



# 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](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

### VIA ELECTRONIC MAIL

December 20, 2019

Ryan G. Bailey  
Charles Cherundolo Consulting  
1280 Route 46 West, Suite 9  
Parsippany, NJ 07054

RE: **EM-SPRINT-057-191211A** – Sprint notice of intent to modify an existing telecommunications facility located at 395 Round Hill Road, Greenwich, Connecticut.

Dear Mr. Bailey:

The Connecticut Siting Council (Council) is in receipt of your correspondence of December 17, 2019 submitted in response to the Council's December 16, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman  
Executive Director

MAB/IN/emr



**From:** Ryan Bailey [mailto:[ryan@mackenzierealtyconsulting.com](mailto:ryan@mackenzierealtyconsulting.com)]  
**Sent:** Tuesday, December 17, 2019 12:41 PM  
**To:** Nwankwo, Ifeanyi  
**Cc:** CSC-DL Siting Council; Ryan Bailey  
**Subject:** RE: Council Incomplete Letter for EM-SPRINT-057-191211A (395 Round Hill Road, Greenwich)

The pole is a stealth pole with the antennas mounted internally in cannisters, there is no external mounts. I checked the other carriers submissions on this pole and nobody has submitted a mount analysis as

Ryan Bailey  
Mackenzie Realty Consulting  
3B Prospect Pl  
Madison NJ 07940  
856-625-1596  
973-215-2940 Fax  
[ryan@mackenzierealtyconsulting.com](mailto:ryan@mackenzierealtyconsulting.com)

**From:** Nwankwo, Ifeanyi <[ifeanyi.Nwankwo@ct.gov](mailto:ifeanyi.Nwankwo@ct.gov)>  
**Sent:** Tuesday, December 17, 2019 12:38 PM  
**To:** Ryan Bailey <[ryan@mackenzierealtyconsulting.com](mailto:ryan@mackenzierealtyconsulting.com)>  
**Cc:** CSC-DL Siting Council <[Siting.Council@ct.gov](mailto:Siting.Council@ct.gov)>  
**Subject:** RE: Council Incomplete Letter for EM-SPRINT-057-191211A (395 Round Hill Road, Greenwich)

Hi Ryan  
Good Afternoon and thank you for your prompt response. The attached response does not contain a mount analysis.  
Please provide an electronic copy and one hard copy of the requested information on or before January 17, 2020 as stated in the notice of incompleteness for your request to be rendered complete and processed.

If you have any further questions please do not hesitate to contact me.

Thank you.

**Best Regards**

Ifeanyichukwu Nwankwo  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051  
P: 860.827.2941 | F: 860.827.2950 | E: [ifeanyi.Nwankwo@ct.gov](mailto:ifeanyi.Nwankwo@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

***Conserving, improving and protecting our natural resources and environment;  
Ensuring a clean, affordable, reliable, and sustainable energy supply.***

**From:** Ryan Bailey [<mailto:ryan@mackenzierealtyconsulting.com>]  
**Sent:** Tuesday, December 17, 2019 11:08 AM  
**To:** Robidoux, Evan  
**Cc:** CSC-DL Siting Council; Ryan Bailey  
**Subject:** RE: Council Incomplete Letter for EM-SPRINT-057-191211A (395 Round Hill Road, Greenwich)

Attached please find a revised submission that includes the structural, map and tax card as requested. Please let me know if you need anything else.

Thank you

Ryan Bailey  
Mackenzie Realty Consulting  
3B Prospect Pl  
Madison NJ 07940  
856-625-1596  
973-215-2940 Fax  
[ryan@mackenzierealtyconsulting.com](mailto:ryan@mackenzierealtyconsulting.com)

**From:** Robidoux, Evan <[Evan.Robidoux@ct.gov](mailto:Evan.Robidoux@ct.gov)>  
**Sent:** Monday, December 16, 2019 4:25 PM  
**To:** Ryan Bailey <[ryan@mackenzierealtyconsulting.com](mailto:ryan@mackenzierealtyconsulting.com)>  
**Cc:** CSC-DL Siting Council <[Siting.Council@ct.gov](mailto:Siting.Council@ct.gov)>  
**Subject:** Council Incomplete Letter for EM-SPRINT-057-191211A (395 Round Hill Road, Greenwich)

Please see the attached correspondence.

Evan Robidoux  
Clerk Typist  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051



1280 Route 46 West, Suite 9, Parsippany NJ, 07054

Melanie Bachman  
Executive Director  
CT Siting Council  
10 Franklin Square  
New Britain, CT 06051

Re: Notice of Exempt Modification Application  
395 Round Hill Road, Greenwich, CT 06831

Latitude: N41.095117  
Longitude: W73.6642

Dear Ms. Bachman:

Sprint currently maintains 3 existing panel antennas at the 100' centerline level of the existing 115' flagpole. Sprint proposes to swap 3 panel antennas at the 100' centerline on the tower. Sprint further proposes to add 3 remote radio heads at the base of the pole. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to First Selectman Peter Tesei of the Town of Greenwich as well as Katie DeLuca, Director of Planning for the Town of Greenwich and Round Hill Community Church, owner of the property

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration as well as the latest CSC decision, tax sheet and tax map.

### **Existing Facility**

CSC Summary Statement – CT43XC856 – 395 Round Hill Rd, Greenwich CT 06831

The Communications Tower facility is located at 395 Round Hill Rd, Greenwich CT 06831 and is owned by the Round Hill Community Church, the Site coordinates are: N41.095117 W73.6642.

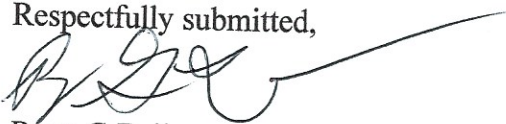
The existing facility consists of a 115' Flagpole. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 3 antennas mounted at centerline of 100'.

The planned modifications to the facility fall within the activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2)

1. The height of the overall structure will be unaffected.
2. The proposed changes will not require an extension of the property boundaries.
3. The proposed additions will not increase the noise level at the existing facility by six decibels or more, or to levels that exceed state and/or local criteria
4. The changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Sprint respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully submitted,



Ryan G Bailey  
Charles Cherundolo Consulting  
856-625-1596

[ryan@mackenzierealtyconsulting.com](mailto:ryan@mackenzierealtyconsulting.com)

Additional Recipients:

First Selectman Peter Tesei for the Town of Greenwich– Via FedEx  
Katie DeLuca, Director of Planning for the Town of Greenwich - Via FedEx  
Round Hill Community Church, owner of the property



**"DO MACRO UPGRADE"**  
**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CONNECTICUT 06831**  
**FAIRFIELD COUNTY**

**COM-EX**  
 Consultants  
 115 Route 46  
 Suite E39  
 Mountain Lakes, NJ 07046  
 PHONE: 862.209.4300  
 FAX: 862.209.4301



SCHEDULE OF REVISIONS		
REV NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4	02/26/19	ISSUED AS FINAL
3	12/28/18	PER NEW SCOPE OF WORK
2	05/01/18	REVISED PER COMMENTS
1	09/26/17	REVISED PER RFDS
0	07/19/17	INITIAL SUBMISSION

**DRAWN BY:** DTB  
**CHECKED BY:** DTS  
**SCALE:** AS NOTED  
**JOB NO:** 17057-CHE

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**NICHOLAS D. BARILE**  
 PROFESSIONAL ENGINEER, CT LIC. No. 28643

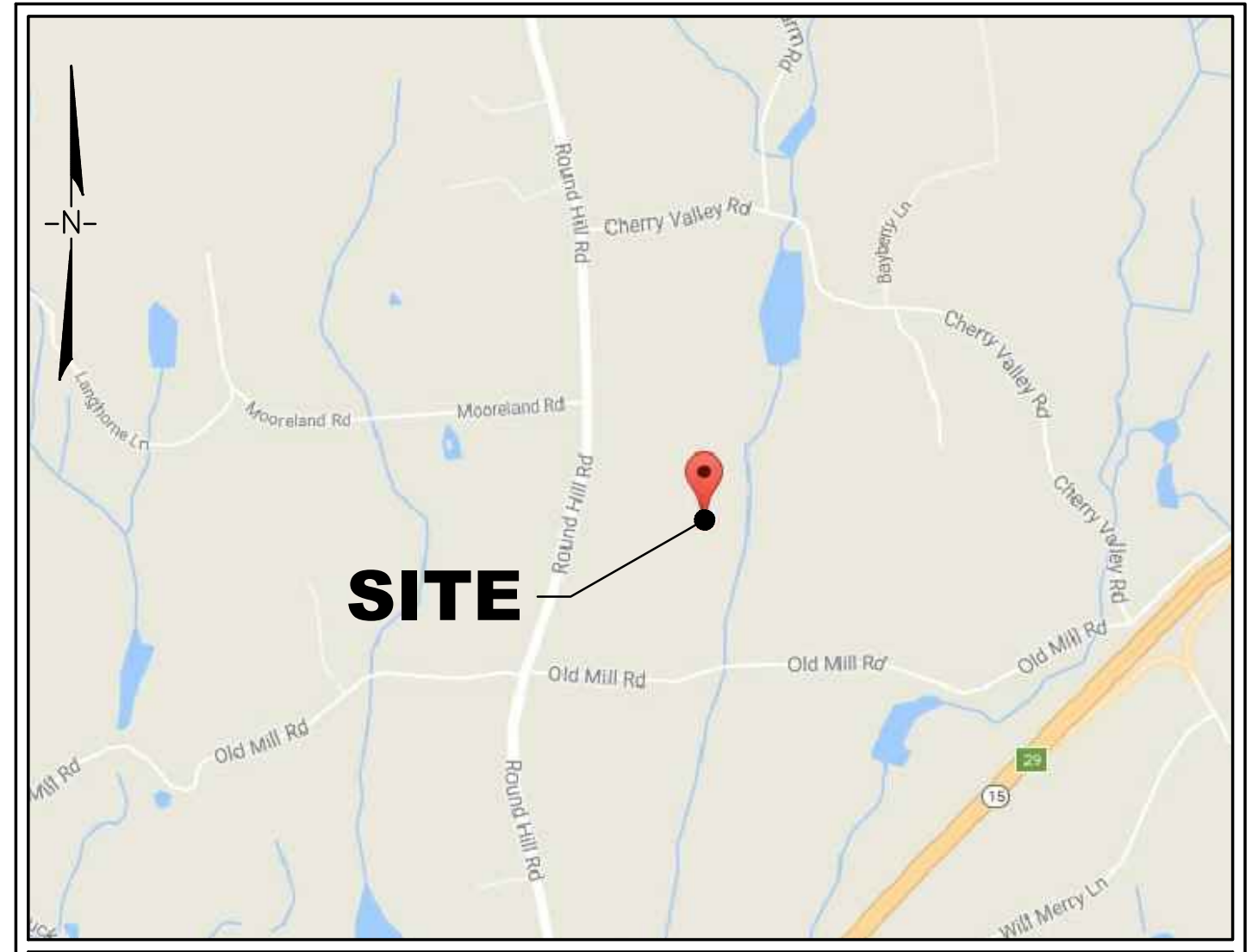
**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**

**TITLE SHEET**

**DRAWING SHEET: 1 OF 10**

**T-1**



**KEY MAP**  
 SCALE = N.T.S.



SITE LOCATION INFORMATION	
SITE ID NUMBER:	CT43XC856
SITE NAME:	ROUND HILL COMMUNITY CHURCH
SITE ADDRESS:	395 ROUND HILL ROAD GREENWICH, CONNECTICUT 06831
PARCEL ID:	N.A.
PROPERTY OWNER:	ROUND HILL COMMUNITY CHURCH 395 ROUND HILL ROAD GREENWICH, CONNECTICUT 06831
APPLICANT:	SPRINT 6100 SPRINT PARKWAY OVERLAND PARK, KS 66251
COUNTY:	FAIRFIELD COUNTY

SITE CHARACTERISTICS	
LATITUDE:	41°-05'-42.42"
LONGITUDE:	73°-39'-51.19"
STRUCTURE TYPE:	FLAG POLE
LOCATION OF PROPOSED EQUIPMENT:	EXISTING EQUIPMENT ROOM
STRUCTURE HEIGHT:	±115'-0" AGL
ANTENNA (RAD CENTER):	±100'-0" AGL (ALPHA) ±100'-0" AGL (BETA) ±100'-0" AGL (GAMMA)

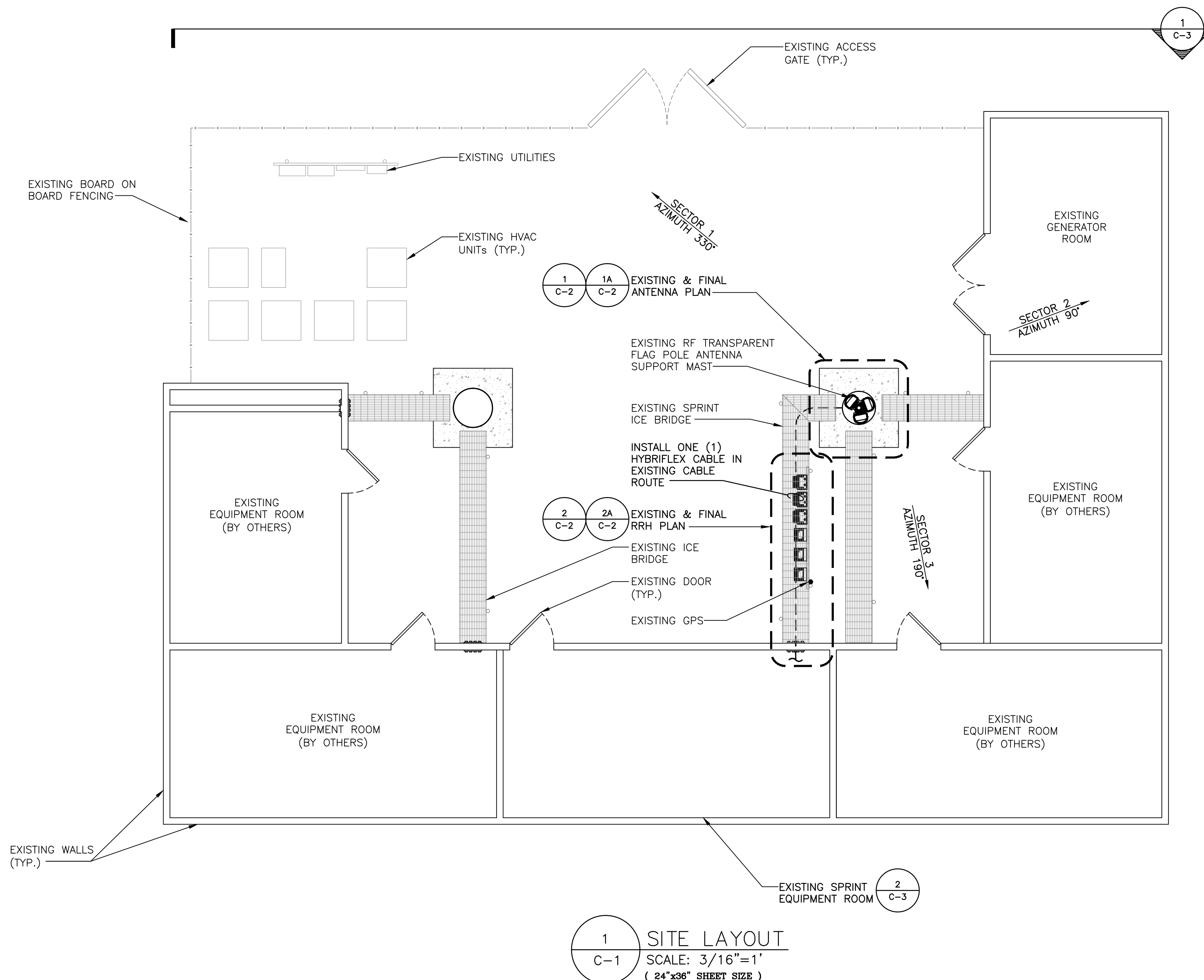
SHEET INDEX	
SHEET NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
C-1	SITE LAYOUT & GENERAL NOTES
C-2	EXISTING & FINAL ANTENNA PLANS
C-3	ELEVATION, B.O.M., & FINAL EQUIPMENT PLAN
C-4	CONSTRUCTION DETAILS
C-5	FIBER PLUMBING DIAGRAM
C-6	CABLE COLOR CODING
C-7	EQUIPMENT DETAILS
E-1	GROUNDING DETAILS
E-2	DC POWER DETAILS & PANEL SCHEDULES

**SCOPE OF WORK**

SPRINT PROPOSED TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- REMOVE (3) EXISTING PANEL ANTENNAS
- INSTALL (3) 800/1900 MHz PANEL ANTENNAS
- INSTALL (3) 800 MHz RRHs AT GRADE
- INSTALL (12) 7/8" JUMPER CABLES
- INSTALL (3) HYBRID CABLES

THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. COM-EX HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL ANALYSIS PREPARED BY A LICENSED ENGINEER.



**GENERAL NOTES:**

1. SUBJECT PROPERTY IS KNOWN AS TAX PARCEL ID N.A., AS SHOWN THE OFFICIAL TAX MAP OF THE TOWN OF GREENWICH, CT.
2. THE APPLICANT PROPOSES TO REPLACE THREE (1) EXISTING ANTENNAS WITH THREE (3) NEW ANTENNAS AND INSTALL THREE (3) RRHs ON EXISTING/PROPOSED MOUNTING HARDWARE AT GRADE.
3. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY SPRINT, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
4. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION".
5. SITE INFORMATION SHOWN TAKEN FROM PLANS PREPARED BY URS CORPORATION AES FOR SPRINT'S INSTALLATION ON THIS FACILITY. DRAWINGS ENTITLED "SPRINT, SITE NAME: ROUND HILL COMMUNITY CHURCH, SPRINT NUMBER: CT43XC821" DATED 01/30/08. ADDITIONAL SITE INFORMATION WAS SUPPLEMENTED WITH A LIMITED SITE VISIT BY COM-EX CONSULTANTS ON 05/24/17.
6. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
8. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
10. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
11. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
12. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
13. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
14. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
15. 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 AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
16. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND RELATED PARTIES. THE SUBCONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT EFFECTS THEIR WORK.
17. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON THE SITE AT ALL TIMES AND INSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA CONTRACTOR FURNISH 3 SETS OF REDLINE "AS-BUILT" DRAWINGS TO SPRINT UPON COMPLETION OF THE WORK.
18. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL INCLUDED AS PART OF THE WORK.
19. ALL MATERIAL PROVIDED BY IS TO BE REVIEWED BY THE CONTRACTOR AND ALL APPLICABLE SUB-CRITERIA PRIOR TO INSTALLATION. ANY DEFICIENCIES TO PROVIDE MATERIALS SHALL BE BROUGHT TO THE CONSTRUCTION MANAGERS ATTENTION IMMEDIATELY.
20. THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
21. THE CONTRACTOR SHALL COORDINATE ALL CIVIL, STRUCTURAL AND ELECTRICAL DRAWINGS FOR THE LOCATIONS OF ALL OPENINGS, RECESSES, BUILT-IN WORK, ETC..
22. THE CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTACT DOCUMENTS.
23. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
24. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST-ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAND PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
25. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
27. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS MAY TAKE PRECEDENCE.
28. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
29. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
30. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORKS, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
31. DESIGN REQUIREMENTS PER INTERNATIONAL BUILDING CODE 2015 AND THE EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

**COM-EX**  
Consultants  
115 Route 46  
Suite E39  
Mountain Lakes, NJ 07046  
PHONE: 862.209.4300  
FAX: 862.209.4301

**Sprint**  
6100 SPRINT PARKWAY  
OVERLAND PARK, KS 66251

**Cherundolo Consulting**

**SCHEDULE OF REVISIONS**

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
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4	02/26/19	ISSUED AS FINAL
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0	07/19/17	INITIAL SUBMISSION

