STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

February 15, 2024

Kenneth C. Baldwin, Esq.
Robinson & Cole
280 Trumbull Street
Hartford, CT 06103-3597
kbaldwin@rc.com

RE: **PETITION NO. 1547 –** SBA Communications Corporation Declaratory Ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the replacement and extension of an existing telecommunications facility located at 277 Huckleberry Hill Road, Avon, Connecticut. **Request for Project Changes.**

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated February 7, 2024, on behalf of Cellco Partnership d/b/a Verizon Wireless, regarding changes to the above-referenced Declaratory Ruling that was issued by the Council on March 3, 2023.

Pursuant to Condition No. 1 of the Council's March 3, 2023 Declaratory Ruling, your request to install antenna models MT6413-77A and NNHSS-65B-R2BT4 in lieu of MT6407-77A and NHHSS-65-R2BT0 and remote radio head models RF4423-48A, RF4439d-25A and RF4461-13A in lieu of models RT 4401-48A/CBRS, B2/B66A and B5/B13 is hereby approved.

This approval applies only to the project changes described in your February 7, 2024 correspondence.

Please be advised that deviations from the standards established by the Council in the Declaratory Ruling are enforceable under the provisions of Connecticut General Statutes §16-50u.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

c: Brandon Robertson, Town Manager, Town of Avon (brobertson@avonct.gov)
Service List, dated December 8, 2022

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

February 7, 2024

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**

Minor Equipment Changes

Dear Attorney Bachman:

On behalf of Cellco Partnership d/b/a Verizon Wireless ("Cellco"), and pursuant to Conditions No. 1 of the Siting Council's decision in Petition No. 1547, we respectfully request staff approval of the following minor equipment changes at the SBA Communication Corporation wireless facility at 277 Huckleberry Road in Avon, Connecticut.

Due to equipment availability issues, Cellco will install antenna models MT6413-77A and NNHSS-65B-R2BT4 in lieu of models MT6407-77A and NHHSS-65B-R2BT0. Cellco will also be installing remote radio head (RRH) models RF4423-48A, RF4439d-25A and RF4461-13A in lieu of models RT 4401-48A/CBRS, B2/B66A and B5/B13.

Attached is a revised set of project plans, specifications for the new antennas and RRHs and an updated Structural Analysis Report confirming that the new tower is capable of supporting this new equipment. Please contact me if you have any questions or need any additional information.

Robinson+Cole

Sincerely,

Kenneth C. Baldwin

Copy to:

Greg Hines, SBA Communication Corp.
Brandon Robertson, Avon Town Manager
Tim Parks
Michael Humphreys

verizon

SITE NAME: BURLINGTON 2 CT

277 HUCKLEBERRY HILL ROAD

AVON, CT 06001

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
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10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
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15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
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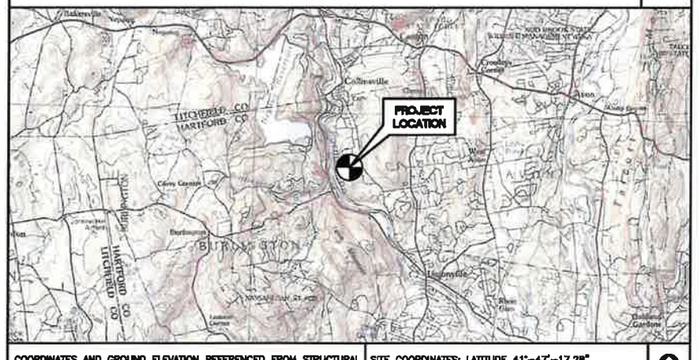
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

SITE LOCATION MAP — N.T.S.

VICINITY MAP — N.T.S.



COORDINATES AND GROUND ELEVATION REFERENCED FROM STRUCTURAL ANALYSIS REPORT PREPARED BY TOWER ENGINEERING PROFESSIONALS FOR VERIZON WIRELESS, DATE (REVISED) 04/17/2023.

SITE COORDINATES: LATITUDE 41°-47'-17.28"
LONGITUDE 72°-55'-5.71"
GROUND ELEVATION: 468.0'± A.M.S.L.

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. INSTALL (3) PROPOSED COMMSCOPE: NHH-65B-R2B ANTENNAS
2. INSTALL (3) PROPOSED COMMSCOPE: NHHSS-65B-R2B14 ANTENNAS
3. INSTALL (3) PROPOSED SAMSUNG: MT6413-77A ANTENNAS
4. INSTALL (3) PROPOSED COMMSCOPE: BASMNT-SBS-1-2 ANTENNA MOUNTS
5. INSTALL (3) PROPOSED SAMSUNG: B2/B66A RRH ORAN (RF4439d-25A) RADIO
6. INSTALL (3) PROPOSED SAMSUNG: RF4461d-13A RADIO
7. INSTALL (3) PROPOSED SAMSUNG: CBRS RT4423-48A RADIO
8. INSTALL (1) PROPOSED RAYCAP: OVP 12 BOX
9. INSTALL (2) PROPOSED 6x12 HYBRIFLEX CABLES
10. INSTALL PROPOSED SITEPRO: F3P-12W ANTENNA PLATFORM WITH HANDRAIL KIT
11. INSTALL PROPOSED CABLE ICE BRIDGE
12. INSTALL PROPOSED EQUIPMENT CANOPY
13. INSTALL PROPOSED DIESEL GENERATOR AND ASSOCIATED EQUIPMENT CABINETS ATOP A PROPOSED 20' x 12' CONCRETE PAD.

PROJECT INFORMATION

SITE NAME:	BURLINGTON 2 CT
SITE ADDRESS:	277 HUCKLEBERRY HILL ROAD AVON, CT 06001
PROPERTY OWNER:	TOWN OF AVON 60 WEST MAIN STREET AVON, CT 06001
LESSEE/TENANT:	VERIZON WIRELESS 20 ALEXANDER DRIVE, FLOOR 2 WALLINGFORD, CT 06492
VERIZON SITE ACQUISITION CONTACT:	PHILLIP COTTO STRUCTURE CONSULTING GROUP (617) 454-7383
PROPOSED TOWER COORDINATES:	LATITUDE 41°-47'-17.28" LONGITUDE 72°-55'-5.71" GROUND ELEVATION: 468.0'± A.M.S.L. COORDINATES AND GROUND ELEVATION REFERENCED FROM STRUCTURAL ANALYSIS REPORT PREPARED BY TOWER ENGINEERING PROFESSIONALS FOR VERIZON WIRELESS, DATE (REVISED) 04/17/2023.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER UPDATED SA REFERENCE
1	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT COMMENTS
0	06/20/23	BSP	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

verizon

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

VERIZON WIRELESS

BURLINGTON 2 CT

277 HUCKLEBERRY HILL ROAD
AVON, CT 06001

DATE: 06/05/23
SCALE: AS NOTED
JOB NO. 21058.04

TITLE SHEET

T-1

Sheet No. 1 of 18

NOTES AND SPECIFICATIONS:

DESIGN BASIS

GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED: 116 MPH (Vasd)
  (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-16).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
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STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   A. STRUCTURAL STEEL (W SHAPES)----ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)----ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)----ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)----ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE-----ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS-----ASTM A325-N
   G. U-BOLTS----ASTM A36
   H. ANCHOR RODS----ASTM F 1554
   I. WELDING ELECTRODE----ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCH-UP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) OVP (QTY)	(QTY) PROPOSED HYBRID/COAX
A1	PROPOSED	SAMSUNG (MT6413-77A)	24 x 11.8 x 4.53	110'	0°	(P) SAMSUNG: CBRS RT4423-48A (1)	(P) OVP 12 BOX (1)	(2) 6x12 HYBRID CABLES
A2	PROPOSED	COMMSCOPE (NHHSS-65B-R2BT4)	71.6 x 19 x 7.4	110'	0°	(P) SAMSUNG: RF4461d-13A (1)		
A3	PROPOSED	COMMSCOPE (NHH-65B-R2B)	71.6 x 19 x 7.4	110'	0°	(P) SAMSUNG: B2/B66A RRH ORAN (RF4439d-25A) (1)		
B1	PROPOSED	SAMSUNG (MT6413-77A)	24 x 11.8 x 4.53	110'	120°	(P) SAMSUNG: CBRS RT4423-48A (1)		
B2	PROPOSED	COMMSCOPE (NHHSS-65B-R2BT4)	71.6 x 19 x 7.4	110'	120°	(P) SAMSUNG: RF4461d-13A (1)		
B3	PROPOSED	COMMSCOPE (NHH-65B-R2B)	71.6 x 19 x 7.4	110'	120°	(P) SAMSUNG: B2/B66A RRH ORAN (RF4439d-25A) (1)		
C1	PROPOSED	SAMSUNG (MT6413-77A)	24 x 11.8 x 4.53	110'	240°	(P) SAMSUNG: CBRS RT4423-48A (1)		
C2	PROPOSED	COMMSCOPE (NHHSS-65B-R2BT4)	71.6 x 19 x 7.4	110'	240°	(P) SAMSUNG: RF4461d-13A (1)		
C3	PROPOSED	COMMSCOPE (NHH-65B-R2B)	71.6 x 19 x 7.4	110'	240°	(P) SAMSUNG: B2/B66A RRH ORAN (RF4439d-25A) (1)		

NOTE:
ALL HYBRID/COAX LENGTHS TO BE MEASURED AND VERIFIED IN FIELD BEFORE ORDERING

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3	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER UPDATED SA REFERENCE
2	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS - 90% REVIEWS
1	08/25/23	BSP	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
0	08/25/23	BSP	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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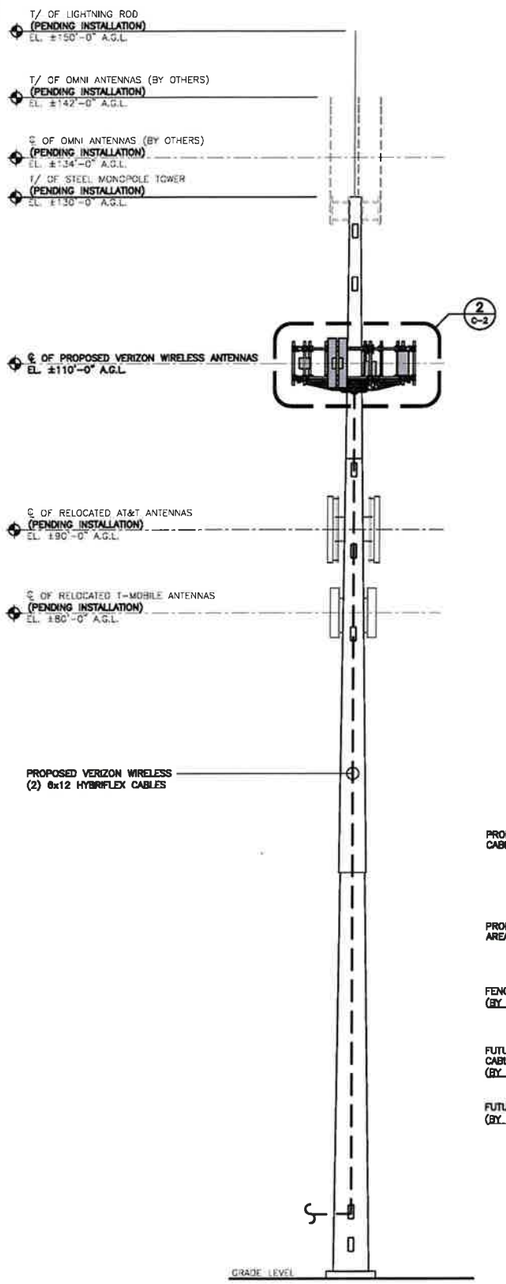
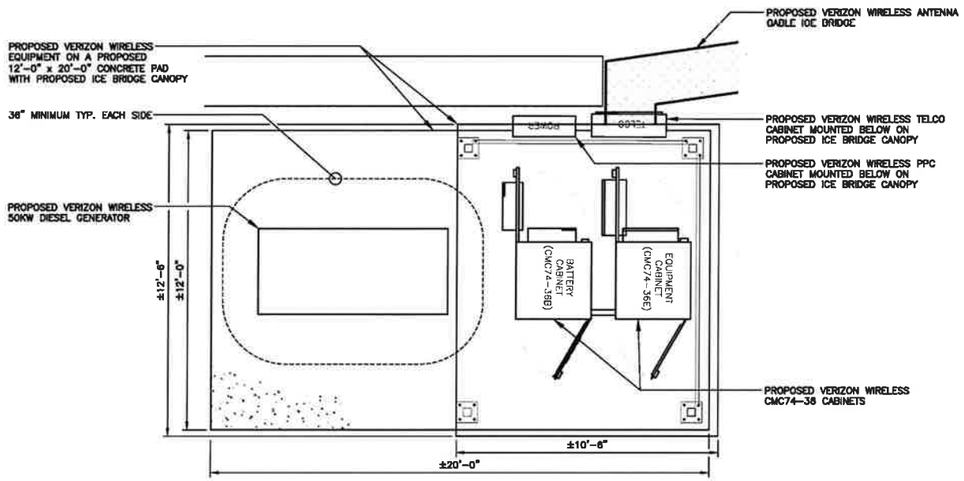
SPECIFICATIONS, NOTES & ANT. SCHEDULE

N-1

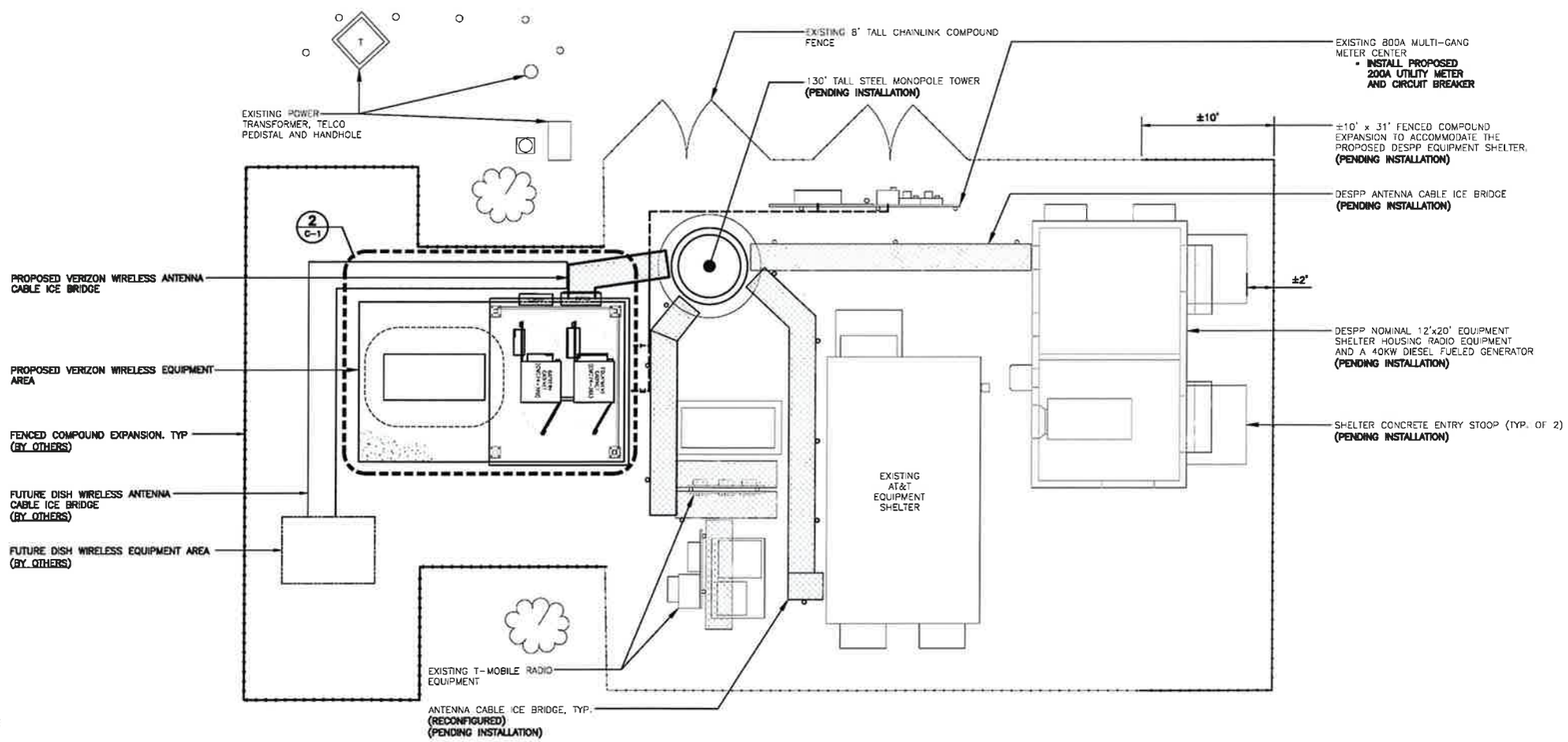
Sheet No. 2 of 15



3 C-1 **PROPOSED TOWER ELEVATION**
SCALE: 1" = 5'-0"



2 C-1 **PROPOSED EQUIPMENT PLAN**
SCALE: 3/8" = 1'-0"
NORTH



1 C-1 **PROPOSED COMPOUND PLAN**
SCALE: 1" = 5'-0"
NORTH

STRUCTURAL COMPLIANCE

TOWER AND TOWER FOUNDATION

A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY "TOWER ENGINEERING PROFESSIONALS" (PROJECT # 144880) DATED 01/28/24 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER UPDATED SA REFERENCE
2	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER UPDATED ANALYSIS
1	08/25/23	BSP	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION
0	08/25/23	BSP	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

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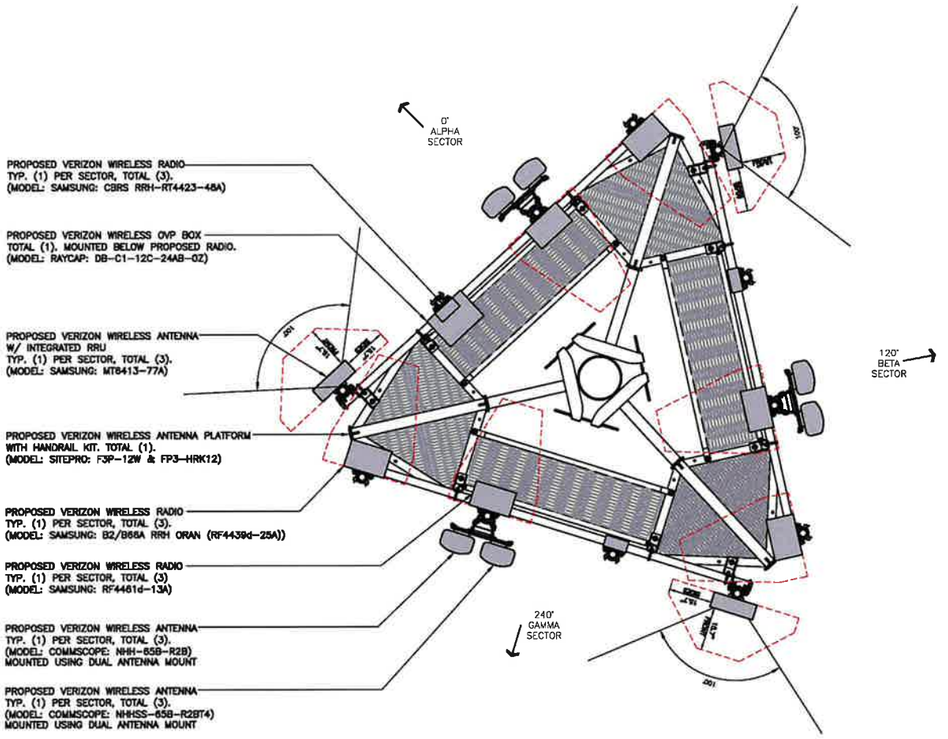
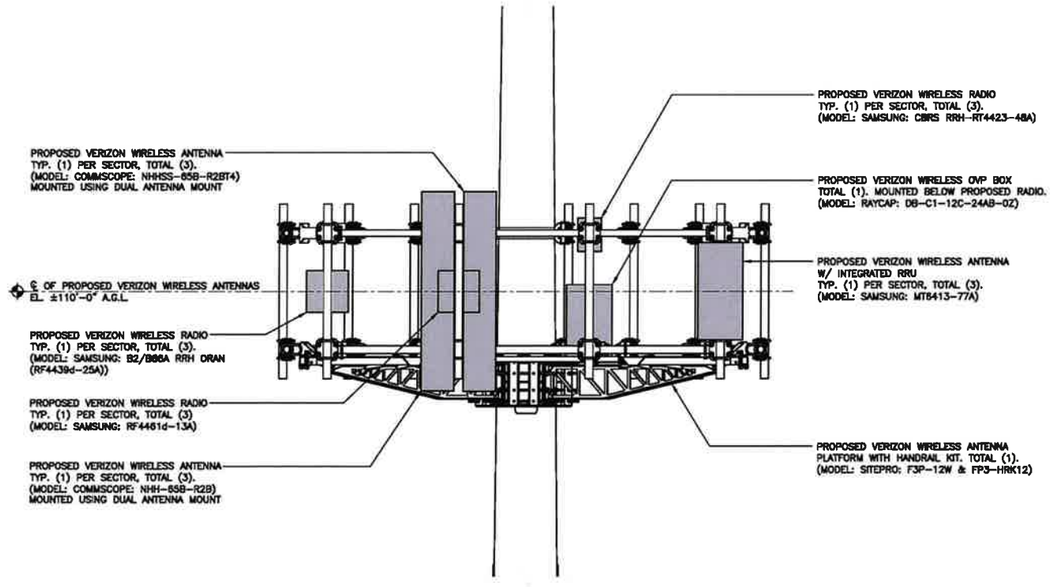
COMPOUND PLAN, EQUIPMENT PLAN AND ELEVATION

C-1

Sheet No. 3 of 16



1 C-2 **PROPOSED ANTENNA CONFIGURATION PLAN**
SCALE: 1/2" = 1'-0"



2 C-2 **PROPOSED ANTENNA ELEVATION**
SCALE: 1/2" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER UPDATED SA REFERENCE
1	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT COMMENTS
0	08/25/23	BSP	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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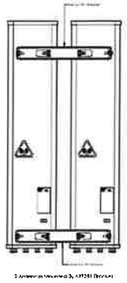
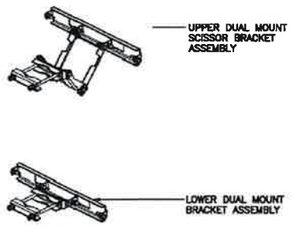
ANTENNA PLAN AND ELEVATION

C-2

Sheet No. 4 of 16



ELEVATION



ISOMETRIC

SIDE-BY-SIDE ANTENNA MOUNTING KIT			
MOUNT	DESCRIPTION	SUPPORTED ANTENNAS	GAP BETWEEN ANTENNAS
MAKE: COMMSCOPE MODEL: BASMNT-SBS-1-2	(2) BRACKET KIT FOR MOUNTING (2) ANTENNAS SIDE-BY-SIDE	SBNHH 65" AND 85" NHH 65" AND 85"	3-3/8"

NOTES:
1. MOUNT ACCOMMODATES MAST DIAMETERS FROM 2.375" TO 4.5" (O.D.).
2. CONTRACTOR TO CONFIRM MOUNT MAKE/MODEL AND QUANTITY WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

1 C-3 PROPOSED SIDE-BY-SIDE ANTENNA MOUNT
NOT TO SCALE

MT6413-77A

ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: MT6413-77A	28.90"H x 15.75"W x 5.51"D	57.3 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. ANTENNA HAS ITS OWN BUILT-IN RRU.

2 C-3 PROPOSED ANTENNA DETAIL
SCALE: NOT TO SCALE

ELEVATION - ISOMETRIC

BOTTOM

6-PORT SECTOR ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: NHH-65B-R2B	71.9"L x 11.8"W x 7.1"D	43.6 LBS. (W/OUT MOUNT KIT)

3 C-3 SECTOR ANTENNA DETAIL
NOT TO SCALE

ELEVATION - ISOMETRIC

BOTTOM

10-PORT SECTOR ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: NHHSS-65B-R2BT4	71.9"L x 11.8"W x 7.1"D	±51 LBS. (W/OUT MOUNT KIT)

4 C-3 SECTOR ANTENNA DETAIL
NOT TO SCALE

RF4439d-25A

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RF4439d-25A	14.96"H x 14.96"W x 10.04"D	74.7 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 C-3 PROPOSED REMOTE RADIO UNIT DETAIL
SCALE: NOT TO SCALE

RF4461d-13A

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RF4461d-13A	14.96"H x 14.96"W x 10.23"D	78.1 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 C-3 PROPOSED REMOTE RADIO UNIT DETAIL
SCALE: NOT TO SCALE

RT4423-48 ONLY

RT4423-48 WITH CLIP-ON ANTENNA

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RT4423-48(A/B)	11.8"H x 8.7"W x 3.6"D	15.43 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. RT4423-48A IS FOR DC
   RT4423-48B IS FOR AC (AC AND DC TYPE HAVE SAME SIZE AND WEIGHT)
3. DIMENSIONS AND WEIGHT SHOWN ARE FOR THE RRU ONLY.

7 C-3 PROPOSED REMOTE RADIO UNIT DETAIL
SCALE: NOT TO SCALE

OVP BOX		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RAYCAP MODEL: DS-C1-12C-24AB-0Z	29.5"H x 18.5"W x 12.6"D	32 LBS.

