Robinson+Cole

KENNETH C. BALDWIN

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Also admitted in Massachusetts
and New York

October 1, 2021

Via Hand Delivery

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

Re: **Docket No. 489 - Application of The First Taxing District Water Department For A Certificate Of Environmental Compatibility And Public Need For The Construction, Maintenance And Operation Of A Wireless Telecommunications Facility at 173 ½ West Rocks Road, Norwalk, 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 173 ½ West Rocks Road, Norwalk, Connecticut, incorporating the Council's conditions of approval. Also enclosed are three (3) full size (24" x 36") sets of the D&M plans.

2. Tower and Foundation design and calculations prepared by Valmont Structures.

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

Together, this information constitutes the final D&M Plan submission for the approved telecommunications facility at 173 ½ West Rocks Road in Norwalk, 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:
Harry W. Rilling, Norwalk Mayor
Kristen Motel, Esq. (via electronic mail)
Lucia Chiocchio, Esq. (via electronic mail)
Tim Parks, Verizon Wireless (via electronic mail)

FIRST TAXING DISTRICT - NORWALK
173.5 WEST ROCKS ROAD
NORWALK, CT 06851

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

VICINITY MAP
SCALE : 1" = 500'-0"

SITE INFORMATION

SITE TYPE:	PROP. 130'± A.G.L. MONOPOLE TOWER
SCOPE OF WORK:	WIRELESS EQUIPMENT ON A PROP. 130'± A.G.L. MONOPOLE WITHIN NEW IRREGULARLY SHAPED (3518± SF) EQUIPMENT COMPOUND. INSTALLATION OF TWO (2) NEW 500 GAL LPG TANKS AND TWO (2) PROPANE FUELED EMERGENCY STANDBY GENERATORS. EXISTING 110'± A.G.L., 100,000 GAL. ELEVATED WATER TANK TO BE DEMOLISHED (BY OTHERS).
SITE NAME:	FIRST TAXING DISTRICT - NORWALK
SITE ADDRESS:	173.5 WEST ROCKS ROAD NORWALK, CT 06851
JURISDICTION:	CONNECTICUT SITING COUNCIL
COUNTY:	FAIRFIELD
ASSESSOR'S TAX ID#:	MAP: 5, BLOCK 22A, LOT: 18-0
LATITUDE:	41° 08' 36.6271" N (41.14350753° N)
LONGITUDE:	73° 25' 08.2799" W (73.41896665° W)
GROUND ELEVATION:	220.9'± AMSL
PROPERTY OWNER:	FIRST TAXING DISTRICT (WATER DEPARTMENT) 12 NEW CANAAN AVENUE NORWALK, CT 06852
APPLICANT:	FIRST TAXING DISTRICT (WATER DEPARTMENT) 12 NEW CANAAN AVENUE NORWALK, CT 06852
LEGAL:	ROBINSON & COLE, LLP 280 TRUMBULL STREET HARTFORD, CT 06103
SITE ENGINEER:	ALL-POINTS TECHNOLOGY CORP., P.C. 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

MONOPOLE COORDINATES & GROUND ELEVATION INDICATED HEREIN WERE ESTABLISHED FROM AN FAA 1-A SURVEY CERTIFICATION, AS PREPARED BY WILLIAM W. SEYMOUR & ASSOCIATES, P.C. DATED 10.01.19

LIST OF DRAWINGS

GOVERNING CODES
CONNECTICUT STATE BUILDING CODE, LATEST EDITION NATIONAL ELECTRICAL CODE, LATEST EDITION TIA-222-H

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

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

D&M DOCUMENTS

NO	DATE	REVISION
0	09/30/21	FOR FILING: RCB
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5		
6		

DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT
ROBERT CHARLES BURNS
NO. 20071
LICENSED
PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD NORWALK, CT 06851

APT FILING NUMBER: CT544100

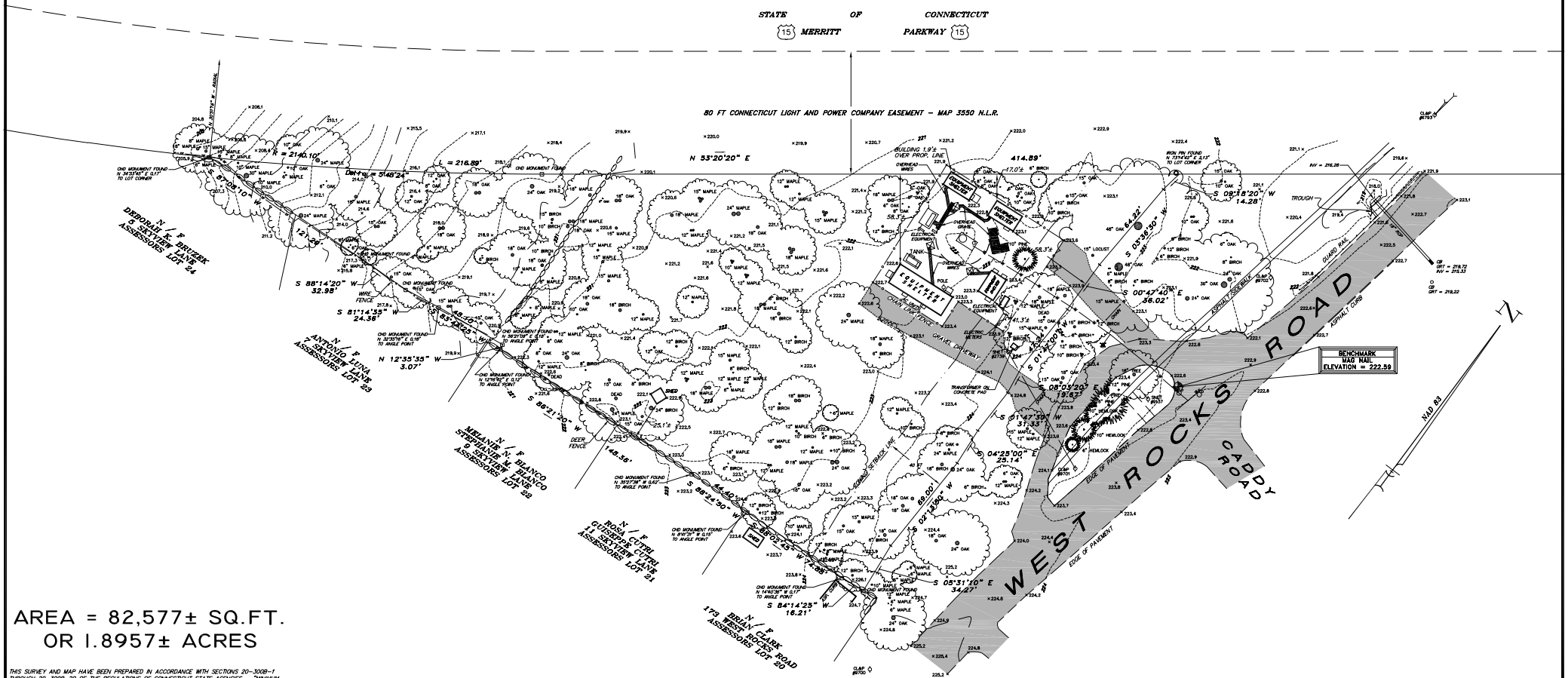
DRAWN BY:CSH

DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:
TITLE SHEET & INDEX

SHEET NUMBER:
T-1

TAX ASSESSORS MAP: 12NE
BLOCK: 22A
LOT: 18
DISTRICT: 5



AREA = 82,577± SQ.FT.
OR 1.8957± ACRES

THIS SURVEY AND MAP HAVE BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED FOR USE BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A ZONING LOCATION AND TOPOGRAPHIC SURVEY THE BOUNDARY DETERMINATION CATEGORY OF WHICH IS A RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "A" – 2', TOPOGRAPHIC ACCURACY CLASS "T-2", VERTICAL ACCURACY CLASS "V" – 2' AND IS INTENDED TO DEPICT OR NOTE THE POSITION OF EXISTING OR PROPOSED IMPROVEMENTS WITH RESPECT TO APPLICABLE MUNICIPAL SETBACK REQUIREMENTS IN ORDER TO ENABLE DETERMINATION OF COMPLIANCE WITH SAID REGULATIONS.

THIS SURVEY WAS PREPARED FOR A SPECIFIC PURPOSE. ANY USE OTHER THAN FOR THAT WHICH WAS INTENDED IS A MISUSE OF THIS INFORMATION AND RENDERS THE PREPARER'S DECLARATION NULL AND VOID.

UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS MAP RENDERS THE PREPARER'S DECLARATION NULL AND VOID.

DISTANCES NOTED +/- FROM BUILDINGS TO PROPERTY LINES ARE FOR REFERENCE PURPOSES ONLY AND ARE NOT TO BE USED TO ESTABLISH PROPERTY BOUNDARIES.

UNDERGROUND IMPROVEMENTS OR ENCROACHMENTS, IF ANY, ARE NOT DEPICTED HEREON.

PROPERTY IS LOCATED IN AN "A – RESIDENCE" ZONE.

REFER TO MAP 3550 OF THE NORWALK LAND RECORDS.

REFER TO A QUIT CLAIM DEED RECORDED IN BK. 365, PG. 140 OF THE NORWALK LAND RECORDS.

INLAND WETLANDS, IF ANY, ARE NOT DEPICTED HEREON. THERE ARE NO WETLANDS ON THIS PROPERTY AS DEPICTED ON THE CITY OF NORWALK INLAND WETLANDS AND WATERCOURSES MAP AMENDED OCTOBER 29, 2009.

PROPERTY IS DEPICTED AS LYING OUTSIDE OF ANY 1% ANNUAL CHANCE FLOOD ZONE BOUNDARY AS NOTED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP 09001C0393G REVISED ON OCTOBER 16, 2013. THIS INFORMATION IS PROVIDED FOR REFERENCE PURPOSES AND DOES NOT NECESSARILY REPRESENT THE ACTUAL POTENTIAL FOR FLOOD DAMAGE TO ANY EXISTING OR PROPOSED STRUCTURES OR IMPROVEMENTS LOCATED ON THIS PROPERTY.

ZONING DATA CHART "A – RESIDENCE" ZONE

	REQUIRED / ALLOWED	EXISTING	PROPOSED
LOT AREA	12,500 SQ. FT.	82,577± SQ. FT.	
LOT WIDTH	100 FT. MIN.	VARIES	
FRONT YARD	40 FT. MIN. (1)	41.3± FT.	
REAR YARD	20% OR 20 FT. MAX.		
SIDE YARD	10 FT. MIN.		
AGGREGATE SIDE YARD	25%		
BUILDING HEIGHT (2)	35 FT.	NOT MEASURED	
	40 FT. MAX. TO PEAK	NOT MEASURED	
# OF STORIES	2 1/2 MAX.	NOT MEASURED	
BUILDING COVERAGE	25% MAX. (20,644 SQ. FT.)	1.6±% (1,280± SQ. FT.)	

(1) SUBJECT TO SECTION 118-900F.

(2) EXCEPT FOR STRUCTURES LOCATED IN FLOOD ZONES A OR V, WHERE ONE (1) ADDITIONAL FOOT IN HEIGHT SHALL BE PERMITTED TO THE MIDPOINT AND TO THE PEAK.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

VERTICAL DATUM: N.A.V.D. 88

ZONING LOCATION & TOPOGRAPHIC SURVEY
173 1/2 WEST ROCKS ROAD
PREPARED FOR

FIRST TAXING DISTRICT WATER DEPARTMENT

NORWALK, CONNECTICUT

SCALE: 1" = 30 FT. APRIL 20, 2016

WILLIAM W. SEYMOUR & ASSOCIATES, P.C.
LAND SURVEYORS ~ ZONING & LAND USE CONSULTANTS
170 NOROTON AVENUE ~ 203-655-3331 ~ DARIEN, CONN. ©

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

Mark S. Lebow Conn. L.L.S. Reg. No. 15564

16-13797

MAP NOTES:

1. THIS SURVEY AND MAP HAVE BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES - "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED FOR USE BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996. IT IS A ZONING LOCATION AND TOPOGRAPHIC SURVEY THE BOUNDARY DETERMINATION CATEGORY OF WHICH IS A RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "A - 2, TOPOGRAPHIC ACCURACY CLASS "T-2, VERTICAL ACCURACY CLASS "V - 2" AND IS INTENDED TO DEPICT OR NOTE THE POSITION OF EXISTING OR PROPOSED IMPROVEMENTS WITH RESPECT TO APPLICABLE MUNICIPAL SETBACK REQUIREMENTS IN ORDER TO ENABLE DETERMINATION OF COMPLIANCE WITH SAID REGULATIONS.
2. THIS SURVEY WAS PREPARED FOR A SPECIFIC PURPOSE. ANY USE OTHER THAN FOR THAT WHICH WAS INTENDED IS A MISUSE OF THIS INFORMATION AND RENDERS THE PREPARER'S DECLARATION NULL AND VOID.
3. UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS MAP RENDERS THE PREPARERS DECLARATION NULL AND VOID.
4. DISTANCES NOTED +/- FROM BUILDINGS TO PROPERTY LINES ARE FOR REFERENCE PURPOSES ONLY AND ARE NOT TO BE USED TO ESTABLISH PROPERTY BOUNDARIES.
5. UNDERGROUND IMPROVEMENTS OR ENCROACHMENTS, IF ANY, ARE NOT DEPICTED HEREON.
6. PROPERTY IS LOCATED IN AN "A - RESIDENCE ZONE.
7. REFER TO MAP 3550 OF THE NORWALK LAND RECORDS.
8. REFER TO A QUIT CLAIM DEED RECORDED IN BK. 385, PG. 140 OF THE NORWALK LAND RECORDS.
9. INLAND WETLANDS, IF ANY, ARE NOT DEPICTED HEREON. THERE ARE NO WETLANDS ON THIS PROPERTY AS DEPICTED ON THE CITY OF NORWALK INLAND WETLANDS AND WATERCOURSES MAP AMENDED OCTOBER 29, 2009.
10. PROPERTY IS DEPICTED AS LYING OUTSIDE OF ANY 1% ANNUAL CHANCE FLOOD ZONE BOUNDARY AS NOTED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP 09001C0393G REVISED ON OCTOBER 16, 2013. THIS INFORMATION IS PROVIDED FOR REFERENCE PURPOSES AND DOES NOT NECESSARILY REPRESENT THE ACTUAL POTENTIAL FOR FLOOD DAMAGE TO ANY EXISTING OR PROPOSED STRUCTURES OR IMPROVEMENTS LOCATED ON THIS PROPERTY.

NOTE:
157 RESIDENCES ARE LOCATED WITHIN 1,000' OF PROPOSED FACILITY.

SITE AREAS & VOLUMES OF EARTHWORK

SITEWORK ENTAILS APPROXIMATELY 160 CY OF EXCESS MATERIAL. THE COMPOUND AND ROADWAY WILL IMPORT APPROXIMATELY 160 CUBIC YARDS OF CLEAN BROKEN STONE. THE UTILITY TRENCH FROM THE DEMARC TO THE COMPOUND WILL EXCAVATE APPROXIMATELY 185 CUBIC YARDS OF MATERIAL THAT WILL BE USED TO BACKFILL THE TRENCH

COMPOUND AREA SLOPES:
EXISTING - 1%-3%
PROPOSED - 1%-3%

TOTAL AREA OF DISTURBANCE = 10,500± SF

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

STORMWATER VOLUME:
PROPOSED IMPERVIOUS AREA = 6,562 SF
WATER QUALITY STD VOLUME (1") = 542 CF
STORAGE VOLUME (6" DEPTH, 40% VOIDS) = 703 CF

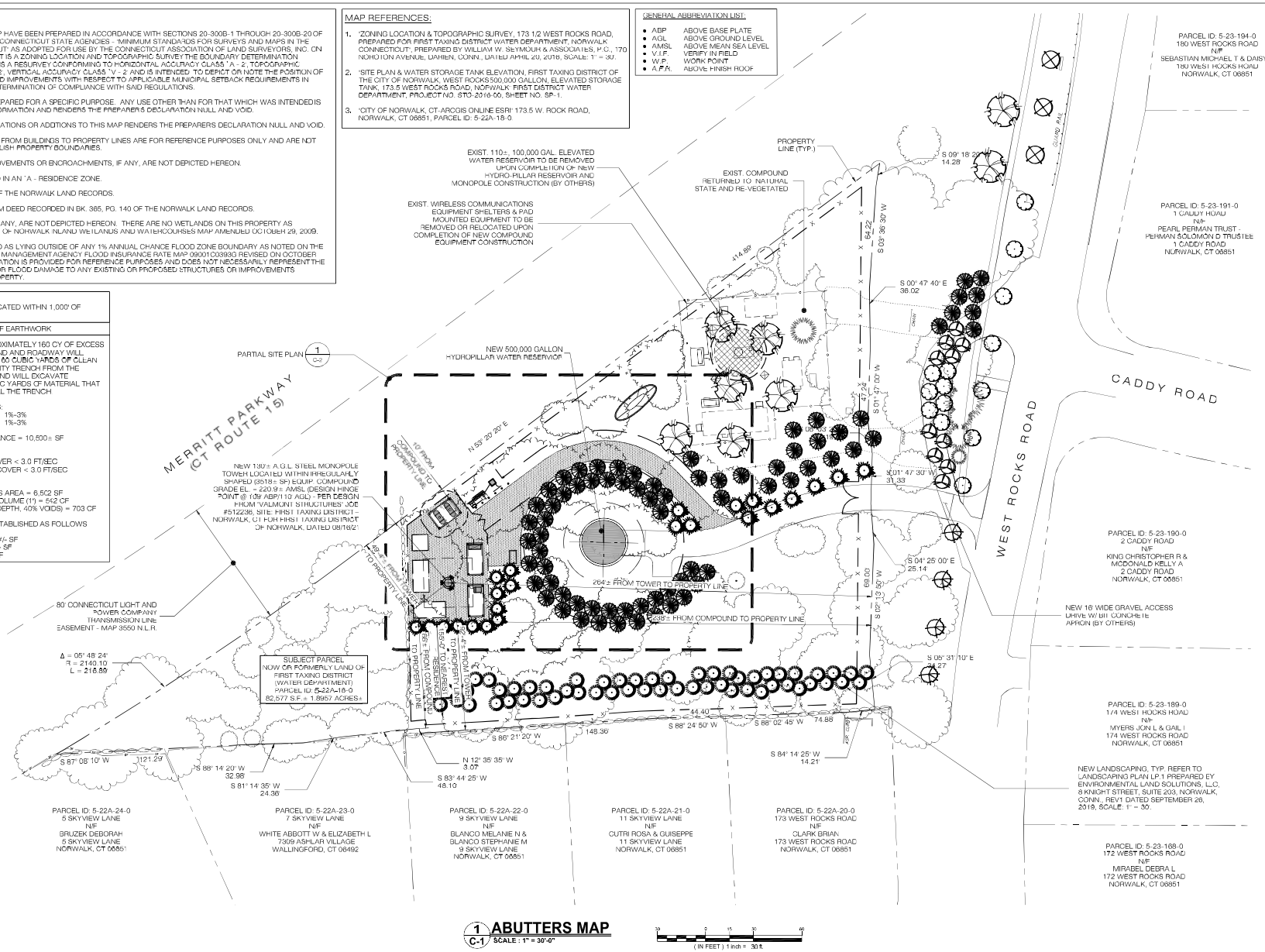
GROUND COVER TO BE ESTABLISHED AS FOLLOWS (U.O.N):
- WHITE CLOVER @ 0.20#/- SF
- TALL FESCUE @ 0.45#/- SF
- RYEGRASS @ 0.10#/- SF

MAP REFERENCES:

1. "ZONING LOCATION & TOPOGRAPHIC SURVEY, 173 1/2 WEST ROCKS ROAD, PREPARED FOR FIRST TAXING DISTRICT WATER DEPARTMENT, NORWALK CONNECTICUT, PREPARED BY WILLIAM W. SEYMOUR & ASSOCIATES, P.C., 170 NORTH UNION AVENUE, DARIEN, CONN., DATED APRIL 20, 2018, SCALE: 1" = 30'.
2. "SITE PLAN & WATER STORAGE TANK ELEVATION, FIRST TAXING DISTRICT OF THE CITY OF NORWALK, WEST ROCKS 500,000 GALLON, ELEVATED STORAGE TANK, 173.5 WEST ROCKS ROAD, NORWALK" FIRST DISTRICT WATER DEPARTMENT, PROJECT NO. STO-2016-00, SHEET NO. SP-1.
3. "CITY OF NORWALK, CT-ARCGIS ONLINE ESRI" 173.5 W. ROCK ROAD, NORWALK, CT 06851, PARCEL ID: 5-22A-18-0

GENERAL ABBREVIATION LIST:

ABP	ABOVE BASE PLATE
AGL	ABOVE GROUND LEVEL
AMSL	ABOVE MEAN SEA LEVEL
V.I.F.	VERIFY IN FIELD
W.P.	WORK POINT
A.F.F.	ABOVE FINISH ROOF



1 C-1 ABUTTERS MAP
SCALE : 1" = 30'-0"

(IN FEET) 1 inch = 30 ft.

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

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

D&M DOCUMENTS

NO	DATE	REVISION
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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT ROBERT CHARLES BURNS 20071 LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD NORWALK, CT 06851

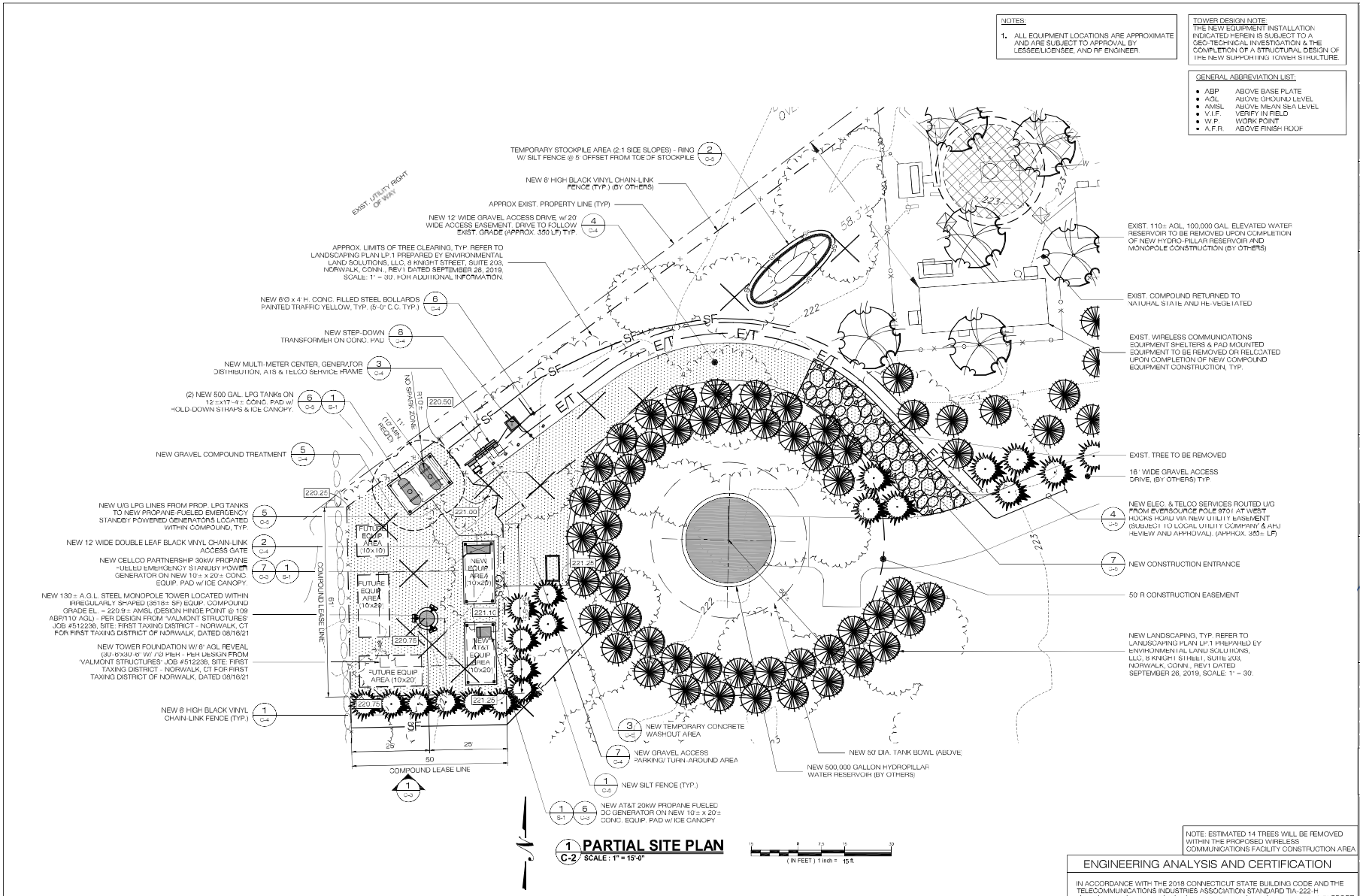
APT FILING NUMBER: CT544100

DRAWN BY:CSH

DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:
ABUTTERS MAP

SHEET NUMBER:
C-1



1 PARTIAL SITE PLAN
C-2 SCALE: 1" = 15'-0"

(IN FEET) 1 inch = 15 ft.

NOTES:
1. ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE, AND RF ENGINEER.

TOWER DESIGN NOTE:
THE NEW EQUIPMENT INSTALLATION INDICATED HEREIN IS SUBJECT TO A GEO-TECHNICAL INVESTIGATION & THE COMPLETION OF A STRUCTURAL DESIGN OF THE NEW SUPPORTING TOWER STRUCTURE.

GENERAL ABBREVIATION LIST:
- ABP ABOVE BASE PLATE
- AGL ABOVE GROUND LEVEL
- AMSL ABOVE MEAN SEA LEVEL
- V.I.F. VERIFY IN FIELD
- W.P. WORK POINT
- A.F.F. ABOVE FINISH ROOF

NOTE: ESTIMATED 14 TREES WILL BE REMOVED WITHIN THE PROPOSED WIRELESS COMMUNICATIONS FACILITY CONSTRUCTION AREA

ENGINEERING ANALYSIS AND CERTIFICATION

IN ACCORDANCE WITH THE 2018 CONNECTICUT STATE BUILDING CODE AND THE TELECOMMUNICATIONS INDUSTRIES ASSOCIATION STANDARD TIA-222-H "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORT STRUCTURES". FOR FAIRFIELD COUNTY, THE TOWER WOULD BE DESIGNED TO WITHSTAND PRESSURES EQUIVALENT TO A MAXIMUM 120 MPH ULTIMATE BASIC WIND SPEED EQUIVALENT TO 93 MPH NOMINAL BASIC WIND SPEED. THE FOUNDATION DESIGN WOULD BE BASED ON SOIL CONDITIONS AT THE SITE

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

ALL-POINTS TECHNOLOGY CORPORATION
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WATERFORD, CT 06385 PHONE: (860)-663-1697
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PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHALL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT ROBERT CHARLES BURNS 20071 LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD, NORWALK, CT 06851

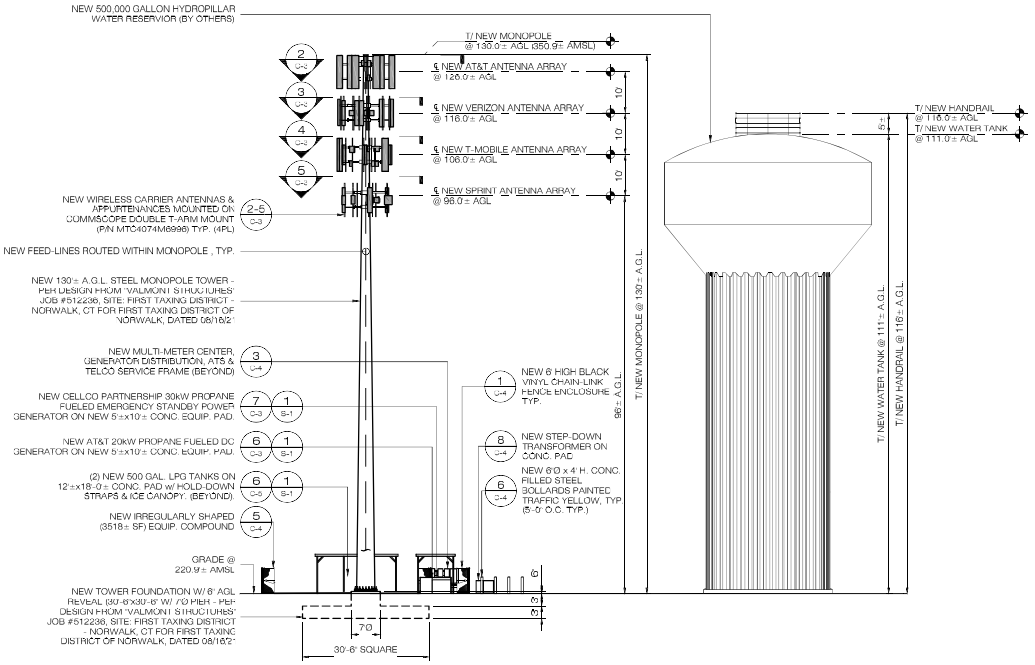
APT FILING NUMBER: CT544100

DRAWN BY:CSH

DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE: PARTIAL SITE PLAN

SHEET NUMBER: C-2

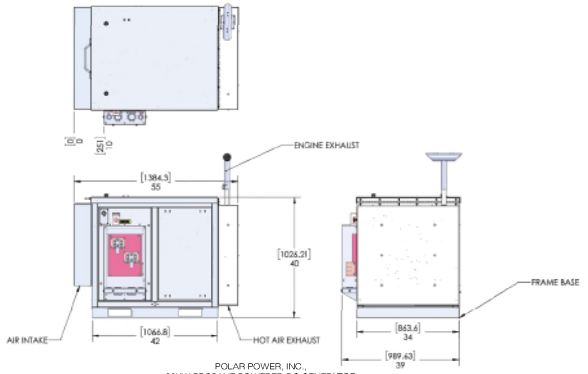


NOTE:

EXISTING AND PROPOSED PLANTINGS OMITTED FOR CLARITY.

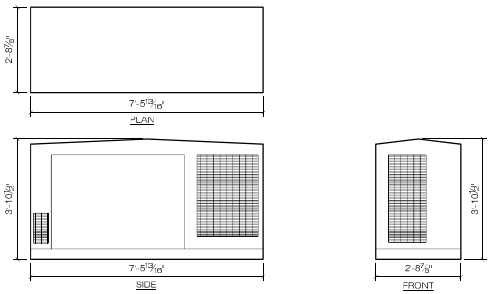
1 SOUTH ELEVATION
C-3 SCALE : 1" = 15'-0"

(IN FEET) 1 inch = 15 ft.



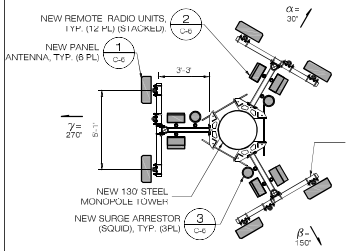
POLAR POWER, INC.,
20KW PROPANE POWERED DC GENEFATOR
P/N 8620-100-NGLPG-20-03
HORIZONTAL ALUMINUM ENCLOSURE

6 AT&T GENERATOR
C-3 SCALE : N.T.S.

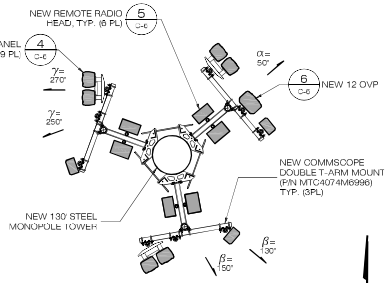


KOHLER
30KW PROPANE POWERED DC GENEFATOR
P/N 30CCL

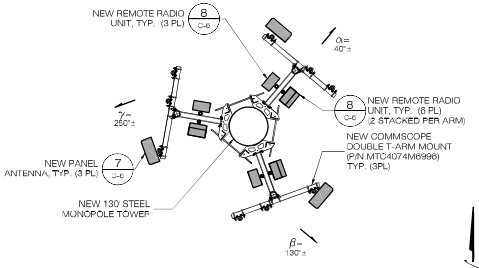
7 VERIZON GENERATOR
C-3 SCALE : ½"=1'-0"



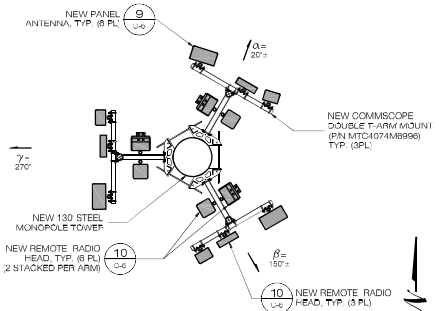
2 AT&T ANTENNA PLAN
C-3 SCALE : ¼" = 1'-0"



3 VERIZON ANTENNA PLAN
C-3 SCALE : ¼" = 1'-0"



4 T-MOBILE ANTENNA PLAN
C-3 SCALE : ¼" = 1'-0"



5 SPRINT ANTENNA PLAN
C-3 SCALE : ¼" = 1'-0"

FIRST TAXING DISTRICT WATER DEPARTMENT
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STATE OF CONNECTICUT ROBERT CHARLES BURNS 20071 LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

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APT FILING NUMBER: CT544100

DRAWN BY:CSH

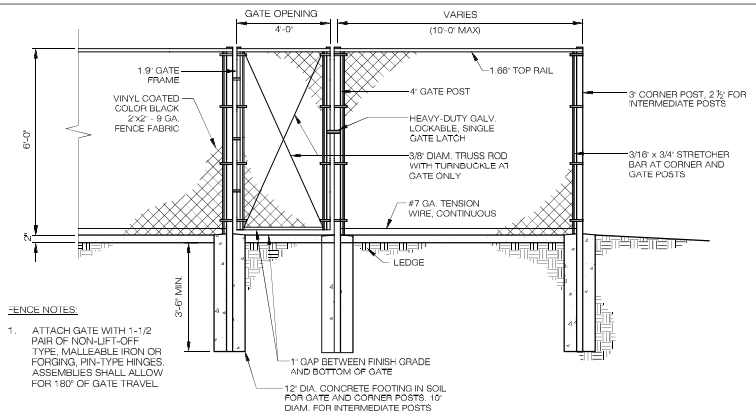
DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:

EQUIPMENT PLANS & SOUTH ELEVATION

SHEET NUMBER:

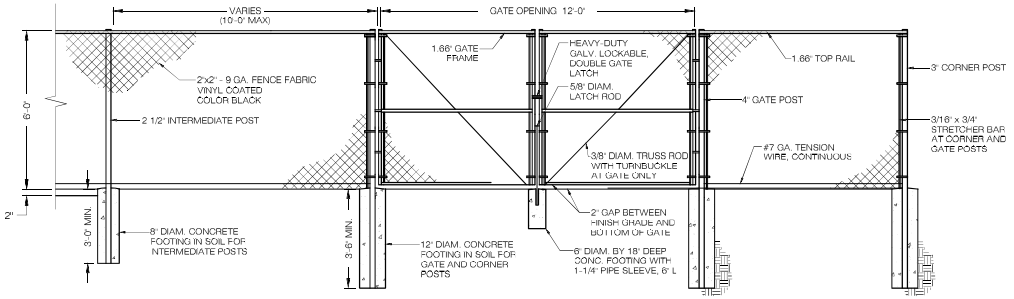
C-3



FENCE NOTES:

1. ATTACH GATE WITH 1-1/2 PAIR OF NON-LIFT-OFF TYPE, MALLEABLE IRON OR FORGING, PIN-TYPE HINGES. ASSEMBLIES SHALL ALLOW FOR 180° OF GATE TRAVEL.

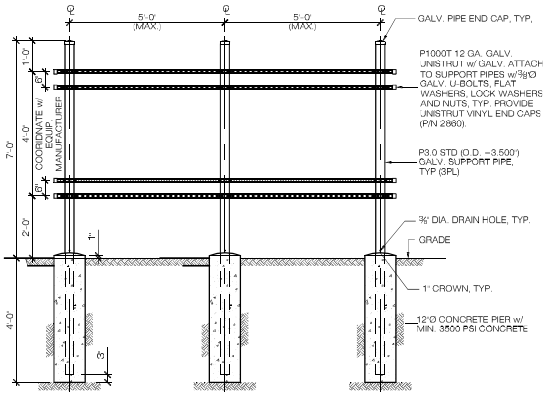
1 C-4 CHAIN-LINK FENCE & SWING GATE
SCALE : N.T.S.