**DRAWN BY:** DTB  
**CHECKED BY:** DTS  
**SCALE:** AS NOTED  
**JOB NO:** 17057-CHE

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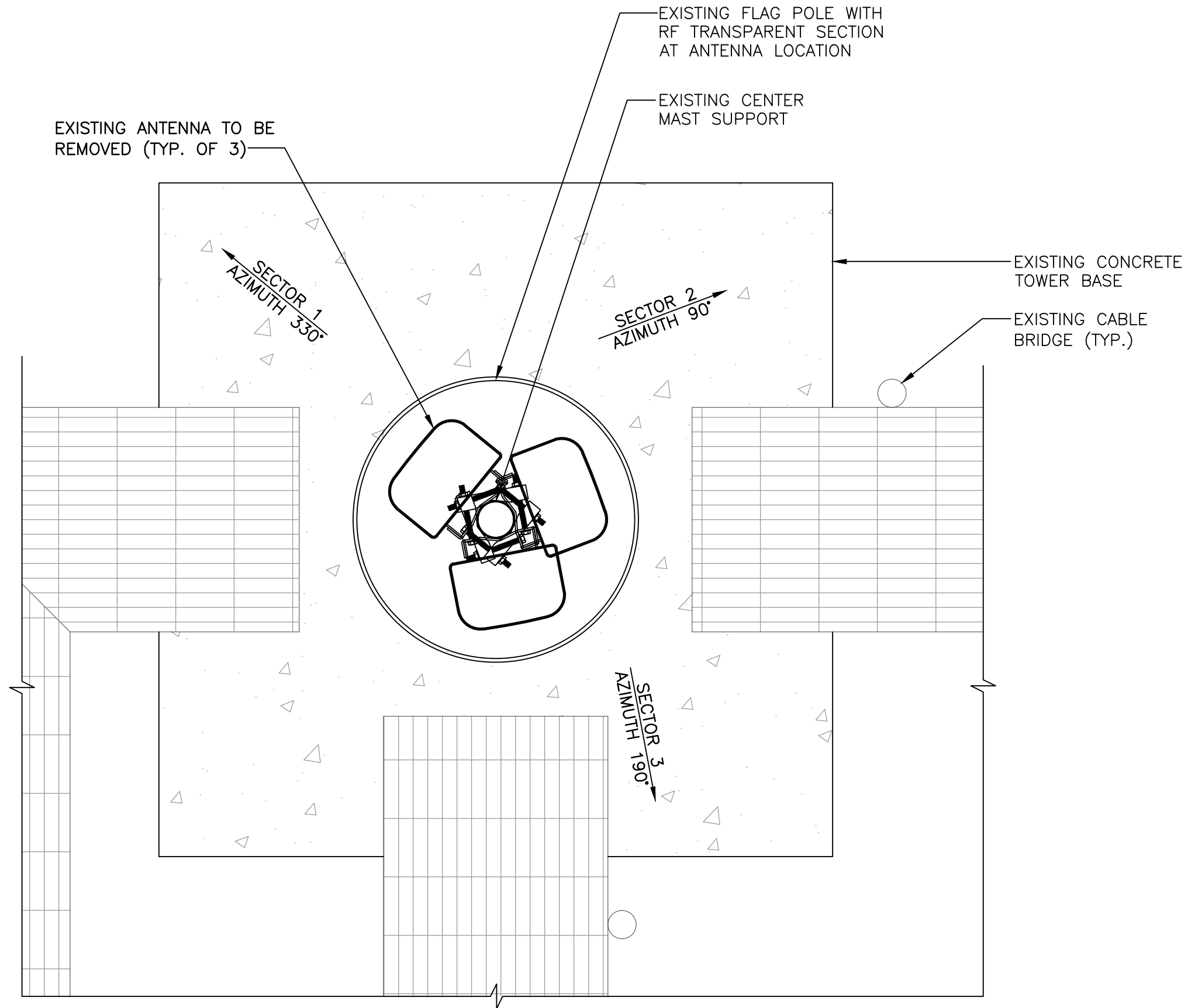
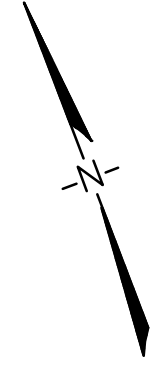
*Nicholas D. Barile*  
**NICHOLAS D. BARILE**  
PROFESSIONAL ENGINEER, CT LIC. No. 28643

**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**  
**SITE LAYOUT & GENERAL NOTES**

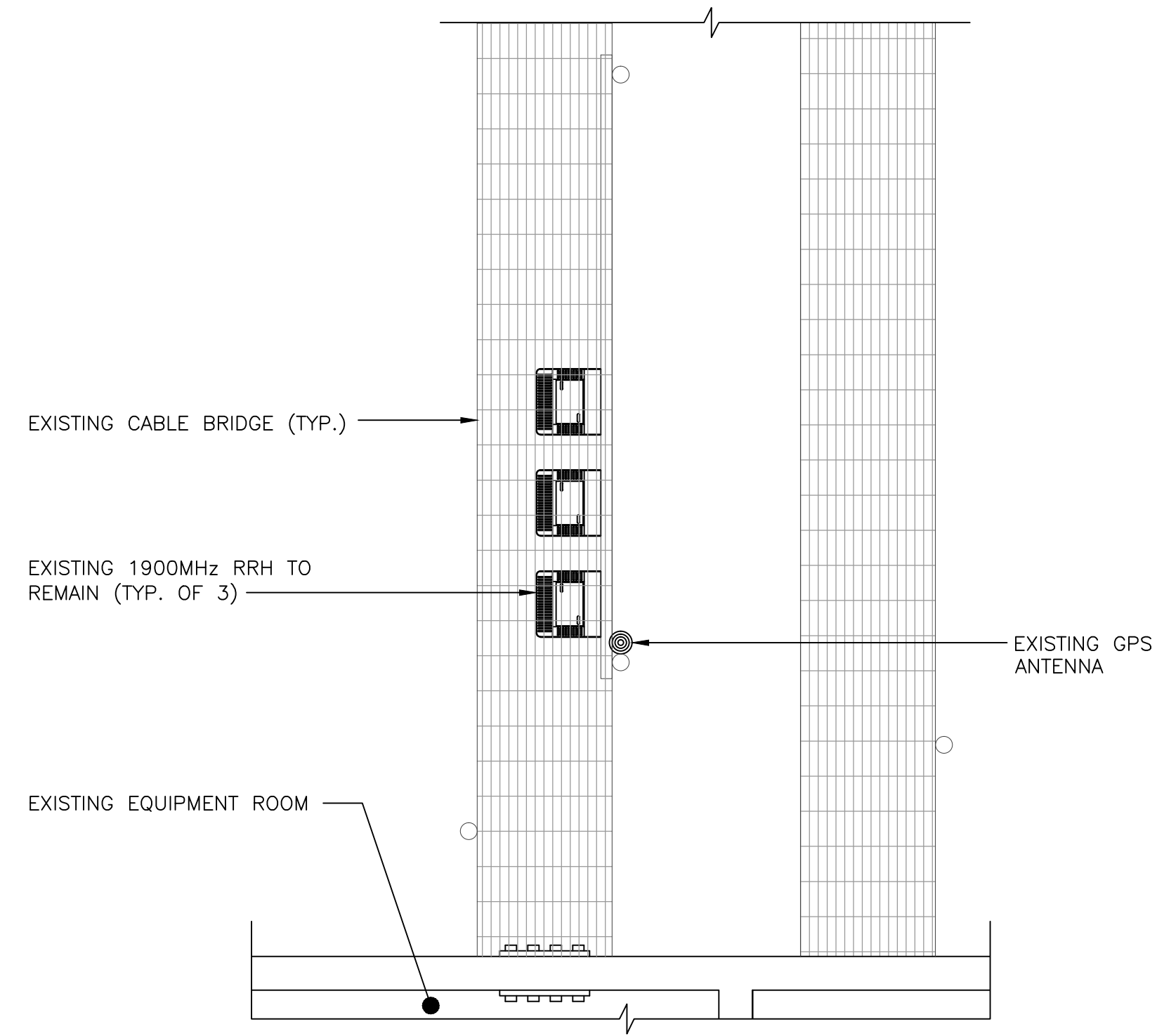
**DRAWING SHEET: 2 OF 10**

**C-1**



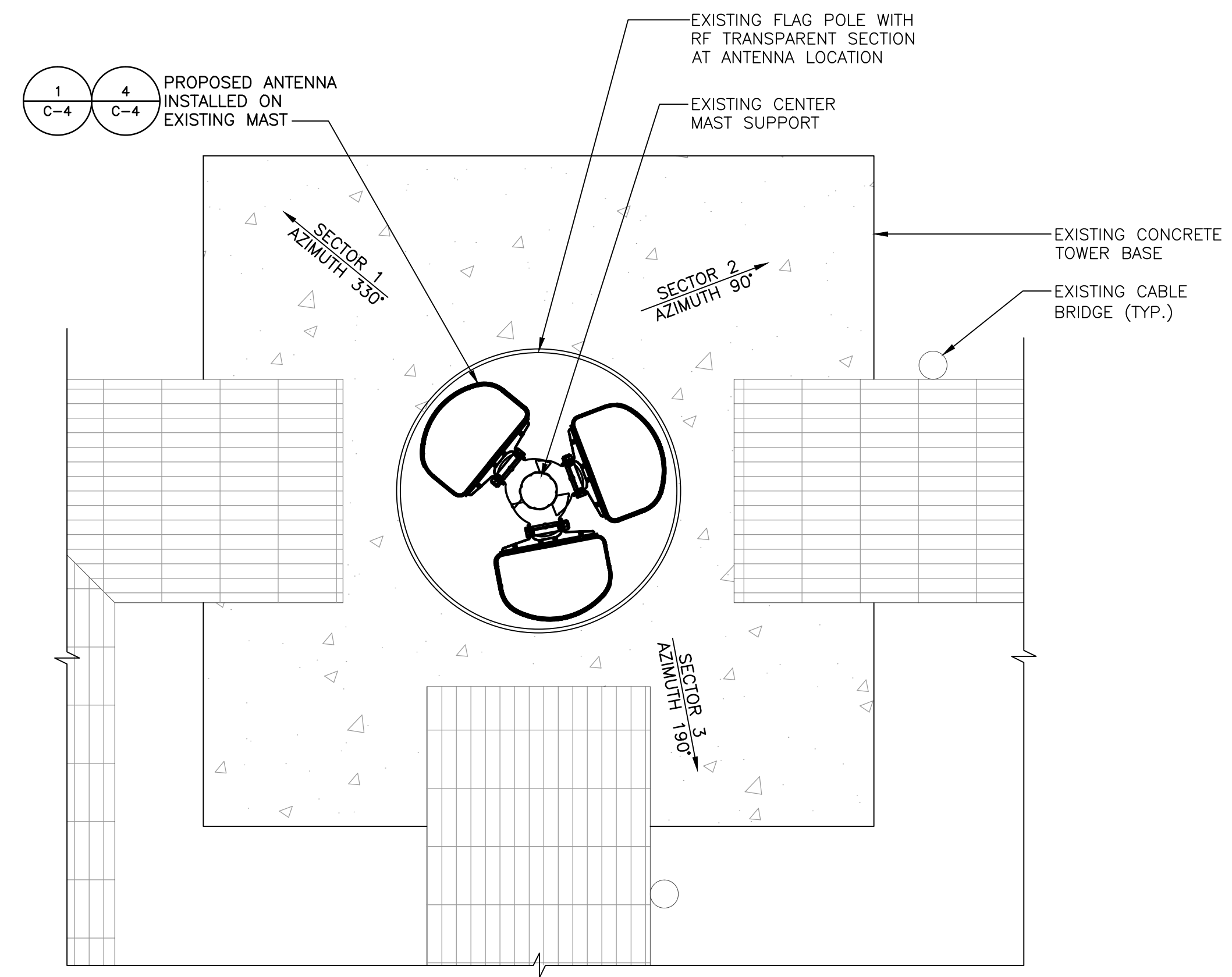
1 EXISTING ANTENNA PLAN  
C-2 SCALE: N.T.S.

NO ACCESS TO ANTENNAS AT TIME OF VISIT. LAYOUT SHOWN TAKEN FROM PREVIOUS SPRINT CDS



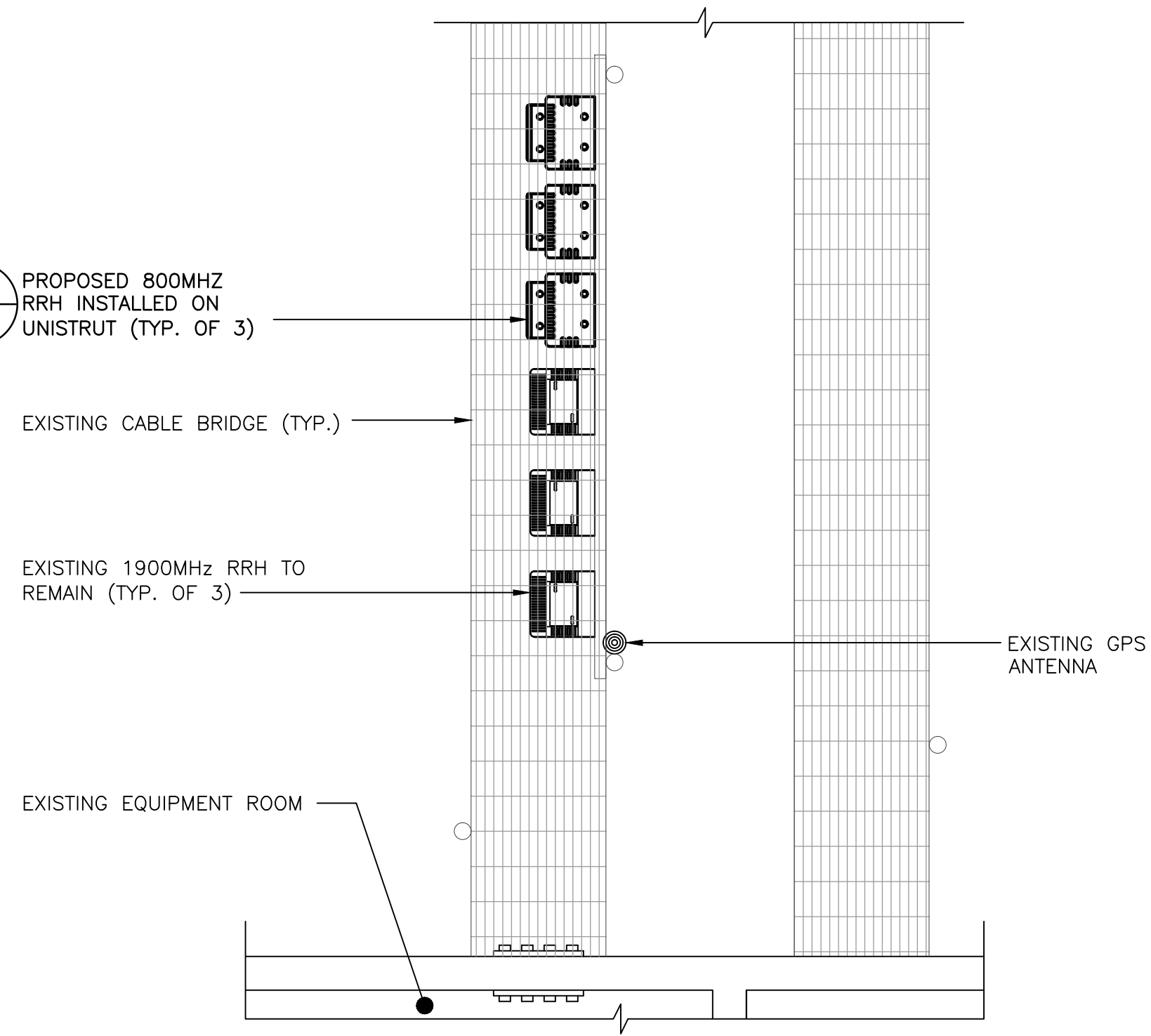
2 EXISTING RRH PLAN  
C-2 SCALE: N.T.S.

ALL LOADING ASSOCIATED WITH PROPOSED EQUIPMENT CABINETS, ANTENNAS, AND CABLE ROUTING SHALL BE VERIFIED BY A PASSING STRUCTURAL ANALYSIS PERFORMED BY A LICENSED ENGINEER PRIOR TO INSTALLATION



1A FINAL ANTENNA PLAN  
C-2 SCALE: N.T.S.

2 5 PROPOSED 800MHZ RRH INSTALLED ON UNISTRUT (TYP. OF 3)  
C-4 C-4



2A FINAL RRH PLAN  
C-2 SCALE: N.T.S.

**COM-EX**  
Consultants

115 Route 46  
Suite E39  
Mountain Lakes, NJ 07046  
PHONE: 862.209.4300  
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6100 SPRINT PARKWAY  
OVERLAND PARK, KS 66251



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CHECKED BY: DTS

SCALE: AS NOTED

JOB NO: 17057-CHE

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*Nicholas D. Barile*  
PROFESSIONAL ENGINEER

NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER, CT LIC. No. 28643

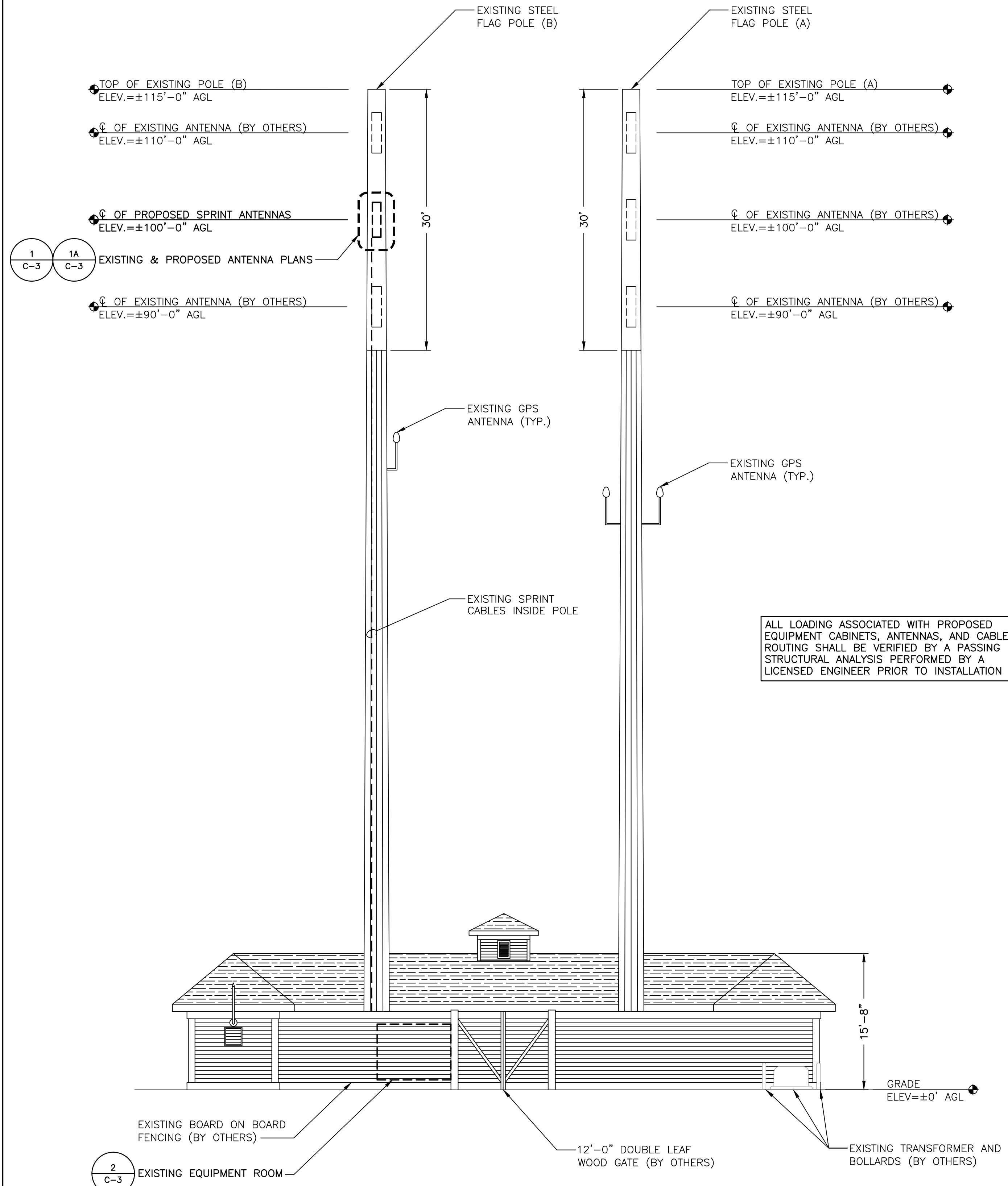
**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