NOTES:
1. CONTRACTOR TO CONFIRM OVP BOX MAKE/MODEL AND QUANTITY WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

8 C-3 PROPOSED OVER-VOLTAGE PROTECTION BOX
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER UPDATED SA REFERENCE
1	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT COMMENTS
0	06/30/23	BSP	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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TYPICAL EQUIPMENT DETAILS

C-3

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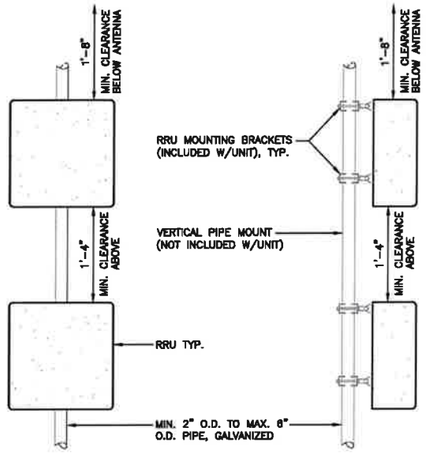
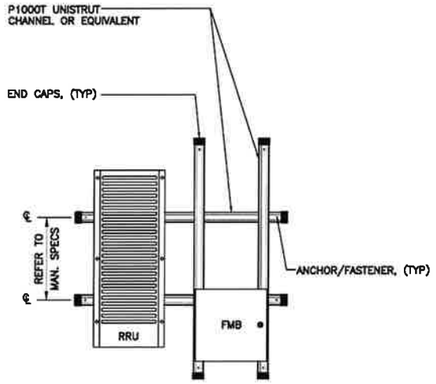


NOTES: (PIPE MOUNTING)

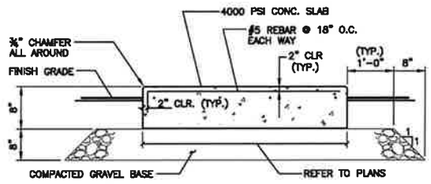
1. VERIZON WIRELESS SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.



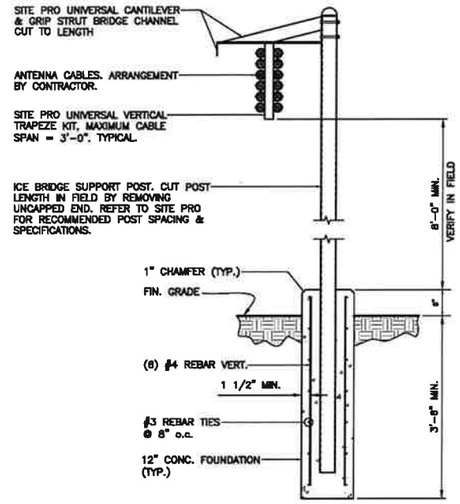
NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

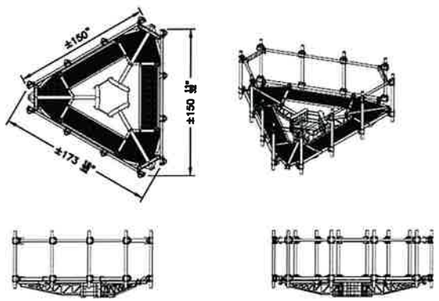
1 C-4 **TYPICAL RRU MOUNTING DETAILS**
SCALE: NOT TO SCALE



2 C-4 **TYPICAL CONCRETE PAD DETAIL**
SCALE: NOT TO SCALE

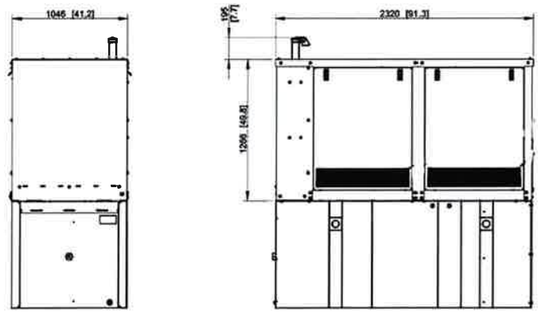


3 C-4 **TYPICAL ICE-BRIDGE DETAIL**
SCALE: NOT TO SCALE



ANTENNA PLATFORM MOUNT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SITE PRO 1 PART NO.: F3P-12W & F3P-HRK12	150.34"L x 173.59"W	±2527.9 LBS.

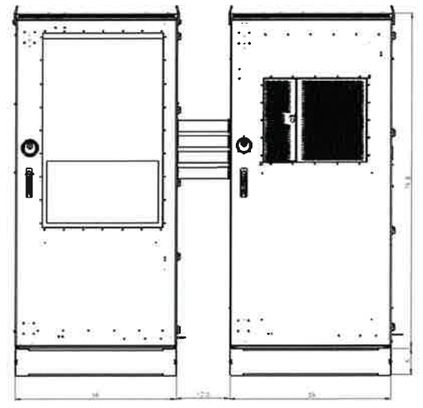
4 C-4 **ANTENNA PLATFORM MOUNT DETAIL**
SCALE: NOT TO SCALE



BACKUP POWER GENERATOR						
EQUIPMENT	POWER GENERATED	FUEL	MODEL NUMBER	FUEL TANK SIZE (GAL)	DIMENSIONS	WEIGHT
MAKE: KOHLER MODEL: 50REOZJE	50 KW, AC	DIESEL	GM117250-SA8	283	91.3"L x 41.2"W x 49.8"H	3795 LBS.

NOTES:
1. FUEL LEVEL/SECONDARY CONTAINMENT SHALL BE ALARMED AND IN COMMUNICATION WITH VERIZON WIRELESS'S NOC.
2. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION AND ALL OPTIONAL FEATURES WITH VERIZON WIRELESS'S CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 C-4 **PROPOSED GENERATOR DETAIL**
SCALE: NOT TO SCALE



EQUIPMENT CABINETS		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: CMC74-36E CABINET	74.8"H x 36.2"W x 43.7"D	±385 LBS
MAKE: COMMSCOPE MODEL: CMC74-36B CABINET	74.8"H x 36.2"W x 43.7"D	±776 LBS

6 C-4 **CMC74-36 CABINET DETAILS**
SCALE: NOT TO SCALE

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2	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER UPDATED SA REFERENCE
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TYPICAL EQUIPMENT DETAILS

C-4

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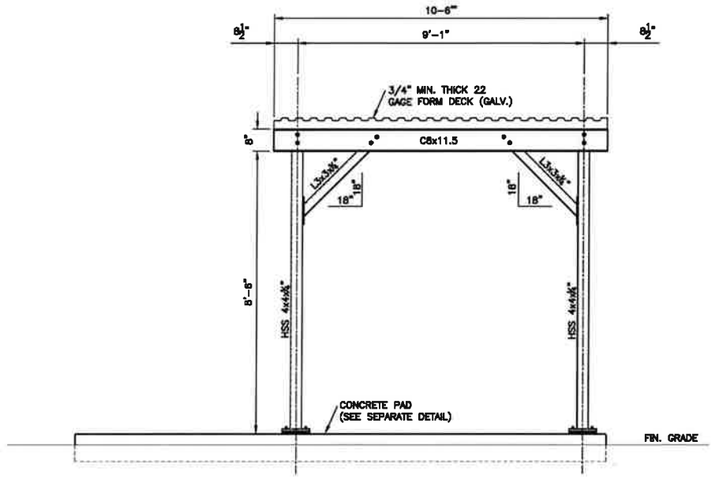
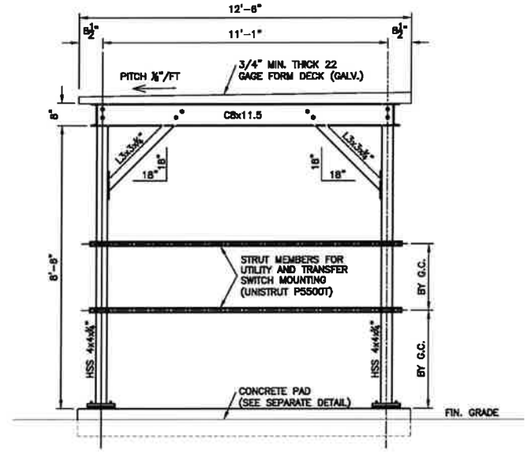


FRONT ELEVATION



SIDE ELEVATION

1 / C-5 **EQUIPMENT ICE BRIDGE CANOPY ELEVATIONS**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER UPDATED SA REFERENCE
2	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT COMMENTS
1	09/20/23	BSP	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION
0	08/30/23	BSP	TJR	

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ICE CANOPY DETAILS

C-5

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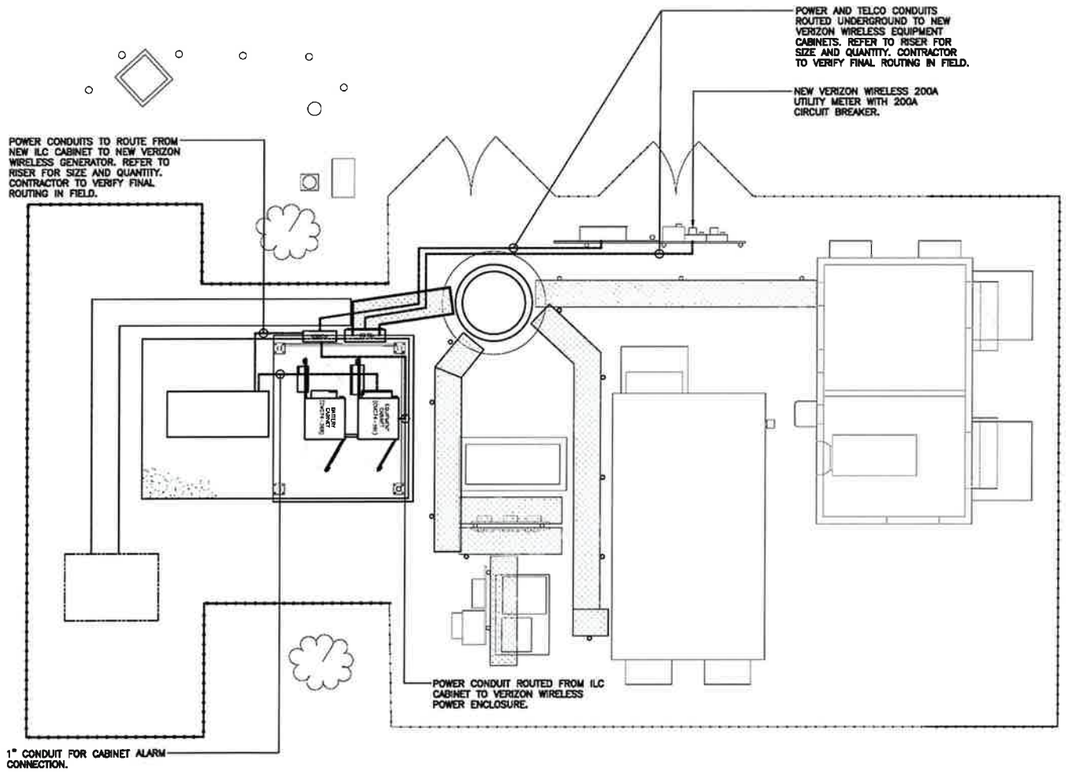
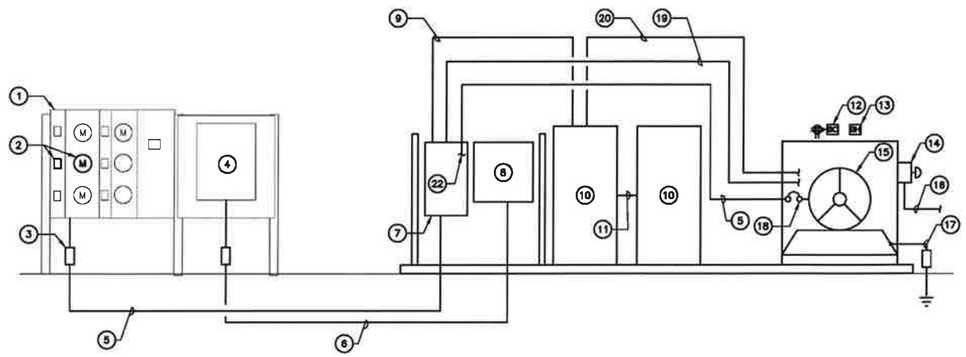


1 E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: NOT TO SCALE

RISER NOTES

1. EXISTING 800A MUTLI-GANG METER CENTER TO REMAIN.
2. INSTALL NEW 200A, SINGLE PHASE, 240V RATED UTILITY METER. WITH 200A/2P CIRCUIT BREAKER.
3. EXPANSION COUPLING TYP.
4. EXISTING FIBER/TELCO DEMARC.
5. (3) 3/0 AWG, (1) #6 AWG GROUND. 2" CONDUIT
6. (1) 2" CONDUIT WITH PULL ROPES FOR TELEPHONE COMPANY CONDUCTORS. CONDUCTORS PROVIDED Y TELEPHONE COMPANY. PROVIDE ALL COUPLINGS, ADAPTERS, SWEEPS AND ASSOCIATED HARDWARE. MATERIAL SHALL BE PER TELEPHONE COMPANY SPECIFICATIONS.
7. NEW 200A, 240V, 1Ø, ILC CABINET
8. VERIZON WIRELESS EQUIPMENT CABINET
9. 3' x 3' x 1' NEMA 3R HOFFMAN BOX AT EQUIPMENT FORM TELCO CONNECTIONS.
10. POWER CONDUITS AND CONDUCTORS FROM EQUIPMENT CABINET AS REQUIRED BY MANUFACTURER FOR PROPER OPERATION.
11. VERIZON WIRELESS EQUIPMENT CABINETS.
12. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
13. GENERATOR BATTERY CHARGER AND CONVENIENCE GFCI OUTLET WIRED TO NEW ILC. OUTLET TO BE MOUNTED IN WEATHERPROOF ENCLOSURE.
14. GENERATOR BLOCK HEATER WIRED TO ILC CABINET
15. REMOTE GENERATOR SHUT OFF SWITCH IN BREAK GLASS ENCLOSURE MOUNTED TO EXTERIOR OF GENERATOR ENCLOSURE PER 2019 NFPA 110 5.6.5.6.1.
16. EMERGENCY BACK-UP GENERATOR
17. 3/4" CONDUIT AND CONDUCTORS REQUIRED FOR PROPER OPERATION OF EMERGENCY GENERATOR SHUT OFF SWITCH.
18. GENERATOR GROUNDING PER NEC AND MANUFACTURER'S REQUIREMENTS. BOND TO EXISTING GROUNDING SYSTEM. (MINIMUM OF (1) #2 AWG GROUND)
19. GENERATOR OUTPUT CIRCUIT BREAKER.
20. 1" CONDUIT FOR GENERATOR CONTROL AND SIGNAL WIRING. CONTRACTOR TO VERIFY ROUTING IN FIELD.
21. 1" CONDUIT FOR CABINET ALARM.
22. EXTEND GENERATOR POWER OUTPUT CONDUCTORS TO EMERGENCY LUGS IN ILC CABINET.



2 E-1 **ELECTRICAL RISER DIAGRAM**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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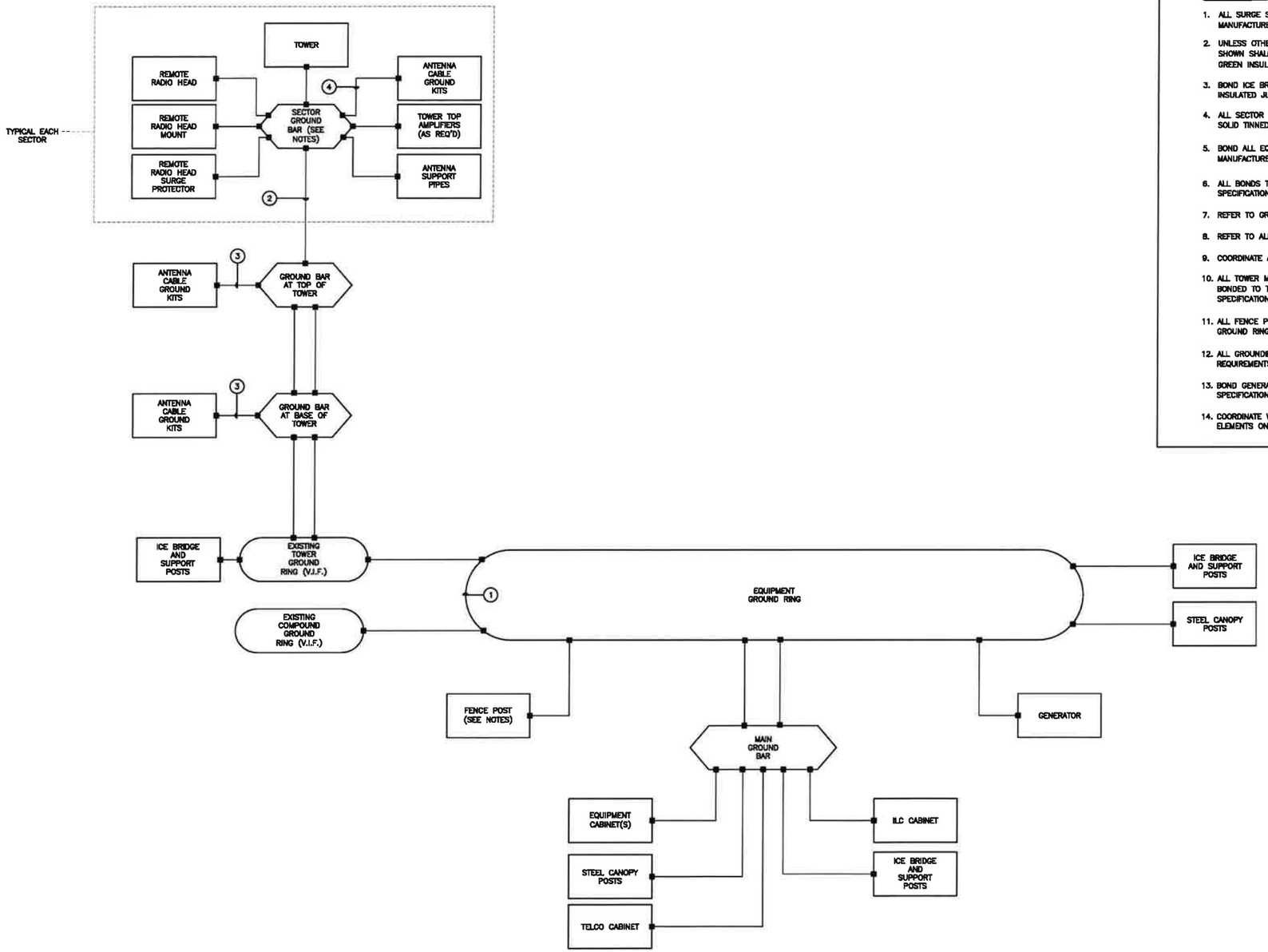
ELECTRICAL RISER AND CONDUIT ROUTING PLAN

E-1

Sheet No. 3 of 15



1 E-2 **ELECTRICAL SCHEMATIC DIAGRAM**

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

1. GROUND RING, #2 AWG BCW
2. #2/0 GREEN INSULATED
3. #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
7. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
8. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
9. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
10. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
11. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT PAD SHALL BE BONDED TO GROUND RING.
12. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
13. BOND GENERATOR TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS
14. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

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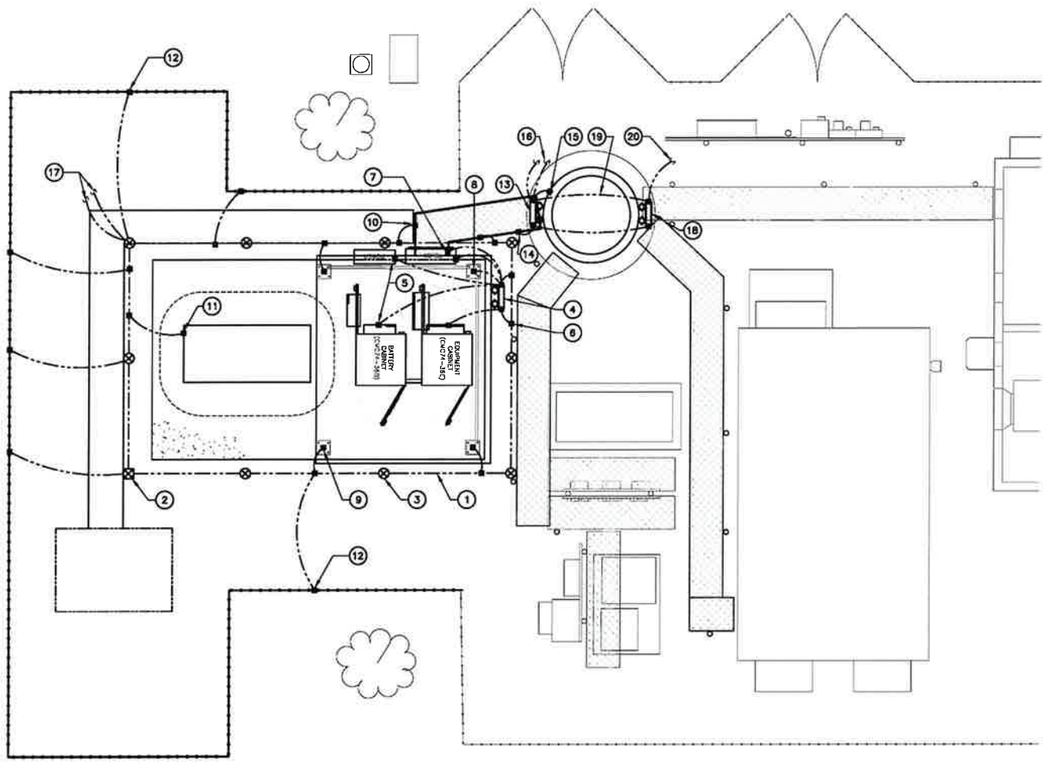
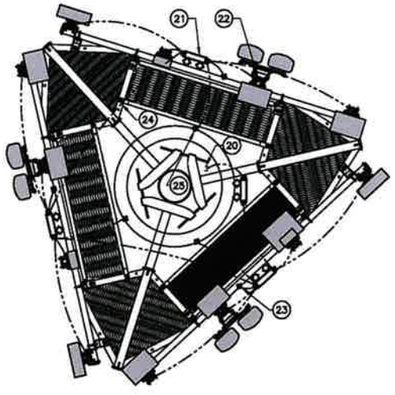
ELECTRICAL SCHEMATIC DIAGRAM

E-2

Sheet No. 2 of 16



1 E-3 **EQUIPMENT GROUNDING PLAN**
SCALE: NOT TO SCALE



2 E-3 **ANTENNA GROUNDING PLAN**
SCALE: NOT TO SCALE

GROUNDING PLAN NOTES:

1. #2 SOLID TINNED BCW GROUND RING (2'-0" FROM OUTSIDE EDGE OF EQUIPMENT PAD FOUNDATION) (TYP.).
2. GROUNDING ROD WITH ACCESS (TYP.) PER DETAILS.
3. GROUNDING ROD (TYP.) PER DETAILS.
4. MAIN GROUND BAR TYP.
5. BOND EQUIPMENT CABINETS TO MAIN GROUND BAR, TYP.
6. BOND MAIN GROUND BAR TO GROUND RING TYP. 2 LEADS.
7. BOND ICE-BRIDGE POST TO MAIN GROUND BAR.
8. BOND STEEL CANOPY POST TO MAIN GROUND BAR.
9. BOND STEEL CANOPY POSTS TO GROUND RING TYP.
10. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING.
11. BOND GENERATOR TO GROUND RING PER NEC AND MANUFACTURER REQUIREMENTS.
12. CONNECT FENCE AND FENCE POSTS TO GROUND RING TYP. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT PAD SHALL BE BONDED TO GROUND RING.
13. LOWER TOWER MOUNTED GROUND BAR.
14. BOND LOWER TOWER MOUNTED GROUND BAR TO ICE-BRIDGE POST. TYP.
15. BOND LOWER TOWER MOUNTED GROUND BAR TO TOWER STEEL.
16. BOND LOWER TOWER MOUNTED GROUND BAR TO TOWER GROUND RING TYP. 2 LEADS.
17. BOND EQUIPMENT GROUND RING TO COMPOUND GROUND RING TYP. 2 LEADS.
18. UPPER TOWER MOUNTED GROUND BAR.
19. BOND LOWER TOWER MOUNTED GROUND BAR TO UPPER TOWER MOUNTED GROUND TYP. 2 LEADS.
20. BOND UPPER TOWER MOUNTED GROUND BAR TO SECTOR GROUND BAR TYP.
21. SECTOR GROUND BAR, TYP.
22. BOND ANTENNA AND RRU MOUNTING PIPES TO SECTOR GROUND BAR. TYP.
23. BOND SECTOR GROUND BAR TO STEEL ANTENNA FRAME
24. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW
25. BOND SECTOR GROUND BAR TO TOWER STEEL TYP.

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ELECTRICAL GROUNDING PLANS

E-3

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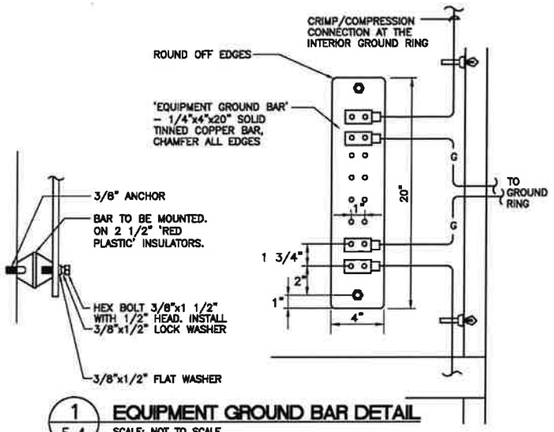
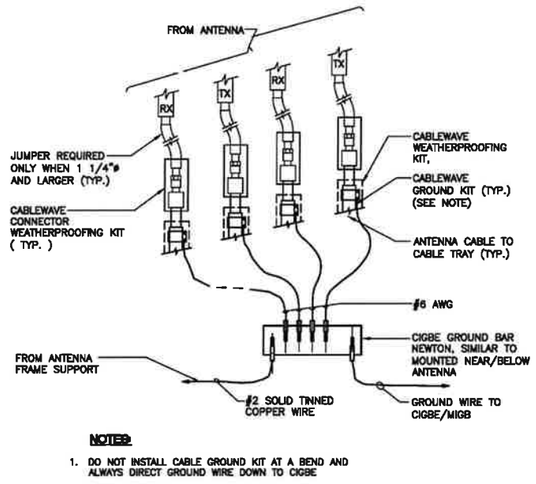
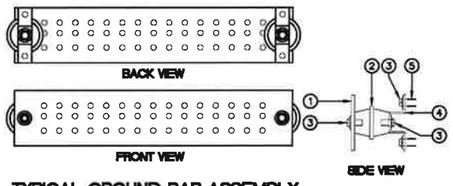


1 E-4 **EQUIPMENT GROUND BAR DETAIL**
SCALE: NOT TO SCALE



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

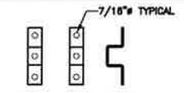
2 E-4 **CONNECTION OF GROUND WIRES TO GROUND BAR**
SCALE: NOT TO SCALE



TYPICAL GROUND BAR ASSEMBLY
SCALE: 1/8"= 1'-0"

TYPICAL GROUND BAR - DIMENSIONS
SCALE: 1/8"= 1'-0"

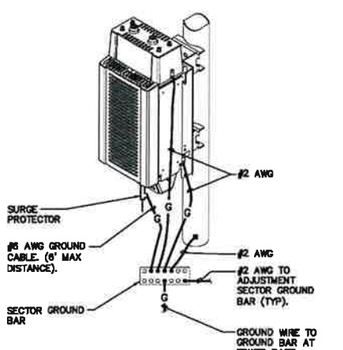
NOTES
1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE – 3/8"ø EXPANSION BOLT FOR CONCRETE.