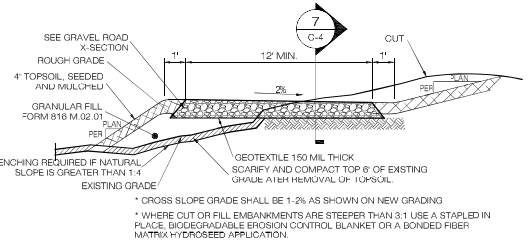
FENCE NOTES

1. ATTACH GATE WITH 1-1/2 PAIR OF NON-LIFT-OFF TYPE, MALLEABLE IRON OR FORGING, PIN-TYPE HINGES. ASSEMBLIES SHALL ALLOW FOR 180° OF GATE TRAVEL.

2 C-4 CHAIN-LINK FENCE & DOUBLE SWING ACCESS GATE
SCALE : N.T.S.



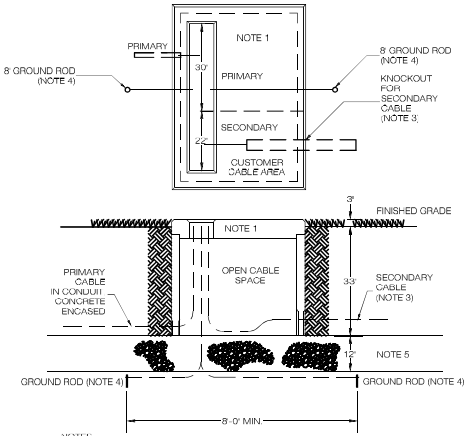
3 C-4 UTILITY SERVICE FRAME DETAIL
SCALE : ½" = 1'



* 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.

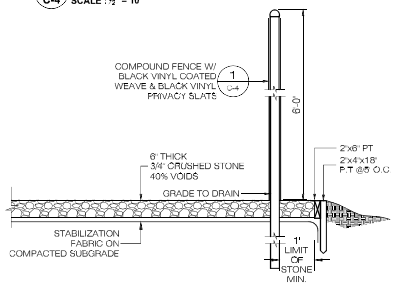
4 C-4 TYPICAL ROAD CROSS SECTION
SCALE :NTS



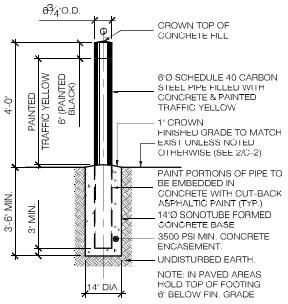
NOTES

1. 75 - 300KVA - INSTALL 76"x54"x36" PAD AS PER SPC P-013 AND P-014. 500-2500KVA - INSTALL 76"x70"x36" PAD AS PER SPC P-015 AND P-016. (COORDINATE REQUIRED PAD SIZE FOR PROJECT WITH UTILITY COMPANY)
2. PRIMARY CABLE: BY UTILITY COMPANY
3. SECONDARY CABLE: LEAVE SLACK FOR FUTURE RECONNECTING TO TRANSFORMERS. WITH HIGHER SECONDARY TERMINALS. CUSTOMER CABLE(S) SHALL ENTER FROM THE REAR AND SHALL BE CONFINED TO THE AREA DEFINED AS THE 'CUSTOMER CABLE AREA'.
4. GALVANIZED GROUND RODS: INSTALL IN TRENCH AND CONNECT A #2 COPPER CONDUCTOR FROM ROD THROUGH PAD OPENING AND EXTENDING 5'-0" ABOVE PAD. GROUND RODS SHALL BE A MINIMUM OF 8' FROM EACH OTHER.
5. THE EXCAVATION FOR THE PAD SHALL BE CARRIED TO A DEPTH OF 12 INCHES BELOW THE BOTTOM OF THE PAD WALLS. THE BACKFILL UNDER THE PAD WALLS SHALL BE A CLEAN GRAVEL, FREE OF FOREIGN MATTER AND CONSTRUCTION DEBRIS, AND IN ACCORDANCE WITH CONNECTICUT DOT SPEC M.02.06 GRADING 'A'. BACKFILL SHALL BE PLACED IN 6 INCH LAYERS AND COMPACTED WITH MECHANICAL TAMPERS TO NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY STANDARD COMPACTION TESTS, AASHTO T180 OR ASTM D698
6. ALL WORK SHALL CONFORM TO EVERSOURCE TRANSFORMER PAD INSTALLATION REQUIREMENTS. REFER TO EVERSOURCE CONSTRUCTION STANDARD DTR 88.301 FOR ADDITIONAL INFORMATION.

8 C-4 UTILITY PAD TRANSFORMER DETAIL
SCALE : N.T.S.

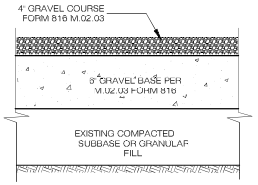


5 C-4 COMPOUND DETAIL
SCALE : N.T.S.



NOTE: IN PAVED AREAS HOLD TOP OF FOOTING 6" BELOW FIN. GRADE

6 C-4 BOLLARD DETAIL
SCALE :NTS



7 C-4 GRAVEL ROAD SECTION
SCALE : NTS

FIRST TAXING DISTRICT WATER DEPARTMENT
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ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT ROBERT CHARLES BURNS 20071 LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD NORWALK, CT 06851

APT FILING NUMBER: CT544100

DRAWN BY:CSH

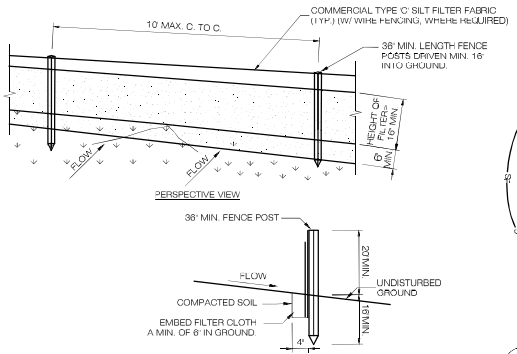
DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:

SITE DETAILS

SHEET NUMBER:

C-4

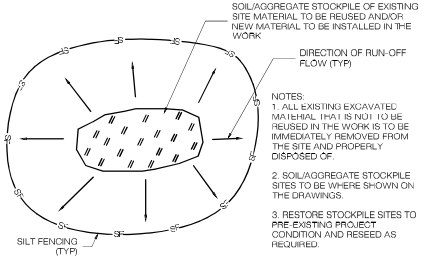


CONSTRUCTION SPECIFICATIONS:

1. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
3. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

1 GEOTEXTILE SILT FENCE DETAIL

C-5 SCALE : N.T.S.

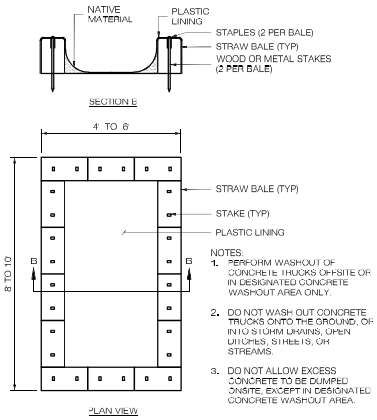


NOTES:

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.

2 TEMPORARY STOCKPILE DETAIL

C-5 SCALE : N.T.S.

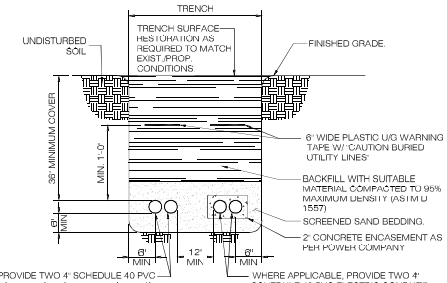


NOTES:

1. PERFORM WASHOUT OF CONCRETE TRUCKS OFFSITE OR IN DESIGNATED CONCRETE WASHOUT AREA ONLY.
2. DO NOT WASH OUT CONCRETE TRUCKS ONTO THE GROUND, OR INTO STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.
3. DO NOT ALLOW EXCESS CONCRETE TO BE DUMPED ONSITE, EXCEPT IN DESIGNATED CONCRETE WASHOUT AREA.

3 DEWATERING STRAW BALE BASIN

C-5 SCALE : N.T.S.

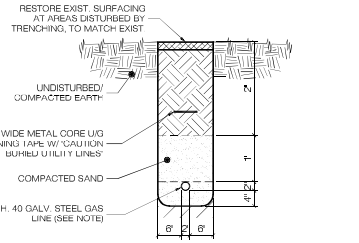


NOTES:

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

4 PRIMARY UTILITY TRENCH

C-5 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.

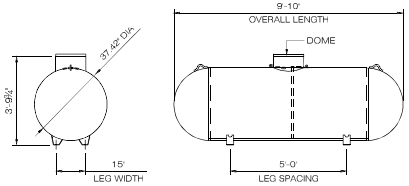
PIPING INSTALLATION SHALL COMPLY WITH NFPA 54 CHAPTER 7 OR AS OTHERWISE NOTED AND SHALL HAVE A CATHODIC PROTECTION SYSTEM INSTALLED.

5 PROPANE GAS TRENCH

C-5 SCALE : N.T.S.

NOTES:

1. PROPANE TANKS SHALL BE REFILLED FROM HOSE PULLED FROM A REFILLING VEHICLE PARKED AT THE NEW PARKING AREA.
2. PER NFPA 58 TABLE 5.9.4.1(B) FILLER VALVE REQUIRED ON ALL TANKS BUT MAY BE MANUAL OF BACKFLOW CHECK VALVE, NFPA 58 5.9.4.1(C)(7).
3. ALL ABOVE-GROUND GAS SERVICE LINES SHALL MEET STATE CODE REGULATIONS.



500 USWG AMSE VIII, DIV. 1 ABOVE GROUND LPG TANK

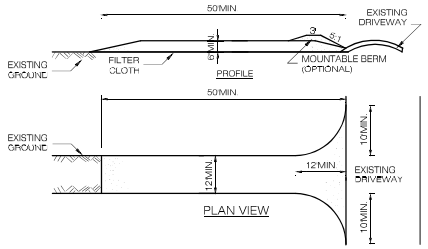
- WEIGHT (EMPTY) – 871 lbs

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

6 ABOVE GROUND PROPANE TANK DETAIL

C-5 SCALE : N.T.S.



CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

7 CONSTRUCTION ENTRANCE DETAIL

C-5 SCALE : N.T.S.

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STATE OF CONNECTICUT ROBERT CHARLES BURNS No. 20071 LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD NORWALK, CT 06851

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DRAWN BY:CSH

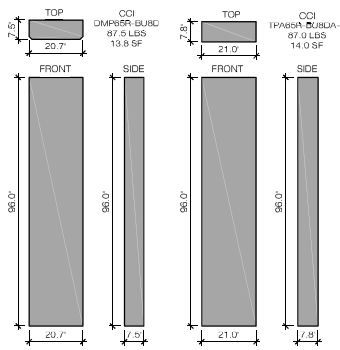
DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:

SITE DETAILS

SHEET NUMBER:

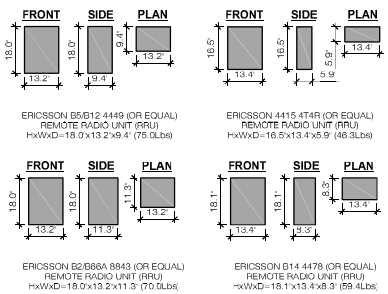
C-5



PANEL ANTENNAS

1 AT&T ANTENNA DETAIL

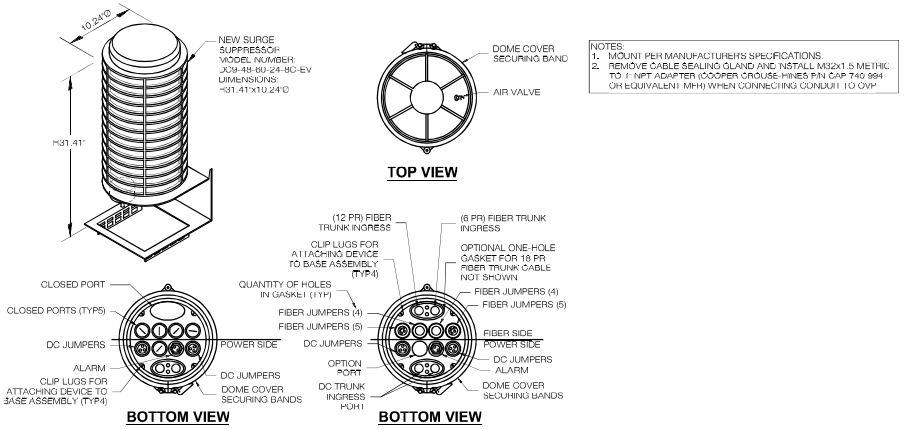
C-6 SCALE : ½" = 1'-0"



NOTES:
1. DIMENSIONS SUBJECT TO CHANGE BASED UPON AVAILABILITY AT TIME OF CONSTRUCTION.
2. MANUFACTURER'S RECOMMENDED RFH CLEARANCES: FRONT: 36"; SIDES: 12"; BOTTOM: 24"
3. SFPs ARE PROTOCOOL SPECIFIC. THE CONNECTIONS BETWEEN RRHs AND BEJs ARE CPRI CONNECTIONS, AND REQUIRE CPRI SFP (ON BOTH ENDS). THE CONNECTIONS BETWEEN BBUs AND 7705 ARE ETHERNET AND REQUIRE ETHERNET SFP (ON BOTH ENDS.)

2 AT&T RRU EQUIPMENT

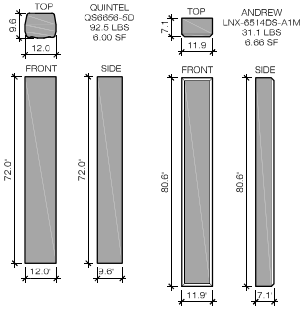
C-6 SCALE : ½" = 1'-0"



RAYCAP DC9-48-60-24-8C-EV (SURGE SUPPRESSOR)
HxDia. = 31.41"x10.24"Ø (26.2 Lbs)
(OR EQUAL)
COLOR: GRAY

3 TYPICAL SURGE SUPPRESSOR

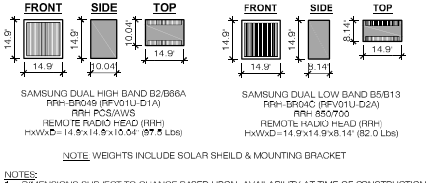
C-6 SCALE : N.T.S.



PANEL ANTENNAS

4 VERIZON ANTENNA DETAIL

C-6 SCALE : ½" = 1'-0"



NOTE WEIGHTS INCLUDE SOLAR SHEILD & MOUNTING BRACKET

NOTES:
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5 VERIZON RRH EQUIPMENT

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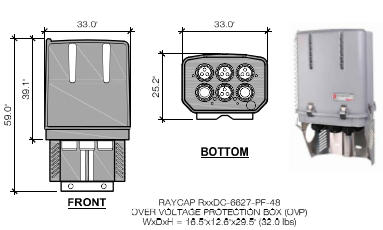
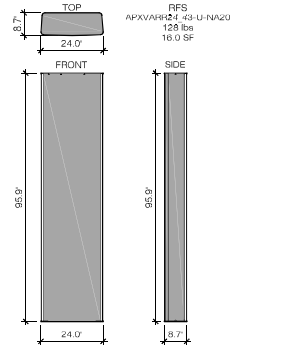


RAYCAP RxxDC-6627-PF-48
OVER VOLTAGE PROTECTION BOX (OVP)
WxDxH = 16.5"x12.6"x29.5" (32.0 lbs)

6 MAIN DISTRIBUTION BOX (12 OVP)

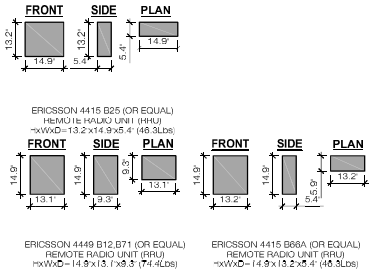
C-6 SCALE: 1" = 1'-0"



PANEL ANTENNAS

7 T-MOBILE ANTENNA DETAIL

C-6 SCALE : ½" = 1'-0"



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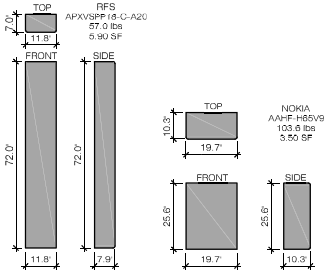
8 T-MOBILE RRU EQUIPMENT

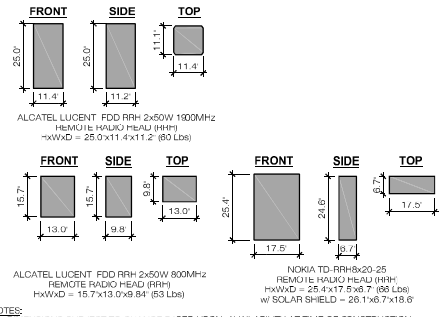
C-6 SCALE : 1"= 1'-0"



PANEL ANTENNAS

9 SPRINT ANTENNA DETAIL

C-6 SCALE : ½" = 1'-0"



NOTES:
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10 SPRINT RRH EQUIPMENT

C-6 SCALE : ½" = 1'-0"

FIRST TAXING DISTRICT WATER DEPARTMENT
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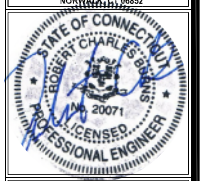


FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD, NORWALK, CT 06851

APT FILING NUMBER: CT544100

DRAWN BY:CSH

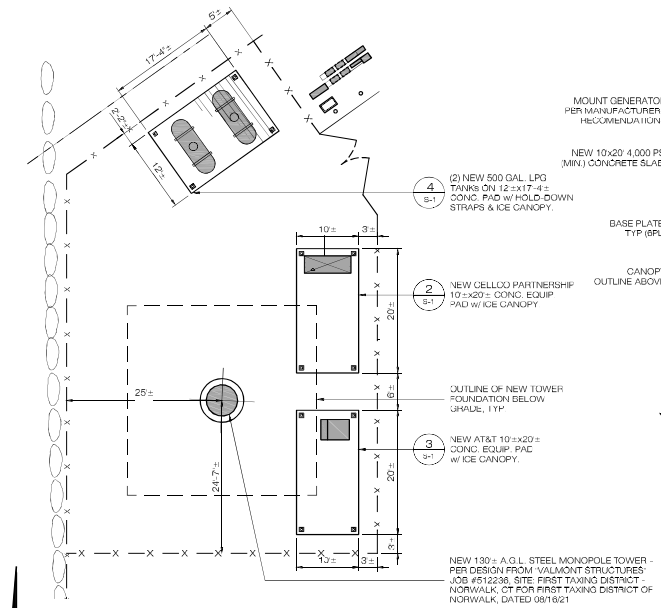
DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:

CARRIER ANTENNA & EQUIPMENT DETAILS

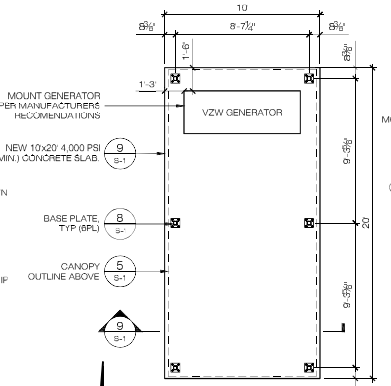
SHEET NUMBER:

C-6



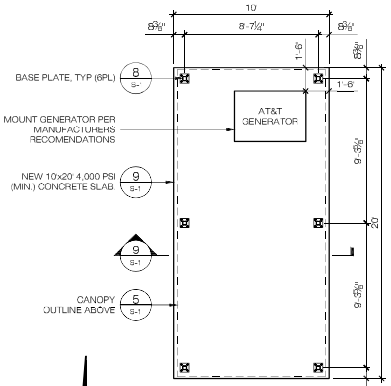
1 COMPOUND PLAN
S-1 SCALE : 1" = 10'-0"

(IN FEET) 1 inch = 10 ft.



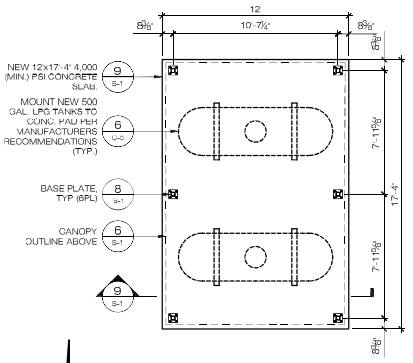
2 VERIZON EQUIPMENT PAD
S-1 SCALE : ¼" = 1'-0"

(IN FEET) 1 inch = 4 ft.



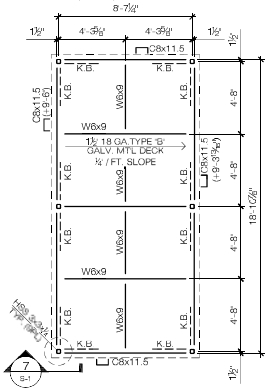
3 AT&T EQUIPMENT PAD
S-1 SCALE : ¼" = 1'-0"

(IN FEET) 1 inch = 4 ft.



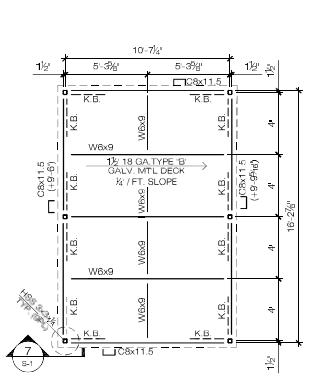
4 PROPANE TANK EQUIPMENT PAD
S-1 SCALE : ¼" = 1'-0"

(IN FEET) 1 inch = 4 ft.



NOTES
1. ELEVATIONS REFERENCE T/ CONCRETE
2. K.B. = KNEE BRACE (1) L2½"x2½"x½"
3. ALL EXPOSED STEEL SHALL BE HOT DIP GALVANIZED (HDG)

5 EQUIP. CANOPY FRAMING
S-1 SCALE : ¼" = 1'-0"



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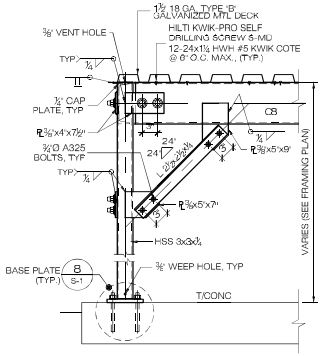
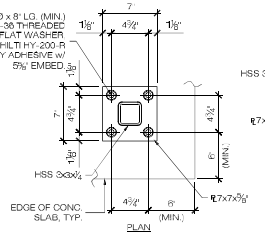
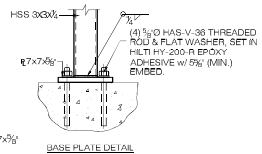
6 PROPANE TANK CANOPY FRAMING
S-1 SCALE : ¼" = 1'-0"

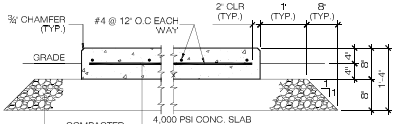


7 CANOPY SUPPORT
S-1 SCALE : 1" = 1'-0"



8 POST BASE DETAIL
S-1 SCALE : 1½" = 1'-0"





NOTES:
1. CONTRACTOR SHALL COORDINATE ALL SLAB DIMENSIONS, CONDUIT STUB-UP LOCATIONS & 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

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

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

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

D&M DOCUMENTS		
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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD, NORWALK, CT 06851

APT FILING NUMBER: CT544100

DRAWN BY:CSH

DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:

STRUCTURAL PLAN & DETAILS

SHEET NUMBER:

S-1

LEGEND

- PROPERTY LINE
- 62 EXISTING CONTOUR
- NEW GRAVEL
- EX. TREE TO BE REMOVED
- NEW DECIDUOUS SHADE TREE
- NEW DECIDUOUS SMALL TREE

GRAPHIC SCALE
0' X' XX0' 20'

PROJECT NORTH

NOTES:

1. CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO HAVE UNDERGROUND UTILITY LINES MARKED BY THEM PRIOR TO START OF ANY EXCAVATION WORK.
2. EXACT LOCATION OF PROPOSED PLANTINGS AND SPECIES TYPES MAY VARY FROM THIS PLAN BASED ON SITE PLAN REVISIONS AND/OR ACTUAL FIELD CONDITIONS.
3. SEED LAWN AREAS WITH A HIGH QUALITY FESCUE AND BLUEGRASS MIX TURF MIX SUCH AS SEED "SMART SEED NORTHEAST MIX" BY PENNINGTON SEED, INC. OR APPROVED EQUIVALENT. APPLY SOIL AMENDMENTS AS RECOMMENDED BY THE MANUFACTURER. SEED AREAS AT THE METHODS AND RATE RECOMMENDED BY THE MANUFACTURER. LIGHTLY MULCH SEEDED AREA WITH WEED-FREE CLEAN HAY. A NURSE CROP SHALL BE ADDED TO THE SEED MIX ON SLOPES OF EXCESS OF 10% AND AS SPECIFIED. LIGHTLY RAKE OR ROLL GROUND SURFACE AFTER SOWING.
4. PLANT SPECIES SUBSTITUTIONS MAY BE MADE WITH THE APPROVAL OF THE PROJECT LANDSCAPE ARCHITECT PRIOR TO PLANTING. SUBSTITUTED PLANTS SHALL BE AT AN EQUAL OR GREATER SIZE AS NOTED USING A SIMILAR TYPE PLANT.
5. PLANTING METHODS SHALL BE IN ACCORDANCE WITH THE "AMERICAN STANDARDS FOR NURSERY STOCK", LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION.
6. THIS PLAN FOR PLANTING PURPOSES ONLY. SEE PLANS BY OTHERS FOR ADDITIONAL INFORMATION.
7. SPRAY NEW PLANTINGS IMMEDIATELY AFTER INSTALLATION WITH A WHITE-TAILED DEER REPELLENT AND CONTINUE AS NEEDED TO MAINTAIN PLANTS FREE OF SIGNIFICANT DEER BROWSING.
8. MULCH AREAS AROUND NEW TREES WITH A 2.5' THICK LAYER OF SHREDDED CEDAR BARK MULCH. NEW TREES SHALL EACH HAVE A 5' MIN. DIA. MULCHED BED AND NEW SHRUBS SHALL EACH HAVE A 3' MIN. DIA. MULCHED BED. AREAS WITHIN 4" OF TREE TRUNKS SHALL BE MAINTAINED FREE OF MULCH.

PLANT LIST

QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
30	PS	PINUS STROBUS	WHITE PINE	6-8' HT.	B&B	FULL
34	PS2	PINUS STROBUS	WHITE PINE	8-10' HT.	B&B	FULL
2	QR	QUERCUS RUBRA	RED OAK	3-3.5" CAL	B&B	LIMBED TO 7'
10	AC	AMELACHIER CANADENSIS	SHADBLOW	5-6' HT	B&B	CLUMP
4	AB	AMELANCHER C. 'AUTUMN BRILLANCE'	AUTUMN BRILLANCE SHAD	2-2.5" CAL.	B&B	SINGLE STEM
7	CF	CORNUS FLORIDA	DOGWOOD	5-6' HT	B&B	
7	CF2	CORNUS FLORIDA	DOGWOOD	2-2.5" CAL	B&B	LIMBED TO 7'
3	WK	CRATAEGUS 'WINTER KING'	WINTER KING HAWTHORN	2-2.5" CAL.	B&B	LIMBED TO 7'
57	TO	THUJA OCCIDENTALIS 'NIGRA'	DARK ARBORVITAE	7-8' HT.	B&B	LIMBED TO 7'

REVISIONS:			DRAWING TITLE: LANDSCAPE PLAN
			PROJECT: NORWALK FIRST TAXING DISTRICT 173.5 WEST ROCKS ROAD NORWALK, CONNECTICUT
1	6-10-19	UPDATED AS REQUESTED	

ENVIRONMENTAL LAND SOLUTIONS, LLC
Landscape Architecture and Environmental Planning
8 KNIGHT STREET, SUITE 203
NORWALK, CONNECTICUT 06851
Tel: (203) 855-7879 Fax: (203) 855-7836
info@elsllc.net www.elsllc.net

SEAL:

DATE: DEC. 10, 2018
SCALE: 1"=30'
DRAWING NO.: LP.1

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. 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 WATERTOWN, PERMITTEE, AND/OR SWMP MONITOR. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.

2. THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. SEE CONSTRUCTION SEQUENCE FOR ADDITIONAL INFORMATION. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN AS REQUIRED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPCP MONITOR. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

3. A BOND OR LETTER OF CREDIT MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.

4. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANOR.

6. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOST FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.

7. ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.

8. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING, ORANGE SAFETY FENCE, CONSTRUCTION TAPE, OR EQUIVALENT FENCING/TAPE. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA. FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION

9. CONSTRUCTION ENTRANCES (ANTI-TRACKING PADS) SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION IF REQUIRED. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED. CONTRACTOR SHALL ENSURE THAT ALL VEHICLES EXITING THE SITE ARE PASSING OVER THE ANTI TRACKING PADS PRIOR TO EXISTING.

10. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.

11. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

12. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE CONFORMING TO THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.

13. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.

14. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE IF NECESSARY. REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

15. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.

16. VEGETATIVE ESTABLISHMENT SHALL OCCUR ON ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.

17. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.

18. SEEDING MIXTURES SHALL BE NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX (SEE SITE DETAILS SHEET DN-1), OR APPROVED EQUAL BY OWNER.

SEDIMENT & EROSION CONTROL NARRATIVE

1. THE PROJECT INCLUDES THE INSTALLATION OF A 130± AGL STEEL MONOPOLE WITH ASSOCIATED GROUND MOUNTED EQUIPMENT. ALL DISTURBED AREAS ARE TO BE SEEDED AND STABILIZED PRIOR TO THE INSTALLATION OF THE PROPOSED EQUIPMENT.

   THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:
   A. CONSTRUCTION OF 130± AGL MONOPOLE.
   C. CONSTRUCTION OF IRREGULARLY SHAPED (3,518± SF) FENCED EQUIPMENT COMPOUND W/ GRAVEL SURFACE TREATMENT AND ASSOCIATED UTILITIES.
   D. CONSTRUCTION OF 350 ± 12' WIDE GRAVEL ACCESS DRIVE.
   E. CONSTRUCTION OF (2) 10'x20' (200± SF) CONCRETE EQUIPMENT PAD & 12'±x17'-4"± (207± SF) CONCRETE PAD WITH (2) 500 GALLON LP3 TANKS .
   F. THE STABILIZATION OF PERVIOUS DISTURBED AREAS WITH PERMANENT GRASS TREATMENTS.

2. FOR THIS PROJECT, THERE ARE APPROXIMATELY 10,500± SF OF THE SITE BEING DISTURBED.

3. A GEOTECHNICAL ENGINEERING REPORT HAS BEEN COMPLETED FOR THIS PROJECT AND WILL BE AVAILABLE UNDER SEPARATE COVER.

4. IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 12 WEEKS.

5. REFER TO THE CONSTRUCTION SEQUENCING AND EROSION AND SEDIMENTATION NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.

6. EROSION AND SEDIMENTATION MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGEMENT AND THE APPLICABLE SECTIONS OF THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.

7. DETAILS FOR THE TYPICAL EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON PLAN SHEET C-5 OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.

8. CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION AREA:
   A. STAGED CONSTRUCTION;
   B. MINIMIZE THE DISTURBED AREAS DURING CONSTRUCTION;
   C. STABILIZE DISTURBED AREAS AS SOON AS POSSIBLE WITH TEMPORARY OR PERMANENT MEASURES;
   D. MINIMIZE IMPERVIOUS AREAS;
   E. UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

SUGGESTED CONSTRUCTION SEQUENCE

THE FOLLOWING SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR MAY ELECT TO ALTER THE SEQUENCING TO BEST MEET THE CONSTRUCTION SCHEDULE, THE EXISTING SITE ACTIVITIES AND WEATHER CONDITIONS. CONTRACTOR TO HIRE SURVEYOR FOR PROJECT STAKEOUT AS NEEDED THROUGHOUT CONSTRUCTION ACTIVITIES.

1. CONTACT THE OWNER TO SCHEDULE A PRE-CONSTRUCTION MEETING. PHYSICALLY FLAG THE TREES TO BE REMOVED IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.

2. CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED WORK, LIMITS OF DISTURBANCE AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE OWNER, THE OWNER REPRESENTATIVE(S), THE GENERAL CONTRACTOR, DESIGNATED SUB-CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.

3. NOTIFY THE OWNER AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION OR REGULATED ACTIVITY ON THIS PROJECT. NOTIFY CALL BEFORE YOU DIG CONNECTICUT AT (800) 922-4455.

4. CLEAR AND GRUB AS REQUIRED, TO INSTALL THE PERIMETER EROSION AND SEDIMENTATION CONTROL MEASURES AND, IF APPLICABLE, TREE PROTECTION.

5. INSTALL CONSTRUCTION ENTRANCE.

6. PERFORM THE REMAINING CLEARING AND GRUBBING AS NECESSARY. REMOVE CUT WOOD AND STUMPS. CHIP BRUSH AND STOCKPILE FOR FUTURE USE OR REMOVE OFF-SITE. REMOVE AND DISPOSE OF DEMOLITION DEBRIS OFF-SITE.

7. TEMPORARILY SEED DISTURBED AREAS NOT UNDER CONSTRUCTION FOR THIRTY (30) DAYS OR MORE.

8. EXCAVATE AND GRADE NEW ACCESS DRIVE.

9. EXCAVATE AND ROUGH GRADE EQUIPMENT COMPOUND.

10. EXCAVATE FOR TOWER FOUNDATION & EQUIPMENT PADS.

11. FINALIZE ACCESS ROAD GRADES.

12. PREPARE SUBGRADE AND INSTALL FORMS, STEEL REINFORCING, & CONCRETE FOR TOWER FOUNDATION & EQUIPMENT PADS.

13. INSTALL BURIED GROUND RINGS, GROUND RODS, GROUND LEADS, UTILITY CONDUITS & UTILITY EQUIPMENT.

14. BACKFILL TOWER FOUNDATION.

15. ERECT MONOPOLE.

16. INSTALL TELECOMMUNICATIONS EQUIPMENT ON TOWER & IN COMPOUND.

17. INSTALL COMPOUND GRAVEL SURFACES.

18. FINALIZE GRADES. INSTALL GRAVEL SURFACES.

19. INSTALL FENCING.

20. CONNECT GROUNDING LEADS & LIGHTNING PROTECTION

21. FINAL GRADE AROUND COMPOUND.

22. LOAM & SEED DISTURBED AREAS OUTSIDE COMPOUND, AS REQUIRED & INSTALL LANDSCAPING.

23. TEST ALL NEW EQUIPMENT.

24. AFTER THE SITE IS STABILIZED AND WITH THE APPROVAL OF THE OWNER, REMOVE PERIMETER EROSION AND SEDIMENTATION CONTROLS.

25. PERFORM FINAL PROJECT CLEANUP.

THE ESTIMATED TIME FOR THE COMPLETION OF THE WORK IS APPROXIMATELY TWELVE (12) WEEKS. THE EXACT PROCESS MAY VARY DEPENDING ON THE CONTRACTOR'S & SUBCONTRACTORS AVAILABILITY TO COMPLETE WORK, MATERIAL DELIVERIES & WEATHER DELAYS.

CONSTRUCTION OPERATION AND MAINTENANCE PLAN - BY CONTRACTOR

E&S MEASURE	INSPECTION SCHEDULE	MAINTENANCE REQUIRED
CONSTRUCTION ENTRANCE	DAILY	PLACE ADDITIONAL STONE, EXTEND THE LENGTH OR REMOVE AND REPLACE THE STONE. CLEAN PAVED SURFACES OF TRACKED SEDIMENT.
HAY BALES	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/REPLACE WHEN FAILURE, OR OBSERVED DETERIORATION, IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE BALE.
SILT FENCE	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/REPLACE WHEN FAILURE, OR OBSERVED DETERIORATION, IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE.
SILT SACKS	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/REPLACE WHEN FAILURE, OR OBSERVED DETERIORATION, IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE SACK.
TOPSOIL/BORROW STOCKPILES	DAILY	REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY.
WATER BARS	DAILY	REPAIR/RESHAPE AS NECESSARY. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE WATER BAR.
TEMPORARY DIVERSION DITCHES	DAILY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR/RESHAPE AS NECESSARY. REVIEW CONDITIONS IF REPETITIVE FAILURES OCCUR.
TEMPORARY SEDIMENT TRAPS/BASINS	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REMOVE SEDIMENT WHEN IT REACHES 1/2 OF THE MINIMUM REQUIRED WET STORAGE VOLUME.
TEMPORARY SOIL PROTECTION	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.2"	REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH.

