Robinson+Cole

KENNETH C. BALDWIN

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

Also admitted in Massachusetts
and New York

September 18, 2023

Via Electronic Mail and Federal Express

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

Re: **Petition No. 1547 – SBA Communications Corporation – Petition for a Declaratory Ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed replacement and extension of an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut.**

Dear Attorney Bachman:

In accordance with conditions of 4, 5 and 6 of the Council's March 2, 2023 approval of the above referenced Petition, enclosed please find the following:

1. Final construction drawings stamped and signed by a Professional Engineer licensed in the State of Connecticut.

2. A Structural Analysis, including antenna mounts, tower and foundation design information stamped and signed by a professional engineer duly licensed in the State of Connecticut.

3. Correspondence from the Town of Avon regarding its plan to commence equipment installation in April of 2024.

Thank you very much for your continued assistance and cooperation.

Sincerely,

Kenneth C. Baldwin

Attachment

Copy to:
Greg Hines, SBA Communications Corporation
Paul Melanson, Avon Chief of Police
Brandon Robertson, Avon Town Manager

PROJECT SUMMARY

SITE NAME:	BURLINGTON-AVON LANDFILL
SITE I.D.:	CT46143A
SITE ADDRESS:	277 HUCKLEBERRY HILL ROAD AVON, CT 06001
JURISDICTION:	TOWN OF AVON
LAND USE:	TELECOMMUNICATIONS FACILITY
PROPERTY OWNER:	TOWN OF AVON 60 WEST MAIN STREET AVON, CT 06001
APPLICANT:	SBA COMMUNICATIONS CORPORATION 8051 CONGRESS AVENUE BOCA RATON, FL 33487 OFFICE: (561) 226-9332
PARCEL TAX ID:	2810277
ZONING DISTRICT:	R-40 (RESIDENTIAL)
1-A CERTIFICATION LATITUDE: LONGITUDE:	 N 41° 47' 17.277882" (NAD '83) W 72° 55' 05.713930" (NAD '83)
GROUND ELEVATION:	528.8'± AMSL (NAVD '88)
PROPOSED OCCUPANCY TYPE:	TELECOMMUNICATIONS FACILITY
CONSTRUCTION TYPE:	PROPOSED 130' MONOPOLE TOWER
DRIVING DIRECTIONS:	FROM BRADLEY INT. AIRPORT (BDL): TAKE THE CT-20 W EXIT TOWARD E GRANBY/GRANBY. SLIGHT LEFT ONTO CT-20 W/W GRANBY RD. TURN LEFT ONTO CT-219 S. TURN LEFT ONTO CASE ST. SLIGHT LEFT ONTO CT-179 S. TURN RIGHT ONTO BRIDGE ST. SLIGHT LEFT ONTO CENTER ST. CONTINUE ONTO HUCKLEBERRY HILL RD
GENERAL PROJECT DESCRIPTION:	REMOVAL/REPLACEMENT OF THE EXISTING 100' WOODEN TOWER, WITH THE INSTALLATION OF A PROPOSED 130' MONOPOLE TOWER AND CONCRETE FOUNDATION, WITHIN EXISTING FENCED COMPOUND AT HUCKLEBERRY HILL RD.

HANDICAPPED REQUIREMENTS

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
HANDICAP ACCESS NOT REQUIRED.

PLUMBING REQUIREMENTS

FACILITY HAS NO PLUMBING.

CONSULTING TEAM

ARCHITECTURAL - ENGINEERING FIRM:
TOWER ENGINEERING PROFESSIONALS, INC.
326 TRYON ROAD, RALEIGH, NC 27603
CONTACT: SCOTT C. BRANTLEY, P.E.
PHONE: (919) 661-6351 FAX: (919) 661-6350

SURVEYING FIRM:
MILLMAN SURVEYING, INC.
4111 BRADLEY CIRCLE NW, SUITE 240
CANTON, OH 44718
PHONE: (800) 520-1010

APPLICANT/LESSEE CONTACTS:
SBA COMMUNICATIONS CORPORATION
ANDREA GASSNER - (561) 226-9207

POWER COMPANY:
EVERSOURCE ENERGY
(888) 544-4826

TELCO COMPANY:
FRONTIER COMMUNICATIONS
(800) 921-8101

ELECTRICAL ENGINEER:
TOWER ENGINEERING PROFESSIONALS, INC.
326 TRYON ROAD, RALEIGH, NC 27603
CONTACT: SCOTT C. BRANTLEY, P.E.
PHONE: (919) 661-6351 FAX: (919) 661-6350

SBA

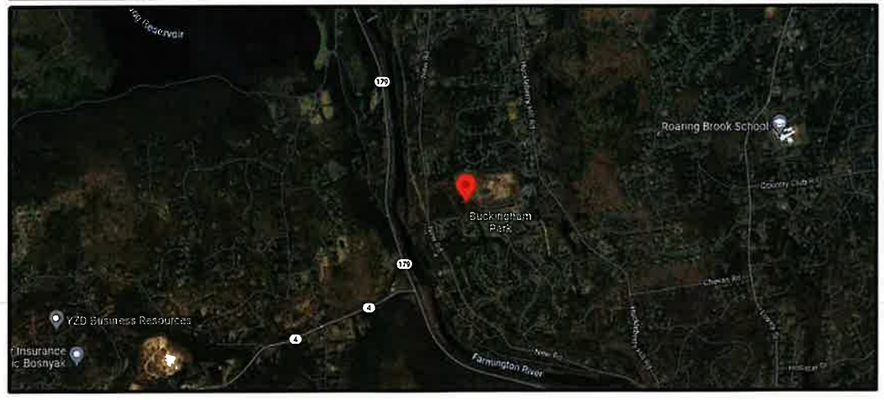
SITE NAME
BURLINGTON-AVON LANDFILL

SBA SITE I.D.
CT46143A

ADDRESS
277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PROJECT TYPE
PROPOSED 130' MONOPOLE TOWER

LOCATION & VICINITY MAPS



SHEET INDEX

APPROVALS

LANDLORD		DATE
PROPERTY		DATE
CONSTRUCTION		DATE
RSM		DATE
TENANT		DATE
ZONING		DATE

CBYD.COM 811 — Call Before You Dig, Inc.

CONNECTICUT 811
CALL BEFORE YOU DIG
DIAL 811 OR
1 (800) 922-4455

THE UTILITIES SHOWN HEREON ARE FOR THE CONTRACTORS CONVENIENCE ONLY. THERE MAY BE OTHER UTILITIES NOT SHOWN ON THESE PLANS. THE ENGINEER/SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS SHOWN AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES WITHIN THE LIMITS OF THE WORK. ALL DAMAGE MADE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

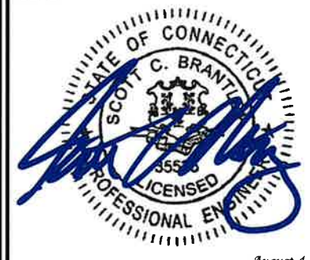
PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A
277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



August 4, 2023

REV	DATE	ISSUED FOR:
3	08-04-23	CONSTRUCTION
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

TITLE SHEET

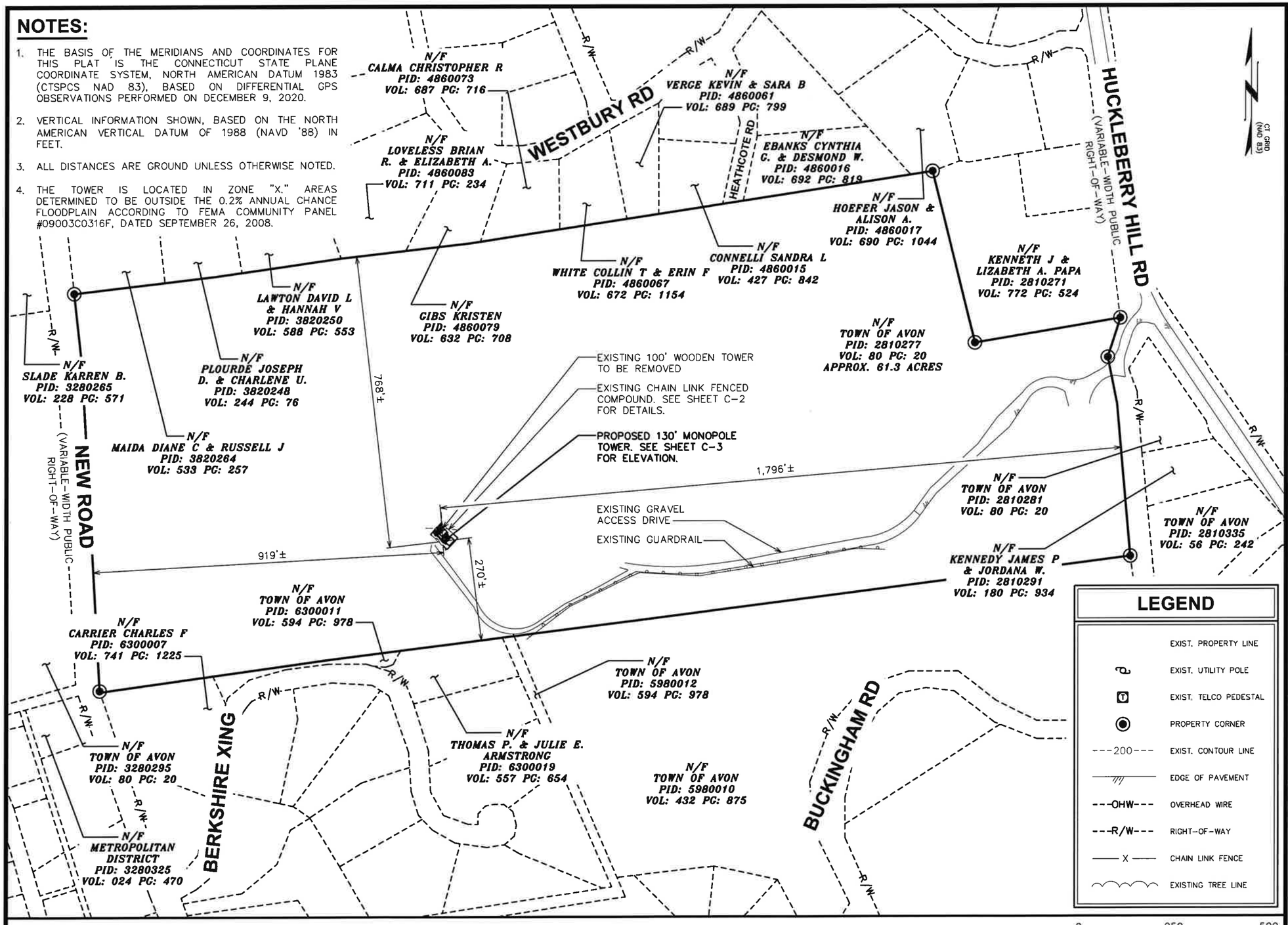
SHEET NUMBER: **T-1**

REVISION: 3

TEP#: 26144.833086

NOTES:

1. THE BASIS OF THE MERIDIANS AND COORDINATES FOR THIS PLAT IS THE CONNECTICUT STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983 (CTSPCS NAD 83), BASED ON DIFFERENTIAL GPS OBSERVATIONS PERFORMED ON DECEMBER 9, 2020.
2. VERTICAL INFORMATION SHOWN, BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88) IN FEET.
3. ALL DISTANCES ARE GROUND UNLESS OTHERWISE NOTED.
4. THE TOWER IS LOCATED IN ZONE "X." AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO FEMA COMMUNITY PANEL #09003C0316F, DATED SEPTEMBER 26, 2008.



LEGEND

- EXIST. PROPERTY LINE
- EXIST. UTILITY POLE
- EXIST. TELCO PEDESTAL
- PROPERTY CORNER
- ---200--- EXIST. CONTOUR LINE
- EDGE OF PAVEMENT
- ---OHW--- OVERHEAD WIRE
- ---R/W--- RIGHT-OF-WAY
- —— X —— CHAIN LINK FENCE
- EXISTING TREE LINE

SITE PLAN

SCALE: 1" = 250'

0 250 500

SCALE IN FEET

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
SCOTT C. BRAMLEY
35536
LICENSED
PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

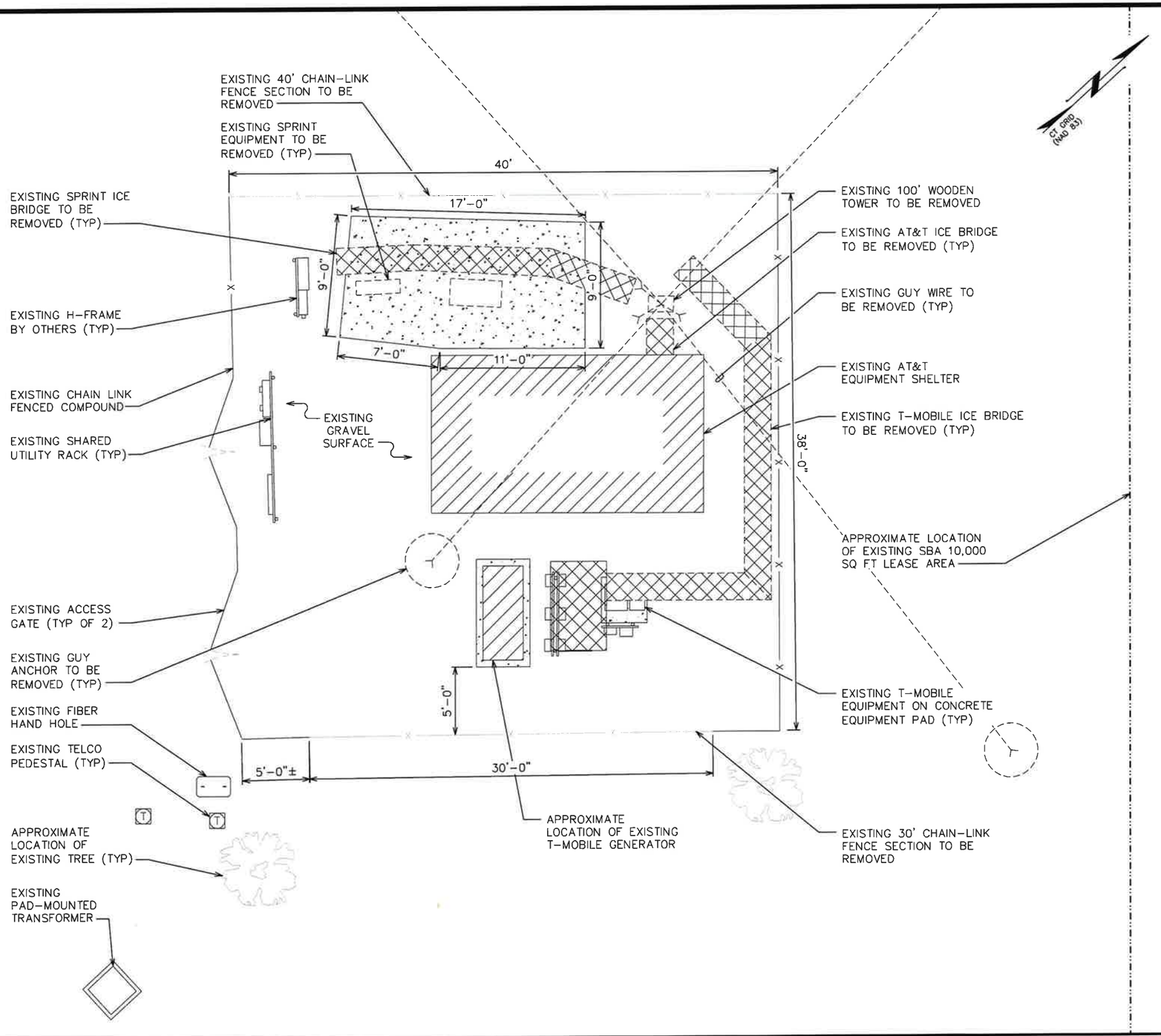
SHEET TITLE:

SITE PLAN

SHEET NUMBER: **C-1**

REVISION: 2

TEP#: 265144.833086



EXISTING COMPOUND LAYOUT

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

0 8 16

SCALE IN FEET

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
SCOTT C. BRANT
35536
LICENSED
PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

EXISTING COMPOUND LAYOUT

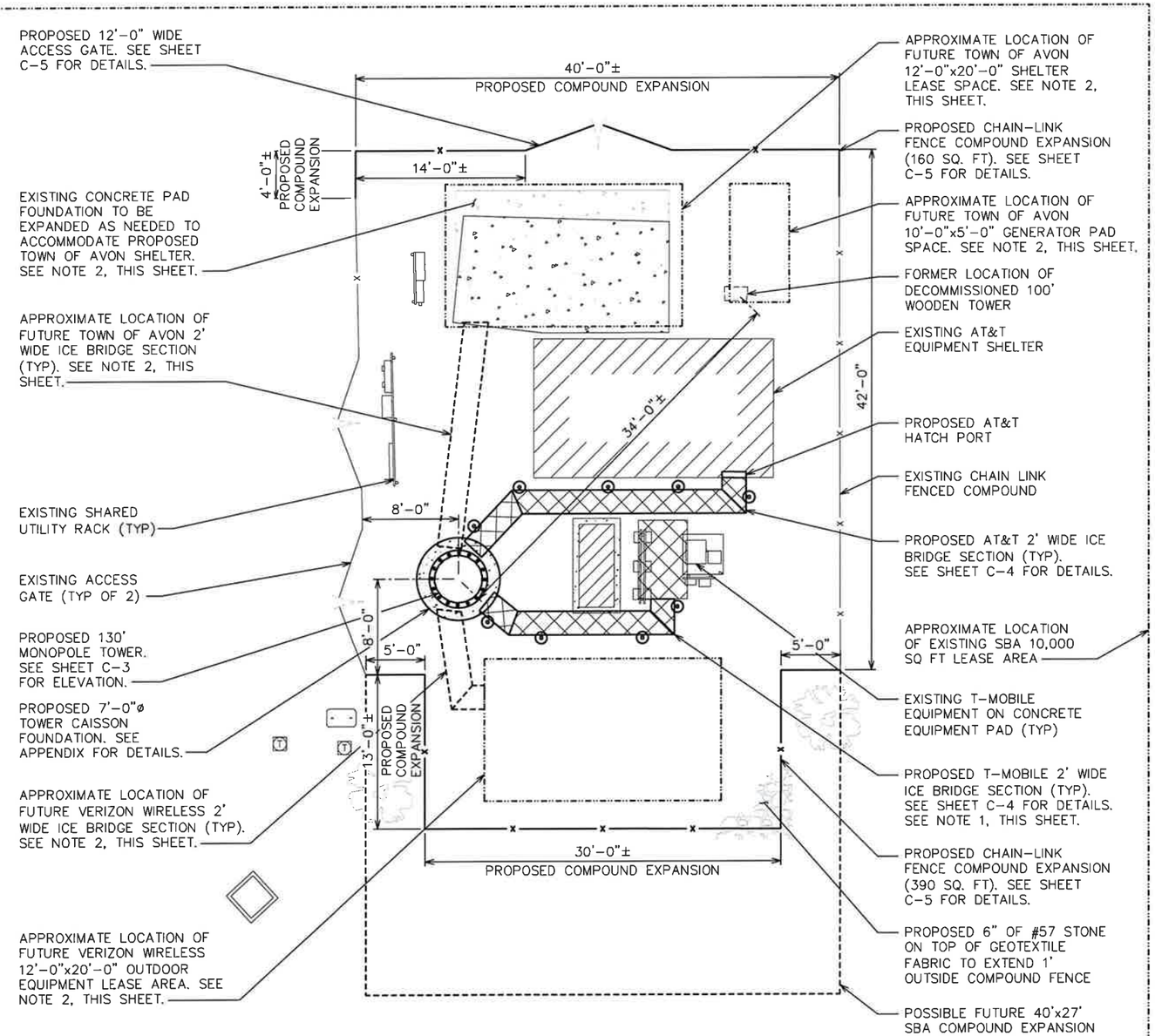
SHEET NUMBER: **C-2**

REVISION: **2**

TEP#: 265144.833086

NOTES:

1. PROPOSED LESSEE ICE BRIDGE LOCATIONS SUBJECT TO CHANGE. CONTRACTOR TO VERIFY LOCATIONS PRIOR TO CONSTRUCTION.
2. ALL PROPOSED VERIZON & TOWN OF AVON EQUIPMENT INSTALLATIONS ON TOWER & AT GROUND LEVEL TO BE PERMITTED & INSTALLED SEPARATELY FROM THIS PROJECT



PROPOSED COMPOUND LAYOUT

SCALE: 3/32" = 1'-0"

0 8 16
SCALE IN FEET

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

August 4, 2023

REV	DATE	ISSUED FOR:
3	08-04-23	CONSTRUCTION
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

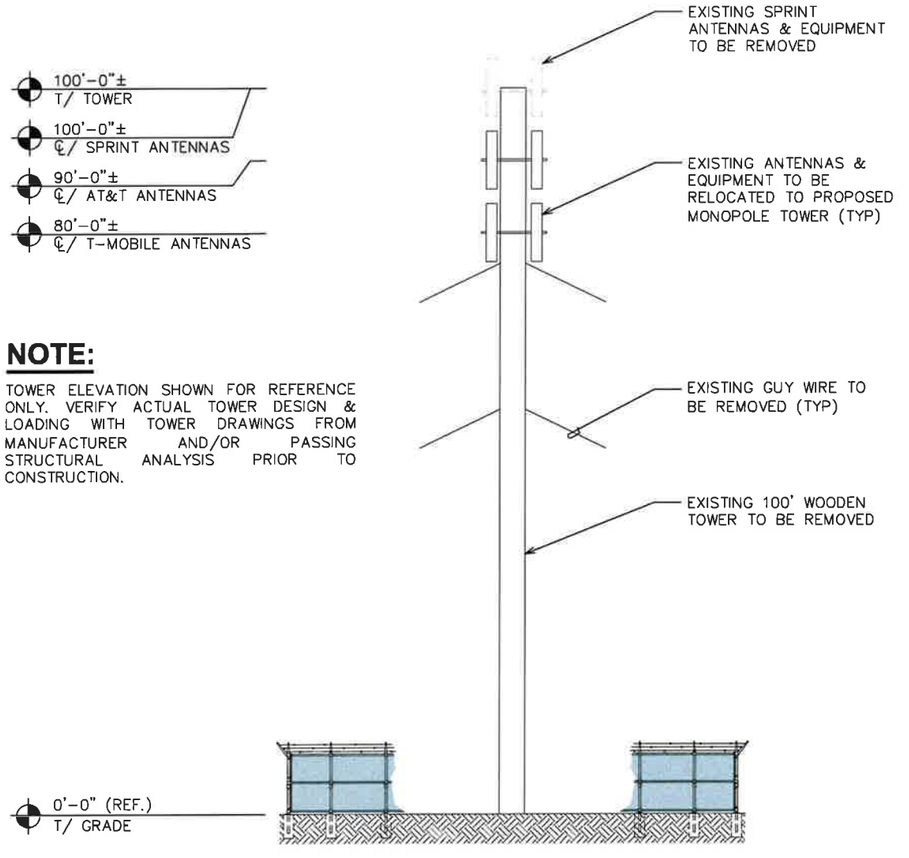
SHEET TITLE:

PROPOSED COMPOUND LAYOUT

SHEET NUMBER: **C-2A**

REVISION: 3

TEP#: 26144.833086



NOTE:

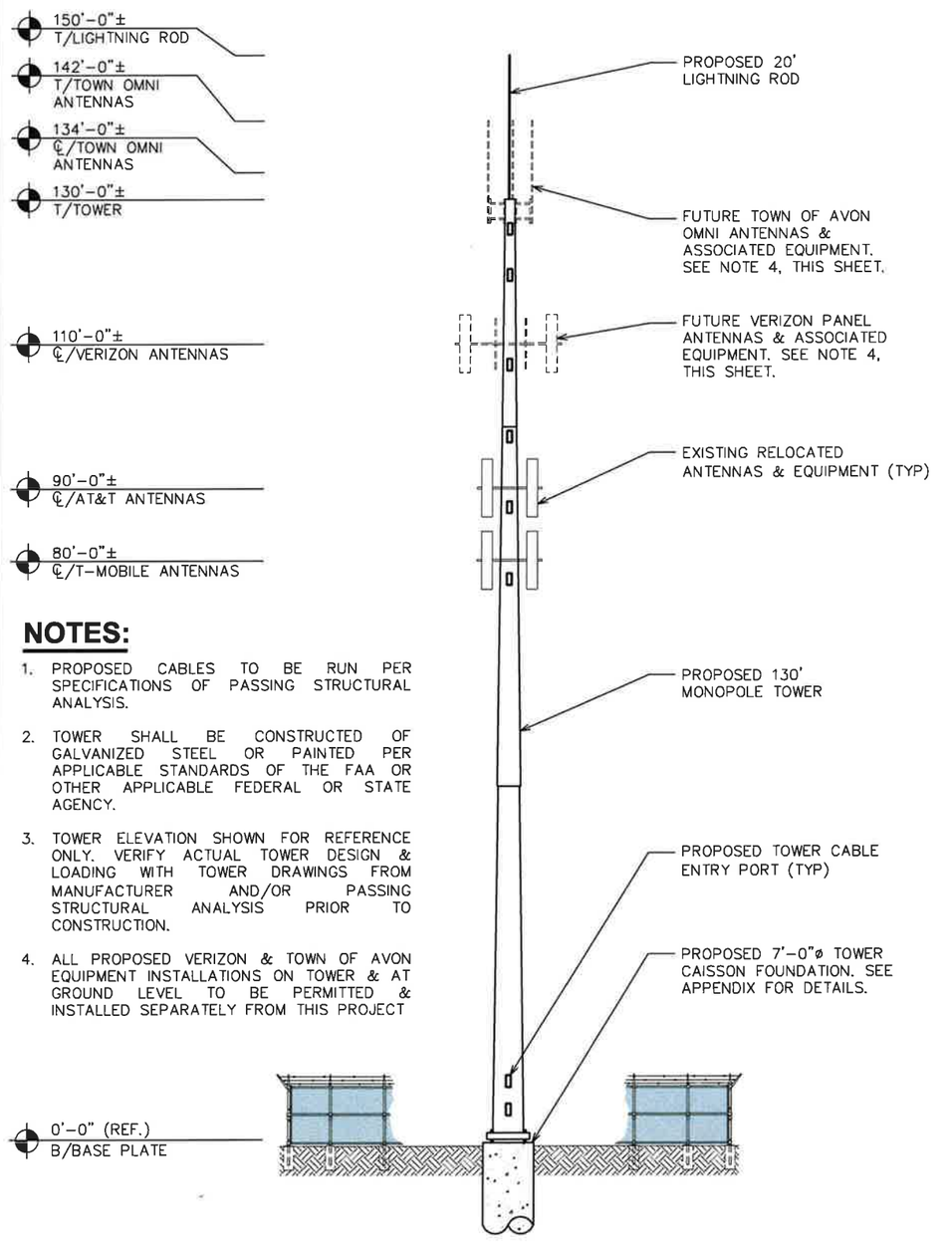
TOWER ELEVATION SHOWN FOR REFERENCE ONLY. VERIFY ACTUAL TOWER DESIGN & LOADING WITH TOWER DRAWINGS FROM MANUFACTURER AND/OR PASSING STRUCTURAL ANALYSIS PRIOR TO CONSTRUCTION.