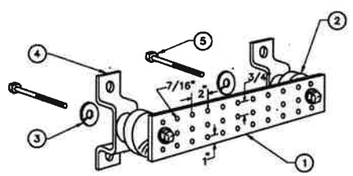
BRACKET FOR GROUND BAR-DIMENSIONS
SCALE: 1/8"= 1'-0"

3 E-4 **MASTER/EQUIPMENT GROUND BAR DETAILS**
SCALE: NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.

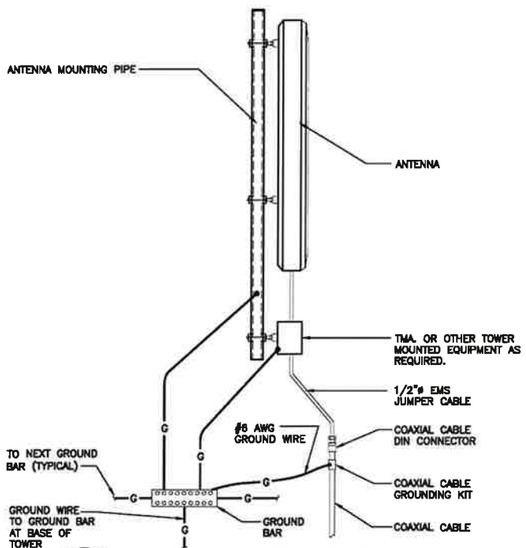


4 E-4 **RRH POLE MOUNT GROUNDING**
SCALE: NOT TO SCALE

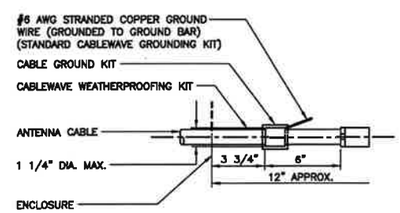


NOTES
1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-8058.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

5 E-4 **GROUND BAR DETAIL**
SCALE: NOT TO SCALE



6 E-4 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NOT TO SCALE



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

7 E-4 **ANTENNA CABLE GROUNDING DETAIL**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-4

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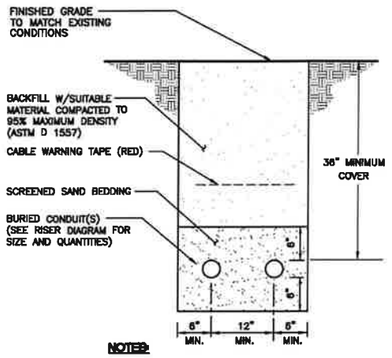
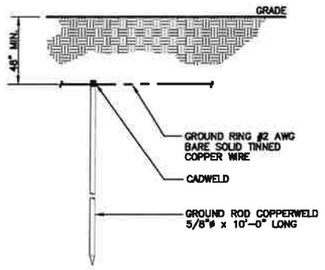


NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN UTILITY SOURCE AND SERVICE EQUIPMENT, COORDINATE WITH UTILITY COMPANY FOR BURIAL DEPTH REQUIREMENTS.
4. COORDINATE WITH ELECTRICAL ENGINEER WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN SERVICE EQUIPMENT AND EQUIPMENT SHELTER.

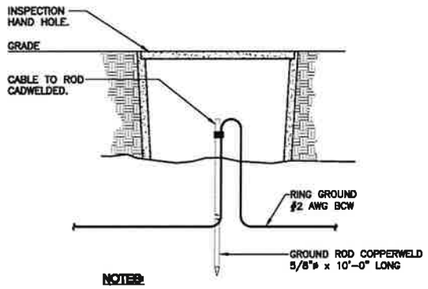
1 / E-5 **TYPICAL ELECTRICAL TRENCH DETAIL**
NOT TO SCALE



NOTES:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

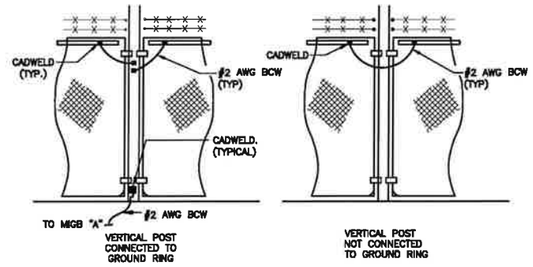
2 / E-5 **GROUND ROD DETAIL**
NOT TO SCALE



NOTES:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

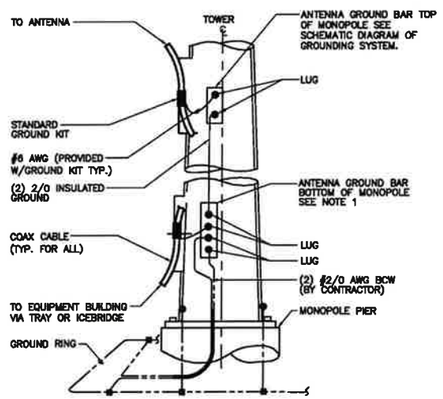
3 / E-5 **GROUND ROD WITH ACCESS DETAIL**
NOT TO SCALE



NOTES:

1. VERTICAL POSTS SHALL BE BONDED TO THE RING AT EACH CORNER AND AT EACH GATE POST. AS A MINIMUM ONE VERTICAL POST SHALL BE BONDED TO THE GROUND RING IN EVERY 100 FOOT STRAIGHT RUN OF FENCE.
2. HORIZONTAL POLES SHALL BE BONDED TO EACH OTHER.
3. BOND EACH HORIZONTAL POLE / BRACE TO EACH OTHER AND TO EACH VERTICAL POST THAT IS BONDED TO THE EXTERIOR GROUND RING.

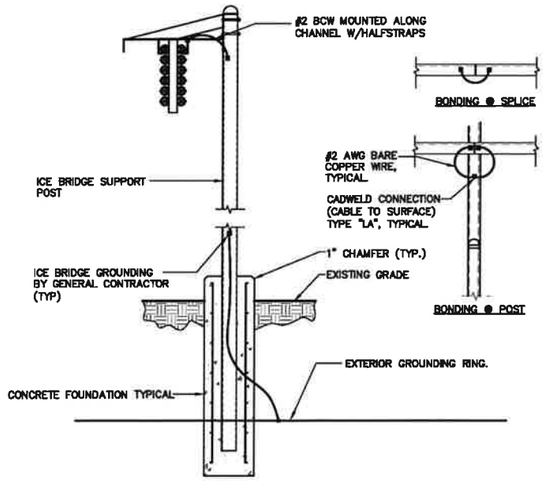
4 / E-5 **GROUND-STD. DETAIL. FENCE GROUNDING**
NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

5 / E-5 **ANTENNA CABLE GROUNDING**
NOT TO SCALE



6 / E-5 **ICE BRIDGE BONDING DETAIL**
NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-5

Sheet No. 12 of 16

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL 200A, 120/240V, 1Ø, 3W ELECTRIC SERVICE REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.
3. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, ETC. AS INDICATED OR NOTED ON PLANS.
4. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, INTERIOR GROUNDING RING, GROUND BARS, ETC.
5. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
6. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. TELEPHONE CABLES.

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

N. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN BURIAL DEPTH OVER NEC TABLE 300.5 [2]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, Ø PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-5", ETC.).

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/30/23	BSP	TJR	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION
1	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT COMMENTS
2	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS - REVISED PER UPDATED SA REFERENCE

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(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
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BURLINGTON 2 CT

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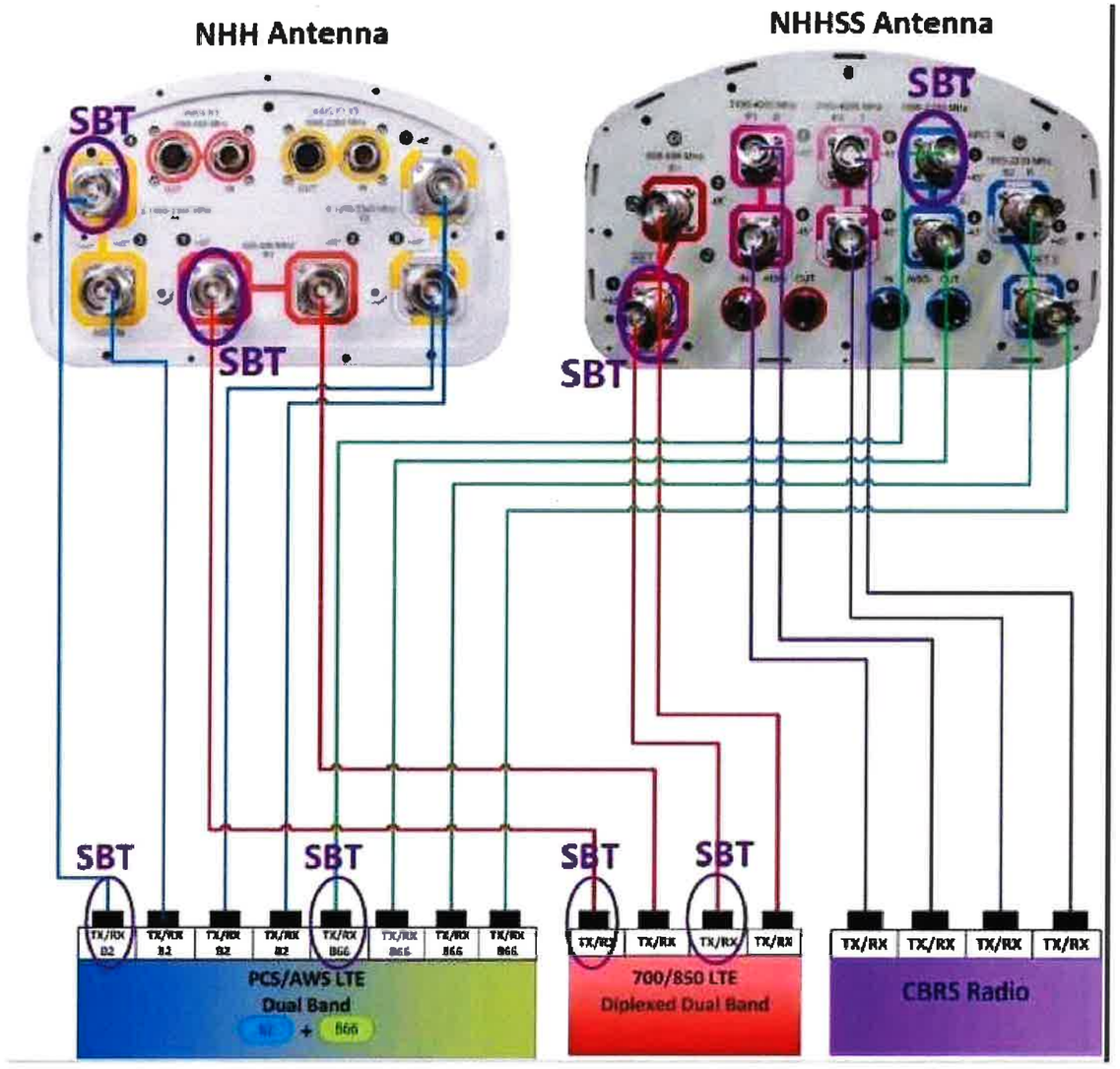
AVON, CT 06001

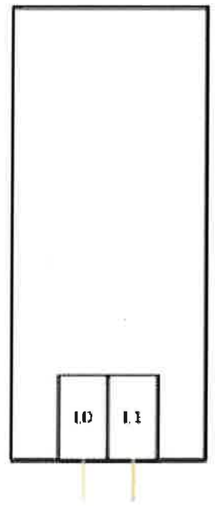
DATE: 06/05/23
SCALE: AS NOTED
JOB NO. 21058.04

ELECTRICAL SPECIFICATIONS

E-6

Sheet No. 13 of 16





ALPHA SECTOR PLUMBING DIAGRAM

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	02/01/24	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER UPDATED SA REFERENCE
1	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT COMMENTS
0	06/20/23	BSP	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

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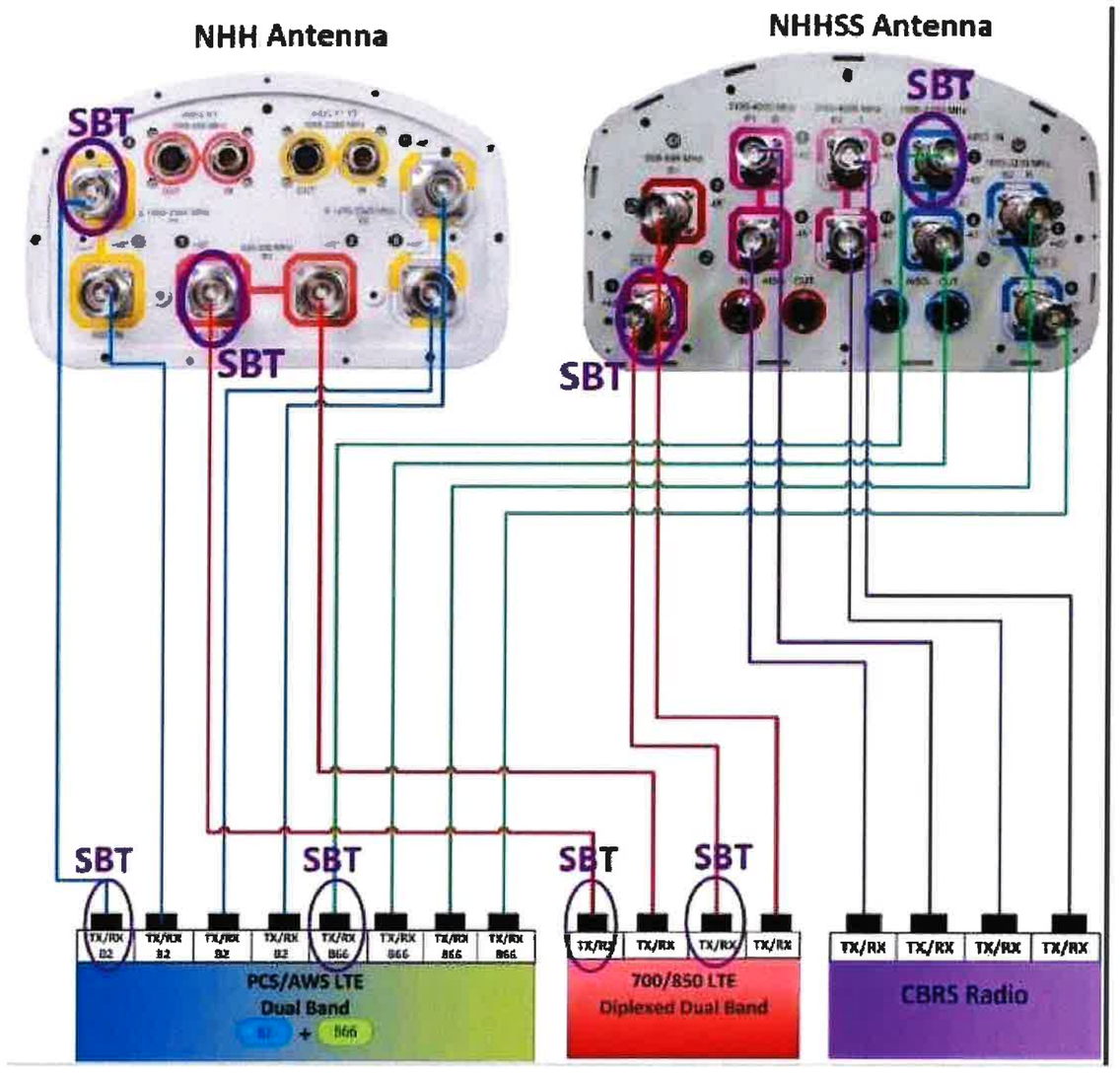
DATE: 06/06/23
SCALE: AS NOTED
JOB NO. 21058.04

PLUMBING DIAGRAM ALPHA SECTOR

RF-1

Sheet No. 14 of 16



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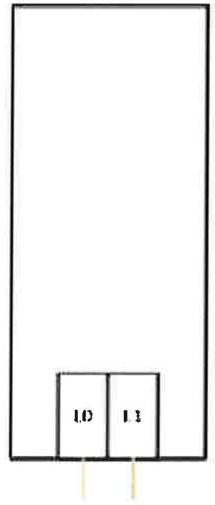

BETA SECTOR PLUMBING DIAGRAM

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2	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT COMMENTS
0	06/20/23	BSP	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

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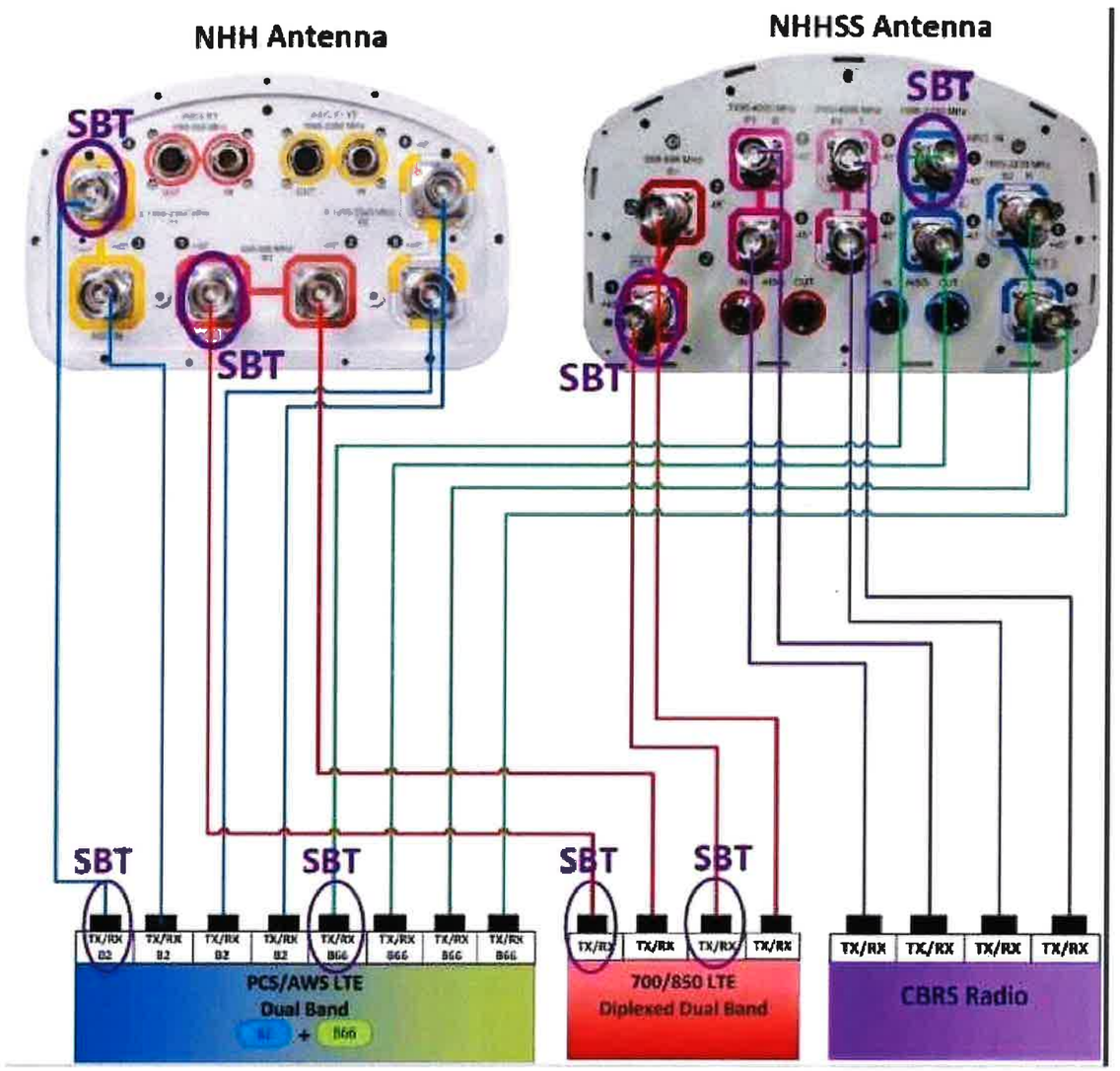
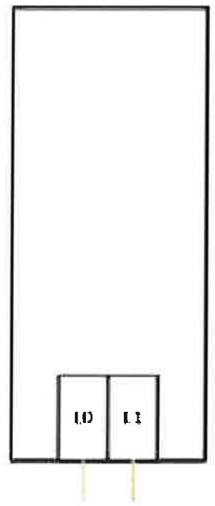
SCALE: AS NOTED
JOB NO. 21058.04

PLUMBING DIAGRAM BETA SECTOR

RF-2

Sheet No. 15 of 18





GAMMA SECTOR PLUMBING DIAGRAM

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3	11/10/23	BSP	TJR	CONSTRUCTION DOCUMENTS – REVISED PER CLIENT COMMENTS
0	08/20/23	BSP	TJR	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

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DATE: 08/05/23
SCALE: AS NOTED
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PLUMBING DIAGRAM GAMMA SECTOR

RF-3

Sheet No. 16 of 16

C-band 64T64R

SAMSUNG

Gen 2

Gen 2 : Higher conducted power radio with reduced size/volume/weight vs Gen 1 and also SOC embedded for flexibility to support new features

※ Preliminary Design: External appearance and mechanical design can be subject to change

Gen 2. 64T64R C-band MMU Dimensions	
Size (WxHxD)	400 x 734 x 140 mm (15.75 x 28.90 x 5.51 inch)
Weight	26kg (57.3 lb)

Item	Gen 2 64T64R (MT6413-77A)
Air Technology	NR n77/TDD
Frequency	3700 – 3980 MHz
IBW	200 MHz
OBW	200 MHz
Carrier Bandwidth	20(HW ready)/40/60/80/100 MHz
# of Carriers	2 carriers
Layer	DL : 16L, UL : 16RX (8L)
RF Chain	64T64R
Antenna Configuration	4V16H with 192 AE
EIRP	80.5 dBm @320W (55 dBm + 25.5 dBi)
Conductive Power	320W
Spectrum Analyzer	TX/RX support
RX Sensitivity	Typical -97.8dBm @(1Rx, 18.36MHz with 30kHz,51RBs)
Modulation	DL 256QAM support, (DL 1024QAM with 1~2dB power back-off)
Function Split	DL/UL option 7-2x
Input Power	-48 VDC (-38 VDC to -57 VDC)
Power Consumption	1,287W (100% load, room temp.)
Size (WHD)	**400 x 734 x 140 mm (15.75 x 28.90 x 5.51 inch)**
Volume	**41.1L**
Weight	**26kg (57.3 lb)**
Operating Temperature	-40°C - 55°C (w/o solar load)
Cooling	Natural convection
Unwanted Emission	3GPP 38.104 FCC 47 CFR 27.53 : < -13dBm/MHz < -40 dBm/MHz @ above 4 GHz <-50 dBm /MHz @ 4,040 ~ 4,050 MHz, <-60 dBm /MHz @ above 4,050 MHz
Optic Interface	15km, 4 ports (25Gbps x 4), SFP28, single mode, Bi-di (Option: Duplex)
Mounting Options	Pole, wall
NB-IoT	Not support
External Alarm	4RX
Fronthaul Interface	eCPRI

NHHSS-65B-R2BT4

10-port sector antenna, 2x 698–896, 4x 1695–2200 and 4x 3100-4200 MHz, 65° HPBW, 2x RETs and 2x SBTs. Both high bands share the same electrical tilt.

