL-POINTS TECHNOLOGY CORP., ENTITLED "LEBANON CENTER CT, 917 EXETER ROAD, LEBANON, CT 06249", DRAWING SP-1, REVISION DATED SEPTEMBER 26, 2017. ORIGINAL SCALE 1" = 100'.
2) EXPLORATIONS WERE COMPLETED BY NEW ENGLAND BORING CONTRACTORS, INC. AND OBSERVED BY DOWN TO EARTH CONSULTING, LLC.
3) RESISTIVITY TESTING WAS PERFORMED ON MAY 11, 2019 BY DOWN TO EARTH CONSULTING, LLC.
4) THE LOCATIONS OF THE EXPLORATIONS AND RESISTIVITY TESTING WERE DETERMINED BY TAPING AND VISUAL ESTIMATES FROM EXISTING SITE FEATURES. THESE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

DESIGNED BY OTHERS					
DRAWN BY RPJ					
CHECKED BY DFL					
APPROVED BY RPJ	NO.	DATE	REVISIONS	DRWN.	CHK'D	APPV'D

SCALE 1"= 40'
40' 20' 0 40'

DOWN TO EARTH CONSULTING, LLC
122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770

PROJECT: LEBANON CENTER CT
917 EXETER ROAD
LEBANON, CONNECTICUT

DWG. TITLE: SITE AND EXPLORATION LOCATION PLAN

FILE NO. 0032-008.00
SCALE AS NOTED
DATE 06/02/19
FIGURE NO. 2

G:\My Drive\DTE Root Drive\Client Folders\0032 - All-Points Technology\008 - Proposed Monopole, Lebanon, CT\CADD\0032-008.00 AREA AND SITE PLAN.dwg Ray, 6/2/2019 10:18 PM

APPENDIX 2 -

EXPLORATION LOGS

DOWN TO EARTH CONSULTING, LLC

PROJECT		
VERIZON LEBANON CENTER	BORING NO.	B-1
917 EXETER ROAD	SHEET	1 of 1
	FILE NO.	0032-006.00
LEBANON, CONNECTICUT	CHKD. BY	DFL

Boring Co.	New England Boring Contractors, Inc.	Boring Location	See Boring Location Plan		
Driller	Scott Marino	Ground Surface El.	506'+/-	Datum	NAVD 88
Logged By	Ray Janeiro	Date Start	5/11/2019	Date End	5/11/2019

Sampler Type:	Auto-Hammer
Sampler Size:	1-3/8" I.D. Split Spoon
Type Drill Rig:	D-50 ATV Rig
Drilling Method:	3-inch I.D. FJ Casing

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time
5/11	-	2'	504'+/-	wet sample
5/11	-	3.5'	502.5'+/-	end of drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	STRATA DESCRIPTION
1		S-1	24/8	0 to 2	2-1-2-2		Very loose, orange-brown fine to coarse SAND, some Silt, trace fine Gravel, trace (-) Roots, moist	TOPSOIL/FOREST DEBRIS
2								SUBSOIL
3		S-2	24/15	2 to 4	4-7-11-18		Medium dense, orange-brown to gray fine to coarse SAND, little grading to trace Silt, trace fine Gravel, trace (-) Roots, wet	
4								
5								
6		S-3	24/17	5 to 7	12-11-15-21		Medium dense, gray fine to coarse SAND and GRAVEL, trace Silt, with decomposed schist fragments at sample tip	GRAVELLY SAND
7								
8								
9								
10							Very dense (refusal), gray/brown fine to coarse SAND and GRAVEL, little Silt, with decomposed schist fragments	
11		S-4	8/6	10 to 10.7	52-50/2"			
12								
13					PEN = 60"		Fair Quality, Hard, Fresh, gray, medium- to coarse-grained SCHIST, fracturing 0 to 30 degrees [Core Times (min/ft) = 2, 2, 2, 2, 2]	BEDROCK
14		R-1	60/56	11 to 16	REC = 56"/60" = 93%			
15					RQD = 42"/60" = 70%			
16							END OF BORING @ 16 FEET BELOW GRADE	
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

SPT N-Values	SPT N-Values	Proportions	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	Trace = 1 to 10%	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Solt	Little = 10 to 20%	2. ST denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	Some = 20 to 35%	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	And = 35 to 50%	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff		5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard		6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

FIELD NOTES: 1) Water was measured at 1 fbg (El. 205+/-) in the standpipe at a former test pit excavation located about 15 feet west from boring location.