EXISTING TOWER ELEVATION

SCALE: 1" = 20'

0 20 40

SCALE IN FEET



NOTES:

1. PROPOSED CABLES TO BE RUN PER SPECIFICATIONS OF PASSING STRUCTURAL ANALYSIS.
2. TOWER SHALL BE CONSTRUCTED OF GALVANIZED STEEL OR PAINTED PER APPLICABLE STANDARDS OF THE FAA OR OTHER APPLICABLE FEDERAL OR STATE AGENCY.
3. TOWER ELEVATION SHOWN FOR REFERENCE ONLY. VERIFY ACTUAL TOWER DESIGN & LOADING WITH TOWER DRAWINGS FROM MANUFACTURER AND/OR PASSING STRUCTURAL ANALYSIS PRIOR TO CONSTRUCTION.
4. ALL PROPOSED VERIZON & TOWN OF AVON EQUIPMENT INSTALLATIONS ON TOWER & AT GROUND LEVEL TO BE PERMITTED & INSTALLED SEPARATELY FROM THIS PROJECT

PROPOSED TOWER ELEVATION

SCALE: 1" = 20'

0 20 40

SCALE IN FEET

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

August 4, 2023

REV	DATE	ISSUED FOR:
3	08-04-23	CONSTRUCTION
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

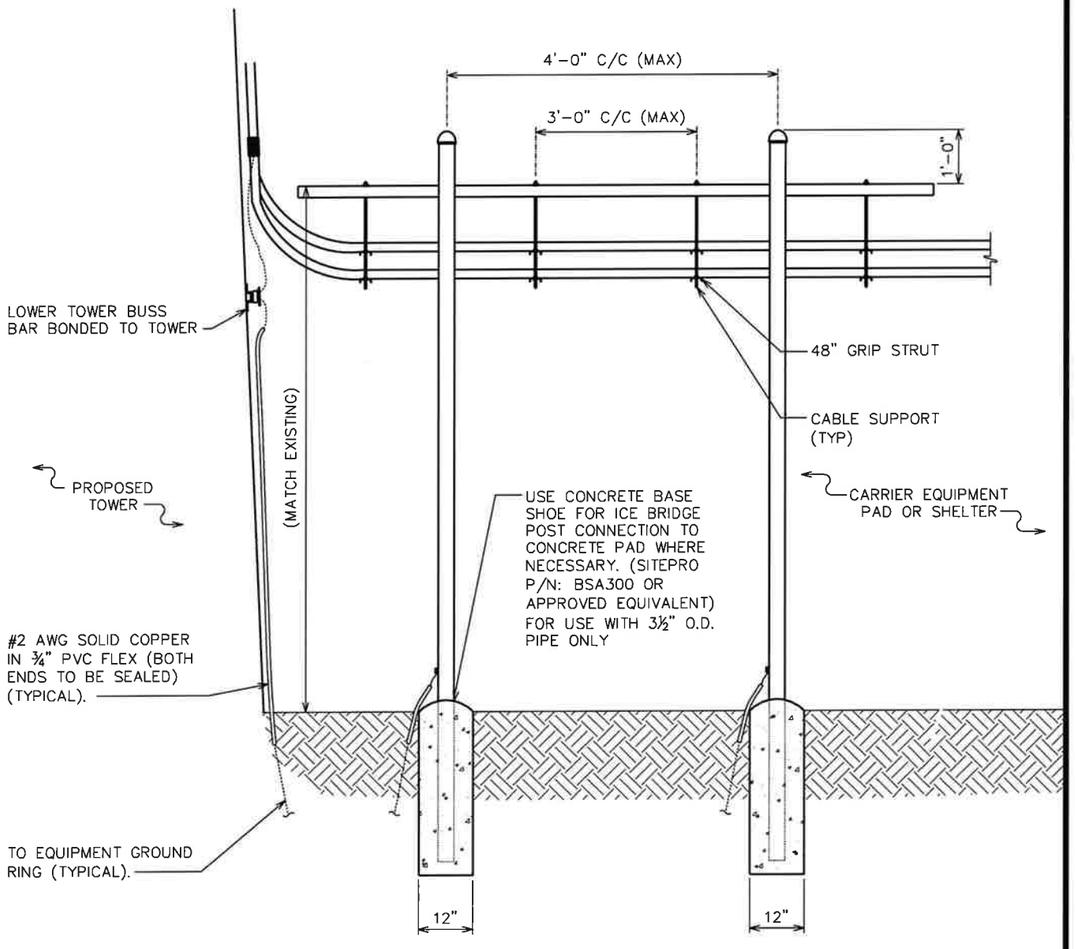
SHEET TITLE:

TOWER ELEVATION

SHEET NUMBER: **C-3**

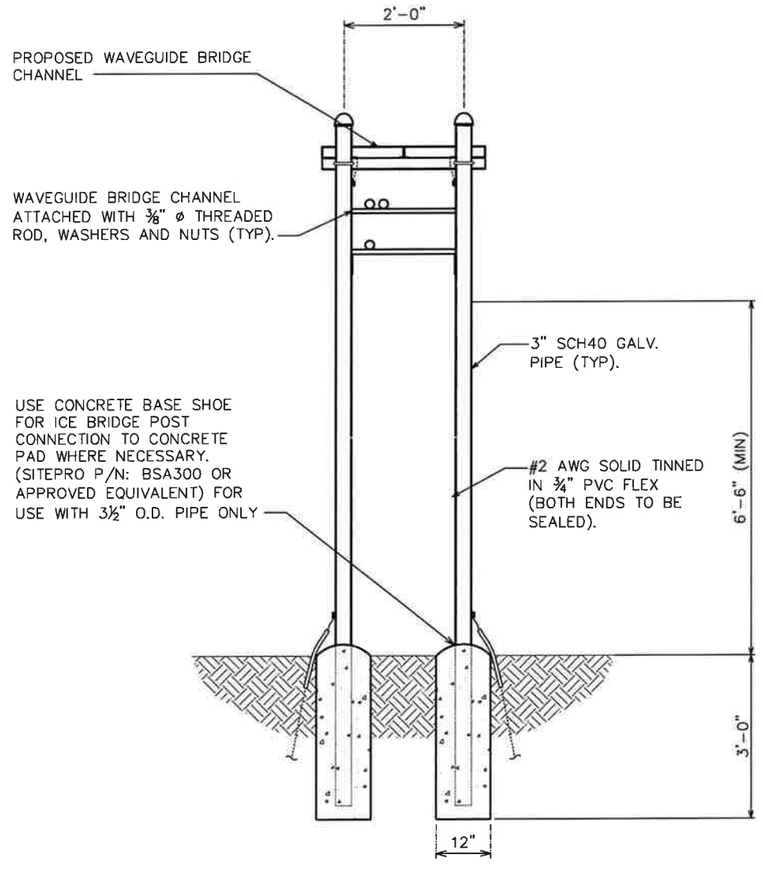
REVISION: 3

TEP#: 26514.833086



ICE BRIDGE DETAIL (SIDE VIEW)

SCALE: N.T.S



ICE BRIDGE DETAIL (FRONT VIEW)

SCALE: N.T.S

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
SCOTT C. BRANT
35536
LICENSED
PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

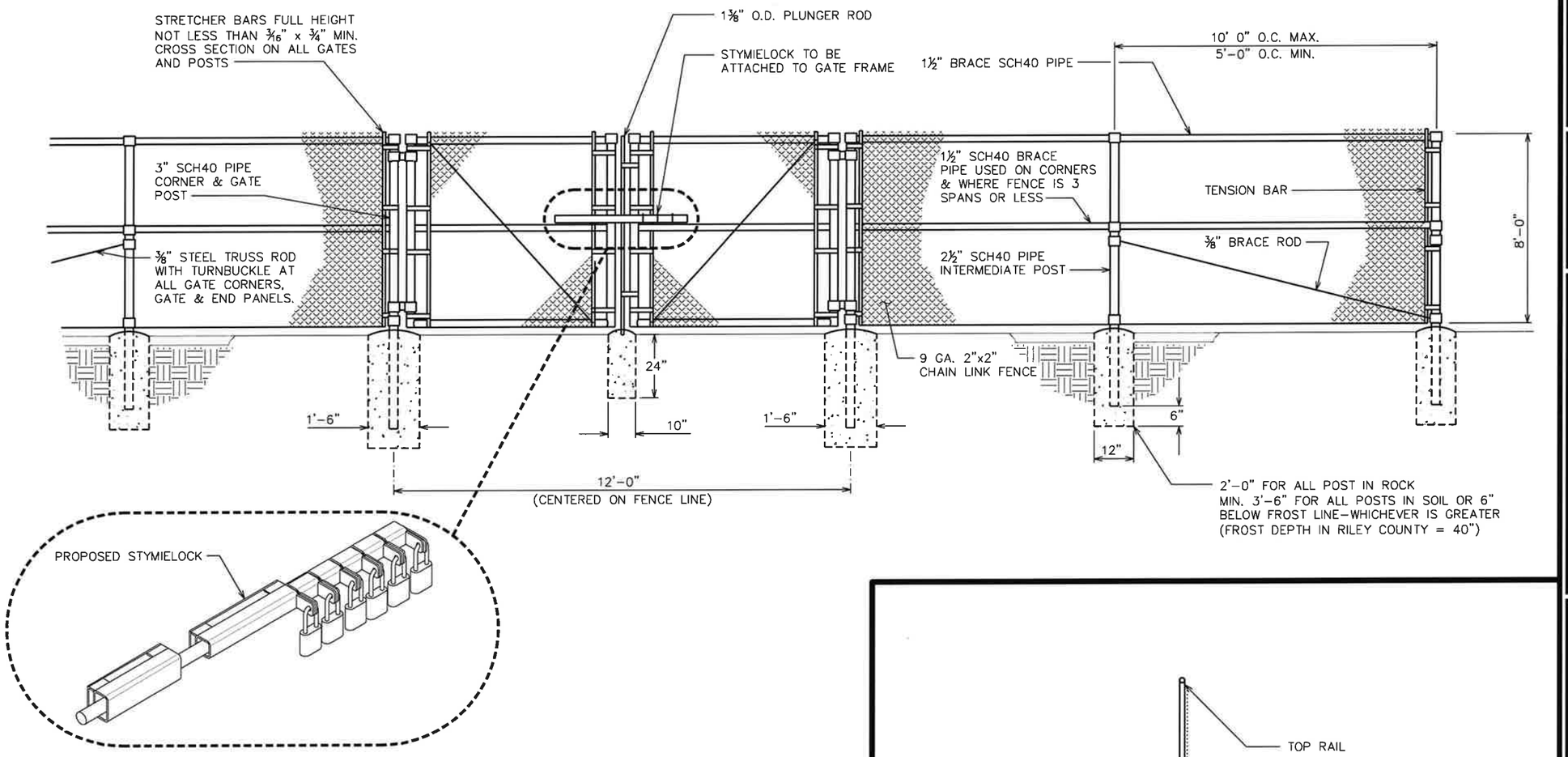
SHEET TITLE:

ICE BRIDGE DETAILS

SHEET NUMBER: **C-4**

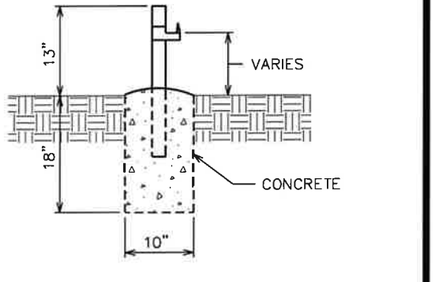
REVISION: 2

TEP#: 265144.833086



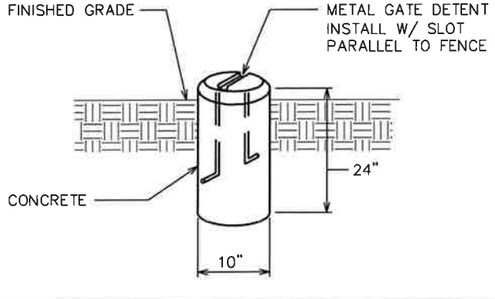
TYPICAL FENCE ELEVATION

SCALE: N.T.S.



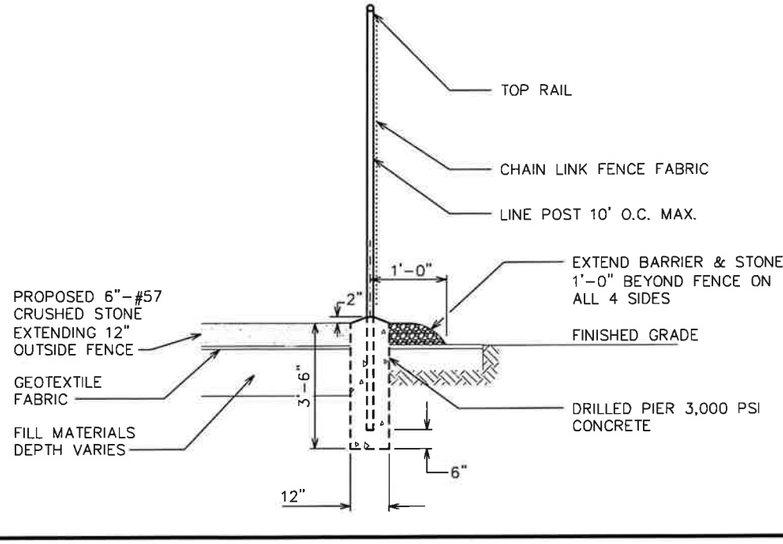
GATE STOP / KEEPER DETAIL

SCALE: N.T.S.



GATE DETENT DETAIL

SCALE: N.T.S.



FENCE / BARBED WIRE ARM DETAIL

SCALE: N.T.S.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
SCOTT C. BRAN
35536
LICENSED PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

FENCE DETAILS

SHEET NUMBER: **C-5**

REVISION: 2

TEP#: 265144.833086

SCOPE:

1. PROVIDE LABOR, MATERIALS, INSPECTION, AND TESTING TO PROVIDE CODE COMPLIANCE FOR ELECTRIC, TELEPHONE, AND GROUNDING/LIGHTNING SYSTEMS.

CODES:

1. THE INSTALLATION SHALL COMPLY WITH APPLICABLE LAWS AND CODES. THESE INCLUDE BUT ARE NOT LIMITED TO THE LATEST ADOPTED EDITIONS OF:
   A. THE NATIONAL ELECTRICAL SAFETY CODE
   B. THE NATIONAL ELECTRIC CODE – NFPA–70
   C. REGULATIONS OF THE SERVING UTILITY COMPANY
   D. LOCAL AND STATE AMENDMENTS
   E. THE INTERNATIONAL ELECTRIC CODE – IEC (WHERE APPLICABLE)
2. PERMITS REQUIRED SHALL BE OBTAINED BY THE CONTRACTOR.
3. AFTER COMPLETION AND FINAL INSPECTION OF THE WORK, THE OWNER SHALL BE FURNISHED A CERTIFICATE OF COMPLETION AND APPROVAL.

TESTING:

1. UPON COMPLETION OF THE INSTALLATION, OPERATE AND ADJUST THE EQUIPMENT AND SYSTEMS TO MEET SPECIFIED PERFORMANCE REQUIREMENTS. THE TESTING SHALL BE DONE BY QUALIFIED PERSONNEL.

GUARANTEE:

1. IN ADDITION TO THE GUARANTEE OF THE EQUIPMENT BY THE MANUFACTURER, EACH PIECE OF EQUIPMENT SPECIFIED HEREIN SHALL ALSO BE GUARANTEED FOR DEFECTS OF MATERIAL OR WORKMANSHIP OCCURRING DURING A PERIOD OF ONE (1) YEAR FROM FINAL ACCEPTANCE OF THE WORK BY THE OWNER AND WITHOUT EXPENSE TO THE OWNER.
2. THE WARRANTEE CERTIFICATES & GUARANTEES FURNISHED BY THE MANUFACTURERS SHALL BE TURNED OVER TO THE OWNER.

UTILITY CO-ORDINATION:

1. CONTRACTOR SHALL COORDINATE WORK WITH THE POWER AND TELEPHONE COMPANIES AND SHALL COMPLY WITH THE SERVICE REQUIREMENTS OF EACH UTILITY COMPANY.

EXAMINATION OF SITE:

1. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE JOB AND SHALL FAMILIARIZE HIMSELF WITH THE CONDITIONS AFFECTING THE PROPOSED ELECTRICAL INSTALLATION AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. FAILURE TO COMPLY WITH THE INTENT OF THIS SECTION WILL IN NO WAY RELIEVE THE CONTRACTOR OF PERFORMING THE WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM OR SYSTEMS.

CUTTING, PATCHING AND EXCAVATION:

1. COORDINATION OF SLEEVES, CHASES, ETC., BETWEEN SUBCONTRACTORS WILL BE REQUIRED PRIOR TO THE CONSTRUCTION OF ANY PORTION OF THE WORK. CUTTING AND PATCHING OF WALLS, PARTITIONS, FLOORS, AND CHASES IN CONCRETE, WOOD, STEEL OR MASONRY SHALL BE DONE AS PROVIDED ON THE DRAWINGS.
2. NECESSARY EXCAVATIONS AND BACKFILLING INCIDENTAL TO THE ELECTRICAL WORK SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWING.
3. SEAL PENETRATIONS THROUGH RATED WALLS, FLOORS, ETC., WITH APPROVED METHOD AS LISTED BY UL.

RACEWAYS / CONDUITS GENERAL:

1. CONDUCTORS SHALL BE INSTALLED IN LISTED RACEWAYS. CONDUIT SHALL BE RIGID STEEL, EMT, SCH40 PVC, OR SCH80PVC AS INDICATED ON THE DRAWINGS. THE RACEWAY SYSTEM SHALL BE COMPLETE COMPLETE BEFORE INSTALLING CONDUCTORS.
2. EXTERIOR RACEWAYS AND GROUNDING SLEEVES SHALL BE SEALED AT POINTS OF ENTRANCE AND EXIT. THE RACEWAY SYSTEM SHALL BE BONDED PER NEC.

EXTERIOR CONDUIT:

1. EXPOSED CONDUIT SHALL BE NEATLY INSTALLED AND RUN PARALLEL OR PERPENDICULAR TO STRUCTURAL ELEMENTS. SUPPORTS AND MOUNTING HARDWARE SHALL BE HOT DIPPED GALVANIZED STEEL.
2. THE CONDUIT SHALL BE RIGID STEEL AT GRADE TRANSITIONS OR WHERE EXPOSED TO DAMAGE.
3. UNDERGROUND CONDUITS SHALL BE RIGID STEEL, SCH40 PVC, OR SCH80 PVC AS INDICATED ON THE DRAWINGS.
4. BURIAL DEPTH OF CONDUITS SHALL BE AS REQUIRED BY CODE FOR EACH SPECIFIC CONDUIT TYPE AND APPLICATION, BUT SHALL NOT BE LESS THAN THE FROST DEPTH AT THE SITE.
5. CONDUIT ROUTES ARE SCHEMATIC. CONTRACTOR SHALL FIELD VERIFY ROUTES BEFORE BID. COORDINATE ROUTE WITH WIRELESS CARRIER AND/OR BUILDING OWNER.

INTERIOR CONDUIT:

1. CONCEALED CONDUIT IN WALLS OR INTERIOR SPACES ABOVE GRADE MAY BE EMT OR PVC.
2. CONDUIT RUNS SHALL USE APPROVED COUPLINGS AND CONNECTORS. PROVIDE INSULATED BUSHING FOR ALL CONDUIT TERMINATIONS. CONDUIT RUNS IN A WET LOCATION SHALL HAVE WATERPROOF FITTINGS.
3. PROVIDE SUPPORTS FOR CONDUITS IN ACCORDANCE WITH NEC REQUIREMENTS. CONDUITS SHALL BE SIZED AS REQUIRED BY NEC.

EQUIPMENT:

1. DISCONNECT SWITCHES SHALL BE SERVICE ENTRANCE RATED, HEAVY DUTY TYPE.
2. CONTRACTOR SHALL VERIFY MAXIMUM AVAILABLE FAULT CURRENT AND COORDINATE INSTALLATION WITH THE LOCAL UTILITY BEFORE STARTING WORK. CONTRACTOR WILL VERIFY THAT EXISTING CIRCUIT BREAKERS ARE RATED FOR MORE THAN AVAILABLE FAULT CURRENT AND REPLACE AS NECESSARY.
3. NEW CIRCUIT BREAKERS SHALL BE RATED TO WITHSTAND THE MAXIMUM AVAILABLE FAULT CURRENT AS DETERMINED BY THE LOCAL UTILITY.

CONDUCTORS:

1. FURNISH AND INSTALL CONDUCTORS SPECIFIED IN THE DRAWINGS. CONDUCTORS SHALL BE COPPER AND SHALL HAVE TYPE THWN (MIN) (75° C) INSULATION, RATED FOR 600 VOLTS.
2. THE USE OF ALUMINUM CONDUCTORS SHALL BE LIMITED TO THE SERVICE FEEDERS INSTALLED BY THE UTILITY.
3. CONDUCTORS SHALL BE PROVIDED AND INSTALLED AS FOLLOWS:
   A. MINIMUM WIRE SIZE SHALL BE #12 AWG.
   B. CONDUCTORS SIZE #8 AND LARGER SHALL BE STRANDED. CONDUCTORS SIZED #10 AND #12 MAY BE SOLID OR STRANDED.
   C. CONNECTION FOR #10 AWG #12 AWG SHALL BE BY TWISTING TIGHT AND INSTALLING INSULATED PRESSURE OR WIRE NUT CONNECTIONS.
   D. CONNECTION FOR #8 AWG AND LARGER SHALL BE BY USE OF STEEL CRIMP–ON SLEEVES WITH NYLON INSULATOR.
3. CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH NEC STANDARDS.

UL COMPLIANCE:

1. ELECTRICAL MATERIALS, DEVICES, CONDUCTORS, APPLIANCES, AND EQUIPMENT SHALL BE LABELED/LISTED BY UL OR ACCEPTED BY JURISDICTION (I.E., LOCAL COUNTY OR STATE) APPROVED THIRD PARTY TESTING AGENCY.

GROUNDING:

1. ELECTRICAL NEUTRALS, RACEWAYS AND NON–CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT AND ASSOCIATED ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250. THIS SHALL INCLUDE NEUTRAL CONDUCTORS, CONDUITS, SUPPORTS, CABINETS, BOXES, GROUND BUSSES, ETC. THE NEUTRAL CONDUCTOR FOR EACH SYSTEM SHALL BE GROUNDED AT A SINGLE POINT.
2. PROVIDE GROUND CONDUCTOR IN RACEWAYS PER NEC.
3. PROVIDE BONDING AND GROUND TO MEET NFPA 780 – "LIGHTNING PROTECTION" AS A MINIMUM.
4. PROVIDE GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS, AS REQUIRED BY THE NATIONAL ELECTRIC CODE, RADIO EQUIPMENT MANUFACTURERS, AND MOTOROLA R56 (AS APPLICABLE).