DRAWING TITLE:  
**EXISTING & FINAL ANTENNA PLANS**

DRAWING SHEET: 3 OF 10

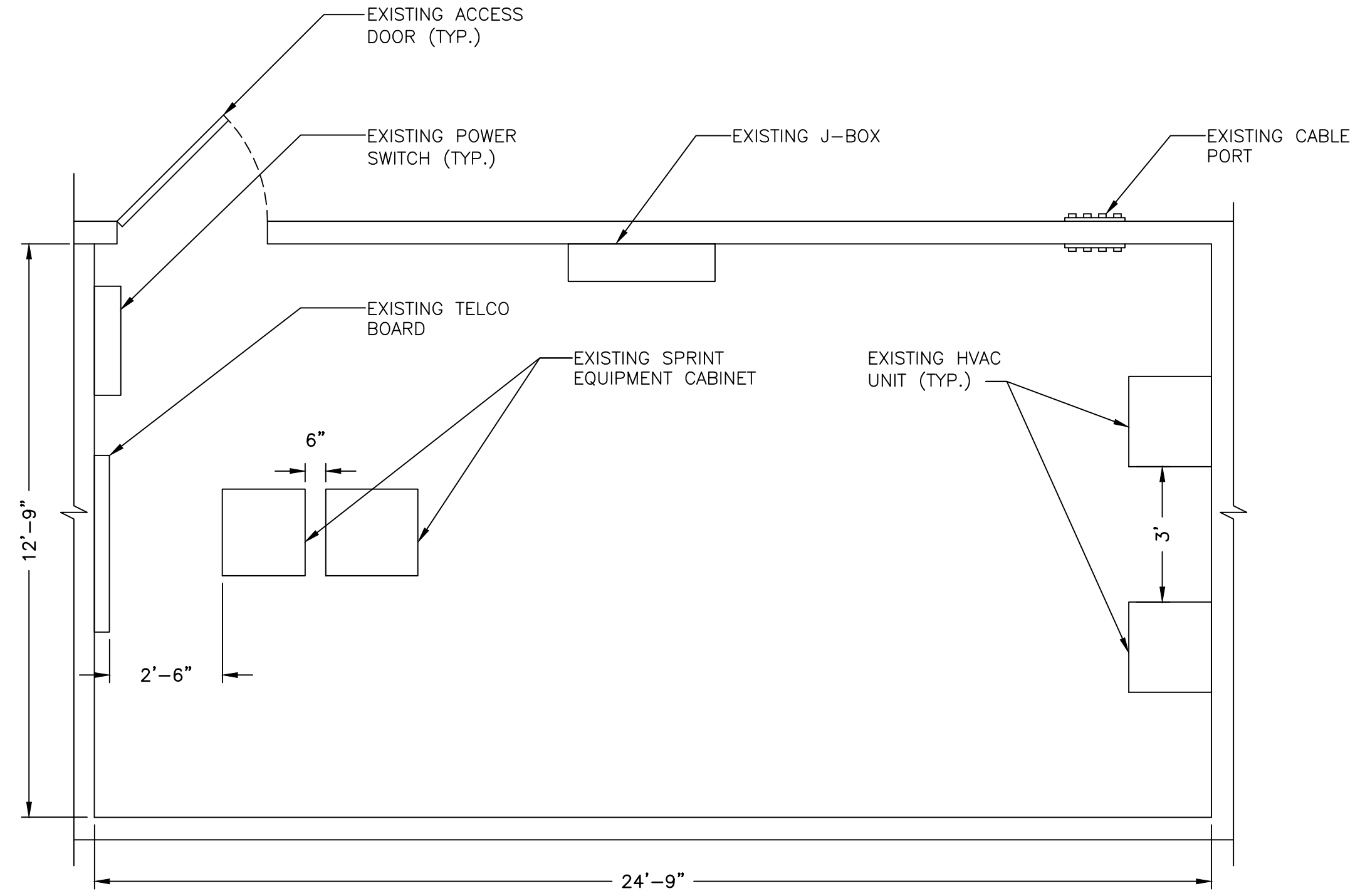
**C-2**





1 ELEVATION  
C-3 SCALE: 1/8"=1'  
( 24"x36" SHEET SIZE )

BILL OF MATERIALS					
	DESCRIPTION	QUANTITY EACH	DIMENSIONS (HxWxD)	WEIGHT (LBS) EACH	MANUFACTURER: PART/ MODEL#
ANTENNAS	800/1900MHz PANEL ANTENNA - SECTOR 1	1	72"x11.8"x7.0"	57.0 LBS W/OUT MOUNTING HARDWARE	RFS: APXVSP18-C-A20
	800 MHz RRH	1	15.7"x12.9"x9.8"	69.1 LBS W/OUT MOUNTING HARDWARE	ALU: RRH-2x50-800
	800/1900MHz PANEL ANTENNA - SECTOR 2	1	72"x11.8"x7.0"	57.0 LBS W/OUT MOUNTING HARDWARE	RFS: APXVSP18-C-A20
	800 MHz RRH	1	15.7"x12.9"x9.8"	69.1 LBS W/OUT MOUNTING HARDWARE	ALU: RRH-2x50-800
	800/1900MHz PANEL ANTENNA - SECTOR 3	1	72"x11.8"x7.0"	57.0 LBS W/OUT MOUNTING HARDWARE	RFS: APXVSP18-C-A20
	800 MHz RRH	1	15.7"x12.9"x9.8"	69.1 LBS W/OUT MOUNTING HARDWARE	ALU: RRH-2x50-800
CABLES	SECTOR 1 HYBRIFLEX RUN (BTS TO RRH)	1	±35'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 1 COAX CABLE JUMPERS	4	150'	N/A	LDF5-50A (OR EQUIVALENT)
	SECTOR 1 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD
	SECTOR 2 HYBRIFLEX RUN (BTS TO RRH)	1	±35'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 2 COAX CABLE JUMPERS	4	150'	N/A	LDF5-50A (OR EQUIVALENT)
	SECTOR 2 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD
	SECTOR 3 HYBRIFLEX RUN (BTS TO RRH)	1	±35'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 3 COAX CABLE JUMPERS	4	150'	N/A	LDF5-50A (OR EQUIVALENT)
	SECTOR 3 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD
	DESCRIPTION	QUANTITY EACH	DIMENSIONS (LENGTH)	WEIGHT (LBS/FOOT)	MANUFACTURER: SIZE/PART/MODEL#
	SECTOR 1 HYBRIFLEX RUN (BTS TO RRH)	1	±35'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J
	SECTOR 1 COAX CABLE JUMPERS	4	150'	N/A	LDF5-50A (OR EQUIVALENT)
SECTOR 1 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD	
SECTOR 2 HYBRIFLEX RUN (BTS TO RRH)	1	±35'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J	
SECTOR 2 COAX CABLE JUMPERS	4	150'	N/A	LDF5-50A (OR EQUIVALENT)	
SECTOR 2 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD	
SECTOR 3 HYBRIFLEX RUN (BTS TO RRH)	1	±35'	1.3 LBS	RFS: 1-1/4" / HB114-1-08U4-M5J	
SECTOR 3 COAX CABLE JUMPERS	4	150'	N/A	LDF5-50A (OR EQUIVALENT)	
SECTOR 3 R.E.T. CABLES	4	(3) 10' / (1) 2'	N/A	TBD	



2 EXISTING EQUIPMENT PLAN  
C-3 SCALE: 3/8"=1'

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**Cherundolo Consulting**

REV NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4	02/26/19	ISSUED AS FINAL
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0	07/19/17	INITIAL SUBMISSION

**DRAWN BY:** DTB  
**CHECKED BY:** DTS  
**SCALE:** AS NOTED  
**JOB NO:** 17057-CHE

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*Nicholas D. Barile*  
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PROFESSIONAL ENGINEER, CT LIC. No. 28643

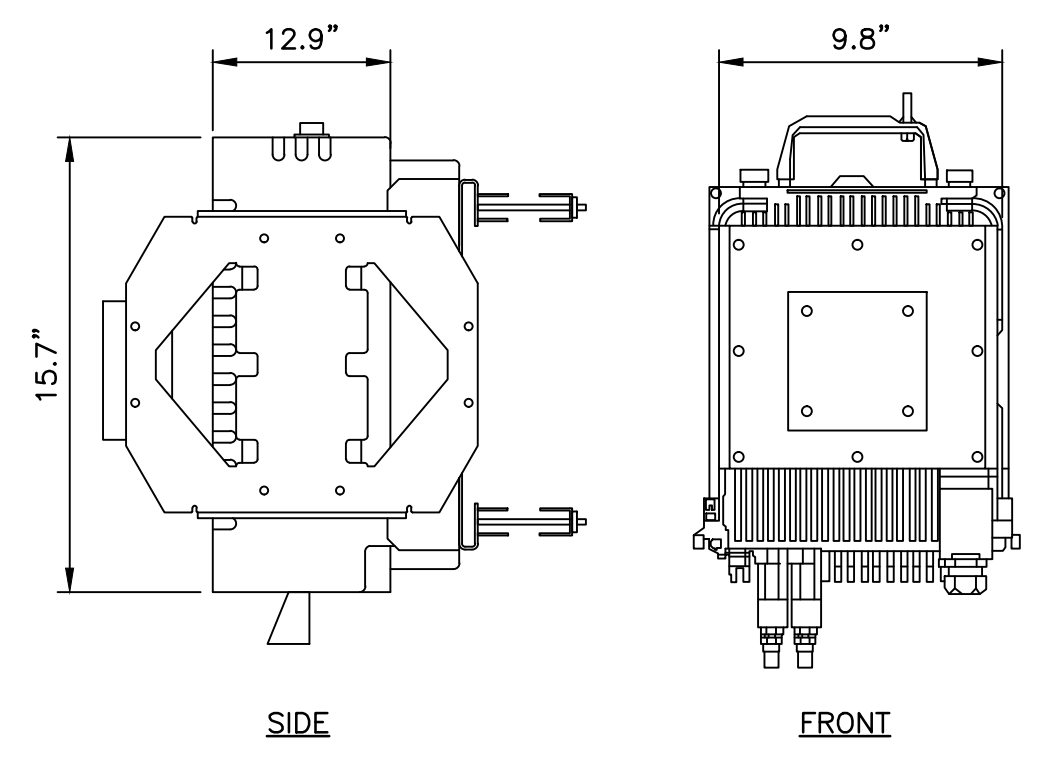
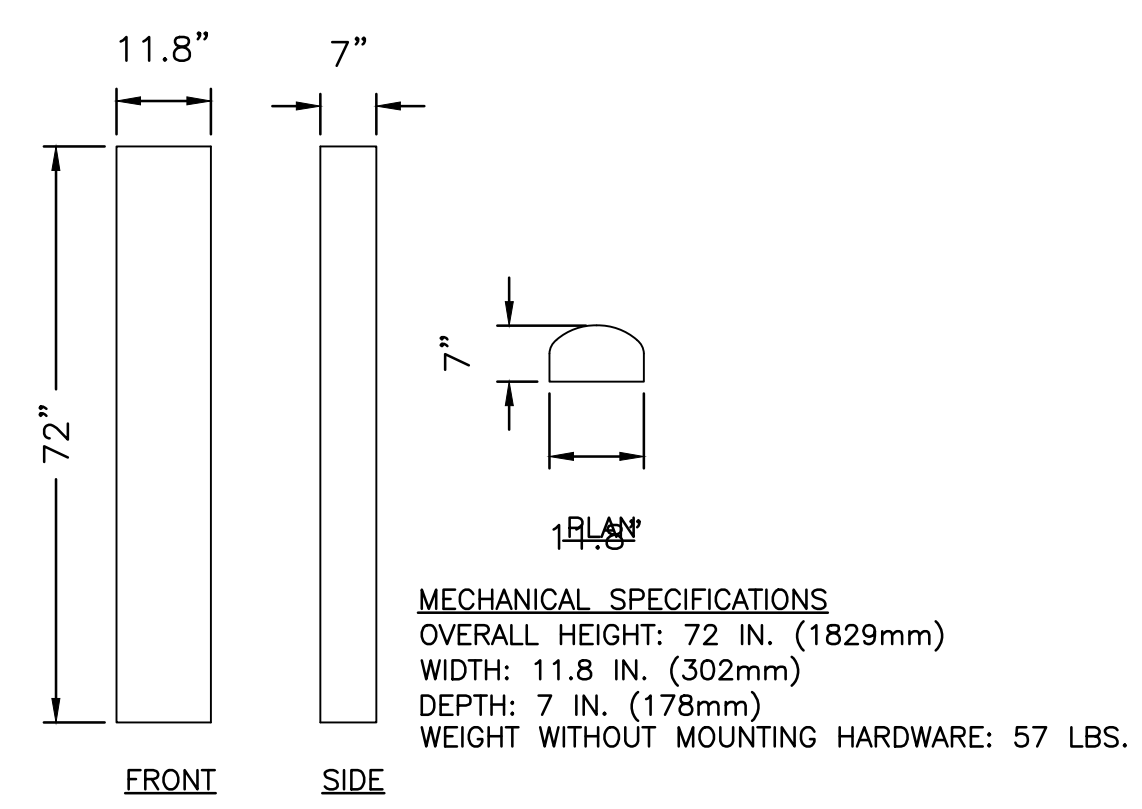
**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**  
**ELEVATION, B.O.M., & FINAL EQUIPMENT PLAN**

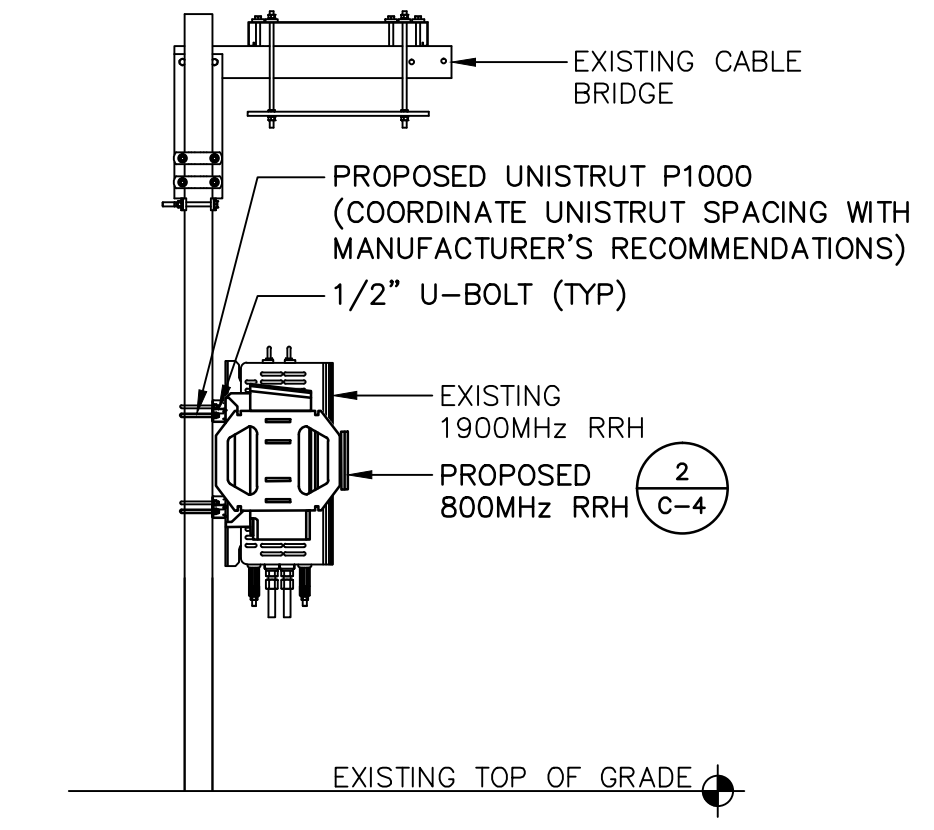
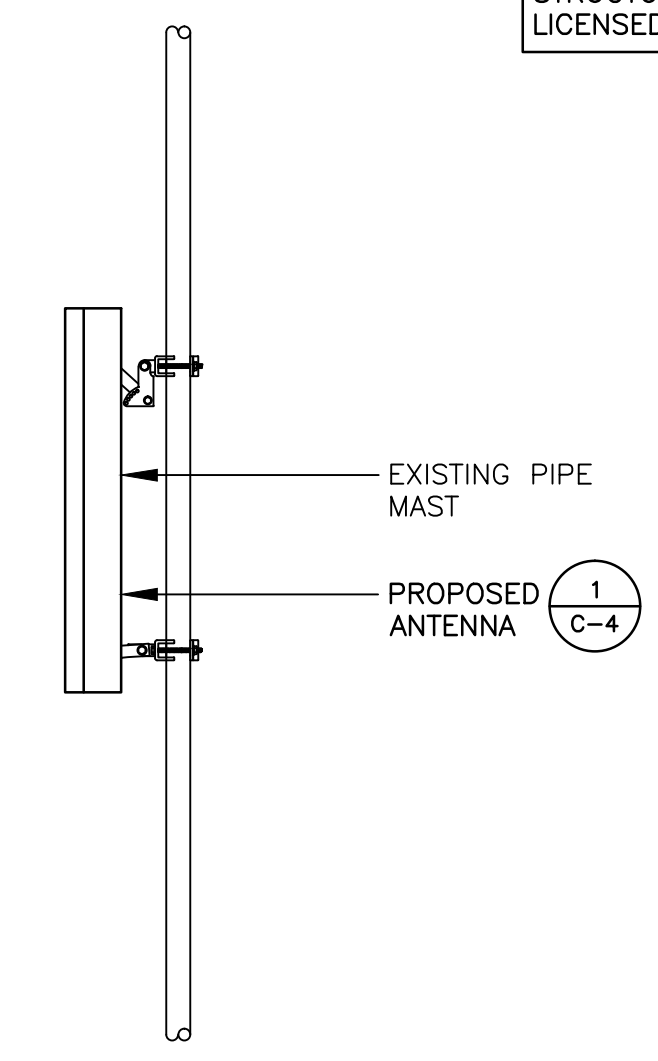
**DRAWING SHEET: 4 OF 10**

**C-3**

ALL LOADING ASSOCIATED WITH PROPOSED EQUIPMENT CABINETS, ANTENNAS, AND CABLE ROUTING SHALL BE VERIFIED BY A PASSING STRUCTURAL ANALYSIS PERFORMED BY A LICENSED ENGINEER PRIOR TO INSTALLATION