DOWN TO EARTH CONSULTING, LLC

PROJECT		BORING NO.	P-1
VERIZON LEBANON CENTER		SHEET	1 of 1
917 EXETER ROAD		FILE NO.	0032-006.00
LEBANON, CONNECTICUT		CHKD. BY	DFL

Boring Co.	New England Boring Contractors, Inc.	Boring Location	See Boring Location Plan		
Driller	Scott Marino	Ground Surface El.	506'+/-	Datum	NAVD 88
Logged By	Ray Janeiro	Date Start	5/11/2019	Date End	5/11/2019

Sampler Type	-
Sampler Size	-
Type Drill Rig	D-50 ATV Rig
Drilling Method	3-inch O.D. Solid Stem Augers

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time
5/11	-	1.5'	504.5'+/-	wet spoils

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	STRATA DESCRIPTION
1							8" Forest Debris/Topsoil	SUBSOIL
2								
3							Orange-brown, fine to medium SAND, some Silt, little fine to coarse Gravel, moist	
4								
5							Gray, fine to coarse SAND and GRAVEL, little Silt, with cobbles, wet	GRAVELLY SAND
6								
7								
8								
9								
10							END OF PROBE @ 9 FEET BELOW GRADE	
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

SPT N-Values	SPT N-Values	Proportions	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	Trace = 1 to 10%	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	Little = 10 to 20%	2. ST denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	Some = 20 to 35%	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	And = 35 to 50%	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff		5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard		6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

FIELD NOTES: 1) Auger chatter observed from about 7 to 9 feet below grade (inferred cobbles/boulders).

DOWN TO EARTH CONSULTING, LLC

PROJECT		BORING NO.	P-2
VERIZON LEBANON CENTER		SHEET	1 of 1
917 EXETER ROAD		FILE NO.	0032-006.00
LEBANON, CONNECTICUT		CHKD. BY	DFL

Boring Co.	New England Boring Contractors, Inc.	Boring Location	See Boring Location Plan		
Driller	Scott Marino	Ground Surface El.	506.5'+/-	Datum	NAVD 88
Logged By	Ray Janeiro	Date Start	5/11/2019	Date End	5/11/2019

Sampler Type	-
Sampler Size:	-
Type Drill Rig:	D-50 ATV Rig
Drilling Method	3-inch O.D. Solid Stem Augers

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time
5/11	-	2'	504.5'+/-	wet spoils

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	STRATA DESCRIPTION
1							6" Forest Debris/Topsoil	SUBSOIL
2							Orange-brown, fine to medium SAND, little Silt, little fine to coarse Gravel, moist	
3								
4								
5							Gray, fine to coarse SAND and GRAVEL, little Silt, with cobbles, wet	GRAVELLY SAND
6								
7								
8								
9								
10							END OF PROBE @ 9 FEET BELOW GRADE	
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

SPT N-Values	SPT N-Values	Proportions	SYMBOL KEY	
0 to 4 - Very Loose	0 to 2 - Very Soft	Trace = 1 to 10%	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	Little = 10 to 20%	2. ST denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	Some = 20 to 35%	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	And = 35 to 50%	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff		5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard		6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

FIELD NOTES: 1) Auger chatter observed from about 8 to 9 feet below grade (inferred cobbles).

APPENDIX 3 -

LIMITATIONS

LIMITATIONS

Explorations

1. The analyses and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations by Down To Earth Consulting, LLC (DTE) and others. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the boring logs.

3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, tidal, temperature, and other factors occurring since the time measurements were made.

Review

4. In the event that any changes in the nature, design or location of the proposed structures are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by DTE. It is recommended that this firm be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

Construction

5. It is recommended that this firm be retained to provide soil engineering services during construction of the earthworks and foundation phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

Use of Report

6. This report has been prepared for the exclusive use of All-Points Technology Corporation, P.C. for specific application to the project noted in this geotechnical report in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made.

7. This soil and foundation engineering report has been prepared for this project by DTE. This report is for design purposes only and is not sufficient to prepare an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.

8. This report may contain comparative cost estimates for the purpose of evaluating alternative foundation schemes. These estimates may also involve approximate quantity evaluations. It should be noted that quantity estimates may not be accurate enough for construction bids. Since DTE has no control over labor and materials cost and design, the estimates of construction costs have been made on the basis of experience. DTE does not guarantee the accuracy of cost estimates as compared to contractor's bids for construction costs.