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

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

D&M DOCUMENTS

NO	DATE	REVISION
0	09/30/21	FOR FILING: RCB
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6		

DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT · ROBERT CHARLES BURNS · 20071 · LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD, NORWALK, CT 06851

APT FILING NUMBER: CT544100

DRAWN BY: CSH

DATE: 09/XX/21 CHECKED BY: RCB

SHEET TITLE:

EROSION CONTROL NOTES

SHEET NUMBER:

EC-1

ENVIRONMENTAL NOTES

PUBLIC WATER SUPPLY AQUIFER PROTECTION PROGRAM

THE PROPOSED FACILITY IS LOCATED WITHIN A CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION LEVEL A KELLOGG-DEERING AQUIFER PROTECTION AREA (APA 106) MAINTAINED BY THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK. AS A RESULT, THE FOLLOWING PROTECTIVE MEASURES SHALL BE FOLLOWED TO HELP AVOID DEGRADATION OF WATER QUALITY THAT COULD AFFECT THIS PUBLIC WATER SUPPLY SOURCE. THESE PROTECTIVE MEASURES SATISFY BEST MANAGEMENT PRACTICE GUIDELINES RECOMMENDED BY THE CONNECTICUT DEPARTMENT OF HEALTH FOR CONSTRUCTION ACTIVITIES.

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. THIS PROTECTION PROGRAM SHALL BE IMPLEMENTED REGARDLESS OF TIME OF YEAR THE CONSTRUCTION ACTIVITIES OCCUR. 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. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR ENVIRONMENTAL SCIENTIST AT APT AND THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK PERSONNEL, AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 552-2033 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK PERSONNEL SHALL BE ALLOWED TO PERIODICALLY INSPECT THIS PROJECT DURING CONSTRUCTION TO ENSURE THAT DRINKING WATER QUALITY IS NOT BE ADVERSELY IMPACTED.

THE PUBLIC WATER SUPPLY AQUIFER PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS: USE OF APPROPRIATE EROSION CONTROL MEASURES TO CONTROL AND CONTAIN EROSION; PERIODIC INSPECTION AND MAINTENANCE OF ISOLATION STRUCTURES AND EROSION CONTROL MEASURES; EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PROTECTIVE MEASURES; AND, REPORTING.

1. 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 TO UNDERSTAND THE ENVIRONMENTALLY SENSITIVE NATURE OF THE DEVELOPMENT SITE AND THE NEED TO FOLLOW THE AQUIFER PROTECTION MEASURES.

   b. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK PERSONNEL TO IMMEDIATELY REPORT ANY RELEASES OF SEDIMENT, FUEL OR HAZARDOUS MATERIALS.

2. EROSION AND SEDIMENTATION 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 WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NET LESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.

   b. INSTALLATION OF EROSION CONTROL MEASURES (I.E., CONVENTIONAL SILT FENCING, STRAW BALES, STRAW WATTLES, COMPOST FILTER SOCKS, ETC.) SHALL BE PERFORMED BY THE CONTRACTOR PRIOR TO ANY EARTHWORK. APT WILL INSPECT THE WORK ZONE FOLLOWING EROSION CONTROL INSTALLATION TO ENSURE EROSION CONTROLS ARE PROPERLY INSTALLED PRIOR TO THE START OF EARTHWORK.

   c. ALL EROSION CONTROLS MATERIALS AND INSTALLATION/MAINTENANCE METHODS SHALL FOLLOW THE 2002 *CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL*. THE CONTRACTOR IS RESPONSIBLE FOR DAILY INSPECTIONS OF EROSION CONTROL MEASURES FOR TEARS OR BREECHES IN THE FABRIC/MATERIAL AND ACCUMULATION LEVELS OF SEDIMENT, PARTICULARLY FOLLOWING STORM EVENTS OF 0.10 INCH OR GREATER. APT WILL PROVIDE PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.

   d. THE EXTENT OF THE EROSION CONTROL WILL BE AS SHOWN ON THE SITE PLANS. THE CONTRACTOR SHALL HAVE ADDITIONAL EROSION CONTROL MATERIALS STOCKPILED ON SITE SHOULD FIELD CONDITIONS WARRANT EXTENDING/REINFORCING EROSION CONTROL AS DIRECTED BY APT OR OTHER RESPONSIBLE AGENCIES.

   e. ALL SILT FENCING AND OTHER EROSION CONTROL DEVICES SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS. IF FIBER ROLLS/WATTLES, STRAW BALES, OR OTHER NATURAL MATERIAL EROSION CONTROL PRODUCTS ARE USED, SUCH DEVICES WILL NOT BE LEFT IN PLACE TO BIODEGRADE AND SHALL BE PROMPTLY REMOVED AFTER SOILS ARE STABLE. SEED FROM SEEDING OF SOILS SHOULD NOT SPREAD OVER FIBER ROLLS/WATTLES AS IT MAKES THEM HARDER TO REMOVE ONCE SOILS ARE STABILIZED BY VEGETATION.

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 PROJECT'S LOCATION WITHIN THE PUBLIC WATER SUPPLY AQUIFER PROTECTION ZONE.

   b. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL SHALL 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. SERVICING OF MACHINERY SHOULD BE COMPLETED OUTSIDE OF THE PUBLIC WATER SUPPLY AQUIFER PROTECTION ZONE.

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

      i. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING

         3. 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.
         4. FUEL AND OTHER HAZARDOUS MATERIALS SHOULD NOT BE STORED WITHIN THE PUBLIC WATER SUPPLY AQUIFER PROTECTION ZONE. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT WITHIN THE PUBLIC WATER SUPPLY AQUIFER PROTECTION ZONE DURING WORKING HOURS SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT THAT CAN RETAIN 110% OF THE TOTAL VOLUME A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES

      ii. INITIAL SPILL RESPONSE PROCEDURES

         1. STOP OPERATIONS AND SHUT OFF EQUIPMENT.
         2. REMOVE ANY SOURCES OF SPARK OR FLAME.
         3. CONTAIN THE SOURCE OF THE SPILL.
         4. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.
         5. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO NEARBY STORM DRAINS.
         6. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.

      iii. SPILL CLEAN UP & CONTAINMENT

         1. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.
         2. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.
         3. ISOLATE AND ELIMINATE THE SPILL SOURCE.
         4. CONTACT THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK PERSONNEL ALONG WITH OTHER APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.
         5. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS.

      iv. REPORTING

         1. COMPLETE AN INCIDENT REPORT.
         2. SUBMIT A COMPLETED INCIDENT REPORT TO THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK.

4. HERBICIDE AND PESTICIDE RESTRICTIONS

   a. THE USE OF HERBICIDES AND PESTICIDES AT THIS SITE IS RESTRICTED.

   b. IF USE OF HERBICIDES AND PESTICIDES ARE REQUIRED AT THIS SITE, USAGE SHOULD FOLLOW INTEGRATED PEST MANAGEMENT ("IPM") TECHNIQUES, INCLUDING FOCUSED SPOT APPLICATIONS AND AVOIDANCE OF BROAD SPECTRUM APPLICATIONS OF CHEMICALS.

5. SALT RESTRICTIONS

   a. SALT USAGE FOR SNOW AND ICE MANAGEMENT IS RESTRICTED FROM USE AT THIS SITE; SAND ONLY SHOULD BE FIRST CONSIDERED.

6. REPORTING

   a. DAILY INSPECTION REPORTS (BRIEF NARRATIVE AND APPLICABLE PHOTOS ON DAYS APT PERFORMS AN INSPECTION) WILL BE COMPLETED FOR COMPLIANCE VERIFICATION WITH THIS AQUIFER PROTECTION PLAN. REPORTS WILL BE PROVIDED TO THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK AND CONNECTICUT SITING COUNCIL.

   a. ANY SIGNIFICANT RELEASES OF SEDIMENT THAT COULD IMPACT WATER QUALITY WILL BE REPORTED TO THE FIRST TAXING DISTRICT WATER DEPARTMENT OF NORWALK WITHIN 24 HOURS.

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

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

D&M DOCUMENTS

NO	DATE	REVISION
0	09/30/21	FOR FILING: RCB
1		
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DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT
ROBERT CHARLES BURNS
NO. 20071
LICENSED
PROFESSIONAL ENGINEER

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DESIGN BASIS:

GOVERNING CODES/DESIGN STANDARDS:

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

DESIGN CRITERIA:

RISK CATEGORY (TOWER) :	III	(IBC 2015 TABLE 1604.5)
RISK CATEGORY (BASE EQUIP.):	III	(TIA-222-H, TABLE 2-1)

WIND LOADS:

ULTIMATE BASIC WIND SPEED, V_{ULT}: (3-SECOND GUST)	120 MPH	(2018 CSBC APPENDIX N)
EXPOSURE CATEGORY	C	(2015 IBC SEC. 1609.4.3)

ICE LOAD

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

LIVE LOAD

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

SNOW LOAD

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

SEISMIC LOAD:

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

01 GENERAL:

ABBREVIATIONS USED IN THESE SPECIFICATIONS INCLUDE THE FOLLOWING:

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

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

THE ENGINEER IS NOT RESPONSIBLE FOR NOR A GUARANTOR OF THE INSTALLING CONTRACTORS WORK, ADEQUACY OF ANY SITE COMPONENT, SUPERVISION OF ANY WORK, AND SAFETY IN, ON, OF 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 OWNER'S 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 CONTRACTOR'S 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, T1
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 MANUFACTURER'S 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 DUST LESS 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 CONTRACTOR'S 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 CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.

ALL STEEL ELEMENTS SHALL BE INSTALLED PLUMB AND LEVEL.

TOWER MANUFACTURERS DESIGNS SHALL PREVAIL FOR TOWER.

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

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

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

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

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

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

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

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 OWNERS 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 IEGR TO THE EXTERNAL EQUIPMENT RING GROUND.
- PLACE GROUND RODS AT THE EQUIPMENT GROUND RING CORNERS.

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

RADIALS (TYP. NEW DEDICATED COMMUNICATION SITES):
- WHERE FEASIBLE WITH ENOUGH SPACE AVAILABLE, INSTALL A MINIMUM OF 4, MAXIMUM 10 RING RADIALS.
- EACH RADIAL'S LENGTH SHALL BE MIN 20 FT, MAX 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 MANUFACTURER'S AND OWNER'S 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 MANUFACTURER'S 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. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE SUCH AS TEMPORARY SEDIMENT TRAPS OR GRASS FILTERS WITHIN THE APPROVED LIMIT OF DISTURBANCE. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE ENGINEER.

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.

FIRST TAXING DISTRICT WATER DEPARTMENT
12 NEW CANAAN AVENUE
NORWALK, CT 06851

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

D&M DOCUMENTS

NO	DATE	REVISION
0	09/30/21	FOR FILING: RCB
1		
2		
3		
4		
5		
6		

DESIGN PROFESSIONALS OF RECORD

PROF: ROBERT C. BURNS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION, P.C.
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: FIRST TAXING DISTRICT (WATER DEPARTMENT)
ADDRESS: 12 NEW CANAAN AVENUE NORWALK, CT 06852

STATE OF CONNECTICUT ROBERT CHARLES BURNS No. 20071 LICENSED PROFESSIONAL ENGINEER

FIRST TAXING DISTRICT - NORWALK

SITE ADDRESS: 173.5 WEST ROCKS ROAD NORWALK, CT 06851

APT FILING NUMBER: CT544100

	DRAWN BY: CSH
DATE: 09/XX/21	CHECKED BY: RCB

SHEET TITLE:

NOTES & SPECIFICATIONS

SHEET NUMBER:

N-2

Valmont Structures
28800 Ida Street
Vally, NE 68064
(402) 359-2201
Engineer:YZ
Reviewed by:YZ

Slab Foundation
Design Calculations

Digitally signed by Nathan A Ross
Date: 2021-08-17 15:31-07:00

Valmont Order Number: 512236
Customer: First Taxing District of Norwalk
Site: First Tax District - Norwalk, CT
Pole Height: 149 ft (150 ft agl)

Inputs

Site Information

Customer:	First Taxing District of Norwalk	
Site:	First Tax District - Norwalk	
Project Number:	512236	
State Abbreviation:	CT	
Soil Parameters Based On:	Geotechnical Report	
Select Soil Type:		
Soil Report Name & Project Number:	Down To Earth Consulting File No. 0032-047.00 dated 3/12/2021	
Design Date:	8/16/2021	
Engineer:	YZ	
Reviewed By:	YZ	
Select Design Code:	TIA 222 H	

Design Requirements

Seismic Design Category:	C	
Ground Water Depth:	1	ft
Frost Depth:	3.5	ft
Clear Cover (Pad)	3	in
Clear Cover (Pedestal):	4	in

Structure Properties

Type:	Pole	
Height:	149	ft
Bolt Circle:	63	in
Number of Bolts:	20	
Bolt Diameter:	2.25	in
Bolt Projection:	12	in
Bolt Length:	66	in
Embedment Plate Diameter:	66.5	in

Reactions

Foundation Maximum Stress:	100.00%	
Moment:	76352.062	in*kips
Global Shear:	55.868	kips
Axial:	62.564	kips
Torsion:	0.000	ft*kips

Material Properties

Anchor Bolt Grade:	A615 Gr75	
Anchor Bolt Allowable Rupture:	100	ksi
Anchor Bolt Allowable Yield:	75	ksi
Concrete Type:	Normal	
Unit Weight of Concrete:	150	pcf
Concrete Compressive Strength:	4500	psi
Reinforcement Yield Strength:	60	ksi
Reinforcement Modulus of Elasticity:	29000	ksi

Bearing Capacity (ksf)	Allowable or Ult?	Safety Factor if Allowable	Backfill Weight (pcf)	Cohesion (ksf)	Internal Friction Angle (deg)	Sliding Friction	Passive Pressure (ksf)	Allowable or Ult?	Safety Factor if Allowable
5.00	Allowable	2.00	110.00	0.00	0.00	0.45	0.00	Ultimate	1.00

Net

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Pad and Pier Data Entry & Calculations

Soil Information	
Soil Parameters Based On:	**Geotechnical Report**
Geotechnical Report Information:	**Down To Earth Consulting File No. 0032-047.00 dated 3/12/2021**

Reactions		
Structure Type	**Pole**	
Axial:	**62.564**	kips
Global Shear	**55.868**	kips
Moment	**6362.672**	ft-kips
Torsion	**0.000**	ft-kips
Bolt Circle	**63**	in
Bolt Length	**66**	in
Bolt Projection	**12**	in

Enter Foundation Size		
Concrete Slab Only?	N	(Enter "Y" if there is no pier)
Pedestal Diameter	**7.00**	ft
Pedestal Shape	**CIRCULAR**	
Pedestal Extension Above Grade	**0.50**	ft
Depth to Bottom of Slab	**6.00**	ft
Height of Pedestal	**3.50**	ft
Slab Width	**30.50**	ft
Slab Thickness	**3.00**	ft

Enter Rebar Size & Quantity	
Pad Rebar Size (Top)	6
Pad Rebar Quantity (Top)	**35**
Pad Rebar Size (Bottom)	9
Pad Rebar Quantity (Bottom)	**35**
Pedestal Vertical Rebar Size	10
Pedestal Vertical Rebar Quantity	**36**
Pedestal Tie Rebar Size	4
Pedestal Tie Rebar Quantity	**8**

Rebar Spacing		Min. Rebar
Top	3 ≤ 9.8 ≤ 17.3	27
	✓	✓
Bottom	3 ≤ 9.4 ≤ 16.9	12
	✓	✓
Vertical	3 ≤ 5.2 ≤ 16.7	22
	✓	✓
Ties	3 ≤ 7 ≤ 20.32	4
	✓	✓

Select Design Options		
Excess Reinforcement Reduction (ACI 318-14 25.4.10)	☑	(Not permitted for Seismic Design Category D, E, or F, 25.4.10.2(e))
Eccentricity Using Working Loads?	☑	(For REV G or REV H Only)
Working Load Conversion Factor	**1.35**	
Top and Bottom Rebar Same?	☐	
Check if Eccentricity is Within Kern?	☐	
Check Diagonal Bearing Pressure?	☑	(Required for TIA-H. Optional for Other Codes)

Site Information			
Customer:	**First Taxing District of Norwalk**	Site:	**First Tax District - Norwalk, CT**
Project Number:	**512236**		

Soil & Concrete Properties		
Allowable Net Soil Bearing Capacity	**5.00**	ksf
Water Depth	**1.00**	ft
Depth of Fill	**3.00**	ft
Backfill Weight Above Water, γ	**110.00**	pcf
Backfill Weight Below Water	**47.60**	pcf
Concrete Weight Above Water	**150.00**	pcf

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Concrete Weight Below Water	**87.60**	pcf
Cohesion	**0.00**	ksf
Internal Friction Angle	**0.00**	deg
Passive Pressure	**0.00**	ksf
Sliding Friction	**0.45**	
Frost Depth	**3.50**	ft
Concrete Design Strength	**4500.00**	psi

Foundation Calculations			
Structural Code:	**TIA-222-H**	**Concrete Code:**	**ACI 318-14**

Concrete & Soil Weight		
Pedestal Volume	**134.696**	ft^3
Pedestal Weight (total weight above & below water)	**15.402**	kips
Slab Volume	**2790.750**	ft^3
Slab Weight	**244.470**	kips
Total Concrete Weight	**259.871**	kips
Soil Weight Above Footing	**182.990**	kips
Total Concrete Volume	**108.35**	cubic yards

Sliding Resistance		
Passive Pressre Coefficient, Kp	**1.00**	
Passive Pressure Top	**0.17**	ksf
Passive Pressure Bottom	**0.29**	ksf
Average Passive Pressure	**0.23**	ksf
Shear Depth	**2.50**	ft2
Shear Area	**76.25**	ft^2
Resisting Weight (Factored)	**445.50**	kips
Ultimate Shear Resistance	**217.71**	kips
Nominal Shear Resistance	**163.29**	kips
Shear Demand	**55.87**	kips
Check for Sliding	✓	
Stress Ratio	**34.21%**	

Overturning Resistance		
From Weight	**6793.84**	ft-kips
From Passive Pressure	**14.37**	ft-kips
From Soil Wedge	**0.00**	ft-kips
Total Resisting Moment (Factored)	**6804.62**	ft-kips
Moment Resistance Demand	**6725.81167**	ft-kips
Check for Overturning Resistance	✓	
Stress Ratio	**98.84%**	

Bearing Resistance (Parallel Direction)		
Slab Area	**930.2500**	ft^2
Section Modulus of Slab	**4728.7708**	ft^3
Kern Limit	**5.0833**	ft
Total Weight (LC 0.9D)	**445.4980**	kips
Eccentricity (LC 0.9D)	**11.1832**	ft
Maximum Toe Pressure (LC 0.9D)	**2.0688**	ksf
Minimum Toe Pressure (LC 0.9D)	**-0.7758**	ksf
Adjusted Toe Pressure (if E > Kern) (LC 0.9D)	**3.2325**	ksf

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Total Weight (LC 1.2D)	**593.9973**	kips	
Eccentricity (LC 1.2D)	**8.3874**	ft	
Maximum Toe Pressure (LC 1.2D)	**2.2843**	ksf	
Minimum Toe Pressure (LC 1.2D)	**-0.5603**	ksf	
Adjusted Toe Pressure (if E > Kern) (LC 1.2D)	**2.5541**	ksf	

Bearing Resistance (Diagonal Direction)			
Kern Limit	**5.0833**	ft	
Moment of Inertia of Mat	**72113.7552**	ft^4	
Total Weight (LC 0.9D)	**445.4980**	kips	
Eccentricity (LC 0.9D)	**11.1832**	ft	
Bearing at A	**1.9689**	ksf	
Bearing at B	**0.4789**	ksf	
Bearing at C	**-1.0111**	ksf	
Bearing at D	**0.4789**	ksf	
Initial Location of NA from C	**14.6348**	ft	
Calculated Location of NA from C	**22.3656**	ft	
Length of Line GH	**41.5358**	ft	
Length of EG & HJ	**0.0000**	ft	
Length of BG & HD	**0.0000**	ft	
Length of EJ	**41.5358**	ft	
Height for EAJ	**20.7679**	ft	
Height for EBG & HDJ	**0.0000**	ft	
MOI for EAJ	**31003.9641**	ft^4	
MOI for EBG & HDJ	**0.0000**	ft^4	
MOI for ABGHDA	**31003.9641**	ft^4	
Distance to Point Load from EJ	**10.3843**	ft	
Effective Length in Bearing Along AB & AD	**29.3702**	ft	
Volume of Pressure Envelope for ABD	**445.5134**	kips	
Volume of Pressure Envelope for GIKH	**0.0000**	kips	
Volume of Pressure Envelope for BIG & DKH	**0.00000000**	kips	
Total Volume of Pressure Envelope	**445.5134**	kips	
Difference in Weight	**0.0000**	kips	OK
Adjusted Bearing at A	**3.0988**	ksf	
Adjusted Bearing at B &D	**0.0000**	ksf	
Maximum Diagonal Bearing Pressure (LC 0.9D)	**4.1834**	ksf	
Total Weight (LC 1.2D)	**593.9973**	kips	
Eccentricity (LC 1.2D)	**8.3874**	ft	
Bearing at A	**2.1285**	ksf	
Bearing at B	**0.6385**	ksf	
Bearing at C	**-0.8514**	ksf	
Bearing at D	**0.6385**	ksf	
Initial Location of NA from C	**12.3242**	ft	
Calculated Location of NA from C	**16.4670**	ft	
Length of Line GH	**32.9341**	ft	
Length of EG & HJ	**10.1994**	ft	
Length of BG & HD	**7.2121**	ft	
Length of EJ	**53.3329**	ft	
Height for EAJ	**26.6665**	ft	
Height for EBG & HDJ	**5.0997**	ft	
MOI for EAJ	**84277.3985**	ft^4	
MOI for EBG & HDJ	**112.7283**	ft^4	

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MOI for ABGHDA	**84051.9418**	ft^4	
Distance to Point Load from EJ	**13.4871**	ft	
Effective Length in Bearing Along AB & AD	**30.5000**	ft	
Volume of Pressure Envelope for ABD	**544.7894**	kips	
Volume of Pressure Envelope for GIKH	**40.8191**	kips	
Volume of Pressure Envelope for BIG & DKH	**4.2138**	kips	
Total Volume of Pressure Envelope	**594.0361**	kips	
Difference in Weight	**0.0000**	kips	OK
Adjusted Bearing at A	**2.5417**	ksf	
Adjusted Bearing at B &D	**0.4861**	ksf	
Maximum Diagonal Bearing Pressure (LC 1.2D)	**3.4313**	ksf	
IS ECCENTRICITY WITHIN 45% OF FOUNDATION WIDTH	**YES**		
Maximum Bearing Pressure	**4.1834**		
Ultimate Gross Bearing Pressure	**10.3480**	ksf	
Factored Bearing Pressure	**7.7610**	ksf	
Check Bearing Capacity	✓		
Stress Ratio	**53.90%**		

Concrete One Way Shear Strength		
Pad Rebar Size (Top)	**6**	
Pad Rebar Diameter (Top)	**0.750**	in
Pad Single Rebar Area (Top)	**0.442**	in^2
Pad Rebar Size (Bottom)	**9**	
Pad Rebar Diameter (Bottom)	**1.128**	in
Pad Single Rebar Area (Bottom)	**0.999**	in^2
Effective Depth (dc)	**32.4360**	in
Distance from Edge of Pad to Column Face	**141.0000**	in
Distance from Edge of Pad to DC	**108.5640**	in
Bearing Slope (LC 0.9D)	**0.2649**	kcf
Shear Demand (LC 0.9D)	**561.2428**	kips
Bearing Slope (LC 1.2D)	**0.1241**	kcf
Shear Demand (LC 1.2D)	**549.9130**	kips
Shear Resistance (per ACI 318-14 22.5.5.1)	**1194.5543**	kips
Check One Way Shear	✓	
Stress Ratio	**46.98%**	

Concrete Two Way Shear Strength		
Equivalent Column Width (PER ACI 318-14 8.10.1.3 & 22.6.4.1.2)	**74.4431**	in
Mat Effective Width in Bearing (LC 0.9D)	**12.2005**	ft
Mat Effective Width in Bearing (LC 1.2D)	**20.5879**	ft
Critical Section Properties		
Critical Section Length (b1)	**106.8791**	in
Critical Section Length (b2)	**106.8791**	in
Critical Section Perimeter (b0)	**427.5162**	in
Centroid of Critical Section (c)	**53.4395**	in
Slab Moment (Msc)	**6558.2087**	ft-kips
Polar MOI of Critical Section (Jc)	**27008495.6710**	in^4

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Fraction of Moment Transferred by Flexure	**0.6000**	
Fraction of Moment Transferred by Eccentricy of Shear	**0.4000**	
Bearing Slope (LC 0.9D)	**0.2649**	kcf
Average Bearing Pressure at Centroid (LC 0.9D)	**0.0000**	ksf
Bearing Slope (LC 1.2D)	**0.1241**	kcf
Average Bearing Pressure at Centroid (LC 1.2D)	**0.6622**	ksf
Shear Force at Centroid	**81.0454**	kips
Shear Stress at Centroid	**68.1303**	psi
Available Shear (PER ACI 318-14 22.6.5.2)	**201.2461**	psi
Check Two Way Shear for Interior Column	✓	
Stress Ratio	**33.85%**	
Critical Section Reinforcement Design		
Effective Beam Width for Resisting Flexure	**16.0000**	ft
Moment Transferred by Flexure	**3934.9252**	ft-kips
ACI Factor per Table 22.2.2.4.3 ($ß_1$)	**0.8250**	
Area of Steel Required	**26.9586**	in^2
Depth of Stress Block	**2.2025**	in
Area of Steel Required in Effective Width	**25.1154**	in^2
Area of Steel Required in Entire Mat (One Way)	**47.8762**	in^2
Area of Steel Provided in Bottom	**50.4390**	in^2
Check Two Way Shear Reinforcement	✓	
Stress Ratio	**94.92%**	

Pad Flexure / Reinforcement Design		
Bottom Rebar		
Bearing Pressure at Critical Section (LC 0.9D)	**0.1194**	ksf
Factored Bearing Moment (LC 0.9D)	**4620.9567**	ft-kips
Bearing Pressure at Critical Section (LC 1.2D)	**1.0964**	ksf
Factored Bearing Moment (LC 1.2D)	**4354.5009**	ft-kips
Area of Rebar Steel Provided in Bottom	**34.9765**	in^2
Depth of Stress Block	**1.4990**	in^2
Nominal Flexural Strength	**5541.4075**	ft-kips
Depth to Neutral Axis	**1.8170**	in
Steel Strain	**0.0506**	in/in
Strength Reduction Factor per ACI 21.2.2	**0.90**	
Factored Flexural Strength	**4987.2667**	ft-kips
Check Bottom Rebar Flexural Strength	✓	
Stress Ratio	**92.66%**	
Top Rebar		
Factored Moment from Dead Weight (LC 0.9D)	**1478.0281**	ft-kips
Factored Moment from Dead Weight (LC 1.2D)	**1970.7041**	ft-kips
Area of Rebar Steel Provided in Top	**15.4625**	in^2
Depth of Stress Block	**0.6627**	in^2
Nominal Flexural Strength	**2482.0949**	ft-kips
Depth to Neutral Axis	**0.8033**	in
Steel Strain	**0.1181**	in/in

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Strength Reduction Factor per ACI 21.2.2	**0.90**		
Factored Flexural Strength	**2233.8854**	ft-kips	
Check Top Rebar Flexural Strength	✓		
Stress Ratio	**88.22%**		

Pad Min. Rebar & Spacing Requirements			
Minimum Reinforcement Ratio for Slabs	**0.0018**		PER ACI 318-14 (7.6.1.1, 24.4.3.2)
Minimum Reinforcement Ratio for Beams	**0.0034**		PER ACI 318-14 (9.6.1.2)
Minimum Reinforcement Area Required	**11.8584**	in^2	
Area of Rebar Steel Provided in Top	**15.4625**	in^2	
Check Minimum Rebar Area in Top	✓		
Stress Ratio	**76.69%**		
Area of Rebar Steel Provided in Bottom	**34.9765**	in^2	
Check Minimum Rebar Area in Bottom	✓		
Stress Ratio	**33.90%**		
Minimum Rebar Clear Spacing	**3.0000**	in	Minimum clear spacing per ACI 318-14 (25.2.1) is smaller of 1 in, 1 rebar diameter, or 4/3 * maximum coarse aggregate diameter using 3 in here as minimum.
Maximum Rebar Center to Center Spacing	**18.0000**	in	PER ACI 318-14 (8.7.2)
Rebar Clear Spacing in Top	**9.8162**	in	
Check Rebar Clear Spacing in Top	✓		
Rebar Clear Spacing in Bottom	**9.4271**	in	
Check Rebar Clear Spacing in Bottom	✓		

Pad Rebar Development Length Requirements per ACI 318-14 25.4.2			
Modification Factors per ACI 318-14 Table 25.4.2.4			
Normal vs. Light Weight	**1**		
Epoxy Coating	**1.0**		Adjust per ACI for epoxy coated rebar if used.
Size (Top)	**0.8**		
Size (Bottom)	**1.0**		
Casting Position (Top)	**1.3**		
Casting Position (Bottom)	**1.0**		
Spacing / Cover (Top)	**2.5**		
Spacing / Cover (Bottom)	**2.5**		
Excess Reinforcement Ratio (Top)	**0.767**		PER ACI 318-14 25.4.10.1
Excess Reinforcement Ratio (Bottom)	**0.339**		
Development Length Demand (Top)	**16.0512**	in	
Development Length Demand (Bottom)	**12.0000**	in	
Length Available (Top & Bottom)	**138.0000**		
Check Length (Top)	✓		
Check Length (Bottom)	✓		

Pedestal Design		
Pedestal Min. Rebar & Spacing Requirements		
Pedestal Vertical Rebar Size	**10**	
Pedestal Vertical Rebar Diameter	**1.270**	in

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Pedestal Vertical Single Rebar Area	**1.267**	in^2	
Pedestal Vertical Total Rebar Area Provided	**45.604**	in^2	
Minimum Rebar Ratio for Pedestals	**0.005**		PER ACI 318-14 16.3.4
Pedestal Vertical Total Rebar Area Required	**27.709**	in^2	
Check Pier Vertical Rebar Area	✓		
Rebar Cage Diameter (to Center of Vertical Bars)	**73.730**	in	
Pedestal Vertical Rebar Clear Spacing	**5.164**	in	
Check Pier Vertical Rebar Spacing	✓		
Pedestal Tie Rebar Size	**4**	in	
Pedestal Tie Rebar Diameter	**0.500**	in	
Pedestal Tie Rebar Area	**0.196**	in^2	
Pedestal Tie Quantity Provided	**8**		
Maximum Tie Spacing	**20.320**		PER ACI 318-14 25.7.2
Minimum Tie Quantity Required	**4.000**		Includes 1 additional at the top below the first tie
Check Tie Spacing & Quantity	✓		
Pedestal Compression Capacity			
Maximum Axial Compressive Strength	**14665.866**	kips	PER ACI 318-14 Table 21.2.1 & 22.4.2.2
Check Pedestal Compression Capacity	✓		
Stress Ratio	**0.43%**		

Pedestal Shear Capacity			
Cross Section Diameter, Bw	**84.000**	in	
Distance from Extreme Compression Fiber to Centroid of Longitudinal Reinforcement	**67.200**	in	PER ACI 318-14 22.5.2.2
Factored Concrete Shear Capacity, Vc	**570.669**	kips	PER ACI 318-14 22.5.6.1 - PHI = 0.75
Check Cross Section Dimensions	**OK**		PER ACI 318-14 22.5.1.2
Shear Reinforcement Required	**0.000**	kips	PER ACI 318-14 22.5.10.1
Spacing of Shear Reinforcement Required	**NA**	in	PER ACI 318-14 22.5.10.5.3
Check Pedestal Shear Capacity	✓		
Stress Ratio	**9.79%**		

Pedestal Moment Capacity		
Pedestal Applied Moment	**6558.209**	ft-kips
Pedestal Factored Moment Capacity	**7227.215**	ft-kips
Check Pedestal Capacity	✓	
Stress Ratio	**90.74%**	

Pedestal Vertical Rebar Development Length Requirements			
Normal vs. Light Weight	**1**		
Epoxy Coating	**1.0**		
Casting Position	**1.0**		
Size	**1.0**		
Spacing Cover	**2.5**		
Confining Reinforcement (Compression)	**1.0**		PER ACI 318-14 TABLE 25.4.9.3
Confining Reinforcement (Hooks)	**1.0**		PER ACI 318-14 TABLE 25.4.3.2

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Bar Size & Clear Cover	**0.7**		PER ACI 318-14 TABLE 25.4.3.2
Excess Reinforcement Ratio	**0.6076**		PER ACI 318-14 25.4.10.1
Development Length Demand (Tension)	**20.71**	in	PER ACI 318-14 25.4.2
Development Length Demand (Compression)	**13.89**	in	PER ACI 318-14 25.4.9.2
Development Length Demand (Hook)	**10.16**	in	
Length Available in Pedestal	**39.00**	in	
Check Vertical Bar in Pedestal (Tension)	✓		
Check Vertical Bar in Pedestal (Compression)	✓		
Length Available in Pad	**33.00**	in	
Check Vertical Bar in Pad (Tension)	✓		
Check Vertical bar in Pad (Compression)	✓		
Check Hook	✓		

Pedestal Torsional Capacity			
Pier Cross Section Area, Acp	**5541.769**	in^2	
Pier Perimeter	**263.894**	in	
Threshold Torsion	**496.406**	ft-kips	PER ACI 318-14 22.7.4
Consider Torsion Effects?	**N**		
Web Width Bw	**84.000**	in	
Distance from Extreme Compression Fiber to Centroid of Longitudinal Reinforcement Diameter	**67.200**	in	
Perimeter Along Center of Transverse Rebar, ph	**237.190**	in	
Area Enclosed by Transverse Rebar, Aoh	**4476.966**	in^2	
Ao	**3805.421**	in^2	
Tie Spacing as Provided, s	**7.000**	in	
Nominal Torsional Strength	**1067.418**	ft-kips	
Factored Torsional Strength	**800.564**	ft-kips	
Cross Section Limits for Solid Sections	**OK**		PER ACI 318-14 22.7.7.1
Check Torsional Strength	✓		PER ACI 318-14 22.7.6
Stress Ratio	**0.00%**		
Anchor Steel Length Check			
Anchor Bolt Embedment in Concrete	**54.000**	in	
Available Development Length	**46.743**	in	Note: assumes embedment plate is 2 in above bottom of anchor bolt.
Required Development Length (Tension)	**20.706**	in	
Check Anchor Bolt Engagement	✓		
Minimum Anchor Bolt Embedment per TIA-222-H 9.6	**10.730**	in	
Check Anchor Bolt Length	✓		

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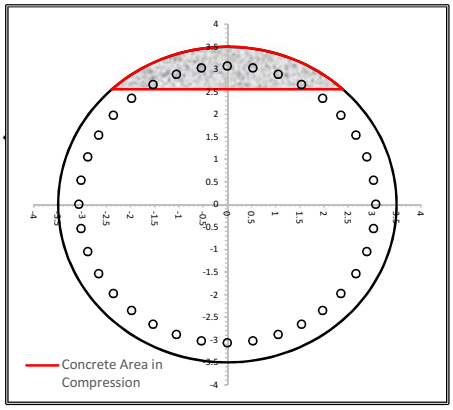
MAXIMUM FACTORED MOMENT OF A CIRCULAR SECTION

Axial Load (Negative for Compression)	-62.564	kips
Limiting Compressive Strain	0.003	in/in
Reinforcement Yield Strain	0.00207	in/in
Pier Diameter	7.00	ft
Vertical Rebar Diameter	1.270	in
Vertical Rebar Quantity	36	
Vertical Rebar Area	1.2668	in^2
Tie Rebar Diameter	0.500	in
Concrete Clear Cover	4.0	in
Rebar Cage Diameter (to Center of Vertical Bars)	73.7	in
Concrete Compressive Strength	4500	psi
Distance from Extreme Edge to Neutral Axis	13.7	in
ACI Factor per Table 22.2.2.4.3 ($ß_1$)	0.825	
Depth of Equivalent Stress Block	11.3	in
Distrance from Centroid to Neutral Axis	28.3	in
Angle from Centroid to Compression Zone	43.1	deg
Area of Concrete in Compression	447.2	in^2
Distance from Centroid of Concrete in Compression to Centroid of Pier	35.3	in
Concrete Compression Force	1676.7	kips
Total Reinforcement Forces	-1614.1	kips
Axial Load	-62.6	kips
Sum of Axial Forces	-1676.7	kips
Sum of Forces in Concrete	0.000	kips
Moment of Concrete in Compression	4925.8	ft-kips
Total Reinforcement Moment	3104.5	ft-kips
Nominal Strength of Column	8030.2	ft-kips
Tensile Strain in Extreme Layer of Reinforcement	-0.0142	in/in
ACI Strength Reduction Factor	0.90	
Factored Moment Strength of Column	7227.2	ft-kips



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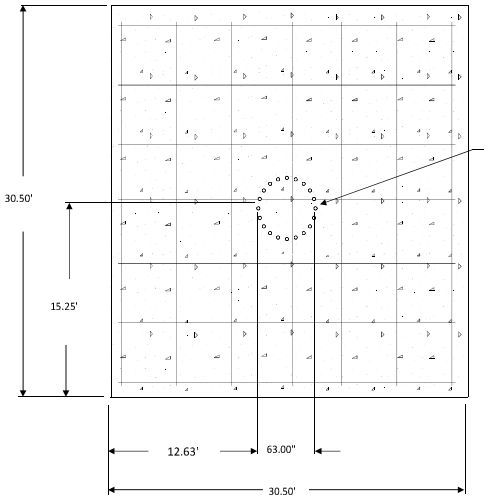
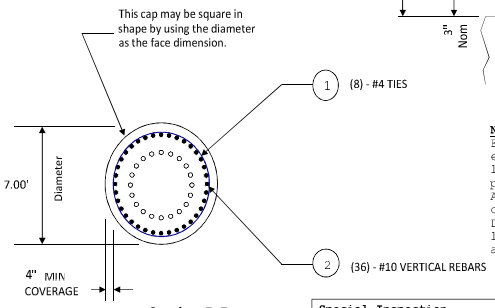


Section A-A
No Scale



Section B-B
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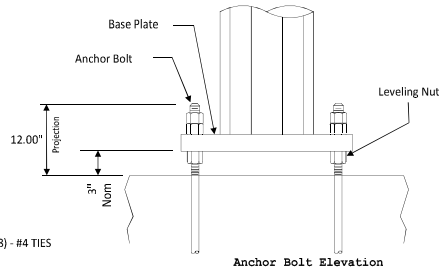


Anchor Bolt Elevation
(No Scale)

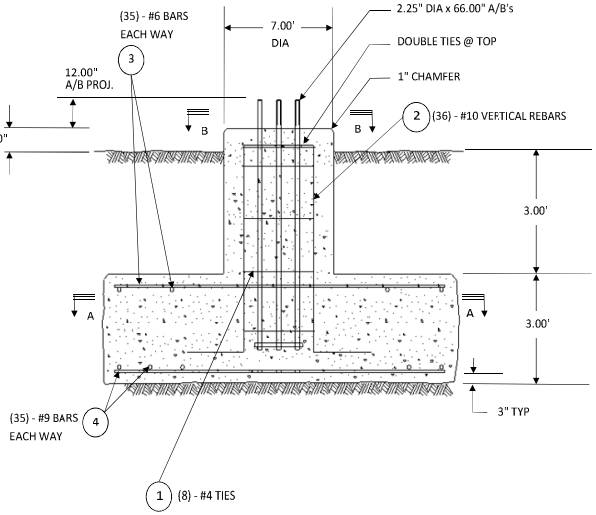
Note:
Extreme care should be taken to ensure that all leveling nuts are level with respect to each other prior to erection of the structure. Anchor bolts shall extend through the top nut completely, fully engaging all nut threads. Distance from top of concrete and bottom of leveling nut shall not exceed the diameter of the anchor bolt.