ABBREVIATIONS AND LEGEND

A	–	AMPERE
AFG	–	ABOVE FINISHED GRADE
ATS	–	AUTOMATIC TRANSFER SWITCH
AWG	–	AMERICAN WIRE GAUGE
BCW	–	BARE COPPER WIRE
BFG	–	BELOW FINISHED GRADE
BKR	–	BREAKER
C	–	CONDUIT
CKT	–	CIRCUIT
DISC	–	DISCONNECT
EGR	–	EXTERNAL GROUND RING
EMT	–	ELECTRIC METALLIC TUBING
FSC	–	FLEXIBLE STEEL CONDUIT
GEN	–	GENERATOR
GPS	–	GLOBAL POSITIONING SYSTEM
GRD	–	GROUND
IGB	–	ISOLATED GROUND BAR
IGR	–	INTERIOR GROUND RING (HALO)
KW	–	KILOWATTS
NEC	–	NATIONAL ELECTRIC CODE
PCS	–	PERSONAL COMMUNICATION SYSTEM
PH	–	PHASE
PNL	–	PANEL
PNLBD	–	PANELBOARD
PVC	–	RIGID NON–METALLIC CONDUIT
RGS	–	RIGID GALVANIZED STEEL CONDUIT
SW	–	SWITCH
TGB	–	TOWER GROUND BAR
UL	–	UNDERWRITERS LABORATORIES
V	–	VOLTAGE
W	–	WATTS
XFMR	–	TRANSFORMER
XMTR	–	TRANSMITTER

——E——	UNDERGROUND ELECTRICAL CONDUIT
——T——	UNDERGROUND TELEPHONE CONDUIT
	KILOWATT–HOUR METER
	UNDERGROUND BONDING AND GROUNDING CONDUCTOR.
⌀	GROUND ROD
●	CADWELD
⊠	GROUND ROD WITH INSPECTION WELL

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487–1307
OFFICE: (561) 226–9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603–3530
OFFICE: (919) 661–6351
www.tepgroup.net

SEAL:

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

ELECTRICAL NOTES

SHEET NUMBER: **E-1**

REVISION: 2

TEP#: 265144.833086

ELECTRICAL LEGEND:

ABBREVIATIONS:

A	–	AMPERE
AFG	–	ABOVE FINISHED GRADE
ATS	–	AUTOMATIC TRANSFER SWITCH
AWG	–	AMERICAN WIRE GAUGE
BCW	–	BARE COPPER WIRE
BFG	–	BELOW FINISHED GRADE
BKR	–	BREAKER
BTS	–	BASE TRANSCEIVER STATION
C	–	CONDUIT
C/W	–	COMPLETE WITH
CKT	–	CIRCUIT
DISC	–	DISCONNECT
EC	–	EMPTY CONDUIT
EGR	–	EXTERNAL GROUND RING
EMT	–	ELECTRIC METALLIC TUBING
F/A	–	FIRE ALARM
FSC	–	FLEXIBLE STEEL CONDUIT
GEN	–	GENERATOR
GPS	–	GLOBAL POSITIONING SYSTEM
GRD	–	GROUND
IGB	–	ISOLATED GROUND BAR
IGR	–	INTERIOR GROUND RING (HALO)
KW	–	KILOWATTS
MGB	–	MAIN GROUND BAR
CEC	–	CANADIAN ELECTRIC CODE
PCS	–	PERSONAL COMMUNICATION SYSTEM
PH	–	PHASE
PNL	–	PANEL
PNLBD	–	PANELBOARD
PVC	–	SCH40 RIGID NON-METALLIC CONDUIT
RBS	–	RADIO BASE STATION
REL	–	RELOCATED
RGS	–	RIGID GALVANIZED STEEL CONDUIT
S/C	–	SEPERATE CONDUIT
SES	–	SITE ENGINEERING SPECIFICATIONS
SW	–	SWITCH
TGB	–	TOWER GROUND BAR
U/F	–	UNFUSED
ULC	–	UNDERWRITERS LABORATORIES, CANADA
V	–	VOLTAGE
W	–	WATTS
WP	–	WEATHERPROOF
XFMR	–	TRANSFORMER
XMTR	–	TRANSMITTER

-----E-----	UNDERGROUND ELECTRICAL CONDUIT
-----T-----	UNDERGROUND TELEPHONE CONDUIT
	KILOWATT-HOUR METER
----------	UNDERGROUND BONDING AND GROUNDING CONDUCTOR
	CADWELD
	GROUND ROD WITH INSPECTION WELL
	EXISTING M/W DISH ANTENNA
	FUTURE M/W DISH ANTENNA
	EXISTING ROOF DRAIN
	EXISTING ROOF HATCH
$	15A 120V SPST SWITCH
	15A 120V DUPLEX RECEPTACLE
	120V, 1Ø DIRECT CONNECTION TO EQUIPMENT SUPPLIED BY OTHER DIVISIONS
	208V, 1Ø DIRECT CONNECTION TO EQUIPMENT SUPPLIED BY OTHER DIVISIONS
	CIRCUIT BREAKER
	DISCONNECT SWITCH. F DENOTES FUSED
	SURFACE MOUNTED PANELBOARD
T	TRANSFORMER
	CHECK METER
	DENOTES CABLE OR CONDUITTURNING UP IN PLAN VIEW
	CHANGE IN ELEVATION OF CABLE OR CONDUIT IN PLAN VIEW
	DENOTES CABLE OR CONDUITTURNING DOWN IN PLAN VIEW
	GROUND ROD
	LIGHTNING PROTECTION AIR TERMINAL
—EC—	ETHERNET CABLE
—F—	FIBRE CABLE
—DC—	DC CABLE

ELECTRICAL LEGEND

SCALE: N.T.S.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

ELECTRICAL LEGEND

SHEET NUMBER: **E-2**

REVISION: **2**

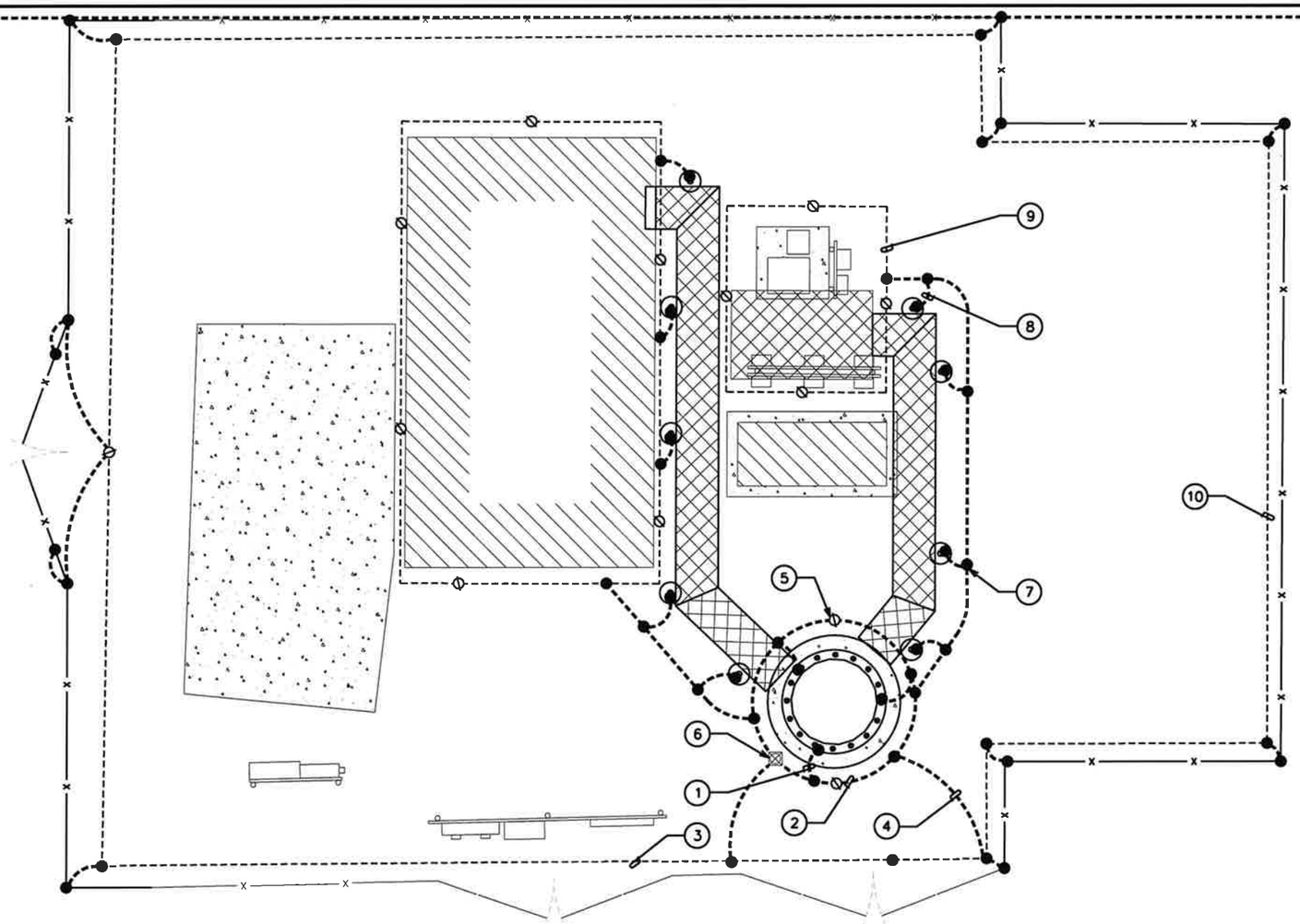
TEP#: 26514.833086

GROUNDING NOTES:

1. CONTRACTOR SHALL VERIFY THAT GROUNDING ELECTRODES SHALL BE CONNECTED IN A RING USING #2 AWG BARE TINNED COPPER WIRE. THE TOP OF THE GROUND RODS AND THE RING CONDUCTOR SHALL BE 30" BELOW FINISHED GRADE. GROUNDING ELECTRODES SHALL BE DRIVEN ON 10'-0" CENTERS (PROVIDE AND INSTALL AS REQUIRED. REQUIRED PER PLAN BELOW).
2. BONDING OF THE GROUNDED CONDUCTOR (NEUTRAL) AND THE GROUNDING CONDUCTOR SHALL BE AT THE SERVICE DISCONNECTING MEANS. BONDING JUMPER SHALL BE INSTALLED PER N.E.C. ARTICLE 250.30.
3. GROUND RING CONNECTION CONDUCTORS SHALL BE OF EQUAL LENGTH, MATERIAL, AND BONDING TECHNIQUE.
4. CONTRACTOR SHALL ENSURE GROUND RING IS WITHIN 12 TO 36 INCHES OF THE EQUIPMENT PAD. PROVIDE AND INSTALL GROUNDING CONNECTIONS SHOWN BELOW AS NEEDED PER EXISTING SITE GROUNDING SYSTEM. CONTRACTOR SHALL VERIFY ALL EXISTING SITE GROUNDING CONDITIONS BEFORE STARTING WORK OR PURCHASING EQUIPMENT
5. BOND GROUND BAR TO EXTERNAL GROUND RING WITH (1) RUN OF #2 BARE, TINNED, SOLID COPPER CONDUCTOR IN PVC. CONNECT BAR END WITH 2-HOLE LUG, AND "CADWELD" THE OTHER END TO THE EXTERNAL GROUND ROD.
6. ALL DOWN CONDUCTORS MUST GO DOWN
7. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHEN THE GROUNDING SYSTEM IS COMPLETE. THE CONSTRUCTION MANAGER SHALL INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING

DRAWING NOTES:

1. PROPOSED #2 BARE TINNED SOLID COPPER CONDUCTOR FROM TOWER TO PROPOSED TOWER GROUND RING (TYP)
2. PROPOSED #2 TINNED SOLID COPPER TOWER GROUND RING
3. EXISTING COMPOUND GROUNDING SYSTEM. CONTRACTOR TO VERIFY LOCATION & EXISTENCE.
4. PROPOSED #2 BARE TINNED SOLID COPPER CONDUCTOR FROM PROPOSED TOWER GROUND RING TO EXISTING COMPOUND GROUNDING SYSTEM (TYP)
5. GROUND ROD 5/8"x10' LONG (TYP)
6. GROUND ROD WITH INSPECTION WELL (TYP)
7. CADWELD (TYP)
8. PROPOSED ICE BRIDGE GROUNDING (TYP). CONTRACTOR TO RELOCATE FROM EXISTING TOWER GROUND RING TO PROPOSED TOWER GROUND RING.
9. EXISTING EQUIPMENT GROUND RING (TYP) CONTRACTOR TO VERIFY LOCATION & EXISTENCE.
10. PROPOSED EXPANSION TO COMPOUND GROUNDING SYSTEM. CONTRACTOR TO VERIFY LOCATION PRIOR TO CONSTRUCTION.



TOWER GROUNDING PLAN

SCALE: N.T.S.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
SCOTT C. BRANT
35536
LICENSED PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

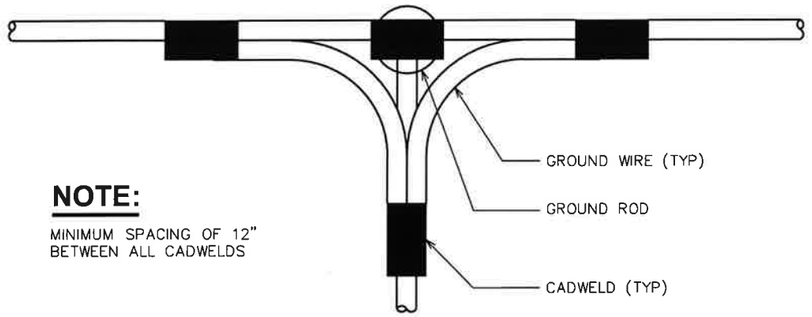
SHEET TITLE:

TOWER GROUNDING PLAN

SHEET NUMBER: **E-3**

REVISION: **2**

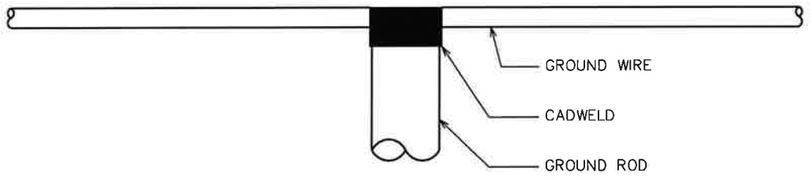
TEP#: 265144.833086



NOTE:

MINIMUM SPACING OF 12" BETWEEN ALL CADWELDS

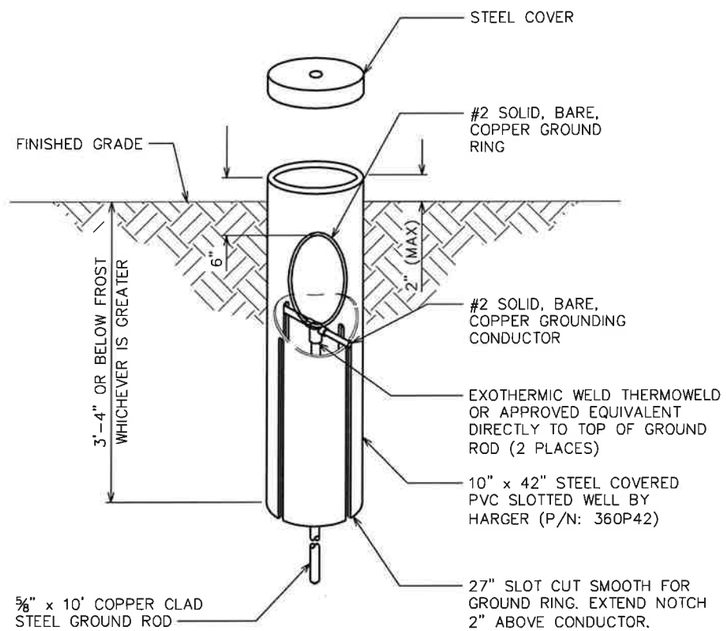
TOP VIEW



SIDE VIEW

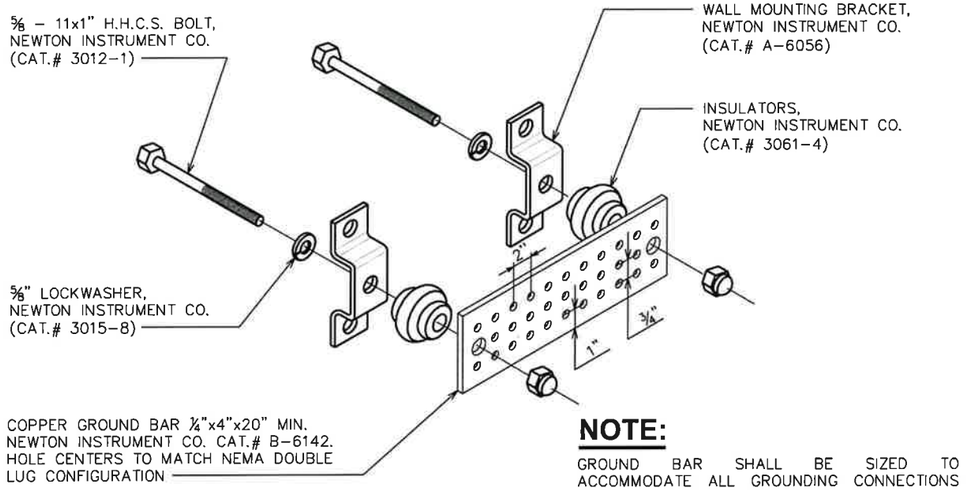
CADWELD GROUNDING DETAIL

SCALE: N.T.S.



GROUND ROD WITH INSPECTION WELL DETAIL

SCALE: N.T.S.

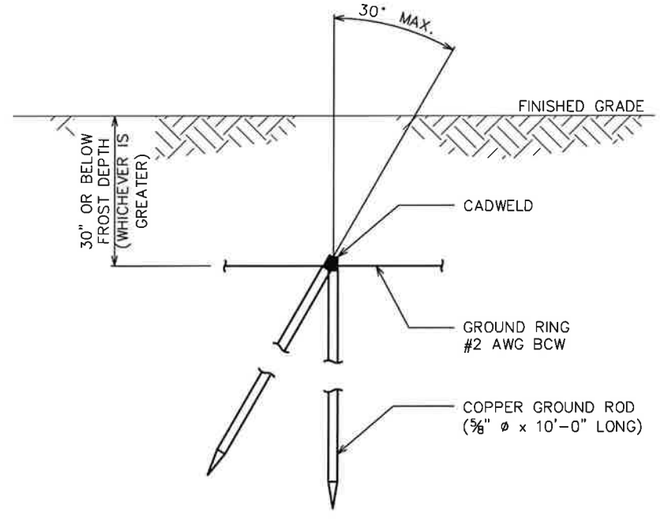


NOTE:

GROUND BAR SHALL BE SIZED TO ACCOMMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY

STANDARD GROUND BAR DETAIL

SCALE: N.T.S.



COPPER-CLAD STEEL GROUND ROD DETAIL

SCALE: N.T.S.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME: BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
SCOTT C. BRAM
35536
LICENSED
PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

GROUNDING DETAILS I

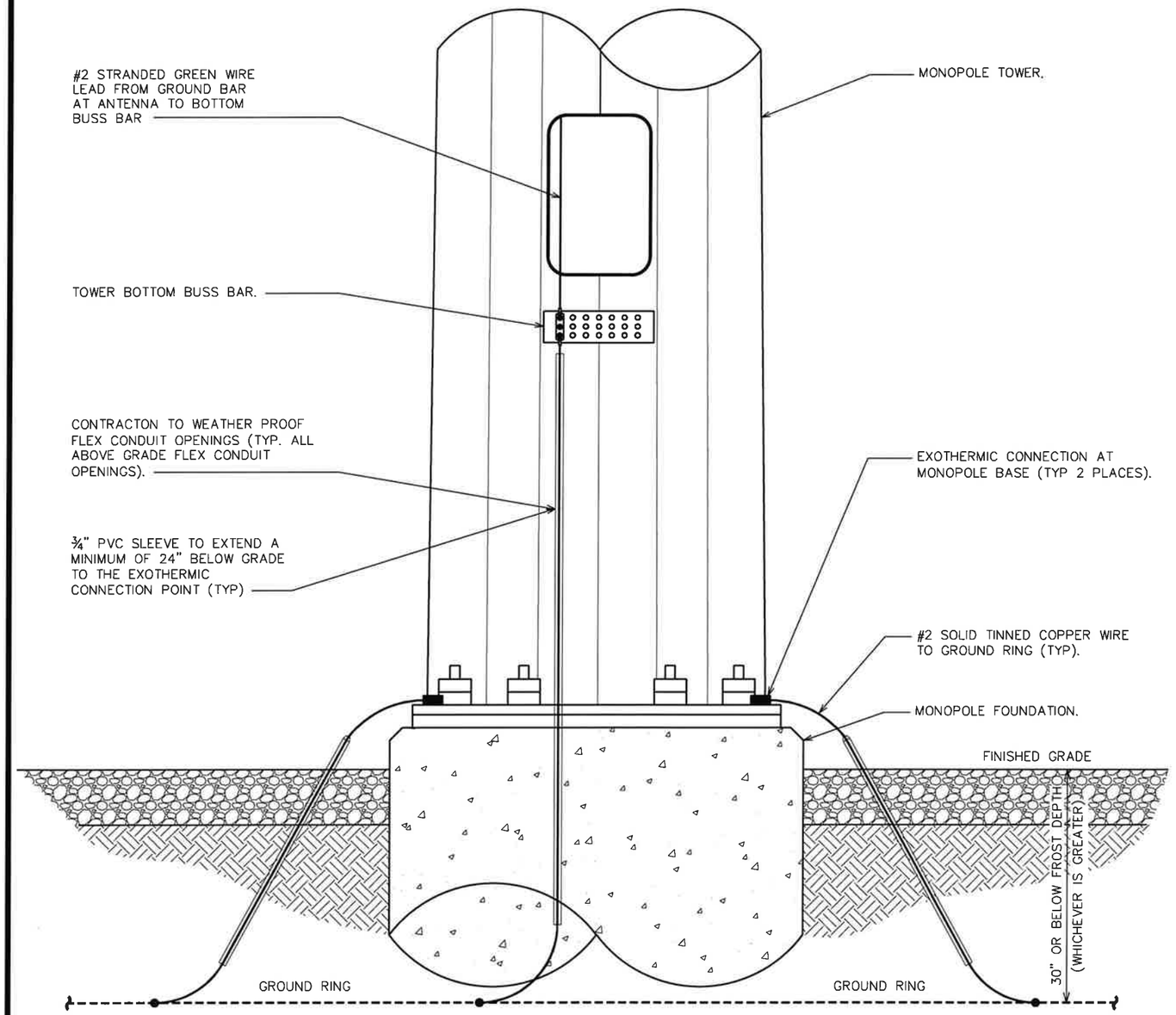
SHEET NUMBER: **E-4**

REVISION: 2

TEP#: 265144.833086

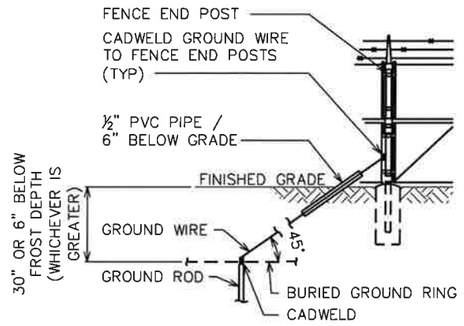
NOTE:

US VIRGIN ISLANDS DOES NOT HAVE A FROST DEPTH



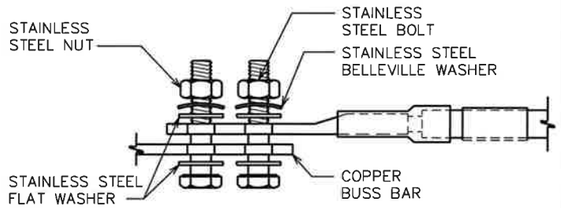
TOWER GROUNDING DETAIL

SCALE: N.T.S.



FENCE GROUDNING DETAILS

SCALE: N.T.S.



NOTES:

1. ALL HARDWARE SHALL BE 18-8 STAINLESS STEEL, INCLUDING THE BELLEVILLE WASHERS. COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN THE LUG AND STEEL. COAT ALL SURFACES WITH KOPR-SHIELD.