MODEL	H x W x D	WEIGHT
800MHz RRH 2x50W	15.7"x12.9"x9.8"	53 LBS



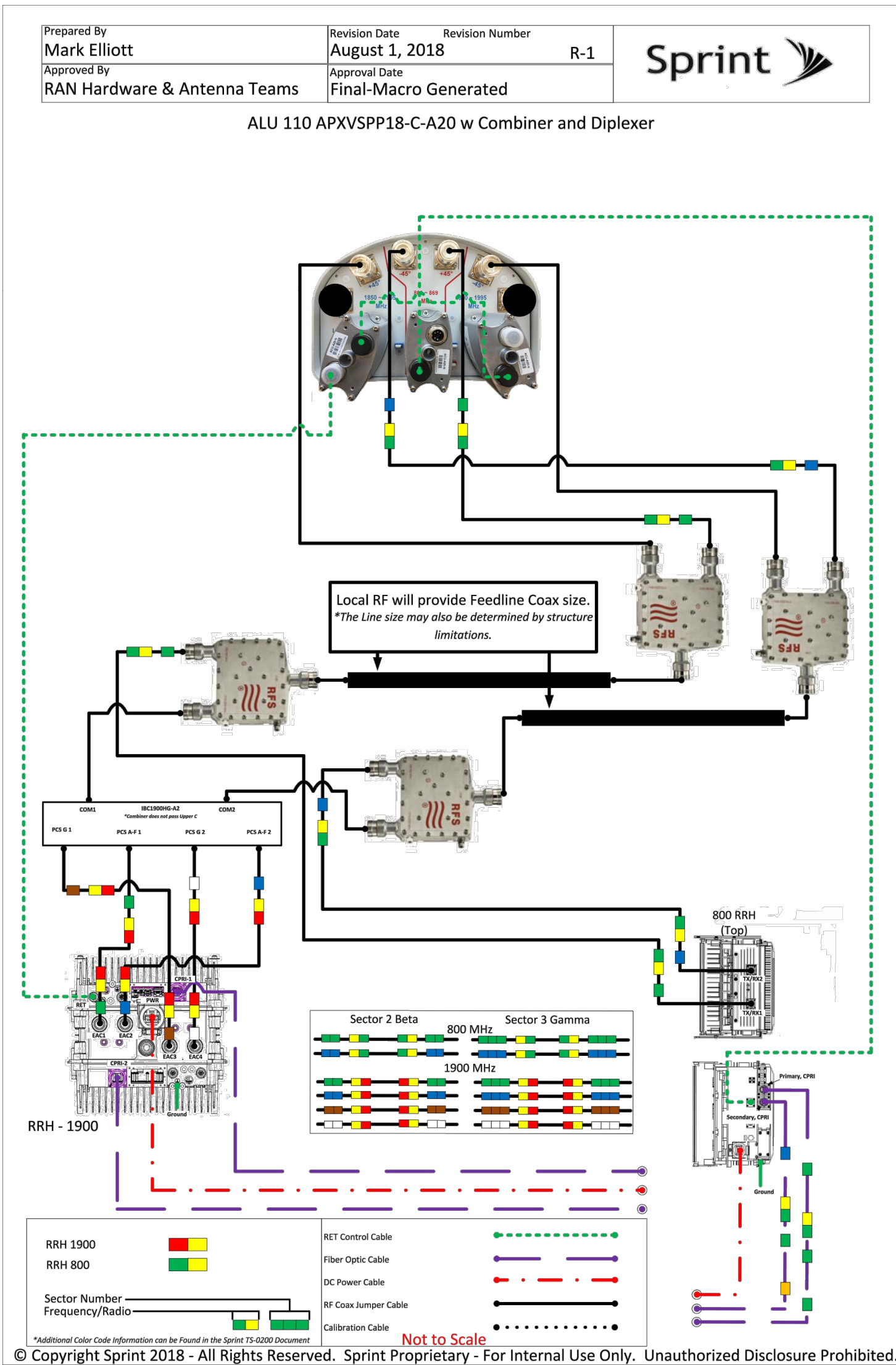
1  
C-4 800/1900MHz ANTENNA  
RFS: APXVSP18-C-A20  
SCALE: 1/2"=1'

2  
C-4 800MHz RRH DETAIL  
SCALE: N.T.S.

3  
C-4 NOT USED  
SCALE: N.T.S.

4  
C-4 TYPICAL ANTENNA  
INSTALLATION DETAIL  
SCALE: N.T.S.

5  
C-4 TYPICAL RRH  
INSTALLATION DETAIL  
SCALE: N.T.S.



6  
C-4 ANTENNA SCHEMATIC  
SCALE: N.T.S.

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**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**

**CONSTRUCTION DETAILS**

**DRAWING SHEET: 5 OF 10**

**C-4**

**SCHEDULE OF REVISIONS**

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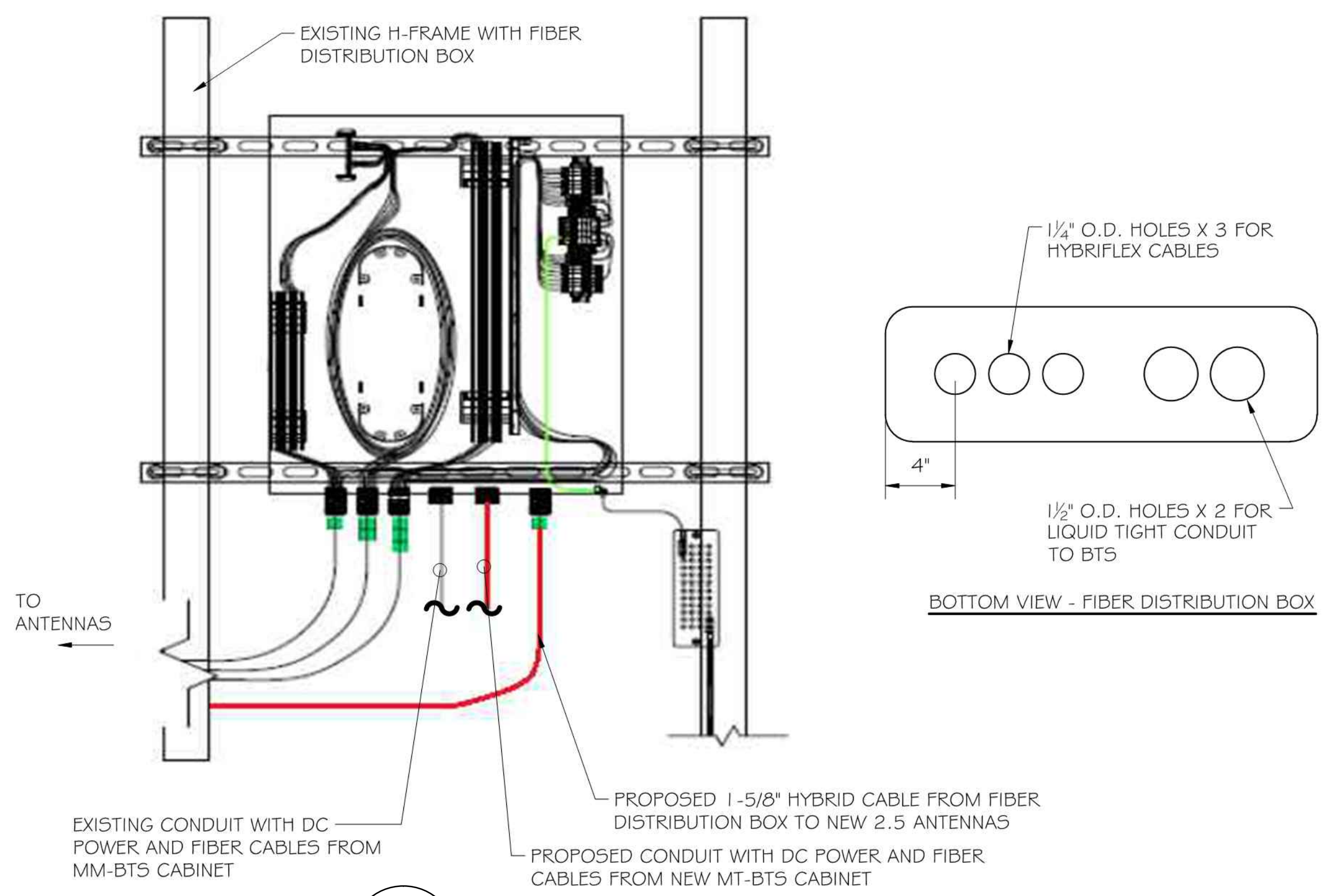
**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**

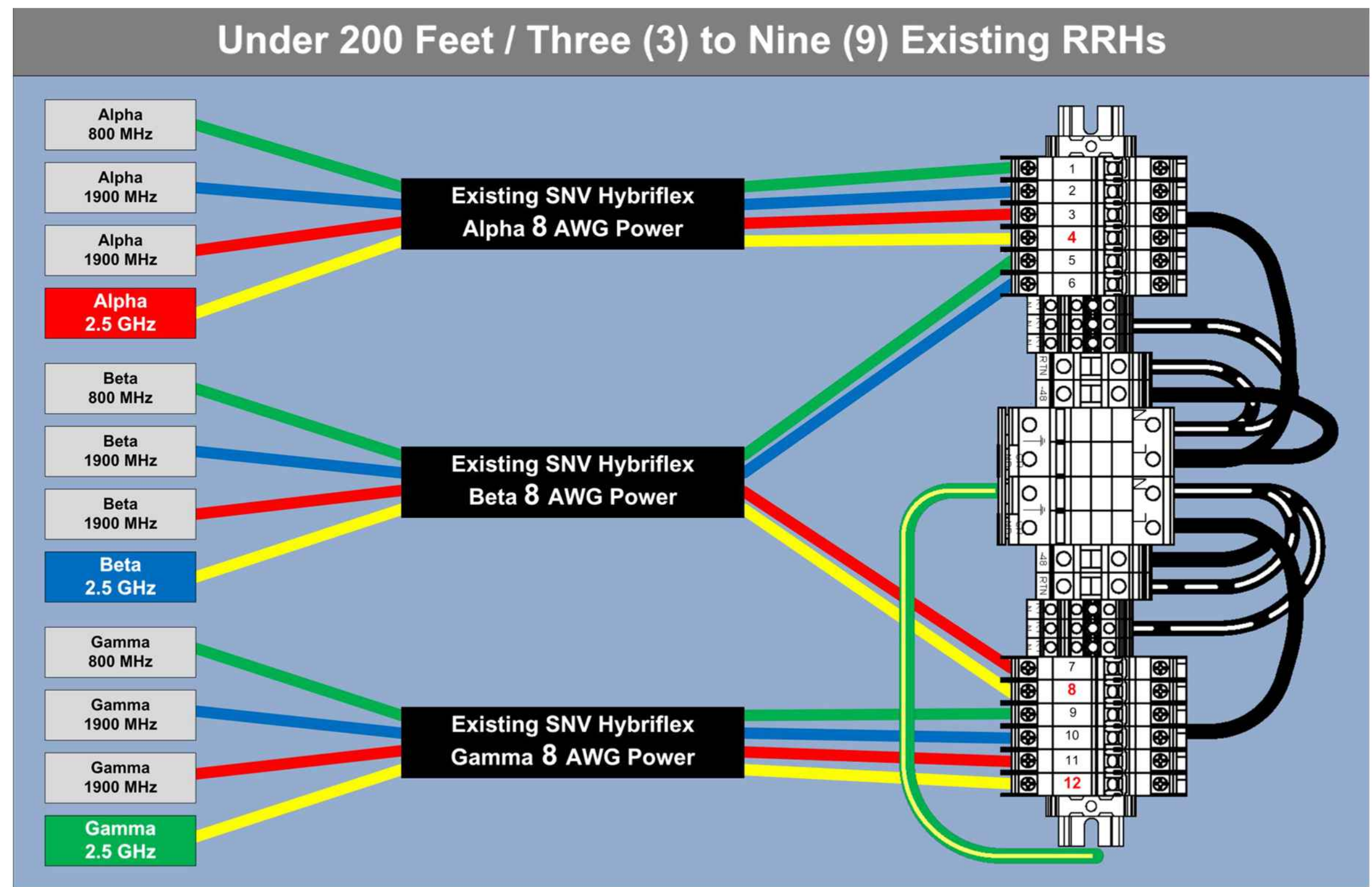
**FIBER PLUMBING DIAGRAM**

**DRAWING SHEET: 6 OF 10**

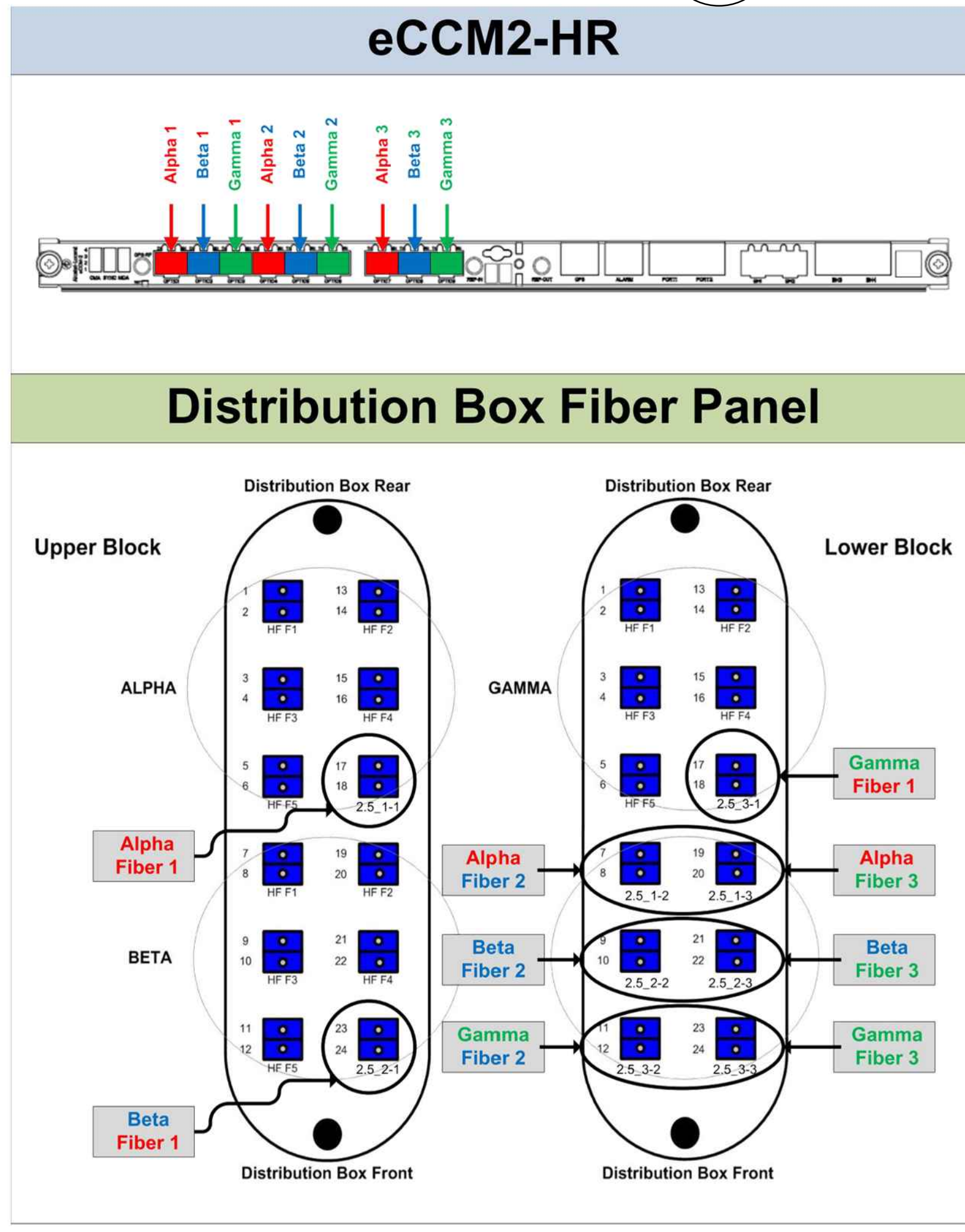
**C-5**



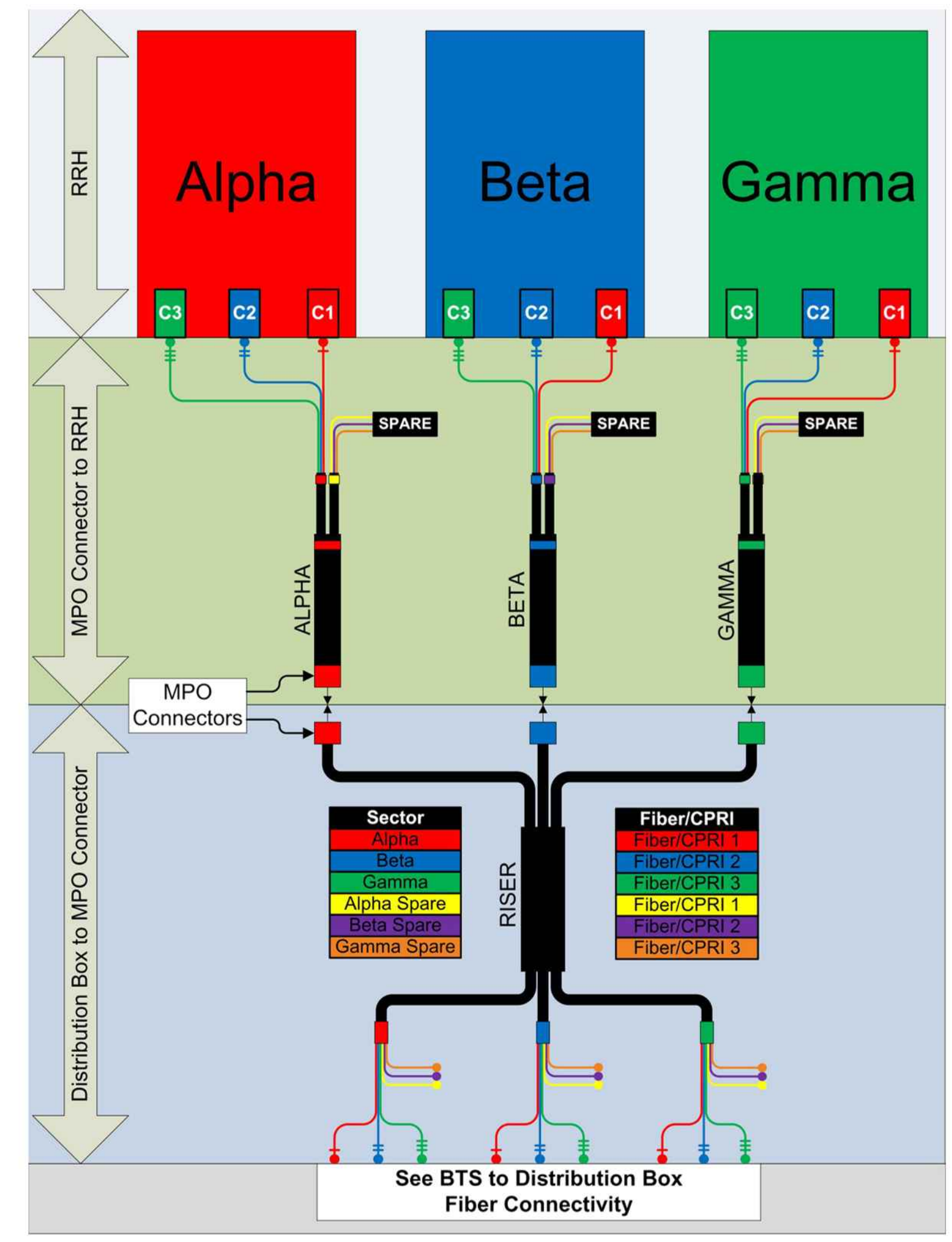
1 TYPICAL FIBER DISTRIBUTION BOX DETAIL  
C-5 SCALE: NTS