- Perfect antenna to add 3.5GHz CBRS to macro sites
- Low band and mid band performance mirrors the performance of existing NHH hex port antennas
- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One LB RET and one HB RET. Both high bands are controlled by one RET to ensure same tilt level for 4x MIMO

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, mid band	4
RF Connector Quantity, low band	2
RF Connector Quantity, total	10

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	4x 8 pin connector as per IEC 60130-9 Daisy chain in: Male / Daisy chain out: Female Pin3: RS485A(AISG_B), Pin5: RS485B(AISG_A), Pin6: DC 10~30V, Pin7: DC_ Return

COMMSCOPE®

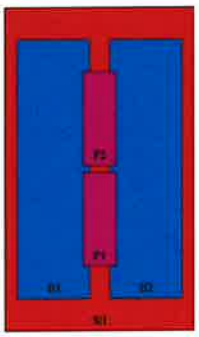
NHHSS-65B-R2BT4

RET Interface, quantity	2 female | 2 male
Input Voltage	10–30 Vdc
Internal RET	High band (1) | Low band (1)
Power Consumption, active state, maximum	10 W
Power Consumption, idle state, maximum	2 W
Protocol	3GPP/AISG 2.0 (Single RET)

Dimensions

Width	301 mm | 11.85 in
Depth	181 mm | 7.126 in
Length	1828 mm | 71.969 in
Net Weight, without mounting kit	23.1 kg | 50.927 lb

Array Layout

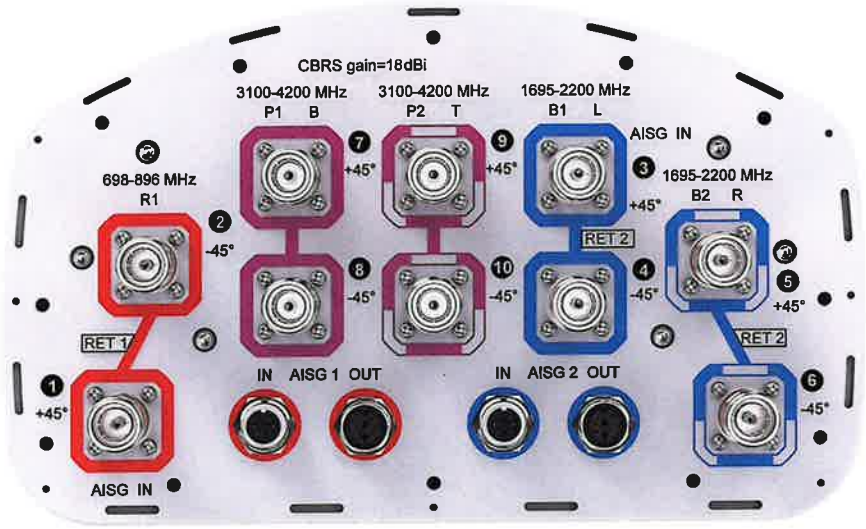


Array ID	Frequency (MHz)	RF Connector	RET (SRET)	AISG No.	AISG RET UID
P1	698-896	1 - 2	1	AISG1	CPxxxxxxxxxxxxxxR1
P3	1695-2200	3 - 4	2	AISG2	CPxxxxxxxxxxxxxxB1
P2	1695-2200	5 - 6			
P7	3100-4200	7 - 8	N/A	NA	N/A
P8	3100-4200	9 - 10			

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

Port Configuration

NHHSS-65B-R2BT4



Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2200 MHz | 3100 – 4200 MHz | 698 – 896 MHz
Polarization	±45°
Total Input Power, maximum	1,000 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**3100–3550**	**3550–3700**	**3700–4200**
Gain, dBi	14.8	15.2	17.4	17.8	18	17.7	17.3	17.9
Beamwidth, Horizontal, degrees	65	62	66	61	64	54	64	60
Beamwidth, Vertical, degrees	13	11.6	5.5	5.2	4.9	5.7	5.3	4.9
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	4	4	4
USLS (First Lobe), dB	15	15	16	18	18	16	17	18
Front-to-Back Ratio at 180°, dB	26	29	31	28	27	30	33	29
Isolation, Cross Polarization, dB	25	25	25	25	25	25	25	25
Isolation, Inter-band, dB	25	25	25	25	25	28	28	28
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-140	-140	-140

NHHSS-65B-R2BT4

Input Power per Port at 50°C, maximum, watts	300	300	300	300	300	100	100	100

Electrical Specifications, BASTA

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2200**	**3100–3550**	**3550–3700**	**3700–4200**
Gain by all Beam Tilts, average, dBi	14.6	14.8	17	17.5	17.7	17.3	17	17.2
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.4	±0.6	±0.3	±0.4	±0.6	±0.7	±0.8
Gain by Beam Tilt, average, dBi	0° | 14.6 7° | 14.6 14° | 14.4	0° | 15.0 7° | 14.9 14° | 14.5	0° | 16.9 3° | 17.0 7° | 16.8	0° | 17.4 3° | 17.5 7° | 17.4	0° | 17.5 3° | 17.8 7° | 17.6			
Beamwidth, Horizontal Tolerance, degrees	±1.7	±1.3	±7.2	±3.1	±6.2	±10	±6.7	±10.5
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.8	±0.2	±0.2	±0.4	±0.4	±0.3	±0.4
USLS, beampeak to 20° above beampeak, dB	18	16	14	15	17	14		
Front-to-Back Total Power at 180° ± 30°, dB	22	25	25	25	24	26	25	24
CPR at Boresight, dB	24	17	16	21	19	15	17	14
CPR at Sector, dB	12	6	11	10	8	8	9	7

Mechanical Specifications

Wind Loading @ Velocity, frontal	278.0 N @ 150 km/h (62.5 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	230.0 N @ 150 km/h (51.7 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	537.0 N @ 150 km/h (120.7 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	287.0 N @ 150 km/h (64.5 lbf @ 150 km/h)
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

Width, packed	1973 mm | 77.677 in
Depth, packed	441 mm | 17.362 in
Length, packed	337 mm | 13.268 in
Weight, gross	35.1 kg | 77.382 lb

Regulatory Compliance/Certifications

Agency	**Classification**
CHINA-ROHS	Above maximum concentration value

NHHSS-65B-R2BT4

ROHS	Compliant/Exempted

Included Products

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

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

SAMSUNG

Samsung Micro Radio

CBRS(N48) 4T4R Micro Radio

Samsung's CBRS 4T4R Micro Radio provides mobile operators with a cost-effective solution to fill coverage gaps encountered when Macro Radios are in use.

Model Code	RT4423-48A(DC) RT4423-48B(AC)

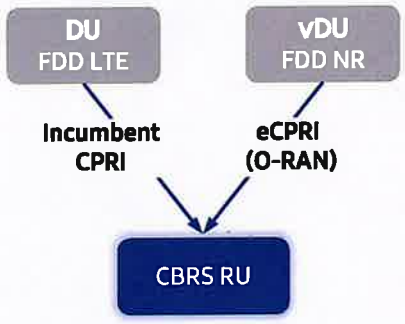
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Dual Personality

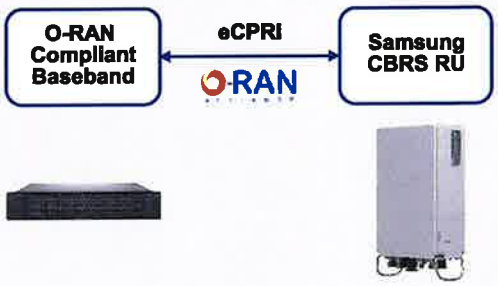
The new CBRS Radio supports existing CPRI and advanced eCPRI interfaces providing installation options for both legacy LTE and NR network equipment.



O-RAN Compliant

A standardized O-RAN radio supports implementing cost-effective networks capable of enhanced data throughput without compromising existing or new network investments.

Samsung O-RAN products ensure state-of-the-art O-RAN technology will accelerate efforts for creating solid O-RAN ecosystems.



High Capacity

The number of carriers required varies according to site(region). Supporting multiple carriers is essential to customers as they seek to utilize all frequencies available to them.

The new CBRS radio can support up to 5 carriers which is and increase of 3 carriers over the capacity of the previous CBRS product.

Compact and Easy Installation

New CBRS RU is compact in it's design with a volume of 6L and weighing only about 7kg.

This compact design allows for various installation options including, tower, rooftop, pole, wall and shroud.

A clip on antenna is available providing flexibility to installation requirements.

w/o Clip-on antenna

w/Clip-on antenna

Technical Specifications

Item	Specification
Tech	LTE / NR
Band	B48, n48 / TDD
Frequency Band	3,550 – 3,700 MHz
RF Power	20 W (5 W x 4 Ports)
IBW/OBW	150MHz / 100MHz
Installation	Pole, Wall, Side by side (max 3 radio)
Size/ Weight	**[Radio]** w/o Clip-on antenna : 8.7 x 11.8 x 3.6 inch, 5.97L, 7kg w/ Clip-on antenna : 8.7 x 11.8 x 5.0 inch, 8.42L, 8.5kg *AC and DC type have same size and weight **[Bracket Weight]** Tilting & Swivel (EP97-02038A) : 2.51kg Fixed (EP97-02037A) : 1.31kg Side by side (EP97-02089A) : 8.0kg

SAMSUNG

AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

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

Model Code	RF4439d-25A

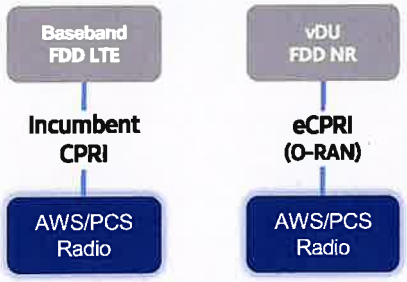
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

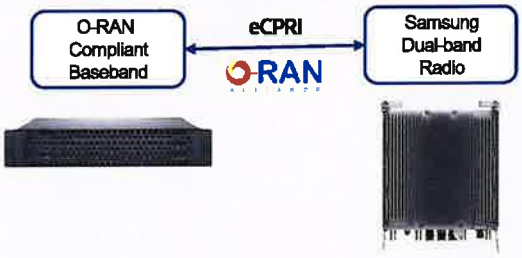
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

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

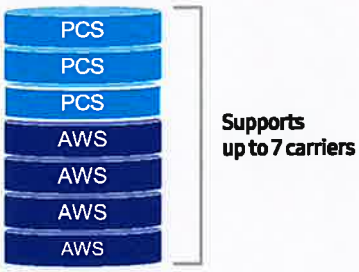
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

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

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



Brand New Features in a Compact Size

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

Technical Specifications

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

700/850 4T4R Macro 320W ORU - New Filter (RF4461d-13A)

SAMSUNG

Specifications

Item	Specification	
Air Interface	LTE, NR(HW resource ready)	
Band	Band13 (700MHz)	Band5 (850MHz)
Frequency	DL: 746~756MHz UL: 777~787MHz	DL: 869~894MHz UL: 824~849MHz
IBW	10MHz	25MHz
OBW	10MHz	25MHz
Carrier Bandwidth	LTE/NR 5*/10MHz	LTE 5/10MHz NR 5/10/15/20MHz
# of carriers	2C*	3C
Total # of carriers	4C + B13 (SDL) 1C	
RF Chain	4T4R/2T4R/2T2R/1T2R 2T2R+2T2R bi-sector	
RF Output Power	Total : 320W 4 x 40W or 2 x 60W	4 x 40W or 2 x 60W
Spectrum Analyzer	TX/RX Support	
RX Sensitivity	Typ. -104.5dBm @1Rx (25RBs 5MHz)	
Modulation	256QAM support, (1024QAM with 1~2dB power back-off)	
Input Power	-48VDC (-38VDC to -57VDC)	
Power Consumption	1,165 Watt @ 100% RF load, room temperature	
Size (WHD)	380 x 380 x 260 mm (14.96 x 14.96 x 10.23 inch)	
Volume	37.5 L	
Weight (W/o Solar Shield & finger guard)	35.9 kg (79.1 lb)	
Operating Temperature	-40℃ (-40°F) ~ 55℃ (131°F) (Without solar load)	
Cooling	Natural convection	
Unwanted Emission	3GPP 36.104 FCC 47 CFR 27.53 c), f) -	3GPP 36.104 FCC 47 CFR 22.917 -69 dBm/100 kHz per path @ 896 ~901MHz
CPRI Cascade	Not supported	
Optic Interface	20km, 2 ports (9.8Gbps x 2), SFP+, single mode, Duplex (Option: Bi-di)	
RET & TMA Interface	AISG 3.0	
Bias-T	4 ports (2 ports per band)	
Mounting Options	Pole, wall	
NB-IoT	2GB+2IB or 4IB	2SA+2GB or 2GB+2IB or 4GB
PIM Cancellation	Support	
# of antenna port	4	
External Alarm	4	
Fronthaul Interface	Opt. 8 CPRI / Opt. 7-2x selectable (not simultaneous support)	
CPRI compression	Not Support	

* 5MHz supporting in B13(700MHz) depends on 3GPP std. and UE capability. External filters in interferer and victim sides for Mexican boarder to support 5MHz service need to be considered
** Finger guard is not needed.

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 130 ft SABRE Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT46143-A

Customer Site Name: Burlington - Avon Landfill

Carrier Name: Verizon (App#: 241526-1)

Carrier Site ID / Name: 5000205807 / BURLINGTON_2_CT

Site Location: 277 Huckleberry Hill Road

Avon, Connecticut

Hartford County

Latitude: 41.788055

Longitude: -72.918166

Analysis Result:

Max Structural Usage: 30.8% [Pass]

Max Foundation Usage: 26.5% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By : Changzhi Zang

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Report Prepared By : Changzhi Zang

Introduction

The purpose of this report is to summarize the analysis results on the 130 ft SABRE Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Design Report prepared by Sabre, Job #521586 Revision A dated 6/29/2023
Foundation Drawing	Design Report prepared by Sabre, Job #521586 Revision A dated 6/29/2023
Geotechnical Report	Delta Oaks Group, Project #23-19365-01 Revision 0 dated 6/28/2023
Modification Drawings	N/A
Mount Analysis	N/A

Analysis Criteria

The comprehensive analysis was performed in accordance with the requirements and stipulations of the TIA-222-H. In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	120.0 mph (3-Sec. Gust) (Ultimate wind speed)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1"1/2 radial ice concurrent
Service Load Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
Exposure Category:	C
Risk Category:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.189, S_1 = 0.055

This structural analysis is based upon the tower being classified as a Risk Category II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
-	110.0	3	Commscope NHHSS-65B-R2B - Panel	(2) Ring Mounts	(2) 1 5/8" 6x12 Hybrid	Verizon
-		3	Commscope NHH-65B-R2B - Panel			
-		3	Samsung MT6407-77A - Panel			
-		3	Samsung B2/B66A RRH-BR049 - RRU			
-		3	Samsung B5/B13 RRH-BR04C - RRU			
-		3	Samusng CBRS RRH - RT4401-48A - RRU			
-		1	Raycap DB-B1-6C-12AB-0Z - Junction box			
8	99.0	3	Andrew DHHTT65B-3XR - Panel	Flush Mount	(4) 1 1/4"	Sprint Nextel
9		4	RFS ACU-A20-N - RRU			
10		3	ALU 1900MHz RRH - RRU			
11		3	ALU 800 MHz RRH - RRU			
12		3	ALU TD-RRH8x20-25 - RRU			
13		3	ALU 800MHz Filter			
14	90.0	3	Andrew SBNHH-1D65C - Panel	Flush Mount	(6) 1 5/8" (1) 3" Conduit housing {(2) 3/4" DC (1) 7/16" Fiber}	AT&T
15		3	Powerwave LGP21401 - TMA			
16		3	Cci TMABPD7823VG12A - TMA			
17		3	Andrew APTDC-BDFDM-DBW - OVP			
18	80.0	3	RFS APXVAR18_43-C-NA20 - Panel	Flush Mount	(12) 7/8"	T-Mobile
19		6	RFS ATMAA1412D-A1A20 - TMA			
20	70.0	3	JMA Wireless MX08FRO665-21 - Panel	Platform w/HRK [Commscope MC-PK8-DSH]	(1) 1.41" Hybrid	Dish Wireless
21		3	Fujitsu TA08025-B605 - RRU			
22		3	Fujitsu TA08025-B604 - RRU			
23		1	Raycap RDIDC-9181-PF-48 - OVP			

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	110.0	3	Commscope NHHSS-65B-R2B - Panel	(2) Ring Mounts	(2) 1 5/8" 6x12 Hybrid	Verizon
2		3	Commscope NHH-65B-R2B - Panel			
3		3	Samsung MT6413-77A - Panel			
4		3	Samsung RF4439d-25A - RRU			
5		3	Samsung RF4461d-13A - RRU			
6		3	Samsung RT4423-48A - RRU			
7		1	Raycap DB-B1-6C-12AB-0Z - Junction box			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**30.8%**	**28.9%**	**30.8%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	1570.3	20.7	32.3

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Service Load Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.4412 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 30.84% at 0.0ft

Structure:	CT46143-A-SBA	**Code:**	EIA/TIA-222-H	1/26/2024
Site Name:	Burlington - Avon Landfill	**Exposure:**	C	
Height:	130.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

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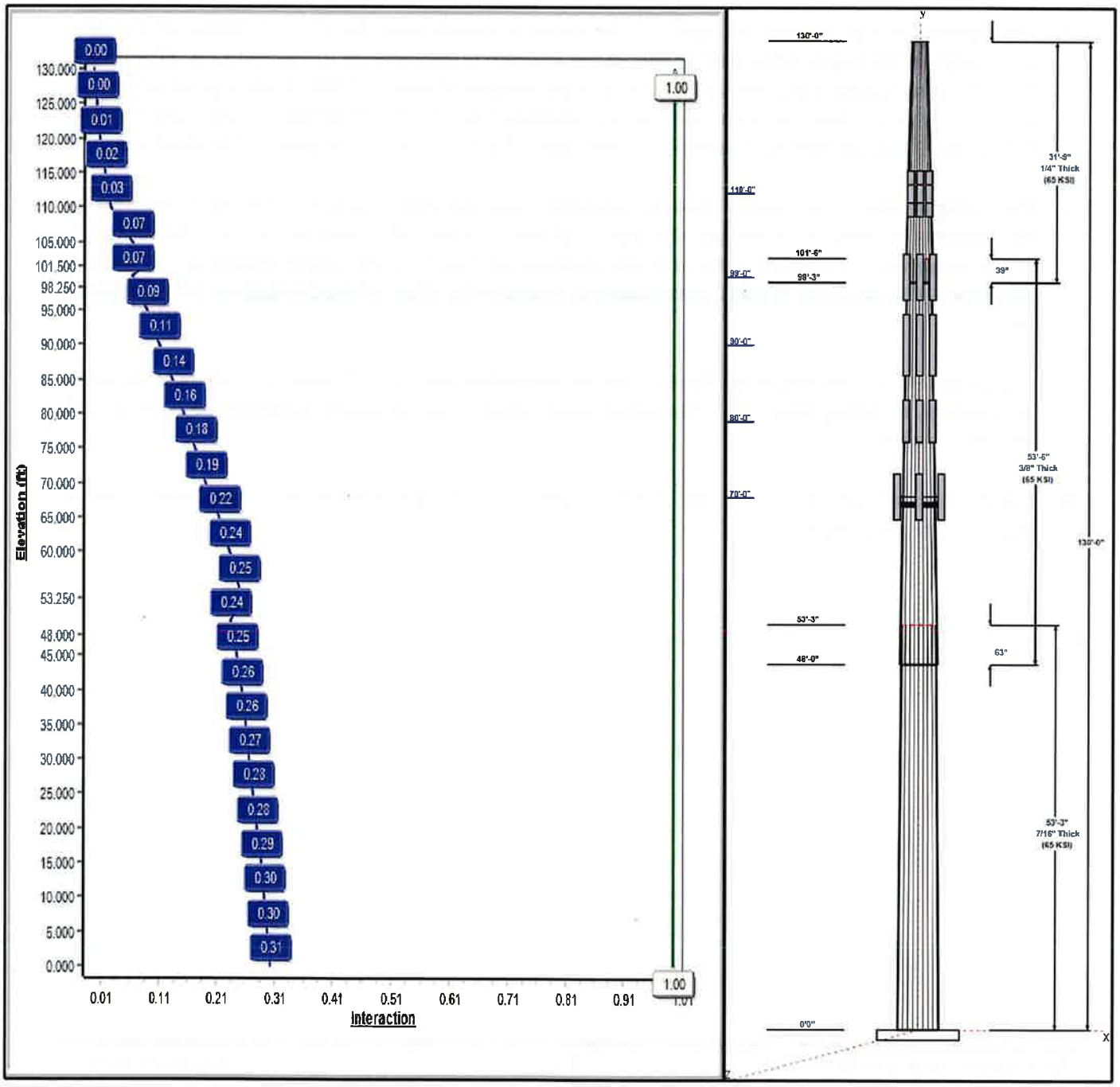
Dead Load Factor:	1.20	**Iterations:**	21
Wind Load Factor:	1.00		

Load Case : 1.2D + 1.0W 120 mph Wind



Structure: CT46143-A-SBA

Type: Tapered
Site Name: Burlington - Avon Landfill
Height: 130.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.29531

1/26/2024

TES Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.25	35.41	51.14	0.438		0.29531	65
2	53.50	21.92	37.72	0.375	Slip	0.29531	65
3	31.75	14.00	23.38	0.250	Slip	0.29531	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
110.00	110.00	1	Ring Mount	Verizon
110.00	110.00	1	Raycap	Verizon
110.00	110.00	3	Commscope	Verizon
110.00	110.00	3	Commscope	Verizon
110.00	110.00	3	Samsung RF4439d-25A	Verizon
110.00	110.00	3	Samsung RF4461d-13A	Verizon
110.00	110.00	3	Samsung RT4423-48A	Verizon
110.00	110.00	3	Samsung MT6413-77A	Verizon
99.00	99.00	3	Andrew DHHTT65B-3XR	Sprint Nextel
99.00	99.00	1	Flush Mount	Sprint Nextel
99.00	99.00	4	RFS ACU-A20-N	Sprint Nextel
99.00	99.00	3	ALU 1900MHz RRH	Sprint Nextel
99.00	99.00	3	ALU 800 MHz RRH	Sprint Nextel
99.00	99.00	3	ALU TD-RRH8x20-25	Sprint Nextel
99.00	99.00	3	ALU 800MHz Filter	Sprint Nextel
90.00	90.00	3	Andrew SBNHH-1D65C	AT&T
90.00	90.00	3	Powerwave LGP21401	AT&T
90.00	90.00	3	Cci TMABPD7823VG12A	AT&T
90.00	90.00	3	Andrew	AT&T
90.00	90.00	1	Flush Mount	AT&T
80.00	80.00	1	Flush Mount	T-Mobile
80.00	80.00	3	RFS	T-Mobile
80.00	80.00	6	RFS ATMAA1412D-A1A20	T-Mobile
70.00	70.00	3	JMA Wireless	Dish Wireless
70.00	70.00	3	Fujitsu TA08025-B605	Dish Wireless
70.00	70.00	3	Fujitsu TA08025-B604	Dish Wireless
70.00	70.00	1	Raycap	Dish Wireless
70.00	70.00	1	Commscope MC-PK8-DSH	Dish Wireless

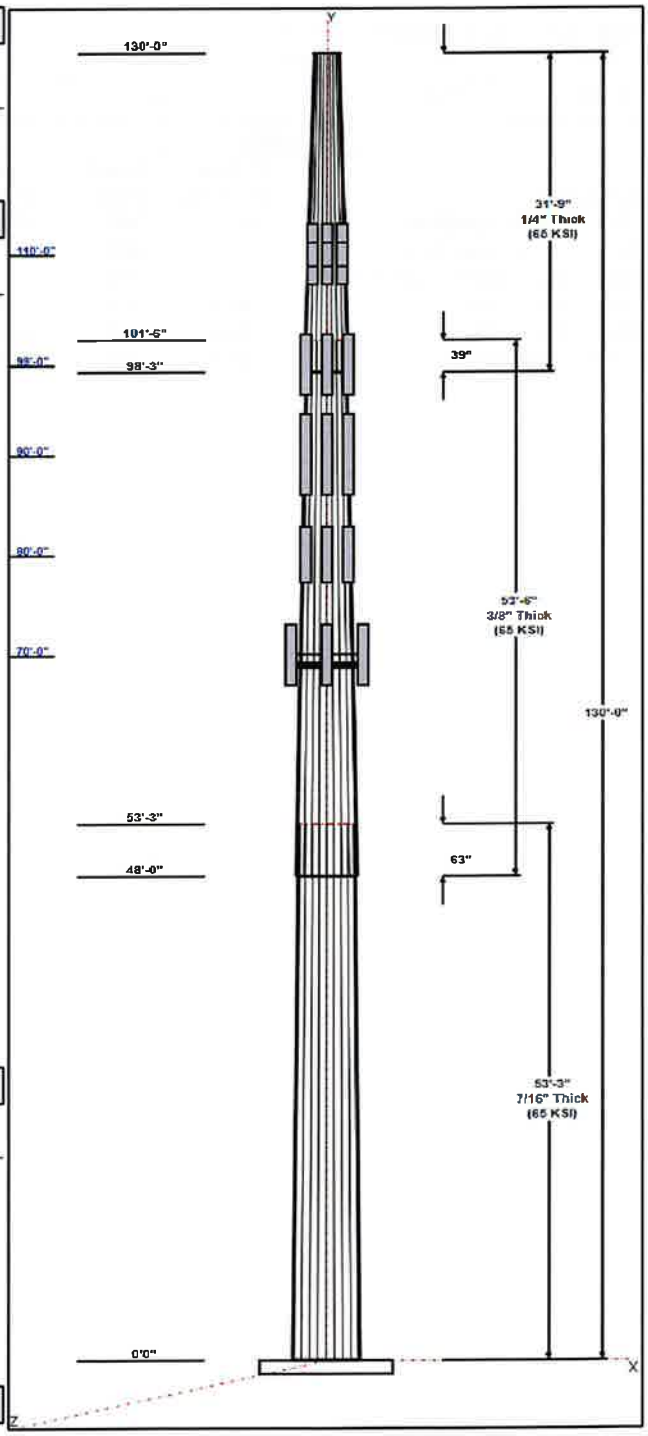
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	110.00	Inside	1 5/8" 6x12 Hybrid	Verizon
0.00	99.00	Inside	1 1/4" Coax	Sprint Nextel
0.00	90.00	Inside	1 5/8" Coax	AT&T
0.00	90.00	Inside	3" Coax	AT&T
0.00	90.00	Inside	3/4" DC	AT&T
0.00	90.00	Inside	7/16" Fiber	AT&T
0.00	80.00	Inside	7/8" Coax	T-Mobile
0.00	70.00	Outside	1.41" Hybrid	Dish Wireless