LUG DETAILS

SCALE: N.T.S.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

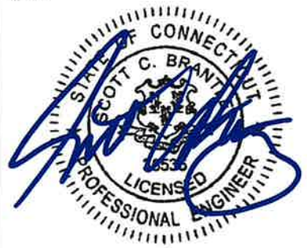
SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

GROUNDING DETAILS II

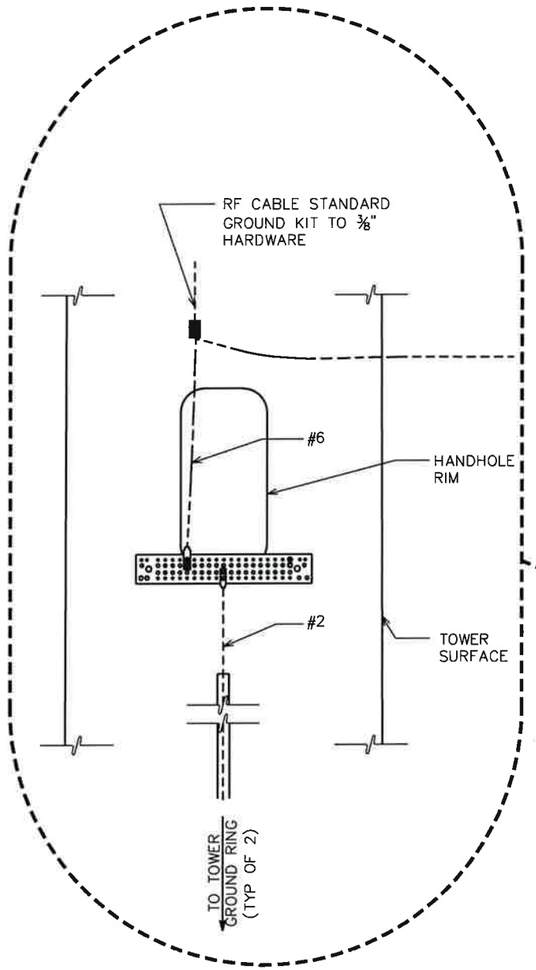
SHEET NUMBER: **E-5**

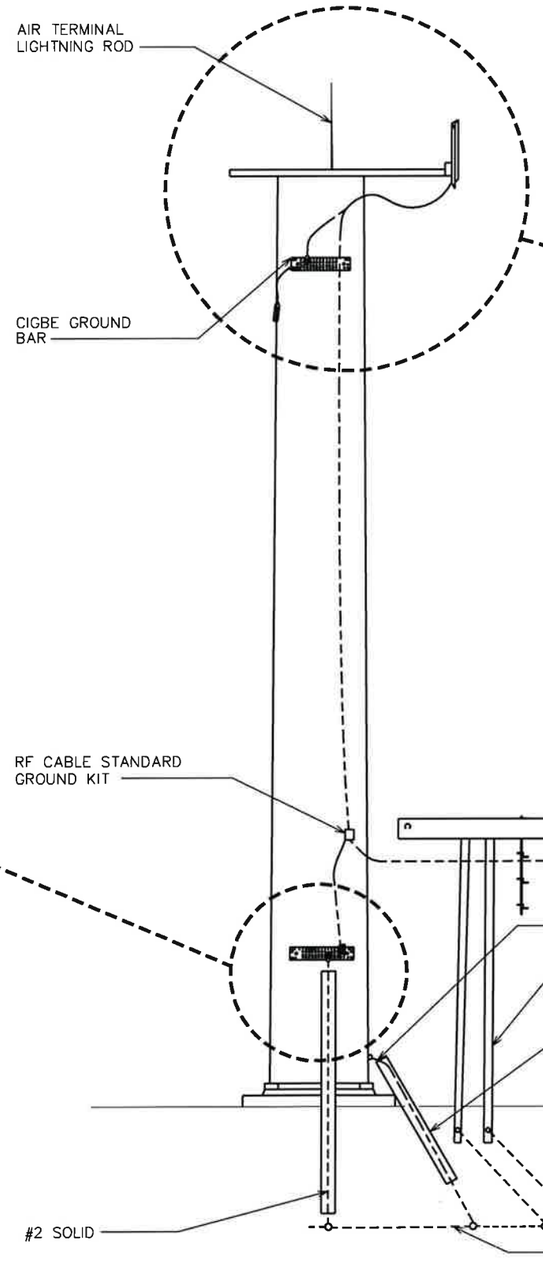
REVISION: 2

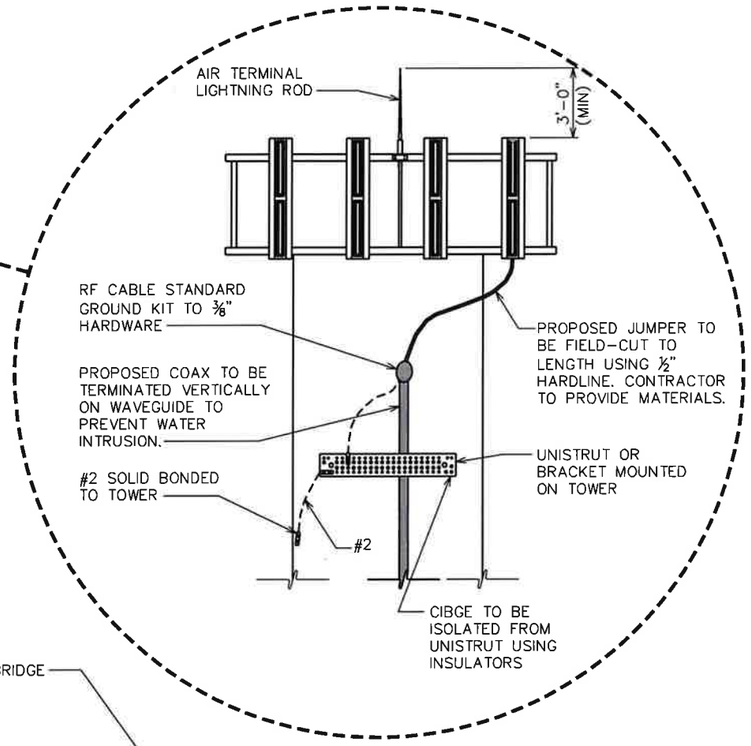
TEP#: 265144.833086

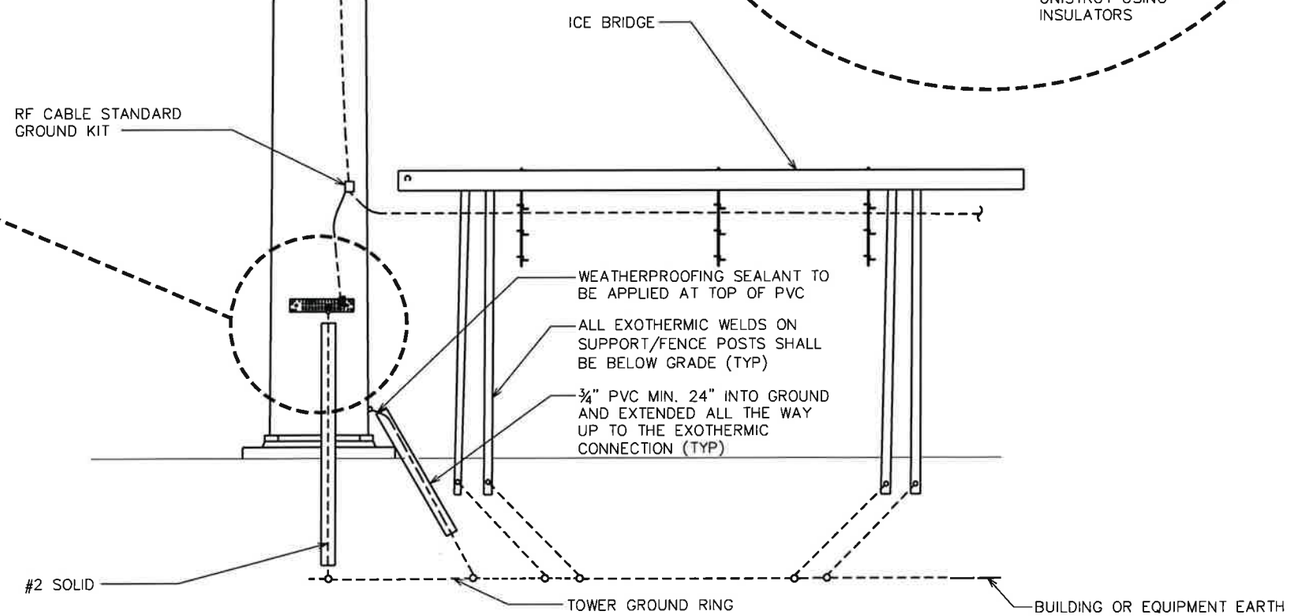
NOTES:

1. MINIMUM BEND RADIUS OF #2 SOLID CONDUCTOR IS 12".
2. ALL GROUND BARS SHALL BE INSTALLED WITH TAMPER RESISTANT MOUTING HARDWARE.









ICE BRIDGE, COAX, STANCHION, AND TOWER GROUNDING DETAIL

SCALE: N.T.S.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT · SCOTT C. BRANT · 25586 · LICENSED PROFESSIONAL ENGINEER

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

GROUNDING DETAILS III

SHEET NUMBER: **E-6**

REVISION: **2**

TEP#: 26514.833086

GENERAL NOTES:

1. ALL REFERENCES MADE TO OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED SBA COMMUNICATIONS OR IT'S DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF CONNECTICUT.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH ANSI/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDINGS AND THE 2018 INTERNATIONAL BUILDING CODE.
4. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
5. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
6. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND IT'S COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
7. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATION. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR INSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, PROVINCIAL, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
10. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE SBA PROJECT MANAGER.
11. BILL OF MATERIALS AND PART NUMBERS LISTED ON CONSTRUCTION DRAWINGS ARE INTENDED TO AID CONTRACTOR/OWNER. CONTRACTOR/OWNER SHALL VERIFY PARTS AND QUANTITIES WITH MANUFACTURER PRIOR TO BIDDING AND/OR ORDERING MATERIALS.
12. THE CONTRACTOR SHALL REWORK (DRY, SCARIFY, ETC.) ALL MATERIAL NOT SUITABLE FOR SUBGRADE IN ITS PRESENT STATE. AFTER REWORKING, IF THE MATERIAL REMAINS UNSUITABLE, THE CONTRACTOR SHALL UNDERCUT THIS MATERIAL AND REPLACE WITH APPROVED MATERIAL. ALL SUBGRADES SHALL BE PROOF-ROLLED WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK PRIOR TO PAVING. ANY SOFT MATERIAL SHALL BE REWORKED OR REPLACED.
13. THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL PIPES, DITCHES, AND OTHER DRAINAGE STRUCTURES FREE FROM OBSTRUCTION UNTIL WORK IS ACCEPTED BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED BY FAILURE TO MAINTAIN DRAINAGE STRUCTURE IN OPERABLE CONDITION.
14. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
15. ALL BUILDING/TOWER DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
16. ANY BUILDINGS ON THIS SITE ARE INTENDED TO SHELTER EQUIPMENT WHICH WILL ONLY BE PERIODICALLY MAINTAINED, AND ARE NOT INTENDED FOR HUMAN OCCUPANCY.
17. TEMPORARY FACILITIES FOR PROTECTION OF TOOLS AND EQUIPMENT SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
18. RENTAL CHARGES, SAFETY, PROTECTION AND MAINTENANCE OF RENTED EQUIPMENT SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
19. THE CONTRACTOR AND ITS SUBCONTRACTORS SHALL CARRY LIABILITY INSURANCE IN THE AMOUNTS AND FORM IN ACCORDANCE WITH GLOBALIVE SPECIFICATIONS. CERTIFICATES DEMONSTRATING PROOF OF COVERAGE SHALL BE PROVIDED TO GLOBALIVE PRIOR TO THE START OF THE WORK ON THE PROJECT.
20. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. SAFETY, CARE OF ADJACENT PROPERTIES, AND COMPLIANCE WITH PROVINCIAL AND FEDERAL REGULATIONS REGARDING SAFETY, SHALL BE THE CONTRACTOR'S RESPONSIBILITY, AND THIS, PER THE INTERNATIONAL CODE – REGULATORS RESPECTING OCCUPATIONAL SAFETY & HEALTH THE SUCCESSFUL CONTRACTOR WILL SUBMIT HIT SAFETY MANUAL AT THE PROJECT SITE.
21. THE CONTRACTOR SHALL CONTACT ALL APPLICABLE UTILITY SERVICES TO VERIFY LOCATIONS OF EXISTING UTILITIES AND REQUIREMENTS FOR NEW UTILITY CONNECTIONS PRIOR TO EXCAVATING.
22. THE CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. ALL WASTE MATERIALS SHALL BE REMOVED FROM THE SITE PRIOR TO SUBSTANTIAL COMPLETION AND PRIOR TO FINAL ACCEPTANCE. THE CONTRACTOR SHALL FURNISH ONE 55 GALLON BARREL, AND TRASH BAGS, AND SHALL REMOVE TRASH, DEBRIS, ETC., ON A DAILY BASIS.
23. COSTS FOR BUILDING PERMITS, LANDFILL TAXES, USE TAXES, SALES TAXES AND OTHER CHARGES RELATIVE TO CONSTRUCTION OF THIS PROJECT SHALL BE INCLUDED IN THE CONTRACT PRICE.
24. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON THESE DRAWINGS WITH THOSE AT THE SITE. ANY VARIATION WHICH REQUIRES PHYSICAL CHANGE SHALL BE BROUGHT TO THE ATTENTION OF THE SBA PROJECT ENGINEER FOR FACILITIES/CONSTRUCTION.
25. THE CONTRACTOR SHALL GUARANTEE THE WORK PERFORMED ON THE PROJECT BY THE CONTRACTOR AND ANY OR ALL OF THE SUBCONTRACTORS WHO PERFORMED WORK FOR THE CONTRACTOR ON THIS PROJECT. THE GUARANTEE SHALL BE FOR A FULL YEAR FOLLOWING ISSUANCE OF THE FINAL PAYMENT OF HOLDBACK.
26. AWARDED CONTRACTOR WILL BE REQUIRED TO SIGN AND RETURN A COPY OF AN AWARD LETTER FOR SBA'S FILE.
27. CONTRACTOR WILL BE REQUIRED TO PROVIDE PROOF OF LICENSE TO PERFORM WORK IN JURISDICTION AT TIME OF BID AWARD.
28. CONTRACTOR WILL PROVIDE A CONSTRUCTION SCHEDULE PRIOR TO CONSTRUCTION STARTING AND WILL PROVIDE UPDATE/CHANGES (WITH EXPLANATIONS) TO THAT SCHEDULE WHEN/IF ITEMS ARE DELAYED OR PUSHED OUT.
29. CONTRACTOR WILL BE RESPONSIBLE TO PROVIDE SBA PROJECT MANAGERS WITH PHOTOS OF THE MAJOR CONSTRUCTION MILESTONES AS THEY OCCUR.
30. CONTRACTOR WILL BE RESPONSIBLE TO ASSIST IN COORDINATING AND OBTAINING PRIMARY POWER TO THE SITE PRIOR TO TOWER ERECTION BEFORE PROJECT COMPLETION. (ON SITE VISITS WITH UTILITY COMPANY REPRESENTATIVES AS NECESSARY, ETC...)
31. CONTRACTOR SHOULD BE PREPARED FOR RANDOM SBA SAFETY INSPECTIONS AT ALL TIMES.
32. CONTRACTOR IS EXPECTED TO MAINTAIN PROPER WORKING CONDITIONS AND PROCEDURES PER OKLAHOMA STANDARDS AT ALL TIMES.
33. CONTRACTOR WILL BE REQUIRED TO OBTAIN THE NECESSARY ELECTRICAL PERMITS AND INSPECTIONS AS REQUIRED BY JURISDICTION.
34. CONTRACTOR IS EXPECTED TO CLOSE-OUT THE JOB SITE AS QUICKLY AS POSSIBLE (OBTAINING A CERTIFICATE OF OCCUPANCY AS REQUIRED BY LOCAL MUNICIPALITY AND GETTING SBA'S REGIONAL SITE MANAGER'S SIGN-OFF/CHECKLIST APPROVAL ON THE SITE).
35. CONTRACTOR WILL PROVIDE A COMPLETED TOWER HEIGHT VERIFICATION FORM AND TAPE DROP WITHIN 24 HOURS OF REACHING OVERALL HEIGHT.
36. CONTRACTOR WILL UTILIZE ALL OF THE SBA PROVIDED DOCUMENTATION INCLUDING BUT NOT LIMITED TO: TOWER CONSTRUCTION ACCEPTANCE CHECKLIST, CONSTRUCTION SCHEDULE, CONSTRUCTION CLOSE-OUT LIST & TOWER HEIGHT VERIFICATION.
37. CONTRACTOR IS RESPONSIBLE FOR CONCRETE COMPRESSION TESTING.
38. CONTRACTOR IS RESPONSIBLE FOR GROUND MEG TESTING AND PROVIDING PROOF OF RESULT.
39. WHEN REQUESTED, PROVIDE 3 COPIES OF FABRICATION AND ERECTION DRAWINGS PRIOR TO FABRICATION. ALLOW UP TO 1 WEEK FOR REVIEW BY CONSULTANT.
40. IN ADDITION TO CONTRACTOR'S QUALITY CONTROL PROGRAM, INDEPENDENT TESTING AND INSPECTION MAY BE PERFORMED BY OWNER OR OWNER'S REPRESENTATIVE.
41. SUBMIT RED-LINES COPY OF CONSTRUCTION DRAWINGS UPON COMPLETION OF CONSTRUCTION HIGHLIGHTING CHANGES IN THE STAMPED AND SIGNED AS-BUILT CONDITION FROM SHOWN ON THE DRAWINGS.
42. CONTRACTOR WILL BE RESPONSIBLE FOR ALL GRADING AND FILL COMPACTION TESTING REQUIRED AS SET FORTH IN THE GEO TECHNOLOGICAL REPORT PROVIDED BY OWNER.

CONCRETE:

1. ALL CONCRETE AND CONCRETE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF THE 2018 INTERNATIONAL BUILDING CODE.
2. THE CONTRACTOR SHALL TAKE SAMPLES OF THE CONCRETE POURED UNDER THE CONDITIONS OUTLINED IN THE 2018 INTERNATIONAL BUILDING CODE.
3. ANY FAILURE OF A CONCRETE TEST CYLINDER TO MEET THE SPECIFIED STRENGTH REQUIREMENTS MUST BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY. CORRECTIVE ACTION MUST BE APPROVED BY THE ENGINEER AND ALL RELATED COSTS SHALL BE AT THE CONTRACTOR'S EXPENSE.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

GENERAL NOTES I

SHEET NUMBER: **N-1**

REVISION: 2

TEP#: 265144.833086

CONCRETE (CONTINUED):

4. THE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE A MINIMUM OF 30 MPA, EXCEPT AS NOTED OR DIRECTED IN THE SOIL REPORT. THE CONCRETE, WHEN POURED, SHALL CONTAIN 7% AIR ENTRAINMENT WITH AN ALLOWABLE VARIATION OF +2%.

5. CONTRACTOR MUST TAKE SLUMP TEST AT LEAST ONCE FROM EACH TRANSIT MIXER AFTER A MINIMUM OF 5% CONCRETE LOAD HAD BEEN DISCHARGED. SLUMP, UNLESS NOTED OTHERWISE ON THE DRAWINGS, SHALL BE 75 MM.

6. MIXED CONCRETE ON SITE (REMOTE AREAS) WITH THE CORRECT PROPORTION OF CEMENT, SAND, GRAVEL, AND AIR-ENTRAINING AGENT ALREADY ADDED, THE DRY PREMIX IS TO BE MIXED IN A CONCRETE BATCHER IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

7. BEFORE POURING CONCRETE, THE TRANPORTING EQUIPMENT AND FORMS SHALL BE CLEANED AND ALL DEBRIS AND ICE SHALL BE REMOVED FROM PLACES TO BE OCCUPIED BY THE CONCRETE. ANY WATER THAT HAS ACCUMALATED IN THE FORMS SHALL BE REMOVED.

8. ALL CONCRETE SHALL BE VIBRATED AND WORKED AROUND THE REINFORCEMENTS, EMBEDDED FIXTURES AND INTO THE CORNERS OF THE FORMS. ANY EXCESS WATER THAT ACCUMALATES WHILE THE CONCRETE IS BEING POURED SHALL BE REMOVED.

9. THE DESIGN ENGINEER SHALL RECEIVE A MINIMUM OF 24 HOURS NOTICE OF EVERY POUR.

10. THE CONCRETE IN FOUNDATIONS MUST BE POURED IN CONTINOUS POURS BETWEEN CONSTRUCTION JOINTS. NO CONSTRUCTION JOINTS OTHER THAN THOSE SHOWN ON SITE SPECIFIC DRAWINGS WILL BE PERMITTED. THE CONTRACTOR SHALL PROVIDE EFFICIENT EQUIPMENT TO COMPLETE THE POURING OF EACH SECTION IN ONE CONTINOUS POUR.

11. ALL FRAMEWORK SHALL BE BUILT IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE SHALL BE THOROUGHLY BRACED AND PLUMBED SO THAT THE FINISHED CONCRETE WILL CONFORM TO THE SHAPES, LINES, GRADES, AND DIMENSIONS INDICATED ON THE SITE DRAWINGS.

12. FORMS AND SHORING SHALL NOT BE REMOVED UNTIL THE CONCRETE IS ADEQUATELY SET. THEIR REMOVAL SHALL BE DONE IN SUCH A MANNER AS TO ENSURE THE COMPLETE SAFETY OF THE STRUCTURE.

13. FORMS WHICH SUPPORT THE WEIGHT OF THE CONCRETE, OR OF SUPERIMPOSED LOADS, SHALL NOT BE REMOVED UNTIL THE CONCRETE IS STRONG ENOUGH TO CARRY ITS OWN WEIGHT, AND SUCH SUPERIMPOSED LOADS AS MAY BE PLACED UPON IT.

14. THE CONCRETE SHALL BE MAINTAINED IN A MOIST CONDITION FOR AT LEAST 5 DAYS AFTER IT HAS BEEN POURED.

15. ALL SURFACES WHICH ARE NOT PROTECTED BY FORMS OR A SEALED WATERPROOF COATING SHALL BE KEPT MOIST BY CONTINOUS SPRINKLING, OR OTHER MEANS SUCH AS COVERING WITH MOIST SAND, SAWDUST, OR BURLAP.

16. WHERE NECESSARY, THE CONCRETE SHALL BE PROTECTED AGAINST THE WEATHER BY A FRAMED HOUSING, TARPAULINS, OR OTHER SUITABLE COVERING.

REINFORCING STEEL (REBAR):

1. REINFORCING STEEL SHALL MEET CODE AND BE PLACED ACCORDING TO THE APPLICABLE DRAWINGS. THE MINIMUM THICKNESS OF CONCRETE OVER THE STEEL SHALL BE AT LEAST 3".

2. ALL REINFORCEMENTS THAT ARE REQUIRED FOR A DAYS POUR ON CONCRETE SHALL BE SECURELY FIXED IN PLACE IN SUFFICIENT TIME TO PERMIT INSPECTION BEFORE CONCRETING BEGINS.

3. THE DESIGN ENGINEER SHALL BE GIVEN 24 HOURS NOTICE BEFORE THE CONCRETE IS TO BE POURED. FAILURE TO COMPLY MAY NECESSITATE, BUT NOT BE LIMITED TO, THE REMOVAL OF THE POURED CONCRETE AT THE CONTRACTOR'S EXPENSE.

GROUTING:

1. WHERE GROUT IS INDICATED ON THE DRAWINGS UNDER STRUCTURAL BASE PLATES, THIS SHALL BE A NON-SHRINK, NON-FERROUS TYPE. METHODS OF MIXING AND PLACING MUST BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

COLD WEATHER CONCRETING:

1. THE CONTRACTOR SHALL PROVIDE AND HAVE ON THE SITE READY FOR USE, ADEQUATE EQUIPMENT FOR HEATING CONCRETE MATERIALS AND PROTECTING FRESH CONCRETE DURING FREEZING OR NEAR FREEZING WEATHER CONDITIONS, ACCORDING TO THE INTERNATIONAL BUILDING CODE, 2012 EDITION.

2. ALL CONCRETE MATERIALS, REBAR, FORMS, FILLERS, AND THE EARTH WITH WHICH THE CONCRETE IS TO COME INTO CONTACT WITH, SHALL BE FREE FROM FROST AND ICE.

3. WHENEVER THE SURROUNDING TEMPERATURE IS BELOW 39°F, ALL CONCRETE POURED IN THE FORMS SHALL HAVE A TEMPERATURE OF 68°F FOR 4 DAYS.

4. THE HOUSING, COVERING, OR OTHER PROTECTION USED FOR THE CURING SHALL REMAIN IN PLACE AND INTACT FOR AT LEAST 24 HOURS AFTER THE ARTIFICIAL HEATING IS DISCONTINUED.

5. SALT, CALCIUM CHLORIDE, OR OTHER CHEMICALS SHALL NOT BE USED IN THE CONCRETE MIX TO PREVENT THE WATER CONTENT FROM FREEZING.

UTILITIES:

1. CONTRACTOR SHALL CONTACT A SUBSURFACE UTILITY LOCATOR FOR LOCATION OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. LOCATION OF EXISTING SEWER, WATER LINES, GAS LINES, CONDUITS OR OTHER STRUCTURES ACROSS, UNDERNEATH, OR OTHERWISE ALONG THE LINE OF PROPOSED WORK ARE NOT NECESSARILY SHOWN ON THE PLANS, AND IF SHOWN ARE ONLY APPROXIMATELY CORRECT. CONTRACTOR ASSUMES SOLE RESPONSIBILITY FOR VERIFYING LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES (INCLUDING TEST PITS BY HAND IF NECESSARY) IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT ENGINEER IMMEDIATELY IF LOCATION OF ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLANS, OR IF THERE APPEARS TO BE A CONFLICT.

2. CONTRACTOR SHALL COORDINATE ALL UTILITY CONNECTIONS WITH APPROPRIATE UTILITY OWNERS AND CONSTRUCTION MANAGER.

3. DAMAGE BY THE CONTRACTOR TO UTILITIES OR PROPERTY OF OTHERS, INCLUDING EXISTING PAVEMENT AND OTHER SURFACES DISTURBED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE REPAIRED TO PRE-CONSTRUCTION CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CLIENT. FOR GRASSES AREAS, SEED AND MULCH SHALL BE ACCEPTABLE.

4. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER THE REQUIREMENTS FOR AND LIMITS OF OVERHEAD AND/OR UNDERGROUND ELECTRICAL SERVICE.

5. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF NEW UNDERGROUND TELEPHONE SERVICE WITH THE TELEPHONE UTILITY AND THE OWNER'S REQUIREMENTS.

6. ALL UNDERGROUND UTILITIES SHALL BE INSTALLED AND TESTED SATISFACTORY PRIOR TO COMMENCING ANY PAVING OPERATIONS WHERE SUCH UTILITIES ARE WITHIN THE LIMITS OF PAVEMENT.

GRADING:

1. THE CONTRACTOR SHALL REWORK (DRY, SCARIFY, ETC...) ALL MATERIAL NOT SUITABLE FOR SUB GRADE IN ITS PRESENT STATE. IF THE MATERIAL, AFTER REWORKING, REMAINS UNSUITABLE THEN THE CONTRACTOR SHALL UNDERCUT THIS MATERIAL AND REPLACE WITH APPROVED MATERIAL AT HIS EXPENSE. ALL SUB GRADES SHALL BE PROOF ROLLED WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK PRIOR TO PAVING. ANY SOFT MATERIAL SHALL BE REWORKED OR REPLACED.

2. THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL DITCHES, PIPES, AND OTHER DRAINAGE STRUCTURES FREE FROM OBSTRUCTION UNTIL WORK IS ACCEPTABLE BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED BY FAILURE TO MAINTAIN DRAINAGE STRUCTURES IN OPERABLE CONDITION.

3. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE.

GROUNDING:

1. CONTRACTOR SHALL VERIFY THAT GROUNDING ELECTRODES SHALL BE CONNECTED IN A RING USING #2 SOLID TINNED COPPER WIRE. THE TOP OF THE GROUND RODS AND THE RING CONDUCTOR SHALL BE 2 FEET BELOW FINISHED GRADE. GROUNDING ELECTRODES SHALL BE DRIVEN ON 10'-0" CENTERS (15'-0" MAXIMUM; PROVIDE AND INSTALL AS REQUIRED PER TYPICAL GROUNDING PLAN ON THIS SET).

2. BONDING OF THE GROUNDING CONDUCTOR (NEUTRAL) AND THE GROUNDING CONDUCTOR SHALL BE AT THE SERVICE DISCONNECTING MEANS. BONDING JUMPER SHALL BE INSTALLED PER CSA.

3. GROUND RING CONNECTION CONDUCTORS SHALL BE OF EQUAL LENGTH, MATERIAL, AND BONDING TECHNIQUE.

4. CONTRACTOR SHALL ENSURE GROUND RING IS WITHIN 12 TO 36 INCHES OF THE EQUIPMENT PAD. PROVIDE AND INSTALL GROUNDING CONNECTIONS SHOWN IN DETAILS AS NEEDED PER EXISTING SITE GROUNDING SYSTEM. CONTRACTOR SHALL VERIFY ALL EXISTING SITE GROUNDING CONDITIONS BEFORE STARTING WORK OR PURCHASING EQUIPMENT.

5. BOND CIGBE TO EXTERNAL GROUND RING WITH 2 RUNS OF #2 SOLID TINNED COPPER CONDUCTOR IN PVC. CONNECT BAR END WITH 2 HOLE LUG, AND "CADWELD" THE OTHER END TO THE EXTERNAL GROUND ROD.