2 RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL  
C-5 SCALE: NTS



4 BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL  
C-5 SCALE: NTS

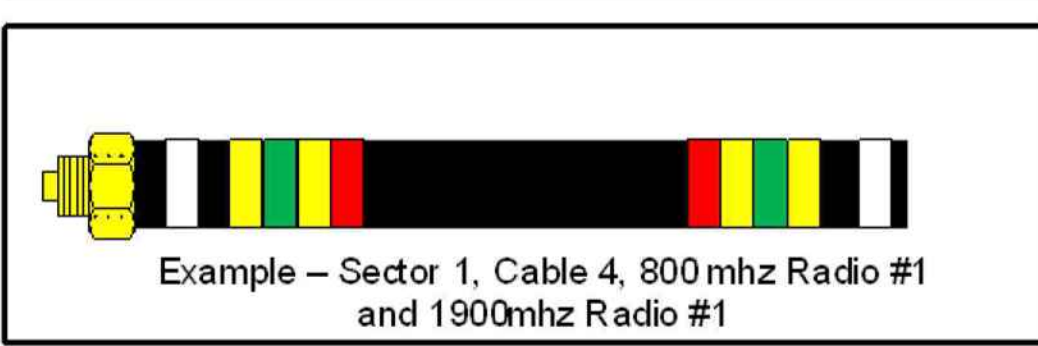
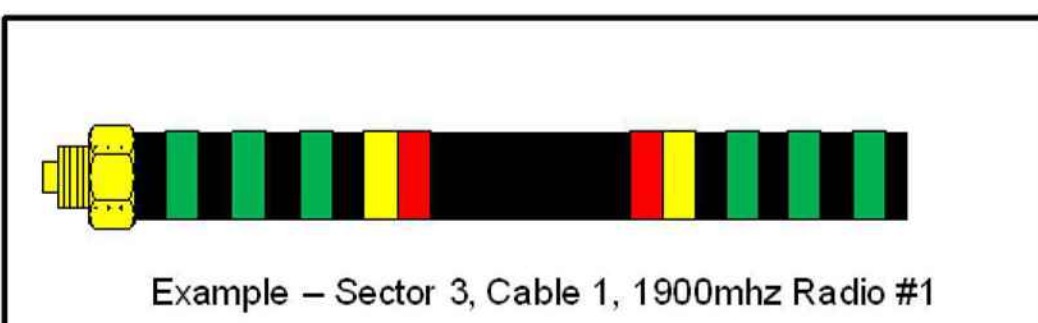
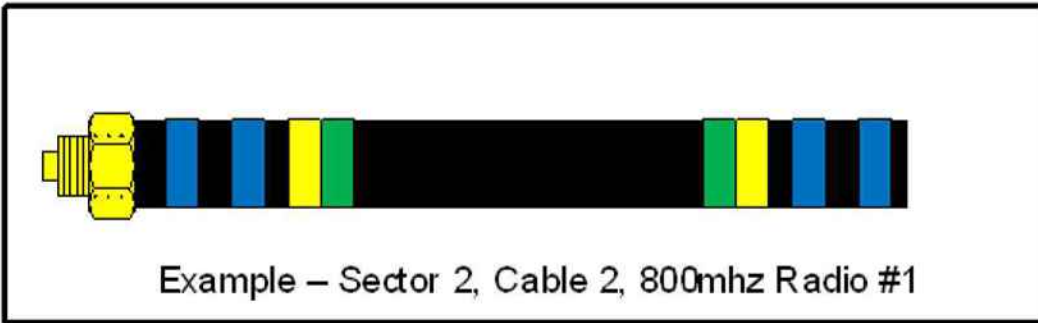
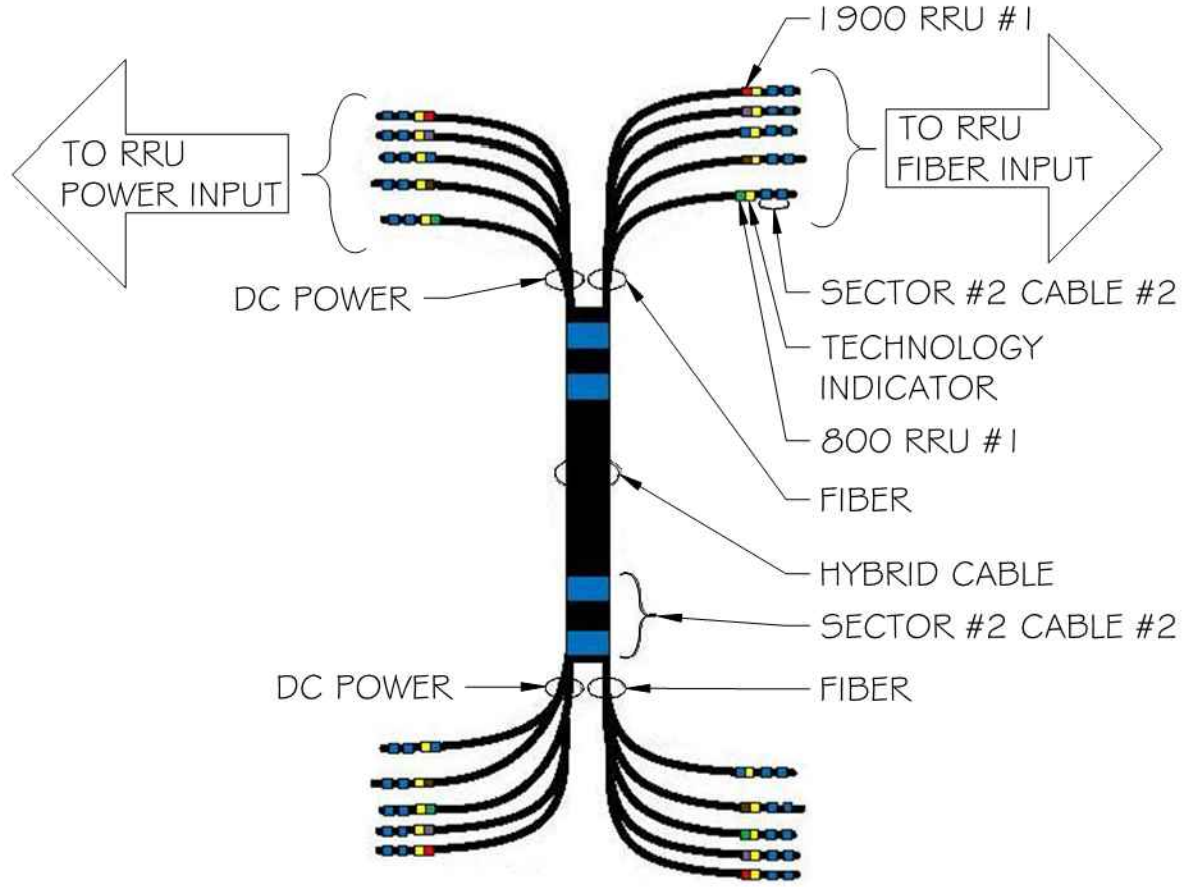


5 RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL  
C-5 SCALE: NTS

3 NOT USED  
C-5 SCALE: NTS

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL



**CABLE MARKING NOTES**

- ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
- THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
- A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
- THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
- SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE.
- HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
- HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
- INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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<b>DRAWN BY:</b>	DTB
<b>CHECKED BY:</b>	DTS
<b>SCALE:</b>	AS NOTED
<b>JOB NO:</b>	17057-CHE

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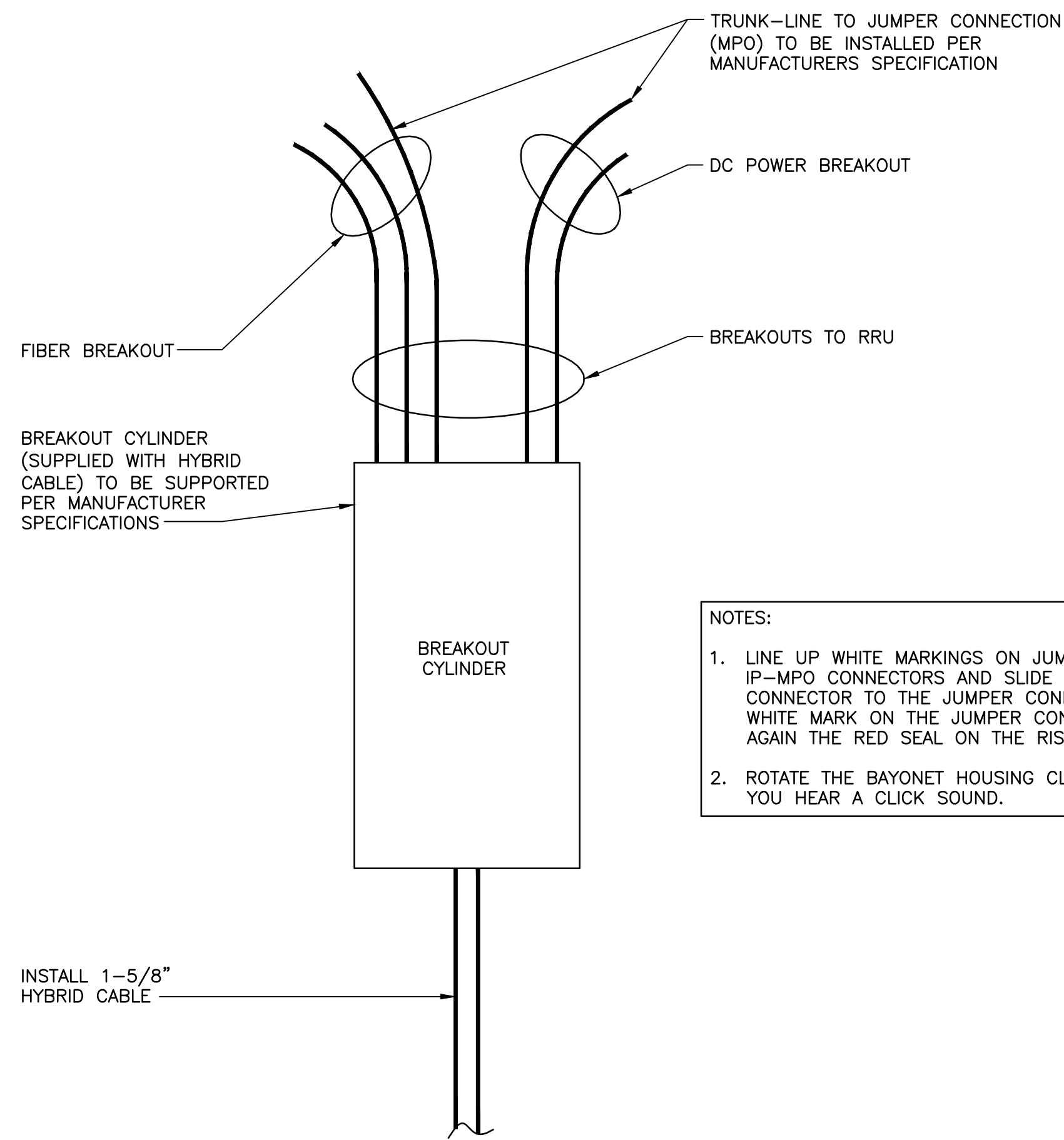
**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**

**CABLE COLOR CODING**

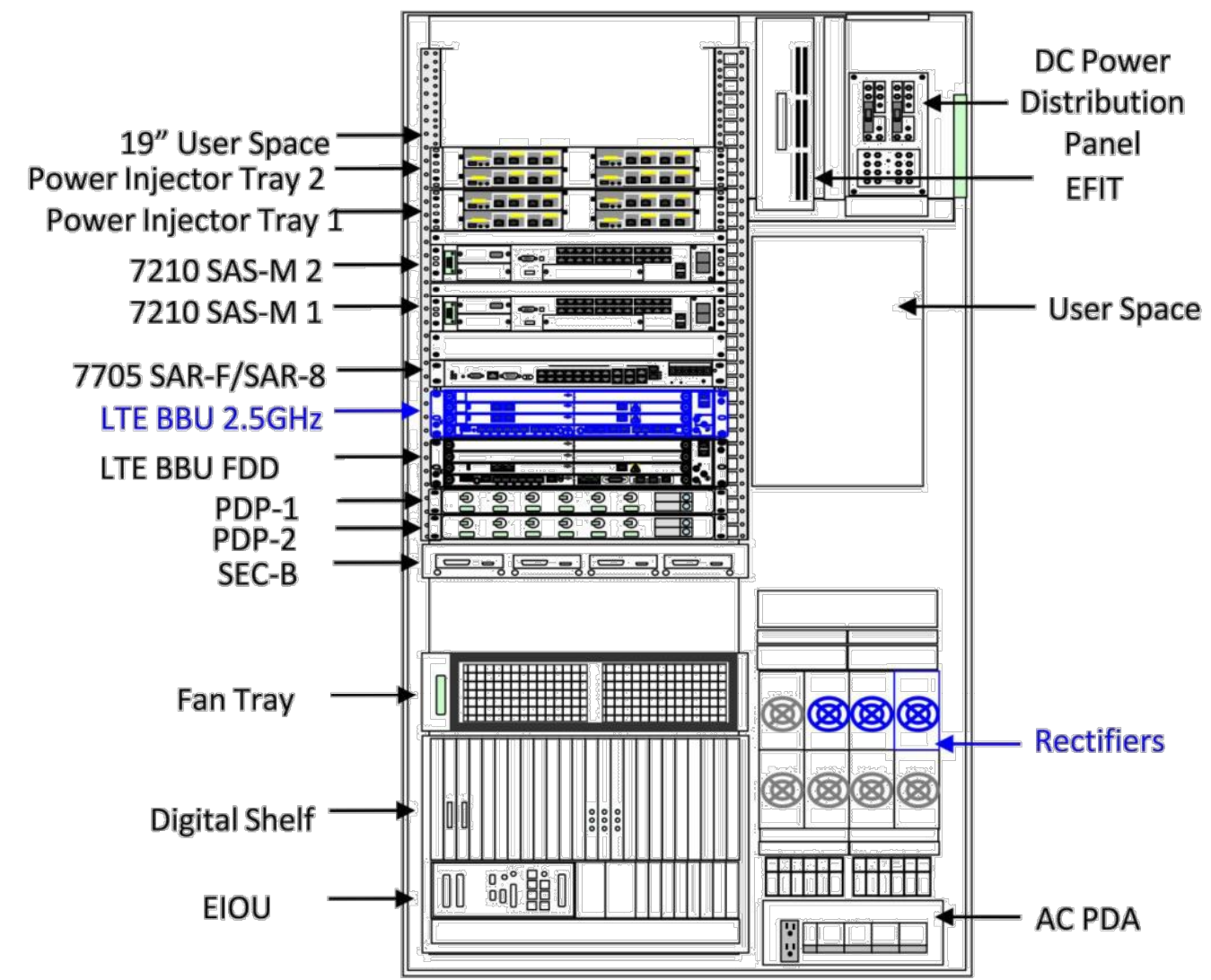
**DRAWING SHEET: 7 OF 10**

**C-6**



- NOTES:
1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.
  2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

1 HYBRID BREAKOUT DETAIL  
C-7 SCALE: NTS



2 EXISTING MMBS CABINET  
C-7 SCALE: NTS

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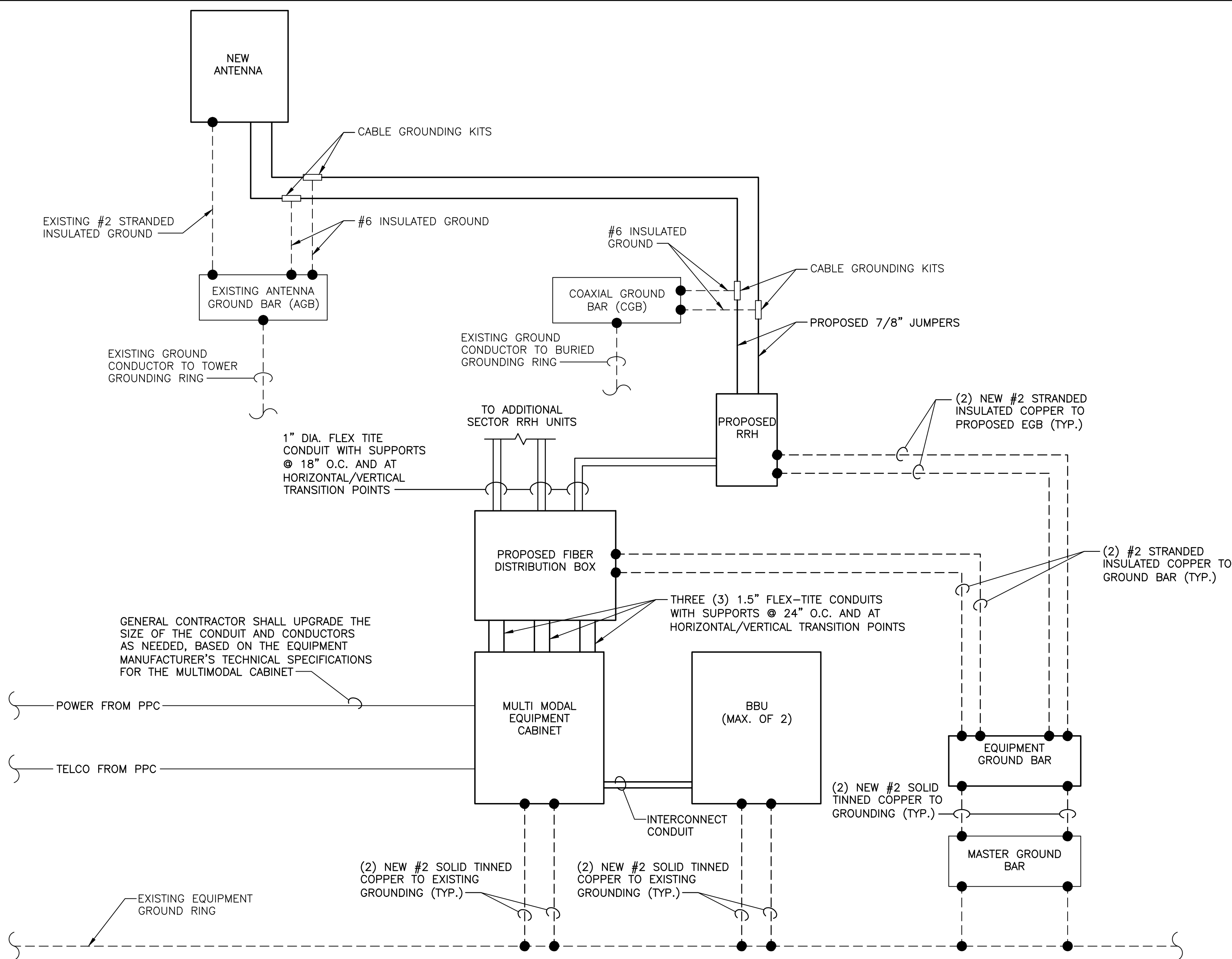
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**DRAWING TITLE:**