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' below grade during boring.
7. Foundation design based on Ultimate vert. bearing pressure of 10000 psf.
8. Concrete is assumed to weigh 150 pcf.
9. Estimated concrete volume = **108.35 cubic yards total.**
10. Design Based on the following loads from installation drawing for order No: 512236.

Factored Moment = 6363 FT-KIPS **Overturning Safety Factor = 1.01**
Factored Download = 62.6 KIPS **Max. Toe Bearing Pressure = 4.18 ksf**
Factored Shear = 55.9 KIPS

11. Backfill should be compacted to a density of 110 pcf.
12. Anchor bolts to be ASTM A615 Gr75.
13. Reference: geotechnical report Down To Earth Consulting File No. 0032-047.00 dated 3/12/2021
14. Foundation designed to not exceed 100% of monopole's capacity.
15. Footings shall bear on a prepared subgrade of firm natural Glacial Till, or Compacted Granular Fill or Crushed Stone placed over a prepared native Glacial Till subgrade. Refer to Geotech Section 6.0 for more details.

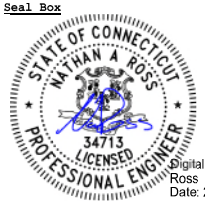


ELEVATION
No Scale

Special Inspection

1. Inspection of reinforcing steel and placement (periodic).
2. Inspection of anchor bolts cast in concrete (periodic).
3. Verifying use of required mix design (periodic).
4. At the time fresh concrete is sampled to fabricate specimens for strength tests; perform slump and air content tests and determine temperature of concrete (continuous).
5. Inspection of concrete placement for proper application techniques (continuous).
6. Inspect formwork for shape, location, and dimensions of the concrete member being formed (periodic).
7. Verify materials below shallow foundation are adequate to achieve the design bearing capacity (periodic).
8. Verify excavations are extended to proper depth and have reached proper material (periodic).
9. Perform classification and testing of compacted fill materials (periodic).
10. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill (continuous).

Seal Box



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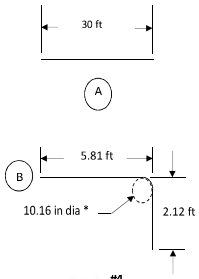
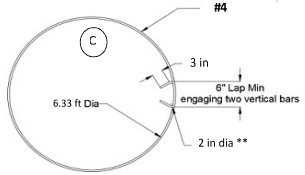
Date: 2021-08-17 15:32-07:00





Note: adjacent circular ties shall not engage the same longitudinal bar with end hook anchorages (stagger hook location).

Reinforcement Steel Schedule

	Type	Rebar Size	Rebar Spacing	Weight (lbs)	Qty
Cap Ties	1	C	#4	Equal	113	8
Cap Vertical Rebar	2	B	#10	-----	1179	36
Slab Top Steel	3	A	#6	10.57 in	3154	70
Slab Bottom Steel	4	A	#9	10.56 in	7140	70
Total Steel Weight for Complete Foundation Installation =					11587	

Grade 60 Rebar

Size	Wt/ft	6db (in)	d* (in)	d** (in)
#3	0.38	2.25	2.25	1.50
#4	0.67	3.00	3.00	2.00
#5	1.04	3.75	3.75	2.50
#6	1.50	4.50	4.50	4.50
#7	2.04	5.25	5.25	4.25
#8	2.67	6.00	6.00	6.00
#9	3.40	6.77	9.50	-
#10	4.30	7.62	10.75	-
#11	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.

Rev.	Description	Date	By/Ck
A	addressed comments	08-16-21	YZ

valmont STRUCTURES
28800 Ida Street
Valley, NE 68064
(402) 359-2201

By:	YZ
Check:	YZ
Date:	08/16/21
Project #512236	
SIZE - B	**Drawing No. CT512236FS**
Slab Foundation Layout	
Customer: First Taxing District of Norwalk	
Site: First Tax District - Norwalk, CT	
Sheet 1 of 1	

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STRUCTURES

September 14th, 2021

Jason R.Mead
All-Points Technology Corporation, P.C.
(860) 490-9930

Ref: Design and failure modes for a 130'/150' AGL Tapered Monopole
Quality of Steel and Fabrication of a Monopole Structure
Valmont Project No. 512236
Site Name: First Tax District - Norwalk, CT
Pole Designed With a Maximum Theoretical Fall Radius of 40'

Tapered Monopole Design Standards and Failure Modes:

Communications monopole structures designed by Valmont are sized in accordance with the latest governing revision of the ANSI/TIA 222 standard unless otherwise requested by our customer. This standard has been approved by ANSI/ASCE, which has dealt with the design of antenna support structures for over 40 years. The TIA standard, based on provisions of this nationally known specification, has a long history of reliability. At its core philosophy is it's first and foremost priority to safeguard and maintain the health and welfare of the public.

The TIA standard designates a minimum wind loading for each county in the United States. Valmont uses the wind loading listed in the TIA standard unless a greater value is specified by our customer. Structures are also designed for radial ice at a code specified reduced design wind loading. Code designated coefficients are used to ensure that the structure will survive the designed wind speed. The structure can usually survive even a greater wind load than the basic design wind speed because of these conservative coefficients.

Design and loading assumptions that are used for the analyses of these structures are very conservative in nature when compared to other codes, which makes structural failure highly improbable.

Failure of a steel monopole occurs when a point is reached where the induced stresses exceed the yield strength of the material. At this point, the deflections induced in the material are no longer temporary. Hence, a permanent deflection in the monopole would exist.

The term failure above refers to local buckling at a designated point on the pole. Local buckling does not cause a free falling pole; rather it relieves the stresses from the pole at this location. Monopoles are flexible, forgiving structures, which are not generally susceptible to damage by impact loads such as wind gust or earthquake shocks.

When local buckling occurs, a relatively small portion of the shaft distorts and "kinks" the steel. When the pole begins to bend the exposure area is reduced and therefore, the force due to wind is decreased as well. Even though buckling exists, the cross section of the pole is capable of carrying the entire vertical load. Therefore, wind induced loads could not conceivably bring this type of structure to the ground due to the excellent ductile properties, design criteria, and failure mode.

Valmont's communication poles have proven to be very reliable products. Valmont has provided structures that have performed well during earthquakes in California, hurricanes in the South (including Hugo, Andrew, Opal and Katrina), and a number of tornadoes. In over 25 years of engineering and fabricating thousands of monopoles, to our knowledge Valmont has never experienced an in service failure of a communication pole due to weather induced overloading, even though, as in the cases of Hurricanes Hugo, Andrew and Katrina, the wind speeds exceeded the design wind speed. We use the latest standards, wind speed information, and sophisticated analytical tools to ensure that we maintain our unblemished record for quality.

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STRUCTURES

Valmont Quality of Steel and Manufacturing:

- Monopoles are fabricated from ASTM A572 Grade 65 material with a controlled silicon content of 0.06% maximum to ensure a uniform galvanized coating. The base material is fabricated from Grade 50 material. All plate material meets a V-Notch toughness requirement of 15 ft-lbs. @ -20 degrees Fahrenheit. By meeting the strict toughness requirement, monopoles are best suited to resist the cyclic/fatigue type loading (i.e. wind induced loading) these structures exhibit.
- Valmont's anchor bolts are fabricated from A615 Grade 75 material. The bolts are typically 2 ¼ in diameter, made from #18J bar stock. Anchor bolts come complete with five (5) A194 Grade 2H hex nuts.
- For the past 40 years, our company has always guaranteed the quality of the steel used in building our structures. Material Certifications are available on all material at the time of fabrication. Fabrication of the monopole is performed in accordance with the provisions of the AISC Manual of Steel Construction and ASCE's Design of Steel Transmission Pole Structures. All welding and inspection is in accordance with the American Welding Society's Specification D1.1-latest revision. Testing and inspection reports are available upon request at the time of fabrication.

In addition, this monopole can be designed to theoretically fail at approximately 110' AGL or above by purposely over designing the pole sections below this point. In the unlikely event the pole were to fail at this point, the significant loading reduction caused by the removal of the tower wind area and weight above would greatly reduce any chance that the remaining tower would have any structural damage, thereby providing a maximum theoretical failure radius of approximately 40' (20' for 130' AGL pole/40' for 150' AGL pole) for the 130'/150' AGL monopole.

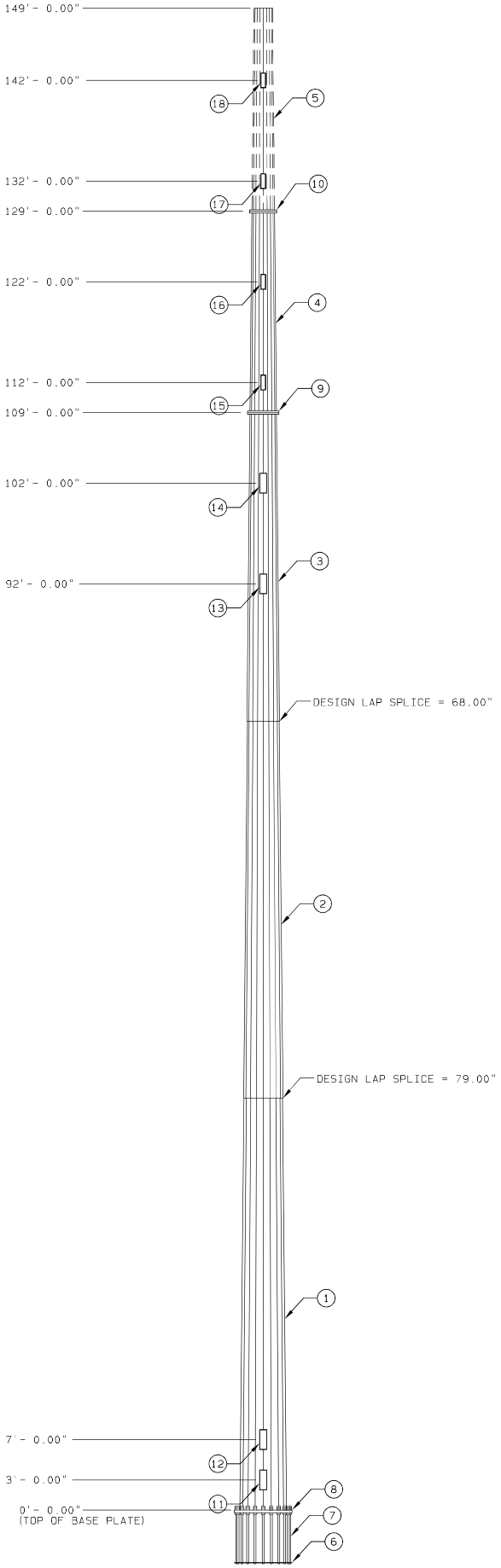
I hope these comments address any issues that you might encounter relative to the anticipated performance of monopole structures and quality of steel fabrication. If you have additional questions or comments, I may be reached at (402) 359-6830 or Yatong.Zeng@Valmont.com.

Sincerely,

Yatong Zeng, EIT
Associate Engineer

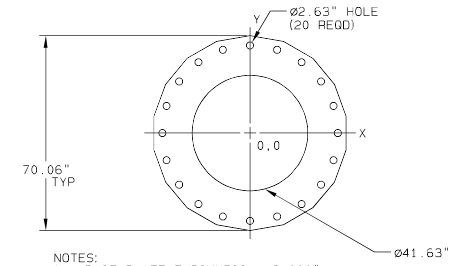
Digitally signed by Nathan A Ross
Date: 2021-09-15 05:33-07:00

Valmont Microflect, Valmont Industries, Inc.
3575 25th Street Salem, OR 97302-1123 USA
Toll Free: 800-547-2151 Fax: 503-316-2040 www.valmont.com



ITEM ID	NO. REQD	FEATURES	UNIT WEIGHT (LBS)	WEIGHT (LBS)
1	1	SECTION A VALMONT S-22 0.500" THK (A572 GR65)	12,619	12,619
2	1	SECTION B VALMONT S-22 0.438" THK (A572 GR65)	8,352	8,352
3	1	SECTION C VALMONT S-22 0.375" THK (A572 GR65)	4,285	4,285
4	1	SECTION D VALMONT S-22 0.250" THK (A572 GR65)	1,549	1,549
5	1	SECTION E VALMONT S-22 0.219" THK (A572 GR65)	1,134	1,134
6	1	BOTTOM CAGE PLATE	123	123
7	20	2.25" ANCHOR BOLT, LENGTH=5.50' A615 GR75	99	1,962
8	1	BASE PLATE VALMONT S-56 3.000" THK (A572 GR50)	2,484	2,484
9	2	FLANGE PLATE	377	754
10	2	FLANGE PLATE	307	614
	1	TOP CAGE PLATE (REMOVE BEFORE SETTING POLE)	163	163
	28	BOLT 0.75" DIA		
	16	BOLT 0.75" DIA		
	1	SAFETY CLIMBING CABLE (LENGTH = 139.00')	108	108
	3	GROUNDING LUG	2	6
		GALVANIZING	479	479
	222	STEP AND CLIP (VALMONT STANDARD)	1	222
11	3	HAND HOLE HVY (9" x 24")	52	156
12	3	HAND HOLE HVY (9" x 24")	52	156
13	3	HAND HOLE STD (9" x 24")	52	156
14	3	HAND HOLE STD (9" x 24")	52	156
15	3	HAND HOLE STD (6" x 18")	18	54
16	3	HAND HOLE STD (6" x 18")	18	54
17	3	HAND HOLE STD (6" x 18")	18	54
18	3	HAND HOLE STD (6" x 18")	18	54
	1	POLE CAP	25	25

HOLE COORDS (INCHES)	
X-COORD	Y-COORD
31.50	0.00
29.96	9.73
25.48	18.52
18.52	25.48
9.73	29.96
0.00	31.50



NOTES:
1. BASE PLATE THICKNESS = 3.000"
2. BASE PLATE ALLOWABLE STRESS (KSI) = 50
3. ANGLES ARE MEASURED CLOCKWISE FROM 0 DEGREES
4. BOLT CIRCLE DIAMETER = 63.00"
5. CAGE TEMPLATE DIAMETER = 66.50"

BASE PLATE / ANCHORAGE CHARACTERISTICS

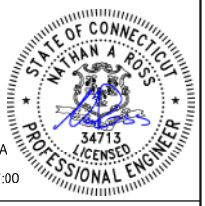
NOTES:

1. FACTORED BASE REACTIONS.
   MOMENT = 76,352 IN-KIPS
   SHEAR = 55,868 #
   VERTICAL = 62,564 #
2. GALVANIZED PER ASTM A-123.
3. DESIGN CRITERIA: ANSI/TIA 222-H
4. THIS STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING LOADING:
   EXPOSURE CATEGORY = C
   TOPOGRAPHY CATEGORY = 1
   RISK CATEGORY = 2
   SITE ELEVATION = 221 FT
   EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS Ss = 0.23
   EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT ONE SECOND S1 = 0.07
   EARTHQUAKE SITE CLASS = C
   WIND LOAD CASES ARE BASED ON 3 SECOND GUST AND 700 YEAR MRI
   A. CASE 1: WIND = 120 MPH WIND SPEED
   B. CASE 2: WIND = 50 MPH ICE AND WIND SPEED
      DESIGN ICE THICKNESS = 1.00 INCH
   C. CASE 3: WIND = 60 MPH WIND SPEED
   D. CASE 4: SEISMIC
   E. CASE 5: SEISMIC
   F. 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)
6-T-ARM, 3' S/O 6' C/A	145.00	145.00	12.87	1728	18.74	2130
6-T-ARM, 3' S/O 6' C/A	135.00	135.00	12.87	1728	18.74	2130
6-T-ARM, 3' S/O 6' C/A	125.00	125.00	12.87	1728	18.74	2130
6-T-ARM, 3' S/O 6' C/A	115.00	115.00	12.87	1728	18.74	2130
6-T-ARM, 3' S/O 6' C/A	105.00	105.00	12.87	1728	18.74	2130
6-T-ARM, 3' S/O 6' C/A	95.00	95.00	12.87	1728	18.74	2130
1-1/2" X 4' LIGHTNING ROD	149.00	151.00	0.20	14	0.96	24
9-PANEL ANTENNA (96"X21"X6.3"	145.00	145.00	95.04	1035	106.56	3420
12-RRH (22" X 18" X 12")	145.00	145.00	26.40	480	30.72	1368
3-RAYCAP DC6-48-60-0-8C-EV	145.00	145.00	7.62	78	8.73	348
9-PANEL ANTENNA (96"X21"X6.3"	135.00	135.00	95.04	1035	106.47	3402
12-RRH (22" X 18" X 12")	135.00	135.00	26.40	480	30.60	1356
3-RAYCAP DC6-48-60-0-8C-EV	135.00	135.00	7.62	78	8.73	348
9-PANEL ANTENNA (96"X21"X6.3"	125.00	125.00	95.04	1035	106.38	3384
12-RRH (22" X 18" X 12")	125.00	125.00	26.40	480	30.60	1344
3-RAYCAP DC6-48-60-0-8C-EV	125.00	125.00	7.62	78	8.73	345
9-PANEL ANTENNA (96"X21"X6.3"	115.00	115.00	95.04	1035	106.29	3357
12-RRH (22" X 18" X 12")	115.00	115.00	26.40	480	30.60	1344
3-RAYCAP DC6-48-60-0-8C-EV	115.00	115.00	7.62	78	8.70	342
9-PANEL ANTENNA (96"X21"X6.3"	105.00	105.00	95.04	1035	106.20	3339
12-RRH (22" X 18" X 12")	105.00	105.00	26.40	480	30.48	1332
3-RAYCAP DC6-48-60-0-8C-EV	105.00	105.00	7.62	78	8.70	339
9-PANEL ANTENNA (96"X21"X6.3"	95.00	95.00	95.04	1035	106.11	3312
12-RRH (22" X 18" X 12")	95.00	95.00	26.40	480	30.48	1320
3-RAYCAP DC6-48-60-0-8C-EV	95.00	95.00	7.62	78	8.70	336

5. FEEDLINES ARE PLACED INTERIOR TO POLE SHAFT (UNLESS NOTED OTHERWISE).
6. TOTAL POLE HEIGHT IS 150 FT AGL.
7. ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE (APPROX. 1 FT AGL).
8. 18 SIDED SHAFT
9. POLE IS DESIGNED FOR A THEORETICAL FALL ZONE RADIUS OF 40'WITH EXTENSION.
10. POLE IS DESIGNED FOR 120 MPH ULTIMATE WIND PER 2018 CSBC APPENDIX N
11. POLE IS EXTENDABLE FROM 130' AGL TO 150' AGL
12. POTENTIAL FUTURE EXTENSION BY OTHERS.
13. THE PROPOSED TOWER SHALL BE PAINTED AS NOTED ON THE RFQ FORM.

SECTION INFORMATION					
ITEM ID	LENGTH	BASE OD	TOP OD	THK	MATL
1	47'- 6.00"	55.50"	44.30"	0.500"	A572 65 KSI
2	43'- 1.00"	46.73"	36.57"	0.438"	A572 65 KSI
3	30'- 8.00"	38.66"	31.43"	0.375"	A572 65 KSI
4	20'- 0.00"	31.43"	26.71"	0.250"	A572 65 KSI
5	20'- 0.00"	26.71"	22.00"	0.219"	A572 65 KSI



Digitally signed by Nathan A Ross
Date: 2021-08-17 15:35-07:00

REV ID	DATE	REV BY	DESCRIPTION
	08/12/2021	YZ	addressed comments

ORDER	PROJECT	FILE ID	SCALE	DATE	ENGR
512236		512236-Pireva	NONE	08/16/21	YZ70

DESCRIPTION
FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT - NORWALK, CT

valmont

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

Communication Structure Calculations
for
First Taxing District of Norwalk
First Tax District - Norwalk, CT

512236-P1

Monday, 16 August 2021

Prepared By:
Yatong Zeng

Reviewed By:
YZ

Digitally signed by Nathan A Ross
Date: 2021-08-17 15:30-07:00

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

Table Of Contents

Valmont Industries, Inc.
Project Summary
First Taxing District of Norwalk
512236

			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)
512236-P1reva	149.00	----	63.00	66	20	55.50	55.50	22.00	12619	8352	4285	1549	1134	----	2484	1961	WIND	76352	55.9	60.1	140

Valmont Industries, Inc.
Project Summary
First Taxing District of Norwalk
512236

								Length (ft)						Thickness (in)					
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)	Sect A	Sect B	Sect C	Sect D	Sect E	Sect F	Sect A	Sect B	Sect C	Sect D	Sect E	Sect F
512236-P1reva	65	0.236	18	2.25	69.00	3.00	0.0	47.50	43.08	30.67	20.00	20.00	----	0.500	0.438	0.375	0.250	0.219	----

Valmont Industries, Inc.
Project Summary
First Taxing District of Norwalk
512236

	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
512236-P1reva	55.50	44.30	46.73	36.57	38.66	31.43	31.43	26.71	26.71	22.00	----	----	Slip Joint	Slip Joint	Flange	Flange	

Valmont Industries, Inc.
Engineering Data

*** OVERVIEW ***

1. Structure design conforms to TIA-222-H including:
   120 mph Wind Speed (3 second gust, 700 year mean recurrence interval)
   50 mph Ice Wind (500 year mean recurrence interval)
   1.00 in ice thickness
   60.0 mph Basic Wind Speed with no ice for twist and sway
   Exposure Category C
   Risk Category II
   Topographic Category 1
   Site Elevation = 221 (ft) above mean sea level
   Spectral response acceleration at short periods and 1 sec.: Ss = 0.23 & S1 = 0.07
   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 150.0 ft agl
5. Elevations are measured from top of base plate (approximately 1.0 ft agl)
6. Pole is designed for a theoretical fall zone radius of 40' with extension
7. Pole is designed for 120 mph ultimate wind per 2018 CSBC Appendix N
8. Pole is extendable from 130' AGL to 150' AGL
9. potential future extension by others.
10. the proposed tower shall be painted as noted on the rfq form

*** Structure Anchorage Information ***

Pole Height (ft):	149.0	Number of Anchor Bolts:	20
Bolt Circle (in):	63.00	Diameter of Anchor Bolts (in):	2.25
Base Shear (lbs):	55868	Length of Anchor Bolts (in):	66.00
Base Vertical (lbs):	62564	Projection Length (in):	12.00
Base Moment (in-kips):	76352	Template OD (in):	66.50

*** Loading Data***

			Without Ice		With Ice	
Qty	Description	ABP Height (ft)	EPA (ft^2)	Weight (lbs)	EPA (ft^2)	Weight (lbs)
6	T-ARM, 3' S/O 6' C/A	145.00	12.84	1728	18.72	2130
6	T-ARM, 3' S/O 6' C/A	135.00	12.84	1728	18.72	2130
6	T-ARM, 3' S/O 6' C/A	125.00	12.84	1728	18.72	2130
6	T-ARM, 3' S/O 6' C/A	115.00	12.84	1728	18.72	2130
6	T-ARM, 3' S/O 6' C/A	105.00	12.84	1728	18.72	2130
6	T-ARM, 3' S/O 6' C/A	95.00	12.84	1728	18.72	2130
1	1/2" X 4' LIGHTNING ROD	149.00	0.20	14	0.96	24
9	PANEL ANTENNA (96"X21"X6.3") (W/PM)	145.00	95.04	1035	106.56	3420
12	RRH (22" X 18" X 12")	145.00	26.40	480	30.72	1368
3	RAYCAP DC6-48-60-0-8C-EV	145.00	7.62	78	8.73	348
9	PANEL ANTENNA (96"X21"X6.3") (W/PM)	135.00	95.04	1035	106.47	3402
12	RRH (22" X 18" X 12")	135.00	26.40	480	30.60	1356
3	RAYCAP DC6-48-60-0-8C-EV	135.00	7.62	78	8.73	348
9	PANEL ANTENNA (96"X21"X6.3") (W/PM)	125.00	95.04	1035	106.38	3384
12	RRH (22" X 18" X 12")	125.00	26.40	480	30.60	1344
3	RAYCAP DC6-48-60-0-8C-EV	125.00	7.62	78	8.73	345
9	PANEL ANTENNA (96"X21"X6.3") (W/PM)	115.00	95.04	1035	106.29	3357
12	RRH (22" X 18" X 12")	115.00	26.40	480	30.60	1344
3	RAYCAP DC6-48-60-0-8C-EV	115.00	7.62	78	8.70	342

			Without Ice		With Ice	
Qty	Description	ABP Height (ft)	EPA (ft^2)	Weight (lbs)	EPA (ft^2)	Weight (lbs)
9	PANEL ANTENNA (96"X21"X6.3") (W/PM)	105.00	95.04	1035	106.20	3339
12	RRH (22" X 18" X 12")	105.00	26.40	480	30.48	1332
3	RAYCAP DC6-48-60-0-8C-EV	105.00	7.62	78	8.70	339
9	PANEL ANTENNA (96"X21"X6.3") (W/PM)	95.00	95.04	1035	106.11	3312
12	RRH (22" X 18" X 12")	95.00	26.40	480	30.48	1320
3	RAYCAP DC6-48-60-0-8C-EV	95.00	7.62	78	8.70	336

BY VALMONT INDUSTRIES FOR: FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT DATE 08/16/2021
Design Id: 512236-P1reva IMPAX 24.3.20.4

*** SUMMARY ***

Design Code: TIA-222-H

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

Height Above Base Plate	149'- 0.00"	Dia. at Top of Baseplate (in)	55.500	Pole Shaft Weight (lbs)	27939
		Top Diameter (in)	21.999		
		Pole Taper (in/ft)	0.23574	Shape:	18 Sides

Connections Between Sections	/First/	/Second/	/Third/	/Fourth/
Height Above Ground	47'- 6.00"	84'- 0.00"	109'- 0.00"	129'- 0.00"
Type	Slip Joint	Slip Joint	Flange Joint	Flange Joint
Overlap Length (in)	79	68	0	0
Maximum Axial Force (lbs)	74910	63208	39899	19354

Section Characteristics	/First/	/Second/	/Third/	/Fourth/	/Fifth/
Base Diameter (in)	55.500	46.729	38.659	31.429	26.714
Top Diameter (in)	44.302	36.573	31.430	26.714	21.999
Thickness (in)	0.50000	0.43750	0.37500	0.25000	0.21875
Length	47'- 6.00"	43'- 1.00"	30'- 8.00"	20'- 0.00"	20'- 0.00"
Weight (lbs)	12619	8352	4285	1549	1134
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	47.50	84.00	109.00	129.00	149.00
Resultant Moment (in-kips)	76352	76352	45127	22324	8856	2385	0
Shear Force (lbs)	55982	55982	53381	50647	33990	17138	13
Axial Force (lbs)	59973	59973	40504	28921	16260	7255	15
Effective Yield Strength (ksi)	80.45	80.45	82.06	82.55	77.40	78.15	82.55
Combined Interaction Value	0.91	0.91	0.91	0.77	0.70	0.30	0.00
Total Deflection (in)	0.00	0.00	13.63	44.66	76.44	107.09	140.38

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

BY VALMONT INDUSTRIES FOR: FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT DATE 08/16/2021
Design Id: 512236-P1reva IMPAX 24.3.20.4

SUMMARY OF SECTION DIMENSIONS AS DETAILED

Height Above Base Plate 149'- 0.00" Dia. at Top of Baseplate (in) 55.500 Pole Shaft Weight (lbs) 27939

Top Diameter (in) 21.999

Pole Taper (in/ft) 0.23574 Shape: 18 Sides

Connections Between Sections	/First/	/Second/	/Third/	/Fourth/
Height Above Ground	47'- 6.00"	84'- 0.00"	109'- 0.00"	129'- 0.00"
Type	Slip Joint	Slip Joint	Flange Joint	Flange Joint
Flange Thickness (in)			2.000	2.000
Weld Root Gap (in)			0.250	0.250

Theoretical Design Section Dimensions	/First/	/Second/	/Third/	/Fourth/	/Fifth/
Base Diameter (in)	55.500	46.729	38.659	31.429	26.714
Top Diameter (in)	44.302	36.573	31.430	26.714	21.999
Thickness (in)	0.50000	0.43750	0.37500	0.25000	0.21875
Length	47'- 6.00"	43'- 1.00"	30'- 8.00"	20'- 0.00"	20'- 0.00"

As Detailed Section Characteristics	/First/	/Second/	/Third/	/Fourth/	/Fifth/
BasePlate/Flange thk.at Base (in)	3.000	0.000	0.000	2.000	2.000
Weld Root Gap at Base (in)	0.000	0.000	0.000	0.250	0.250
Base Diameter (in)	55.500	46.729	38.659	31.385	26.670
Top Diameter (in)	44.302	36.573	31.474	26.758	21.999
Thickness (in)	0.50000	0.43750	0.37500	0.25000	0.21875
Length	47'- 6.00"	43'- 1.00"	30'- 5.75"	19'- 7.50"	19'- 9.75"
Taper (in/ft)	0.23574	0.23574	0.23574	0.23574	0.23574
Weld Root Gap at Top (in)	0.000	0.000	0.250	0.250	0.000
BasePlate/Flange thk. at Top (in)	0.000	0.000	2.000	2.000	0.000

Note: Diameter are outside, measured across the flats

BY VALMONT INDUSTRIES FOR: FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT DATE 08/16/2021
Design Id: 512236-P1reva IMPAX 24.3.20.4

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

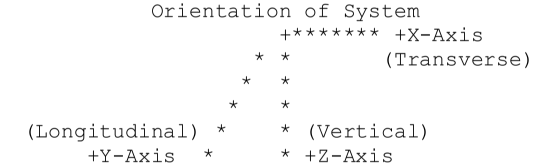
Loading Case Identifier	Moments About X-Axis (in-kips)	Moments About Y-Axis (in-kips)	Moments Resultant (X & Y) (in-kips)	Moments Torsional (in-kips)	Vertical Force (lbs)	Shear In X-Direction (lbs)	Shear In Y-Direction (lbs)	Shear Resultant (X & Y) (lbs)	Notes
WIND	58496	-49070	76352	1390	60080	35911	42797	55868	
ICE + WIND	14533	-12191	18969	274	94964	8210	9785	12773	
T+S	14760	-12383	19266	350	49361	8991	10716	13988	
Seismic	2012	-1688	2626	17	61128	951	1133	1479	
Seismic 2	1872	-1570	2443	17	42406	951	1133	1479	

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

*** INPUT LOADS ***

Design Code TIA-222-H
Loading Case WIND (1.2 D + 1.0 Wo)

Basic Wind Velocity is 120.00 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
Risk Category II, 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
Flange Weight 389 lbs (unfactored) 2 @ 109.0 ft
Flange Weight 292 lbs (unfactored) 2 @ 129.0 ft
Elevation of structure base above surrounding terrain = 1.00 ft



Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	145.00	145.00	0.00	50.00	432	515	2074	12.84	6-T-arm, 3' S
2	135.00	135.00	0.00	50.00	426	508	2074	12.84	6-T-arm, 3' S
3	125.00	125.00	0.00	50.00	419	499	2074	12.84	6-T-arm, 3' S
4	115.00	115.00	0.00	50.00	412	491	2074	12.84	6-T-arm, 3' S
5	105.00	105.00	0.00	50.00	404	482	2074	12.84	6-T-arm, 3' S
6	95.00	95.00	0.00	50.00	396	472	2074	12.84	6-T-arm, 3' S
7	149.00	151.00	0.00	50.00	7	8	17	0.20	1-1/2" x 4' l
8	145.00	145.00	3.00	50.00	3200	3813	1242	95.04	9-Panel Anten
9	145.00	145.00	3.00	50.00	889	1059	576	26.40	12-RRH (22" x
10	145.00	145.00	3.00	50.00	257	306	94	7.62	3-Raycap DC6-
11	135.00	135.00	3.00	50.00	3152	3757	1242	95.04	9-Panel Anten
12	135.00	135.00	3.00	50.00	876	1044	576	26.40	12-RRH (22" x
13	135.00	135.00	3.00	50.00	253	301	94	7.62	3-Raycap DC6-
14	125.00	125.00	3.00	50.00	3102	3697	1242	95.04	9-Panel Anten
15	125.00	125.00	3.00	50.00	862	1027	576	26.40	12-RRH (22" x
16	125.00	125.00	3.00	50.00	249	296	94	7.62	3-Raycap DC6-