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
18	2.25" 18J	75.0	Radial

Base Plate



Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.2500	63.8	50.0	Round

Reactions

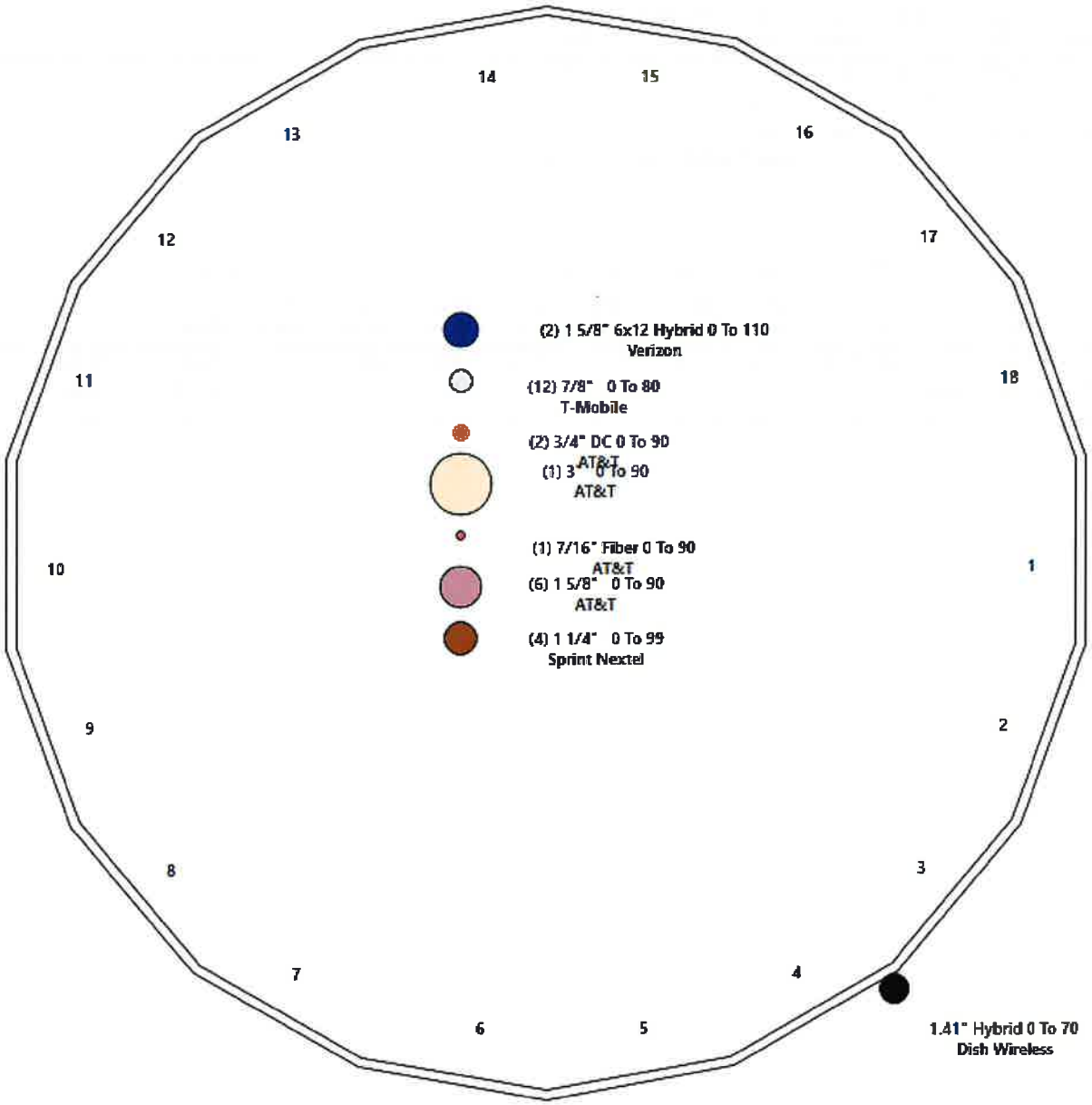
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.0W 120 mph Wind	1570.3	20.7	32.3
0.9D + 1.0W 120 mph Wind	1563.7	20.7	24.2
1.2D + 1.0Di + 1.0Wi 50 mph Wind	440.7	5.9	50.4
1.2D + 1.0Ev + 1.0Eh	68.7	0.8	33.4
0.9D + 1.0Ev + 1.0Eh	68.6	0.8	25.3
1.0D + 1.0W 60 mph Wind	350.3	4.6	26.9

Structure: CT46143-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Burlington - Avon Landfill
Height: 130.00 (ft)

1/26/2024

Tower Engineering Solutions



Shaft Properties

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 5	

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.250	0.4375	65		0.00	10,779
2	18	53.500	0.3750	65	Slip	63.00	6,379
3	18	31.750	0.2500	65	Slip	39.00	1,581
					Total Shaft Weight:		**18,739**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	51.14	0.00	70.40	22867.07	19.20	116.89	35.41	53.25	48.57	7507.30	12.86	80.95	0.295308
2	37.72	48.00	44.44	7829.01	16.32	100.57	21.92	101.50	25.64	1503.11	8.89	58.44	0.295308
3	23.38	98.25	18.35	1239.90	15.08	93.50	14.00	130.00	10.91	260.61	8.46	56.00	0.295308

Load Summary

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	110.00	Ring Mount	1	660.00	7.50	1.00	1553.33	15.114	1.00	0.00	0.00
2	110.00	Raycap DB-B1-6C-12AB-0Z	1	21.40	4.10	1.00	136.39	4.877	1.00	0.00	0.00
3	110.00	Commscope NHHSS-65B-R2B	3	51.00	8.05	0.84	237.52	9.276	0.84	0.00	0.00
4	110.00	Commscope NHH-65B-R2B	3	43.70	8.08	0.83	238.01	9.330	0.83	0.00	0.00
5	110.00	Samsung RF4439d-25A	3	74.70	1.87	0.67	190.98	3.009	0.67	0.00	0.00
6	110.00	Samsung RF4461d-13A	3	39.70	1.37	0.67	120.30	2.204	0.67	0.00	0.00
7	110.00	Samsung RT4423-48A	3	15.40	0.86	0.67	57.09	1.745	0.67	0.00	0.00
8	110.00	Samsung MT6413-77A	3	57.32	3.79	0.69	251.28	5.329	0.75	0.00	0.00
9	99.00	Andrew DHHTT65B-3XR	3	45.00	8.09	0.83	238.03	9.388	0.83	0.00	0.00
10	99.00	Flush Mount	1	350.00	5.00	1.00	631.26	8.348	1.00	0.00	0.00
11	99.00	RFS ACU-A20-N	4	1.00	0.14	0.67	5.12	0.425	0.67	0.00	0.00
12	99.00	ALU 1900MHz RRH	3	60.00	2.31	0.67	132.57	2.933	0.67	0.00	0.00
13	99.00	ALU 800 MHz RRH	3	53.00	2.13	0.67	113.52	2.698	0.67	0.00	0.00
14	99.00	ALU TD-RRH8x20-25	3	70.00	4.05	0.67	175.07	4.828	0.67	0.00	0.00
15	99.00	ALU 800MHz Filter	3	8.80	0.78	0.67	25.73	1.401	0.67	0.00	0.00
16	90.00	Andrew SBNHH-1D65C	3	49.60	11.39	0.84	296.91	12.962	0.84	0.00	0.00
17	90.00	Powerwave LGP21401	3	17.50	0.82	0.67	37.85	1.196	0.67	0.00	0.00
18	90.00	Cci TMABPD7823VG12A	3	26.00	1.37	0.67	58.22	1.822	0.67	0.00	0.00
19	90.00	Andrew APTDC-BDFDM-DBW	3	1.32	0.10	0.67	4.21	0.248	0.67	0.00	0.00
20	90.00	Flush Mount	1	350.00	5.00	1.00	628.60	8.317	1.00	0.00	0.00
21	80.00	Flush Mount	1	350.00	5.00	1.00	625.33	8.278	1.00	0.00	0.00
22	80.00	RFS APXVAR18_43-C-NA20	3	69.40	9.65	0.81	290.10	10.884	0.81	0.00	0.00
23	80.00	RFS ATMAA1412D-A1A20	6	1.16	0.15	0.67	6.33	0.336	0.67	0.00	0.00
24	70.00	JMA Wireless MX08FRO665-21	3	64.50	12.49	0.74	334.03	13.847	0.74	0.00	0.00
25	70.00	Fujitsu TA08025-B605	3	75.00	1.96	0.67	123.47	2.480	0.67	0.00	0.00
26	70.00	Fujitsu TA08025-B604	3	63.90	1.96	0.67	110.81	2.480	0.67	0.00	0.00
27	70.00	Raycap RDIDC-9181-PF-48	1	21.85	2.56	1.00	84.10	3.146	1.00	0.00	0.00
28	70.00	Commscope MC-PK8-DSH	1	1727.00	37.59	1.00	3290.98	81.358	1.00	0.00	0.00
		Totals:	**74**	**6,148.73**			**16,115.43**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	110.00	(2) 1 5/8" 6x12 Hybrid	0.00	Inside
0.00	99.00	(4) 1 1/4" Coax	0.00	Inside
0.00	90.00	(6) 1 5/8" Coax	0.00	Inside
0.00	90.00	(1) 3" Coax	0.00	Inside
0.00	90.00	(2) 3/4" DC	0.00	Inside
0.00	90.00	(1) 7/16" Fiber	0.00	Inside
0.00	80.00	(12) 7/8" Coax	0.00	Inside
0.00	70.00	(1) 1.41" Hybrid	1.41	Outside

Shaft Section Properties

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	51.140	70.404	22867.1	19.20	116.89	78.8	880.7	0.0
5.00		0.4375	49.663	68.354	20926.9	18.61	113.52	79.5	829.9	1180.4
10.00		0.4375	48.187	66.304	19099.7	18.01	110.14	80.2	780.7	1145.5
15.00		0.4375	46.710	64.253	17382.1	17.42	106.77	80.9	732.9	1110.6
20.00		0.4375	45.234	62.203	15770.7	16.82	103.39	81.6	686.7	1075.8
25.00		0.4375	43.757	60.153	14262.1	16.23	100.02	82.3	642.0	1040.9
30.00		0.4375	42.281	58.103	12852.8	15.63	96.64	82.5	598.7	1006.0
35.00		0.4375	40.804	56.052	11539.7	15.03	93.27	82.5	557.0	971.1
40.00		0.4375	39.328	54.002	10319.1	14.44	89.89	82.5	516.8	936.2
45.00		0.4375	37.851	51.952	9187.8	13.84	86.52	82.5	478.1	901.3
48.00	Bot - Section 2	0.4375	36.965	50.721	8550.5	13.49	84.49	82.5	455.6	524.1
50.00		0.4375	36.375	49.901	8142.4	13.25	83.14	82.5	440.9	642.5
53.25	Top - Section 1	0.3750	36.165	42.597	6893.8	15.59	96.44	0.0	0.0	1021.9
55.00		0.3750	35.648	41.982	6599.4	15.35	95.06	82.5	364.6	251.8
60.00		0.3750	34.172	40.225	5804.9	14.66	91.12	82.5	334.6	699.3
65.00		0.3750	32.695	38.467	5076.8	13.96	87.19	82.5	305.8	669.4
70.00		0.3750	31.218	36.710	4412.3	13.27	83.25	82.5	278.4	639.5
75.00		0.3750	29.742	34.953	3808.5	12.57	79.31	82.5	252.2	609.6
80.00		0.3750	28.265	33.195	3262.4	11.88	75.37	82.5	227.3	579.7
85.00		0.3750	26.789	31.438	2771.2	11.19	71.44	82.5	203.8	549.8
90.00		0.3750	25.312	29.681	2332.0	10.49	67.50	82.5	181.5	519.9
95.00		0.3750	23.836	27.923	1941.8	9.80	63.56	82.5	160.5	490.0
98.25	Bot - Section 3	0.3750	22.876	26.781	1713.1	9.35	61.00	82.5	147.5	302.5
99.00		0.3750	22.655	26.517	1663.0	9.24	60.41	82.5	144.6	114.6
100.00		0.3750	22.359	26.166	1597.8	9.10	59.62	82.5	140.7	151.1
101.50	Top - Section 2	0.2500	22.416	17.588	1091.8	14.40	89.67	0.0	0.0	222.9
105.00		0.2500	21.383	16.768	946.1	13.67	85.53	82.5	87.2	204.6
110.00		0.2500	19.906	15.597	761.3	12.63	79.62	82.5	75.3	275.3
115.00		0.2500	18.430	14.425	602.3	11.59	73.72	82.5	64.4	255.4
120.00		0.2500	16.953	13.253	467.2	10.55	67.81	82.5	54.3	235.5
125.00		0.2500	15.477	12.082	353.9	9.51	61.91	82.5	45.0	215.5
130.00		0.2500	14.000	10.910	260.6	8.46	56.00	82.5	36.7	195.6
										18738.5

Wind Loading - Shaft

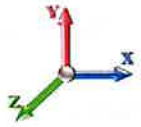
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.0W 120 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	29.269	32.20	474.73	0.730	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	29.269	32.20	461.02	0.730	0.000	5.00	21.325	15.57	501.2	0.0	1416.5
10.00		1.00	0.85	29.269	32.20	447.32	0.730	0.000	5.00	20.700	15.11	486.5	0.0	1374.6
15.00		1.00	0.85	29.269	32.20	433.61	0.730	0.000	5.00	20.075	14.65	471.8	0.0	1332.8
20.00		1.00	0.90	31.055	34.16	432.53	0.730	0.000	5.00	19.451	14.20	485.0	0.0	1290.9
25.00		1.00	0.95	32.549	35.80	428.36	0.730	0.000	5.00	18.826	13.74	492.0	0.0	1249.0
30.00		1.00	0.98	33.823	37.20	421.92	0.730	0.000	5.00	18.201	13.29	494.3	0.0	1207.2
35.00		1.00	1.01	34.938	38.43	413.85	0.730	0.000	5.00	17.576	12.83	493.1	0.0	1165.3
40.00		1.00	1.04	35.934	39.53	404.52	0.730	0.000	5.00	16.952	12.37	489.1	0.0	1123.5
45.00		1.00	1.07	36.837	40.52	394.19	0.730	0.000	5.00	16.327	11.92	482.9	0.0	1081.6
48.00	Bot - Section 2	1.00	1.08	37.341	41.07	387.59	0.730	0.000	3.00	9.496	6.93	284.7	0.0	628.9
50.00		1.00	1.09	37.663	41.43	383.04	0.730	0.000	2.00	6.333	4.62	191.5	0.0	771.0
53.25	Top - Section 1	1.00	1.11	38.165	41.98	375.41	0.730	0.000	3.25	10.078	7.36	308.9	0.0	1226.3
55.00		1.00	1.12	38.426	42.27	379.17	0.730	0.000	1.75	5.317	3.88	164.1	0.0	302.2
60.00		1.00	1.14	39.137	43.05	366.81	0.730	0.000	5.00	14.770	10.78	464.2	0.0	839.2
65.00		1.00	1.16	39.802	43.78	353.93	0.730	0.000	5.00	14.145	10.33	452.1	0.0	803.3
70.00	Appurtenance(s)	1.00	1.17	40.427	44.47	340.59	0.730	0.000	5.00	13.521	9.87	438.9	0.0	767.4
75.00		1.00	1.19	41.019	45.12	326.85	0.730	0.000	5.00	12.896	9.41	424.8	0.0	731.6
80.00	Appurtenance(s)	1.00	1.21	41.580	45.74	312.74	0.730	0.000	5.00	12.271	8.96	409.7	0.0	695.7
85.00		1.00	1.22	42.114	46.33	298.30	0.730	0.000	5.00	11.647	8.50	393.9	0.0	659.8
90.00	Appurtenance(s)	1.00	1.24	42.624	46.89	283.56	0.730	0.000	5.00	11.022	8.05	377.2	0.0	623.9
95.00		1.00	1.25	43.112	47.42	268.54	0.730	0.000	5.00	10.397	7.59	359.9	0.0	588.0
98.25	Bot - Section 3	1.00	1.26	43.418	47.76	258.64	0.730	0.000	3.25	6.423	4.69	223.9	0.0	363.0
99.00	Appurtenance(s)	1.00	1.26	43.488	47.84	256.35	0.730	0.000	0.75	1.477	1.08	51.6	0.0	137.5
100.00		1.00	1.27	43.580	47.94	253.27	0.730	0.000	1.00	1.947	1.42	68.1	0.0	181.3
101.50	Top - Section 2	1.00	1.27	43.717	48.09	248.64	0.730	0.000	1.50	2.873	2.10	100.9	0.0	267.5
105.00		1.00	1.28	44.030	48.43	243.46	0.730	0.000	3.50	6.486	4.73	229.3	0.0	245.5
110.00	Appurtenance(s)	1.00	1.29	44.463	48.91	227.76	0.730	0.000	5.00	8.735	6.38	311.9	0.0	330.4
115.00		1.00	1.30	44.881	49.37	211.85	0.730	0.000	5.00	8.110	5.92	292.3	0.0	306.5
120.00		1.00	1.32	45.285	49.81	195.75	0.730	0.000	5.00	7.485	5.46	272.2	0.0	282.6
125.00		1.00	1.33	45.676	50.24	179.48	0.730	0.000	5.00	6.860	5.01	251.6	0.0	258.6
130.00		1.00	1.34	46.055	50.66	163.02	0.730	0.000	5.00	6.236	4.55	230.6	0.0	234.7
								Totals:	**130.00**			**10,698.5**		**22,486.2**

Discrete Appurtenance Forces

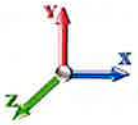
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

TES Tower Engineering Solutions

Load Case: 1.2D + 1.0W 120 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	110.00	Commscope	3	44.463	48.910	0.66	0.80	16.10	157.32	0.000	0.000	787.22	0.00	0.00
2	110.00	Ring Mount	1	44.463	48.910	1.00	1.00	7.50	792.00	0.000	0.000	366.82	0.00	0.00
3	110.00	Raycap	1	44.463	48.910	0.80	0.80	3.28	25.68	0.000	0.000	160.42	0.00	0.00
4	110.00	Commscope	3	44.463	48.910	0.67	0.80	16.23	183.60	0.000	0.000	793.75	0.00	0.00
5	110.00	Samsung MT6413-77A	3	44.463	48.910	0.55	0.80	6.30	206.35	0.000	0.000	308.30	0.00	0.00
6	110.00	Samsung RF4439d-25A	3	44.463	48.910	0.54	0.80	3.01	268.92	0.000	0.000	147.07	0.00	0.00
7	110.00	Samsung RF4461d-13A	3	44.463	48.910	0.54	0.80	2.20	142.92	0.000	0.000	107.75	0.00	0.00
8	110.00	Samsung RT4423-48A	3	44.463	48.910	0.54	0.80	1.38	55.44	0.000	0.000	67.64	0.00	0.00
9	99.00	ALU 800MHz Filter	3	43.488	47.837	0.54	0.80	1.25	31.68	0.000	0.000	60.00	0.00	0.00
10	99.00	ALU TD-RRH8x20-25	3	43.488	47.837	0.54	0.80	6.51	252.00	0.000	0.000	311.53	0.00	0.00
11	99.00	ALU 800 MHz RRH	3	43.488	47.837	0.54	0.80	3.43	190.80	0.000	0.000	163.84	0.00	0.00
12	99.00	ALU 1900MHz RRH	3	43.488	47.837	0.54	0.80	3.71	216.00	0.000	0.000	177.69	0.00	0.00
13	99.00	RFS ACU-A20-N	4	43.488	47.837	0.54	0.80	0.30	4.80	0.000	0.000	14.36	0.00	0.00
14	99.00	Flush Mount	1	43.488	47.837	1.00	1.00	5.00	420.00	0.000	0.000	239.18	0.00	0.00
15	99.00	Andrew DHHTT65B-3XR	3	43.488	47.837	0.66	0.80	16.12	162.00	0.000	0.000	770.90	0.00	0.00
16	90.00	Flush Mount	1	42.624	46.886	1.00	1.00	5.00	420.00	0.000	0.000	234.43	0.00	0.00
17	90.00	Andrew	3	42.624	46.886	0.54	0.80	0.16	4.75	0.000	0.000	7.54	0.00	0.00
18	90.00	Cci TMABPD7823VG12A	3	42.624	46.886	0.54	0.80	2.20	93.60	0.000	0.000	103.29	0.00	0.00
19	90.00	Powerwave LGP21401	3	42.624	46.886	0.54	0.80	1.32	63.00	0.000	0.000	61.82	0.00	0.00
20	90.00	Andrew SBNHH-1D65C	3	42.624	46.886	0.67	0.80	22.96	178.56	0.000	0.000	1076.62	0.00	0.00
21	80.00	Flush Mount	1	41.580	45.738	1.00	1.00	5.00	420.00	0.000	0.000	228.69	0.00	0.00
22	80.00	RFS	3	41.580	45.738	0.65	0.80	18.76	249.84	0.000	0.000	858.03	0.00	0.00
23	80.00	RFS	6	41.580	45.738	0.54	0.80	0.48	8.35	0.000	0.000	22.06	0.00	0.00
24	70.00	Commscope	1	40.427	44.470	1.00	1.00	37.59	2072.40	0.000	0.000	1671.64	0.00	0.00
25	70.00	Raycap	1	40.427	44.470	0.75	0.75	1.92	26.22	0.000	0.000	85.38	0.00	0.00
26	70.00	Fujitsu TA08025-B604	3	40.427	44.470	0.50	0.75	2.95	230.04	0.000	0.000	131.40	0.00	0.00
27	70.00	Fujitsu TA08025-B605	3	40.427	44.470	0.50	0.75	2.95	270.00	0.000	0.000	131.40	0.00	0.00
28	70.00	JMA Wireless	3	40.427	44.470	0.55	0.75	20.80	232.20	0.000	0.000	924.80	0.00	0.00
							Totals:		**7,378.48**			**10,013.57**		

Total Applied Force Summary

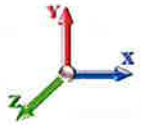
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.0W 120 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		501.19	1553.37	0.00	0.00
10.00		486.51	1511.51	0.00	0.00
15.00		471.82	1469.65	0.00	0.00
20.00		485.05	1427.79	0.00	0.00
25.00		492.05	1385.93	0.00	0.00
30.00		494.34	1344.07	0.00	0.00
35.00		493.11	1302.21	0.00	0.00
40.00		489.15	1260.35	0.00	0.00
45.00		482.95	1218.49	0.00	0.00
48.00		284.74	711.00	0.00	0.00
50.00		191.53	825.71	0.00	0.00
53.25		308.85	1315.25	0.00	0.00
55.00		164.07	350.11	0.00	0.00
60.00		464.18	976.08	0.00	0.00
65.00		452.10	940.20	0.00	0.00
70.00	(11) attachments	3383.54	3735.18	0.00	0.00
75.00		424.77	861.60	0.00	0.00
80.00	(10) attachments	1518.51	1503.91	0.00	0.00
85.00		393.86	752.40	0.00	0.00
90.00	(13) attachments	1860.95	1476.43	0.00	0.00
95.00		359.94	623.40	0.00	0.00
98.25		223.94	385.97	0.00	0.00
99.00	(20) attachments	1789.07	1420.12	0.00	0.00
100.00		68.13	185.20	0.00	0.00
101.50		100.87	273.31	0.00	0.00
105.00		229.32	259.17	0.00	0.00
110.00	(20) attachments	3050.82	2182.15	0.00	0.00
115.00		292.28	306.47	0.00	0.00
120.00		272.19	282.55	0.00	0.00
125.00		251.63	258.63	0.00	0.00
130.00		230.61	234.71	0.00	0.00
	Totals:	**20,712.03**	**32,332.97**	**0.00**	**0.00**

Linear Appurtenance Segment Forces (Factored)

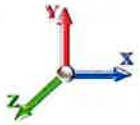
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.0W 120 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.028	0.000	29.269	0.00	6.84
10.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.028	0.000	29.269	0.00	6.84
15.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.029	0.000	29.269	0.00	6.84
20.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.030	0.000	31.055	0.00	6.84
25.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.031	0.000	32.549	0.00	6.84
30.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.032	0.000	33.823	0.00	6.84
35.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.033	0.000	34.938	0.00	6.84
40.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.035	0.000	35.934	0.00	6.84
45.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.036	0.000	36.837	0.00	6.84
48.00	1.41" Hybrid	Yes	3.00	0.000	1.41	0.35	0.00	0.037	0.000	37.341	0.00	4.10
50.00	1.41" Hybrid	Yes	2.00	0.000	1.41	0.23	0.00	0.038	0.000	37.663	0.00	2.74
53.25	1.41" Hybrid	Yes	3.25	0.000	1.41	0.38	0.00	0.039	0.000	38.165	0.00	4.45
55.00	1.41" Hybrid	Yes	1.75	0.000	1.41	0.21	0.00	0.039	0.000	38.426	0.00	2.39
60.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.040	0.000	39.137	0.00	6.84
65.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.042	0.000	39.802	0.00	6.84
70.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.043	0.000	40.427	0.00	6.84
										Totals:	**0.0**	**95.8**