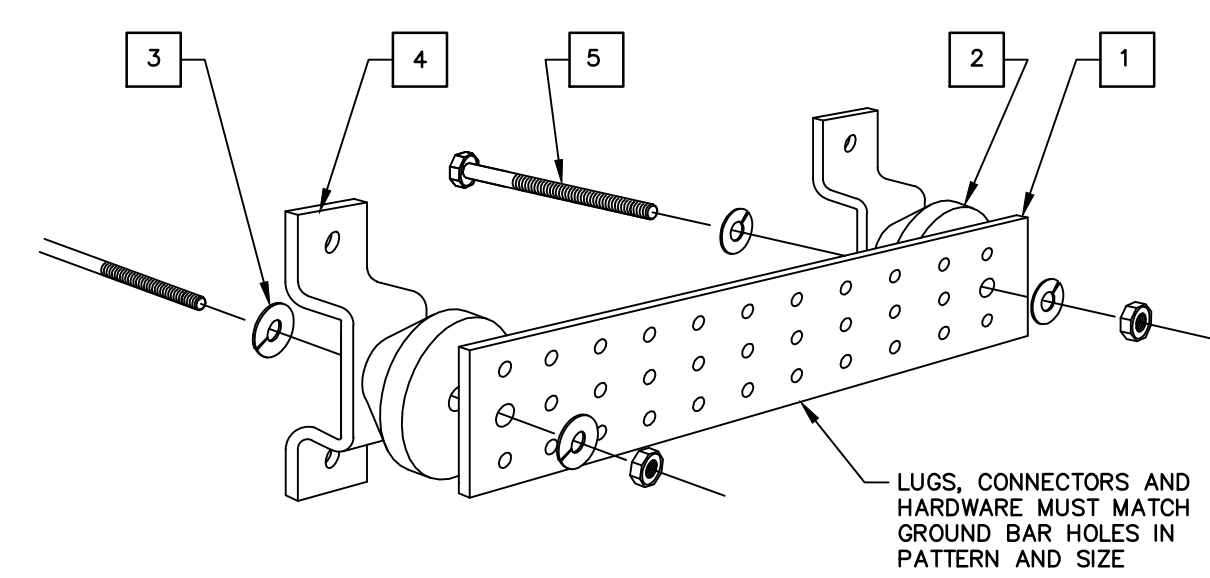
**EQUIPMENT DETAILS**

**DRAWING SHEET: 8 OF 10**

**C-7**



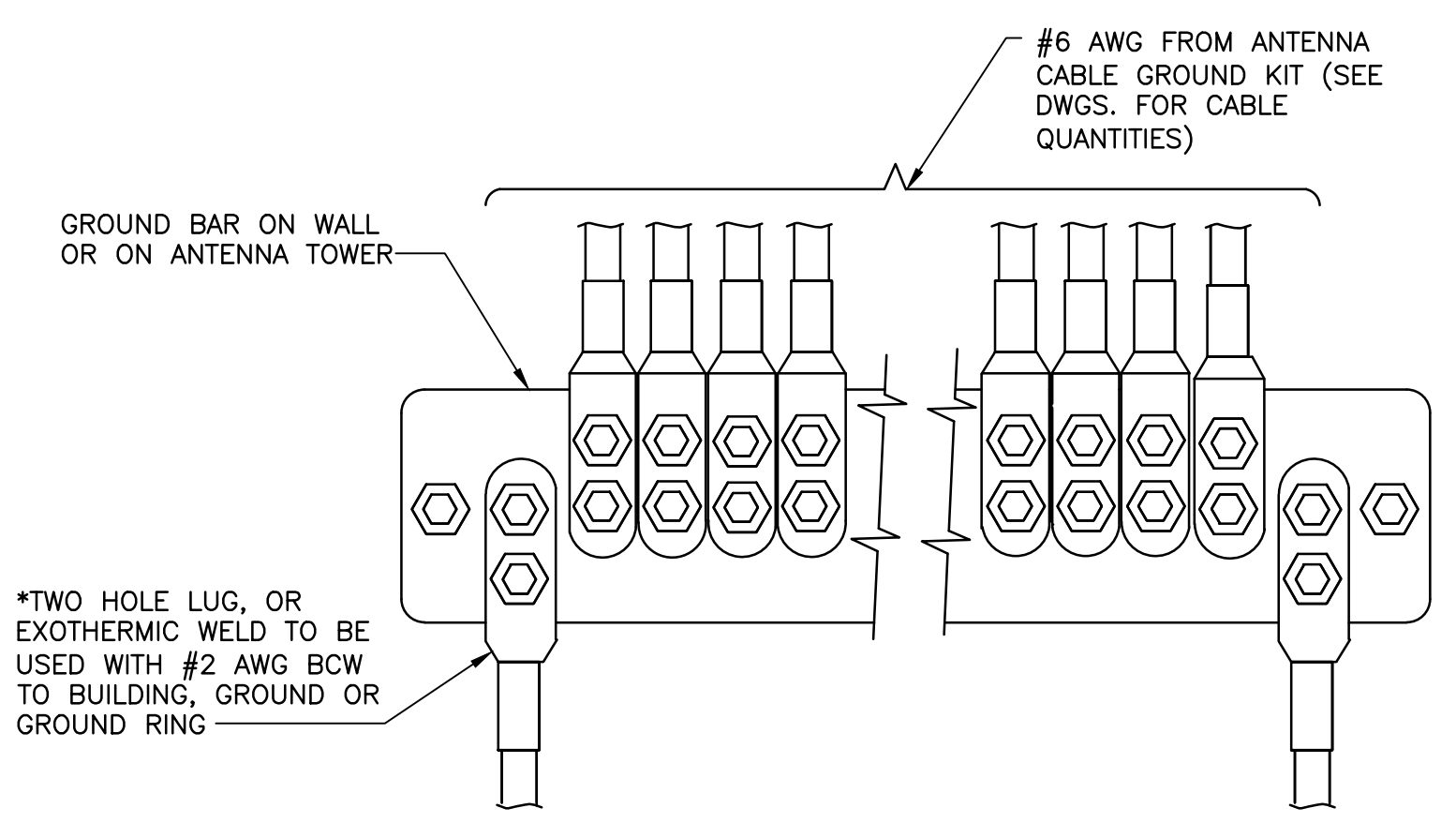
1  
E-1  
TYPICAL POWER & GROUNDING ONE-LINE DIAGRAM  
SCALE: N.T.S.



- LEGEND
1. COPPER GROUND BAR, 7/16" x 4" x 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
  2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
  3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-B.
  4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056.
  5. 5/8-11 x 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012-1

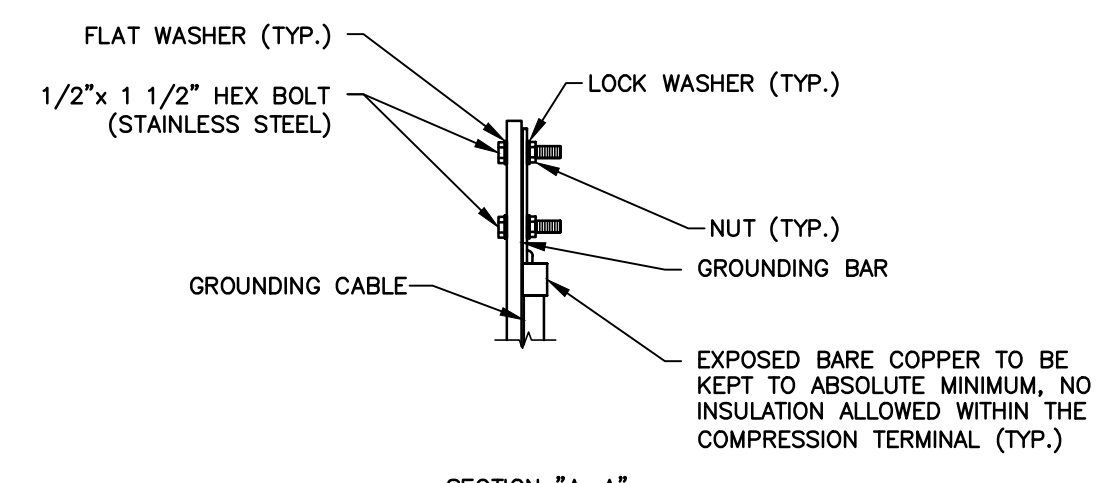
GROUND BAR SCHEDULE				
TYPE	QTY.	MANUFACTURER	CAT. NO.	REMARKS
MGB	2	HARGER	GB14420TMGB	OR EQUAL
CGB	3	HARGER	GB14412TMGB	OR EQUAL

2  
E-1  
TYPICAL GROUND BAR DETAIL  
SCALE: NTS



- \* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.
- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRIFLEX GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.
- CONNECT SEQUENCE- BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

3  
E-1  
TYPICAL GROUND BAR CONNECTION PLAN  
SCALE: NTS



- NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
  2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

4  
E-1  
TYPICAL GROUND BAR CONNECTION DETAIL  
SCALE: NTS

- ELECTRICAL AND GROUNDING NOTES
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
  2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
  3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
  4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
  5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
  6. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
  7. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
  8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
  9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
  10. GROUND HYBRIFLEX CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRIFLEX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
  11. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
  12. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
  13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
  14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
  15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
  16. BOND ANTENNA MOUNTING BRACKETS, HYBRIFLEX CABLE GROUND KITS, AND RRHS TO EGB PLACED NEAR THE ANTENNA LOCATION.
  17. BOND ANTENNA EGB'S AND MGB TO GROUND RING.
  18. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
  19. CONTRACTOR SHALL CONDUCT ANTENNA, HYBRIFLEX CABLES, AND RRH RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
  20. CONTRACTOR (CERTIFIED ELECTRICIAN) SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.

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FAX: 862.209.4301

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OVERLAND PARK, KS 66251

**Cherundolo**  
Consulting

SCHEDULE OF REVISIONS

REV NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4	02/26/19	ISSUED AS FINAL
3	12/28/18	PER NEW SCOPE OF WORK
2	05/01/18	REVISED PER COMMENTS
1	09/26/17	REVISED PER RFDS
0	07/19/17	INITIAL SUBMISSION

DRAWN BY: DTB  
CHECKED BY: DTS  
SCALE: AS NOTED  
JOB NO: 17057-CHE

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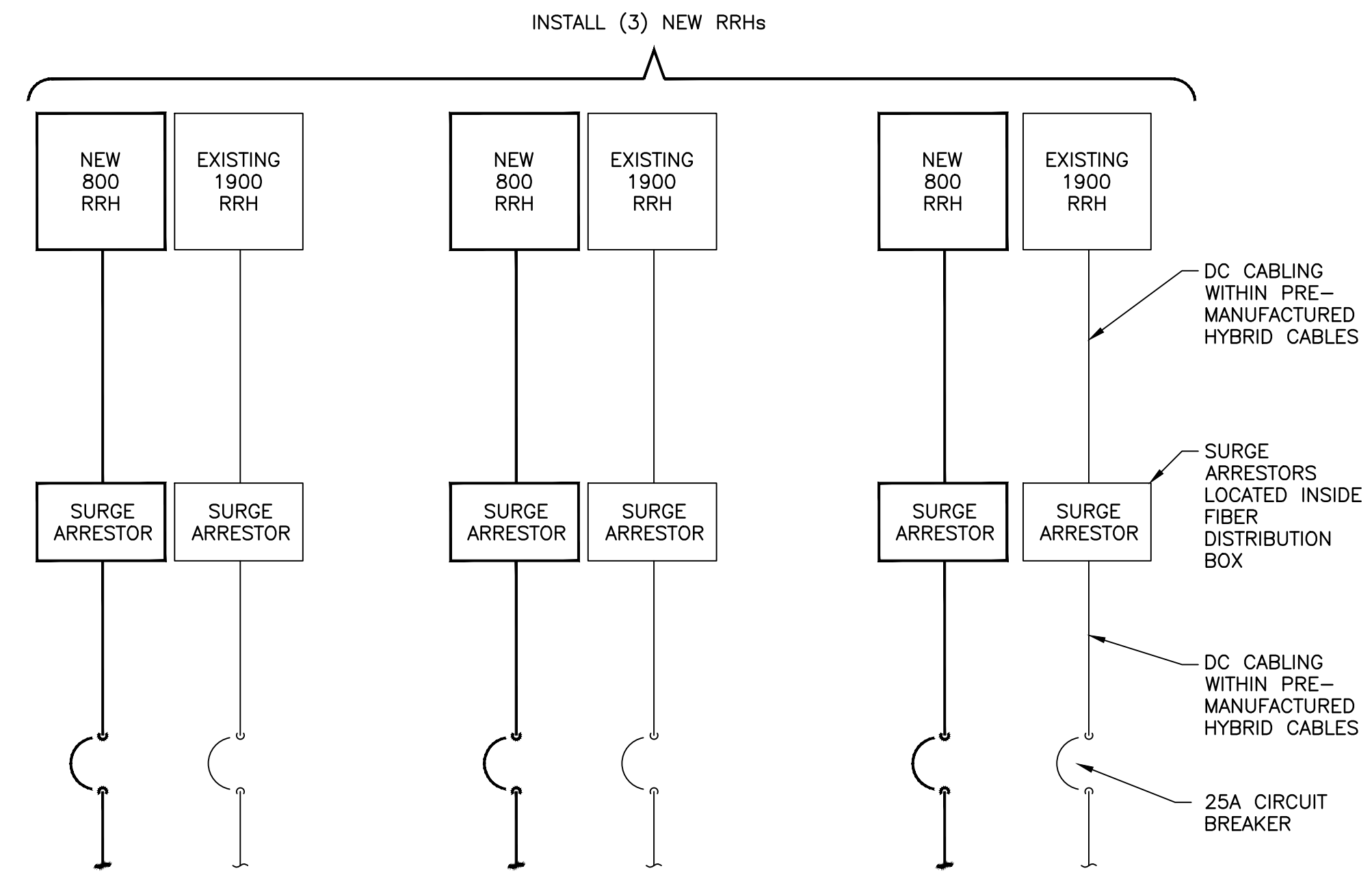
*Nicholas D. Barile*  
NICHOLAS D. BARILE  
PROFESSIONAL ENGINEER, CT LIC. No. 28643

**CT43XC856**  
395 ROUND HILL ROAD  
GREENWICH, CT 06831  
FAIRFIELD COUNTY

DRAWING TITLE:  
**GROUNDING DETAILS**

DRAWING SHEET: 9 OF 10

**E-1**



1 DC ONE-LINE DIAGRAM  
E-2 SCALE: NTS

A/C PANEL SCHEDULE					
VOLTAGE:	240V/120	PANEL STATUS:	EXISTING	N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP	MODEL NUMBER:	TBD	INTERNAL TVSS:	YES
MOUNT:	EQUIP. ROOM	PHASE:	1	WIRE:	3
ENCLOSURE:	NEMA 3R	BUSS RATING:	200 AMP	GROUND BAR:	YES
		NEUTRAL BAR:	YES		

2 AC PANEL SCHEDULE  
E-2 SCALE: NTS

SCHEDULE OF REVISIONS		
7		
6		
5		
4	02/26/19	ISSUED AS FINAL
3	12/28/18	PER NEW SCOPE OF WORK
2	05/01/18	REVISED PER COMMENTS
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REV NO.	DATE	DESCRIPTION OF CHANGES

**DRAWN BY:** DTB  
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*Nicholas D. Barile*  
**NICHOLAS D. BARILE**  
PROFESSIONAL ENGINEER, C.T.L.C. No. 28643

**CT43XC856**  
**395 ROUND HILL ROAD**  
**GREENWICH, CT 06831**  
**FAIRFIELD COUNTY**

**DRAWING TITLE:**  
**DC POWER**  
**DETAILS & PANEL**  
**SCHEDULES**

**DRAWING SHEET: 10 OF 10**

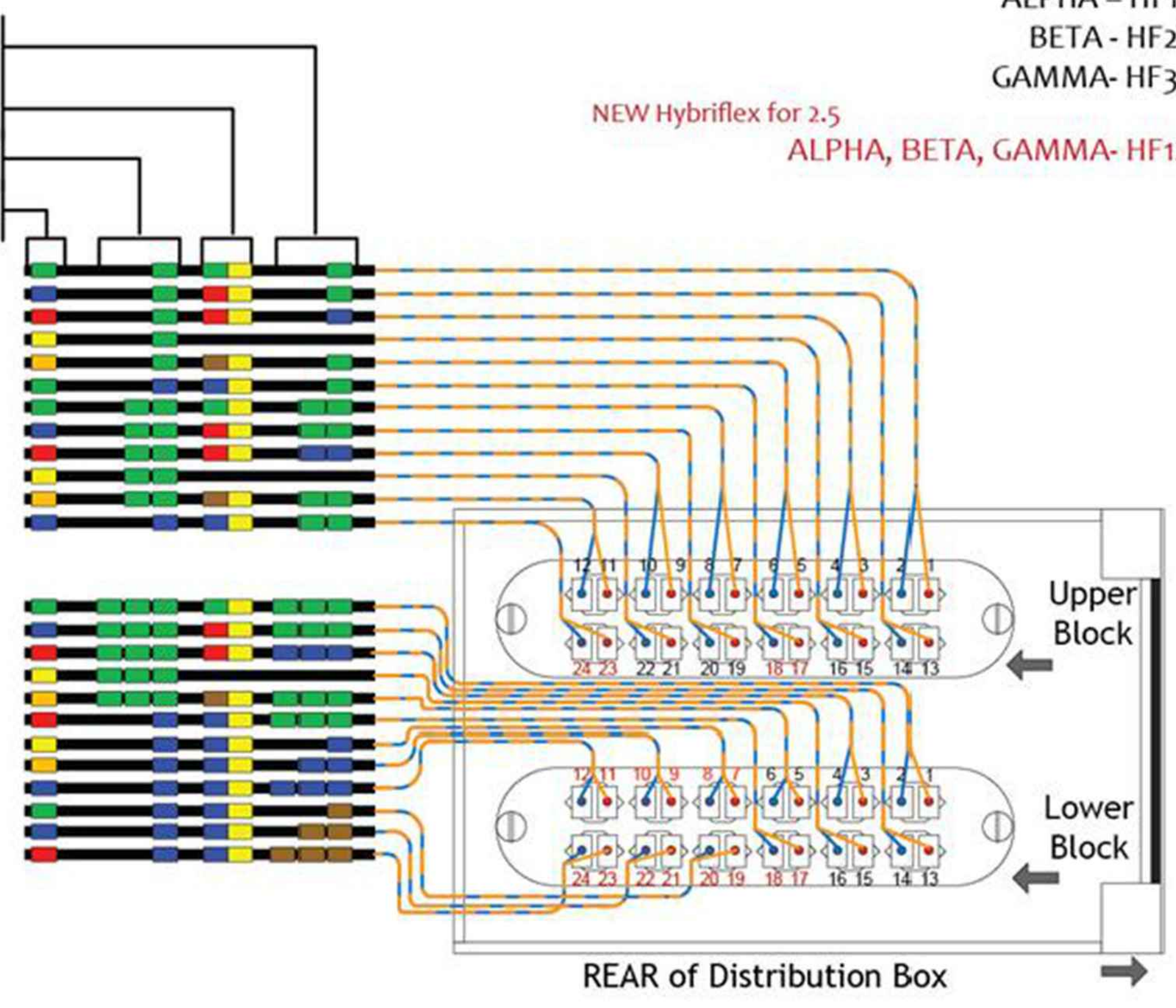
**E-2**

Each sector has separate Hybriflex cable.  
Hybriflex cable naming as follows:  
ALPHA - HF11  
BETA - HF21  
GAMMA - HF31  
NEW Hybriflex for 2.5  
ALPHA, BETA, GAMMA - HF12

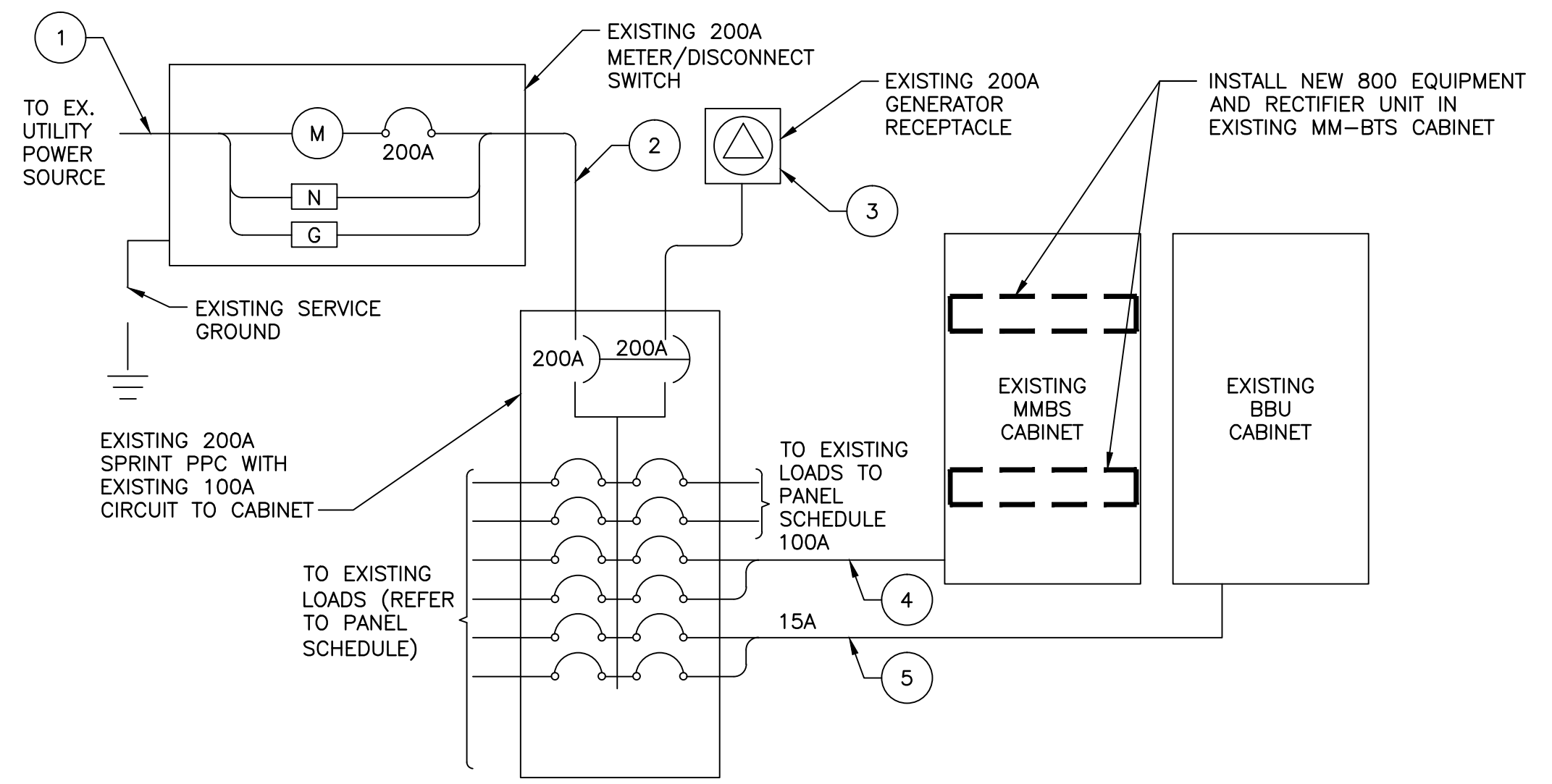
- FREQ BAND (1900,800) + RADIO NUMBER  
HYBRID SHEATH COLOR CODE  
RFS (OEM)COLOR CODE
- HF1 1 - FIBER PAIR 1-(F1)
  - HF1 1 - FIBER PAIR 2-(F2)
  - HF1 1 - FIBER PAIR 3-(F3)
  - HF1 1 - FIBER PAIR 4-(F4)
  - HF1 1 - FIBER PAIR 5-(F5)
  - HF1 2 - FIBER PAIR 1-(F1) 2.5 ALPHA 1
  - HF2 1 - FIBER PAIR 1-(F1)
  - HF2 1 - FIBER PAIR 2-(F2)
  - HF2 1 - FIBER PAIR 3-(F3)
  - HF2 1 - FIBER PAIR 4-(F4)
  - HF2 1 - FIBER PAIR 5-(F5)
  - HF1 2 - FIBER PAIR 2-(F2) 2.5 BETA 1

- HF3 1 - FIBER PAIR 1-(F1)
- HF3 1 - FIBER PAIR 2-(F2)
- HF3 1 - FIBER PAIR 3-(F3)
- HF3 1 - FIBER PAIR 4-(F4)
- HF3 1 - FIBER PAIR 5-(F5)
- HF1 2 - FIBER PAIR 3-(F3) 2.5 GAMMA 1
- HF1 2 - FIBER PAIR 4-(F4) 2.5 ALPHA 2
- HF1 2 - FIBER PAIR 5-(F5) 2.5 BETA 2
- HF1 2 - FIBER PAIR 6-(F6) 2.5 GAMMA 2
- HF1 2 - FIBER PAIR 7-(F7) 2.5 ALPHA 3
- HF1 2 - FIBER PAIR 8-(F8) 2.5 BETA 3
- HF1 2 - FIBER PAIR 9-(F9) 2.5 GAMMA 3

**NOTES:**  
1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.  
2). USE DC POWER LOOP.  
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.  
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.