*** INPUT LOADS ***

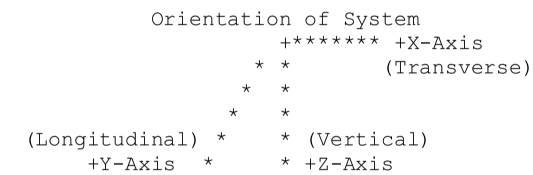
Loading Case WIND - Continued

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Orientation of System Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
17	115.00	115.00	3.00	50.00	3049	3633	1242	95.04	9-Panel Anten
18	115.00	115.00	3.00	50.00	847	1009	576	26.40	12-RRH (22" x
19	115.00	115.00	3.00	50.00	244	291	94	7.62	3-Raycap DC6-
20	105.00	105.00	3.00	50.00	2991	3565	1242	95.04	9-Panel Anten
21	105.00	105.00	3.00	50.00	831	990	576	26.40	12-RRH (22" x
22	105.00	105.00	3.00	50.00	240	286	94	7.62	3-Raycap DC6-
23	95.00	95.00	3.00	50.00	2929	3491	1242	95.04	9-Panel Anten
24	95.00	95.00	3.00	50.00	814	970	576	26.40	12-RRH (22" x
25	95.00	95.00	3.00	50.00	235	280	94	7.62	3-Raycap DC6-

*** INPUT LOADS ***

Design Code TIA-222-H
Loading Case ICE + WIND (1.2 D + 1.0 Wi + 1.0 Di)

Basic Wind Velocity is 50.00 mph Ice Thickness 1.00
Wind Orientation is 50.0 Degrees Clockwise From +X Axis
Structure Weight Overload Factor is 1.200
Exposure C, Gust Factor 1.10
Risk Category II, 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
Flange Weight 389 lbs (unfactored) 2 @ 109.0 ft
Flange Weight 292 lbs (unfactored) 2 @ 129.0 ft
Elevation of structure base above surrounding terrain = 1.00 ft



Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	145.00	145.00	0.00	50.00	109	130	2556	18.72	6-T-arm, 3' S
2	135.00	135.00	0.00	50.00	108	128	2556	18.72	6-T-arm, 3' S
3	125.00	125.00	0.00	50.00	106	126	2556	18.72	6-T-arm, 3' S
4	115.00	115.00	0.00	50.00	104	124	2556	18.72	6-T-arm, 3' S
5	105.00	105.00	0.00	50.00	102	122	2556	18.72	6-T-arm, 3' S
6	95.00	95.00	0.00	50.00	100	119	2556	18.72	6-T-arm, 3' S
7	149.00	151.00	0.00	50.00	6	7	29	0.96	1-1/2" x 4' l
8	145.00	145.00	3.00	50.00	623	742	4104	106.56	9-Panel Anten
9	145.00	145.00	3.00	50.00	180	214	1642	30.72	12-RRH (22" x
10	145.00	145.00	3.00	50.00	51	61	418	8.73	3-Raycap DC6-
11	135.00	135.00	3.00	50.00	613	731	4082	106.47	9-Panel Anten
12	135.00	135.00	3.00	50.00	176	210	1627	30.60	12-RRH (22" x
13	135.00	135.00	3.00	50.00	50	60	418	8.73	3-Raycap DC6-
14	125.00	125.00	3.00	50.00	603	718	4061	106.38	9-Panel Anten
15	125.00	125.00	3.00	50.00	173	207	1613	30.60	12-RRH (22" x
16	125.00	125.00	3.00	50.00	49	59	414	8.73	3-Raycap DC6-

*** INPUT LOADS ***

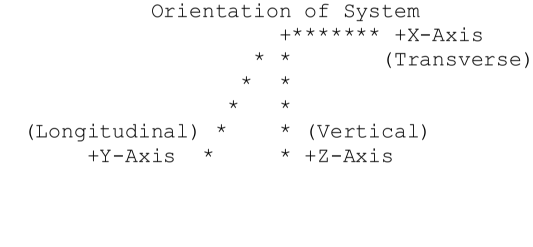
Loading Case ICE + WIND - Continued

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Orientation of System Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
17	115.00	115.00	3.00	50.00	592	705	4028	106.29	9-Panel Anten
18	115.00	115.00	3.00	50.00	170	203	1613	30.60	12-RRH (22" x
19	115.00	115.00	3.00	50.00	48	58	410	8.70	3-Raycap DC6-
20	105.00	105.00	3.00	50.00	580	692	4007	106.20	9-Panel Anten
21	105.00	105.00	3.00	50.00	167	198	1598	30.48	12-RRH (22" x
22	105.00	105.00	3.00	50.00	48	57	407	8.70	3-Raycap DC6-
23	95.00	95.00	3.00	50.00	568	677	3974	106.11	9-Panel Anten
24	95.00	95.00	3.00	50.00	163	194	1584	30.48	12-RRH (22" x
25	95.00	95.00	3.00	50.00	47	55	403	8.70	3-Raycap DC6-

*** INPUT LOADS ***

Design Code TIA-222-H
Loading Case T+S (1.0 D + 1.0 Wo)

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
Risk Category II, 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
Flange Weight 389 lbs (unfactored) 2 @ 109.0 ft
Flange Weight 292 lbs (unfactored) 2 @ 129.0 ft
Elevation of structure base above surrounding terrain = 1.00 ft



Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	145.00	145.00	0.00	50.00	108	129	1728	12.84	6-T-arm, 3' S
2	135.00	135.00	0.00	50.00	106	127	1728	12.84	6-T-arm, 3' S
3	125.00	125.00	0.00	50.00	105	125	1728	12.84	6-T-arm, 3' S
4	115.00	115.00	0.00	50.00	103	123	1728	12.84	6-T-arm, 3' S
5	105.00	105.00	0.00	50.00	101	120	1728	12.84	6-T-arm, 3' S
6	95.00	95.00	0.00	50.00	99	118	1728	12.84	6-T-arm, 3' S
7	149.00	151.00	0.00	50.00	2	2	14	0.20	1-1/2" x 4' l
8	145.00	145.00	3.00	50.00	800	953	1035	95.04	9-Panel Anten
9	145.00	145.00	3.00	50.00	222	265	480	26.40	12-RRH (22" x
10	145.00	145.00	3.00	50.00	64	76	78	7.62	3-Raycap DC6-
11	135.00	135.00	3.00	50.00	788	939	1035	95.04	9-Panel Anten
12	135.00	135.00	3.00	50.00	219	261	480	26.40	12-RRH (22" x
13	135.00	135.00	3.00	50.00	63	75	78	7.62	3-Raycap DC6-
14	125.00	125.00	3.00	50.00	776	924	1035	95.04	9-Panel Anten
15	125.00	125.00	3.00	50.00	215	257	480	26.40	12-RRH (22" x
16	125.00	125.00	3.00	50.00	62	74	78	7.62	3-Raycap DC6-

*** INPUT LOADS ***

Loading Case T+S - Continued

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Orientation of System Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
17	115.00	115.00	3.00	50.00	762	908	1035	95.04	9-Panel Anten
18	115.00	115.00	3.00	50.00	212	252	480	26.40	12-RRH (22" x
19	115.00	115.00	3.00	50.00	61	73	78	7.62	3-Raycap DC6-
20	105.00	105.00	3.00	50.00	748	891	1035	95.04	9-Panel Anten
21	105.00	105.00	3.00	50.00	208	248	480	26.40	12-RRH (22" x
22	105.00	105.00	3.00	50.00	60	71	78	7.62	3-Raycap DC6-
23	95.00	95.00	3.00	50.00	732	873	1035	95.04	9-Panel Anten
24	95.00	95.00	3.00	50.00	203	242	480	26.40	12-RRH (22" x
25	95.00	95.00	3.00	50.00	59	70	78	7.62	3-Raycap DC6-

*** INPUT LOADS ***

Design Code TIA-222-H
Loading Case Seismic (1.2 D + 1.0 Ev + 1.0 Eh)
Seismic analysis following the Equivalent Lateral Force Procedure
Risk Category: II
Site Class: C
Response Acceleration at short periods: 0.23
Response Acceleration at one second: 0.07
The above are used to obtain the acceleration and velocity based site coefficients Fa and Fv
Foundation Rotation of 0.00 Degrees
Flange Weight 389 lbs (unfactored) 2 @ 109.0 ft
Flange Weight 292 lbs (unfactored) 2 @ 129.0 ft
Elevation of structure base above surrounding terrain = 1.00 ft

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	145.00	145.00	0.00	50.00	0	0	2074	12.84	6-T-arm, 3' S
2	135.00	135.00	0.00	50.00	0	0	2074	12.84	6-T-arm, 3' S
3	125.00	125.00	0.00	50.00	0	0	2074	12.84	6-T-arm, 3' S
4	115.00	115.00	0.00	50.00	0	0	2074	12.84	6-T-arm, 3' S
5	105.00	105.00	0.00	50.00	0	0	2074	12.84	6-T-arm, 3' S
6	95.00	95.00	0.00	50.00	0	0	2074	12.84	6-T-arm, 3' S
7	149.00	151.00	0.00	50.00	0	0	17	0.20	1-1/2" x 4' l
8	145.00	145.00	3.00	50.00	0	0	1242	95.04	9-Panel Anten
9	145.00	145.00	3.00	50.00	0	0	576	26.40	12-RRH (22" x
10	145.00	145.00	3.00	50.00	0	0	94	7.62	3-Raycap DC6-
11	135.00	135.00	3.00	50.00	0	0	1242	95.04	9-Panel Anten
12	135.00	135.00	3.00	50.00	0	0	576	26.40	12-RRH (22" x
13	135.00	135.00	3.00	50.00	0	0	94	7.62	3-Raycap DC6-
14	125.00	125.00	3.00	50.00	0	0	1242	95.04	9-Panel Anten
15	125.00	125.00	3.00	50.00	0	0	576	26.40	12-RRH (22" x
16	125.00	125.00	3.00	50.00	0	0	94	7.62	3-Raycap DC6-
17	115.00	115.00	3.00	50.00	0	0	1242	95.04	9-Panel Anten

*** INPUT LOADS ***

Loading Case Seismic - Continued

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Orientation of System Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
18	115.00	115.00	3.00	50.00	0	0	576	26.40	12-RRH (22" x
19	115.00	115.00	3.00	50.00	0	0	94	7.62	3-Raycap DC6-
20	105.00	105.00	3.00	50.00	0	0	1242	95.04	9-Panel Anten
21	105.00	105.00	3.00	50.00	0	0	576	26.40	12-RRH (22" x
22	105.00	105.00	3.00	50.00	0	0	94	7.62	3-Raycap DC6-
23	95.00	95.00	3.00	50.00	0	0	1242	95.04	9-Panel Anten
24	95.00	95.00	3.00	50.00	0	0	576	26.40	12-RRH (22" x
25	95.00	95.00	3.00	50.00	0	0	94	7.62	3-Raycap DC6-

*** INPUT LOADS ***

Design Code TIA-222-H
Loading Case Seismic 2 (0.9 D - 1.0 Ev + 1.0 Eh)
Seismic analysis following the Equivalent Lateral Force Procedure
Risk Category: II
Site Class: C
Response Acceleration at short periods: 0.23
Response Acceleration at one second: 0.07
The above are used to obtain the acceleration and velocity based site coefficients Fa and Fv
Foundation Rotation of 0.00 Degrees
Flange Weight 389 lbs (unfactored) 2 @ 109.0 ft
Flange Weight 292 lbs (unfactored) 2 @ 129.0 ft
Elevation of structure base above surrounding terrain = 1.00 ft

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
1	145.00	145.00	0.00	50.00	0	0	1555	12.84	6-T-arm, 3' S
2	135.00	135.00	0.00	50.00	0	0	1555	12.84	6-T-arm, 3' S
3	125.00	125.00	0.00	50.00	0	0	1555	12.84	6-T-arm, 3' S
4	115.00	115.00	0.00	50.00	0	0	1555	12.84	6-T-arm, 3' S
5	105.00	105.00	0.00	50.00	0	0	1555	12.84	6-T-arm, 3' S
6	95.00	95.00	0.00	50.00	0	0	1555	12.84	6-T-arm, 3' S
7	149.00	151.00	0.00	50.00	0	0	13	0.20	1-1/2" x 4' l
8	145.00	145.00	3.00	50.00	0	0	932	95.04	9-Panel Anten
9	145.00	145.00	3.00	50.00	0	0	432	26.40	12-RRH (22" x
10	145.00	145.00	3.00	50.00	0	0	70	7.62	3-Raycap DC6-
11	135.00	135.00	3.00	50.00	0	0	932	95.04	9-Panel Anten
12	135.00	135.00	3.00	50.00	0	0	432	26.40	12-RRH (22" x
13	135.00	135.00	3.00	50.00	0	0	70	7.62	3-Raycap DC6-
14	125.00	125.00	3.00	50.00	0	0	932	95.04	9-Panel Anten
15	125.00	125.00	3.00	50.00	0	0	432	26.40	12-RRH (22" x
16	125.00	125.00	3.00	50.00	0	0	70	7.62	3-Raycap DC6-
17	115.00	115.00	3.00	50.00	0	0	932	95.04	9-Panel Anten

*** INPUT LOADS ***

Loading Case Seismic 2 - Continued

Load Number	Mounting Height	Load Height	Load Eccentricity	Orientation in XY Plane (Degrees)	Orientation of System Force-X (lbs)	Force-Y (lbs)	Force-Z (lbs)	EPA (ft^2)	
18	115.00	115.00	3.00	50.00	0	0	432	26.40	12-RRH (22" x
19	115.00	115.00	3.00	50.00	0	0	70	7.62	3-Raycap DC6-
20	105.00	105.00	3.00	50.00	0	0	932	95.04	9-Panel Anten
21	105.00	105.00	3.00	50.00	0	0	432	26.40	12-RRH (22" x
22	105.00	105.00	3.00	50.00	0	0	70	7.62	3-Raycap DC6-
23	95.00	95.00	3.00	50.00	0	0	932	95.04	9-Panel Anten
24	95.00	95.00	3.00	50.00	0	0	432	26.40	12-RRH (22" x
25	95.00	95.00	3.00	50.00	0	0	70	7.62	3-Raycap DC6-

Equivalent Lateral Force Values for Pole

W = 49,302 lbs
Cs = 0.03
Vs = 1,479 lbs
Sds = 0.20
Ev = 1,965 lbs
Fa = 1.30
Fv = 1.50
k = 2.00
f1 = 0.32 Hz

Distance From Fixity H (ft)	Weight Wx (lbs)	H^k	H^k * Wx	Load Distribution Factor	Lateral Seismic Force Fx (lbs)
149.00	14	22,201.00	310,814	0.0007	1
147.00	209	21,609.00	4,516,966	0.0104	15
145.00	3,321	21,025.00	69,824,025	0.1603	237
144.50	54	20,880.25	1,120,231	0.0026	4
143.67	36	20,640.11	744,618	0.0017	3
143.33	2	20,544.44	41,089	0.0001	0
141.17	241	19,928.03	4,793,269	0.0110	16
138.38	71	19,147.64	1,365,741	0.0031	5
137.75	3	18,975.06	56,925	0.0001	0
136.38	160	18,598.14	2,975,371	0.0068	10
135.00	3,321	18,225.00	60,525,225	0.1389	205
134.50	59	18,090.25	1,071,297	0.0025	4
133.04	115	17,700.09	2,036,588	0.0047	7
132.08	2	17,446.01	34,892	0.0001	0
130.54	189	17,041.13	3,227,436	0.0074	11
129.00	584	16,641.00	9,718,344	0.0223	33
127.50	216	16,256.25	3,512,812	0.0081	12
126.00	3	15,876.00	47,628	0.0001	0
125.50	73	15,750.25	1,154,540	0.0027	4
125.00	3,321	15,625.00	51,890,625	0.1191	176
124.50	74	15,500.25	1,146,080	0.0026	4
122.42	238	14,985.84	3,571,736	0.0082	12
120.83	3	14,600.69	43,802	0.0001	0
119.92	141	14,380.01	2,026,200	0.0047	7
117.00	315	13,689.00	4,310,018	0.0099	15
115.00	3,321	13,225.00	43,920,225	0.1008	149
114.79	33	13,177.13	439,890	0.0010	1
114.58	4	13,129.34	52,517	0.0001	0
114.29	47	13,062.59	612,917	0.0014	2
111.50	411	12,432.25	5,110,518	0.0117	17
109.00	780	11,881.00	9,267,180	0.0213	31
107.00	508	11,449.00	5,815,468	0.0133	20
105.00	3,321	11,025.00	36,614,025	0.0840	124

BY VALMONT INDUSTRIES FOR: FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT DATE 08/16/2021
Design Id: 512236-P1reva IMPAX 24.3.20.4

Equivalent Lateral Force Values for Pole

Distance From Fixity H (ft)	Weight Wx (lbs)	H^k	H^k * Wx	Load Distribution Factor	Lateral Seismic Force Fx (lbs)
104.42	151	10,902.84	1,646,637	0.0038	6
103.83	4	10,781.36	43,125	0.0001	0
101.42	640	10,285.34	6,577,807	0.0151	22
98.29	192	9,661.25	1,851,828	0.0043	6
97.58	4	9,522.51	38,090	0.0001	0
96.29	354	9,272.09	3,286,577	0.0075	11
95.00	3,321	9,025.00	29,972,025	0.0688	102
94.50	139	8,930.25	1,240,596	0.0028	4
92.67	375	8,587.11	3,221,220	0.0074	11
91.33	2	8,341.78	16,684	0.0000	0
90.17	334	8,130.03	2,713,817	0.0062	9
87.04	572	7,576.25	4,333,583	0.0099	15
85.08	4	7,239.17	28,957	0.0001	0
84.54	161	7,147.29	1,149,266	0.0026	4
82.71	830	6,840.67	5,680,993	0.0130	19
80.13	844	6,420.02	5,420,281	0.0124	18
78.83	2	6,214.69	12,429	0.0000	0
78.58	165	6,175.34	1,018,951	0.0023	3
76.17	774	5,801.36	4,489,400	0.0103	15
73.33	242	5,377.78	1,303,124	0.0030	4
72.67	2	5,280.44	10,561	0.0000	0
70.83	677	5,017.36	3,394,651	0.0078	12
67.71	486	4,584.42	2,226,533	0.0051	8
66.42	4	4,411.17	17,645	0.0000	0
65.21	461	4,252.13	1,960,528	0.0045	7
62.71	500	3,932.34	1,966,410	0.0045	7
61.42	2	3,772.01	7,544	0.0000	0
60.21	475	3,625.04	1,720,189	0.0039	6
57.08	766	3,258.51	2,496,162	0.0057	8
55.17	2	3,043.36	6,087	0.0000	0
54.58	236	2,979.34	704,295	0.0016	2
52.73	520	2,780.37	1,446,479	0.0033	5
50.19	527	2,518.79	1,328,517	0.0031	5
48.92	2	2,392.84	4,786	0.0000	0
48.21	297	2,324.04	690,492	0.0016	2
45.75	1,575	2,093.06	3,297,504	0.0076	11
43.33	608	1,877.78	1,141,427	0.0026	4
42.67	2	1,820.44	3,641	0.0000	0
41.79	804	1,746.54	1,404,669	0.0032	5
39.96	470	1,596.67	749,886	0.0017	3
38.00	495	1,444.00	714,870	0.0016	2
37.00	2	1,369.00	2,738	0.0000	0
35.50	752	1,260.25	947,886	0.0022	3

BY VALMONT INDUSTRIES FOR: FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT DATE 08/16/2021
Design Id: 512236-P1reva IMPAX 24.3.20.4

Equivalent Lateral Force Values for Pole

Distance From Fixity H (ft)	Weight Wx (lbs)	H^k	H^k * Wx	Load Distribution Factor	Lateral Seismic Force Fx (lbs)
32.38	828	1,048.14	867,597	0.0020	3
30.75	4	945.56	3,782	0.0000	0
29.88	451	892.52	402,774	0.0009	1
26.75	1,178	715.56	843,173	0.0019	3
24.50	2	600.25	1,201	0.0000	0
24.25	133	588.06	77,929	0.0002	0
21.50	1,343	462.25	620,653	0.0014	2
18.63	204	346.89	70,817	0.0002	0
18.25	2	333.06	666	0.0000	0
16.13	1,170	260.02	304,311	0.0007	1
13.00	559	169.00	94,422	0.0002	0
12.00	2	144.00	288	0.0000	0
10.50	848	110.25	93,450	0.0002	0
6.50	1,438	42.25	60,762	0.0001	0
2.00	1,173	4.00	4,694	0.0000	0

*** 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	149.00	21.999	0.2188	100.57	15.97	906	15.12
	145.00	22.942	0.2188	104.88	16.73	1029	15.78
	144.00	23.178	0.2188	105.96	16.92	1061	15.94
	143.33	23.335	0.2188	106.67	17.05	1083	16.05
	139.00	24.356	0.2188	111.34	17.87	1233	16.76
	137.75	24.651	0.2188	112.69	18.11	1279	16.96
	135.00	25.299	0.2188	115.65	18.63	1383	17.41
	134.00	25.535	0.2188	116.73	18.82	1423	17.58
	132.08	25.987	0.2188	118.80	19.18	1500	17.89
	129.00	26.714	0.2188	122.12	19.77	1631	18.40
Top of Sect 4	129.00	26.714	0.2500	106.86	17.08	1857	21.00
	126.00	27.421	0.2500	109.68	17.58	2010	21.56
	125.00	27.657	0.2500	110.63	17.74	2063	21.75
	124.00	27.893	0.2500	111.57	17.91	2117	21.93
	120.83	28.639	0.2500	114.56	18.44	2293	22.53
	119.00	29.071	0.2500	116.29	18.74	2399	22.87
	115.00	30.014	0.2500	120.06	19.41	2643	23.62
	114.58	30.113	0.2500	120.45	19.48	2669	23.70
	114.00	30.250	0.2500	121.00	19.57	2706	23.80
	109.00	31.429	0.2500	125.72	20.40	3037	24.74
Top of Sect 3	109.00	31.430	0.3750	83.81	13.02	4502	36.96
	105.00	32.372	0.3750	86.33	13.46	4925	38.08
	103.83	32.648	0.3750	87.06	13.59	5053	38.41
	99.00	33.787	0.3750	90.10	14.12	5607	39.77
	97.58	34.121	0.3750	90.99	14.28	5777	40.16
	95.00	34.730	0.3750	92.61	14.57	6095	40.89
	94.00	34.966	0.3750	93.24	14.68	6222	41.17
	91.33	35.594	0.3750	94.92	14.97	6567	41.92
	89.00	36.144	0.3750	96.38	15.23	6880	42.57
	85.08	37.068	0.3750	98.85	15.67	7426	43.67
	84.00	37.323	0.3750	99.53	15.79	7582	43.98
Top of Sect 2	84.00	36.573	0.4375	83.60	12.98	8275	50.18
	81.42	37.182	0.4375	84.99	13.22	8701	51.02
	78.83	37.791	0.4375	86.38	13.47	9140	51.87
Base of Sect 3	78.33	37.909	0.4375	86.65	13.52	9227	52.03
	74.00	38.930	0.4375	88.98	13.93	10003	53.45
	72.67	39.245	0.4375	89.70	14.05	10250	53.89

*** 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)
	69.00	40.109	0.4375	91.68	14.40	10950	55.09
	66.42	40.718	0.4375	93.07	14.65	11462	55.93
	64.00	41.288	0.4375	94.37	14.88	11955	56.72
	61.42	41.897	0.4375	95.76	15.12	12498	57.57
	59.00	42.466	0.4375	97.07	15.35	13020	58.36
	55.17	43.370	0.4375	99.13	15.72	13878	59.62
	54.00	43.645	0.4375	99.76	15.83	14147	60.00
	51.46	44.244	0.4375	101.13	16.07	14743	60.83
	48.92	44.843	0.4375	102.50	16.31	15357	61.66
	47.50	45.177	0.4375	103.26	16.44	15706	62.12
Top of Sect 1	47.50	44.302	0.5000	88.60	13.86	16845	69.51
	44.00	45.128	0.5000	90.26	14.15	17815	70.82
	42.67	45.442	0.5000	90.88	14.26	18194	71.32
Base of Sect 2	40.92	45.854	0.5000	91.71	14.41	18699	71.97
	39.00	46.306	0.5000	92.61	14.57	19264	72.69
	37.00	46.778	0.5000	93.56	14.73	19865	73.44
	34.00	47.485	0.5000	94.97	14.98	20789	74.56
	30.75	48.251	0.5000	96.50	15.25	21823	75.78
	29.00	48.664	0.5000	97.33	15.40	22393	76.43
	24.50	49.724	0.5000	99.45	15.77	23906	78.12
	24.00	49.842	0.5000	99.68	15.81	24078	78.30
	19.00	51.021	0.5000	102.04	16.23	25845	80.17
	18.25	51.198	0.5000	102.40	16.29	26117	80.45
	14.00	52.200	0.5000	104.40	16.65	27697	82.04
	12.00	52.671	0.5000	105.34	16.81	28461	82.79
	9.00	53.378	0.5000	106.76	17.06	29634	83.91
	4.00	54.557	0.5000	109.11	17.48	31661	85.79
Pt of Fixity	0.00	55.500	0.5000	111.00	17.81	33346	87.28

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)
149.00	0	0	0	0	8	10	13	15
145.00	5	-4	7	0	170	199	262	264
145.00	79	-22	82	241	5325	6208	8179	3169
144.00	154	-86	177	241	5366	6257	8243	3233
143.33	204	-129	242	241	5394	6290	8286	3276
143.33	204	-129	242	241	5403	6303	8302	3279
139.00	538	-415	679	241	5588	6523	8589	3569
137.75	636	-499	809	241	5644	6588	8675	3654
137.75	636	-499	809	241	5659	6608	8700	3659
135.00	857	-688	1099	241	5785	6755	8893	3849
135.00	930	-707	1168	478	10855	12681	16693	6792
134.00	1083	-837	1369	478	10896	12735	16760	6872
132.08	1377	-1089	1755	478	10987	12841	16900	7009
132.08	1377	-1089	1755	478	10988	12852	16909	7030
129.00	1856	-1498	2385	478	11137	13027	17138	7255
129.00	1856	-1498	2385	478	11184	13094	17220	7979
126.00	2330	-1903	3009	478	11336	13271	17453	8236
126.00	2330	-1903	3009	478	11347	13290	17475	8256
125.00	2490	-2040	3219	478	11398	13351	17555	8343
125.00	2563	-2059	3288	712	16373	19182	25219	11350
124.00	2793	-2256	3591	712	16407	19234	25281	11477
120.83	3528	-2883	4556	712	16573	19430	25538	11760
120.83	3528	-2882	4556	712	16566	19436	25538	11812
119.00	3957	-3248	5119	712	16636	19534	25657	12048
115.00	4901	-4051	6359	712	16855	19791	25996	12423
115.00	4972	-4073	6427	942	21707	25504	33491	15551
114.58	5100	-4181	6595	942	21730	25532	33527	15591
114.58	5100	-4181	6595	942	21742	25550	33549	15609
114.00	5279	-4333	6830	942	21732	25561	33550	15770
109.00	6823	-5646	8856	942	22016	25896	33990	16260
109.00	6824	-5645	8856	942	22038	25953	34047	17340
105.00	8076	-6709	10499	942	22286	26245	34430	17946
105.00	8146	-6732	10568	1168	27014	31829	41747	21189
103.83	8592	-7111	11153	1168	27087	31915	41861	21369
103.83	8592	-7111	11153	1168	27061	31904	41835	21489
99.00	10454	-8688	13593	1168	27315	32226	42244	22381
97.58	11003	-9153	14312	1168	27407	32334	42387	22609
97.58	11003	-9153	14312	1168	27389	32326	42369	22698
95.00	12008	-10005	15630	1168	27558	32526	42631	23121
95.00	12076	-10030	15698	1390	32167	37978	49770	26456

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)
94.00	12533	-10416	16296	1390	32190	38021	49818	26722
91.33	13753	-11449	17895	1390	32368	38231	50093	27170
91.33	13753	-11449	17895	1390	32319	38194	50033	27311
89.00	14826	-12355	19299	1390	32399	38311	50174	27894
85.08	16634	-13884	21667	1390	32665	38626	50586	28577
85.08	16635	-13883	21667	1390	32621	38592	50532	28729
84.00	17137	-14308	22324	1390	32695	38680	50647	28921
84.00	17137	-14307	22324	1390	32650	38638	50586	29028
81.42	18339	-15322	23898	1390	32794	38824	50821	30170
78.83	19547	-16342	25478	1390	33004	39073	51146	31179
78.83	19547	-16341	25478	1390	32975	39047	51108	31270
78.33	19782	-16539	25785	1390	32951	39033	51082	31612
74.00	21822	-18259	28453	1390	33178	39318	51446	32708
72.67	22452	-18791	29278	1390	33272	39429	51592	32998
72.67	22452	-18790	29278	1390	33213	39372	51510	33152
69.00	24192	-20256	31553	1390	33384	39591	51787	34154
66.42	25423	-21294	33163	1390	33569	39810	52074	34735
66.42	25424	-21293	33163	1390	33515	39757	51999	34894
64.00	26580	-22267	34675	1390	33614	39886	52161	35602
61.42	27820	-23312	36296	1390	33800	40106	52449	36201
61.42	27821	-23311	36296	1390	33733	40038	52355	36360
59.00	28985	-24291	37818	1390	33811	40144	52485	37125
55.17	30840	-25853	40243	1390	34086	40471	52913	38043
55.17	30840	-25852	40243	1390	34017	40399	52813	38203
54.00	31407	-26329	40983	1390	34042	40436	52858	38604
51.46	32644	-27369	42599	1390	34143	40565	53021	39388
48.92	33885	-28413	44221	1390	34325	40781	53304	40020
48.92	33885	-28412	44221	1390	34270	40723	53224	40148
47.50	34579	-28996	45127	1390	34371	40843	53381	40504
47.50	34579	-28995	45127	1390	34294	40761	53268	40652
44.00	36299	-30441	47373	1390	34497	41009	53589	42683
42.67	36956	-30994	48232	1390	34602	41135	53753	43412
42.67	36956	-30993	48232	1390	34562	41091	53694	43505
40.92	37821	-31720	49362	1390	34639	41189	53819	44577
39.00	38771	-32518	50602	1390	34709	41278	53931	45255
37.00	39763	-33352	51899	1390	34848	41444	54148	45848
37.00	39764	-33352	51899	1390	34775	41363	54039	45996
34.00	41258	-34607	53850	1390	34877	41493	54204	47080
30.75	42881	-35971	55971	1390	35099	41758	54550	48072
30.75	42882	-35971	55971	1390	35032	41685	54450	48221

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)
29.00	43759	-36707	57116	1390	35044	41706	54474	48942
24.50	46021	-38607	60070	1390	35344	42064	54941	50355
24.50	46022	-38607	60070	1390	35264	41975	54822	50501
24.00	46274	-38818	60400	1390	35201	41907	54729	50815
19.00	48801	-40939	63698	1390	35421	42175	55076	52589
18.25	49181	-41258	64194	1390	35468	42231	55150	52834
18.25	49181	-41257	64194	1390	35388	42141	55028	52975
14.00	51339	-43068	67011	1390	35536	42324	55264	54553
12.00	52356	-43922	68340	1390	35656	42467	55451	55223
12.00	52357	-43921	68340	1390	35573	42374	55326	55363
9.00	53887	-45205	70337	1390	35608	42424	55387	56597
4.00	56444	-47349	73674	1390	35744	42594	55604	58565
0.00	58495	-49071	76352	1390	35987	42883	55982	59973

Deflections for Pole

Loading Case WIND

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
149.00	89.8	107.9	140.4	7.4	8.05
145.00	85.6	102.7	133.7	6.9	8.05
145.00	85.6	102.7	133.7	6.9	8.05
144.00	84.5	101.4	132.0	6.8	8.05
143.33	83.8	100.5	130.9	6.7	8.04
143.33	83.8	100.5	130.9	6.7	8.04
139.00	79.1	94.9	123.6	6.2	8.00
137.75	77.8	93.3	121.5	6.0	7.98
137.75	77.8	93.3	121.5	6.0	7.98
135.00	74.9	89.8	116.9	5.7	7.94
135.00	74.9	89.8	116.9	5.7	7.94
134.00	73.8	88.5	115.3	5.6	7.92
132.08	71.8	86.1	112.1	5.4	7.87
132.08	71.8	86.1	112.1	5.4	7.87
129.00	68.6	82.2	107.1	5.1	7.77
129.00	68.6	82.2	107.1	5.1	7.77
126.00	65.5	78.5	102.3	4.7	7.67
126.00	65.5	78.5	102.3	4.7	7.67
125.00	64.5	77.3	100.7	4.6	7.64
125.00	64.5	77.3	100.7	4.6	7.64
124.00	63.5	76.0	99.1	4.5	7.60
120.83	60.3	72.2	94.1	4.2	7.46
120.83	60.3	72.2	94.1	4.2	7.46
119.00	58.5	70.0	91.2	4.0	7.37
115.00	54.6	65.4	85.2	3.6	7.15
115.00	54.6	65.4	85.2	3.6	7.15
114.58	54.2	64.9	84.6	3.6	7.13
114.58	54.2	64.9	84.6	3.6	7.13
114.00	53.7	64.2	83.7	3.5	7.09
109.00	49.0	58.6	76.4	3.1	6.77
109.00	49.0	58.6	76.4	3.1	6.77
105.00	45.5	54.4	70.9	2.8	6.58
105.00	45.5	54.4	70.9	2.8	6.58
103.83	44.4	53.1	69.3	2.7	6.52
103.83	44.4	53.1	69.3	2.7	6.52
99.00	40.3	48.2	62.8	2.3	6.25
97.58	39.1	46.8	61.0	2.2	6.17
97.58	39.1	46.8	61.0	2.2	6.17
95.00	37.0	44.2	57.7	2.0	6.01

Deflections for Pole

Loading Case WIND

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
95.00	37.0	44.2	57.7	2.0	6.01
94.00	36.2	43.3	56.4	2.0	5.95
91.33	34.1	40.8	53.2	1.8	5.78
91.33	34.1	40.8	53.2	1.8	5.78
89.00	32.3	38.6	50.4	1.7	5.63
85.08	29.4	35.2	45.9	1.4	5.36
85.08	29.4	35.2	45.9	1.4	5.36
84.00	28.7	34.2	44.7	1.4	5.29
84.00	28.7	34.2	44.7	1.4	5.29
81.42	26.9	32.1	41.9	1.2	5.12
78.83	25.1	30.0	39.1	1.1	4.95
78.83	25.1	30.0	39.1	1.1	4.95
78.33	24.8	29.6	38.6	1.1	4.92
74.00	22.0	26.3	34.3	0.9	4.63
72.67	21.2	25.3	33.0	0.9	4.54
72.67	21.2	25.3	33.0	0.9	4.54
69.00	19.0	22.7	29.6	0.7	4.29
66.42	17.6	21.0	27.3	0.7	4.11
66.42	17.6	21.0	27.3	0.7	4.11
64.00	16.3	19.4	25.3	0.6	3.95
61.42	14.9	17.8	23.2	0.5	3.77
61.42	14.9	17.8	23.2	0.5	3.77
59.00	13.7	16.4	21.4	0.5	3.60
55.17	11.9	14.2	18.6	0.4	3.34
55.17	11.9	14.2	18.6	0.4	3.34
54.00	11.4	13.6	17.8	0.3	3.26
51.46	10.3	12.3	16.1	0.3	3.08
48.92	9.3	11.1	14.5	0.3	2.91
48.92	9.3	11.1	14.5	0.3	2.91
47.50	8.8	10.4	13.6	0.2	2.81
47.50	8.8	10.4	13.6	0.2	2.81
44.00	7.5	8.9	11.7	0.2	2.59
42.67	7.0	8.4	10.9	0.2	2.51
42.67	7.0	8.4	10.9	0.2	2.51
40.92	6.4	7.7	10.0	0.1	2.40
39.00	5.8	7.0	9.1	0.1	2.28
37.00	5.3	6.3	8.2	0.1	2.16
37.00	5.3	6.3	8.2	0.1	2.16
34.00	4.4	5.3	6.9	0.1	1.97
30.75	3.6	4.3	5.6	0.1	1.77

Deflections for Pole

Loading Case WIND

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
30.75	3.6	4.3	5.6	0.1	1.77
29.00	3.2	3.8	5.0	0.1	1.67
24.50	2.3	2.7	3.5	0.0	1.40
24.50	2.3	2.7	3.5	0.0	1.40
24.00	2.2	2.6	3.4	0.0	1.37
19.00	1.4	1.6	2.1	0.0	1.07
18.25	1.2	1.5	1.9	0.0	1.03
18.25	1.2	1.5	1.9	0.0	1.03
14.00	0.7	0.9	1.1	0.0	0.78
12.00	0.5	0.6	0.8	0.0	0.67
12.00	0.5	0.6	0.8	0.0	0.67
9.00	0.3	0.4	0.5	0.0	0.50
4.00	0.1	0.1	0.1	0.0	0.22
0.00	0.0	0.0	0.0	0.0	0.00