Calculated Forces

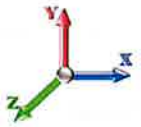
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.0W 120 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-32.32	-20.74	0.00	-1570.2	0.00	1570.27	4994.17	1235.59	5197.80	5206.12	0.00	0.000	0.000	0.308
5.00	-30.73	-20.29	0.00	-1466.5	0.00	1466.57	4891.79	1199.61	4899.47	4949.63	0.05	-0.094	0.000	0.303
10.00	-29.18	-19.85	0.00	-1365.1	0.00	1365.13	4786.83	1163.63	4609.96	4696.86	0.20	-0.191	0.000	0.297
15.00	-27.68	-19.42	0.00	-1265.9	0.00	1265.90	4679.28	1127.65	4329.26	4448.07	0.46	-0.289	0.000	0.291
20.00	-26.23	-18.97	0.00	-1168.8	0.00	1168.82	4569.15	1091.66	4057.38	4203.49	0.81	-0.388	0.000	0.284
25.00	-24.81	-18.51	0.00	-1073.9	0.00	1073.97	4456.44	1055.68	3794.32	3963.36	1.27	-0.489	0.000	0.277
30.00	-23.44	-18.05	0.00	-981.42	0.00	981.42	4316.73	1019.70	3540.07	3706.95	1.84	-0.592	0.000	0.270
35.00	-22.11	-17.58	0.00	-891.19	0.00	891.19	4164.40	983.72	3294.64	3448.64	2.52	-0.696	0.000	0.264
40.00	-20.83	-17.11	0.00	-803.30	0.00	803.30	4012.07	947.73	3058.03	3199.66	3.30	-0.800	0.000	0.257
45.00	-19.59	-16.64	0.00	-717.75	0.00	717.75	3859.75	911.75	2830.23	2960.01	4.20	-0.905	0.000	0.248
48.00	-18.87	-16.36	0.00	-667.83	0.00	667.83	3768.35	890.16	2697.78	2820.70	4.79	-0.969	0.000	0.242
50.00	-18.03	-16.17	0.00	-635.11	0.00	635.11	3707.42	875.77	2611.24	2729.69	5.20	-1.013	0.000	0.238
53.25	-16.71	-15.85	0.00	-582.55	0.00	582.55	3164.77	747.58	2219.90	2324.50	5.92	-1.082	0.000	0.256
55.00	-16.34	-15.71	0.00	-554.81	0.00	554.81	3119.07	736.79	2156.26	2257.51	6.32	-1.119	0.000	0.251
60.00	-15.34	-15.25	0.00	-476.28	0.00	476.28	2988.51	705.95	1979.51	2071.51	7.55	-1.231	0.000	0.236
65.00	-14.39	-14.80	0.00	-400.03	0.00	400.03	2857.94	675.10	1810.33	1893.51	8.90	-1.338	0.000	0.217
70.00	-10.71	-11.35	0.00	-326.01	0.00	326.01	2727.38	644.26	1648.70	1723.51	10.36	-1.440	0.000	0.193
75.00	-9.85	-10.92	0.00	-269.27	0.00	269.27	2596.81	613.42	1494.62	1561.50	11.92	-1.536	0.000	0.177
80.00	-8.37	-9.37	0.00	-214.68	0.00	214.68	2466.25	582.58	1348.10	1407.49	13.58	-1.626	0.000	0.156
85.00	-7.62	-8.97	0.00	-167.82	0.00	167.82	2335.68	551.74	1209.14	1261.47	15.33	-1.709	0.000	0.137
90.00	-6.19	-7.07	0.00	-122.99	0.00	122.99	2205.12	520.89	1077.74	1123.45	17.16	-1.784	0.000	0.112
95.00	-5.57	-6.69	0.00	-87.65	0.00	87.65	2074.55	490.05	953.89	993.42	19.06	-1.848	0.000	0.091
98.25	-5.19	-6.46	0.00	-65.89	0.00	65.89	1989.68	470.00	877.44	913.19	20.34	-1.885	0.000	0.075
99.00	-3.83	-4.63	0.00	-61.05	0.00	61.05	1970.10	465.38	860.25	895.16	20.63	-1.893	0.000	0.070
100.00	-3.65	-4.55	0.00	-56.42	0.00	56.42	1943.99	459.21	837.60	871.39	21.03	-1.903	0.000	0.067
101.50	-3.38	-4.44	0.00	-49.60	0.00	49.60	1306.72	308.67	567.69	593.96	21.63	-1.917	0.000	0.086
105.00	-3.12	-4.21	0.00	-34.05	0.00	34.05	1245.79	294.28	515.98	539.57	23.05	-1.945	0.000	0.066
110.00	-1.05	-1.08	0.00	-13.01	0.00	13.01	1158.75	273.72	446.40	466.39	25.11	-1.980	0.000	0.029
115.00	-0.75	-0.78	0.00	-7.59	0.00	7.59	1071.71	253.16	381.85	398.55	27.19	-1.999	0.000	0.020
120.00	-0.48	-0.50	0.00	-3.69	0.00	3.69	984.66	232.60	322.34	336.04	29.29	-2.013	0.000	0.011
125.00	-0.23	-0.24	0.00	-1.19	0.00	1.19	897.62	212.04	267.87	278.85	31.40	-2.020	0.000	0.005
130.00	0.00	-0.23	0.00	0.00	0.00	0.00	810.58	191.47	218.44	227.00	33.52	-2.022	0.000	0.000

Wind Loading - Shaft

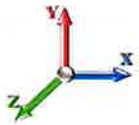
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 0.9D + 1.0W 120 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	29.269	32.20	474.73	0.730	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	29.269	32.20	461.02	0.730	0.000	5.00	21.325	15.57	501.2	0.0	1062.4
10.00		1.00	0.85	29.269	32.20	447.32	0.730	0.000	5.00	20.700	15.11	486.5	0.0	1031.0
15.00		1.00	0.85	29.269	32.20	433.61	0.730	0.000	5.00	20.075	14.65	471.8	0.0	999.6
20.00		1.00	0.90	31.055	34.16	432.53	0.730	0.000	5.00	19.451	14.20	485.0	0.0	968.2
25.00		1.00	0.95	32.549	35.80	428.36	0.730	0.000	5.00	18.826	13.74	492.0	0.0	936.8
30.00		1.00	0.98	33.823	37.20	421.92	0.730	0.000	5.00	18.201	13.29	494.3	0.0	905.4
35.00		1.00	1.01	34.938	38.43	413.85	0.730	0.000	5.00	17.576	12.83	493.1	0.0	874.0
40.00		1.00	1.04	35.934	39.53	404.52	0.730	0.000	5.00	16.952	12.37	489.1	0.0	842.6
45.00		1.00	1.07	36.837	40.52	394.19	0.730	0.000	5.00	16.327	11.92	482.9	0.0	811.2
48.00	Bot - Section 2	1.00	1.08	37.341	41.07	387.59	0.730	0.000	3.00	9.496	6.93	284.7	0.0	471.7
50.00		1.00	1.09	37.663	41.43	383.04	0.730	0.000	2.00	6.333	4.62	191.5	0.0	578.2
53.25	Top - Section 1	1.00	1.11	38.165	41.98	375.41	0.730	0.000	3.25	10.078	7.36	308.9	0.0	919.7
55.00		1.00	1.12	38.426	42.27	379.17	0.730	0.000	1.75	5.317	3.88	164.1	0.0	226.6
60.00		1.00	1.14	39.137	43.05	366.81	0.730	0.000	5.00	14.770	10.78	464.2	0.0	629.4
65.00		1.00	1.16	39.802	43.78	353.93	0.730	0.000	5.00	14.145	10.33	452.1	0.0	602.5
70.00	Appurtenance(s)	1.00	1.17	40.427	44.47	340.59	0.730	0.000	5.00	13.521	9.87	438.9	0.0	575.6
75.00		1.00	1.19	41.019	45.12	326.85	0.730	0.000	5.00	12.896	9.41	424.8	0.0	548.7
80.00	Appurtenance(s)	1.00	1.21	41.580	45.74	312.74	0.730	0.000	5.00	12.271	8.96	409.7	0.0	521.8
85.00		1.00	1.22	42.114	46.33	298.30	0.730	0.000	5.00	11.647	8.50	393.9	0.0	494.8
90.00	Appurtenance(s)	1.00	1.24	42.624	46.89	283.56	0.730	0.000	5.00	11.022	8.05	377.2	0.0	467.9
95.00		1.00	1.25	43.112	47.42	268.54	0.730	0.000	5.00	10.397	7.59	359.9	0.0	441.0
98.25	Bot - Section 3	1.00	1.26	43.418	47.76	258.64	0.730	0.000	3.25	6.423	4.69	223.9	0.0	272.2
99.00	Appurtenance(s)	1.00	1.26	43.488	47.84	256.35	0.730	0.000	0.75	1.477	1.08	51.6	0.0	103.2
100.00		1.00	1.27	43.580	47.94	253.27	0.730	0.000	1.00	1.947	1.42	68.1	0.0	136.0
101.50	Top - Section 2	1.00	1.27	43.717	48.09	248.64	0.730	0.000	1.50	2.873	2.10	100.9	0.0	200.6
105.00		1.00	1.28	44.030	48.43	243.46	0.730	0.000	3.50	6.486	4.73	229.3	0.0	184.1
110.00	Appurtenance(s)	1.00	1.29	44.463	48.91	227.76	0.730	0.000	5.00	8.735	6.38	311.9	0.0	247.8
115.00		1.00	1.30	44.881	49.37	211.85	0.730	0.000	5.00	8.110	5.92	292.3	0.0	229.9
120.00		1.00	1.32	45.285	49.81	195.75	0.730	0.000	5.00	7.485	5.46	272.2	0.0	211.9
125.00		1.00	1.33	45.676	50.24	179.48	0.730	0.000	5.00	6.860	5.01	251.6	0.0	194.0
130.00		1.00	1.34	46.055	50.66	163.02	0.730	0.000	5.00	6.236	4.55	230.6	0.0	176.0
								Totals:	**130.00**			**10,698.5**		**16,864.7**

Discrete Appurtenance Forces

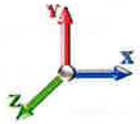
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.0W 120 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.00



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	110.00	Commscope	3	44.463	48.910	0.66	0.80	16.10	117.99	0.000	0.000	787.22	0.00	0.00
2	110.00	Ring Mount	1	44.463	48.910	1.00	1.00	7.50	594.00	0.000	0.000	366.82	0.00	0.00
3	110.00	Raycap	1	44.463	48.910	0.80	0.80	3.28	19.26	0.000	0.000	160.42	0.00	0.00
4	110.00	Commscope	3	44.463	48.910	0.67	0.80	16.23	137.70	0.000	0.000	793.75	0.00	0.00
5	110.00	Samsung MT6413-77A	3	44.463	48.910	0.55	0.80	6.30	154.76	0.000	0.000	308.30	0.00	0.00
6	110.00	Samsung RF4439d-25A	3	44.463	48.910	0.54	0.80	3.01	201.69	0.000	0.000	147.07	0.00	0.00
7	110.00	Samsung RF4461d-13A	3	44.463	48.910	0.54	0.80	2.20	107.19	0.000	0.000	107.75	0.00	0.00
8	110.00	Samsung RT4423-48A	3	44.463	48.910	0.54	0.80	1.38	41.58	0.000	0.000	67.64	0.00	0.00
9	99.00	ALU 800MHz Filter	3	43.488	47.837	0.54	0.80	1.25	23.76	0.000	0.000	60.00	0.00	0.00
10	99.00	ALU TD-RRH8x20-25	3	43.488	47.837	0.54	0.80	6.51	189.00	0.000	0.000	311.53	0.00	0.00
11	99.00	ALU 800 MHz RRH	3	43.488	47.837	0.54	0.80	3.43	143.10	0.000	0.000	163.84	0.00	0.00
12	99.00	ALU 1900MHz RRH	3	43.488	47.837	0.54	0.80	3.71	162.00	0.000	0.000	177.69	0.00	0.00
13	99.00	RFS ACU-A20-N	4	43.488	47.837	0.54	0.80	0.30	3.60	0.000	0.000	14.36	0.00	0.00
14	99.00	Flush Mount	1	43.488	47.837	1.00	1.00	5.00	315.00	0.000	0.000	239.18	0.00	0.00
15	99.00	Andrew DHHTT65B-3XR	3	43.488	47.837	0.66	0.80	16.12	121.50	0.000	0.000	770.90	0.00	0.00
16	90.00	Flush Mount	1	42.624	46.886	1.00	1.00	5.00	315.00	0.000	0.000	234.43	0.00	0.00
17	90.00	Andrew	3	42.624	46.886	0.54	0.80	0.16	3.56	0.000	0.000	7.54	0.00	0.00
18	90.00	Cci TMABPD7823VG12A	3	42.624	46.886	0.54	0.80	2.20	70.20	0.000	0.000	103.29	0.00	0.00
19	90.00	Powerwave LGP21401	3	42.624	46.886	0.54	0.80	1.32	47.25	0.000	0.000	61.82	0.00	0.00
20	90.00	Andrew SBNHH-1D65C	3	42.624	46.886	0.67	0.80	22.96	133.92	0.000	0.000	1076.62	0.00	0.00
21	80.00	Flush Mount	1	41.580	45.738	1.00	1.00	5.00	315.00	0.000	0.000	228.69	0.00	0.00
22	80.00	RFS	3	41.580	45.738	0.65	0.80	18.76	187.38	0.000	0.000	858.03	0.00	0.00
23	80.00	RFS	6	41.580	45.738	0.54	0.80	0.48	6.26	0.000	0.000	22.06	0.00	0.00
24	70.00	Commscope	1	40.427	44.470	1.00	1.00	37.59	1554.30	0.000	0.000	1671.64	0.00	0.00
25	70.00	Raycap	1	40.427	44.470	0.75	0.75	1.92	19.67	0.000	0.000	85.38	0.00	0.00
26	70.00	Fujitsu TA08025-B604	3	40.427	44.470	0.50	0.75	2.95	172.53	0.000	0.000	131.40	0.00	0.00
27	70.00	Fujitsu TA08025-B605	3	40.427	44.470	0.50	0.75	2.95	202.50	0.000	0.000	131.40	0.00	0.00
28	70.00	JMA Wireless	3	40.427	44.470	0.55	0.75	20.80	174.15	0.000	0.000	924.80	0.00	0.00
							Totals:		**5,533.86**			**10,013.57**		

Total Applied Force Summary

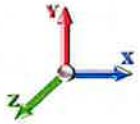
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

TES Tower Engineering Solutions

Load Case: 0.9D + 1.0W 120 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		501.19	1165.03	0.00	0.00
10.00		486.51	1133.64	0.00	0.00
15.00		471.82	1102.24	0.00	0.00
20.00		485.05	1070.85	0.00	0.00
25.00		492.05	1039.45	0.00	0.00
30.00		494.34	1008.06	0.00	0.00
35.00		493.11	976.66	0.00	0.00
40.00		489.15	945.27	0.00	0.00
45.00		482.95	913.87	0.00	0.00
48.00		284.74	533.25	0.00	0.00
50.00		191.53	619.28	0.00	0.00
53.25		308.85	986.43	0.00	0.00
55.00		164.07	262.58	0.00	0.00
60.00		464.18	732.06	0.00	0.00
65.00		452.10	705.15	0.00	0.00
70.00	(11) attachments	3383.54	2801.39	0.00	0.00
75.00		424.77	646.20	0.00	0.00
80.00	(10) attachments	1518.51	1127.94	0.00	0.00
85.00		393.86	564.30	0.00	0.00
90.00	(13) attachments	1860.95	1107.33	0.00	0.00
95.00		359.94	467.55	0.00	0.00
98.25		223.94	289.48	0.00	0.00
99.00	(20) attachments	1789.07	1065.09	0.00	0.00
100.00		68.13	138.90	0.00	0.00
101.50		100.87	204.98	0.00	0.00
105.00		229.32	194.38	0.00	0.00
110.00	(20) attachments	3050.82	1636.61	0.00	0.00
115.00		292.28	229.85	0.00	0.00
120.00		272.19	211.91	0.00	0.00
125.00		251.63	193.97	0.00	0.00
130.00		230.61	176.03	0.00	0.00
	Totals:	**20,712.03**	**24,249.73**	**0.00**	**0.00**

Linear Appurtenance Segment Forces (Factored)

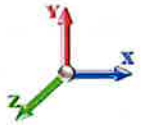
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

TES Tower Engineering Solutions

Load Case: 0.9D + 1.0W 120 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.028	0.000	29.269	0.00	5.13
10.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.028	0.000	29.269	0.00	5.13
15.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.029	0.000	29.269	0.00	5.13
20.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.030	0.000	31.055	0.00	5.13
25.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.031	0.000	32.549	0.00	5.13
30.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.032	0.000	33.823	0.00	5.13
35.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.033	0.000	34.938	0.00	5.13
40.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.035	0.000	35.934	0.00	5.13
45.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.036	0.000	36.837	0.00	5.13
48.00	1.41" Hybrid	Yes	3.00	0.000	1.41	0.35	0.00	0.037	0.000	37.341	0.00	3.08
50.00	1.41" Hybrid	Yes	2.00	0.000	1.41	0.23	0.00	0.038	0.000	37.663	0.00	2.05
53.25	1.41" Hybrid	Yes	3.25	0.000	1.41	0.38	0.00	0.039	0.000	38.165	0.00	3.33
55.00	1.41" Hybrid	Yes	1.75	0.000	1.41	0.21	0.00	0.039	0.000	38.426	0.00	1.80
60.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.040	0.000	39.137	0.00	5.13
65.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.042	0.000	39.802	0.00	5.13
70.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.043	0.000	40.427	0.00	5.13
										Totals:	**0.0**	**71.8**

Calculated Forces

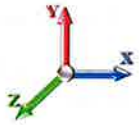
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.0W 120 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.00



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-24.23	-20.73	0.00	-1563.6	0.00	1563.69	4994.17	1235.59	5197.80	5206.12	0.00	0.000	0.000	0.305
5.00	-23.03	-20.27	0.00	-1460.0	0.00	1460.03	4891.79	1199.61	4899.47	4949.63	0.05	-0.094	0.000	0.300
10.00	-21.87	-19.82	0.00	-1358.6	0.00	1358.69	4786.83	1163.63	4609.96	4696.86	0.20	-0.190	0.000	0.294
15.00	-20.73	-19.38	0.00	-1259.6	0.00	1259.61	4679.28	1127.65	4329.26	4448.07	0.45	-0.287	0.000	0.288
20.00	-19.63	-18.92	0.00	-1162.7	0.00	1162.74	4569.15	1091.66	4057.38	4203.49	0.81	-0.386	0.000	0.281
25.00	-18.57	-18.45	0.00	-1068.1	0.00	1068.15	4456.44	1055.68	3794.32	3963.36	1.27	-0.487	0.000	0.274
30.00	-17.53	-17.98	0.00	-975.90	0.00	975.90	4316.73	1019.70	3540.07	3706.95	1.83	-0.589	0.000	0.268
35.00	-16.53	-17.50	0.00	-886.01	0.00	886.01	4164.40	983.72	3294.64	3448.64	2.51	-0.692	0.000	0.261
40.00	-15.56	-17.03	0.00	-798.49	0.00	798.49	4012.07	947.73	3058.03	3199.66	3.29	-0.796	0.000	0.254
45.00	-14.63	-16.56	0.00	-713.33	0.00	713.33	3859.75	911.75	2830.23	2960.01	4.18	-0.900	0.000	0.245
48.00	-14.08	-16.28	0.00	-663.66	0.00	663.66	3768.35	890.16	2697.78	2820.70	4.76	-0.964	0.000	0.239
50.00	-13.45	-16.09	0.00	-631.11	0.00	631.11	3707.42	875.77	2611.24	2729.69	5.18	-1.007	0.000	0.235
53.25	-12.46	-15.77	0.00	-578.83	0.00	578.83	3164.77	747.58	2219.90	2324.50	5.89	-1.076	0.000	0.253
55.00	-12.18	-15.62	0.00	-551.23	0.00	551.23	3119.07	736.79	2156.26	2257.51	6.29	-1.113	0.000	0.249
60.00	-11.43	-15.16	0.00	-473.14	0.00	473.14	2988.51	705.95	1979.51	2071.51	7.52	-1.224	0.000	0.233
65.00	-10.70	-14.71	0.00	-397.34	0.00	397.34	2857.94	675.10	1810.33	1893.51	8.86	-1.330	0.000	0.214
70.00	-7.97	-11.28	0.00	-323.77	0.00	323.77	2727.38	644.26	1648.70	1723.51	10.31	-1.431	0.000	0.191
75.00	-7.31	-10.85	0.00	-267.39	0.00	267.39	2596.81	613.42	1494.62	1561.50	11.86	-1.527	0.000	0.174
80.00	-6.21	-9.31	0.00	-213.16	0.00	213.16	2466.25	582.58	1348.10	1407.49	13.51	-1.616	0.000	0.154
85.00	-5.65	-8.90	0.00	-166.62	0.00	166.62	2335.68	551.74	1209.14	1261.47	15.24	-1.699	0.000	0.135
90.00	-4.59	-7.02	0.00	-122.10	0.00	122.10	2205.12	520.89	1077.74	1123.45	17.07	-1.773	0.000	0.111
95.00	-4.13	-6.65	0.00	-87.01	0.00	87.01	2074.55	490.05	953.89	993.42	18.96	-1.837	0.000	0.090
98.25	-3.84	-6.41	0.00	-65.42	0.00	65.42	1989.68	470.00	877.44	913.19	20.22	-1.873	0.000	0.074
99.00	-2.84	-4.59	0.00	-60.60	0.00	60.60	1970.10	465.38	860.25	895.16	20.52	-1.881	0.000	0.069
100.00	-2.70	-4.52	0.00	-56.01	0.00	56.01	1943.99	459.21	837.60	871.39	20.91	-1.891	0.000	0.066
101.50	-2.50	-4.41	0.00	-49.23	0.00	49.23	1306.72	308.67	567.69	593.96	21.51	-1.905	0.000	0.085
105.00	-2.31	-4.18	0.00	-33.79	0.00	33.79	1245.79	294.28	515.98	539.57	22.92	-1.933	0.000	0.065
110.00	-0.78	-1.07	0.00	-12.90	0.00	12.90	1158.75	273.72	446.40	466.39	24.96	-1.968	0.000	0.028
115.00	-0.56	-0.77	0.00	-7.53	0.00	7.53	1071.71	253.16	381.85	398.55	27.03	-1.987	0.000	0.019
120.00	-0.35	-0.49	0.00	-3.66	0.00	3.66	984.66	232.60	322.34	336.04	29.12	-2.000	0.000	0.011
125.00	-0.17	-0.24	0.00	-1.18	0.00	1.18	897.62	212.04	267.87	278.85	31.22	-2.008	0.000	0.004
130.00	0.00	-0.23	0.00	0.00	0.00	0.00	810.58	191.47	218.44	227.00	33.32	-2.010	0.000	0.000

Wind Loading - Shaft

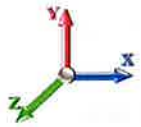
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.081	5.59	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.081	5.59	0.00	1.200	1.242	5.00	22.360	26.83	150.0	396.1	1812.6
10.00		1.00	0.85	5.081	5.59	0.00	1.200	1.331	5.00	21.809	26.17	146.3	412.9	1787.5
15.00		1.00	0.85	5.081	5.59	0.00	1.200	1.386	5.00	21.230	25.48	142.4	417.6	1750.4
20.00		1.00	0.90	5.392	5.93	0.00	1.200	1.427	5.00	20.639	24.77	146.9	417.0	1707.9
25.00		1.00	0.95	5.651	6.22	0.00	1.200	1.459	5.00	20.042	24.05	149.5	413.2	1662.2
30.00		1.00	0.98	5.872	6.46	0.00	1.200	1.486	5.00	19.439	23.33	150.7	407.3	1614.5
35.00		1.00	1.01	6.066	6.67	0.00	1.200	1.509	5.00	18.834	22.60	150.8	399.9	1565.2
40.00		1.00	1.04	6.239	6.86	0.00	1.200	1.529	5.00	18.226	21.87	150.1	391.3	1514.8
45.00		1.00	1.07	6.395	7.03	0.00	1.200	1.547	5.00	17.616	21.14	148.7	381.8	1463.4
48.00	Bot - Section 2	1.00	1.08	6.483	7.13	0.00	1.200	1.557	3.00	10.275	12.33	87.9	225.4	854.3
50.00		1.00	1.09	6.539	7.19	0.00	1.200	1.564	2.00	6.854	8.22	59.2	151.5	922.5
53.25	Top - Section 1	1.00	1.11	6.626	7.29	0.00	1.200	1.574	3.25	10.930	13.12	95.6	241.7	1468.0
55.00		1.00	1.12	6.671	7.34	0.00	1.200	1.579	1.75	5.778	6.93	50.9	128.8	431.0
60.00		1.00	1.14	6.795	7.47	0.00	1.200	1.592	5.00	16.097	19.32	144.4	356.6	1195.8
65.00		1.00	1.16	6.910	7.60	0.00	1.200	1.605	5.00	15.483	18.58	141.2	344.8	1148.1
70.00	Appurtenance(s)	1.00	1.17	7.019	7.72	0.00	1.200	1.617	5.00	14.868	17.84	137.7	332.5	1099.9
75.00		1.00	1.19	7.121	7.83	0.00	1.200	1.628	5.00	14.253	17.10	134.0	319.9	1051.4
80.00	Appurtenance(s)	1.00	1.21	7.219	7.94	0.00	1.200	1.639	5.00	13.637	16.36	129.9	306.9	1002.5
85.00		1.00	1.22	7.311	8.04	0.00	1.200	1.649	5.00	13.021	15.62	125.7	293.6	953.4
90.00	Appurtenance(s)	1.00	1.24	7.400	8.14	0.00	1.200	1.658	5.00	12.404	14.88	121.2	280.0	903.9
95.00		1.00	1.25	7.485	8.23	0.00	1.200	1.667	5.00	11.787	14.14	116.4	266.2	854.2
98.25	Bot - Section 3	1.00	1.26	7.538	8.29	0.00	1.200	1.673	3.25	7.329	8.80	72.9	167.1	530.1
99.00	Appurtenance(s)	1.00	1.26	7.550	8.30	0.00	1.200	1.674	0.75	1.686	2.02	16.8	39.0	176.6
100.00		1.00	1.27	7.566	8.32	0.00	1.200	1.676	1.00	2.226	2.67	22.2	51.5	232.8
101.50	Top - Section 2	1.00	1.27	7.590	8.35	0.00	1.200	1.678	1.50	3.293	3.95	33.0	75.9	343.4
105.00		1.00	1.28	7.644	8.41	0.00	1.200	1.684	3.50	7.468	8.96	75.4	170.2	415.7
110.00	Appurtenance(s)	1.00	1.29	7.719	8.49	0.00	1.200	1.692	5.00	10.144	12.17	103.4	228.7	559.1
115.00		1.00	1.30	7.792	8.57	0.00	1.200	1.699	5.00	9.526	11.43	98.0	214.1	520.6
120.00		1.00	1.32	7.862	8.65	0.00	1.200	1.707	5.00	8.907	10.69	92.4	199.3	481.8
125.00		1.00	1.33	7.930	8.72	0.00	1.200	1.714	5.00	8.288	9.95	86.8	184.3	443.0
130.00		1.00	1.34	7.996	8.80	0.00	1.200	1.720	5.00	7.669	9.20	80.9	169.2	403.9
								Totals:	**130.00**			**3,361.2**		**30,870.7**