6. THE PREFERRED LOCATION FOR COAX GROUNDING IS AT THE BASE OF THE TOWER PRIOR TO THE COAX BEND. BONDING IS SHOWN ON THE ICE BRIDGE DUE TO DIFFICULTY WITH WELDING OR ATTACHING TO TOWER LEGS. CONTRACTOR SHALL ADVISE CONSTRUCTION MANAGER PRIOR TO PLACING CIGBE ON ICE BRIDGE IF MOUNTING TO TOWER LEG IS POSSIBLE.

7. CONTRACTOR SHALL VERIFY EXISTING GROUNDING BOND TO THE FENCE POST OR EXTERNAL GROUND RING IN AT (2) PLACES. PROVIDE AND INSTALL GROUNDING CONNECTIONS AS REQUIRED TO MEET THESE CONDITIONS.

APPLICANT/LESSEE:

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487-1307
OFFICE: (561) 226-9457

PROJECT INFORMATION:

SITE NAME:
BURLINGTON-AVON LANDFILL
SITE ID: CT46143A

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-3530
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

May 4, 2023

REV	DATE	ISSUED FOR:
2	05-04-23	CONSTRUCTION
1	05-02-23	PRELIMINARY
0	04-20-23	PRELIMINARY

DRAWN BY: CLR | CHECKED BY: MJC

SHEET TITLE:

GENERAL NOTES II

SHEET NUMBER: **N-2**

REVISION: **2**

TEP#: 26144.833086

September 14, 2023

Greg Hines
SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487
(561) 226-9532

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
PHX_Structures@tepgroup.net

Subject: **Structural Analysis Report**

Owner Designation:	**Site Number:**	CT46143-A
	Site Name:	Burlington Avon Landfill
Engineering Firm Designation:	**TEP Project Number:**	265144.882085
Site Data:	**277 Huckleberry Hill Road, Avon, Hartford County, CT 06001** **Latitude *41° 47' 17.28"*, Longitude *-72° 55' 5.71"*** **131.0± Foot - Monopole**	

Dear Greg Hines,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC1: Existing + Proposed + Reserved Loading **Sufficient Capacity**
Note: See Table 1 for the existing, proposed, and reserved loading

Structure Capacity	Foundation Capacity
30.4%	23.4%

The analysis has been performed in accordance with the ANSI/TIA-222-H Structural Standard for Antenna Supporting Structures and Antennas - Addendum 2 and the 2022 Connecticut State Building Code.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Table 1 for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *SBA Communications Corporation.* If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Anqi Wang / PHX

Respectfully submitted by:

Aaron T. Rucker, P.E.

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

09/14/2023

TABLE OF CONTENTS

1) INTRODUCTION

The tower is a proposed 131.0± foot monopole tower designed by Sabre Industries in June of 2023.

2) ANALYSIS CRITERIA

TIA-222 Revision:	ANSI/TIA-222-H
Type of Analysis:	Comprehensive
Risk Category:	II
Wind Speed:	120 mph (Ultimate)
Exposure Category:	C
Topographic Category:	1 (Kzt = 1.0)
Ice Thickness:	1.50 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Existing, Proposed, and Reserved Antenna and Cable Information

Existing/ Proposed/ Reserved	Mount Level (ft)	Ant CL (ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size	Coax Location	Owner/ Tenant
Proposed	*130.0*	*130.0*	*3*	*DBSpectra DS7C09P36U-D*	*Platform Mount*	*3*	*1-5/8*	*Inside*	*Town of Avon*
			1	*TX RX Systems 432F-83W-01T*		*1*	*1/2*		
Proposed	*110.0*	*110.0*	*3*	*Commscope NHHSS-65B-R2B*	*Ring Mount*	*2*	*1-5/8*	*Inside*	*Verizon*
			3	*Commscope NHH-65B-R2B*					
			3	*Samsung Telecom. MT6407-77A*					
			3	*Samsung Telecom. B2/B66A RRH ORAN*					
			3	*Samsung Telecom. B5/B13 RRH ORAN*					
			3	*Samsung Telecom. CBRS RRH-RT4401-48A*					
			1	*Raycap DB-B1-6C-12AB-0Z*					
Proposed	*90.0*	*90.0*	*3*	*Andrew SBNHH-1D65C*	*Pipe Mount*	*6* *2* *1*	*1-5/8* *3/4* *7/16*	*Inside*	*AT&T*
			3	*Andrew APTDC-BDFDM-DBW*					
			3	*Powerwave LGP2140 TMA*					
			3	*CCI TMABPDB7823VG12A*					
Proposed	*80.0*	*80.0*	*3*	*RFS Celwave APXVAR18_43-C-NA20*	*Pipe Mount*	*12*	*7/8*	*Inside*	*T-Mobile*
			6	*RFS Celwave ATMAA1412D-1A20*					

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Source
Tower and Foundation Design	Sabre Industries, dated June 29, 2023 Job No. 521586	SBA Communications
Geotechnical Report	Delta Oaks Group, dated June 28, 2023 Project GEO 23-19365-01	SBA Communications
Correspondence	Correspondence in reference to the existing, proposed, and reserved loading.	SBA Communications

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Analysis Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) Unless specified by the client or tower mapping, the location of the existing and proposed coax is assumed by TEP and listed in Table 1.
3) All tower components are in sufficient condition to carry their full design capacity.
4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
5) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
6) The soil properties below 18-ft were not provided in the geotechnical report and were assumed to match the layer above.

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

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
L1	130 - 98.25	Pole	TP23.38x14x0.25	1	-7.43	1029.12	19.4	Pass
L2	98.25 - 48	Pole	TP37.71x21.92x0.375	2	-16.91	2491.73	29.1	Pass
L3	48 - 0	Pole	TP51.14x35.41x0.438	3	-33.15	4118.80	30.3	Pass
							Summary	
						Pole (L3)	30.3	Pass
						Rating =	**30.3**	**Pass**

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	27.9	Pass
1	Base Plate	-	30.4	Pass
1	Base Foundation Structural	-	21.6	Pass
1	Base Foundation Soil Interaction	-	23.4	Pass

Structure Rating (max from all components) =	30.4%

Notes:
1) See additional documentation in "Appendix B - Additional Calculations" for calculations supporting the % capacity listed.

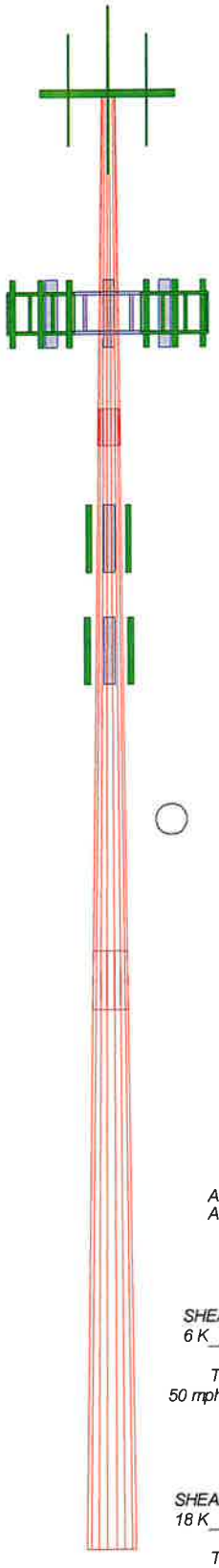
4.1) Recommendations

1) If the load differs from that described in Table 1 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	31.75	18	0.250	3.25	14.000	23.380		1.6
2	53.50	18	0.375	5.25	21.920	37.710	A572-65	6.4
3	53.25	18	0.438		35.410	51.140		10.8
								18.7



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 30.3%

ALL REACTIONS ARE FACTORED

AXIAL 54 K
SHEAR 6 K
MOMENT 533 kip-ft
TORQUE 1 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 33 K
SHEAR 18 K
MOMENT 1521 kip-ft
TORQUE 1 kip-ft
REACTIONS - 120 mph WIND

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6360
TEP

Job: *Burlington Avon Landfill (CT46143-A)*			
Project: *TEP No. 265144.882085*			
Client: SBA Communications Corporation	Drawn by: awang		App'd:
Code: TIA-222-H	Date: 09/08/23		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 468.00 ft.
Basic wind speed of 120 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs	√	Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	130.00-98.25	31.75	3.250	18	14.000	23.380	0.250	1.000	A572-65 (65 ksi)
L2	98.25-48.00	53.50	5.250	18	21.920	37.710	0.375	1.500	A572-65 (65 ksi)
L3	48.00-0.00	53.25		18	35.410	51.140	0.438	1.750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	14.177	10.911	260.611	4.881	7.112	36.644	521.565	5.456	2.024	8.096
	23.702	18.354	1240.541	8.211	11.877	104.449	2482.715	9.179	3.675	14.7
L2	23.174	25.644	1503.854	7.648	11.135	135.053	3009.686	12.824	3.198	8.528
	38.234	44.438	7825.716	13.254	19.157	408.511	15661.730	22.223	5.977	15.939
L3	37.464	48.564	7504.488	12.415	17.989	417.182	15018.850	24.287	5.462	12.485
	51.861	70.407	22867.072	17.999	25.979	880.210	45764.232	35.210	8.231	18.813

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 130.00-98.25				1	1	1			
L2 98.25-48.00				1	1	1			
L3 48.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***											
******											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Misc									
Safcty Linc 3/8	C	No	No	CaAa (Out Of Face)	130.00 - 0.00	1	No Ice	0.04	0.220
							1/2" Ice	0.14	0.750
							1" Ice	0.24	1.280
							2" Ice	0.44	2.340
Step Pegs (5/8" SR)	C	No	No	CaAa (Out	130.00 - 0.00	1	No Ice	0.01	0.209

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
6-in. w/ 30" step				Of Face)			1/2" Ice	0.11	0.591
							1" Ice	0.21	1.583
							2" Ice	0.41	5.401
130									
EC7-50(1-5/8")	C	No	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	1.010
							1/2" Ice	0.00	1.010
							1" Ice	0.00	1.010
							2" Ice	0.00	1.010
EC4-50(1/2")	C	No	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	0.160
							1/2" Ice	0.00	0.160
							1" Ice	0.00	0.160
							2" Ice	0.00	0.160
110									
HFT1206-24SVL-210(1-5/8)	C	No	No	Inside Pole	110.00 - 0.00	2	No Ice	0.00	1.920
							1/2" Ice	0.00	1.920
							1" Ice	0.00	1.920
							2" Ice	0.00	1.920
90									
HFT1206-24SVL-210(1-5/8)	C	No	No	Inside Pole	90.00 - 0.00	6	No Ice	0.00	1.920
							1/2" Ice	0.00	1.920
							1" Ice	0.00	1.920
							2" Ice	0.00	1.920
3/4" DC	C	No	No	Inside Pole	90.00 - 0.00	2	No Ice	0.00	1.240
							1/2" Ice	0.00	1.240
							1" Ice	0.00	1.240
							2" Ice	0.00	1.240
8107971/DB(7/16)	C	No	No	Inside Pole	90.00 - 0.00	1	No Ice	0.00	0.081
							1/2" Ice	0.00	0.081
							1" Ice	0.00	0.081
							2" Ice	0.00	0.081
3" Flexible Conduit	C	No	No	Inside Pole	90.00 - 0.00	1	No Ice	0.00	1.040
							1/2" Ice	0.00	1.040
							1" Ice	0.00	1.040
							2" Ice	0.00	1.040
80									
WR-VG66ST-BRD(7/8)	C	No	No	Inside Pole	80.00 - 0.00	12	No Ice	0.00	0.912
							1/2" Ice	0.00	0.912
							1" Ice	0.00	0.912
							2" Ice	0.00	0.912
***									
******									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-98.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.588	0.16
L2	98.25-48.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.513	1.36
L3	48.00-0.00	A	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.400	1.61

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-98.25	A	1.696	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	23.131	0.35
L2	98.25-48.00	A	1.621	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	36.609	1.65
L3	48.00-0.00	A	1.452	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	33.516	1.87

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-98.25	-0.387	0.224	-2.124	1.226
L2	98.25-48.00	-0.395	0.228	-2.489	1.437
L3	48.00-0.00	-0.398	0.230	-2.633	1.520

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
5/8" x 20' Lightning Rod	C	None		0.000	130.00	No Ice	1.25	1.25	0.02
						1/2" Ice	3.26	3.26	0.03
						1" Ice	5.29	5.29	0.06
						2" Ice	9.40	9.40	0.15
130									
DS7C06P36U-D	A	From Centroid-Leg	4.00 0.000 0.000	0.000	130.00	No Ice	2.08	2.08	0.03
						1/2" Ice	2.95	2.95	0.04
						1" Ice	3.66	3.66	0.07
						2" Ice	4.69	4.69	0.12
DS7C06P36U-D	B	From	4.00	0.000	130.00	No Ice	2.08	2.08	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.000 0.000			1/2" Ice	2.95	2.95	0.04
						1" Ice	3.66	3.66	0.07
						2" Ice	4.69	4.69	0.12
DS7C06P36U-D	C	From Centroid-Leg	4.00 0.000 0.000	0.000	130.00	No Ice	2.08	2.08	0.03
						1/2" Ice	2.95	2.95	0.04
						1" Ice	3.66	3.66	0.07
						2" Ice	4.69	4.69	0.12
431-86A-01-T	C	From Centroid-Leg	4.00 0.000 0.000	0.000	130.00	No Ice	1.60	1.20	0.05
						1/2" Ice	1.76	1.34	0.06
						1" Ice	1.93	1.49	0.08
						2" Ice	2.28	1.81	0.12
Platform Mount [LP 301-1]	C	None		0.000	130.00	No Ice	23.81	23.81	1.59
						1/2" Ice	30.24	30.24	2.10
						1" Ice	36.33	36.33	2.73
						2" Ice	48.05	48.05	4.34
110									
NHHSS-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	8.32	7.00	0.09
						1/2" Ice	8.88	8.19	0.16
						1" Ice	9.40	9.08	0.24
						2" Ice	10.47	10.90	0.42
NHHSS-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	8.32	7.00	0.09
						1/2" Ice	8.88	8.19	0.16
						1" Ice	9.40	9.08	0.24
						2" Ice	10.47	10.90	0.42
NHHSS-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	8.32	7.00	0.09
						1/2" Ice	8.88	8.19	0.16
						1" Ice	9.40	9.08	0.24
						2" Ice	10.47	10.90	0.42
NHH-65B-R2B w/ Mount Pipe	A	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	9.04	7.48	0.08
						1/2" Ice	9.90	8.86	0.15
						1" Ice	10.77	10.27	0.23
						2" Ice	12.28	12.33	0.43
NHH-65B-R2B w/ Mount Pipe	B	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	9.04	7.48	0.08
						1/2" Ice	9.90	8.86	0.15
						1" Ice	10.77	10.27	0.23
						2" Ice	12.28	12.33	0.43
NHH-65B-R2B w/ Mount Pipe	C	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	9.04	7.48	0.08
						1/2" Ice	9.90	8.86	0.15
						1" Ice	10.77	10.27	0.23
						2" Ice	12.28	12.33	0.43
MT6407-77A w/ Mount Pipe	A	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	4.91	2.68	0.10
						1/2" Ice	5.26	3.14	0.14
						1" Ice	5.61	3.62	0.18
						2" Ice	6.36	4.63	0.29
MT6407-77A w/ Mount Pipe	B	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	4.91	2.68	0.10
						1/2" Ice	5.26	3.14	0.14
						1" Ice	5.61	3.62	0.18
						2" Ice	6.36	4.63	0.29
MT6407-77A w/ Mount Pipe	C	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	4.91	2.68	0.10
						1/2" Ice	5.26	3.14	0.14
						1" Ice	5.61	3.62	0.18
						2" Ice	6.36	4.63	0.29
RF4439D-25A	A	From Leg	4.00 0.000 0.000	0.000	110.00	No Ice	1.87	1.25	0.07
						1/2" Ice	2.03	1.39	0.09
						1" Ice	2.21	1.54	0.11
						2" Ice	2.59	1.87	0.17
RF4439D-25A	B	From Leg	4.00	0.000	110.00	No Ice	1.87	1.25	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	2.03	1.39	0.09
			0.000			1" Ice	2.21	1.54	0.11
						2" Ice	2.59	1.87	0.17
RF4439D-25A	C	From Leg	4.00	0.000	110.00	No Ice	1.87	1.25	0.07
			0.000			1/2" Ice	2.03	1.39	0.09
			0.000			1" Ice	2.21	1.54	0.11
						2" Ice	2.59	1.87	0.17
RF4440D-13A	A	From Leg	4.00	0.000	110.00	No Ice	1.87	1.13	0.07
			0.000			1/2" Ice	2.03	1.27	0.09
			0.000			1" Ice	2.21	1.41	0.11
						2" Ice	2.59	1.72	0.16
RF4440D-13A	B	From Leg	4.00	0.000	110.00	No Ice	1.87	1.13	0.07
			0.000			1/2" Ice	2.03	1.27	0.09
			0.000			1" Ice	2.21	1.41	0.11
						2" Ice	2.59	1.72	0.16
RF4440D-13A	C	From Leg	4.00	0.000	110.00	No Ice	1.87	1.13	0.07
			0.000			1/2" Ice	2.03	1.27	0.09
			0.000			1" Ice	2.21	1.41	0.11
						2" Ice	2.59	1.72	0.16
CBRS RRHRT4401-48A	A	From Leg	4.00	0.000	110.00	No Ice	0.99	0.50	0.02
			0.000			1/2" Ice	1.12	0.60	0.03
			0.000			1" Ice	1.26	0.70	0.04
						2" Ice	1.55	0.94	0.06
CBRS RRHRT4401-48A	B	From Leg	4.00	0.000	110.00	No Ice	0.99	0.50	0.02
			0.000			1/2" Ice	1.12	0.60	0.03
			0.000			1" Ice	1.26	0.70	0.04
						2" Ice	1.55	0.94	0.06
CBRS RRHRT4401-48A	C	From Leg	4.00	0.000	110.00	No Ice	0.99	0.50	0.02
			0.000			1/2" Ice	1.12	0.60	0.03
			0.000			1" Ice	1.26	0.70	0.04
						2" Ice	1.55	0.94	0.06
DB-B1-6C-12AB-0Z	C	From Leg	4.00	0.000	110.00	No Ice	3.36	2.19	0.03
			0.000			1/2" Ice	3.60	2.39	0.06
			0.000			1" Ice	3.84	2.61	0.09
						2" Ice	4.34	3.05	0.16
Pipe Mount [PM 601-3]	C	None		0.000	110.00	No Ice	3.17	3.17	0.20
						1/2" Ice	3.79	3.79	0.23
						1" Ice	4.42	4.42	0.28
						2" Ice	5.76	5.76	0.40
Sector Mount [SM 502-3]	C	None		0.000	110.00	No Ice	29.82	29.82	1.67
						1/2" Ice	42.21	42.21	2.27
						1" Ice	54.43	54.43	3.05
						2" Ice	78.49	78.49	5.18
90									
SBNHH-1D65C	A	From Leg	1.00	0.000	90.00	No Ice	11.47	7.72	0.05
			0.000			1/2" Ice	12.09	8.31	0.12
			0.000			1" Ice	12.72	8.91	0.19
						2" Ice	13.98	10.14	0.36
SBNHH-1D65C	B	From Leg	1.00	0.000	90.00	No Ice	11.47	7.72	0.05
			0.000			1/2" Ice	12.09	8.31	0.12
			0.000			1" Ice	12.72	8.91	0.19
						2" Ice	13.98	10.14	0.36
SBNHH-1D65C	C	From Leg	1.00	0.000	90.00	No Ice	11.47	7.72	0.05
			0.000			1/2" Ice	12.09	8.31	0.12
			0.000			1" Ice	12.72	8.91	0.19
						2" Ice	13.98	10.14	0.36
APTDC-BDFDM-DB	A	From Leg	1.00	0.000	90.00	No Ice	0.05	0.10	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	0.08	0.14	0.00
			0.000			1" Ice	0.12	0.19	0.00
						2" Ice	0.22	0.31	0.01
APTDC-BDFDM-DB	B	From Leg	1.00	0.000	90.00	No Ice	0.05	0.10	0.00
			0.000			1/2" Ice	0.08	0.14	0.00
			0.000			1" Ice	0.12	0.19	0.00
						2" Ice	0.22	0.31	0.01
APTDC-BDFDM-DB	C	From Leg	1.00	0.000	90.00	No Ice	0.05	0.10	0.00
			0.000			1/2" Ice	0.08	0.14	0.00
			0.000			1" Ice	0.12	0.19	0.00
						2" Ice	0.22	0.31	0.01
LGP21401	A	From Leg	1.00	0.000	90.00	No Ice	1.10	0.35	0.01
			0.000			1/2" Ice	1.24	0.44	0.02
			0.000			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
LGP21401	B	From Leg	1.00	0.000	90.00	No Ice	1.10	0.35	0.01
			0.000			1/2" Ice	1.24	0.44	0.02
			0.000			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
LGP21401	C	From Leg	1.00	0.000	90.00	No Ice	1.10	0.35	0.01
			0.000			1/2" Ice	1.24	0.44	0.02
			0.000			1" Ice	1.38	0.54	0.03
						2" Ice	1.69	0.77	0.05
TMABPDB7823VG12A	A	From Leg	1.00	0.000	90.00	No Ice	0.98	0.33	0.02
			0.000			1/2" Ice	1.10	0.41	0.03
			0.000			1" Ice	1.23	0.50	0.04
						2" Ice	1.52	0.71	0.06
TMABPDB7823VG12A	B	From Leg	1.00	0.000	90.00	No Ice	0.98	0.33	0.02
			0.000			1/2" Ice	1.10	0.41	0.03
			0.000			1" Ice	1.23	0.50	0.04
						2" Ice	1.52	0.71	0.06
TMABPDB7823VG12A	C	From Leg	1.00	0.000	90.00	No Ice	0.98	0.33	0.02
			0.000			1/2" Ice	1.10	0.41	0.03
			0.000			1" Ice	1.23	0.50	0.04
						2" Ice	1.52	0.71	0.06
Pipe Mount [PM 501-3]	C	None		0.000	90.00	No Ice	4.46	4.46	0.16
						1/2" Ice	5.52	5.52	0.21
						1" Ice	6.66	6.66	0.29
						2" Ice	9.16	9.16	0.49
80									
APXVAR18_43-C-NA20	A	From Leg	1.00	0.000	80.00	No Ice	9.65	6.03	0.07
			0.000			1/2" Ice	10.11	6.47	0.13
			0.000			1" Ice	10.57	6.90	0.20
						2" Ice	11.52	7.78	0.36
APXVAR18_43-C-NA20	B	From Leg	1.00	0.000	80.00	No Ice	9.65	6.03	0.07
			0.000			1/2" Ice	10.11	6.47	0.13
			0.000			1" Ice	10.57	6.90	0.20
						2" Ice	11.52	7.78	0.36
APXVAR18_43-C-NA20	C	From Leg	1.00	0.000	80.00	No Ice	9.65	6.03	0.07
			0.000			1/2" Ice	10.11	6.47	0.13
			0.000			1" Ice	10.57	6.90	0.20
						2" Ice	11.52	7.78	0.36
(2) ATMAA1412D-1A20	A	From Leg	1.00	0.000	80.00	No Ice	1.00	0.41	0.01
			0.000			1/2" Ice	1.13	0.50	0.02
			0.000			1" Ice	1.26	0.59	0.03
						2" Ice	1.55	0.81	0.06
(2) ATMAA1412D-1A20	B	From Leg	1.00	0.000	80.00	No Ice	1.00	0.41	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	1.13	0.50	0.02
			0.000			1" Ice	1.26	0.59	0.03
						2" Ice	1.55	0.81	0.06
(2) ATMAA1412D-1A20	C	From Leg	1.00	0.000	80.00	No Ice	1.00	0.41	0.01
			0.000			1/2" Ice	1.13	0.50	0.02
			0.000			1" Ice	1.26	0.59	0.03
						2" Ice	1.55	0.81	0.06
Pipe Mount [PM 501-3]	C	None		0.000	80.00	No Ice	4.46	4.46	0.16
						1/2" Ice	5.52	5.52	0.21
						1" Ice	6.66	6.66	0.29
						2" Ice	9.16	9.16	0.49
***									
*****									
**********									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 98.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.67	1.20	-0.69
			Max. Mx	20	-7.44	109.94	-0.64
			Max. My	14	-7.44	0.79	-109.28
			Max. Vy	20	-7.90	109.94	-0.64
			Max. Vx	14	7.86	0.79	-109.28
			Max. Torque	24			0.72
L2	98.25 - 48	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.02	1.56	-0.90
			Max. Mx	20	-16.91	657.70	-2.10
			Max. My	14	-16.91	2.27	-655.38
			Max. Vy	20	-14.06	657.70	-2.10
			Max. Vx	14	14.02	2.27	-655.38
			Max. Torque	24			0.85
L3	48 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.96	2.05	-1.19
			Max. Mx	20	-33.15	1518.88	-3.68
			Max. My	14	-33.15	3.87	-1514.75
			Max. Vy	20	-18.23	1518.88	-3.68
			Max. Vx	14	18.19	3.87	-1514.75
			Max. Torque	38			1.05

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	35	53.96	5.45	-3.15
	Max. H_x	20	33.16	18.21	-0.03
	Max. H_z	2	33.16	-0.03	18.18
	Max. M_x	2	1514.22	-0.03	18.18

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_z	8	1517.97	-18.21	0.03
	Max. Torsion	38	1.05	3.14	5.44
	Min. Vert	25	24.87	9.08	15.73
	Min. H_x	8	33.16	-18.21	0.03
	Min. H_z	14	33.16	0.03	-18.18
	Min. M_x	14	-1514.75	0.03	-18.18
	Min. M_z	20	-1518.88	18.21	-0.03
	Min. Torsion	32	-1.05	-3.14	-5.44