3 TYPICAL FIBER DISTRIBUTION  
E-2 SCALE: NTS



CIRCUIT SCHEDULE			
NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	EXISTING
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EX. MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1-1/2" CONDUIT
5	TRANSFER & LOAD CENTER	EX. BBU CABINET	(2) #12 AWG, (1) #12 GND IN 3/4" CONDUIT

4 ELECTRICAL ONE-LINE DIAGRAM  
E-2 SCALE: NTS



## Structural Analysis Report

Prepared for:

**KGI**

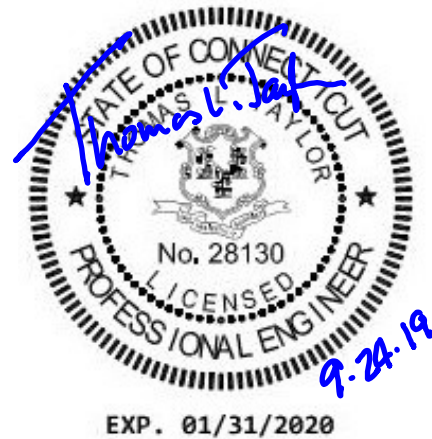
805 Las Cimas Parkway  
Building Three, Suite 370  
Austin, TX 78746

ATTN: Mr. Sean Rock

**Structure** : 114 ft Monopole  
**Site ID** : 27741\_B  
**Proposed Carrier** : Sprint  
**Site Name** : Round Hill CT  
**Site Location** : 395 Round Hill Road  
Greenwich, CT  
41.095117, -73.664219  
**County** : Greenwich  
**Date** : September 16, 2019  
**Max Usage** : 51%  
**Result** : Pass

Prepared By:  
Jung Hyun Hong  
Structural Engineer

A handwritten signature in black ink, appearing to read 'JH Hong', is written over a light blue rectangular background.







**Table of Contents**

Introduction .....	1
Supporting Documents .....	1
Analysis .....	1
Conclusion.....	1
Existing and Reserved Equipment.....	2
Equipment to be Removed.....	2
Proposed Equipment .....	2
Structure Usages.....	3
Foundations .....	3
Deflection, Twist, and Sway.....	3
Standard Conditions .....	4
Calculations .....	Attached

**Introduction**

The purpose of this report is to summarize results of a structural analysis performed on the 114 ft monopole to reflect the change in loading by Sprint.

**Supporting Documents**

<b>Tower Drawings</b>	EI Drawing #GS56652-2, dated September 28, 2007
<b>Foundation Drawing</b>	EI Drawing #14679S-115.0, dated February 12, 2007
<b>Geotechnical Report</b>	Clarence Welti Associate, dated February 6, 2007

**Analysis**

The tower was analyzed using American Tower Corporation’s tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	93 mph (3-Second Gust) Vasd / 120 mph (3-Second Gust) Vult
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
<b>Structure Class:</b>	II
<b>Exposure Category:</b>	D (Hurricane Zone)
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Spectral Response:</b>	$S_s = 0.26, S_1 = 0.07$
<b>Site Class:</b>	D - Stiff Soil

**Conclusion**

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

**The pier reinforcement is less than the minimum allowance. Due to this, the pier should be frequently monitored for cracking/spalling.**

If you have any questions or require additional information, please contact Semaan Engineering Solutions at 402-289-1888.

**Existing and Reserved Equipment**

This loading **is** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
110.0	110.0	3	DBXNH-6565A-A2M	Flush Mount Inside Canister	(12) 1 5/8"	T-Mobile
		3	TMAT1921XB6811A			
		3	782 11066			
100.0	-	-	-	Flush Mount Inside Canister	(6) 1 5/8"	Sprint
90.0	-	-	-	Empty Flush Mount Inside Canister	-	-

**Equipment to be Removed**

This loading **is not** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
100.0	100.0	3	RR65-18-00DPL2	-	-	Sprint

**Proposed Equipment**

This loading **is** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
100.0	100.0	3	APXVSP18-C-A20	Existing Flush Mount Inside Canister	(2) 1 1/4"	Sprint
		6	KIT-FD9R6004/1C-DL			
		9	IBC1900HG-SA			

Install proposed coax inside the pole shaft.



**Structure Usages**

Structural Component	Controlling Usage	Pass/Fail
Shaft	31%	Pass
Base Plate	31%	Pass
Anchor Bolts	51%	Pass
Flange Bolts	9%	Pass

**Foundations**

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	504.0	46%
Axial (Kips)	27.0	18%
Shear (Kips)	8.9	19%
Reinf. Conc. Foundation Capacity	N/A	22%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

**Deflection and Sway\***

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
100.0	APXVSP18-C-A20	Sprint	0.390	0.752
	KIT-FD9R6004/1C-DL			
	IBC1900HG-SA			

\*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G



## **Standard Conditions**

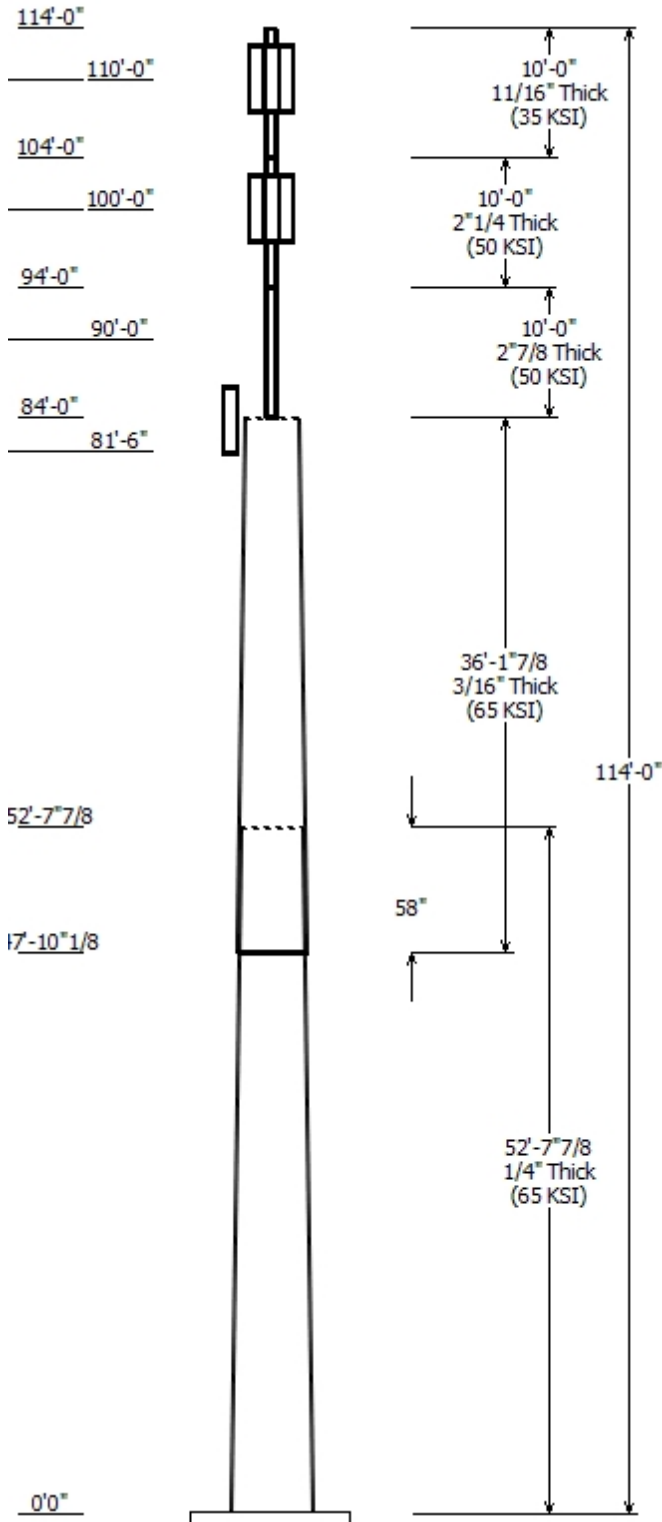
All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



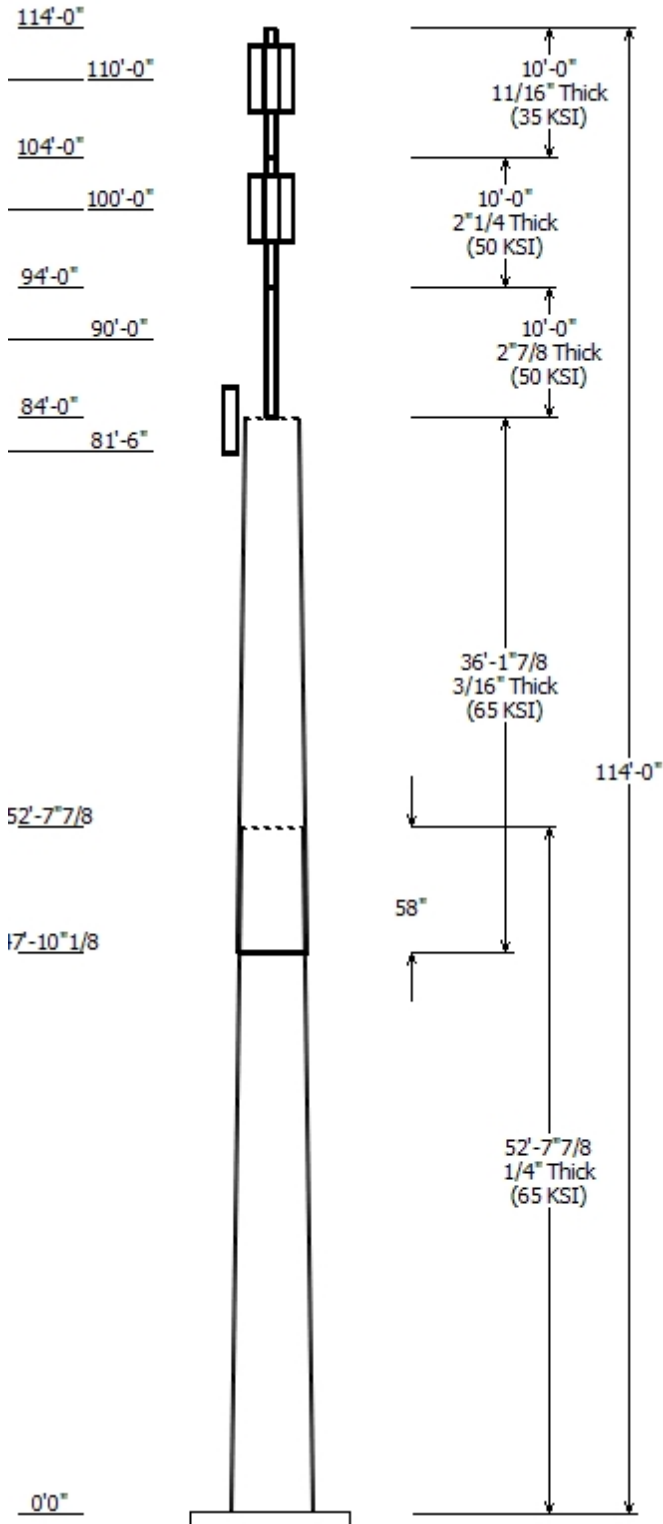
Job Information	
Pole :	27741_B
Code :	ANSI/TIA-222-G
Description :	
Client :	KGI
Struct Class :	II
Location :	Round Hill CT, Greenwich, CT
Shape :	18 Sides
Exposure :	D
Height :	114.00 (ft)
Topo :	1
Base Elev (ft) :	1.00
Taper :	0.14434(in/ft)

Sections Properties								
Shaft Section	Length (ft)	Diameter (in)		Thick (in)	Joint Type	Overlap		Steel Grade (ksi)
		Top	Bottom			Length (in)	Taper (in/ft)	
1	52.658	33.39	41.00	0.250		0.000	0.144341	65
2	36.158	29.25	34.46	0.188	Slip Joint	57.781	0.144341	65
3	10.000	5.750	5.750	2.875	Butt Joint	0.000	0.000000	50
4	10.000	4.500	4.500	2.250	Butt Joint	0.000	0.000000	50
5	10.000	4.500	4.500	0.674	Butt Joint	0.000	0.000000	35

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
110.000	110.000	3	782 11066
110.000	110.000	3	TMAT1921XB6811A
110.000	110.000	3	DBXNH-6565A-A2M
110.000	110.000	1	Flush Mount
100.000	100.000	9	IBC1900HG-SA
100.000	100.000	6	KIT-FD9R6004/1C-DL
100.000	100.000	3	APXVSP18-C-A20
100.000	100.000	1	Flush Mount
90.000	90.000	1	Flush Mount
81.500	83.000	1	GPS
81.500	81.500	1	3 ft Standoff

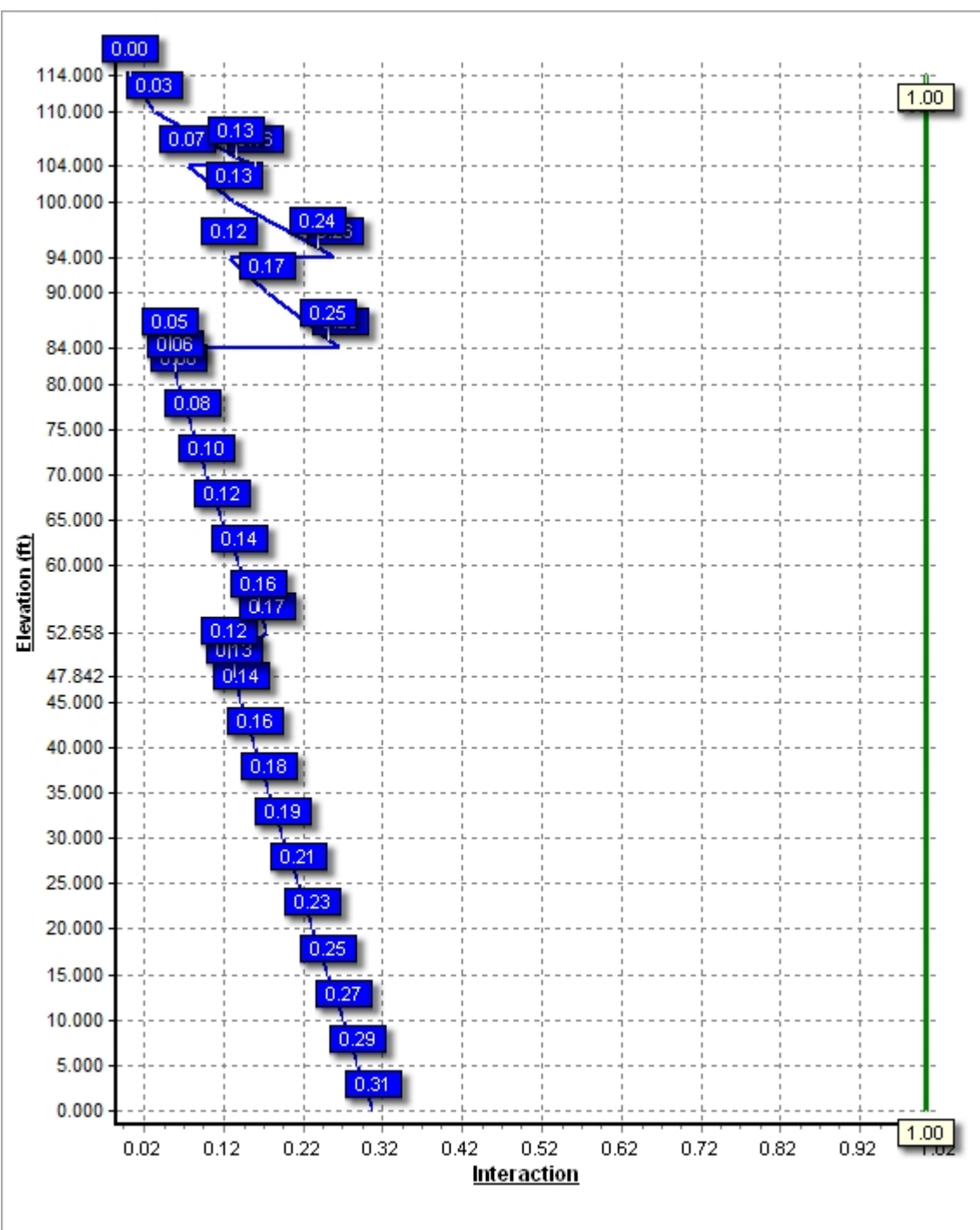
Linear Appurtenance			
Elev (ft) From	To	Description	Exposed To Wind
104.0	114.0	Concealment	Yes
94.000	104.0	Concealment	Yes
84.000	94.000	Concealment	Yes
0.000	100.0	.32"	No
0.000	100.0	1 1/4" Coax	No
0.000	100.0	1 5/8" Coax	No
0.000	110.0	.32"	No
0.000	110.0	1 5/8" Coax	No
0.000	81.500	1/2" Coax	No

Load Cases	
1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph



Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	503.96	8.95	15.49
0.9D + 1.6W	501.34	8.94	11.61
1.2D + 1.0Di + 1.0Wi	196.12	3.32	27.00
(1.2 + 0.2Sds) * DL + E ELFM	67.58	0.83	15.40
(1.2 + 0.2Sds) * DL + E EMAM	61.07	0.80	15.40
(0.9 - 0.2Sds) * DL + E ELFM	67.07	0.83	10.37
(0.9 - 0.2Sds) * DL + E EMAM	60.55	0.80	10.37
1.0D + 1.0W	130.62	2.33	12.91

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000





Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:08 AM

Customer: KGI

**Analysis Parameters**

Location:	Greenwich County, CT		
Code:	ANSI/TIA-222-G	Height (ft):	114
Shape:	18 Sides. Sect 3: Round Solid. Sect 4: Round Solid. Sect 5: Round		41.00
Pole Type:	Custom	Top Diameter (in):	4.50
Pole Manufacturer:	EI	Taper (in/ft) :	0.144

**Ice & Wind Parameters**

Structure Class:	II	Design Wind Speed Without Ice:	93 mph
Exposure Category:	D	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	0.75 in

**Seismic Parameters**

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	1.53		
$T_L$ (sec):	6	$p$ :	1.3
$S_s$ :	0.259	$S_1$ :	0.071
$F_a$ :	1.593	$F_v$ :	2.400
$S_{ds}$ :	0.275	$S_{d1}$ :	0.114
		$C_s$ :	0.050
		$C_s$ Max:	0.050
		$C_s$ Min:	0.030