Discrete Appurtenance Forces

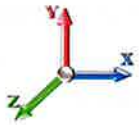
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	110.00	Commscope	3	7.719	8.491	0.66	0.80	18.58	740.24	0.000	0.000	157.81	0.00	0.00
2	110.00	Ring Mount	1	7.719	8.491	1.00	1.00	15.11	2028.33	0.000	0.000	128.33	0.00	0.00
3	110.00	Raycap	1	7.719	8.491	0.80	0.80	3.90	110.97	0.000	0.000	33.13	0.00	0.00
4	110.00	Commscope	3	7.719	8.491	0.67	0.80	18.70	605.16	0.000	0.000	158.79	0.00	0.00
5	110.00	Samsung MT6413-77A	3	7.719	8.491	0.60	0.80	9.57	788.90	0.000	0.000	81.23	0.00	0.00
6	110.00	Samsung RF4439d-25A	3	7.719	8.491	0.54	0.80	4.84	841.85	0.000	0.000	41.08	0.00	0.00
7	110.00	Samsung RF4461d-13A	3	7.719	8.491	0.54	0.80	3.54	405.43	0.000	0.000	30.10	0.00	0.00
8	110.00	Samsung RT4423-48A	3	7.719	8.491	0.54	0.80	2.81	152.31	0.000	0.000	23.82	0.00	0.00
9	99.00	ALU 800MHz Filter	3	7.550	8.305	0.54	0.80	2.25	67.46	0.000	0.000	18.70	0.00	0.00
10	99.00	ALU TD-RRH8x20-25	3	7.550	8.305	0.54	0.80	7.76	567.21	0.000	0.000	64.47	0.00	0.00
11	99.00	ALU 800 MHz RRH	3	7.550	8.305	0.54	0.80	4.34	285.65	0.000	0.000	36.03	0.00	0.00
12	99.00	ALU 1900MHz RRH	3	7.550	8.305	0.54	0.80	4.72	388.10	0.000	0.000	39.17	0.00	0.00
13	99.00	RFS ACU-A20-N	4	7.550	8.305	0.54	0.80	0.91	16.08	0.000	0.000	7.56	0.00	0.00
14	99.00	Flush Mount	1	7.550	8.305	1.00	1.00	8.35	601.26	0.000	0.000	69.33	0.00	0.00
15	99.00	Andrew DHHTT65B-3XR	3	7.550	8.305	0.66	0.80	18.70	741.09	0.000	0.000	155.30	0.00	0.00
16	90.00	Flush Mount	1	7.400	8.140	1.00	1.00	8.32	598.60	0.000	0.000	67.70	0.00	0.00
17	90.00	Andrew	3	7.400	8.140	0.54	0.80	0.40	17.37	0.000	0.000	3.24	0.00	0.00
18	90.00	Cci TMABPD7823VG12A	3	7.400	8.140	0.54	0.80	2.93	268.25	0.000	0.000	23.84	0.00	0.00
19	90.00	Powerwave LGP21401	3	7.400	8.140	0.54	0.80	1.92	112.95	0.000	0.000	15.65	0.00	0.00
20	90.00	Andrew SBNHH-1D65C	3	7.400	8.140	0.67	0.80	26.13	920.48	0.000	0.000	212.71	0.00	0.00
21	80.00	Flush Mount	1	7.219	7.941	1.00	1.00	8.28	595.33	0.000	0.000	65.73	0.00	0.00
22	80.00	RFS	3	7.219	7.941	0.65	0.80	21.16	1120.14	0.000	0.000	168.01	0.00	0.00
23	80.00	RFS	6	7.219	7.941	0.54	0.80	1.08	-77.28	0.000	0.000	8.58	0.00	0.00
24	70.00	Commscope	1	7.019	7.721	1.00	1.00	81.36	3263.38	0.000	0.000	628.13	0.00	0.00
25	70.00	Raycap	1	7.019	7.721	0.75	0.75	2.36	75.72	0.000	0.000	18.22	0.00	0.00
26	70.00	Fujitsu TA08025-B604	3	7.019	7.721	0.50	0.75	3.74	334.48	0.000	0.000	28.86	0.00	0.00
27	70.00	Fujitsu TA08025-B605	3	7.019	7.721	0.50	0.75	3.74	377.60	0.000	0.000	28.86	0.00	0.00
28	70.00	JMA Wireless	3	7.019	7.721	0.55	0.75	23.06	839.18	0.000	0.000	178.00	0.00	0.00
							Totals:		**16,786.21**			**2,492.40**		

Total Applied Force Summary

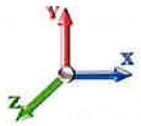
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		149.98	1966.51	0.00	0.00
10.00		146.28	1943.38	0.00	0.00
15.00		142.40	1907.47	0.00	0.00
20.00		146.89	1865.87	0.00	0.00
25.00		149.49	1820.96	0.00	0.00
30.00		150.67	1773.83	0.00	0.00
35.00		150.80	1725.10	0.00	0.00
40.00		150.09	1675.14	0.00	0.00
45.00		148.71	1624.21	0.00	0.00
48.00		87.92	950.94	0.00	0.00
50.00		59.16	986.99	0.00	0.00
53.25		95.60	1572.95	0.00	0.00
55.00		50.88	487.56	0.00	0.00
60.00		144.37	1357.78	0.00	0.00
65.00		141.22	1310.36	0.00	0.00
70.00	(11) attachments	1019.82	6152.86	0.00	0.00
75.00		133.98	1181.46	0.00	0.00
80.00	(10) attachments	372.26	2770.79	0.00	0.00
85.00		125.66	1045.98	0.00	0.00
90.00	(13) attachments	444.31	2914.18	0.00	0.00
95.00		116.45	889.60	0.00	0.00
98.25		72.93	553.08	0.00	0.00
99.00	(20) attachments	407.37	2848.72	0.00	0.00
100.00		22.23	236.68	0.00	0.00
101.50		32.99	349.26	0.00	0.00
105.00		75.36	429.39	0.00	0.00
110.00	(20) attachments	757.66	6251.82	0.00	0.00
115.00		97.98	520.57	0.00	0.00
120.00		92.44	481.85	0.00	0.00
125.00		86.76	442.96	0.00	0.00
130.00		80.94	403.91	0.00	0.00
	Totals:	**5,853.62**	**50,442.16**	**0.00**	**0.00**

Linear Appurtenance Segment Forces (Factored)

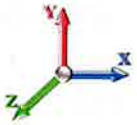
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.62	0.00	0.028	0.000	5.081	0.00	23.90
10.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.70	0.00	0.028	0.000	5.081	0.00	25.79
15.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.74	0.00	0.029	0.000	5.081	0.00	27.01
20.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.78	0.00	0.030	0.000	5.392	0.00	27.93
25.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.80	0.00	0.031	0.000	5.651	0.00	28.67
30.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.83	0.00	0.032	0.000	5.872	0.00	29.30
35.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.84	0.00	0.033	0.000	6.066	0.00	29.85
40.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.86	0.00	0.035	0.000	6.239	0.00	30.34
45.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.88	0.00	0.036	0.000	6.395	0.00	30.78
48.00	1.41" Hybrid	Yes	3.00	0.000	1.41	1.13	0.00	0.037	0.000	6.483	0.00	18.61
50.00	1.41" Hybrid	Yes	2.00	0.000	1.41	0.76	0.00	0.038	0.000	6.539	0.00	12.47
53.25	1.41" Hybrid	Yes	3.25	0.000	1.41	1.23	0.00	0.039	0.000	6.626	0.00	20.42
55.00	1.41" Hybrid	Yes	1.75	0.000	1.41	0.67	0.00	0.039	0.000	6.671	0.00	11.04
60.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.91	0.00	0.040	0.000	6.795	0.00	31.89
65.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.93	0.00	0.042	0.000	6.910	0.00	32.21
70.00	1.41" Hybrid	Yes	5.00	0.000	1.41	1.94	0.00	0.043	0.000	7.019	0.00	32.51
										Totals:	**0.0**	**412.7**

Calculated Forces

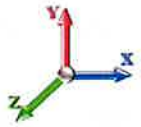
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

TES Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 20

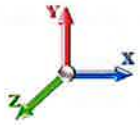
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-50.44	-5.87	0.00	-440.70	0.00	440.70	4994.17	1235.59	5197.80	5206.12	0.00	0.000	0.000	0.095
5.00	-48.47	-5.74	0.00	-411.37	0.00	411.37	4891.79	1199.61	4899.47	4949.63	0.01	-0.027	0.000	0.093
10.00	-46.53	-5.61	0.00	-382.69	0.00	382.69	4786.83	1163.63	4609.96	4696.86	0.06	-0.053	0.000	0.091
15.00	-44.62	-5.49	0.00	-354.63	0.00	354.63	4679.28	1127.65	4329.26	4448.07	0.13	-0.081	0.000	0.089
20.00	-42.75	-5.36	0.00	-327.19	0.00	327.19	4569.15	1091.66	4057.38	4203.49	0.23	-0.109	0.000	0.087
25.00	-40.92	-5.23	0.00	-300.39	0.00	300.39	4456.44	1055.68	3794.32	3963.36	0.36	-0.137	0.000	0.085
30.00	-39.15	-5.09	0.00	-274.26	0.00	274.26	4316.73	1019.70	3540.07	3706.95	0.52	-0.166	0.000	0.083
35.00	-37.42	-4.95	0.00	-248.80	0.00	248.80	4164.40	983.72	3294.64	3448.64	0.71	-0.195	0.000	0.081
40.00	-35.74	-4.82	0.00	-224.04	0.00	224.04	4012.07	947.73	3058.03	3199.66	0.93	-0.224	0.000	0.079
45.00	-34.12	-4.67	0.00	-199.96	0.00	199.96	3859.75	911.75	2830.23	2960.01	1.18	-0.253	0.000	0.076
48.00	-33.17	-4.59	0.00	-185.94	0.00	185.94	3768.35	890.16	2697.78	2820.70	1.34	-0.271	0.000	0.075
50.00	-32.18	-4.54	0.00	-176.76	0.00	176.76	3707.42	875.77	2611.24	2729.69	1.46	-0.283	0.000	0.073
53.25	-30.61	-4.44	0.00	-162.02	0.00	162.02	3164.77	747.58	2219.90	2324.50	1.66	-0.302	0.000	0.079
55.00	-30.12	-4.40	0.00	-154.25	0.00	154.25	3119.07	736.79	2156.26	2257.51	1.77	-0.313	0.000	0.078
60.00	-28.76	-4.26	0.00	-132.26	0.00	132.26	2988.51	705.95	1979.51	2071.51	2.11	-0.344	0.000	0.074
65.00	-27.45	-4.12	0.00	-110.96	0.00	110.96	2857.94	675.10	1810.33	1893.51	2.49	-0.374	0.000	0.068
70.00	-21.30	-3.07	0.00	-90.34	0.00	90.34	2727.38	644.26	1648.70	1723.51	2.90	-0.402	0.000	0.060
75.00	-20.12	-2.94	0.00	-74.97	0.00	74.97	2596.81	613.42	1494.62	1561.50	3.33	-0.428	0.000	0.056
80.00	-17.35	-2.55	0.00	-60.27	0.00	60.27	2466.25	582.58	1348.10	1407.49	3.80	-0.454	0.000	0.050
85.00	-16.30	-2.43	0.00	-47.50	0.00	47.50	2335.68	551.74	1209.14	1261.47	4.28	-0.477	0.000	0.045
90.00	-13.39	-1.96	0.00	-35.37	0.00	35.37	2205.12	520.89	1077.74	1123.45	4.80	-0.498	0.000	0.038
95.00	-12.50	-1.84	0.00	-25.56	0.00	25.56	2074.55	490.05	953.89	993.42	5.33	-0.517	0.000	0.032
98.25	-11.95	-1.76	0.00	-19.58	0.00	19.58	1989.68	470.00	877.44	913.19	5.68	-0.528	0.000	0.027
99.00	-9.10	-1.33	0.00	-18.26	0.00	18.26	1970.10	465.38	860.25	895.16	5.77	-0.530	0.000	0.025
100.00	-8.87	-1.31	0.00	-16.93	0.00	16.93	1943.99	459.21	837.60	871.39	5.88	-0.533	0.000	0.024
101.50	-8.52	-1.27	0.00	-14.97	0.00	14.97	1306.72	308.67	567.69	593.96	6.05	-0.537	0.000	0.032
105.00	-8.09	-1.19	0.00	-10.52	0.00	10.52	1245.79	294.28	515.98	539.57	6.44	-0.546	0.000	0.026
110.00	-1.85	-0.38	0.00	-4.55	0.00	4.55	1158.75	273.72	446.40	466.39	7.02	-0.557	0.000	0.011
115.00	-1.33	-0.27	0.00	-2.67	0.00	2.67	1071.71	253.16	381.85	398.55	7.61	-0.564	0.000	0.008
120.00	-0.85	-0.18	0.00	-1.30	0.00	1.30	984.66	232.60	322.34	336.04	8.20	-0.569	0.000	0.005
125.00	-0.40	-0.08	0.00	-0.42	0.00	0.42	897.62	212.04	267.87	278.85	8.80	-0.571	0.000	0.002
130.00	0.00	-0.08	0.00	0.00	0.00	0.00	810.58	191.47	218.44	227.00	9.40	-0.572	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Ev + 1.0Eh



Gust Response Factor	1.10			**Sds**	0.20	**Iterations**	18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09	**Ss**	0.19
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.56	**SA**	0.05	**S1**	0.06
						Seismic Importance Factor	1.00

Top Elev (ft)	Description	Wz (lb)	Hz (lb)	Vertical Ev (lb)	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	
5.00		1317.2	2.50	53.11	0.21	
10.00		1282.4	7.50	51.71	1.21	
15.00		1247.5	12.50	50.30	2.69	
20.00		1212.6	17.50	48.89	4.47	
25.00		1177.7	22.50	47.49	6.44	
30.00		1142.8	27.50	46.08	8.53	
35.00		1107.9	32.50	44.67	10.68	
40.00		1073.1	37.50	43.27	12.82	
45.00		1038.2	42.50	41.86	14.92	
48.00	Bot - Section 2	606.19	46.50	24.44	7.13	
50.00		697.22	49.00	28.11	9.79	
53.25	Top - Section 1	1110.8	51.63	44.79	22.98	
55.00		299.74	54.13	12.09	2.87	
60.00		836.22	57.50	33.72	17.19	
65.00		806.32	62.50	32.51	18.57	
70.00	Appurtenance(s)	3135.4	67.50	126.42	197.31	
75.00		739.68	72.50	29.82	20.57	
80.00	Appurtenance(s)	1274.9	77.50	51.41	56.28	
85.00		642.44	82.50	25.90	20.18	
90.00	Appurtenance(s)	1245.8	87.50	50.23	66.17	
95.00		525.40	92.50	21.18	17.49	
98.25	Bot - Section 3	325.47	96.63	13.12	8.54	
99.00	Appurtenance(s)	1184.3	98.63	47.75	74.14	
100.00		154.98	99.50	6.25	2.64	
101.50	Top - Section 2	228.74	100.75	9.22	5.12	
105.00		218.25	103.25	8.80	4.93	
110.00	Appurtenance(s)	1821.7	107.50	73.45	173.63	
115.00		255.39	112.50	10.30	7.36	
120.00		235.46	117.50	9.49	6.92	
125.00		215.53	122.50	8.69	6.40	
130.00		195.59	127.50	7.89	5.83	
	Totals:	**27,355.5**		**1,103.0**	**814.1**	**Total Wind:** **20,712.0**

Calculated Forces

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

TES Tower Engineering Solutions

Load Case: 1.2D + 1.0Ev + 1.0Eh

Gust Response Factor	1.10			**Sds**	0.20			**Iterations**	18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.09			**Ss**	0.19
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.56	**SA**	0.05	**Seismic Importance Factor**	1.00	**S1**	0.06

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-33.44	-0.81	0.00	-68.66	0.00	68.66	4994.17	1235.59	5197.80	5206.12		0.00	0.00	0.020
5.00	-31.83	-0.82	0.00	-64.59	0.00	64.59	4891.79	1199.61	4899.47	4949.63		0.00	0.00	0.020
10.00	-30.27	-0.82	0.00	-60.51	0.00	60.51	4786.83	1163.63	4609.96	4696.86		0.01	-0.01	0.019
15.00	-28.75	-0.82	0.00	-56.42	0.00	56.42	4679.28	1127.65	4329.26	4448.07		0.02	-0.01	0.019
20.00	-27.27	-0.81	0.00	-52.34	0.00	52.34	4569.15	1091.66	4057.38	4203.49		0.04	-0.02	0.018
25.00	-25.84	-0.81	0.00	-48.27	0.00	48.27	4456.44	1055.68	3794.32	3963.36		0.06	-0.02	0.018
30.00	-24.45	-0.80	0.00	-44.23	0.00	44.23	4316.73	1019.70	3540.07	3706.95		0.08	-0.03	0.018
35.00	-23.10	-0.79	0.00	-40.22	0.00	40.22	4164.40	983.72	3294.64	3448.64		0.11	-0.03	0.017
40.00	-21.80	-0.78	0.00	-36.26	0.00	36.26	4012.07	947.73	3058.03	3199.66		0.15	-0.04	0.017
45.00	-20.53	-0.77	0.00	-32.36	0.00	32.36	3859.75	911.75	2830.23	2960.01		0.19	-0.04	0.016
48.00	-19.80	-0.76	0.00	-30.06	0.00	30.06	3768.35	890.16	2697.78	2820.70		0.21	-0.04	0.016
50.00	-18.95	-0.75	0.00	-28.54	0.00	28.54	3707.42	875.77	2611.24	2729.69		0.23	-0.05	0.016
53.25	-17.59	-0.73	0.00	-26.10	0.00	26.10	3164.77	747.58	2219.90	2324.50		0.26	-0.05	0.017
55.00	-17.22	-0.72	0.00	-24.83	0.00	24.83	3119.07	736.79	2156.26	2257.51		0.28	-0.05	0.017
60.00	-16.21	-0.71	0.00	-21.21	0.00	21.21	2988.51	705.95	1979.51	2071.51		0.34	-0.06	0.016
65.00	-15.24	-0.69	0.00	-17.67	0.00	17.67	2857.94	675.10	1810.33	1893.51		0.40	-0.06	0.015
70.00	-11.38	-0.49	0.00	-14.23	0.00	14.23	2727.38	644.26	1648.70	1723.51		0.46	-0.06	0.012
75.00	-10.49	-0.47	0.00	-11.79	0.00	11.79	2596.81	613.42	1494.62	1561.50		0.53	-0.07	0.012
80.00	-8.93	-0.41	0.00	-9.45	0.00	9.45	2466.25	582.58	1348.10	1407.49		0.61	-0.07	0.010
85.00	-8.15	-0.39	0.00	-7.40	0.00	7.40	2335.68	551.74	1209.14	1261.47		0.68	-0.08	0.009
90.00	-6.63	-0.32	0.00	-5.45	0.00	5.45	2205.12	520.89	1077.74	1123.45		0.77	-0.08	0.008
95.00	-5.98	-0.30	0.00	-3.84	0.00	3.84	2074.55	490.05	953.89	993.42		0.85	-0.08	0.007
98.25	-5.58	-0.29	0.00	-2.86	0.00	2.86	1989.68	470.00	877.44	913.19		0.91	-0.08	0.006
99.00	-4.12	-0.22	0.00	-2.64	0.00	2.64	1970.10	465.38	860.25	895.16		0.92	-0.08	0.005
100.00	-3.92	-0.22	0.00	-2.42	0.00	2.42	1943.99	459.21	837.60	871.39		0.94	-0.08	0.005
101.50	-3.64	-0.21	0.00	-2.09	0.00	2.09	1306.72	308.67	567.69	593.96		0.96	-0.09	0.006
105.00	-3.37	-0.20	0.00	-1.36	0.00	1.36	1245.79	294.28	515.98	539.57		1.03	-0.09	0.005
110.00	-1.12	-0.03	0.00	-0.33	0.00	0.33	1158.75	273.72	446.40	466.39		1.12	-0.09	0.002
115.00	-0.80	-0.02	0.00	-0.20	0.00	0.20	1071.71	253.16	381.85	398.55		1.21	-0.09	0.001
120.00	-0.51	-0.01	0.00	-0.09	0.00	0.09	984.66	232.60	322.34	336.04		1.30	-0.09	0.001
125.00	-0.24	-0.01	0.00	-0.03	0.00	0.03	897.62	212.04	267.87	278.85		1.40	-0.09	0.000
130.00	0.00	-0.01	0.00	0.00	0.00	0.00	810.58	191.47	218.44	227.00		1.49	-0.09	0.000

Seismic Segment Forces (Factored)

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 0.9D + 1.0Ev + 1.0Eh

Gust Response Factor	1.10			**Sds**	0.20	**Iterations**	18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09	**Ss**	0.19
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.56	**SA**	0.05	**S1**	0.06
						Seismic Importance Factor	1.00

R: 1.50

Top Elev (ft)	Description	Wz (lb)	Hz (lb)	Vertical Ev (lb)	Lateral Fs (lb)
0.00		0.00	0.00	0.00	0.00
5.00		1283.0	2.50	51.73	0.20
10.00		1248.1	7.50	50.33	1.19
15.00		1213.3	12.50	48.92	2.63
20.00		1178.4	17.50	47.51	4.37
25.00		1143.5	22.50	46.11	6.29
30.00		1108.6	27.50	44.70	8.32
35.00		1073.7	32.50	43.29	10.39
40.00		1038.8	37.50	41.89	12.45
45.00		1004.0	42.50	40.48	14.47
48.00	Bot - Section 2	585.66	46.50	23.61	6.91
50.00		683.53	49.00	27.56	9.71
53.25	Top - Section 1	1088.6	51.63	43.89	22.77
55.00		287.76	54.13	11.60	2.75
60.00		801.99	57.50	32.34	16.44
65.00		772.09	62.50	31.13	17.72
70.00	Appurtenance(s)	3101.2	67.50	125.04	198.55
75.00		707.16	72.50	28.51	19.58
80.00	Appurtenance(s)	1242.4	77.50	50.09	55.27
85.00		619.28	82.50	24.97	19.46
90.00	Appurtenance(s)	1222.6	87.50	49.30	65.73
95.00		516.55	92.50	20.83	17.43
98.25	Bot - Section 3	319.73	96.63	12.89	8.50
99.00	Appurtenance(s)	1183.0	98.63	47.70	75.82
100.00		154.01	99.50	6.21	2.68
101.50	Top - Section 2	227.27	100.75	9.16	5.19
105.00		214.84	103.25	8.66	4.93
110.00	Appurtenance(s)	1816.8	107.50	73.25	177.12
115.00		255.39	112.50	10.30	7.54
120.00		235.46	117.50	9.49	7.09
125.00		215.53	122.50	8.69	6.56
130.00		195.59	127.50	7.89	5.97
	Totals:	**26,738.5**		**1,078.1**	**814.1**

Total Wind: **20,712.0**

Calculated Forces

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 0.9D + 1.0Ev + 1.0Eh

Gust Response Factor	1.10			**Sds**	0.20			**Iterations**	18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.09			**Ss**	0.19
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.56	**SA**	0.05	**Seismic Importance Factor**	1.00	**S1**	0.06

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-25.33	-0.81	0.00	-68.65	0.00	68.65	4994.17	1235.59	5197.80	5206.12		0.00	0.00	0.018
5.00	-24.11	-0.82	0.00	-64.58	0.00	64.58	4891.79	1199.61	4899.47	4949.63		0.00	0.00	0.018
10.00	-22.93	-0.82	0.00	-60.50	0.00	60.50	4786.83	1163.63	4609.96	4696.86		0.01	-0.01	0.018
15.00	-21.78	-0.81	0.00	-56.42	0.00	56.42	4679.28	1127.65	4329.26	4448.07		0.02	-0.01	0.017
20.00	-20.66	-0.81	0.00	-52.35	0.00	52.35	4569.15	1091.66	4057.38	4203.49		0.04	-0.02	0.017
25.00	-19.57	-0.81	0.00	-48.29	0.00	48.29	4456.44	1055.68	3794.32	3963.36		0.06	-0.02	0.017
30.00	-18.52	-0.80	0.00	-44.25	0.00	44.25	4316.73	1019.70	3540.07	3706.95		0.08	-0.03	0.016
35.00	-17.50	-0.79	0.00	-40.26	0.00	40.26	4164.40	983.72	3294.64	3448.64		0.11	-0.03	0.016
40.00	-16.51	-0.78	0.00	-36.31	0.00	36.31	4012.07	947.73	3058.03	3199.66		0.15	-0.04	0.015
45.00	-15.56	-0.76	0.00	-32.42	0.00	32.42	3859.75	911.75	2830.23	2960.01		0.19	-0.04	0.015
48.00	-15.00	-0.76	0.00	-30.13	0.00	30.13	3768.35	890.16	2697.78	2820.70		0.21	-0.04	0.015
50.00	-14.35	-0.75	0.00	-28.61	0.00	28.61	3707.42	875.77	2611.24	2729.69		0.23	-0.05	0.014
53.25	-13.32	-0.72	0.00	-26.18	0.00	26.18	3164.77	747.58	2219.90	2324.50		0.26	-0.05	0.015
55.00	-13.05	-0.72	0.00	-24.91	0.00	24.91	3119.07	736.79	2156.26	2257.51		0.28	-0.05	0.015
60.00	-12.28	-0.71	0.00	-21.30	0.00	21.30	2988.51	705.95	1979.51	2071.51		0.34	-0.06	0.014
65.00	-11.55	-0.69	0.00	-17.77	0.00	17.77	2857.94	675.10	1810.33	1893.51		0.40	-0.06	0.013
70.00	-8.62	-0.49	0.00	-14.32	0.00	14.32	2727.38	644.26	1648.70	1723.51		0.46	-0.06	0.011
75.00	-7.95	-0.47	0.00	-11.88	0.00	11.88	2596.81	613.42	1494.62	1561.50		0.53	-0.07	0.011
80.00	-6.77	-0.41	0.00	-9.54	0.00	9.54	2466.25	582.58	1348.10	1407.49		0.61	-0.07	0.010
85.00	-6.18	-0.39	0.00	-7.48	0.00	7.48	2335.68	551.74	1209.14	1261.47		0.68	-0.08	0.009
90.00	-5.02	-0.33	0.00	-5.52	0.00	5.52	2205.12	520.89	1077.74	1123.45		0.77	-0.08	0.007
95.00	-4.54	-0.31	0.00	-3.89	0.00	3.89	2074.55	490.05	953.89	993.42		0.85	-0.08	0.006
98.25	-4.23	-0.30	0.00	-2.89	0.00	2.89	1989.68	470.00	877.44	913.19		0.91	-0.08	0.005
99.00	-3.12	-0.22	0.00	-2.67	0.00	2.67	1970.10	465.38	860.25	895.16		0.92	-0.08	0.005
100.00	-2.97	-0.22	0.00	-2.45	0.00	2.45	1943.99	459.21	837.60	871.39		0.94	-0.08	0.004
101.50	-2.76	-0.21	0.00	-2.12	0.00	2.12	1306.72	308.67	567.69	593.96		0.97	-0.09	0.006
105.00	-2.56	-0.21	0.00	-1.38	0.00	1.38	1245.79	294.28	515.98	539.57		1.03	-0.09	0.005
110.00	-0.85	-0.03	0.00	-0.34	0.00	0.34	1158.75	273.72	446.40	466.39		1.12	-0.09	0.001
115.00	-0.61	-0.02	0.00	-0.20	0.00	0.20	1071.71	253.16	381.85	398.55		1.21	-0.09	0.001
120.00	-0.39	-0.01	0.00	-0.10	0.00	0.10	984.66	232.60	322.34	336.04		1.31	-0.09	0.001
125.00	-0.18	-0.01	0.00	-0.03	0.00	0.03	897.62	212.04	267.87	278.85		1.40	-0.09	0.000
130.00	0.00	-0.01	0.00	0.00	0.00	0.00	810.58	191.47	218.44	227.00		1.49	-0.09	0.000