Stresses for Pole

Loading Case WIND

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
149.00	982,914	6,696	294,874	6,394	0.00	0.00	0.00	0.00	0.01
145.00	1,025,468	7,219	307,640	6,960	0.00	0.01	0.03	0.04	0.02
144.00	1,036,107	7,350	310,832	7,105	0.00	0.03	0.03	0.04	0.03
143.33	1,043,199	7,437	312,960	7,203	0.00	0.04	0.03	0.04	0.04
139.00	1,089,300	8,016	326,790	7,853	0.00	0.09	0.03	0.03	0.10
137.75	1,102,598	8,185	330,779	8,046	0.00	0.11	0.03	0.03	0.12
135.00	1,131,854	8,561	339,556	8,479	0.01	0.15	0.05	0.06	0.17
134.00	1,142,492	8,699	342,748	8,639	0.01	0.17	0.05	0.06	0.19
132.08	1,162,883	8,965	348,865	8,950	0.01	0.22	0.05	0.06	0.24
129.00	1,195,685	9,397	358,706	9,462	0.01	0.28	0.05	0.05	0.30
129.00	1,364,898	11,135	409,469	10,789	0.01	0.24	0.05	0.05	0.25
126.00	1,401,373	11,657	420,412	11,373	0.01	0.29	0.05	0.04	0.30
125.00	1,413,531	11,832	424,059	11,571	0.01	0.31	0.07	0.06	0.33
124.00	1,425,690	12,008	427,707	11,771	0.01	0.33	0.07	0.06	0.36
120.83	1,464,191	12,571	439,257	12,416	0.01	0.40	0.06	0.06	0.43
119.00	1,486,481	12,900	445,944	12,797	0.01	0.44	0.06	0.06	0.46
115.00	1,535,115	13,626	460,534	13,648	0.01	0.52	0.08	0.07	0.56
114.58	1,540,181	13,702	462,054	13,738	0.01	0.53	0.08	0.07	0.57
114.00	1,547,273	13,809	464,182	13,865	0.01	0.55	0.08	0.07	0.58
109.00	1,608,065	14,734	482,419	14,975	0.01	0.67	0.08	0.07	0.70
109.00	2,402,486	23,290	720,746	22,284	0.01	0.42	0.05	0.04	0.44
105.00	2,475,436	24,734	742,631	23,658	0.01	0.47	0.06	0.05	0.50
103.83	2,496,713	25,164	749,014	24,067	0.01	0.49	0.06	0.05	0.51
99.00	2,584,861	26,983	775,458	25,796	0.01	0.56	0.06	0.05	0.58
97.58	2,610,698	27,528	783,209	26,314	0.01	0.58	0.06	0.05	0.60
95.00	2,657,811	28,536	797,343	27,273	0.01	0.61	0.07	0.05	0.64
94.00	2,676,049	28,931	802,815	27,648	0.01	0.63	0.07	0.05	0.65
91.33	2,724,682	29,998	817,405	28,662	0.01	0.66	0.07	0.05	0.69
89.00	2,767,236	30,947	830,171	29,565	0.01	0.69	0.07	0.05	0.72
85.08	2,838,667	32,574	851,600	31,111	0.01	0.74	0.07	0.05	0.76
84.00	2,858,424	33,031	857,527	31,545	0.01	0.75	0.07	0.05	0.77
84.00	3,261,494	36,789	978,448	35,202	0.01	0.67	0.06	0.04	0.69
81.42	3,316,460	38,047	994,938	36,399	0.01	0.70	0.06	0.04	0.72
78.83	3,371,426	39,326	1,011,428	37,615	0.01	0.72	0.06	0.04	0.74
78.33	3,382,064	39,576	1,014,619	37,853	0.01	0.72	0.06	0.04	0.74
74.00	3,474,265	41,776	1,042,279	39,945	0.01	0.76	0.05	0.04	0.78
72.67	3,502,634	42,465	1,050,790	40,600	0.01	0.77	0.05	0.04	0.78
69.00	3,580,650	44,388	1,074,195	42,429	0.01	0.79	0.05	0.03	0.81

Stresses for Pole

Loading Case WIND

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
66.42	3,635,616	45,769	1,090,685	43,741	0.01	0.81	0.05	0.03	0.82
64.00	3,687,036	47,080	1,106,111	44,987	0.01	0.82	0.05	0.03	0.84
61.42	3,742,002	48,502	1,122,601	46,339	0.01	0.83	0.05	0.03	0.85
59.00	3,793,422	49,851	1,138,026	47,621	0.01	0.84	0.05	0.03	0.86
55.17	3,874,984	52,029	1,162,495	49,691	0.01	0.86	0.05	0.03	0.88
54.00	3,899,807	52,701	1,169,942	50,329	0.01	0.86	0.05	0.03	0.88
51.46	3,953,886	54,148	1,186,166	51,735	0.01	0.87	0.05	0.03	0.89
48.92	4,007,966	55,455	1,202,390	53,160	0.01	0.89	0.05	0.03	0.90
47.50	4,038,108	56,188	1,211,433	53,962	0.01	0.89	0.05	0.03	0.91
47.50	4,518,277	61,821	1,355,483	59,114	0.01	0.81	0.04	0.02	0.83
44.00	4,603,385	64,185	1,381,016	61,362	0.01	0.82	0.04	0.02	0.83
42.67	4,635,807	65,097	1,390,742	62,229	0.01	0.82	0.04	0.02	0.84
40.92	4,678,362	66,304	1,403,508	63,377	0.01	0.83	0.04	0.02	0.84
39.00	4,724,969	67,639	1,417,491	64,646	0.01	0.83	0.04	0.02	0.85
37.00	4,773,602	69,046	1,432,081	65,983	0.01	0.84	0.04	0.02	0.85
34.00	4,846,552	71,184	1,453,966	68,016	0.01	0.84	0.04	0.02	0.86
30.75	4,925,581	73,537	1,477,674	70,252	0.01	0.85	0.04	0.02	0.86
29.00	4,968,136	74,820	1,490,441	71,471	0.01	0.85	0.04	0.02	0.86
24.50	5,077,561	78,169	1,523,268	74,654	0.01	0.85	0.04	0.02	0.87
24.00	5,089,719	78,546	1,526,916	75,012	0.01	0.85	0.04	0.02	0.87
19.00	5,211,303	82,124	1,563,391	78,638	0.01	0.86	0.04	0.02	0.88
18.25	5,229,540	82,629	1,568,862	79,190	0.01	0.86	0.04	0.02	0.88
14.00	5,332,886	85,509	1,599,866	82,351	0.01	0.87	0.04	0.02	0.89
12.00	5,381,519	86,875	1,614,456	83,859	0.01	0.87	0.04	0.02	0.89
9.00	5,454,470	88,937	1,636,341	86,148	0.01	0.88	0.04	0.02	0.89
4.00	5,576,053	92,406	1,672,816	90,032	0.01	0.89	0.04	0.02	0.90
0.00	5,673,320	95,210	1,701,996	93,200	0.01	0.89	0.04	0.02	0.91

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)
149.00	0	0	0	0	6	8	10	28
145.00	2	-2	3	0	70	83	108	406
145.00	173	-143	225	48	1266	1503	1965	9056
144.00	192	-158	249	48	1281	1521	1989	9153
143.33	204	-169	264	48	1292	1534	2006	9218
143.33	204	-169	264	48	1291	1532	2003	9221
139.00	286	-238	372	48	1360	1615	2112	9655
137.75	310	-258	403	48	1382	1640	2145	9784
137.75	310	-258	403	48	1380	1639	2142	9788
135.00	365	-304	475	48	1427	1695	2216	10076
135.00	535	-445	696	95	2597	3085	4033	18694
134.00	572	-476	744	95	2611	3101	4054	18802
132.08	644	-536	838	95	2644	3141	4106	19009
132.08	644	-536	838	95	2637	3132	4095	19013
129.00	761	-635	991	95	2692	3198	4180	19354
129.00	761	-635	991	95	2700	3208	4193	20057
126.00	878	-733	1144	95	2755	3273	4279	20429
126.00	878	-733	1144	95	2749	3266	4269	20435
125.00	917	-766	1195	95	2768	3289	4298	20561
125.00	1086	-906	1414	141	3907	4642	6067	29145
124.00	1142	-953	1487	141	3913	4650	6078	29276
120.83	1320	-1102	1720	141	3973	4721	6171	29686
120.83	1320	-1102	1720	141	3958	4704	6148	29694
119.00	1424	-1190	1856	141	3975	4725	6174	29942
115.00	1653	-1383	2155	141	4052	4817	6295	30483
115.00	1821	-1521	2373	186	5145	6116	7993	39041
114.58	1851	-1547	2413	186	5153	6126	8005	39098
114.58	1851	-1547	2413	186	5149	6121	7998	39105
114.00	1894	-1583	2469	186	5160	6134	8016	39185
109.00	2264	-1894	2952	186	5231	6220	8127	39899
109.00	2264	-1894	2952	186	5211	6197	8096	40847
105.00	2564	-2146	3344	186	5295	6297	8228	41630
105.00	2731	-2284	3560	231	6344	7545	9858	50157
103.83	2836	-2373	3698	231	6369	7575	9897	50390
103.83	2836	-2373	3698	231	6339	7540	9850	50404
99.00	3277	-2744	4274	231	6411	7626	9963	51398
97.58	3407	-2853	4444	231	6441	7663	10011	51693
97.58	3407	-2853	4444	231	6420	7638	9978	51705
95.00	3645	-3053	4755	231	6477	7705	10066	52250
95.00	3810	-3190	4969	274	7488	8909	11638	60732

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)
94.00	3917	-3280	5109	274	7485	8906	11634	60953
91.33	4204	-3520	5483	274	7544	8976	11726	61530
91.33	4204	-3520	5483	274	7510	8936	11673	61542
89.00	4455	-3731	5811	274	7517	8946	11685	62068
85.08	4878	-4086	6363	274	7605	9051	11821	62946
85.08	4878	-4086	6363	274	7569	9008	11766	62961
84.00	4995	-4185	6516	274	7593	9037	11804	63208
84.00	4995	-4185	6516	274	7568	9008	11765	63215
81.42	5275	-4420	6883	274	7601	9047	11816	64459
78.83	5557	-4657	7251	274	7669	9128	11922	65713
78.83	5557	-4657	7251	274	7647	9103	11889	65721
78.33	5612	-4703	7322	274	7626	9079	11857	65976
74.00	6087	-5102	7943	274	7684	9149	11948	67135
72.67	6234	-5225	8134	274	7715	9185	11995	67494
72.67	6234	-5225	8134	274	7679	9143	11940	67506
69.00	6638	-5565	8662	274	7717	9189	12000	68521
66.42	6924	-5805	9036	274	7776	9259	12091	69240
66.42	6924	-5805	9036	274	7740	9216	12035	69255
64.00	7193	-6030	9386	274	7758	9239	12064	69947
61.42	7480	-6272	9761	274	7817	9309	12156	70686
61.42	7480	-6272	9761	274	7780	9266	12099	70698
59.00	7750	-6498	10114	274	7789	9277	12113	71411
55.17	8179	-6858	10674	274	7877	9381	12249	72542
55.17	8179	-6858	10674	274	7839	9337	12191	72554
54.00	8310	-6968	10845	274	7838	9336	12190	72910
51.46	8596	-7208	11218	274	7858	9360	12221	73686
48.92	8882	-7449	11592	274	7916	9428	12310	74463
48.92	8882	-7449	11592	274	7886	9393	12264	74473
47.50	9042	-7583	11801	274	7918	9431	12314	74910
47.50	9042	-7583	11801	274	7883	9390	12260	74919
44.00	9439	-7916	12319	274	7936	9453	12343	77190
42.67	9590	-8043	12517	274	7969	9493	12394	78062
42.67	9590	-8043	12517	274	7947	9467	12360	78070
40.92	9790	-8210	12777	274	7964	9487	12386	79230
39.00	10009	-8394	13063	274	7978	9504	12408	79909
37.00	10237	-8586	13361	274	8021	9556	12476	80618
37.00	10237	-8586	13361	274	7985	9513	12420	80629
34.00	10581	-8875	13810	274	8005	9537	12452	81716
30.75	10955	-9188	14298	274	8075	9621	12561	82898
30.75	10955	-9188	14298	274	8039	9578	12504	82911

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)
29.00	11156	-9357	14561	274	8031	9569	12492	83565
24.50	11676	-9794	15240	274	8125	9681	12639	85243
24.50	11676	-9793	15240	274	8089	9638	12582	85254
24.00	11734	-9842	15315	274	8060	9603	12537	85451
19.00	12314	-10329	16072	274	8119	9674	12629	87366
18.25	12401	-10402	16186	274	8133	9692	12652	87655
18.25	12401	-10402	16186	274	8098	9649	12596	87665
14.00	12896	-10817	16832	274	8134	9693	12653	89329
12.00	13129	-11012	17136	274	8172	9737	12712	90116
12.00	13129	-11012	17136	274	8135	9695	12656	90126
9.00	13479	-11306	17593	274	8134	9694	12655	91328
4.00	14064	-11797	18357	274	8164	9729	12701	93347
0.00	14533	-12191	18969	274	8240	9819	12818	94958

Deflections for Pole

Loading Case ICE + WIND

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
149.00	24.6	29.4	38.3	0.6	2.37
145.00	23.3	27.9	36.3	0.6	2.37
145.00	23.3	27.9	36.3	0.6	2.37
144.00	23.0	27.5	35.9	0.6	2.36
143.33	22.8	27.2	35.5	0.6	2.36
143.33	22.8	27.2	35.5	0.6	2.36
139.00	21.4	25.6	33.4	0.5	2.33
137.75	21.1	25.1	32.8	0.5	2.32
137.75	21.1	25.1	32.8	0.5	2.32
135.00	20.2	24.1	31.5	0.5	2.30
135.00	20.2	24.1	31.5	0.5	2.30
134.00	19.9	23.7	31.0	0.5	2.29
132.08	19.3	23.0	30.1	0.5	2.26
132.08	19.3	23.0	30.1	0.5	2.26
129.00	18.4	21.9	28.6	0.4	2.22
129.00	18.4	21.9	28.6	0.4	2.22
126.00	17.5	20.9	27.2	0.4	2.18
126.00	17.5	20.9	27.2	0.4	2.18
125.00	17.2	20.5	26.8	0.4	2.17
125.00	17.2	20.5	26.8	0.4	2.17
124.00	16.9	20.2	26.3	0.4	2.15
120.83	16.0	19.1	24.9	0.4	2.09
120.83	16.0	19.1	24.9	0.4	2.09
119.00	15.5	18.5	24.1	0.3	2.06
115.00	14.4	17.2	22.4	0.3	1.99
115.00	14.4	17.2	22.4	0.3	1.99
114.58	14.3	17.1	22.3	0.3	1.98
114.58	14.3	17.1	22.3	0.3	1.98
114.00	14.1	16.9	22.0	0.3	1.96
109.00	12.9	15.3	20.0	0.3	1.85
109.00	12.9	15.3	20.0	0.3	1.85
105.00	11.9	14.2	18.5	0.2	1.79
105.00	11.9	14.2	18.5	0.2	1.79
103.83	11.6	13.8	18.1	0.2	1.77
103.83	11.6	13.8	18.1	0.2	1.77
99.00	10.5	12.5	16.3	0.2	1.68
97.58	10.2	12.1	15.8	0.2	1.66
97.58	10.2	12.1	15.8	0.2	1.66
95.00	9.6	11.4	14.9	0.2	1.61

Deflections for Pole

Loading Case ICE + WIND

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
95.00	9.6	11.4	14.9	0.2	1.61
94.00	9.4	11.2	14.6	0.2	1.59
91.33	8.8	10.5	13.7	0.2	1.54
91.33	8.8	10.5	13.7	0.2	1.54
89.00	8.3	9.9	13.0	0.2	1.49
85.08	7.6	9.0	11.8	0.1	1.41
85.08	7.6	9.0	11.8	0.1	1.41
84.00	7.4	8.8	11.5	0.1	1.39
84.00	7.4	8.8	11.5	0.1	1.39
81.42	6.9	8.2	10.7	0.1	1.34
78.83	6.4	7.7	10.0	0.1	1.29
78.83	6.4	7.7	10.0	0.1	1.29
78.33	6.3	7.6	9.9	0.1	1.29
74.00	5.6	6.7	8.7	0.1	1.20
72.67	5.4	6.4	8.4	0.1	1.18
72.67	5.4	6.4	8.4	0.1	1.18
69.00	4.8	5.8	7.5	0.1	1.11
66.42	4.5	5.3	6.9	0.1	1.06
66.42	4.5	5.3	6.9	0.1	1.06
64.00	4.1	4.9	6.4	0.1	1.02
61.42	3.8	4.5	5.9	0.1	0.97
61.42	3.8	4.5	5.9	0.1	0.97
59.00	3.5	4.1	5.4	0.1	0.92
55.17	3.0	3.6	4.7	0.0	0.85
55.17	3.0	3.6	4.7	0.0	0.85
54.00	2.9	3.4	4.5	0.0	0.83
51.46	2.6	3.1	4.1	0.0	0.79
48.92	2.3	2.8	3.7	0.0	0.74
48.92	2.3	2.8	3.7	0.0	0.74
47.50	2.2	2.6	3.4	0.0	0.72
47.50	2.2	2.6	3.4	0.0	0.72
44.00	1.9	2.2	2.9	0.0	0.66
42.67	1.8	2.1	2.8	0.0	0.64
42.67	1.8	2.1	2.8	0.0	0.64
40.92	1.6	1.9	2.5	0.0	0.61
39.00	1.5	1.8	2.3	0.0	0.58
37.00	1.3	1.6	2.1	0.0	0.54
37.00	1.3	1.6	2.1	0.0	0.54
34.00	1.1	1.3	1.7	0.0	0.50
30.75	0.9	1.1	1.4	0.0	0.45

Deflections for Pole

Loading Case ICE + WIND

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
30.75	0.9	1.1	1.4	0.0	0.45
29.00	0.8	1.0	1.2	0.0	0.42
24.50	0.6	0.7	0.9	0.0	0.35
24.50	0.6	0.7	0.9	0.0	0.35
24.00	0.5	0.6	0.8	0.0	0.34
19.00	0.3	0.4	0.5	0.0	0.27
18.25	0.3	0.4	0.5	0.0	0.26
18.25	0.3	0.4	0.5	0.0	0.26
14.00	0.2	0.2	0.3	0.0	0.20
12.00	0.1	0.2	0.2	0.0	0.17
12.00	0.1	0.2	0.2	0.0	0.17
9.00	0.1	0.1	0.1	0.0	0.12
4.00	0.0	0.0	0.0	0.0	0.05
0.00	0.0	0.0	0.0	0.0	0.00

Stresses for Pole

Loading Case ICE + WIND

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
149.00	982,914	6,696	294,874	6,394	0.00	0.00	0.00	0.00	0.01
145.00	1,025,468	7,219	307,640	6,960	0.01	0.03	0.01	0.01	0.04
144.00	1,036,107	7,350	310,832	7,105	0.01	0.04	0.01	0.01	0.05
143.33	1,043,199	7,437	312,960	7,203	0.01	0.04	0.01	0.01	0.05
139.00	1,089,300	8,016	326,790	7,853	0.01	0.05	0.01	0.01	0.06
137.75	1,102,598	8,185	330,779	8,046	0.01	0.05	0.01	0.01	0.06
135.00	1,131,854	8,561	339,556	8,479	0.02	0.09	0.01	0.01	0.11
134.00	1,142,492	8,699	342,748	8,639	0.02	0.10	0.01	0.01	0.11
132.08	1,162,883	8,965	348,865	8,950	0.02	0.10	0.01	0.01	0.12
129.00	1,195,685	9,397	358,706	9,462	0.02	0.12	0.01	0.01	0.14
129.00	1,364,898	11,135	409,469	10,789	0.02	0.10	0.01	0.01	0.12
126.00	1,401,373	11,657	420,412	11,373	0.02	0.11	0.01	0.01	0.13
125.00	1,413,531	11,832	424,059	11,571	0.02	0.13	0.02	0.01	0.16
124.00	1,425,690	12,008	427,707	11,771	0.02	0.14	0.02	0.01	0.16
120.83	1,464,191	12,571	439,257	12,416	0.02	0.15	0.02	0.01	0.18
119.00	1,486,481	12,900	445,944	12,797	0.02	0.16	0.02	0.01	0.18
115.00	1,535,115	13,626	460,534	13,648	0.03	0.19	0.02	0.01	0.22
114.58	1,540,181	13,702	462,054	13,738	0.03	0.20	0.02	0.01	0.22
114.00	1,547,273	13,809	464,182	13,865	0.03	0.20	0.02	0.01	0.23
109.00	1,608,065	14,734	482,419	14,975	0.03	0.22	0.02	0.01	0.25
109.00	2,402,486	23,290	720,746	22,284	0.02	0.14	0.01	0.01	0.16
105.00	2,475,436	24,734	742,631	23,658	0.02	0.16	0.01	0.01	0.18
103.83	2,496,713	25,164	749,014	24,067	0.02	0.16	0.01	0.01	0.19
99.00	2,584,861	26,983	775,458	25,796	0.02	0.18	0.01	0.01	0.20
97.58	2,610,698	27,528	783,209	26,314	0.02	0.18	0.01	0.01	0.20
95.00	2,657,811	28,536	797,343	27,273	0.03	0.19	0.02	0.01	0.22
94.00	2,676,049	28,931	802,815	27,648	0.03	0.20	0.02	0.01	0.22
91.33	2,724,682	29,998	817,405	28,662	0.03	0.20	0.02	0.01	0.23
89.00	2,767,236	30,947	830,171	29,565	0.02	0.21	0.02	0.01	0.23
85.08	2,838,667	32,574	851,600	31,111	0.02	0.22	0.02	0.01	0.24
84.00	2,858,424	33,031	857,527	31,545	0.02	0.22	0.02	0.01	0.24
84.00	3,261,494	36,789	978,448	35,202	0.02	0.20	0.01	0.01	0.22
81.42	3,316,460	38,047	994,938	36,399	0.02	0.20	0.01	0.01	0.22
78.83	3,371,426	39,326	1,011,428	37,615	0.02	0.20	0.01	0.01	0.23
78.33	3,382,064	39,576	1,014,619	37,853	0.02	0.21	0.01	0.01	0.23
74.00	3,474,265	41,776	1,042,279	39,945	0.02	0.21	0.01	0.01	0.23
72.67	3,502,634	42,465	1,050,790	40,600	0.02	0.21	0.01	0.01	0.23
69.00	3,580,650	44,388	1,074,195	42,429	0.02	0.22	0.01	0.01	0.24

Stresses for Pole

Loading Case ICE + WIND

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
66.42	3,635,616	45,769	1,090,685	43,741	0.02	0.22	0.01	0.01	0.24
64.00	3,687,036	47,080	1,106,111	44,987	0.02	0.22	0.01	0.01	0.24
61.42	3,742,002	48,502	1,122,601	46,339	0.02	0.22	0.01	0.01	0.24
59.00	3,793,422	49,851	1,138,026	47,621	0.02	0.23	0.01	0.01	0.25
55.17	3,874,984	52,029	1,162,495	49,691	0.02	0.23	0.01	0.01	0.25
54.00	3,899,807	52,701	1,169,942	50,329	0.02	0.23	0.01	0.01	0.25
51.46	3,953,886	54,148	1,186,166	51,735	0.02	0.23	0.01	0.01	0.25
48.92	4,007,966	55,455	1,202,390	53,160	0.02	0.23	0.01	0.01	0.25
47.50	4,038,108	56,188	1,211,433	53,962	0.02	0.23	0.01	0.01	0.25
47.50	4,518,277	61,821	1,355,483	59,114	0.02	0.21	0.01	0.00	0.23
44.00	4,603,385	64,185	1,381,016	61,362	0.02	0.21	0.01	0.00	0.23
42.67	4,635,807	65,097	1,390,742	62,229	0.02	0.21	0.01	0.00	0.23
40.92	4,678,362	66,304	1,403,508	63,377	0.02	0.21	0.01	0.00	0.23
39.00	4,724,969	67,639	1,417,491	64,646	0.02	0.21	0.01	0.00	0.23
37.00	4,773,602	69,046	1,432,081	65,983	0.02	0.22	0.01	0.00	0.23
34.00	4,846,552	71,184	1,453,966	68,016	0.02	0.22	0.01	0.00	0.23
30.75	4,925,581	73,537	1,477,674	70,252	0.02	0.22	0.01	0.00	0.23
29.00	4,968,136	74,820	1,490,441	71,471	0.02	0.22	0.01	0.00	0.24
24.50	5,077,561	78,169	1,523,268	74,654	0.02	0.22	0.01	0.00	0.24
24.00	5,089,719	78,546	1,526,916	75,012	0.02	0.22	0.01	0.00	0.24
19.00	5,211,303	82,124	1,563,391	78,638	0.02	0.22	0.01	0.00	0.24
18.25	5,229,540	82,629	1,568,862	79,190	0.02	0.22	0.01	0.00	0.24
14.00	5,332,886	85,509	1,599,866	82,351	0.02	0.22	0.01	0.00	0.24
12.00	5,381,519	86,875	1,614,456	83,859	0.02	0.22	0.01	0.00	0.24
9.00	5,454,470	88,937	1,636,341	86,148	0.02	0.22	0.01	0.00	0.24
4.00	5,576,053	92,406	1,672,816	90,032	0.02	0.22	0.01	0.00	0.24
0.00	5,673,320	95,210	1,701,996	93,200	0.02	0.22	0.01	0.00	0.24

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)
149.00	0	0	0	0	2	2	3	14
145.00	1	-1	2	0	42	50	65	223
145.00	47	-36	59	61	1318	1561	2043	3474
144.00	65	-52	84	61	1328	1574	2059	3527
143.33	78	-63	100	61	1335	1582	2070	3563
143.33	78	-63	100	61	1337	1585	2073	3565
139.00	162	-133	210	61	1382	1639	2144	3806
137.75	187	-154	242	61	1396	1655	2165	3877
137.75	187	-154	242	61	1400	1660	2172	3881
135.00	242	-201	315	61	1431	1697	2219	4040
135.00	287	-236	372	121	2687	3186	4167	7294
134.00	326	-269	422	121	2697	3198	4184	7354
132.08	399	-331	519	121	2719	3225	4218	7469
132.08	399	-331	519	121	2720	3226	4220	7472
129.00	520	-432	676	121	2757	3270	4277	7662
129.00	520	-432	676	121	2767	3283	4293	8247
126.00	639	-532	831	121	2804	3327	4351	8463
126.00	639	-532	831	121	2807	3331	4356	8467
125.00	679	-566	884	121	2820	3346	4376	8541
125.00	724	-601	941	180	4052	4809	6288	11799
124.00	782	-650	1017	180	4061	4820	6303	11875
120.83	966	-805	1257	180	4102	4869	6366	12114
120.83	966	-805	1257	180	4101	4868	6365	12120
119.00	1073	-896	1398	180	4119	4891	6394	12265
115.00	1310	-1095	1707	180	4173	4954	6477	12580
115.00	1355	-1130	1764	238	5376	6384	8346	15846
114.58	1387	-1157	1806	238	5382	6391	8355	15880
114.58	1387	-1157	1806	238	5385	6395	8360	15885
114.00	1431	-1195	1864	238	5384	6395	8359	15938
109.00	1818	-1520	2369	238	5453	6478	8468	16349
109.00	1818	-1520	2369	238	5458	6486	8477	17139
105.00	2131	-1783	2778	238	5519	6557	8570	17647
105.00	2176	-1819	2836	294	6692	7952	10393	20921
103.83	2287	-1912	2981	294	6710	7974	10421	21072
103.83	2287	-1912	2981	294	6705	7969	10414	21083
99.00	2752	-2303	3589	294	6768	8045	10513	21731
97.58	2889	-2419	3768	294	6790	8072	10548	21923
97.58	2889	-2419	3768	294	6787	8069	10544	21932
95.00	3140	-2630	4096	294	6828	8118	10608	22286
95.00	3185	-2665	4153	350	7972	9479	12386	25566

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)
94.00	3299	-2761	4302	350	7979	9488	12397	25712
91.33	3603	-3017	4700	350	8022	9539	12464	26087
91.33	3603	-3017	4700	350	8012	9528	12449	26098
89.00	3871	-3242	5049	350	8033	9555	12483	26443
85.08	4322	-3621	5638	350	8098	9632	12584	27015
85.08	4322	-3621	5638	350	8089	9623	12571	27029
84.00	4447	-3726	5802	350	8107	9644	12599	27189
84.00	4447	-3726	5802	350	8098	9633	12584	27196
81.42	4746	-3978	6193	350	8133	9677	12641	28036
78.83	5047	-4231	6586	350	8184	9737	12719	28880
78.83	5047	-4231	6586	350	8178	9730	12710	28888
78.33	5106	-4280	6662	350	8173	9726	12704	29062
74.00	5614	-4707	7326	350	8231	9795	12794	29847
72.67	5771	-4839	7531	350	8254	9822	12830	30089
72.67	5771	-4839	7531	350	8241	9808	12811	30101
69.00	6204	-5203	8097	350	8285	9862	12880	30790
66.42	6511	-5460	8497	350	8330	9915	12950	31275
66.42	6511	-5460	8497	350	8319	9903	12934	31289
64.00	6799	-5702	8873	350	8346	9935	12975	31760
61.42	7108	-5961	9277	350	8391	9989	13046	32260
61.42	7108	-5961	9277	350	8377	9973	13025	32272
59.00	7398	-6205	9655	350	8399	10000	13059	32759
55.17	7859	-6593	10258	350	8466	10080	13164	33525
55.17	7859	-6593	10258	350	8452	10064	13142	33537
54.00	8001	-6711	10443	350	8460	10074	13155	33781
51.46	8309	-6970	10845	350	8487	10107	13198	34311
48.92	8618	-7229	11248	350	8532	10160	13267	34838
48.92	8618	-7229	11248	350	8521	10147	13250	34848
47.50	8790	-7374	11474	350	8546	10177	13289	35145
47.50	8791	-7374	11474	350	8529	10158	13264	35155
44.00	9219	-7734	12033	350	8581	10220	13344	36739
42.67	9383	-7871	12247	350	8606	10250	13384	37347
42.67	9383	-7871	12247	350	8598	10241	13372	37355
40.92	9598	-8052	12529	350	8619	10266	13404	38166
39.00	9835	-8251	12837	350	8638	10289	13435	38643
37.00	10082	-8459	13160	350	8673	10330	13488	39138
37.00	10082	-8459	13160	350	8657	10313	13465	39149
34.00	10455	-8771	13647	350	8686	10348	13510	39912
30.75	10859	-9111	14175	350	8741	10413	13596	40740
30.75	10859	-9111	14175	350	8728	10398	13575	40753

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)
29.00	11078	-9294	14461	350	8735	10406	13587	41216
24.50	11643	-9768	15198	350	8809	10495	13702	42394
24.50	11643	-9768	15198	350	8793	10476	13677	42405
24.00	11706	-9821	15280	350	8781	10462	13659	42547
19.00	12336	-10350	16103	350	8840	10532	13750	43900
18.25	12431	-10430	16227	350	8851	10546	13769	44105
18.25	12431	-10430	16227	350	8835	10527	13743	44115
14.00	12970	-10882	16930	350	8877	10577	13808	45297
12.00	13224	-11095	17262	350	8907	10613	13855	45855
12.00	13224	-11095	17262	350	8890	10593	13829	45866
9.00	13607	-11416	17761	350	8905	10612	13853	46727
4.00	14246	-11952	18596	350	8946	10661	13918	48181
0.00	14760	-12383	19266	350	9007	10734	14012	49354

BY VALMONT INDUSTRIES FOR: FIRST TAXING DISTRICT OF NORWALK 149.0' POLE, SITE: FIRST TAX DISTRICT DATE 08/16/2021
Design Id: 512236-P1reva IMPAX 24.3.20.4
Deflections for Pole

Loading Case T+S

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
149.00	23.2	27.6	36.1	0.5	2.10
145.00	22.0	26.3	34.3	0.5	2.10
145.00	22.0	26.3	34.3	0.5	2.10
144.00	21.7	26.0	33.9	0.5	2.09
143.33	21.6	25.7	33.6	0.5	2.09
143.33	21.6	25.7	33.6	0.5	2.09
139.00	20.3	24.3	31.7	0.4	2.08
137.75	20.0	23.9	31.1	0.4	2.07
137.75	20.0	23.9	31.1	0.4	2.07
135.00	19.2	23.0	29.9	0.4	2.06
135.00	19.2	23.0	29.9	0.4	2.06
134.00	19.0	22.6	29.5	0.4	2.05
132.08	18.4	22.0	28.7	0.4	2.04
132.08	18.4	22.0	28.7	0.4	2.04
129.00	17.6	21.0	27.4	0.4	2.01
129.00	17.6	21.0	27.4	0.4	2.01
126.00	16.8	20.0	26.1	0.3	1.98
126.00	16.8	20.0	26.1	0.3	1.98
125.00	16.5	19.7	25.7	0.3	1.97
125.00	16.5	19.7	25.7	0.3	1.97
124.00	16.3	19.4	25.3	0.3	1.96
120.83	15.4	18.4	24.0	0.3	1.92
120.83	15.4	18.4	24.0	0.3	1.92
119.00	15.0	17.8	23.3	0.3	1.90
115.00	14.0	16.6	21.7	0.3	1.84
115.00	14.0	16.6	21.7	0.3	1.84
114.58	13.8	16.5	21.6	0.3	1.83
114.58	13.8	16.5	21.6	0.3	1.83
114.00	13.7	16.4	21.3	0.3	1.82
109.00	12.5	14.9	19.5	0.2	1.74
109.00	12.5	14.9	19.5	0.2	1.74
105.00	11.6	13.8	18.0	0.2	1.69
105.00	11.6	13.8	18.0	0.2	1.69
103.83	11.3	13.5	17.6	0.2	1.67
103.83	11.3	13.5	17.6	0.2	1.67
99.00	10.3	12.2	16.0	0.2	1.60
97.58	10.0	11.9	15.5	0.2	1.58
97.58	10.0	11.9	15.5	0.2	1.58
95.00	9.4	11.2	14.7	0.2	1.54

Deflections for Pole

Loading Case T+S

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
95.00	9.4	11.2	14.7	0.2	1.54
94.00	9.2	11.0	14.3	0.1	1.52
91.33	8.7	10.3	13.5	0.1	1.48
91.33	8.7	10.3	13.5	0.1	1.48
89.00	8.2	9.8	12.8	0.1	1.44
85.08	7.5	8.9	11.6	0.1	1.37
85.08	7.5	8.9	11.6	0.1	1.37
84.00	7.3	8.7	11.3	0.1	1.35
84.00	7.3	8.7	11.3	0.1	1.35
81.42	6.8	8.1	10.6	0.1	1.30
78.83	6.4	7.6	9.9	0.1	1.26
78.83	6.4	7.6	9.9	0.1	1.26
78.33	6.3	7.5	9.8	0.1	1.25
74.00	5.6	6.7	8.7	0.1	1.18
72.67	5.4	6.4	8.4	0.1	1.15
72.67	5.4	6.4	8.4	0.1	1.15
69.00	4.8	5.7	7.5	0.1	1.09
66.42	4.4	5.3	6.9	0.1	1.04
66.42	4.4	5.3	6.9	0.1	1.04
64.00	4.1	4.9	6.4	0.1	1.00
61.42	3.8	4.5	5.9	0.0	0.96
61.42	3.8	4.5	5.9	0.0	0.96
59.00	3.5	4.1	5.4	0.0	0.91
55.17	3.0	3.6	4.7	0.0	0.85
55.17	3.0	3.6	4.7	0.0	0.85
54.00	2.9	3.4	4.5	0.0	0.83
51.46	2.6	3.1	4.1	0.0	0.78
48.92	2.4	2.8	3.7	0.0	0.74
48.92	2.4	2.8	3.7	0.0	0.74
47.50	2.2	2.6	3.4	0.0	0.71
47.50	2.2	2.6	3.4	0.0	0.71
44.00	1.9	2.3	2.9	0.0	0.66
42.67	1.8	2.1	2.8	0.0	0.63
42.67	1.8	2.1	2.8	0.0	0.63
40.92	1.6	1.9	2.5	0.0	0.61
39.00	1.5	1.8	2.3	0.0	0.58
37.00	1.3	1.6	2.1	0.0	0.54
37.00	1.3	1.6	2.1	0.0	0.54
34.00	1.1	1.3	1.7	0.0	0.50
30.75	0.9	1.1	1.4	0.0	0.45