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	27.63	0.00	0.00	0.21	0.36	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	33.16	0.03	-18.18	-1514.22	-2.96	-0.88
0.9 Dead+1.0 Wind 0 deg - No Ice	24.87	0.03	-18.18	-1505.54	-3.05	-0.88
1.2 Dead+1.0 Wind 30 deg - No Ice	33.16	9.13	-15.76	-1313.02	-761.71	-0.51
0.9 Dead+1.0 Wind 30 deg - No Ice	24.87	9.13	-15.76	-1305.51	-757.42	-0.51
1.2 Dead+1.0 Wind 60 deg - No Ice	33.16	15.79	-9.11	-759.93	-1316.24	-0.00
0.9 Dead+1.0 Wind 60 deg - No Ice	24.87	15.79	-9.11	-755.61	-1308.75	-0.00
1.2 Dead+1.0 Wind 90 deg - No Ice	33.16	18.21	-0.03	-3.15	-1517.97	0.51
0.9 Dead+1.0 Wind 90 deg - No Ice	24.87	18.21	-0.03	-3.20	-1509.31	0.51
1.2 Dead+1.0 Wind 120 deg - No Ice	33.16	15.76	9.06	754.55	-1312.83	0.88
0.9 Dead+1.0 Wind 120 deg - No Ice	24.87	15.76	9.06	750.13	-1305.37	0.88
1.2 Dead+1.0 Wind 150 deg - No Ice	33.16	9.08	15.73	1310.14	-755.80	1.02
0.9 Dead+1.0 Wind 150 deg - No Ice	24.87	9.08	15.73	1302.51	-751.55	1.02
1.2 Dead+1.0 Wind 180 deg - No Ice	33.16	-0.03	18.18	1514.75	3.87	0.88
0.9 Dead+1.0 Wind 180 deg - No Ice	24.87	-0.03	18.18	1505.94	3.73	0.88
1.2 Dead+1.0 Wind 210 deg - No Ice	33.16	-9.13	15.76	1313.55	762.63	0.51
0.9 Dead+1.0 Wind 210 deg - No Ice	24.87	-9.13	15.76	1305.90	758.10	0.51
1.2 Dead+1.0 Wind 240 deg - No Ice	33.16	-15.79	9.11	760.46	1317.16	-0.00
0.9 Dead+1.0 Wind 240 deg - No Ice	24.87	-15.79	9.11	756.00	1309.43	-0.00
1.2 Dead+1.0 Wind 270 deg - No Ice	33.16	-18.21	0.03	3.68	1518.88	-0.51
0.9 Dead+1.0 Wind 270 deg - No Ice	24.87	-18.21	0.03	3.59	1509.99	-0.51
1.2 Dead+1.0 Wind 300 deg - No Ice	33.16	-15.76	-9.06	-754.02	1313.75	-0.88

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 300 deg - No Ice	24.87	-15.76	-9.06	-749.74	1306.04	-0.88
1.2 Dead+1.0 Wind 330 deg - No Ice	33.16	-9.08	-15.73	-1309.61	756.71	-1.02
0.9 Dead+1.0 Wind 330 deg - No Ice	24.87	-9.08	-15.73	-1302.12	752.23	-1.02
1.2 Dead+1.0 Ice+1.0 Temp	53.96	-0.00	0.00	1.19	2.05	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	53.96	0.01	-6.28	-527.99	1.47	-0.91
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	53.96	3.15	-5.44	-457.43	-263.45	-0.52
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	53.96	5.45	-3.15	-263.96	-457.20	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	53.96	6.29	-0.01	0.56	-527.87	0.52
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	53.96	5.44	3.14	265.27	-456.52	0.91
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	53.96	3.14	5.44	459.23	-262.28	1.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	53.96	-0.01	6.28	530.47	2.82	0.91
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	53.96	-3.15	5.44	459.90	267.73	0.52
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	53.96	-5.45	3.15	266.44	461.48	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	53.96	-6.29	0.01	1.91	532.16	-0.52
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	53.96	-5.44	-3.14	-262.79	460.81	-0.91
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	53.96	-3.14	-5.44	-456.75	266.56	-1.05
Dead+Wind 0 deg - Service	27.63	0.01	-4.07	-337.32	-0.38	-0.20
Dead+Wind 30 deg - Service	27.63	2.04	-3.52	-292.48	-169.49	-0.11
Dead+Wind 60 deg - Service	27.63	3.53	-2.04	-169.21	-293.08	-0.00
Dead+Wind 90 deg - Service	27.63	4.07	-0.01	-0.54	-338.04	0.11
Dead+Wind 120 deg - Service	27.63	3.52	2.03	168.33	-292.32	0.20
Dead+Wind 150 deg - Service	27.63	2.03	3.52	292.16	-168.17	0.23
Dead+Wind 180 deg - Service	27.63	-0.01	4.07	337.76	1.14	0.20
Dead+Wind 210 deg - Service	27.63	-2.04	3.52	292.92	170.25	0.11
Dead+Wind 240 deg - Service	27.63	-3.53	2.04	169.65	293.84	-0.00
Dead+Wind 270 deg - Service	27.63	-4.07	0.01	0.98	338.80	-0.11
Dead+Wind 300 deg - Service	27.63	-3.52	-2.03	-167.89	293.08	-0.20
Dead+Wind 330 deg - Service	27.63	-2.03	-3.52	-291.72	168.93	-0.23

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-27.63	0.00	0.00	27.63	0.00	0.000%
2	0.03	-33.16	-18.18	-0.03	33.16	18.18	0.000%
3	0.03	-24.87	-18.18	-0.03	24.87	18.18	0.000%
4	9.13	-33.16	-15.76	-9.13	33.16	15.76	0.000%
5	9.13	-24.87	-15.76	-9.13	24.87	15.76	0.000%
6	15.79	-33.16	-9.11	-15.79	33.16	9.11	0.000%
7	15.79	-24.87	-9.11	-15.79	24.87	9.11	0.000%
8	18.21	-33.16	-0.03	-18.21	33.16	0.03	0.000%
9	18.21	-24.87	-0.03	-18.21	24.87	0.03	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
10	15.76	-33.16	9.06	-15.76	33.16	-9.06	0.000%
11	15.76	-24.87	9.06	-15.76	24.87	-9.06	0.000%
12	9.08	-33.16	15.73	-9.08	33.16	-15.73	0.000%
13	9.08	-24.87	15.73	-9.08	24.87	-15.73	0.000%
14	-0.03	-33.16	18.18	0.03	33.16	-18.18	0.000%
15	-0.03	-24.87	18.18	0.03	24.87	-18.18	0.000%
16	-9.13	-33.16	15.76	9.13	33.16	-15.76	0.000%
17	-9.13	-24.87	15.76	9.13	24.87	-15.76	0.000%
18	-15.79	-33.16	9.11	15.79	33.16	-9.11	0.000%
19	-15.79	-24.87	9.11	15.79	24.87	-9.11	0.000%
20	-18.21	-33.16	0.03	18.21	33.16	-0.03	0.000%
21	-18.21	-24.87	0.03	18.21	24.87	-0.03	0.000%
22	-15.76	-33.16	-9.06	15.76	33.16	9.06	0.000%
23	-15.76	-24.87	-9.06	15.76	24.87	9.06	0.000%
24	-9.08	-33.16	-15.73	9.08	33.16	15.73	0.000%
25	-9.08	-24.87	-15.73	9.08	24.87	15.73	0.000%
26	0.00	-53.96	0.00	0.00	53.96	-0.00	0.000%
27	0.01	-53.96	-6.28	-0.01	53.96	6.28	0.000%
28	3.15	-53.96	-5.44	-3.15	53.96	5.44	0.000%
29	5.45	-53.96	-3.15	-5.45	53.96	3.15	0.000%
30	6.29	-53.96	-0.01	-6.29	53.96	0.01	0.000%
31	5.44	-53.96	3.14	-5.44	53.96	-3.14	0.000%
32	3.14	-53.96	5.44	-3.14	53.96	-5.44	0.000%
33	-0.01	-53.96	6.28	0.01	53.96	-6.28	0.000%
34	-3.15	-53.96	5.44	3.15	53.96	-5.44	0.000%
35	-5.45	-53.96	3.15	5.45	53.96	-3.15	0.000%
36	-6.29	-53.96	0.01	6.29	53.96	-0.01	0.000%
37	-5.44	-53.96	-3.14	5.44	53.96	3.14	0.000%
38	-3.14	-53.96	-5.44	3.14	53.96	5.44	0.000%
39	0.01	-27.63	-4.07	-0.01	27.63	4.07	0.000%
40	2.04	-27.63	-3.52	-2.04	27.63	3.52	0.000%
41	3.53	-27.63	-2.04	-3.53	27.63	2.04	0.000%
42	4.07	-27.63	-0.01	-4.07	27.63	0.01	0.000%
43	3.52	-27.63	2.03	-3.52	27.63	-2.03	0.000%
44	2.03	-27.63	3.52	-2.03	27.63	-3.52	0.000%
45	-0.01	-27.63	4.07	0.01	27.63	-4.07	0.000%
46	-2.04	-27.63	3.52	2.04	27.63	-3.52	0.000%
47	-3.53	-27.63	2.04	3.53	27.63	-2.04	0.000%
48	-4.07	-27.63	0.01	4.07	27.63	-0.01	0.000%
49	-3.52	-27.63	-2.03	3.52	27.63	2.03	0.000%
50	-2.03	-27.63	-3.52	2.03	27.63	3.52	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00012017
3	Yes	4	0.00000001	0.00007953
4	Yes	4	0.00000001	0.00087876
5	Yes	4	0.00000001	0.00057233
6	Yes	4	0.00000001	0.00091330
7	Yes	4	0.00000001	0.00059540
8	Yes	4	0.00000001	0.00006852
9	Yes	4	0.00000001	0.00004476
10	Yes	4	0.00000001	0.00096952

11	Yes	4	0.00000001	0.00063384
12	Yes	4	0.00000001	0.00083751
13	Yes	4	0.00000001	0.00054509
14	Yes	4	0.00000001	0.00013155
15	Yes	4	0.00000001	0.00008703
16	Yes	4	0.00000001	0.00095576
17	Yes	4	0.00000001	0.00062302
18	Yes	4	0.00000001	0.00091953
19	Yes	4	0.00000001	0.00059841
20	Yes	4	0.00000001	0.00007978
21	Yes	4	0.00000001	0.00005225
22	Yes	4	0.00000001	0.00084682
23	Yes	4	0.00000001	0.00055085
24	Yes	4	0.00000001	0.00098067
25	Yes	4	0.00000001	0.00064123
26	Yes	4	0.00000001	0.00000536
27	Yes	4	0.00000001	0.00058063
28	Yes	4	0.00000001	0.00065868
29	Yes	4	0.00000001	0.00066141
30	Yes	4	0.00000001	0.00057630
31	Yes	4	0.00000001	0.00067516
32	Yes	4	0.00000001	0.00066257
33	Yes	4	0.00000001	0.00058646
34	Yes	4	0.00000001	0.00068352
35	Yes	4	0.00000001	0.00067893
36	Yes	4	0.00000001	0.00058617
37	Yes	4	0.00000001	0.00066724
38	Yes	4	0.00000001	0.00068167
39	Yes	4	0.00000001	0.00000670
40	Yes	4	0.00000001	0.00001050
41	Yes	4	0.00000001	0.00001163
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00001544
44	Yes	4	0.00000001	0.00001047
45	Yes	4	0.00000001	0.00000685
46	Yes	4	0.00000001	0.00001392
47	Yes	4	0.00000001	0.00001191
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00001037
50	Yes	4	0.00000001	0.00001621

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 98.25	8.844	47	0.620	0.003
L2	101.5 - 48	5.353	47	0.524	0.001
L3	53.25 - 0	1.377	47	0.247	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	5/8" x 20' Lightning Rod	47	8.844	0.620	0.003	60713

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.00	NHHSS-65B-R2B w/ Mount Pipe	47	6.340	0.558	0.002	15178
90.00	SBNHH-1D65C	47	4.143	0.467	0.001	10063
80.00	APXVAR18_43-C-NA20	47	3.219	0.409	0.001	9602

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 98.25	39.618	18	2.771	0.012
L2	101.5 - 48	23.999	18	2.349	0.005
L3	53.25 - 0	6.176	18	1.106	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	5/8" x 20' Lightning Rod	18	39.618	2.771	0.012	13721
110.00	NHHSS-65B-R2B w/ Mount Pipe	18	28.416	2.500	0.007	3429
90.00	SBNHH-1D65C	18	18.581	2.093	0.004	2264
80.00	APXVAR18_43-C-NA20	18	14.439	1.834	0.003	2154

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	130 - 98.25 (1)	TP23.38x14x0.25	31.75	0.00	0.0	17.592	-7.43	1029.12	0.007
L2	98.25 - 48 (2)	TP37.71x21.92x0.375	53.50	0.00	0.0	42.594	-16.91	2491.73	0.007
L3	48 - 0 (3)	TP51.14x35.41x0.438	53.25	0.00	0.0	70.407	-33.15	4118.80	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	130 - 98.25 (1)	TP23.38x14x0.25	110.25	593.82	0.186	0.00	593.82	0.000
L2	98.25 - 48 (2)	TP37.71x21.92x0.375	658.84	2320.48	0.284	0.00	2320.48	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L3	48 - 0 (3)	TP51.14x35.41x0.438	1520.93	5164.96	0.294	0.00	5164.96	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	130 - 98.25 (1)	TP23.38x14x0.25	7.92	308.74	0.026	0.00	599.42	0.000
L2	98.25 - 48 (2)	TP37.71x21.92x0.375	14.07	747.52	0.019	0.00	2342.66	0.000
L3	48 - 0 (3)	TP51.14x35.41x0.438	18.24	1235.64	0.015	0.00	5486.57	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 98.25 (1)	0.007	0.186	0.000	0.026	0.000	0.194	1.000	4.8.2
L2	98.25 - 48 (2)	0.007	0.284	0.000	0.019	0.000	0.291	1.000	4.8.2
L3	48 - 0 (3)	0.008	0.294	0.000	0.015	0.000	0.303	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	130 - 98.25	Pole	TP23.38x14x0.25	1	-7.43	1029.12	19.4	Pass
L2	98.25 - 48	Pole	TP37.71x21.92x0.375	2	-16.91	2491.73	29.1	Pass
L3	48 - 0	Pole	TP51.14x35.41x0.438	3	-33.15	4118.80	30.3	Pass
							Summary	
						Pole (L3)	30.3	Pass
						RATING =	**30.3**	**Pass**

APPENDIX B

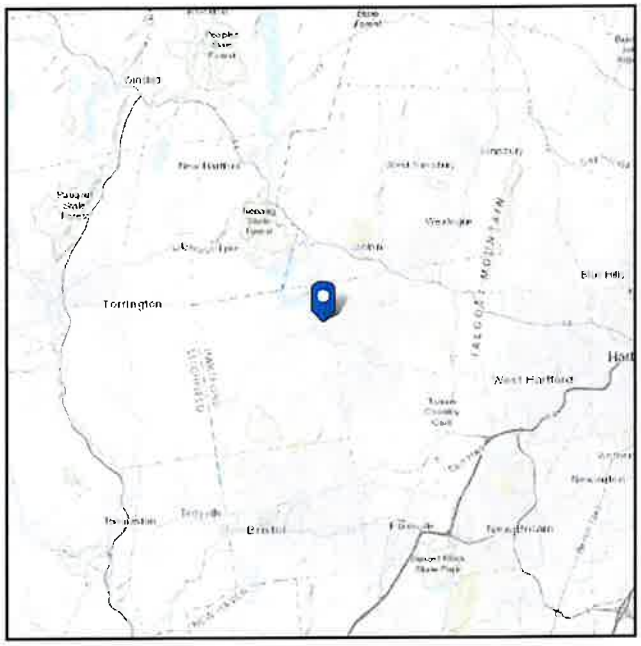
ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Latitude: 41.78805
Longitude: -72.918156
Elevation: 468.02372064604987 ft (NAVD 88)



Wind

Results:

Wind Speed	116 Vmph	120 Vmph per jurisdiction
10-year MRI	75 Vmph	
25-year MRI	84 Vmph	
50-year MRI	89 Vmph	
100-year MRI	96 Vmph	

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Fri Sep 08 2023

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

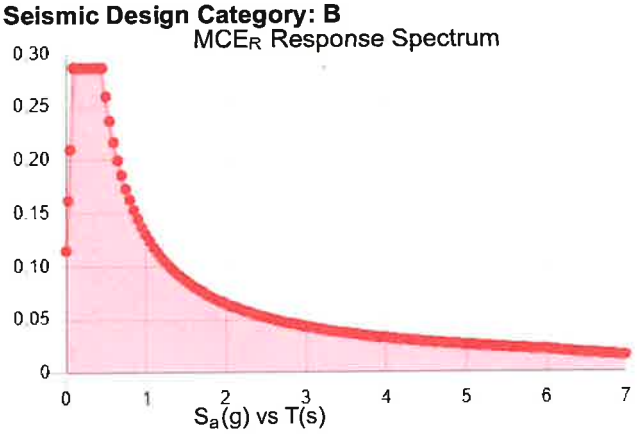
D - Default (see Section 11.4.3)

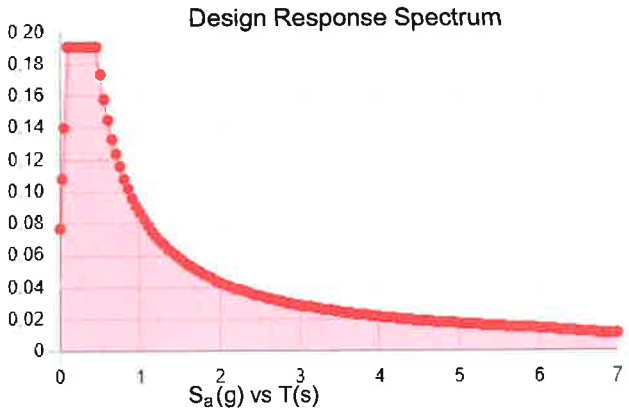
Site Soil Class:

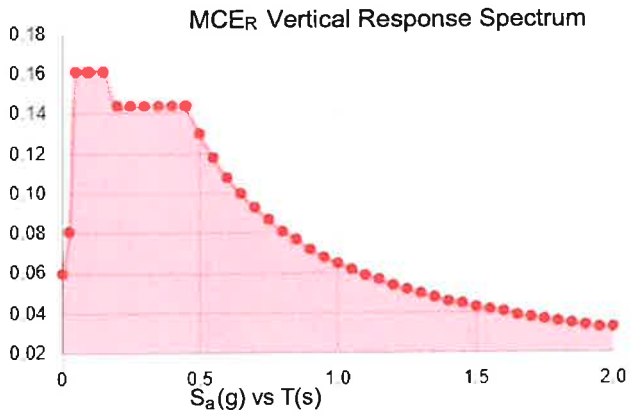
Results:

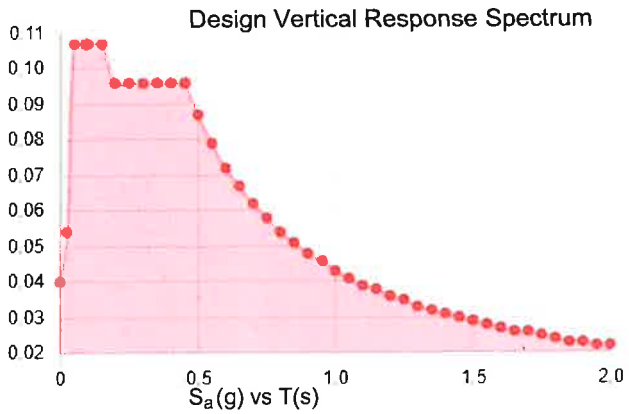
S_S :	0.179	S_{D1} :	0.087
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.096
F_v :	2.4	PGA_M :	0.153
S_{MS} :	0.287	F_{PGA} :	1.6
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.191	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Fri Sep 08 2023**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri Sep 08 2023

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

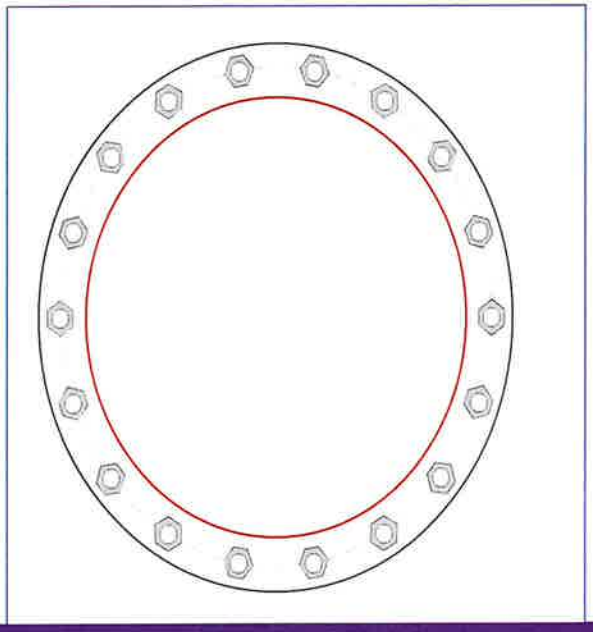
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Monopole Base Plate Connection

Site Info	
Site Name	Burlington- Avon Land

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.25

Applied Loads	
Moment (kip-ft)	1520.92
Axial Force (kips)	33.15
Shear Force (kips)	18.24



Connection Properties

Anchor Rod Data

(18) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 58" BC

Base Plate Data

63.75" OD x 2.25" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

51.14" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 68.04	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.01	ϕVn = 149.1	**27.9%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	13.66	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**30.4%**	**Pass**

Analysis Date: 9/8/2023

Drilled Pier Foundation

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1520.92	
Axial Force (kips)	33.16	
Shear Force (kips)	18.23	

Material Properties		
Concrete Strength, f'c:	4.5	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	19	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 19' below grade		
Pier Diameter	7	ft
Rebar Quantity	46	
Rebar Size	10	
Clear Cover to Ties	3	in
Tie Size	7	
Tie Spacing	4.5	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.73	-
Soil Safety Factor	5.70	-
Max Moment (kip-ft)	1626.14	-
Rating	*23.4%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	442.85	-
End Bearing (kips)	2660.34	-
Weight of Concrete (kips)	135.08	-
Total Capacity (kips)	3103.18	-
Axial (kips)	168.24	-
Rating	*5.4%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.54	-
Critical Moment (kip-ft)	1625.95	-
Critical Moment Capacity	9076.55	-
Rating	*17.9%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	15.81	-
Critical Shear (kip)	357.94	-
Critical Shear Capacity	1658.95	-
Rating	*21.6%*	-

Structural Foundation Rating	**21.6%**
Soil Interaction Rating	**23.4%**

Check Limitation	
Apply TIA-222-H Section 15.5:	☐
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	N/A	# of Layers	7

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	115	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	4	2	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	4	6	2	120	150	0	35	0.000	0.000	0.19	0.14			Cohesionless
4	6	8	2	120	150	0	36	0.000	0.000	0.26	0.20			Cohesionless
5	8	13	5	130	150	0	41	0.000	0.000	0.39	0.29			Cohesionless
6	13	18	5	150	150	10	0	4.500	4.500	4.00	4.00			Cohesive
7	18	19	1	150	150	10	0	4.50	4.50	4.00	4.00	89.67		Cohesive

Sabre Industries™
INNOVATION DELIVERED

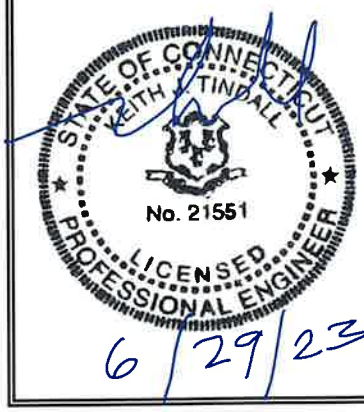
Structural Design Report

131' Monopole
Site: Burlington Avon Landfill, CT
Site Number: CT46143

Prepared for: SBA NETWORK SERVICES INC
by: Sabre Industries ™

Job Number: 521586
Revision A

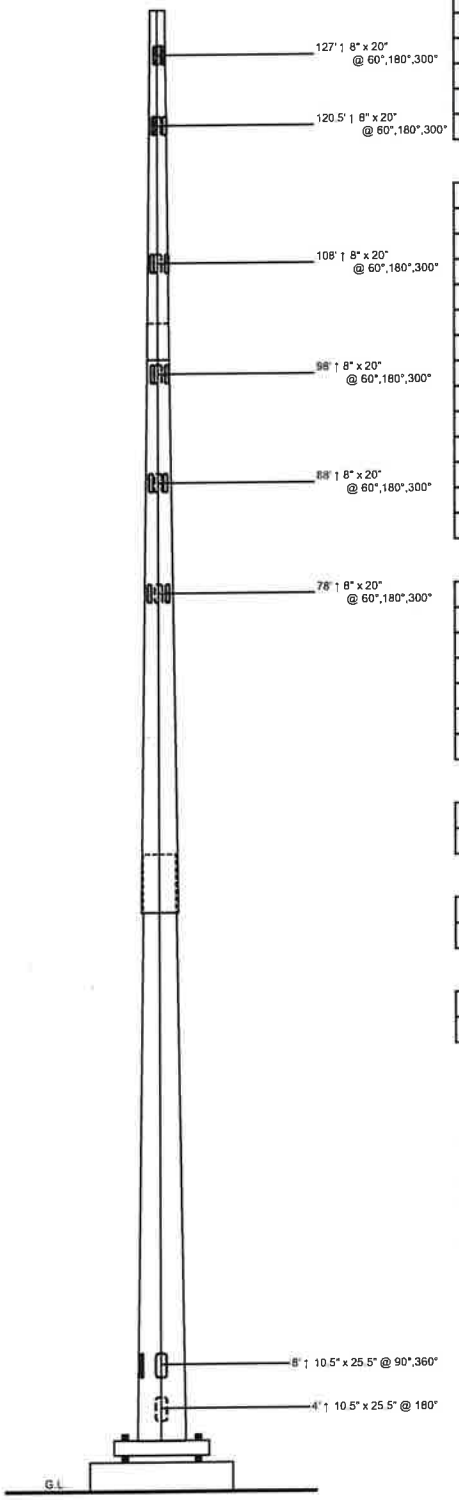
June 29, 2023



6/29/23

Digitally Signed By Keith Tindall
DN: c=US, st=Texas, l=Alvarado, o=SABRE INDUSTRIES, INC., cn=Keith Tindall, email=kjtindall@sabreindustries.com Date: 2023.06.29 15:34:32

Length (ft)	53'-3"	53'-6"	31'-9"						
Number Of Sides	18								
Thickness (in)	7/16"	3/8"	1/4"						
Lap Splice (ft)				5' - 3"	A				
Top Diameter (in)	35.41"	21.92"	14"						
Bottom Diameter (in)	51.14"	37.71"	23.38"						
Taper (in/ft)				0.2953					
Grade				A572-65					
Weight (lbs)	12969	7231	2145						
Overall Steel Height (ft)				130					



Designed Appurtenance Loading

Elev	Description	Tx-Line
138	(1) 50 SQFT	(8) 1 5/8"
122.5	(1) 125 Sq. Ft. EPA (2,000 lbs)	(8) 1 5/8"
110	(1) 150 Sq. Ft. EPA (2250 lbs)	(8) 1 5/8"
100	(1) 150 Sq. Ft. EPA (2250 lbs)	(8) 1 5/8"
90	(1) 175 Sq. Ft. EPA (2500 lbs)	(8) 1 5/8"
80	(1) 150 Sq. Ft. EPA (2250 lbs)	(12) 1 5/8"

Design Criteria - ANSI/TIA-222-H

Wind Speed (No Ice)	120 mph
Wind Speed (Ice)	50 mph
Design Ice Thickness	1.50 in
Risk Category	II
Exposure Category	C
Topographic Factor Procedure	Method 1 (Simplified)
Topographic Category	1
Ground Elevation	468 ft
Seismic Importance Factor, Ie	1.00
0.2-sec Spectral Response, Ss	0.182 g
1-sec Spectral Response, S1	0.064 g
Site Class	B
Seismic Design Category	A
Basic Seismic Force-Resisting System	Telecommunication Tower (Pole: Steel)

Limit State Load Combination Reactions

Load Combination	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
1.2 D + 1.0 Wo	43.46	48.17	4630.55	10.47	8.9
0.9 D + 1.0 Wo	32.55	48.02	4571.06	10.31	8.75
1.2 D + 1.0 Di + 1.0 Wi	71.7	15.17	1527.91	3.65	3.19
1.2 D + 1.0 Ev + 1.0 Eh	44.16	1.09	114.34	0.28	0.25
0.9 D - 1.0 Ev + 1.0 Eh	31.74	1.08	112.61	0.28	0.24
1.0 D + 1.0 Wo (Service @ 60 mph)	36.2	10.77	1034.29	2.38	2

Base Plate Dimensions

Shape	Diameter	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Round	63.75"	2.25"	58"	18	2.25"

Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	2179.8	A615-75	Galv

Material List

Display	Value
A	3' - 3"

Notes

1) Antenna Feed Lines Run Inside Pole
2) All dimensions are above ground level, unless otherwise specified.
3) Weights shown are estimates. Final weights may vary.
4) Full Height Step Bolts
5) Anchor bolt template must be 1/2" thick minimum-50 ksi
6) Tower Rating: 92.9%
7) This tower and foundation design shown on the following page meets or exceeds the requirements of the 2022 Connecticut Building Code.