Wind Loading - Shaft

Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations 20

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	6.547	7.20	237.37	0.730	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	6.547	7.20	230.51	0.730	0.000	5.00	21.325	15.57	112.1	0.0	1180.4
10.00		1.00	0.85	6.547	7.20	223.66	0.730	0.000	5.00	20.700	15.11	108.8	0.0	1145.5
15.00		1.00	0.85	6.547	7.20	216.81	0.730	0.000	5.00	20.075	14.65	105.5	0.0	1110.6
20.00		1.00	0.90	6.947	7.64	216.27	0.730	0.000	5.00	19.451	14.20	108.5	0.0	1075.8
25.00		1.00	0.95	7.281	8.01	214.18	0.730	0.000	5.00	18.826	13.74	110.1	0.0	1040.9
30.00		1.00	0.98	7.566	8.32	210.96	0.730	0.000	5.00	18.201	13.29	110.6	0.0	1006.0
35.00		1.00	1.01	7.815	8.60	206.92	0.730	0.000	5.00	17.576	12.83	110.3	0.0	971.1
40.00		1.00	1.04	8.038	8.84	202.26	0.730	0.000	5.00	16.952	12.37	109.4	0.0	936.2
45.00		1.00	1.07	8.240	9.06	197.09	0.730	0.000	5.00	16.327	11.92	108.0	0.0	901.3
48.00	Bot - Section 2	1.00	1.08	8.352	9.19	193.79	0.730	0.000	3.00	9.496	6.93	63.7	0.0	524.1
50.00		1.00	1.09	8.425	9.27	191.52	0.730	0.000	2.00	6.333	4.62	42.8	0.0	642.5
53.25	Top - Section 1	1.00	1.11	8.537	9.39	187.71	0.730	0.000	3.25	10.078	7.36	69.1	0.0	1021.9
55.00		1.00	1.12	8.595	9.45	189.59	0.730	0.000	1.75	5.317	3.88	36.7	0.0	251.8
60.00		1.00	1.14	8.754	9.63	183.41	0.730	0.000	5.00	14.770	10.78	103.8	0.0	699.3
65.00		1.00	1.16	8.903	9.79	176.97	0.730	0.000	5.00	14.145	10.33	101.1	0.0	669.4
70.00	Appurtenance(s)	1.00	1.17	9.043	9.95	170.30	0.730	0.000	5.00	13.521	9.87	98.2	0.0	639.5
75.00		1.00	1.19	9.175	10.09	163.42	0.730	0.000	5.00	12.896	9.41	95.0	0.0	609.6
80.00	Appurtenance(s)	1.00	1.21	9.301	10.23	156.37	0.730	0.000	5.00	12.271	8.96	91.6	0.0	579.7
85.00		1.00	1.22	9.420	10.36	149.15	0.730	0.000	5.00	11.647	8.50	88.1	0.0	549.8
90.00	Appurtenance(s)	1.00	1.24	9.534	10.49	141.78	0.730	0.000	5.00	11.022	8.05	84.4	0.0	519.9
95.00		1.00	1.25	9.643	10.61	134.27	0.730	0.000	5.00	10.397	7.59	80.5	0.0	490.0
98.25	Bot - Section 3	1.00	1.26	9.712	10.68	129.32	0.730	0.000	3.25	6.423	4.69	50.1	0.0	302.5
99.00	Appurtenance(s)	1.00	1.26	9.728	10.70	128.17	0.730	0.000	0.75	1.477	1.08	11.5	0.0	114.6
100.00		1.00	1.27	9.748	10.72	126.64	0.730	0.000	1.00	1.947	1.42	15.2	0.0	151.1
101.50	Top - Section 2	1.00	1.27	9.779	10.76	124.32	0.730	0.000	1.50	2.873	2.10	22.6	0.0	222.9
105.00		1.00	1.28	9.849	10.83	121.73	0.730	0.000	3.50	6.486	4.73	51.3	0.0	204.6
110.00	Appurtenance(s)	1.00	1.29	9.946	10.94	113.88	0.730	0.000	5.00	8.735	6.38	69.8	0.0	275.3
115.00		1.00	1.30	10.039	11.04	105.93	0.730	0.000	5.00	8.110	5.92	65.4	0.0	255.4
120.00		1.00	1.32	10.130	11.14	97.88	0.730	0.000	5.00	7.485	5.46	60.9	0.0	235.5
125.00		1.00	1.33	10.217	11.24	89.74	0.730	0.000	5.00	6.860	5.01	56.3	0.0	215.5
130.00		1.00	1.34	10.302	11.33	81.51	0.730	0.000	5.00	6.236	4.55	51.6	0.0	195.6
								Totals:	**130.00**			**2,393.1**		**18,738.5**

Discrete Appurtenance Forces

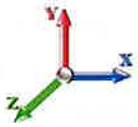
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	110.00	Commscope	3	9.946	10.940	0.66	0.80	16.10	131.10	0.000	0.000	176.09	0.00	0.00
2	110.00	Ring Mount	1	9.946	10.940	1.00	1.00	7.50	660.00	0.000	0.000	82.05	0.00	0.00
3	110.00	Raycap	1	9.946	10.940	0.80	0.80	3.28	21.40	0.000	0.000	35.88	0.00	0.00
4	110.00	Commscope	3	9.946	10.940	0.67	0.80	16.23	153.00	0.000	0.000	177.55	0.00	0.00
5	110.00	Samsung MT6413-77A	3	9.946	10.940	0.55	0.80	6.30	171.96	0.000	0.000	68.96	0.00	0.00
6	110.00	Samsung RF4439d-25A	3	9.946	10.940	0.54	0.80	3.01	224.10	0.000	0.000	32.90	0.00	0.00
7	110.00	Samsung RF4461d-13A	3	9.946	10.940	0.54	0.80	2.20	119.10	0.000	0.000	24.10	0.00	0.00
8	110.00	Samsung RT4423-48A	3	9.946	10.940	0.54	0.80	1.38	46.20	0.000	0.000	15.13	0.00	0.00
9	99.00	ALU 800MHz Filter	3	9.728	10.700	0.54	0.80	1.25	26.40	0.000	0.000	13.42	0.00	0.00
10	99.00	ALU TD-RRH8x20-25	3	9.728	10.700	0.54	0.80	6.51	210.00	0.000	0.000	69.68	0.00	0.00
11	99.00	ALU 800 MHz RRH	3	9.728	10.700	0.54	0.80	3.43	159.00	0.000	0.000	36.65	0.00	0.00
12	99.00	ALU 1900MHz RRH	3	9.728	10.700	0.54	0.80	3.71	180.00	0.000	0.000	39.75	0.00	0.00
13	99.00	RFS ACU-A20-N	4	9.728	10.700	0.54	0.80	0.30	4.00	0.000	0.000	3.21	0.00	0.00
14	99.00	Flush Mount	1	9.728	10.700	1.00	1.00	5.00	350.00	0.000	0.000	53.50	0.00	0.00
15	99.00	Andrew DHHTT65B-3XR	3	9.728	10.700	0.66	0.80	16.12	135.00	0.000	0.000	172.44	0.00	0.00
16	90.00	Flush Mount	1	9.534	10.488	1.00	1.00	5.00	350.00	0.000	0.000	52.44	0.00	0.00
17	90.00	Andrew	3	9.534	10.488	0.54	0.80	0.16	3.96	0.000	0.000	1.69	0.00	0.00
18	90.00	Cci TMABPD7823VG12A	3	9.534	10.488	0.54	0.80	2.20	78.00	0.000	0.000	23.10	0.00	0.00
19	90.00	Powerwave LGP21401	3	9.534	10.488	0.54	0.80	1.32	52.50	0.000	0.000	13.83	0.00	0.00
20	90.00	Andrew SBNHH-1D65C	3	9.534	10.488	0.67	0.80	22.96	148.80	0.000	0.000	240.82	0.00	0.00
21	80.00	Flush Mount	1	9.301	10.231	1.00	1.00	5.00	350.00	0.000	0.000	51.15	0.00	0.00
22	80.00	RFS	3	9.301	10.231	0.65	0.80	18.76	208.20	0.000	0.000	191.93	0.00	0.00
23	80.00	RFS	6	9.301	10.231	0.54	0.80	0.48	6.96	0.000	0.000	4.94	0.00	0.00
24	70.00	Commscope	1	9.043	9.947	1.00	1.00	37.59	1727.00	0.000	0.000	373.92	0.00	0.00
25	70.00	Raycap	1	9.043	9.947	0.75	0.75	1.92	21.85	0.000	0.000	19.10	0.00	0.00
26	70.00	Fujitsu TA08025-B604	3	9.043	9.947	0.50	0.75	2.95	191.70	0.000	0.000	29.39	0.00	0.00
27	70.00	Fujitsu TA08025-B605	3	9.043	9.947	0.50	0.75	2.95	225.00	0.000	0.000	29.39	0.00	0.00
28	70.00	JMA Wireless	3	9.043	9.947	0.55	0.75	20.80	193.50	0.000	0.000	206.86	0.00	0.00
							Totals:		**6,148.73**			**2,239.88**		

Total Applied Force Summary

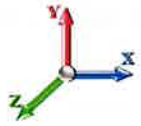
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		112.11	1294.48	0.00	0.00
10.00		108.82	1259.59	0.00	0.00
15.00		105.54	1224.71	0.00	0.00
20.00		108.50	1189.83	0.00	0.00
25.00		110.06	1154.94	0.00	0.00
30.00		110.57	1120.06	0.00	0.00
35.00		110.30	1085.18	0.00	0.00
40.00		109.41	1050.29	0.00	0.00
45.00		108.03	1015.41	0.00	0.00
48.00		63.69	592.50	0.00	0.00
50.00		42.84	688.09	0.00	0.00
53.25		69.09	1096.04	0.00	0.00
55.00		36.70	291.75	0.00	0.00
60.00		103.83	813.40	0.00	0.00
65.00		101.13	783.50	0.00	0.00
70.00	(11) attachments	756.84	3112.65	0.00	0.00
75.00		95.01	718.00	0.00	0.00
80.00	(10) attachments	339.67	1253.26	0.00	0.00
85.00		88.10	627.00	0.00	0.00
90.00	(13) attachments	416.26	1230.36	0.00	0.00
95.00		80.51	519.50	0.00	0.00
98.25		50.09	321.64	0.00	0.00
99.00	(20) attachments	400.19	1183.44	0.00	0.00
100.00		15.24	154.33	0.00	0.00
101.50		22.56	227.76	0.00	0.00
105.00		51.29	215.98	0.00	0.00
110.00	(20) attachments	682.42	1818.46	0.00	0.00
115.00		65.38	255.39	0.00	0.00
120.00		60.88	235.46	0.00	0.00
125.00		56.28	215.53	0.00	0.00
130.00		51.58	195.59	0.00	0.00
	Totals:	**4,632.95**	**26,944.15**	**0.00**	**0.00**

Linear Appurtenance Segment Forces (Factored)

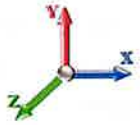
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

TES Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.028	0.000	6.547	0.00	5.70
10.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.028	0.000	6.547	0.00	5.70
15.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.029	0.000	6.547	0.00	5.70
20.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.030	0.000	6.947	0.00	5.70
25.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.031	0.000	7.281	0.00	5.70
30.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.032	0.000	7.566	0.00	5.70
35.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.033	0.000	7.815	0.00	5.70
40.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.035	0.000	8.038	0.00	5.70
45.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.036	0.000	8.240	0.00	5.70
48.00	1.41" Hybrid	Yes	3.00	0.000	1.41	0.35	0.00	0.037	0.000	8.352	0.00	3.42
50.00	1.41" Hybrid	Yes	2.00	0.000	1.41	0.23	0.00	0.038	0.000	8.425	0.00	2.28
53.25	1.41" Hybrid	Yes	3.25	0.000	1.41	0.38	0.00	0.039	0.000	8.537	0.00	3.70
55.00	1.41" Hybrid	Yes	1.75	0.000	1.41	0.21	0.00	0.039	0.000	8.595	0.00	1.99
60.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.040	0.000	8.754	0.00	5.70
65.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.042	0.000	8.903	0.00	5.70
70.00	1.41" Hybrid	Yes	5.00	0.000	1.41	0.59	0.00	0.043	0.000	9.043	0.00	5.70
										Totals:	**0.0**	**79.8**

Calculated Forces

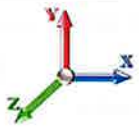
Structure:	CT46143-A-SBA	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 20

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-26.94	-4.64	0.00	-350.28	0.00	350.28	4994.17	1235.59	5197.80	5206.12	0.00	0.000	0.000	0.073
5.00	-25.65	-4.53	0.00	-327.09	0.00	327.09	4891.79	1199.61	4899.47	4949.63	0.01	-0.021	0.000	0.071
10.00	-24.39	-4.43	0.00	-304.42	0.00	304.42	4786.83	1163.63	4609.96	4696.86	0.05	-0.043	0.000	0.070
15.00	-23.16	-4.34	0.00	-282.25	0.00	282.25	4679.28	1127.65	4329.26	4448.07	0.10	-0.064	0.000	0.068
20.00	-21.97	-4.24	0.00	-260.56	0.00	260.56	4569.15	1091.66	4057.38	4203.49	0.18	-0.087	0.000	0.067
25.00	-20.81	-4.13	0.00	-239.39	0.00	239.39	4456.44	1055.68	3794.32	3963.36	0.28	-0.109	0.000	0.065
30.00	-19.69	-4.03	0.00	-218.73	0.00	218.73	4316.73	1019.70	3540.07	3706.95	0.41	-0.132	0.000	0.064
35.00	-18.60	-3.92	0.00	-198.60	0.00	198.60	4164.40	983.72	3294.64	3448.64	0.56	-0.155	0.000	0.062
40.00	-17.55	-3.82	0.00	-179.00	0.00	179.00	4012.07	947.73	3058.03	3199.66	0.74	-0.178	0.000	0.060
45.00	-16.54	-3.71	0.00	-159.92	0.00	159.92	3859.75	911.75	2830.23	2960.01	0.94	-0.202	0.000	0.058
48.00	-15.94	-3.65	0.00	-148.79	0.00	148.79	3768.35	890.16	2697.78	2820.70	1.07	-0.216	0.000	0.057
50.00	-15.25	-3.60	0.00	-141.50	0.00	141.50	3707.42	875.77	2611.24	2729.69	1.16	-0.226	0.000	0.056
53.25	-14.16	-3.53	0.00	-129.78	0.00	129.78	3164.77	747.58	2219.90	2324.50	1.32	-0.241	0.000	0.060
55.00	-13.87	-3.50	0.00	-123.59	0.00	123.59	3119.07	736.79	2156.26	2257.51	1.41	-0.250	0.000	0.059
60.00	-13.05	-3.40	0.00	-106.09	0.00	106.09	2988.51	705.95	1979.51	2071.51	1.68	-0.274	0.000	0.056
65.00	-12.27	-3.30	0.00	-89.10	0.00	89.10	2857.94	675.10	1810.33	1893.51	1.98	-0.298	0.000	0.051
70.00	-9.16	-2.53	0.00	-72.61	0.00	72.61	2727.38	644.26	1648.70	1723.51	2.31	-0.321	0.000	0.046
75.00	-8.44	-2.43	0.00	-59.97	0.00	59.97	2596.81	613.42	1494.62	1561.50	2.66	-0.342	0.000	0.042
80.00	-7.19	-2.09	0.00	-47.81	0.00	47.81	2466.25	582.58	1348.10	1407.49	3.03	-0.362	0.000	0.037
85.00	-6.56	-2.00	0.00	-37.37	0.00	37.37	2335.68	551.74	1209.14	1261.47	3.42	-0.381	0.000	0.032
90.00	-5.33	-1.57	0.00	-27.39	0.00	27.39	2205.12	520.89	1077.74	1123.45	3.83	-0.398	0.000	0.027
95.00	-4.81	-1.49	0.00	-19.52	0.00	19.52	2074.55	490.05	953.89	993.42	4.25	-0.412	0.000	0.022
98.25	-4.49	-1.44	0.00	-14.67	0.00	14.67	1989.68	470.00	877.44	913.19	4.53	-0.420	0.000	0.018
99.00	-3.31	-1.03	0.00	-13.59	0.00	13.59	1970.10	465.38	860.25	895.16	4.60	-0.422	0.000	0.017
100.00	-3.16	-1.01	0.00	-12.56	0.00	12.56	1943.99	459.21	837.60	871.39	4.69	-0.424	0.000	0.016
101.50	-2.93	-0.99	0.00	-11.04	0.00	11.04	1306.72	308.67	567.69	593.96	4.82	-0.427	0.000	0.021
105.00	-2.71	-0.94	0.00	-7.58	0.00	7.58	1245.79	294.28	515.98	539.57	5.14	-0.433	0.000	0.016
110.00	-0.90	-0.24	0.00	-2.89	0.00	2.89	1158.75	273.72	446.40	466.39	5.60	-0.441	0.000	0.007
115.00	-0.65	-0.17	0.00	-1.69	0.00	1.69	1071.71	253.16	381.85	398.55	6.06	-0.445	0.000	0.005
120.00	-0.41	-0.11	0.00	-0.82	0.00	0.82	984.66	232.60	322.34	336.04	6.53	-0.448	0.000	0.003
125.00	-0.20	-0.05	0.00	-0.27	0.00	0.27	897.62	212.04	267.87	278.85	7.00	-0.450	0.000	0.001
130.00	0.00	-0.05	0.00	0.00	0.00	0.00	810.58	191.47	218.44	227.00	7.47	-0.451	0.000	0.000

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.0W 120 mph Wind	20.7	0.00	32.32	0.00	0.00	1570.27
0.9D + 1.0W 120 mph Wind	20.7	0.00	24.23	0.00	0.00	1563.69
1.2D + 1.0Di + 1.0Wi 50 mph Wind	5.9	0.00	50.44	0.00	0.00	440.70
1.2D + 1.0Ev + 1.0Eh	0.8	0.00	33.44	0.00	0.00	68.66
0.9D + 1.0Ev + 1.0Eh	0.8	0.00	25.33	0.00	0.00	68.65
1.0D + 1.0W 60 mph Wind	4.6	0.00	26.94	0.00	0.00	350.28

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.0W 120 mph Wind	-32.32	-20.74	0.00	-1570.2	0.00	-1570.2	4994.17	1235.5	5197.80	5206.12	0.00	0.308
0.9D + 1.0W 120 mph Wind	-24.23	-20.73	0.00	-1563.6	0.00	-1563.6	4994.17	1235.5	5197.80	5206.12	0.00	0.305
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-50.44	-5.87	0.00	-440.70	0.00	-440.70	4994.17	1235.5	5197.80	5206.12	0.00	0.095
1.2D + 1.0Ev + 1.0Eh	-33.44	-0.81	0.00	-68.66	0.00	-68.66	4994.17	1235.5	5197.80	5206.12	0.00	0.020
0.9D + 1.0Ev + 1.0Eh	-25.33	-0.81	0.00	-68.65	0.00	-68.65	4994.17	1235.5	5197.80	5206.12	0.00	0.018
1.0D + 1.0W 60 mph Wind	-26.94	-4.64	0.00	-350.28	0.00	-350.28	4994.17	1235.5	5197.80	5206.12	0.00	0.073

Base Plate Summary

Structure:	CT46143-A-SB	**Code:**	TIA-222-H	1/26/2024	
Site Name:	Burlington - Avon Landfill	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Tower Engineering Solutions

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	50.00	**Bolt Circle:**	58.00
Moment (kip-ft):	4630.55	**Width (in):**	63.75	**Number Bolts:**	18.00
Axial (kip):	43.46	**Style:**	Round	**Bolt Type:**	2.25" 18J
Shear (kip):	48.17	**Polygon Sides:**	0.00	**Bolt Diameter (in):**	2.25
Analysis (1.2D + 1.0W)		**Clip Length (in):**	0.00	**Yield (ksi):**	75.00
Moment (kip-ft):	1570.27	**Effective Len (in):**	14.47	**Ultimate (ksi):**	100.00
Axial (kip):	32.32	**Moment (kip-in):**	253.79	**Arrangement:**	Radial
Shear (kip):	20.74	**Allow Stress (ksi):**	67.50	**Cluster Dist (in):**	0.00
		Applied Stress (ksi):	20.93	**Start Angle (deg):**	0.00
		Stress Ratio:	0.31	Compression	
				Force (kip):	73.99
				Allowable (kip):	268.39
				Ratio:	0.28
				Tension	
				Force (kip):	70.40
				Allowable (kip):	243.75
				Ratio:	0.29

Pier Foundation Design For Monopole

Customer Name:	Dish Wireless	EIA/TIA Standard:	TIA-222-H
Site Name:		Structure Height (Ft.):	130
Site Number:	CT46143-A-SBA	Engineer Name:	C. Zang
Engr. Number:	144880	Engineer Login ID:	

Date: 1/26/2024

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	32.3	Shear Force (Kips):	20.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	1570.3

Foundation Geometries:

Diameter of Pier (ft.):	7.0	Depth of Base B. G. S. :	19.0	ft.
Pier Height A. G. (ft.):	0.50			

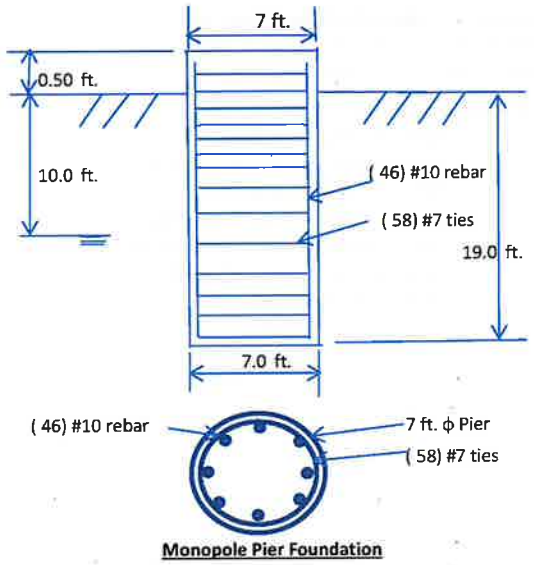
Material Properties and Reabr Info:

Concrete Strength (psi):	4500	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	60	ksi
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	7	
Qty. of Vertical Rebars:	46	Tie Spacing:	4.5	in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0	pcf

Soil Design Parameters:

Water Table B.G.S. (ft):	10.0	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	0.8	Pullout failure Angle:	30	(°)

Skin Frictions are to be obtained from: Soil Report



Monopole Pier Foundation

Depth of Layers (ft) Top	Bottom	γ_{soil} (pcf)	ϕ (°)	Cohesion (psf)	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types
0.0	2.0	115	0	0			Sand
2.0	4.0	120	0	0			Sand
4.0	6.0	120	35	0	190	14740	Sand
6.0	8.0	120	36	0	260	40110	Sand
8.0	13.0	130	41	0	390	68290	Sand
13.0	19.0	150	0	10000	4000	89670	Clay
19.0	24.0						

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75	
Total Dry Soil Volume from Conical Failure (cu. Ft.):	3898	Dry Soil Weight from Conical Failure:	472	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	769	Buoyant Soil Weight from Conical Failure (Ki	33	Kips
Total Dry Concrete Volume (cu. Ft.):	404	Total Dry Concrete Weight:	60.6	Kips
Total Buoyant Concrete Volume (cu. Ft.):	346.4	Total Buoyant Concrete Weight:	30.34	Kips
Total Effective Concrete Weight (Kips):	91.0	Total Effective Soil Weight:	505.2	Kips
Total Effective Vertical Load on Base (Kips):	61.6			

Check Soil Capacities:

					Usage	
Allowable Foundation Overturning Resistance (kips-ft.):	7127.2	>	Design Factored Moment (kips-ft):	1891	0.27	OK!
Factor of Safety of Passive Soil Resistance against Moment:	3.77	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75	
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00	

Reinforcing Concrete Pier:

					Usage	
Vertical Steel Rebar Area (sq. in./each):	1.27		Tie / Stirrup Area (sq. in./each):	0.60		
Calculated Moment Capacity (Mn,Kips-Ft):	9419.1	>	Design Factored Moment (Mu, K-Ft):	1659.2	0.18	OK!
Calculated Shear Capacity (Kips):	1188.9	>	Design Factored Shear (Kips):	256.8	0.22	OK!
Calculated Tension Capacity (Tn, Kips):	3154.7	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	10906	>	Design Factored Axial Load (Pu Kips):	32.3	0.00	OK!
Moment & Axial Strength Combination:	0.18	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.011		Reinforcement Ratio is satisfied per ACI			