Deflections for Pole

Loading Case T+S

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
30.75	0.9	1.1	1.4	0.0	0.45
29.00	0.8	1.0	1.3	0.0	0.42
24.50	0.6	0.7	0.9	0.0	0.35
24.50	0.6	0.7	0.9	0.0	0.35
24.00	0.5	0.7	0.9	0.0	0.34
19.00	0.3	0.4	0.5	0.0	0.27
18.25	0.3	0.4	0.5	0.0	0.26
18.25	0.3	0.4	0.5	0.0	0.26
14.00	0.2	0.2	0.3	0.0	0.20
12.00	0.1	0.2	0.2	0.0	0.17
12.00	0.1	0.2	0.2	0.0	0.17
9.00	0.1	0.1	0.1	0.0	0.13
4.00	0.0	0.0	0.0	0.0	0.06
0.00	0.0	0.0	0.0	0.0	0.00

Stresses for Pole

Loading Case T+S

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
149.00	982,914	6,696	294,874	6,394	0.00	0.00	0.00	0.00	0.01
145.00	1,025,468	7,219	307,640	6,960	0.00	0.01	0.01	0.01	0.01
144.00	1,036,107	7,350	310,832	7,105	0.00	0.01	0.01	0.01	0.02
143.33	1,043,199	7,437	312,960	7,203	0.00	0.01	0.01	0.01	0.02
139.00	1,089,300	8,016	326,790	7,853	0.00	0.03	0.01	0.01	0.03
137.75	1,102,598	8,185	330,779	8,046	0.00	0.03	0.01	0.01	0.04
135.00	1,131,854	8,561	339,556	8,479	0.01	0.05	0.01	0.01	0.06
134.00	1,142,492	8,699	342,748	8,639	0.01	0.05	0.01	0.01	0.06
132.08	1,162,883	8,965	348,865	8,950	0.01	0.06	0.01	0.01	0.07
129.00	1,195,685	9,397	358,706	9,462	0.01	0.08	0.01	0.01	0.09
129.00	1,364,898	11,135	409,469	10,789	0.01	0.07	0.01	0.01	0.07
126.00	1,401,373	11,657	420,412	11,373	0.01	0.08	0.01	0.01	0.09
125.00	1,413,531	11,832	424,059	11,571	0.01	0.09	0.02	0.02	0.10
124.00	1,425,690	12,008	427,707	11,771	0.01	0.09	0.02	0.02	0.10
120.83	1,464,191	12,571	439,257	12,416	0.01	0.11	0.02	0.02	0.12
119.00	1,486,481	12,900	445,944	12,797	0.01	0.12	0.02	0.01	0.13
115.00	1,535,115	13,626	460,534	13,648	0.01	0.14	0.02	0.02	0.16
114.58	1,540,181	13,702	462,054	13,738	0.01	0.15	0.02	0.02	0.16
114.00	1,547,273	13,809	464,182	13,865	0.01	0.15	0.02	0.02	0.16
109.00	1,608,065	14,734	482,419	14,975	0.01	0.18	0.02	0.02	0.19
109.00	2,402,486	23,290	720,746	22,284	0.01	0.11	0.01	0.01	0.12
105.00	2,475,436	24,734	742,631	23,658	0.01	0.13	0.02	0.01	0.14
103.83	2,496,713	25,164	749,014	24,067	0.01	0.13	0.02	0.01	0.14
99.00	2,584,861	26,983	775,458	25,796	0.01	0.15	0.02	0.01	0.16
97.58	2,610,698	27,528	783,209	26,314	0.01	0.15	0.01	0.01	0.16
95.00	2,657,811	28,536	797,343	27,273	0.01	0.16	0.02	0.01	0.17
94.00	2,676,049	28,931	802,815	27,648	0.01	0.17	0.02	0.01	0.18
91.33	2,724,682	29,998	817,405	28,662	0.01	0.17	0.02	0.01	0.19
89.00	2,767,236	30,947	830,171	29,565	0.01	0.18	0.02	0.01	0.19
85.08	2,838,667	32,574	851,600	31,111	0.01	0.19	0.02	0.01	0.20
84.00	2,858,424	33,031	857,527	31,545	0.01	0.20	0.02	0.01	0.21
84.00	3,261,494	36,789	978,448	35,202	0.01	0.18	0.01	0.01	0.19
81.42	3,316,460	38,047	994,938	36,399	0.01	0.18	0.01	0.01	0.19
78.83	3,371,426	39,326	1,011,428	37,615	0.01	0.19	0.01	0.01	0.20
78.33	3,382,064	39,576	1,014,619	37,853	0.01	0.19	0.01	0.01	0.20
74.00	3,474,265	41,776	1,042,279	39,945	0.01	0.19	0.01	0.01	0.20
72.67	3,502,634	42,465	1,050,790	40,600	0.01	0.20	0.01	0.01	0.21
69.00	3,580,650	44,388	1,074,195	42,429	0.01	0.20	0.01	0.01	0.21

Stresses for Pole

Loading Case T+S

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
66.42	3,635,616	45,769	1,090,685	43,741	0.01	0.21	0.01	0.01	0.22
64.00	3,687,036	47,080	1,106,111	44,987	0.01	0.21	0.01	0.01	0.22
61.42	3,742,002	48,502	1,122,601	46,339	0.01	0.21	0.01	0.01	0.22
59.00	3,793,422	49,851	1,138,026	47,621	0.01	0.22	0.01	0.01	0.23
55.17	3,874,984	52,029	1,162,495	49,691	0.01	0.22	0.01	0.01	0.23
54.00	3,899,807	52,701	1,169,942	50,329	0.01	0.22	0.01	0.01	0.23
51.46	3,953,886	54,148	1,186,166	51,735	0.01	0.22	0.01	0.01	0.23
48.92	4,007,966	55,455	1,202,390	53,160	0.01	0.23	0.01	0.01	0.24
47.50	4,038,108	56,188	1,211,433	53,962	0.01	0.23	0.01	0.01	0.24
47.50	4,518,277	61,821	1,355,483	59,114	0.01	0.21	0.01	0.01	0.22
44.00	4,603,385	64,185	1,381,016	61,362	0.01	0.21	0.01	0.01	0.22
42.67	4,635,807	65,097	1,390,742	62,229	0.01	0.21	0.01	0.01	0.22
40.92	4,678,362	66,304	1,403,508	63,377	0.01	0.21	0.01	0.01	0.22
39.00	4,724,969	67,639	1,417,491	64,646	0.01	0.21	0.01	0.01	0.22
37.00	4,773,602	69,046	1,432,081	65,983	0.01	0.21	0.01	0.01	0.22
34.00	4,846,552	71,184	1,453,966	68,016	0.01	0.21	0.01	0.01	0.22
30.75	4,925,581	73,537	1,477,674	70,252	0.01	0.21	0.01	0.01	0.22
29.00	4,968,136	74,820	1,490,441	71,471	0.01	0.21	0.01	0.01	0.22
24.50	5,077,561	78,169	1,523,268	74,654	0.01	0.22	0.01	0.00	0.23
24.00	5,089,719	78,546	1,526,916	75,012	0.01	0.22	0.01	0.00	0.23
19.00	5,211,303	82,124	1,563,391	78,638	0.01	0.22	0.01	0.00	0.23
18.25	5,229,540	82,629	1,568,862	79,190	0.01	0.22	0.01	0.00	0.23
14.00	5,332,886	85,509	1,599,866	82,351	0.01	0.22	0.01	0.00	0.23
12.00	5,381,519	86,875	1,614,456	83,859	0.01	0.22	0.01	0.00	0.23
9.00	5,454,470	88,937	1,636,341	86,148	0.01	0.22	0.01	0.00	0.23
4.00	5,576,053	92,406	1,672,816	90,032	0.01	0.22	0.01	0.00	0.23
0.00	5,673,320	95,210	1,701,996	93,200	0.01	0.22	0.01	0.00	0.23

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)
149.00	0	0	0	0	1	1	1	17
145.00	0	0	0	0	12	14	18	276
145.00	55	-46	72	4	183	218	285	4392
144.00	58	-48	75	4	186	221	289	4459
143.33	59	-50	77	4	187	223	292	4503
143.33	59	-50	77	4	187	223	291	4506
139.00	71	-60	93	4	199	237	309	4804
137.75	75	-63	98	4	202	241	315	4892
137.75	75	-63	98	4	202	241	314	4896
135.00	83	-70	108	4	210	250	326	5094
135.00	137	-115	179	8	359	428	559	9211
134.00	143	-120	186	8	361	431	562	9284
132.08	153	-128	199	8	366	437	570	9427
132.08	153	-128	199	8	366	436	569	9429
129.00	169	-142	220	8	374	445	581	9664
129.00	169	-142	220	8	397	473	617	10388
126.00	186	-156	243	8	406	483	631	10656
126.00	186	-156	243	8	405	483	630	10660
125.00	192	-161	250	8	408	486	635	10750
125.00	246	-207	322	11	537	640	836	14867
124.00	254	-213	332	11	539	642	838	14959
120.83	279	-234	364	11	548	653	852	15254
120.83	279	-234	364	11	546	651	850	15258
119.00	293	-246	382	11	550	655	855	15433
115.00	325	-272	424	11	560	668	872	15823
115.00	379	-318	495	13	669	798	1041	19940
114.58	383	-321	500	13	671	799	1043	19981
114.58	383	-321	500	13	670	799	1043	19986
114.00	389	-326	508	13	669	797	1041	20045
109.00	437	-367	571	13	682	812	1061	20554
109.00	437	-367	571	13	701	836	1091	21521
105.00	478	-401	623	13	716	853	1114	22151
105.00	532	-446	695	15	807	961	1255	26268
103.83	546	-458	712	15	811	966	1262	26455
103.83	546	-458	712	15	808	963	1257	26461
99.00	602	-505	786	15	822	979	1278	27254
97.58	619	-519	808	15	826	985	1286	27491
97.58	619	-519	808	15	824	982	1283	27496
95.00	649	-545	848	15	833	992	1296	27936
95.00	704	-590	919	17	908	1082	1412	32053

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)
94.00	717	-601	936	17	909	1083	1413	32225
91.33	752	-631	981	17	917	1093	1426	32691
91.33	752	-631	981	17	914	1089	1421	32693
89.00	782	-656	1021	17	917	1092	1426	33107
85.08	834	-700	1089	17	928	1106	1443	33816
85.08	834	-700	1089	17	925	1102	1438	33822
84.00	848	-712	1107	17	928	1105	1443	34021
84.00	848	-712	1107	17	925	1103	1439	34021
81.42	883	-741	1152	17	937	1116	1457	35051
78.83	918	-770	1198	17	951	1133	1479	36098
78.83	918	-770	1198	17	949	1131	1476	36100
78.33	924	-776	1207	17	949	1131	1476	36305
74.00	984	-825	1284	17	957	1140	1489	37265
72.67	1002	-841	1308	17	960	1144	1494	37565
72.67	1002	-841	1308	17	957	1141	1489	37568
69.00	1052	-883	1374	17	962	1147	1497	38407
66.42	1088	-913	1420	17	968	1154	1506	39009
66.42	1088	-913	1420	17	965	1150	1501	39014
64.00	1121	-941	1464	17	967	1152	1504	39586
61.42	1157	-971	1510	17	972	1159	1512	40206
61.42	1157	-971	1510	17	969	1155	1507	40209
59.00	1191	-999	1554	17	970	1156	1508	40797
55.17	1244	-1044	1624	17	976	1164	1519	41747
55.17	1244	-1044	1624	17	973	1160	1514	41750
54.00	1260	-1057	1645	17	973	1159	1513	42043
51.46	1296	-1087	1691	17	973	1160	1514	42688
48.92	1331	-1117	1738	17	977	1164	1520	43342
48.92	1331	-1117	1738	17	975	1161	1516	43345
47.50	1351	-1133	1763	17	977	1164	1519	43713
47.50	1351	-1133	1763	17	973	1160	1514	43713
44.00	1400	-1175	1827	17	980	1168	1524	45667
42.67	1419	-1190	1852	17	983	1172	1529	46420
42.67	1419	-1190	1852	17	981	1169	1526	46423
40.92	1443	-1211	1884	17	983	1171	1529	47420
39.00	1470	-1234	1919	17	983	1171	1529	48003
37.00	1498	-1257	1956	17	985	1173	1532	48616
37.00	1498	-1257	1956	17	982	1170	1527	48619
34.00	1540	-1293	2011	17	980	1168	1525	49552
30.75	1586	-1331	2070	17	983	1172	1529	50578
30.75	1586	-1331	2070	17	980	1168	1524	50583

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)
29.00	1611	-1351	2102	17	977	1164	1520	51143
24.50	1674	-1404	2185	17	980	1168	1524	52604
24.50	1674	-1404	2185	17	977	1164	1519	52607
24.00	1681	-1410	2194	17	973	1160	1514	52771
19.00	1750	-1469	2285	17	972	1158	1512	54436
18.25	1761	-1477	2298	17	972	1159	1512	54689
18.25	1761	-1477	2298	17	969	1155	1507	54692
14.00	1820	-1527	2375	17	966	1151	1503	56143
12.00	1847	-1550	2411	17	966	1152	1504	56836
12.00	1847	-1550	2411	17	963	1148	1499	56838
9.00	1889	-1585	2465	17	959	1142	1491	57889
4.00	1957	-1642	2555	17	953	1136	1483	59673
0.00	2012	-1688	2626	17	953	1136	1483	61128

Deflections for Pole

Loading Case Seismic

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
149.00	3.9	4.6	6.0	0.1	0.41
145.00	3.7	4.4	5.7	0.1	0.41
145.00	3.7	4.4	5.7	0.1	0.41
144.00	3.6	4.3	5.6	0.1	0.40
143.33	3.6	4.3	5.6	0.1	0.40
143.33	3.6	4.3	5.6	0.1	0.40
139.00	3.3	4.0	5.2	0.1	0.40
137.75	3.3	3.9	5.1	0.0	0.39
137.75	3.3	3.9	5.1	0.0	0.39
135.00	3.1	3.7	4.9	0.0	0.39
135.00	3.1	3.7	4.9	0.0	0.39
134.00	3.1	3.7	4.8	0.0	0.38
132.08	3.0	3.5	4.6	0.0	0.38
132.08	3.0	3.5	4.6	0.0	0.38
129.00	2.8	3.4	4.4	0.0	0.37
129.00	2.8	3.4	4.4	0.0	0.37
126.00	2.7	3.2	4.2	0.0	0.36
126.00	2.7	3.2	4.2	0.0	0.36
125.00	2.6	3.1	4.1	0.0	0.36
125.00	2.6	3.1	4.1	0.0	0.36
124.00	2.6	3.1	4.0	0.0	0.35
120.83	2.4	2.9	3.8	0.0	0.34
120.83	2.4	2.9	3.8	0.0	0.34
119.00	2.3	2.8	3.7	0.0	0.34
115.00	2.2	2.6	3.4	0.0	0.32
115.00	2.2	2.6	3.4	0.0	0.32
114.58	2.2	2.6	3.3	0.0	0.32
114.58	2.2	2.6	3.3	0.0	0.32
114.00	2.1	2.5	3.3	0.0	0.32
109.00	1.9	2.3	3.0	0.0	0.29
109.00	1.9	2.3	3.0	0.0	0.29
105.00	1.8	2.1	2.7	0.0	0.28
105.00	1.8	2.1	2.7	0.0	0.28
103.83	1.7	2.1	2.7	0.0	0.28
103.83	1.7	2.1	2.7	0.0	0.28
99.00	1.5	1.8	2.4	0.0	0.26
97.58	1.5	1.8	2.3	0.0	0.26
97.58	1.5	1.8	2.3	0.0	0.26
95.00	1.4	1.7	2.2	0.0	0.25

Deflections for Pole

Loading Case Seismic

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
95.00	1.4	1.7	2.2	0.0	0.25
94.00	1.4	1.6	2.1	0.0	0.24
91.33	1.3	1.5	2.0	0.0	0.24
91.33	1.3	1.5	2.0	0.0	0.24
89.00	1.2	1.5	1.9	0.0	0.23
85.08	1.1	1.3	1.7	0.0	0.21
85.08	1.1	1.3	1.7	0.0	0.21
84.00	1.1	1.3	1.7	0.0	0.21
84.00	1.1	1.3	1.7	0.0	0.21
81.42	1.0	1.2	1.6	0.0	0.20
78.83	0.9	1.1	1.5	0.0	0.19
78.83	0.9	1.1	1.5	0.0	0.19
78.33	0.9	1.1	1.4	0.0	0.19
74.00	0.8	1.0	1.3	0.0	0.18
72.67	0.8	0.9	1.2	0.0	0.17
72.67	0.8	0.9	1.2	0.0	0.17
69.00	0.7	0.8	1.1	0.0	0.16
66.42	0.6	0.8	1.0	0.0	0.16
66.42	0.6	0.8	1.0	0.0	0.16
64.00	0.6	0.7	0.9	0.0	0.15
61.42	0.5	0.6	0.8	0.0	0.14
61.42	0.5	0.6	0.8	0.0	0.14
59.00	0.5	0.6	0.8	0.0	0.13
55.17	0.4	0.5	0.7	0.0	0.12
55.17	0.4	0.5	0.7	0.0	0.12
54.00	0.4	0.5	0.6	0.0	0.12
51.46	0.4	0.4	0.6	0.0	0.11
48.92	0.3	0.4	0.5	0.0	0.11
48.92	0.3	0.4	0.5	0.0	0.11
47.50	0.3	0.4	0.5	0.0	0.10
47.50	0.3	0.4	0.5	0.0	0.10
44.00	0.3	0.3	0.4	0.0	0.09
42.67	0.3	0.3	0.4	0.0	0.09
42.67	0.3	0.3	0.4	0.0	0.09
40.92	0.2	0.3	0.4	0.0	0.09
39.00	0.2	0.2	0.3	0.0	0.08
37.00	0.2	0.2	0.3	0.0	0.08
37.00	0.2	0.2	0.3	0.0	0.08
34.00	0.2	0.2	0.2	0.0	0.07
30.75	0.1	0.2	0.2	0.0	0.06

Deflections for Pole

Loading Case Seismic

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
30.75	0.1	0.2	0.2	0.0	0.06
29.00	0.1	0.1	0.2	0.0	0.06
24.50	0.1	0.1	0.1	0.0	0.05
24.50	0.1	0.1	0.1	0.0	0.05
24.00	0.1	0.1	0.1	0.0	0.05
19.00	0.0	0.1	0.1	0.0	0.04
18.25	0.0	0.1	0.1	0.0	0.04
18.25	0.0	0.1	0.1	0.0	0.04
14.00	0.0	0.0	0.0	0.0	0.03
12.00	0.0	0.0	0.0	0.0	0.02
12.00	0.0	0.0	0.0	0.0	0.02
9.00	0.0	0.0	0.0	0.0	0.02
4.00	0.0	0.0	0.0	0.0	0.01
0.00	0.0	0.0	0.0	0.0	0.00

Stresses for Pole

Loading Case Seismic

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
149.00	982,914	6,696	294,874	6,394	0.00	0.00	0.00	0.00	0.01
145.00	1,025,468	7,219	307,640	6,960	0.00	0.01	0.00	0.00	0.02
144.00	1,036,107	7,350	310,832	7,105	0.00	0.01	0.00	0.00	0.02
143.33	1,043,199	7,437	312,960	7,203	0.00	0.01	0.00	0.00	0.02
139.00	1,089,300	8,016	326,790	7,853	0.00	0.01	0.00	0.00	0.02
137.75	1,102,598	8,185	330,779	8,046	0.00	0.01	0.00	0.00	0.02
135.00	1,131,854	8,561	339,556	8,479	0.01	0.02	0.00	0.00	0.03
134.00	1,142,492	8,699	342,748	8,639	0.01	0.02	0.00	0.00	0.03
132.08	1,162,883	8,965	348,865	8,950	0.01	0.02	0.00	0.00	0.03
129.00	1,195,685	9,397	358,706	9,462	0.01	0.03	0.00	0.00	0.04
129.00	1,364,898	11,135	409,469	10,789	0.01	0.02	0.00	0.00	0.03
126.00	1,401,373	11,657	420,412	11,373	0.01	0.02	0.00	0.00	0.03
125.00	1,413,531	11,832	424,059	11,571	0.01	0.03	0.00	0.00	0.04
124.00	1,425,690	12,008	427,707	11,771	0.01	0.03	0.00	0.00	0.04
120.83	1,464,191	12,571	439,257	12,416	0.01	0.03	0.00	0.00	0.04
119.00	1,486,481	12,900	445,944	12,797	0.01	0.03	0.00	0.00	0.04
115.00	1,535,115	13,626	460,534	13,648	0.01	0.04	0.00	0.00	0.05
114.58	1,540,181	13,702	462,054	13,738	0.01	0.04	0.00	0.00	0.05
114.00	1,547,273	13,809	464,182	13,865	0.01	0.04	0.00	0.00	0.06
109.00	1,608,065	14,734	482,419	14,975	0.01	0.04	0.00	0.00	0.06
109.00	2,402,486	23,290	720,746	22,284	0.01	0.03	0.00	0.00	0.04
105.00	2,475,436	24,734	742,631	23,658	0.01	0.03	0.00	0.00	0.04
103.83	2,496,713	25,164	749,014	24,067	0.01	0.03	0.00	0.00	0.04
99.00	2,584,861	26,983	775,458	25,796	0.01	0.03	0.00	0.00	0.04
97.58	2,610,698	27,528	783,209	26,314	0.01	0.03	0.00	0.00	0.04
95.00	2,657,811	28,536	797,343	27,273	0.01	0.04	0.00	0.00	0.05
94.00	2,676,049	28,931	802,815	27,648	0.01	0.04	0.00	0.00	0.05
91.33	2,724,682	29,998	817,405	28,662	0.01	0.04	0.00	0.00	0.05
89.00	2,767,236	30,947	830,171	29,565	0.01	0.04	0.00	0.00	0.05
85.08	2,838,667	32,574	851,600	31,111	0.01	0.04	0.00	0.00	0.05
84.00	2,858,424	33,031	857,527	31,545	0.01	0.04	0.00	0.00	0.05
84.00	3,261,494	36,789	978,448	35,202	0.01	0.03	0.00	0.00	0.05
81.42	3,316,460	38,047	994,938	36,399	0.01	0.03	0.00	0.00	0.05
78.83	3,371,426	39,326	1,011,428	37,615	0.01	0.03	0.00	0.00	0.05
78.33	3,382,064	39,576	1,014,619	37,853	0.01	0.03	0.00	0.00	0.05
74.00	3,474,265	41,776	1,042,279	39,945	0.01	0.03	0.00	0.00	0.05
72.67	3,502,634	42,465	1,050,790	40,600	0.01	0.03	0.00	0.00	0.05
69.00	3,580,650	44,388	1,074,195	42,429	0.01	0.03	0.00	0.00	0.05

Stresses for Pole

Loading Case Seismic

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
66.42	3,635,616	45,769	1,090,685	43,741	0.01	0.03	0.00	0.00	0.05
64.00	3,687,036	47,080	1,106,111	44,987	0.01	0.03	0.00	0.00	0.05
61.42	3,742,002	48,502	1,122,601	46,339	0.01	0.03	0.00	0.00	0.05
59.00	3,793,422	49,851	1,138,026	47,621	0.01	0.03	0.00	0.00	0.05
55.17	3,874,984	52,029	1,162,495	49,691	0.01	0.03	0.00	0.00	0.05
54.00	3,899,807	52,701	1,169,942	50,329	0.01	0.03	0.00	0.00	0.05
51.46	3,953,886	54,148	1,186,166	51,735	0.01	0.03	0.00	0.00	0.05
48.92	4,007,966	55,455	1,202,390	53,160	0.01	0.03	0.00	0.00	0.05
47.50	4,038,108	56,188	1,211,433	53,962	0.01	0.03	0.00	0.00	0.05
47.50	4,518,277	61,821	1,355,483	59,114	0.01	0.03	0.00	0.00	0.04
44.00	4,603,385	64,185	1,381,016	61,362	0.01	0.03	0.00	0.00	0.04
42.67	4,635,807	65,097	1,390,742	62,229	0.01	0.03	0.00	0.00	0.04
40.92	4,678,362	66,304	1,403,508	63,377	0.01	0.03	0.00	0.00	0.04
39.00	4,724,969	67,639	1,417,491	64,646	0.01	0.03	0.00	0.00	0.04
37.00	4,773,602	69,046	1,432,081	65,983	0.01	0.03	0.00	0.00	0.04
34.00	4,846,552	71,184	1,453,966	68,016	0.01	0.03	0.00	0.00	0.04
30.75	4,925,581	73,537	1,477,674	70,252	0.01	0.03	0.00	0.00	0.04
29.00	4,968,136	74,820	1,490,441	71,471	0.01	0.03	0.00	0.00	0.04
24.50	5,077,561	78,169	1,523,268	74,654	0.01	0.03	0.00	0.00	0.04
24.00	5,089,719	78,546	1,526,916	75,012	0.01	0.03	0.00	0.00	0.04
19.00	5,211,303	82,124	1,563,391	78,638	0.01	0.03	0.00	0.00	0.04
18.25	5,229,540	82,629	1,568,862	79,190	0.01	0.03	0.00	0.00	0.04
14.00	5,332,886	85,509	1,599,866	82,351	0.01	0.03	0.00	0.00	0.04
12.00	5,381,519	86,875	1,614,456	83,859	0.01	0.03	0.00	0.00	0.04
9.00	5,454,470	88,937	1,636,341	86,148	0.01	0.03	0.00	0.00	0.04
4.00	5,576,053	92,406	1,672,816	90,032	0.01	0.03	0.00	0.00	0.04
0.00	5,673,320	95,210	1,701,996	93,200	0.01	0.03	0.00	0.00	0.04

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case Seismic 2

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)
149.00	0	0	0	0	1	1	1	12
145.00	0	0	0	0	11	13	18	192
145.00	38	-32	50	4	175	208	272	3047
144.00	41	-34	53	4	177	211	276	3093
143.33	42	-36	55	4	179	213	279	3124
143.33	42	-36	55	4	179	213	279	3126
139.00	54	-45	70	4	190	227	296	3332
137.75	57	-48	75	4	193	231	301	3394
137.75	57	-48	75	4	194	231	301	3396
135.00	65	-55	85	4	201	239	312	3534
135.00	103	-86	134	8	343	409	534	6389
134.00	108	-90	141	8	345	412	537	6440
132.08	117	-98	153	8	350	417	545	6539
132.08	117	-98	153	8	350	417	544	6541
129.00	133	-111	173	8	358	426	556	6704
129.00	133	-111	173	8	380	453	591	7206
126.00	149	-125	195	8	388	463	604	7392
126.00	149	-125	195	8	388	462	604	7394
125.00	155	-130	202	8	391	466	608	7457
125.00	193	-162	252	11	514	612	799	10313
124.00	200	-168	261	11	516	615	802	10377
120.83	224	-188	292	11	524	625	816	10581
120.83	224	-188	292	11	523	624	814	10584
119.00	237	-199	310	11	527	628	820	10705
115.00	268	-225	350	11	538	640	836	10976
115.00	306	-256	399	13	641	764	998	13832
114.58	309	-260	404	13	643	766	999	13861
114.58	309	-260	404	13	642	765	999	13864
114.00	315	-264	411	13	642	765	999	13905
109.00	361	-303	471	13	654	780	1018	14258
109.00	361	-303	471	13	674	804	1049	14929
105.00	400	-336	522	13	688	820	1071	15366
105.00	438	-367	572	15	775	923	1206	18222
103.83	451	-378	589	15	779	928	1212	18352
103.83	451	-378	589	15	777	926	1209	18356
99.00	505	-424	659	15	791	943	1231	18906
97.58	521	-437	680	15	796	948	1238	19071
97.58	521	-437	680	15	795	947	1236	19074
95.00	551	-462	719	15	803	956	1249	19379
95.00	589	-494	768	17	874	1041	1360	22235

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case Seismic 2

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)
94.00	601	-504	785	17	876	1043	1362	22355
91.33	635	-532	828	17	883	1053	1374	22677
91.33	635	-532	828	17	881	1050	1371	22679
89.00	664	-557	867	17	886	1055	1378	22967
85.08	714	-599	932	17	896	1068	1394	23459
85.08	714	-599	932	17	894	1066	1391	23462
84.00	728	-611	950	17	897	1069	1396	23600
84.00	728	-611	950	17	896	1067	1394	23601
81.42	761	-639	994	17	908	1082	1412	24315
78.83	795	-667	1038	17	921	1098	1433	25041
78.83	795	-667	1038	17	920	1096	1431	25043
78.33	802	-673	1046	17	921	1097	1432	25185
74.00	859	-721	1121	17	929	1108	1446	25851
72.67	877	-736	1144	17	933	1111	1451	26059
72.67	877	-736	1144	17	931	1109	1448	26061
69.00	926	-777	1208	17	937	1116	1457	26643
66.42	960	-806	1254	17	942	1123	1466	27061
66.42	960	-806	1254	17	940	1121	1463	27065
64.00	993	-833	1296	17	943	1124	1467	27461
61.42	1028	-863	1342	17	948	1130	1475	27891
61.42	1028	-863	1342	17	946	1128	1472	27893
59.00	1061	-890	1385	17	948	1130	1475	28302
55.17	1113	-934	1453	17	954	1137	1485	28960
55.17	1113	-934	1453	17	952	1135	1481	28962
54.00	1129	-947	1474	17	953	1135	1482	29166
51.46	1164	-976	1519	17	954	1137	1484	29613
48.92	1198	-1005	1564	17	958	1141	1490	30067
48.92	1198	-1005	1564	17	956	1139	1487	30069
47.50	1218	-1022	1589	17	958	1141	1490	30324
47.50	1218	-1022	1589	17	956	1139	1487	30325
44.00	1266	-1062	1652	17	963	1147	1497	31680
42.67	1284	-1077	1676	17	966	1151	1502	32203
42.67	1284	-1077	1676	17	964	1149	1500	32204
40.92	1308	-1098	1708	17	967	1152	1504	32896
39.00	1335	-1120	1742	17	967	1152	1504	33300
37.00	1362	-1143	1779	17	969	1155	1507	33726
37.00	1362	-1143	1779	17	967	1152	1504	33728
34.00	1404	-1178	1833	17	967	1152	1504	34375
30.75	1449	-1216	1892	17	969	1155	1508	35087
30.75	1449	-1216	1892	17	967	1153	1505	35091

Forces and Moments for Pole in the Local Element Coordinate System

Loading Case Seismic 2

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)
29.00	1473	-1236	1923	17	966	1151	1503	35479
24.50	1535	-1288	2004	17	968	1154	1506	36493
24.50	1535	-1288	2004	17	966	1152	1503	36494
24.00	1542	-1294	2013	17	964	1149	1500	36609
19.00	1611	-1352	2103	17	964	1149	1499	37764
18.25	1622	-1361	2117	17	964	1149	1500	37939
18.25	1622	-1361	2117	17	962	1146	1497	37941
14.00	1680	-1410	2193	17	960	1145	1494	38948
12.00	1708	-1433	2229	17	961	1145	1495	39428
12.00	1708	-1433	2229	17	959	1143	1491	39430
9.00	1749	-1467	2283	17	956	1139	1487	40160
4.00	1817	-1525	2372	17	952	1135	1482	41397
0.00	1872	-1570	2443	17	952	1135	1482	42406

Deflections for Pole

Loading Case Seismic 2

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
149.00	3.4	4.1	5.3	0.0	0.35
145.00	3.2	3.9	5.0	0.0	0.35
145.00	3.2	3.9	5.0	0.0	0.35
144.00	3.2	3.8	5.0	0.0	0.35
143.33	3.2	3.8	4.9	0.0	0.35
143.33	3.2	3.8	4.9	0.0	0.35
139.00	3.0	3.5	4.6	0.0	0.34
137.75	2.9	3.5	4.5	0.0	0.34
137.75	2.9	3.5	4.5	0.0	0.34
135.00	2.8	3.3	4.3	0.0	0.33
135.00	2.8	3.3	4.3	0.0	0.33
134.00	2.7	3.3	4.3	0.0	0.33
132.08	2.7	3.2	4.1	0.0	0.33
132.08	2.7	3.2	4.1	0.0	0.33
129.00	2.5	3.0	3.9	0.0	0.32
129.00	2.5	3.0	3.9	0.0	0.32
126.00	2.4	2.9	3.7	0.0	0.31
126.00	2.4	2.9	3.7	0.0	0.31
125.00	2.4	2.8	3.7	0.0	0.31
125.00	2.4	2.8	3.7	0.0	0.31
124.00	2.3	2.8	3.6	0.0	0.31
120.83	2.2	2.6	3.4	0.0	0.30
120.83	2.2	2.6	3.4	0.0	0.30
119.00	2.1	2.5	3.3	0.0	0.29
115.00	2.0	2.3	3.0	0.0	0.28
115.00	2.0	2.3	3.0	0.0	0.28
114.58	1.9	2.3	3.0	0.0	0.28
114.58	1.9	2.3	3.0	0.0	0.28
114.00	1.9	2.3	3.0	0.0	0.28
109.00	1.7	2.1	2.7	0.0	0.26
109.00	1.7	2.1	2.7	0.0	0.26
105.00	1.6	1.9	2.5	0.0	0.25
105.00	1.6	1.9	2.5	0.0	0.25
103.83	1.6	1.9	2.4	0.0	0.25
103.83	1.6	1.9	2.4	0.0	0.25
99.00	1.4	1.7	2.2	0.0	0.23
97.58	1.4	1.6	2.1	0.0	0.23
97.58	1.4	1.6	2.1	0.0	0.23
95.00	1.3	1.5	2.0	0.0	0.22

Deflections for Pole

Loading Case Seismic 2

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
95.00	1.3	1.5	2.0	0.0	0.22
94.00	1.3	1.5	1.9	0.0	0.22
91.33	1.2	1.4	1.8	0.0	0.21
91.33	1.2	1.4	1.8	0.0	0.21
89.00	1.1	1.3	1.7	0.0	0.20
85.08	1.0	1.2	1.6	0.0	0.19
85.08	1.0	1.2	1.6	0.0	0.19
84.00	1.0	1.2	1.5	0.0	0.19
84.00	1.0	1.2	1.5	0.0	0.19
81.42	0.9	1.1	1.4	0.0	0.18
78.83	0.9	1.0	1.3	0.0	0.17
78.83	0.9	1.0	1.3	0.0	0.17
78.33	0.8	1.0	1.3	0.0	0.17
74.00	0.7	0.9	1.2	0.0	0.16
72.67	0.7	0.9	1.1	0.0	0.16
72.67	0.7	0.9	1.1	0.0	0.16
69.00	0.6	0.8	1.0	0.0	0.15
66.42	0.6	0.7	0.9	0.0	0.14
66.42	0.6	0.7	0.9	0.0	0.14
64.00	0.5	0.6	0.8	0.0	0.14
61.42	0.5	0.6	0.8	0.0	0.13
61.42	0.5	0.6	0.8	0.0	0.13
59.00	0.5	0.5	0.7	0.0	0.12
55.17	0.4	0.5	0.6	0.0	0.11
55.17	0.4	0.5	0.6	0.0	0.11
54.00	0.4	0.5	0.6	0.0	0.11
51.46	0.3	0.4	0.5	0.0	0.10
48.92	0.3	0.4	0.5	0.0	0.10
48.92	0.3	0.4	0.5	0.0	0.10
47.50	0.3	0.3	0.4	0.0	0.09
47.50	0.3	0.3	0.4	0.0	0.09
44.00	0.2	0.3	0.4	0.0	0.09
42.67	0.2	0.3	0.4	0.0	0.08
42.67	0.2	0.3	0.4	0.0	0.08
40.92	0.2	0.3	0.3	0.0	0.08
39.00	0.2	0.2	0.3	0.0	0.08
37.00	0.2	0.2	0.3	0.0	0.07
37.00	0.2	0.2	0.3	0.0	0.07
34.00	0.1	0.2	0.2	0.0	0.06
30.75	0.1	0.1	0.2	0.0	0.06