Sabre Industries
INNOVATION DELIVERED

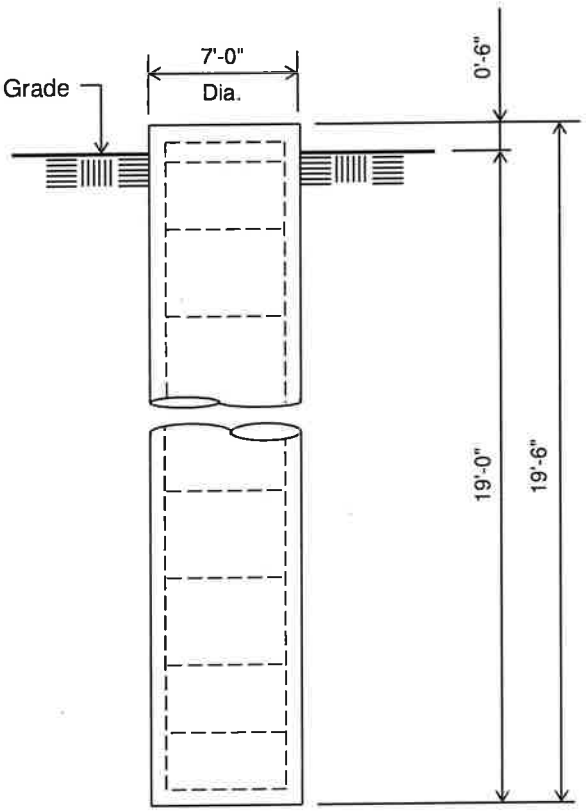
Sabre Industries
7101 Southbridge Drive
P.O. Box 658
Sioux City, IA 51102-0658
Phone: (712) 258 6690
Fax: (712) 279-0814

Job:	521586
Customer:	SBA NETWORK SERVICES INC
Site Name:	Burlington Avon Landfill, CT CT46143
Description:	130' Monopole
Date:	3/15/2023 By: REB

Sabre Industries™
INNOVATION DELIVERED

No.: 521586
Date: 06/29/23
By: KJT
Revision A

Customer: SBA NETWORK SERVICES INC
Site: Burlington Avon Landfill, CT CT46143
131' Monopole



ELEVATION VIEW
(27.79 Cu. Yds.)
(1 REQUIRED; NOT TO SCALE)

Notes:

1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
2) Rebar to conform to ASTM specification A615 Grade 60.
3) All rebar to have a minimum of 3" concrete cover.
4) All exposed concrete corners to be chamfered 3/4".
5) The foundation design is based on the geotechnical report by Delta Oaks Group, Project GEO 23-19365-01, dated June 28, 2023.
6) See the geotechnical report for drilled pier installation requirements, if specified.
7) This foundation is designed for a max capacity ratio of 95%.
8) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.

Rebar Schedule for Pier	
Pier	(46) #10 vertical rebar w/ #7 ties, (2) within top 5" of pier, then 4.5" C/C

7101 Southbridge Drive - P.O. Box 658 - Sioux City, IA 51102-0658 - Phone 712.258.6690 - Fax 712.279.0814

131' Monopole / Burlington Avon Landfill, CT

* All pole diameters shown on the following pages are across corners.
See profile drawing for widths across flats.

POLE GEOMETRY

ELEV ft	SECTION NAME	No. SIDE	OUTSIDE DIAM in	THICK -NESS in	RESISTANCES ϕ*Pn kip	ϕ*Mn ft-kip	SPLICE TYPE	...OVERLAP... LENGTH ft	RATIO	w/t
130.0										
			14.22	0.250	810.6	227.0				
	A	18								8.6
			22.75	0.250	1306.3	593.4				
101.5										
			22.75	0.250	1306.3	593.4				
	A/B	18					SLIP	3.25	1.70	
			23.24	0.375	1990.4	913.7				
98.2										
			23.24	0.375	1990.4	913.7				
	B	18								9.8
			36.71	0.375	3162.4	2321.3				
53.2										
			36.71	0.375	3162.4	2321.3				
	B/C	18					SLIP	5.25	1.70	
			37.55	0.438	3769.5	2821.7				
48.0										
			37.55	0.438	3769.5	2821.7				
	C	18								14.0
			51.93	0.438	4952.9	5161.4				
0.0										

POLE ASSEMBLY

SECTION NAME	BASE ELEV ft	.....BOLTS AT BASE OF SECTION..... NUMBER	TYPE	DIAM in	STRENGTH ksi	THREADS IN SHEAR PLANE	CALC BASE ELEV ft
A	98.250	0	A325	0.00	92.0	0	98.250
B	48.000	0	A325	0.00	92.0	0	48.000
C	0.000	0	A325	0.00	92.0	0	0.000

POLE SECTIONS

SECTION NAME	No.of SIDES	LENGTH ft	OUTSIDE.DIAMETER BOT * in	TOP * in	BEND RAD in	MAT-ERIAL ID	FLANGE.ID BOT	TOP	FLANGE.WELD ..GROUP.ID.. BOT	TOP
A	18	31.75	23.74	14.22	0.625	1	0	0	0	0
B	18	53.50	38.30	22.25	0.625	2	0	0	0	0
C	18	53.25	51.93	35.96	0.625	3	0	0	0	0

* - Diameter of circumscribed circle

MATERIAL TYPES

TYPE OF SHAPE	TYPE NO	NO OF ELEM.	ORIENT & deg	HEIGHT in	WIDTH in	.THICKNESS. WEB in	FLANGE in	IRREGULARITY .PROJECTION. % OF AREA	ORIENT deg
PL	1	1	0.0	23.74	0.25	0.250	0.250	0.00	0.0
PL	2	1	0.0	38.30	0.38	0.375	0.375	0.00	0.0
PL	3	1	0.0	51.93	0.44	0.438	0.438	0.00	0.0

& - With respect to vertical

MATERIAL PROPERTIES

MATERIAL TYPE NO.	ELASTIC MODULUS ksi	UNIT WEIGHT pcf	.. STRENGTH .. Fu ksi	Fy ksi	THERMAL COEFFICIENT /deg
1	29000.0	490.0	80.0	65.0	0.00001170
2	29000.0	490.0	80.0	65.0	0.00001170
3	29000.0	490.0	80.0	65.0	0.00001170

* Only 5 condition(s) shown in full
* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A

120 mph wind with no ice. Wind Azimuth: 0◆ (1.2 D + 1.0 Wo)

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	137.000	0.00	0.0	0.0	2.5650	0.6000	0.0000	0.0000
C	128.000	0.00	0.0	0.0	0.0000	1.2780	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0367	0.0168	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.0000	1.2131	0.0000	0.0000
C	121.500	0.00	0.0	0.0	6.2536	2.4000	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0360	0.0168	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.0883	0.0000	0.0000
C	109.000	0.00	0.0	0.0	7.3362	2.7000	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0354	0.0168	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.9884	0.0000	0.0000
C	99.000	0.00	0.0	0.0	7.1904	2.7000	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0346	0.0168	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.8886	0.0000	0.0000
C	89.000	0.00	0.0	0.0	8.2048	3.0000	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0338	0.0168	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0000	1.1831	0.0000	0.0000
C	79.000	0.00	0.0	0.0	6.8605	2.7000	0.0000	0.0000

C	75.000	0.00	0.0	0.0	0.0329	0.0168	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0320	0.0168	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0309	0.0168	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0296	0.0168	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0281	0.0168	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0261	0.0168	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0235	0.0168	0.0000	0.0000
D	130.000	0.00	180.0	0.0	0.0414	0.0492	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0546	0.0672	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0586	0.1807	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0586	0.1807	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0630	0.1204	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0630	0.1204	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0714	0.1417	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0714	0.1417	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0784	0.1630	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0784	0.1630	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0821	0.3805	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0821	0.3805	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0829	0.2174	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0829	0.2174	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0844	0.2373	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0844	0.2373	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0826	0.2572	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0826	0.2572	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0847	0.2771	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0847	0.2771	0.0000	0.0000

LOADING CONDITION M

120 mph wind with no ice. Wind Azimuth: 0◆ (0.9 D + 1.0 Wo)

LOADS ON POLE

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	.....FORCES..... HORIZ	DOWN	.....MOMENTS..... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	137.000	0.00	0.0	0.0	2.5650	0.4500	0.0000	0.0000
C	128.000	0.00	0.0	0.0	0.0000	0.9585	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0367	0.0126	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.0000	0.9098	0.0000	0.0000
C	121.500	0.00	0.0	0.0	6.2536	1.8000	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0360	0.0126	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	0.8162	0.0000	0.0000
C	109.000	0.00	0.0	0.0	7.3362	2.0250	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0354	0.0126	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.7413	0.0000	0.0000
C	99.000	0.00	0.0	0.0	7.1904	2.0250	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0346	0.0126	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.6664	0.0000	0.0000
C	89.000	0.00	0.0	0.0	8.2048	2.2500	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0338	0.0126	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0000	0.8873	0.0000	0.0000
C	79.000	0.00	0.0	0.0	6.8605	2.0250	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0329	0.0126	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0320	0.0126	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0309	0.0126	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0296	0.0126	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0281	0.0126	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0261	0.0126	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0235	0.0126	0.0000	0.0000

D	130.000	0.00	180.0	0.0	0.0414	0.0369	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0546	0.0504	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0586	0.1355	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0586	0.1355	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0630	0.0903	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0630	0.0903	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0714	0.1063	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0714	0.1063	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0784	0.1222	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0784	0.1222	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0821	0.2853	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0821	0.2853	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0829	0.1631	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0829	0.1631	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0844	0.1780	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0844	0.1780	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0826	0.1929	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0826	0.1929	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0847	0.2078	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0847	0.2078	0.0000	0.0000

==========

LOADING CONDITION Y ==========

50 mph wind with 1.5 ice. Wind Azimuth: 0◆ (1.2 D + 1.0 Di + 1.0 Wi)

LOADS ON POLE
==========

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	137.000	0.00	0.0	0.0	1.2160	1.4654	0.0000	0.0000
C	128.000	0.00	0.0	0.0	0.0000	1.2780	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0494	0.0288	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.0000	1.2131	0.0000	0.0000
C	121.500	0.00	0.0	0.0	1.8284	5.8205	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0482	0.0288	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.0883	0.0000	0.0000
C	109.000	0.00	0.0	0.0	2.1356	6.5068	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0469	0.0288	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.9884	0.0000	0.0000
C	99.000	0.00	0.0	0.0	2.0852	6.4707	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0455	0.0288	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.8886	0.0000	0.0000
C	89.000	0.00	0.0	0.0	2.3693	7.1458	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0441	0.0288	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0000	1.1831	0.0000	0.0000
C	79.000	0.00	0.0	0.0	1.9719	6.3875	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0425	0.0288	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0407	0.0288	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0387	0.0288	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0365	0.0288	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0339	0.0288	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0307	0.0288	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0264	0.0288	0.0000	0.0000
D	130.000	0.00	180.0	0.0	0.0153	0.0856	0.0000	0.0000
D	120.500	0.00	180.0	0.0	0.0153	0.0856	0.0000	0.0000
D	120.500	0.00	180.0	0.0	0.0173	0.1002	0.0000	0.0000
D	111.000	0.00	180.0	0.0	0.0173	0.1002	0.0000	0.0000
D	111.000	0.00	180.0	0.0	0.0191	0.1147	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0191	0.1147	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0203	0.2318	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0203	0.2318	0.0000	0.0000

D	98.250	0.00	180.0	0.0	0.0216	0.1755	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0216	0.1755	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0240	0.2047	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0240	0.2047	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0260	0.2333	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0260	0.2333	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0270	0.4553	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0270	0.4553	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0271	0.2944	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0271	0.2944	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0274	0.3182	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0274	0.3182	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0266	0.3404	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0270	0.3578	0.0000	0.0000

LOADING CONDITION AK

Seismic - Azimuth: 0◆ (1.2 D + 1.0 Ev + 1.0 Eh)

LOADS ON POLE

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	.....FORCES..... HORIZ	DOWN	.....MOMENTS..... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	137.000	0.00	0.0	0.0	0.0405	0.6109	0.0000	0.0000
C	128.000	0.00	0.0	0.0	0.0755	1.3012	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0009	0.0171	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.0646	1.2351	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.1278	2.4436	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0008	0.0171	0.0000	0.0000
C	114.120	0.00	0.0	0.0	0.0890	1.9273	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0467	1.1081	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.1159	2.7490	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0007	0.0171	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0351	1.0064	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0958	2.7490	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0005	0.0171	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0255	0.9047	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0862	3.0545	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0004	0.0171	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0268	1.2046	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0613	2.7490	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0003	0.0171	0.0000	0.0000
C	74.750	0.00	0.0	0.0	0.1552	7.7735	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0003	0.0171	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0002	0.0171	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0001	0.0171	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0001	0.0171	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0339	13.1368	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0000	0.0171	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0000	0.0171	0.0000	0.0000
D	130.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000
D	0.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000

LOADING CONDITION AL

Seismic - Azimuth: 0◆ (0.9 D - 1.0 Ev + 1.0 Eh)

LOADS ON POLE
==========

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	137.000	0.00	0.0	0.0	0.0405	0.4391	0.0000	0.0000
C	128.000	0.00	0.0	0.0	0.0755	0.9353	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0009	0.0123	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.0646	0.8878	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.1278	1.7564	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0008	0.0123	0.0000	0.0000
C	114.120	0.00	0.0	0.0	0.0890	1.3853	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0467	0.7964	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.1159	1.9760	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0007	0.0123	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0351	0.7233	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0958	1.9760	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0005	0.0123	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0255	0.6504	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0862	2.1955	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0004	0.0123	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0268	0.8658	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0613	1.9760	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0003	0.0123	0.0000	0.0000
C	74.750	0.00	0.0	0.0	0.1552	5.5874	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0003	0.0123	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0002	0.0123	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0001	0.0123	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0001	0.0123	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0339	9.4424	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0000	0.0123	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0000	0.0123	0.0000	0.0000
D	130.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000
D	0.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000

131' Monopole / Burlington Avon Landfill, CT

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)
==========

MAST ELEV ft	.....DEFLECTIONS (ft)..... HORIZONTAL ..... ALONG	ACROSS	DOWN	.....ROTATIONS (deg)..... TILT ..... ALONG	ACROSS	TWIST
130.0	10.47A	-0.02N	1.16F	8.90A	-0.02N	0.00B
120.5	9.05A	-0.02N	0.94F	8.66A	-0.02N	0.00B
111.0	7.68A	-0.02N	0.74F	8.21A	-0.02N	0.00B

101.5	6.39A	-0.02N	0.56F	7.55A	-0.02N	0.00B
98.2	5.98A	-0.01N	0.51F	7.37A	-0.02N	0.00B
83.2	4.21A	-0.01N	0.30F	6.29A	-0.02N	0.00B
68.2	2.74A	-0.01N	0.15K	5.01A	-0.01N	0.00B
53.2	1.61A	0.00N	0.07K	3.67A	-0.01N	0.00B
48.0	1.30A	0.00N	0.05K	3.27A	-0.01N	0.00B
36.0	0.71A	0.00N	0.02K	2.36A	-0.01N	0.00B
24.0	0.31A	0.00N	0.01K	1.51A	0.00N	0.00B
12.0	0.07A	0.00N	0.00F	0.72A	0.00N	0.00B
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR ALONG kip	ACROSS kip	MOMENT.w.r.t.WIND.DIR ALONG ft-kip	ACROSS ft-kip	TORSION ft-kip
130.0	1.47 AA	2.57 T	0.00 R	-17.96 N	0.00 R	0.00 R
	10.62 AA	9.27 T	0.00 R	-53.09 E	-0.01 E	-0.01 E
120.5	10.62 AG	9.27 P	0.00 X	-53.09 E	-0.01 E	-0.01 E
	11.60 AG	9.76 P	0.00 X	-150.03 F	0.03 B	-0.05 E
111.0	11.60 AG	9.76 P	0.01 X	-150.03 F	0.03 F	-0.05 E
	20.31 AG	17.62 P	0.01 X	-310.01 C	0.09 B	-0.11 E
101.5	20.32 AD	17.71 N	-0.07 X	-310.08 C	-0.17 X	-0.11 E
	28.53 AD	25.09 N	-0.07 X	-376.99 C	0.13 B	-0.13 E
98.2	28.53 AA	25.20 A	-0.14 N	-376.94 I	0.20 I	-0.13 E
	39.26 AA	34.41 A	-0.14 N	-834.25 A	1.95 N	0.41 B
83.2	39.25 Z	34.38 A	-0.11 T	-834.25 A	1.95 N	0.41 B
	49.92 Z	42.34 A	-0.11 T	-1462.30 A	3.36 N	0.74 B
68.2	49.92 Z	42.36 A	-0.11 N	-1462.29 A	3.36 N	0.74 B
	53.47 Z	43.60 A	-0.11 N	-2134.88 A	4.92 N	0.98 B
53.2	53.47 Z	43.59 A	-0.11 T	-2134.88 A	4.93 N	0.98 B
	55.86 Z	44.02 A	-0.11 T	-2373.58 A	5.48 N	1.05 B
48.0	55.86 Z	44.06 A	-0.13 N	-2373.57 A	5.47 N	1.05 B
	59.42 Z	45.08 A	-0.13 N	-2926.29 A	7.01 N	1.18 B
36.0	59.42 Z	45.08 A	-0.14 N	-2926.29 A	7.02 N	1.18 B
	63.30 Z	46.15 A	-0.14 N	-3487.28 A	8.65 N	1.28 B

24.0						
	63.30 Z	46.14 A	-0.14 N	-3487.28 A	8.65 N	1.28 B
	67.46 Z	47.15 A	-0.14 N	-4055.57 A	10.29 N	1.34 B
12.0						
	67.46 Z	47.15 A	-0.13 N	-4055.57 A	10.29 N	1.34 B
	71.70 Z	48.17 A	-0.13 N	-4630.55 A	11.86 N	1.36 B
base reaction	71.70 Z	-48.17 A	0.13 N	4630.55 A	-11.86 N	-1.36 B

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
130.00							
	0.00AA	0.08N	0.01T	0.08L	YES	8.64A	45.2
	0.01AA	0.16E	0.02T	0.17E	YES	10.62A	45.2
120.50							
	0.01AG	0.16E	0.02P	0.17E	YES	10.62A	45.2
	0.01AG	0.33F	0.02P	0.34F	YES	12.60A	45.2
111.00							
	0.01AG	0.33F	0.02P	0.34F	YES	12.60A	45.2
	0.02AG	0.52C	0.03P	0.53C	YES	14.58A	45.2
101.50							
	0.01AD	0.35C	0.02N	0.36C	YES	9.60A	45.2
	0.01AD	0.39C	0.02N	0.40C	YES	10.05A	45.2
98.25							
	0.01AA	0.41I	0.03A	0.42I	YES	9.82A	45.2
	0.02AA	0.64A	0.03A	0.65A	YES	11.90A	45.2
83.25							
	0.02Z	0.64A	0.03A	0.65A	YES	11.90A	45.2
	0.02Z	0.82A	0.03A	0.83A	YES	13.98A	45.2
68.25							
	0.02Z	0.82A	0.03A	0.83A	YES	13.98A	45.2
	0.02Z	0.92A	0.03A	0.93A	YES	16.06A	45.2
53.25							
	0.01Z	0.79A	0.02A	0.80A	YES	13.72A	45.2
	0.01Z	0.81A	0.02A	0.82A	YES	14.34A	45.2
48.00							
	0.01Z	0.84A	0.02A	0.85A	YES	14.04A	45.2
	0.01Z	0.86A	0.02A	0.87A	YES	15.47A	45.2
36.00							
	0.01Z	0.86A	0.02A	0.87A	YES	15.47A	45.2
	0.01Z	0.88A	0.02A	0.89A	YES	16.90A	45.2
24.00							
	0.01Z	0.88A	0.02A	0.89A	YES	16.90A	45.2
	0.01Z	0.89A	0.02A	0.90A	YES	18.33A	45.2
12.00							
	0.01Z	0.89A	0.02A	0.90A	YES	18.33A	45.2
	0.01Z	0.90A	0.02A	0.91A	YES	19.75A	45.2

0.00 .....

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)
==========

DOWN	SHEAR.w.r.t.WIND.DIR ALONG	ACROSS	MOMENT.w.r.t.WIND.DIR ALONG	ACROSS	TORSION
kip	kip	kip	ft-kip	ft-kip	ft-kip
71.70	48.17	-0.13	-4630.55	11.86	1.36
Z	A	N	A	N	B

==========

==========
(USA 222-H) - Monopole Spatial Analysis (c)2017 Guymast Inc.