Deflections for Pole

Loading Case Seismic 2

Distance From Base (ft)	Defl. X-Dir (in)	Defl. Y-Dir (in)	Defl. Resultant X & Y (in)	Defl. Z-Dir (in)	Rotation (deg.)
30.75	0.1	0.1	0.2	0.0	0.06
29.00	0.1	0.1	0.2	0.0	0.05
24.50	0.1	0.1	0.1	0.0	0.05
24.50	0.1	0.1	0.1	0.0	0.05
24.00	0.1	0.1	0.1	0.0	0.04
19.00	0.0	0.1	0.1	0.0	0.03
18.25	0.0	0.0	0.1	0.0	0.03
18.25	0.0	0.0	0.1	0.0	0.03
14.00	0.0	0.0	0.0	0.0	0.03
12.00	0.0	0.0	0.0	0.0	0.02
12.00	0.0	0.0	0.0	0.0	0.02
9.00	0.0	0.0	0.0	0.0	0.02
4.00	0.0	0.0	0.0	0.0	0.01
0.00	0.0	0.0	0.0	0.0	0.00

Stresses for Pole

Loading Case Seismic 2

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
149.00	982,914	6,696	294,874	6,394	0.00	0.00	0.00	0.00	0.01
145.00	1,025,468	7,219	307,640	6,960	0.00	0.01	0.00	0.00	0.01
144.00	1,036,107	7,350	310,832	7,105	0.00	0.01	0.00	0.00	0.01
143.33	1,043,199	7,437	312,960	7,203	0.00	0.01	0.00	0.00	0.01
139.00	1,089,300	8,016	326,790	7,853	0.00	0.01	0.00	0.00	0.01
137.75	1,102,598	8,185	330,779	8,046	0.00	0.01	0.00	0.00	0.01
135.00	1,131,854	8,561	339,556	8,479	0.01	0.02	0.00	0.00	0.02
134.00	1,142,492	8,699	342,748	8,639	0.01	0.02	0.00	0.00	0.02
132.08	1,162,883	8,965	348,865	8,950	0.01	0.02	0.00	0.00	0.03
129.00	1,195,685	9,397	358,706	9,462	0.01	0.02	0.00	0.00	0.03
129.00	1,364,898	11,135	409,469	10,789	0.01	0.02	0.00	0.00	0.02
126.00	1,401,373	11,657	420,412	11,373	0.01	0.02	0.00	0.00	0.02
125.00	1,413,531	11,832	424,059	11,571	0.01	0.02	0.00	0.00	0.03
124.00	1,425,690	12,008	427,707	11,771	0.01	0.02	0.00	0.00	0.03
120.83	1,464,191	12,571	439,257	12,416	0.01	0.03	0.00	0.00	0.03
119.00	1,486,481	12,900	445,944	12,797	0.01	0.03	0.00	0.00	0.03
115.00	1,535,115	13,626	460,534	13,648	0.01	0.03	0.00	0.00	0.04
114.58	1,540,181	13,702	462,054	13,738	0.01	0.03	0.00	0.00	0.04
114.00	1,547,273	13,809	464,182	13,865	0.01	0.03	0.00	0.00	0.04
109.00	1,608,065	14,734	482,419	14,975	0.01	0.04	0.00	0.00	0.05
109.00	2,402,486	23,290	720,746	22,284	0.01	0.02	0.00	0.00	0.03
105.00	2,475,436	24,734	742,631	23,658	0.01	0.03	0.00	0.00	0.03
103.83	2,496,713	25,164	749,014	24,067	0.01	0.03	0.00	0.00	0.03
99.00	2,584,861	26,983	775,458	25,796	0.01	0.03	0.00	0.00	0.04
97.58	2,610,698	27,528	783,209	26,314	0.01	0.03	0.00	0.00	0.04
95.00	2,657,811	28,536	797,343	27,273	0.01	0.03	0.00	0.00	0.04
94.00	2,676,049	28,931	802,815	27,648	0.01	0.03	0.00	0.00	0.04
91.33	2,724,682	29,998	817,405	28,662	0.01	0.03	0.00	0.00	0.04
89.00	2,767,236	30,947	830,171	29,565	0.01	0.03	0.00	0.00	0.04
85.08	2,838,667	32,574	851,600	31,111	0.01	0.03	0.00	0.00	0.04
84.00	2,858,424	33,031	857,527	31,545	0.01	0.03	0.00	0.00	0.04
84.00	3,261,494	36,789	978,448	35,202	0.01	0.03	0.00	0.00	0.04
81.42	3,316,460	38,047	994,938	36,399	0.01	0.03	0.00	0.00	0.04
78.83	3,371,426	39,326	1,011,428	37,615	0.01	0.03	0.00	0.00	0.04
78.33	3,382,064	39,576	1,014,619	37,853	0.01	0.03	0.00	0.00	0.04
74.00	3,474,265	41,776	1,042,279	39,945	0.01	0.03	0.00	0.00	0.04
72.67	3,502,634	42,465	1,050,790	40,600	0.01	0.03	0.00	0.00	0.04
69.00	3,580,650	44,388	1,074,195	42,429	0.01	0.03	0.00	0.00	0.04

Stresses for Pole

Loading Case Seismic 2

Distance From Base (ft)	Nominal Axial Strength (lbs)	Nominal Flexural Strength (in-kips)	Nominal Shear Strength (lbs)	Nominal Torsional Strength (in-kips)	Axial Interaction Term	Flexural Interaction Term	Shear Interaction Term	Torsion Interaction Term	Combined Stress Interaction
66.42	3,635,616	45,769	1,090,685	43,741	0.01	0.03	0.00	0.00	0.04
64.00	3,687,036	47,080	1,106,111	44,987	0.01	0.03	0.00	0.00	0.04
61.42	3,742,002	48,502	1,122,601	46,339	0.01	0.03	0.00	0.00	0.04
59.00	3,793,422	49,851	1,138,026	47,621	0.01	0.03	0.00	0.00	0.04
55.17	3,874,984	52,029	1,162,495	49,691	0.01	0.03	0.00	0.00	0.04
54.00	3,899,807	52,701	1,169,942	50,329	0.01	0.03	0.00	0.00	0.04
51.46	3,953,886	54,148	1,186,166	51,735	0.01	0.03	0.00	0.00	0.04
48.92	4,007,966	55,455	1,202,390	53,160	0.01	0.03	0.00	0.00	0.04
47.50	4,038,108	56,188	1,211,433	53,962	0.01	0.03	0.00	0.00	0.04
47.50	4,518,277	61,821	1,355,483	59,114	0.01	0.03	0.00	0.00	0.04
44.00	4,603,385	64,185	1,381,016	61,362	0.01	0.03	0.00	0.00	0.04
42.67	4,635,807	65,097	1,390,742	62,229	0.01	0.03	0.00	0.00	0.04
40.92	4,678,362	66,304	1,403,508	63,377	0.01	0.03	0.00	0.00	0.04
39.00	4,724,969	67,639	1,417,491	64,646	0.01	0.03	0.00	0.00	0.04
37.00	4,773,602	69,046	1,432,081	65,983	0.01	0.03	0.00	0.00	0.04
34.00	4,846,552	71,184	1,453,966	68,016	0.01	0.03	0.00	0.00	0.04
30.75	4,925,581	73,537	1,477,674	70,252	0.01	0.03	0.00	0.00	0.04
29.00	4,968,136	74,820	1,490,441	71,471	0.01	0.03	0.00	0.00	0.04
24.50	5,077,561	78,169	1,523,268	74,654	0.01	0.03	0.00	0.00	0.04
24.00	5,089,719	78,546	1,526,916	75,012	0.01	0.03	0.00	0.00	0.04
19.00	5,211,303	82,124	1,563,391	78,638	0.01	0.03	0.00	0.00	0.04
18.25	5,229,540	82,629	1,568,862	79,190	0.01	0.03	0.00	0.00	0.04
14.00	5,332,886	85,509	1,599,866	82,351	0.01	0.03	0.00	0.00	0.04
12.00	5,381,519	86,875	1,614,456	83,859	0.01	0.03	0.00	0.00	0.04
9.00	5,454,470	88,937	1,636,341	86,148	0.01	0.03	0.00	0.00	0.04
4.00	5,576,053	92,406	1,672,816	90,032	0.01	0.03	0.00	0.00	0.04
0.00	5,673,320	95,210	1,701,996	93,200	0.01	0.03	0.00	0.00	0.04

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

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

FLANGE FOR THE C - D JOINT : CONTROLLING LOAD CASE WIND

Input Data

Applied Reactions

Resultant Moment	=	8,856	in-kips
Torsion	=	-942	in-kips
Resultant Shear	=	33,990	lbs
Axial	=	-16,260	lbs

Bolts

Number of Bolts	=	28	
Bolt Diameter	=	0.75	in
Bolt Material	=	A325	
Bolt Circle	=	35.16	in

Flange

Outside Diameter	=	37.16	in
Thickness	=	2.000	in
Yield Strength	=	50	ksi
Tensile Strength	=	65	ksi
Valmont Material Spec.	=	S-56	
Center Hole Diameter	=	22.68	in
Vent Hole Diameter	=	4.00	in
Vent hole 1, X Coordinate	=	12.46	in
Vent hole 1, Y Coordinate	=	0.00	in
Vent hole 2, X Coordinate	=	-12.46	in
Vent hole 2, Y Coordinate	=	0.00	in

Tube

No. of sides	=	18	
Design Diameter	=	31.430	in
Detailed "C" Sect. Dia	=	31.474	in
Detailed "D" Sect. Dia	=	31.385	in
Thickness	=	0.3750	in
Yield	=	65	ksi

Results

Bolts

Maximum Bolt Axial Force	=	28,837	lbs
Maximum Bolt Shear	=	3,127	lbs
Tensile Strength	=	120	ksi
Axial Capacity	=	30,060	lbs
Axial Stress	=	86	ksi
Shear Capacity	=	14,910	lbs
Shear Stress	=	7,079	psi
Combined Stress Ratio	=	0.96	

Flange

Weight	=	377	lbs
Controlling Stress	=	Bending	
Maximum Stress Ratio	=	0.25	
Bending Stress Ratio	=	0.25	
Shear Stress Ratio	=	0.37	
Bearing Stress Ratio	=	0.25	

*** BOLT COORDINATES ***

BOLT NO.	X-COORD	Y-COORD		BOLT NO.	X-COORD	Y-COORD
1	17.58	0.00	*	2	17.14	3.91
3	15.84	7.63	*	4	13.75	10.96
5	10.96	13.75	*	6	7.63	15.84
7	3.91	17.14	*	8	0.00	17.58

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

FLANGE FOR THE D - E JOINT : CONTROLLING LOAD CASE BASED ON 50% OF POLE CAPACITY

Input Data

Applied Reactions

Resultant Moment	=	4,294	in-kips
Torsion	=	0	in-kips
Resultant Shear	=	0	lbs
Axial	=	0	lbs

Bolts

Number of Bolts	=	16	
Bolt Diameter	=	0.75	in
Bolt Material	=	A325	
Bolt Circle	=	30.13	in

Flange

Outside Diameter	=	32.13	in
Thickness	=	2.000	in
Yield Strength	=	50	ksi
Tensile Strength	=	65	ksi
Valmont Material Spec.	=	S-56	
Center Hole Diameter	=	18.21	in
Vent Hole Diameter	=	4.00	in
Vent hole 1, X Coordinate	=	10.14	in
Vent hole 1, Y Coordinate	=	0.00	in
Vent hole 2, X Coordinate	=	-10.14	in
Vent hole 2, Y Coordinate	=	0.00	in

Tube

No. of sides	=	18	
Design Diameter	=	26.714	in
Detailed "D" Sect. Dia	=	26.758	in
Detailed "E" Sect. Dia	=	26.670	in
Thickness	=	0.2500	in
Thickness for M. Cap.	=	0.2188	in
Yield	=	65	ksi

Results

Bolts

Maximum Bolt Axial Force	=	28,546	lbs
Maximum Bolt Shear	=	3,054	lbs
Tensile Strength	=	120	ksi
Axial Capacity	=	30,060	lbs
Axial Stress	=	85	ksi
Shear Capacity	=	14,910	lbs
Shear Stress	=	0	psi
Combined Stress Ratio	=	0.90	

Flange

Weight	=	307	lbs
Controlling Stress	=	Shear	
Maximum Stress Ratio	=	0.21	
Bending Stress Ratio	=	0.15	
Shear Stress Ratio	=	0.24	
Bearing Stress Ratio	=	0.15	

*** BOLT COORDINATES ***

BOLT NO.	X-COORD	Y-COORD		BOLT NO.	X-COORD	Y-COORD
1	15.06	0.00	*	2	13.92	5.76
3	10.65	10.65	*	4	5.76	13.92
5	0.00	15.06	*			

NUMBER OF BOLTS	DIAMETER (IN.)	LENGTH (IN.)	WEIGHT (KIPS)	SHIPPED AS	PROJECTION LENGTH (IN.)	GALVANIZED LENGTH (IN.)	THREAD SIZE
20	2.250	66.00	1.96	BOLTS, TEMPLATES	12.00	66.00	4.5-UNC-2A

STEEL SPEC. VALMONT	STEEL SPECIF.	MAXIMUM BOLT FORCE (KIPS)	MAXIMUM BOLT SHEAR FORCE (KIPS)	NOMINAL STRENGTH (KIPS)	STRESS AREA (SQ. IN.)	INTERACTION VALUE	CONFIGURATION OF BOTTOM END
S23	A615	193.49	2.80	243.75	3.25	0.80	THREADED WITH HEAVY HEX HEAD NUT

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

BOLT NO.	X-COORD	Y-COORD	*	BOLT NO.	X-COORD	Y-COORD
1	31.500	0.000	*	2	29.958	9.734
3	25.484	18.515	*	4	18.515	25.484
5	9.734	29.958	*	6	0.000	31.500

MAX. BOLT CIRCLE = 63.00 IN. TEMPLATE DIAMETER = 66.50 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.)
69.00	3.00	2.48	4.11	55.50

EFFECTIVE PLATE WIDTH (IN.)	PLASTIC SECTION MOD. (CU. IN.)	MOMENT IN BASE PLATE (IN. -K)	PLASTIC MOMENT (IN. -K)	FACTORED RESISTING MOM. (IN. -K)
8.72	19.62	725.60	980.77	882.69

STEEL SPECIF. VALMONT	STEEL SPECIF. OTHER	EFFECTIVE YIELD STRESS (KSI)	STRESS RATIO
S56	A572	50	0.82

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

LOADING CASE IDENTIFICATION	WIND	ICE + WIND	T+S	Seismic	Seismic 2	]MAX CRITERION-	LOAD CASE
MOMENT ABT. X-AXIS (IN-KIP)	58495	14533	14759	2011	1871	]MOMENT ABT. X	WIND
MOMENT ABT. Y-AXIS (IN-KIP)	-49070	-12190	-12383	-1687	-1570	]MOMENT ABT. Y	WIND
SHEAR FORCE (LB.)	55867	12773	13988	1479	1479	]RES. MOMENT	WIND
VERTICAL FORCE (LB.)	60079	94963	49360	61127	42406	]SHEAR FORCE	WIND
						]BOLT FORCE	WIND
						]BOLT TENSION	WIND

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

GEOTECHNICAL ENGINEERING REPORT
PROPOSED TELECOMMUNICATIONS TOWER
FIRST TAXING DISTRICT - NORWALK
173.5 WEST ROCKS ROAD, NORWALK, CONNECTICUT

Prepared for:

All-Points Technologies Corporation, P.C.
567 Vauxhaul Street Extension – Suite 311
Waterford, Connecticut 06385

APT Filing No. CT544100

Prepared by:

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

File No. 0032-047.00
March 2021

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

March 12, 2021
File No. 0032-047.00

Mr. Jason R. Mead
All-Points Technology Corporation, P.C.
567 Vauxhaul Street Extension – Suite 311
Waterford, Connecticut 06385

Via email: jmead@allpointstech.com

Re: Geotechnical Engineering Report
Proposed Telecommunications Tower
173.5 West Rocks Road, Norwalk, Connecticut

Down To Earth Consulting, LLC (DTE) is pleased to submit this geotechnical engineering report for the proposed telecommunications tower on 173.5 West Rocks Road in Norwalk, Connecticut (Site) for All-Points Technologies Corporation, P.C. (Client). Our services were completed in general accordance with our current Master Services Agreement. 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 subsurface explorations, obtaining soil resistivity measurements, characterizing subsurface conditions within the structure limits, performing geotechnical engineering analyses, and providing geotechnical design and construction recommendations for the tower. 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 January 5, 2021, email proposal, which was based in part on the provided drawings (*First Taxing District - Norwalk,* sheet numbers C-1 through C-3, prepared by the Client, revision dated 05/28/2020). We were also provided with a *Topographic Survey*, prepared by William W. Seymour & Associates, P.C., dated April 20, 2016.

Elevations (El.) stated in this report are in feet and based on the North American Vertical Datum of 1988 (NAVD 88). 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 triangular-shaped Site is generally bordered by the Merritt Parkway and an Eversource Easement to the northwest, West Rocks Road to the east, and residential parcels to the south. Site grades are relatively level at about El. 221+/- in the area of the proposed telecommunications compound. Existing Site features generally consist of a 100,000-gallon elevated water reservoir that is fitted with telecommunications equipment. The water reservoir will be demolished and replaced; hence, a new telecommunications tower will be constructed.

The project consists of constructing a 130-foot monopole telecommunications tower and associated equipment cabinets within an irregularly shaped (approximately 50-foot by 70-foot) fenced compound with a gravel wearing surface. Tower and equipment platform loads were not provided to DTE at the time of this writing. It is 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, medium-grained schist (Trap Falls Formation).

3.2 EXPLORATIONS

We observed and logged one test boring (B-1) and one test probe (P-1) drilled by our subcontractor General Borings, Inc. on February 25, 2021. 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. Hollow stem auger drilling methods were used to advance the boring to a depth of approximately 31 feet (approximate El. 190) below existing grades. The boring was terminated upon encountered drilling refusal in weathered bedrock.

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 probe was advanced to a depth of 9 feet below grade. The objective of the probe was to assess 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 (P-1): Loose, orange-brown, sandy SILT with gravel, containing trace amounts of roots (ML)
– about 1 to 2 feet thick in P-1 (to about El. 218); over

Glacial Till: Very dense, gray/brown to gray, silty SAND with gravel (SM)
– about 26 feet thick in B-1 (to about El. 193); over

Weathered Rock – Very dense, gray decomposed SCHIST fragments
– about 3 feet thick in B-1 until drilling refusal at about El. 190.

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 5 feet (approximate El. 216 to 215) below existing grades. Perched water was observed at 1 foot below grade (approximate El. 220 to 219) in the explorations. Standing water was also observed in areas of the proposed compound area. 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 February 25, 2021, 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	121,794	71,908
10	83,302	49,962
20	55,841	39,946
30	35,906	38,434
40	32,248	36,844

Field resistivity results may be influenced by boulders and shallow groundwater/ standing water. 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 130-foot steel monopole telecommunications tower may be supported on a monolithic mat or a pier-and-pad

foundation bearing on undisturbed, natural Glacial Till Deposits, or on Structural Fill (hereinafter specified as Compacted Granular Fill (CGF)) or Crushed Stone placed over a prepared native Glacial Till subgrade. Alternatively, the telecommunications tower may be supported on a drilled shaft foundation extending into competent Glacial Till.

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 = 0.232g and S_1 = 0.067g (Building Code Appendix N)

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 Glacial Till, or CGF or Crushed Stone placed above a proof-rolled Glacial Till 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 0.45. 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	135 pounds per cubic foot
Ultimate Passive Pressure Coefficient, Kp	3.0
Ultimate Coefficient of Sliding Friction	0.45

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 110 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 (e.g., Topsoil and Subsoil), must be removed from beneath footing zones of influence to the top of firm, natural Glacial Till 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 Glacial Till, or CGF or Crushed Stone (over firm natural Glacial Till). 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 Glacial Till	6 ksf
Allowable Bond Value[2] Glacial Till	5 pounds per square inch (psi)
P-Y Modulus (k_{py})[3] Glacial Till (3 to 10 feet) Glacial Till (>10 feet)	100 pounds per cubic inch (pci) 150 pci
Angle of Internal Friction Glacial Till	36
Total Soil Unit Weight Glacial Till	135 pounds per cubic foot (pcf)
Minimum Drilled Shaft Diameter	3 feet or Monopole Base Diameter (whichever is greater)
Allowable Deflection at Top of Shaft	0.5 inch

1. The allowable end bearing capacity assumes that loose, disturbed soil has been removed from the base of the shaft.
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. To analyze foundation under lateral loading (e.g., Ensoft LPILE).

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.

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 0.45 (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.

6.0 MATERIALS RECOMMENDATIONS

6.1 ON-SITE MATERIALS

Based on our visual soil classifications, existing Site soils will likely not satisfy the requirements for CGF. Excavated soils could 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 may 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.

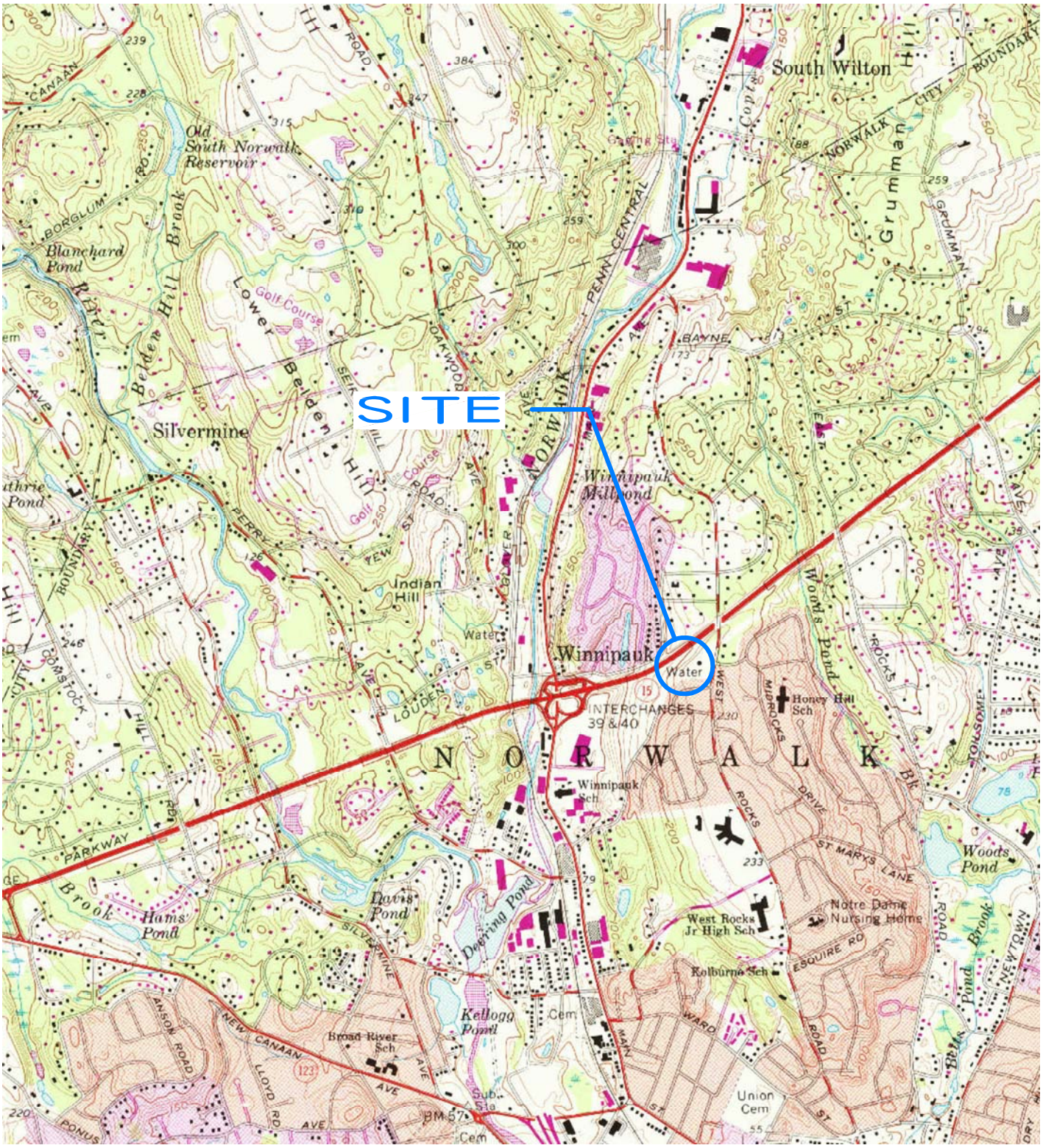
10.0 CLOSURE

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



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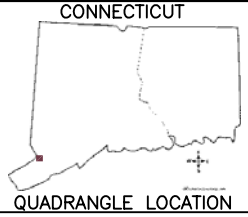
122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770

CONNECTICUT



QUADRANGLE LOCATION

AREA PLAN
FIRST TAXING DISTRICT – NORWALK
173.5 WEST ROCKS ROAD
NORWALK, CONNECTICUT

REFERENCE:
USGS TOPOGRAPHIC QUADRANGLE: NORWALK NORTH, CT

SCALE 1"= 2,000'

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

PROJECT NO.	0032–047.00
DATE:	03/05/21
FIGURE NO.	1

DRAWN BY: RPJ

REVIEWED BY: RPJ

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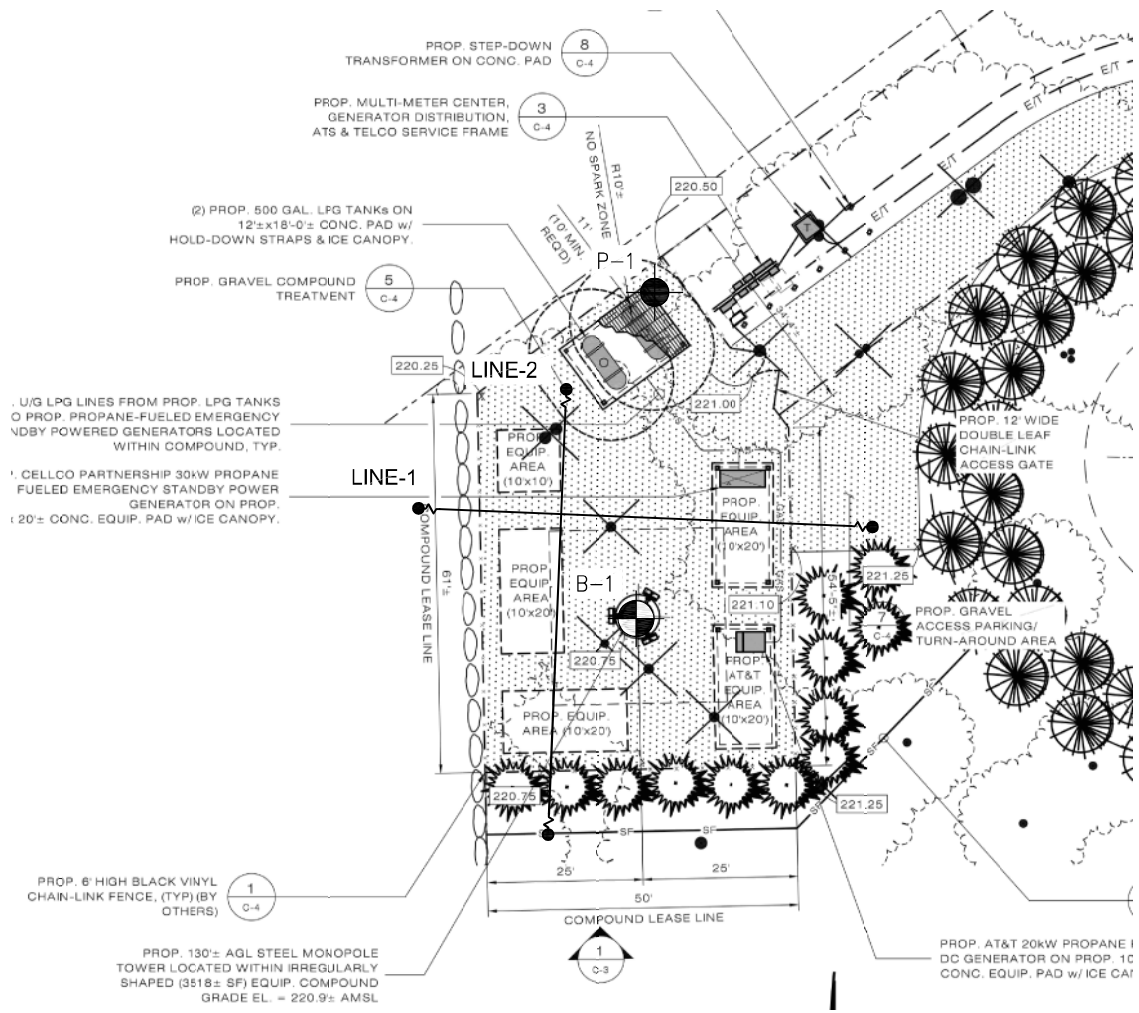


LEGEND

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 "COMPOUND PLAN, FIRST TAXING DISTRICT – NORWALK, 173.5 WEST ROCKS ROAD, NORWALK, CT", DRAWING C-2, REVISION DATED MAY 28, 2020. ORIGINAL SCALE 1" = 15'.
2) EXPLORATIONS WERE COMPLETED BY GENERAL BORINGS, INC. AND OBSERVED BY DOWN TO EARTH CONSULTING, LLC.
3) RESISTIVITY TESTING WAS PERFORMED ON FEBRUARY 25, 2021 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.	CHKD	APPVD

SCALE 1" = 20'
20' 10' 0 20'

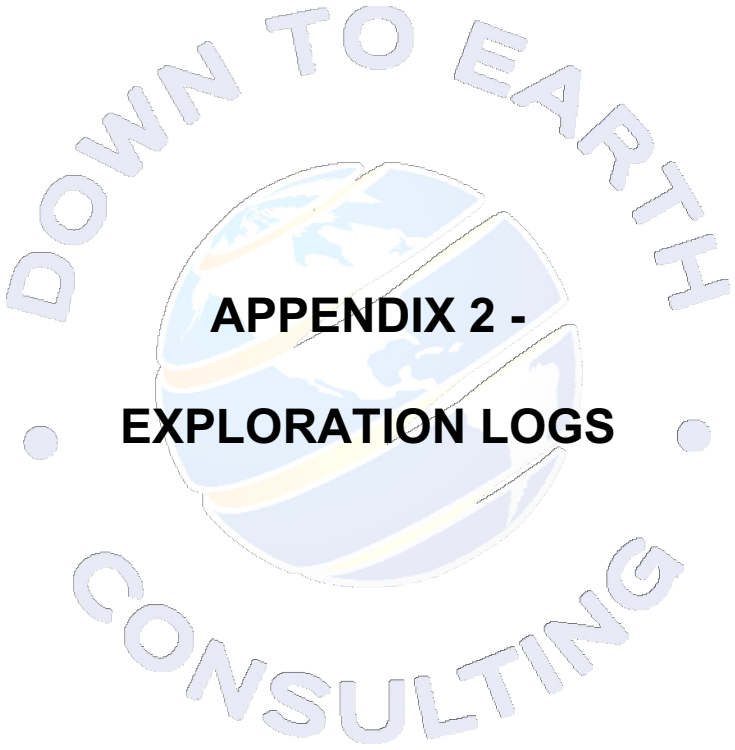
DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING
122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770

PROJECT
FIRST TAXING DISTRICT – NORWALK
173.5 WEST ROCKS ROAD
NORWALK, CONNECTICUT

DWG. TITLE.
SITE AND EXPLORATION LOCATION PLAN

FILE NO. 0032-047.00
SCALE AS NOTED
DATE 03/05/21
FIGURE NO. 2

G:\My Drive\DTE Root Drive\Client Folders\0032 – All-Points Technology\047 – First Taxing District Tower, Norwalk, CT\0032-047.00 AREA AND SITE PLAN.dwg Raymond Janeiro 3/9/2021 6:26 PM



APPENDIX 2 -

EXPLORATION LOGS

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

PROJECT
FIRST TAXING DISTRICT - NORWALK
173.5 WEST ROCKS ROAD
NORWALK, CONNECTICUT

BORING NO. B-1
SHEET 1 of 1
FILE NO. 0032-047.00
CHKD. BY DFL

Boring Co.	General Borings, Inc.	Boring Location	See Boring Location Plan		
Driller	John Wyant	Ground Surface El.	221'+/-	Datum	NAVD 88
Logged By	Ray Janeiro, P.E.	Date Start	2/25/2021	Date End	2/25/2021

Sampler Type:	Safety Hammer
Sampler Size:	1-3/8" I.D. Split Spoon
Type Drill Rig:	Mobile B-47 ATV Rig
Drilling Method:	3.25-inch I.D. Hollow Stem Augers

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
2/25/2021	-	5'	216'+/-	wet sample
2/25/2021	-	1'	220'+/-	3 hours - perched water

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	1-1-2-1		Very loose, dark brown/black SILT, little fine to coarse Sand, trace fine Gravel, trace (-) Roots, wet	TOPSOIL/ FOREST DEBRIS
2								
3		S-2	24/20	2 to 4	7-36-28-33		Very dense, Top 8": Similar to S-1; Bottom 12": gray/brown fine to coarse SAND, some Silt, little fine to coarse Gravel, moist	GLACIAL TILL
4								
5								
6		S-3	24/18	5 to 7	28-29-47-21		Very dense, gray/brown fine to coarse SAND and fine to coarse GRAVEL, some Silt, wet	
7								
8		S-4	3/3	7 to 7.3	50/3"		Very dense, gray/brown fractured coarse GRAVEL fragments, little fine to coarse Sand, trace Silt	
9								
10								
11		S-5	15/15	10 to 11.3	45-83-50/3"		Very dense, gray/brown fine to coarse SAND and fine to coarse GRAVEL, some Silt	
12								
13								
14								
15		S-6	10/8	14 to 14.8	53-50/4"		Very dense, gray/brown fine to coarse SAND, some Silt, little fine Gravel	
16								
17								
18								
19								
20		S-7	5/5	19 to 19.4	100/5"		Very dense, gray fine to coarse SAND and SILT, little fine Gravel	
21								
22								
23								
24								
25		S-8	8/8	24 to 24.7	76-50/2"		Very dense, gray fine to coarse SAND and SILT, trace fine Gravel	
26								
27								
28								
29								
30		S-9	4/4	29 to 29.3	100/4"		Very dense, gray decomposed SCHIST fragments	WEATHERED ROCK
31								
32							END OF BORING (AUGER REFUSAL) @ 31 FEET BELOW GRADE	
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) Stratification lines represent approximate boundaries between soil types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations may occur due to other factors.
3) Auger grinding observed at about 7 to 8.5 feet below grade on inferred boulder. Intermittent chatter observed from about 10 to 20 feet below grade on inferred cobbles and/or boulders.
4) Drillers notes increased drilling resistance at about 28 feet below grade.

DOWN TO EARTH CONSULTING, LLC
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERING

PROJECT
FIRST TAXING DISTRICT - NORWALK
173.5 WEST ROCKS ROAD
NORWALK, CONNECTICUT

BORING NO. P-1
SHEET 1 of 1
FILE NO. 0032-047.00
CHKD. BY DFL

Boring Co.	General Borings, Inc.	Boring Location	See Boring Location Plan		
Driller	John Wyant	Ground Surface El.	220'+/-	Datum	NAVD 88
Logged By	Ray Janeiro, P.E.	Date Start	2/25/2021	Date End	2/25/2021

Sampler Type:	-
Sampler Size:	-
Type Drill Rig:	Mobile B-47 ATV Rig
Drilling Method:	3.25-inch I.D. Hollow Stem Augers

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
2/25/2021	-	5'	215'+/-	wet spoils
2/25/2021	-	1'	219'+/-	end of drilling - perched water

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	PID ppmv	SAMPLE DESCRIPTION	STRATA DESCRIPTION
1							Orange-brown, SILT and fine to coarse SAND, little fine to coarse Gravel, trace (-) Roots, moist	8" Forest Debris/Topsoil SUBSOIL
2								
3							Gray-brown, fine to coarse SAND and SILT, some fine to coarse Gravel, with cobbles, wet	GLACIAL TILL
4								
5								
6								
7								
8								
9								
10							END OF PROBE (AUGER REFUSAL) @ 9 FEET BELOW GRADE	
11								
12								
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36								
37								
38								
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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) Stratification lines represent approximate boundaries between soil types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations may occur due to other factors.
3) Driller notes increased drilling resistance at about 2 feet below grade.
4) Auger chatter observed from about 3.5 to 5 and 8 to 9 feet below grade on inferred cobbles/boulders.
5) Auger refusal encountered at about 9 feet below grade on inferred boulder.

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.