Tel:(416)736-7453 Fax:(416)736-4372 Web:www.guymast.com

Processed under license at:

Sabre Towers and Poles on: 29 jun 2023 at: 14:56:20
==========

131' Monopole / Burlington Avon Landfill, CT

****
********** Service Load Condition **********
****

* Only 1 condition(s) shown in full
* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A ==========

60 mph wind with no ice. Wind Azimuth: 0° (1.0 D + 1.0 Wo)

LOADS ON POLE
==========

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	.....FORCES..... HORIZ	DOWN	.....MOMENTS..... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	137.000	0.00	0.0	0.0	0.5737	0.5000	0.0000	0.0000
C	128.000	0.00	0.0	0.0	0.0000	1.0650	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0082	0.0140	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.0000	1.0109	0.0000	0.0000
C	121.500	0.00	0.0	0.0	1.3988	2.0000	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0081	0.0140	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	0.9069	0.0000	0.0000
C	109.000	0.00	0.0	0.0	1.6410	2.2500	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0079	0.0140	0.0000	0.0000
C	99.000	0.00	0.0	0.0	0.0000	0.8237	0.0000	0.0000
C	99.000	0.00	0.0	0.0	1.6084	2.2500	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0077	0.0140	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.7405	0.0000	0.0000
C	89.000	0.00	0.0	0.0	1.8353	2.5000	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0076	0.0140	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0000	0.9859	0.0000	0.0000
C	79.000	0.00	0.0	0.0	1.5346	2.2500	0.0000	0.0000

C	75.000	0.00	0.0	0.0	0.0074	0.0140	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0071	0.0140	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0069	0.0140	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0066	0.0140	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0063	0.0140	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0058	0.0140	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0053	0.0140	0.0000	0.0000
D	130.000	0.00	180.0	0.0	0.0093	0.0410	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0122	0.0560	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0131	0.1506	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0131	0.1506	0.0000	0.0000
D	98.250	0.00	180.0	0.0	0.0141	0.1004	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0141	0.1004	0.0000	0.0000
D	83.250	0.00	180.0	0.0	0.0160	0.1181	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0160	0.1181	0.0000	0.0000
D	68.250	0.00	180.0	0.0	0.0175	0.1358	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0175	0.1358	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0184	0.3170	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0184	0.3170	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0185	0.1812	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0185	0.1812	0.0000	0.0000
D	36.000	0.00	180.0	0.0	0.0189	0.1978	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0189	0.1978	0.0000	0.0000
D	24.000	0.00	180.0	0.0	0.0185	0.2144	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0185	0.2144	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0190	0.2309	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0190	0.2309	0.0000	0.0000

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

MAST ELEV ft	.....DEFLECTIONS (ft)..... HORIZONTAL ALONG	ACROSS	DOWN	.....ROTATIONS (deg)..... TILT ALONG	ACROSS	TWIST
130.0	2.38I	0.00F	0.06E	2.00I	0.00F	0.00I
120.5	2.05I	0.00F	0.05E	1.95I	0.00F	0.00I
111.0	1.74I	0.00F	0.04E	1.84I	0.00F	0.00I
101.5	1.44I	0.00F	0.03E	1.70I	0.00F	0.00I
98.2	1.35I	0.00F	0.03E	1.65I	0.00F	0.00I
83.2	0.95I	0.00F	0.02E	1.41I	0.00F	0.00I
68.2	0.62I	0.00F	0.01E	1.12I	0.00F	0.00I
53.2	0.36I	0.00F	0.00E	0.82I	0.00F	0.00I
48.0	0.29I	0.00F	0.00E	0.73I	0.00F	0.00I
36.0	0.16I	0.00F	0.00I	0.53I	0.00F	0.00I
24.0	0.07I	0.00F	0.00I	0.34I	0.00F	0.00I
12.0	0.02I	0.00F	0.00I	0.16I	0.00F	0.00I
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR ALONG kip	ACROSS kip	MOMENT.w.r.t.WIND.DIR ALONG ft-kip	ACROSS ft-kip	TORSION ft-kip
130.0						
	0.50 F	0.57 F	0.00 F	-4.02 E	0.00 F	0.00 F
	5.00 F	2.07 F	0.00 F	-11.94 B	0.00 I	0.00 I
120.5						
	5.00 K	2.07 I	0.00 C	-11.94 E	0.00 L	0.00 I
	5.48 K	2.18 I	0.00 C	-33.77 I	0.00 F	0.00 C
111.0						
	5.48 L	2.19 I	0.00 B	-33.77 I	0.00 F	0.00 C
	9.16 L	3.95 I	0.00 B	-69.77 I	0.01 B	0.00 I
101.5						
	9.16 B	3.97 C	-0.01 I	-69.79 L	-0.02 I	0.00 I
	12.72 B	5.62 C	-0.01 I	-84.84 E	0.02 I	0.00 E
98.2						
	12.72 E	5.62 I	0.02 F	-84.85 E	0.03 I	0.00 E
	17.50 E	7.68 I	0.02 F	-187.19 I	-0.39 F	0.01 I
83.2						
	17.50 D	7.69 I	0.02 F	-187.19 I	-0.39 F	0.01 I
	22.52 D	9.47 I	0.02 F	-327.60 I	-0.74 F	0.02 I
68.2						
	22.52 D	9.47 I	0.02 F	-327.60 I	-0.74 F	0.02 I
	24.58 D	9.75 I	0.02 F	-477.68 I	-1.06 F	0.02 I
53.2						
	24.58 D	9.75 I	0.02 F	-477.68 I	-1.06 F	0.02 I
	26.25 D	9.85 I	0.02 F	-530.93 I	-1.18 F	0.02 I
48.0						
	26.25 D	9.85 I	0.02 F	-530.91 I	-1.18 F	0.02 I
	28.44 D	10.08 I	0.02 F	-654.05 I	-1.48 F	0.03 I
36.0						
	28.44 D	10.08 I	0.02 F	-654.05 I	-1.48 F	0.03 I
	30.84 D	10.31 I	0.02 F	-779.04 I	-1.75 F	0.03 I
24.0						
	30.84 D	10.32 I	0.02 F	-779.04 I	-1.75 F	0.03 I
	33.42 D	10.54 I	0.02 F	-905.83 I	-2.03 F	0.03 I
12.0						
	33.42 D	10.54 I	0.02 F	-905.83 I	-2.03 F	0.03 I
	36.20 D	10.77 I	0.02 F	-1034.29 I	-2.31 F	0.03 I
base reaction	36.20 D	-10.77 I	-0.02 F	1034.29 I	2.31 F	-0.03 I

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL		TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
130.00								
	0.00F	0.02E	0.00F	0.02E	YES		8.64A	45.2

	0.01F	0.04B	0.00F	0.04B	YES	10.62A	45.2
120.50							
	0.01K	0.04E	0.00I	0.04E	YES	10.62A	45.2
	0.00K	0.07I	0.00I	0.08I	YES	12.60A	45.2
111.00							
	0.00L	0.07I	0.00I	0.08I	YES	12.60A	45.2
	0.01L	0.12I	0.01I	0.12I	YES	14.58A	45.2
101.50							
	0.00B	0.08L	0.00C	0.08L	YES	9.60A	45.2
	0.01B	0.09E	0.01C	0.10E	YES	10.05A	45.2
98.25							
	0.01E	0.09E	0.01I	0.10E	YES	9.82A	45.2
	0.01E	0.14I	0.01I	0.15I	YES	11.90A	45.2
83.25							
	0.01D	0.14I	0.01I	0.15I	YES	11.90A	45.2
	0.01D	0.18I	0.01I	0.19I	YES	13.98A	45.2
68.25							
	0.01D	0.18I	0.01I	0.19I	YES	13.98A	45.2
	0.01D	0.21I	0.01I	0.21I	YES	16.06A	45.2
53.25							
	0.01D	0.18I	0.01I	0.18I	YES	13.72A	45.2
	0.01D	0.18I	0.01I	0.19I	YES	14.34A	45.2
48.00							
	0.01D	0.19I	0.01I	0.20I	YES	14.04A	45.2
	0.01D	0.19I	0.00I	0.20I	YES	15.47A	45.2
36.00							
	0.01D	0.19I	0.00I	0.20I	YES	15.47A	45.2
	0.01D	0.20I	0.00I	0.20I	YES	16.90A	45.2
24.00							
	0.01D	0.20I	0.00I	0.20I	YES	16.90A	45.2
	0.01D	0.20I	0.00I	0.21I	YES	18.33A	45.2
12.00							
	0.01D	0.20I	0.00I	0.21I	YES	18.33A	45.2
	0.01D	0.20I	0.00I	0.21I	YES	19.75A	45.2
0.00							

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

DOWN	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION
	ALONG	ACROSS	ALONG	ACROSS	
kip	kip	kip	ft-kip	ft-kip	ft-kip
36.20	10.77	0.02	-1034.29	-2.31	0.03
D	I	F	I	F	I

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Parameters	
Risk Category	II
R	1.500
S_S	0.182
S_1	0.064
Site Class	B
T_L (sec)	6.000
F_a	0.900
F_v	0.800
S_{MS}	0.164
S_{M1}	0.051
S_{DS}	0.109
S_{D1}	0.034
T_s	0.312
I_e	1.000
Ω	1.500
C_S	0.030
E (ksi)	29,000
I_{top} (in^4)	261
I_{bot} (in^4)	22,922
I_{avg} (in^4)	11,592
g (in/s^2)	386.4
W_t (kips)	36.143
W_u (kips)	9.500
W_L (kips)	26.643
L_p (in)	1560
f_1 (Hertz)	0.406
T (sec)	2.464
k_e	1.9820
V_s (kips)	1.084
Seismic Design Category	A

Vertical Distribution of Seismic Forces

Description	h_i (ft.)	w_i (kips)	W_u (kips)	$w_i h_i^{ke}$	F_{sz} or E_h (kips)	E_v (kips)	1.2 D + 1.0 E_v (kips)	0.9 D - 1.0 E_v (kips)
Antenna Load	137.00	0.5000	0.5000	8,589.1496	0.0405	0.0109	0.6109	0.4391
Line Deadload	128.00	1.0650	0.0000	15,989.6798	0.0755	0.0232	1.3012	0.9353
Step Bolts/Safety Climb Load	125.00	0.0140	0.0000	200.5412	0.0009	0.0003	0.0171	0.0123
Antenna Load	121.50	2.0000	2.0000	27,080.7182	0.1278	0.0436	2.4436	1.7564
Line Deadload	121.50	1.0109	0.0000	13,687.9490	0.0646	0.0220	1.2351	0.8878
Step Bolts/Safety Climb Load	115.00	0.0140	0.0000	169.9930	0.0008	0.0003	0.0171	0.0123
Structure - Section 1	114.12	1.5774	0.0000	18,863.9593	0.0890	0.0344	1.9273	1.3853
Antenna Load	109.00	2.2500	2.2500	24,567.5493	0.1159	0.0490	2.7490	1.9760
Line Deadload	109.00	0.9069	0.0000	9,902.3602	0.0467	0.0198	1.1081	0.7964
Step Bolts/Safety Climb Load	105.00	0.0140	0.0000	141.9467	0.0007	0.0003	0.0171	0.0123
Antenna Load	99.00	2.2500	2.2500	20,301.6564	0.0958	0.0490	2.7490	1.9760
Line Deadload	99.00	0.8237	0.0000	7,432.2108	0.0351	0.0180	1.0064	0.7233
Step Bolts/Safety Climb Load	95.00	0.0140	0.0000	116.4062	0.0005	0.0003	0.0171	0.0123
Antenna Load	89.00	2.5000	2.5000	18,265.4763	0.0862	0.0545	3.0545	2.1955
Line Deadload	89.00	0.7405	0.0000	5,410.2341	0.0255	0.0161	0.9047	0.6504
Step Bolts/Safety Climb Load	85.00	0.0140	0.0000	93.3762	0.0004	0.0003	0.0171	0.0123
Antenna Load	79.00	2.2500	0.0000	12,980.1411	0.0613	0.0490	2.7490	1.9760
Line Deadload	79.00	0.9859	0.0000	5,687.6094	0.0268	0.0215	1.2046	0.8658
Step Bolts/Safety Climb Load	75.00	0.0140	0.0000	72.8617	0.0003	0.0003	0.0171	0.0123
Structure - Section 2	74.75	6.3623	0.0000	32,893.6098	0.1552	0.1387	7.7735	5.5874
Step Bolts/Safety Climb Load	65.00	0.0140	0.0000	54.8684	0.0003	0.0003	0.0171	0.0123
Step Bolts/Safety Climb Load	55.00	0.0140	0.0000	39.4028	0.0002	0.0003	0.0171	0.0123
Step Bolts/Safety Climb Load	45.00	0.0140	0.0000	26.4725	0.0001	0.0003	0.0171	0.0123
Step Bolts/Safety Climb Load	35.00	0.0140	0.0000	16.0868	0.0001	0.0003	0.0171	0.0123
Structure - Section 3	26.62	10.7520	0.0000	7,182.1027	0.0339	0.2344	13.1368	9.4424
Step Bolts/Safety Climb Load	25.00	0.0140	0.0000	8.2574	0.0000	0.0003	0.0171	0.0123
Step Bolts/Safety Climb Load	15.00	0.0140	0.0000	3.0001	0.0000	0.0003	0.0171	0.0123
	Σ	36.14	9.5000	229,777.62	1.08	0.79	44.16	31.74

Sabre Industries
INNOVATION DELIVERED

SO#: 521586A
Site Name: Burlington Avon Landfill, CT
Date: 6/29/2023

Round Base Plate and Anchor Rods, per ANSI/TIA 222-H

Pole Data

Diameter:	51.140	in (flat to flat)
Thickness:	0.4375	in
Yield (Fy):	65	ksi
# of Sides:	18	"0" IF Round
Strength (Fu):	80	ksi

Reactions

Moment, Mu:	4630.55	ft-kips
Axial, Pu:	43.46	kips
Shear, Vu:	48.17	kips

Anchor Rod Data

Quantity:	18		
Diameter:	2.25	in	
Rod Material:	A615		
Strength (Fu):	100	ksi	
Yield (Fy):	75	ksi	
BC Diam. (in):	58	BC Override:	58

Plate Data

Diameter (in):	63.75	Dia. Override:	63.75
Thickness:	2.25	in	
Yield (Fy):	50	ksi	
Eff Width/Rod:	9.02	in	
Drain Hole:	2.625	in. diameter	
Drain Location:	23.25	in. center of pole to center of drain hole	
Center Hole:	38.5	in. diameter	

Anchor Rod Results

(per 4.9.9)

Maximum Put:	211.09	Kips
Φt*Rnt:	243.75	Kips
Vu:	2.68	Kips
Φv*Rnv:	149.10	Kips
Tension Interaction Ratio:	0.75	
Maximum Puc:	215.31	Kips
Φc*Rnc:	268.39	Kips
Vu:	2.68	Kips
Φc*Rnvc:	120.77	Kips
Compression Interaction Ratio:	0.80	
Maximum Interaction Ratio:	**80.3%**	**Pass**

Base Plate Results

Base Plate (Mu/Z):	41.0	ksi	
Allowable Φ*Fy:	45.0	ksi	(per AISC)
Base Plate Interaction Ratio:	**91.1%**	**Pass**	

```
================================================================================

                    LPile for Windows, Version 2019-11.009

                 Analysis of Individual Piles and Drilled Shafts
               Subjected to Lateral Loading Using the p-y Method
                          © 1985-2019 by Ensoft, Inc.
                              All Rights Reserved

================================================================================

This copy of LPile is being used by:

Sabre Industries
Sioux City, IA

Serial Number of Security Device: 227885948

This copy of LPile is licensed for exclusive use by:

Sabre Communications Corporation

Use of this program by any entity other than Sabre Communications Corporation
is a violation of the software license agreement.

--------------------------------------------------------------------------------
                            Files Used for Analysis
--------------------------------------------------------------------------------

Path to file locations:
\Program Files (x86)\Ensoft\Lpile2019\files\

Name of input data file:
521586A.lp11d

Name of output report file:
521586A.lp11o

Name of plot output file:
521586A.lp11p

Name of runtime message file:
521586A.lp11r


--------------------------------------------------------------------------------
                            Date and Time of Analysis
--------------------------------------------------------------------------------

              Date:  June 29, 2023              Time:  15:18:01


--------------------------------------------------------------------------------
                                 Problem Title
--------------------------------------------------------------------------------

Site         : Burlington Avon Landfill, CT


Tower        : 131' Monopole


Prepared for : SBA NETWORK SERVICES INC


Job Number   : 521586 Revision A
```

Engineer : KJT

Program Options and Settings

Computational Options:
- Conventional Analysis

Engineering Units Used for Data Input and Computations:
- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed	=	999
- Deflection tolerance for convergence	=	1.0000E-05 in
- Maximum allowable deflection	=	100.0000 in
- Number of pile increments	=	100

Loading Type and Number of Cycles of Loading:
- Static loading specified

- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Input of side resistance moment along pile not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:
- Output files use decimal points to denote decimal symbols.
- Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined	=	1
Total length of pile	=	19.500 ft
Depth of ground surface below top of pile	=	0.5000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	84.0000
2	19.500	84.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile

Length of section	=	19.500000 ft
Shaft Diameter	=	84.000000 in
Shear capacity of section	=	0.0000 lbs

Ground Slope and Pile Batter Angles

Ground Slope Angle	=	0.000 degrees
	=	0.000 radians
Pile Batter Angle	=	0.000 degrees
	=	0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 6 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	0.500000 ft
Distance from top of pile to bottom of layer	=	2.500000 ft
Effective unit weight at top of layer	=	115.000000 pcf
Effective unit weight at bottom of layer	=	115.000000 pcf
Undrained cohesion at top of layer	=	14.400000 psf
Undrained cohesion at bottom of layer	=	14.400000 psf
Epsilon-50 at top of layer	=	0.100000
Epsilon-50 at bottom of layer	=	0.100000

Layer 2 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	2.500000 ft
Distance from top of pile to bottom of layer	=	4.500000 ft
Effective unit weight at top of layer	=	120.000000 pcf
Effective unit weight at bottom of layer	=	120.000000 pcf
Undrained cohesion at top of layer	=	14.400000 psf
Undrained cohesion at bottom of layer	=	14.400000 psf
Epsilon-50 at top of layer	=	0.100000
Epsilon-50 at bottom of layer	=	0.100000

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	4.500000 ft
Distance from top of pile to bottom of layer	=	6.500000 ft
Effective unit weight at top of layer	=	120.000000 pcf
Effective unit weight at bottom of layer	=	120.000000 pcf
Friction angle at top of layer	=	35.000000 deg.
Friction angle at bottom of layer	=	35.000000 deg.
Subgrade k at top of layer	=	90.000000 pci
Subgrade k at bottom of layer	=	90.000000 pci

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	6.500000 ft
Distance from top of pile to bottom of layer	=	8.500000 ft
Effective unit weight at top of layer	=	120.000000 pcf

```
   Effective unit weight at bottom of layer          =   120.000000 pcf
   Friction angle at top of layer                    =    36.000000 deg.
   Friction angle at bottom of layer                 =    36.000000 deg.
   Subgrade k at top of layer                        =   225.000000 pci
   Subgrade k at bottom of layer                     =   225.000000 pci


Layer 5 is sand, p-y criteria by Reese et al., 1974

   Distance from top of pile to top of layer         =     8.500000 ft
   Distance from top of pile to bottom of layer      =    13.500000 ft
   Effective unit weight at top of layer             =   130.000000 pcf
   Effective unit weight at bottom of layer          =   130.000000 pcf
   Friction angle at top of layer                    =    41.000000 deg.
   Friction angle at bottom of layer                 =    41.000000 deg.
   Subgrade k at top of layer                        =   225.000000 pci
   Subgrade k at bottom of layer                     =   225.000000 pci


Layer 6 is strong rock (vuggy limestone)

   Distance from top of pile to top of layer         =    13.500000 ft
   Distance from top of pile to bottom of layer      =    19.500000 ft
   Effective unit weight at top of layer             =   150.000000 pcf
   Effective unit weight at bottom of layer          =   150.000000 pcf
   Uniaxial compressive strength at top of layer     =       16700. psi
   Uniaxial compressive strength at bottom of layer  =       16700. psi


 (Depth of the lowest soil layer extends 0.000 ft below the pile tip)


**** Warning - Possible Input Data Error ****

Values entered for effective unit weight of rock were outside the limits of
50 pcf to 150 pcf.

The maximum input value, in layer   1, for effective unit weight = 150.00 pcf

This data may be erroneous. Please check your data.
```

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Cohesion psf	Angle of Friction deg.	Uniaxial qu psi	E50 or krm	kpy pci
1	Soft Clay	0.5000	115.0000	14.4000	--	--	0.10000	--
		2.5000	115.0000	14.4000	--	--	0.10000	--
2	Soft Clay	2.5000	120.0000	14.4000	--	--	0.10000	--
		4.5000	120.0000	14.4000	--	--	0.10000	--
3	Sand (Reese, et al.)	4.5000	120.0000	--	35.0000	--	--	90.0000
		6.5000	120.0000	--	35.0000	--	--	90.0000
4	Sand	6.5000	120.0000	--	36.0000	--	--	225.0000

	(Reese, et al.)	8.5000	120.0000	--	36.0000	--	--	
225.0000								
5	Sand	8.5000	130.0000	--	41.0000	--	--	
225.0000								
	(Reese, et al.)	13.5000	130.0000	--	41.0000	--	--	
225.0000								
6	Strong Rock	13.5000	150.0000	--	--	16700.	--	--
	(Vuggy Limestone)	19.5000	150.0000	--	--	16700.	--	--

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load No.	Load Type	Condition 1		Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run Analysis
1	1	V = 67607. lbs	M =	77988211. in-lbs	60996.	No	Yes
2	1	V = 11337. lbs	M =	13064716. in-lbs	38105.	No	Yes

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with
specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	19.500000 ft
Shaft Diameter	=	84.000000 in
Concrete Cover Thickness (to edge of long. rebar)	=	3.875000 in
Number of Reinforcing Bars	=	46 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	5542. sq. in.
Total Area of Reinforcing Steel	=	58.271360 sq. in.
Area Ratio of Steel Reinforcement	=	1.05 percent
Edge-to-Edge Bar Spacing	=	3.846816 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	5.13

Offset of Center of Rebar Cage from Center of Pile = 0.0000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As = 24470.662 kips
Tensile Load for Cracking of Concrete = -2609.093 kips
Nominal Axial Tensile Capacity = -3496.282 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.270000	1.266769	37.490000	0.00000
2	1.270000	1.266769	37.140816	5.104888
3	1.270000	1.266769	36.099769	10.114681
4	1.270000	1.266769	34.386252	14.936057
5	1.270000	1.266769	32.032183	19.479202
6	1.270000	1.266769	29.081416	23.659487
7	1.270000	1.266769	25.588917	27.399040
8	1.270000	1.266769	21.619745	30.628201
9	1.270000	1.266769	17.247838	33.286817
10	1.270000	1.266769	12.554637	35.325362
11	1.270000	1.266769	7.627566	36.705862
12	1.270000	1.266769	2.558408	37.402602
13	1.270000	1.266769	-2.558408	37.402602
14	1.270000	1.266769	-7.627566	36.705862
15	1.270000	1.266769	-12.554637	35.325362
16	1.270000	1.266769	-17.247838	33.286817
17	1.270000	1.266769	-21.619745	30.628201
18	1.270000	1.266769	-25.588917	27.399040
19	1.270000	1.266769	-29.081416	23.659487
20	1.270000	1.266769	-32.032183	19.479202
21	1.270000	1.266769	-34.386252	14.936057
22	1.270000	1.266769	-36.099769	10.114681
23	1.270000	1.266769	-37.140816	5.104888
24	1.270000	1.266769	-37.490000	0.00000
25	1.270000	1.266769	-37.140816	-5.104888
26	1.270000	1.266769	-36.099769	-10.114681
27	1.270000	1.266769	-34.386252	-14.936057
28	1.270000	1.266769	-32.032183	-19.479202
29	1.270000	1.266769	-29.081416	-23.659487
30	1.270000	1.266769	-25.588917	-27.399040
31	1.270000	1.266769	-21.619745	-30.628201
32	1.270000	1.266769	-17.247838	-33.286817
33	1.270000	1.266769	-12.554637	-35.325362
34	1.270000	1.266769	-7.627566	-36.705862
35	1.270000	1.266769	-2.558408	-37.402602
36	1.270000	1.266769	2.558408	-37.402602
37	1.270000	1.266769	7.627566	-36.705862
38	1.270000	1.266769	12.554637	-35.325362
39	1.270000	1.266769	17.247838	-33.286817
40	1.270000	1.266769	21.619745	-30.628201
41	1.270000	1.266769	25.588917	-27.399040
42	1.270000	1.266769	29.081416	-23.659487
43	1.270000	1.266769	32.032183	-19.479202
44	1.270000	1.266769	34.386252	-14.936057
45	1.270000	1.266769	36.099769	-10.114681
46	1.270000	1.266769	37.140816	-5.104888

NOTE: The positions of the above rebars were computed by LPile

Minimum spacing between any two bars not equal to zero = 3.847 inches
between bars 31 and 32.

Ratio of bar spacing to maximum aggregate size = 5.13

Concrete Properties:

Compressive Strength of Concrete	=	4500. psi
Modulus of Elasticity of Concrete	=	3823676. psi
Modulus of Rupture of Concrete	=	-503.115295 psi
Compression Strain at Peak Stress	=	0.002001
Tensile Strain at Fracture of Concrete	=	-0.0001152
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	38.105
2	60.996

Summary of Results for Nominal Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	38.105	120807.238	0.00300000
2	60.996	121469.864	0.00300000

Note that the values of moment capacity in the table above are not
factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether
the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.75).

The above values should be multiplied by the appropriate strength reduction
factor to compute ultimate moment capacity according to ACI 318,
or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding
bending stiffnesses computed for common resistance factor values used for
reinforced concrete sections.

Axial Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	38.105263	120807.	24.768421	78525.	2.3996E+09
2	0.65	60.996491	121470.	39.647719	78955.	2.4140E+09
1	0.75	38.105263	120807.	28.578947	90605.	2.3176E+09
2	0.75	60.996491	121470.	45.747368	91102.	2.3318E+09
1	0.90	38.105263	120807.	34.294737	108727.	1.5656E+09
2	0.90	60.996491	121470.	54.896842	109323.	1.5769E+09

Layering Correction Equivalent Depths of Soil & Rock Layers

Top of	Equivalent

Layer No.	Layer Below Pile Head ft	Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.5000	0.00	N.A.	No	0.00	1589.
2	2.5000	2.0001	Yes	No	1589.	1814.
3	4.5000	0.8985	No	No	3404.	35214.
4	6.5000	2.8178	Yes	No	38618.	82234.
5	8.5000	4.1757	Yes	No	120852.	565730.
6	13.5000	13.0000	No	Yes	N.A.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Pile-head Load 1	Load Type 2	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	67607.	M, in-lb	7.80E+07	60996.	0.6135	-0.00644	-1839836.	8.40E+07
2	V, lb	11337.	M, in-lb	1.31E+07	38105.	0.02646	-2.48E-04	-298155.	1.42E+07

Maximum pile-head deflection = 0.6135234298 inches
Maximum pile-head rotation = -0.0064376210 radians = -0.368849 deg.

The analysis ended normally.

IBC 1807.3.2.1

Moment (ft·k)	4,874.26	
Shear (k)	50.71	
Caisson diameter (ft)	7	
Caisson height above ground (ft)	0.5	
Caisson height below ground (ft)	26	
Lateral soil pressure (lb/ft^2)	**386.54**	
Ground to application of force, h (ft)	96.63	
Applied lateral force, P (lb)	50,705	
Lateral soil bearing pressure, S_1 (lb/ft)	3,350.00	
Diameter, b (ft)	7	
A	5.06	$= (2.34P)/(S_1 b)$
Minimum depth of embedment, d (ft)	25.75	$= 0.5A[\,1 + (\,1 + (\,4.36h / A\,)\,)^{1/2}\,]$

Avon Police Department

60 West Main St., Avon, CT 06001
Telephone (860) 409-4200 Facsimile (860) 409-4206

Paul J. Melanson, Chief of Police

"To Protect and To Serve"

September 8, 2023

State of Connecticut Siting Council
Ten Franklin Square
New Britain, CT, 06051

Dear Council Members,

In reference to Council Petition No. 1547 – SBA Communications Corporation proposed replacement of an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut, Motorola Solutions plans to commence installation of public safety communications equipment at the site in April of 2024.

Sincerely,

Paul Melanson
Chief of Police

CC. Ken Baldwin