**Load Cases**

1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:08 AM

Customer: KGI

**Shaft Section Properties**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom						Top						
							Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	52.658	0.2500	65		0.00	5,253	41.00	0.00	32.33	6783.7	27.51	164.00	33.39	52.66	26.30	3651.8	22.15	133.60	0.144341
2-18	36.158	0.1875	65	Slip	57.78	2,319	34.46	47.84	20.40	3029.3	31.00	183.84	29.25	84.00	17.30	1845.7	26.10	156.00	0.144341
3-RS	10.000	2.8750	50	Butt	0.00	884	5.750	84.00	25.97	53.7	0.00	2.00	5.750	94.00	25.97	53.7	0.00	2.00	0.000000
4-RS	10.000	2.2500	50	Butt	0.00	541	4.500	94.00	15.90	20.1	0.00	2.00	4.500	104.00	15.90	20.1	0.00	2.00	0.000000
5-R	10.000	0.6740	35	Butt	0.00	276	4.500	104.00	8.10	14.8	0.00	6.68	4.500	114.00	8.10	14.8	0.00	6.68	0.000000
Shaft Weight						9,273													

**Discrete Appurtenance Properties**

Attach Elev (ft)	Description	Qty	Weight (lb)	No Ice EPAa (sf)	Orientation Factor	Weight (lb)	Ice EPAa (sf)	Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
110.00	782 11066	3	1.76	0.000	1.00	5.33	0.000	1.00	0.000	0.000
110.00	DBXNH-6565A-A2M	3	34.20	0.000	1.00	153.17	0.000	1.00	0.000	0.000
110.00	Flush Mount	1	120.00	0.000	1.00	282.20	0.000	1.00	0.000	0.000
110.00	TMAT1921XB6811A	3	17.60	0.000	1.00	35.49	0.000	1.00	0.000	0.000
100.00	APXVSPP18-C-A20	3	57.00	0.000	1.00	171.46	0.000	1.00	0.000	0.000
100.00	Flush Mount	1	120.00	0.000	1.00	280.64	0.000	1.00	0.000	0.000
100.00	IBC1900HG-SA	9	22.00	0.000	1.00	66.18	0.000	1.00	0.000	0.000
100.00	KIT-FD9R6004/1C-DL	6	6.40	0.000	1.00	17.57	0.000	1.00	0.000	0.000
90.00	Flush Mount	1	120.00	0.000	1.00	278.93	0.000	1.00	0.000	0.000
81.50	3 ft Standoff	1	40.00	2.630	1.00	115.55	8.247	1.00	0.000	0.000
81.50	GPS	1	10.00	0.070	1.00	13.74	0.200	1.00	0.000	1.500
Totals		32	978.08			2,768.38			Number of Loadings :	11

**Linear Appurtenance Properties**

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Protected Flat	Protected Width (in)	Exposed To Wind	Carrier
104.00	114.00	1	Concealment (0.5)	30.00	16.95	N	12.75	Y	
0.00	110.00	1	.32"	0.32	0.06	N	0.00	N	T-Mobile
0.00	110.00	12	1 5/8" Coax	1.98	1.04	N	0.00	N	T-Mobile
94.00	104.00	1	Concealment (0.5)	30.00	16.95	N	12.75	Y	
0.00	100.00	1	.32"	0.32	0.06	N	0.00	N	Sprint
0.00	100.00	2	1 1/4" Coax	1.55	0.66	N	0.00	N	Sprint
0.00	100.00	6	1 5/8" Coax	1.98	1.04	N	0.00	N	Sprint
84.00	94.00	1	Concealment (0.5)	30.00	16.95	N	12.12	Y	
0.00	81.50	1	1/2" Coax	0.65	0.16	N	0.00	N	Sprint

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:09 AM

Customer: KGI

**Segment Properties** (Max Len : 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fy (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)
0.00		0.2500	41.000	32.334	6,783.7	27.51	164.00	69.0	325.9	0.0	0.0
5.00		0.2500	40.278	31.761	6,429.6	27.00	161.11	69.6	314.4	0.0	545.3
10.00		0.2500	39.557	31.189	6,088.1	26.49	158.23	70.2	303.1	0.0	535.5
15.00		0.2500	38.835	30.616	5,758.9	25.98	155.34	70.8	292.1	0.0	525.8
20.00		0.2500	38.113	30.043	5,441.7	25.47	152.45	71.4	281.2	0.0	516.0
25.00		0.2500	37.391	29.471	5,136.4	24.96	149.57	72.0	270.6	0.0	506.3
30.00		0.2500	36.670	28.898	4,842.8	24.45	146.68	72.6	260.1	0.0	496.5
35.00		0.2500	35.948	28.325	4,560.6	23.94	143.79	73.2	249.9	0.0	486.8
40.00		0.2500	35.226	27.753	4,289.5	23.43	140.91	73.8	239.8	0.0	477.1
45.00		0.2500	34.505	27.180	4,029.4	22.93	138.02	74.4	230.0	0.0	467.3
47.84	Bot - Section 2	0.2500	34.094	26.855	3,886.4	22.64	136.38	74.8	224.5	0.0	261.3
50.00		0.2500	33.783	26.607	3,780.1	22.42	135.13	75.0	220.4	0.0	345.3
52.66	Top - Section 1	0.1875	33.774	19.988	2,848.7	30.35	180.13	65.7	166.1	0.0	421.0
55.00		0.1875	33.436	19.786	2,763.6	30.03	178.33	66.1	162.8	0.0	158.5
60.00		0.1875	32.715	19.357	2,587.5	29.35	174.48	66.9	155.8	0.0	333.0
65.00		0.1875	31.993	18.927	2,419.1	28.68	170.63	67.7	148.9	0.0	325.7
70.00		0.1875	31.271	18.498	2,258.1	28.00	166.78	68.5	142.2	0.0	318.4
75.00		0.1875	30.549	18.069	2,104.4	27.32	162.93	69.3	135.7	0.0	311.1
80.00		0.1875	29.828	17.639	1,957.9	26.64	159.08	70.1	129.3	0.0	303.8
81.50		0.1875	29.611	17.510	1,915.3	26.44	157.93	70.3	127.4	0.0	89.7
84.00	Top - Section 2	0.1875	29.250	17.295	1,845.7	26.10	156.00	70.7	124.3	0.0	148.0
84.00	Bot - Section 3	2.8750	5.750	25.967	53.7	0.00	2.00	50.0	18.7	31.7	
85.00		2.8750	5.750	25.967	53.7	0.00	2.00	50.0	18.7	31.7	88.4
90.00		2.8750	5.750	25.967	53.7	0.00	2.00	50.0	18.7	31.7	441.8
94.00	Top - Section 3	2.8750	5.750	25.967	53.7	0.00	2.00	50.0	18.7	31.7	353.4
94.00	Bot - Section 4	2.2500	4.500	15.904	20.1	0.00	2.00	50.0	8.9	15.2	
95.00		2.2500	4.500	15.904	20.1	0.00	2.00	50.0	8.9	15.2	54.1
100.0		2.2500	4.500	15.904	20.1	0.00	2.00	50.0	8.9	15.2	270.6
104.0	Top - Section 4	2.2500	4.500	15.904	20.1	0.00	2.00	50.0	8.9	15.2	216.5
104.0	Bot - Section 5	0.6740	4.500	8.101	14.8	0.00	6.68	35.0	6.6	10.0	
105.0		0.6740	4.500	8.101	14.8	0.00	6.68	35.0	6.6	10.0	27.6
110.0		0.6740	4.500	8.101	14.8	0.00	6.68	35.0	6.6	10.0	137.8
114.0		0.6740	4.500	8.101	14.8	0.00	6.68	35.0	6.6	10.0	110.3
9,272.8											

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:09 AM

Customer: KGI

**Load Case:** 1.2D + 1.6W

93 mph with No Ice

25 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		213.1	0.0					0.0	0.0	213.1	0.0	0.0	0.0
5.00		422.4	654.3					0.0	121.9	422.4	776.2	0.0	0.0
10.00		414.8	642.6					0.0	121.9	414.8	764.5	0.0	0.0
15.00		414.8	630.9					0.0	121.9	414.8	752.8	0.0	0.0
20.00		423.3	619.2					0.0	121.9	423.3	741.2	0.0	0.0
25.00		431.2	607.5					0.0	121.9	431.2	729.5	0.0	0.0
30.00		436.1	595.8					0.0	121.9	436.1	717.8	0.0	0.0
35.00		438.9	584.2					0.0	121.9	438.9	706.1	0.0	0.0
40.00		439.9	572.5					0.0	121.9	439.9	694.4	0.0	0.0
45.00		345.0	560.8					0.0	121.9	345.0	682.7	0.0	0.0
47.84	Bot - Section 2	220.6	313.6					0.0	69.3	220.6	382.9	0.0	0.0
50.00		213.4	414.4					0.0	52.6	213.4	467.0	0.0	0.0
52.66	Top - Section 1	221.1	505.2					0.0	64.8	221.1	570.0	0.0	0.0
55.00		323.2	190.2					0.0	57.1	323.2	247.3	0.0	0.0
60.00		437.9	399.6					0.0	121.9	437.9	521.5	0.0	0.0
65.00		434.1	390.8					0.0	121.9	434.1	512.7	0.0	0.0
70.00		429.8	382.1					0.0	121.9	429.8	504.0	0.0	0.0
75.00		424.8	373.3					0.0	121.9	424.8	495.2	0.0	0.0
80.00		273.9	364.5					0.0	121.9	273.9	486.4	0.0	0.0
81.50	Appertunance(s)	166.9	107.6	138.5	0.0	5.4	60.0	0.0	36.6	305.4	204.2	0.0	0.0
84.00	Top - Section 2	118.9	177.7					0.0	60.5	118.9	238.1	0.0	0.0
85.00		89.5	106.0					31.3	44.5	120.8	150.6	0.0	0.0
90.00	Appertunance(s)	134.9	530.2	0.0	0.0	0.0	144.0	157.4	222.7	292.2	896.8	0.0	0.0
94.00	Top - Section 3	72.1	424.1					127.0	178.1	199.1	602.3	0.0	0.0
95.00		71.4	64.9					33.5	44.5	104.9	109.5	0.0	0.0
100.00	Appertunance(s)	107.5	324.7	0.0	0.0	0.0	632.9	168.6	222.7	276.2	1,180.3	0.0	0.0
104.00	Top - Section 4	60.0	259.8					136.0	141.6	196.0	401.3	0.0	0.0
105.00		72.6	33.1					34.1	35.4	106.7	68.5	0.0	0.0
110.00	Appertunance(s)	109.3	165.4	0.0	0.0	0.0	336.8	171.5	176.9	280.8	679.2	0.0	0.0
114.00		48.8	132.3					138.2	81.4	186.9	213.7	0.0	0.0
<b>Totals:</b>										<b>9,146.23</b>	<b>15,496.6</b>	<b>0.00</b>	<b>0.00</b>

**Load Case: 1.2D + 1.6W**

93 mph with No Ice

25 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

**Calculated Forces**

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 (deg)	Ratio
0.00	-15.49	-8.95	0.00	-503.96	0.00	503.96	2,009.33	1,004.66	3,370.24	1,687.62	0.00	0.00	0.306
5.00	-14.70	-8.55	0.00	-459.22	0.00	459.22	1,990.85	995.43	3,279.75	1,642.31	0.05	-0.10	0.287
10.00	-13.92	-8.16	0.00	-416.48	0.00	416.48	1,971.76	985.88	3,189.37	1,597.06	0.21	-0.20	0.268
15.00	-13.16	-7.76	0.00	-375.70	0.00	375.70	1,952.06	976.03	3,099.16	1,551.88	0.47	-0.29	0.249
20.00	-12.41	-7.35	0.00	-336.91	0.00	336.91	1,931.73	965.87	3,009.15	1,506.81	0.82	-0.38	0.230
25.00	-11.67	-6.93	0.00	-300.16	0.00	300.16	1,910.79	955.40	2,919.43	1,461.88	1.26	-0.46	0.211
30.00	-10.95	-6.50	0.00	-265.52	0.00	265.52	1,889.23	944.62	2,830.03	1,417.12	1.79	-0.54	0.193
35.00	-10.24	-6.07	0.00	-233.01	0.00	233.01	1,867.06	933.53	2,741.01	1,372.54	2.40	-0.61	0.175
40.00	-9.54	-5.63	0.00	-202.68	0.00	202.68	1,844.27	922.13	2,652.43	1,328.19	3.08	-0.68	0.158
45.00	-8.86	-5.28	0.00	-174.52	0.00	174.52	1,820.86	910.43	2,564.34	1,284.08	3.82	-0.74	0.141
47.84	-8.48	-5.06	0.00	-159.50	0.00	159.50	1,807.27	903.64	2,514.51	1,259.12	4.28	-0.78	0.131
50.00	-8.01	-4.85	0.00	-148.58	0.00	148.58	1,796.83	898.42	2,476.80	1,240.24	4.63	-0.80	0.124
52.66	-7.44	-4.62	0.00	-135.69	0.00	135.69	1,181.92	590.96	1,634.85	818.64	5.09	-0.83	0.172
55.00	-7.20	-4.30	0.00	-124.87	0.00	124.87	1,176.68	588.34	1,611.12	806.76	5.50	-0.85	0.161
60.00	-6.68	-3.86	0.00	-103.37	0.00	103.37	1,165.04	582.52	1,560.37	781.35	6.43	-0.91	0.138
65.00	-6.17	-3.42	0.00	-84.07	0.00	84.07	1,152.79	576.40	1,509.51	755.88	7.41	-0.96	0.117
70.00	-5.67	-2.99	0.00	-66.95	0.00	66.95	1,139.92	569.96	1,458.59	730.38	8.45	-1.01	0.097
75.00	-5.18	-2.56	0.00	-52.01	0.00	52.01	1,126.44	563.22	1,407.67	704.88	9.52	-1.05	0.078
80.00	-4.70	-2.28	0.00	-39.22	0.00	39.22	1,112.33	556.17	1,356.80	679.41	10.64	-1.08	0.062
81.50	-4.50	-1.97	0.00	-35.80	0.00	35.80	1,107.98	553.99	1,341.56	671.78	10.98	-1.08	0.057
84.00	-4.27	-1.85	0.00	-30.88	0.00	30.88	1,100.61	550.30	1,316.18	659.07	11.55	-1.10	0.051
84.00	-4.27	-1.85	0.00	-30.88	0.00	30.88	1,168.53	584.26	139.98	118.82	11.55	-1.10	0.264
85.00	-4.11	-1.75	0.00	-29.03	0.00	29.03	1,168.53	584.26	139.98	118.82	11.78	-1.10	0.248
90.00	-3.21	-1.46	0.00	-20.29	0.00	20.29	1,168.53	584.26	139.98	118.82	13.30	-1.76	0.174
94.00	-2.61	-1.25	0.00	-14.45	0.00	14.45	1,168.53	584.26	139.98	118.82	14.93	-2.12	0.124
94.00	-2.61	-1.25	0.00	-14.45	0.00	14.45	715.69	357.85	67.10	56.95	14.93	-2.12	0.257
95.00	-2.49	-1.16	0.00	-13.20	0.00	13.20	715.69	357.85	67.10	56.95	15.38	-2.20	0.235
100.00	-1.32	-0.84	0.00	-7.40	0.00	7.40	715.69	357.85	67.10	56.95	18.10	-2.93	0.132
104.00	-0.93	-0.63	0.00	-4.03	0.00	4.03	715.69	357.85	67.10	56.95	20.70	-3.25	0.072
104.00	-0.93	-0.63	0.00	-4.03	0.00	4.03	255.19	127.60	34.57	26.17	20.70	-3.25	0.158
105.00	-0.86	-0.52	0.00	-3.40	0.00	3.40	255.19	127.60	34.57	26.17	21.38	-3.30	0.133
110.00	-0.20	-0.20	0.00	-0.80	0.00	0.80	255.19	127.60	34.57	26.17	24.97	-3.50	0.031
114.00	0.00	-0.19	0.00	0.00	0.00	0.00	255.19	127.60	34.57	26.17	27.91	-3.53	0.000

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:09 AM

Customer: KGI

**Load Case:** 0.9D + 1.6W

93 mph with No Ice (Reduced DL)

25 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces					
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)	
0.00		213.1	0.0					0.0	0.0	213.1	0.0	0.0	0.0	
5.00		422.4	490.7					0.0	91.4	422.4	582.2	0.0	0.0	
10.00		414.8	482.0					0.0	91.4	414.8	573.4	0.0	0.0	
15.00		414.8	473.2					0.0	91.4	414.8	564.6	0.0	0.0	
20.00		423.3	464.4					0.0	91.4	423.3	555.9	0.0	0.0	
25.00		431.2	455.7					0.0	91.4	431.2	547.1	0.0	0.0	
30.00		436.1	446.9					0.0	91.4	436.1	538.3	0.0	0.0	
35.00		438.9	438.1					0.0	91.4	438.9	529.6	0.0	0.0	
40.00		439.9	429.3					0.0	91.4	439.9	520.8	0.0	0.0	
45.00		345.0	420.6					0.0	91.4	345.0	512.0	0.0	0.0	
47.84	Bot - Section 2	220.6	235.2					0.0	52.0	220.6	287.2	0.0	0.0	
50.00		213.4	310.8					0.0	39.5	213.4	350.3	0.0	0.0	
52.66	Top - Section 1	221.1	378.9					0.0	48.6	221.1	427.5	0.0	0.0	
55.00		323.2	142.7					0.0	42.8	323.2	185.5	0.0	0.0	
60.00		437.9	299.7					0.0	91.4	437.9	391.1	0.0	0.0	
65.00		434.1	293.1					0.0	91.4	434.1	384.6	0.0	0.0	
70.00		429.8	286.5					0.0	91.4	429.8	378.0	0.0	0.0	
75.00		424.8	280.0					0.0	91.4	424.8	371.4	0.0	0.0	
80.00		273.9	273.4					0.0	91.4	273.9	364.8	0.0	0.0	
81.50	Appertunance(s)	166.9	80.7	138.5	0.0	5.4	45.0	0.0	27.4	305.4	153.2	0.0	0.0	
84.00	Top - Section 2	118.9	133.2					0.0	45.4	118.9	178.6	0.0	0.0	
85.00		89.5	79.5					31.3	33.4	120.8	112.9	0.0	0.0	
90.00	Appertunance(s)	134.9	397.6	0.0	0.0	0.0	108.0	157.4	167.0	292.2	672.6	0.0	0.0	
94.00	Top - Section 3	72.1	318.1					127.0	133.6	199.1	451.7	0.0	0.0	
95.00		71.4	48.7					33.5	33.4	104.9	82.1	0.0	0.0	
100.00	Appertunance(s)	107.5	243.5	0.0	0.0	0.0	474.7	168.6	167.0	276.2	885.2	0.0	0.0	
104.00	Top - Section 4	60.0	194.8					136.0	106.2	196.0	301.0	0.0	0.0	
105.00		72.6	24.8					34.1	26.5	106.7	51.4	0.0	0.0	
110.00	Appertunance(s)	109.3	124.1	0.0	0.0	0.0	252.6	171.5	132.7	280.8	509.4	0.0	0.0	
114.00		48.8	99.2					138.2	61.0	186.9	160.3	0.0	0.0	
							<b>Totals:</b>				<b>9,146.23</b>	<b>11,622.4</b>	<b>0.00</b>	<b>0.00</b>

**Load Case: 0.9D + 1.6W**

93 mph with No Ice (Reduced DL)

25 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

**Calculated Forces**

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 (deg)	Ratio
0.00	-11.61	-8.94	0.00	-501.34	0.00	501.34	2,009.33	1,004.66	3,370.24	1,687.62	0.00	0.00	0.303
5.00	-11.02	-8.54	0.00	-456.62	0.00	456.62	1,990.85	995.43	3,279.75	1,642.31	0.05	-0.10	0.284
10.00	-10.43	-8.14	0.00	-413.92	0.00	413.92	1,971.76	985.88	3,189.37	1,597.06	0.21	-0.20	0.265
15.00	-9.86	-7.74	0.00	-373.22	0.00	373.22	1,952.06	976.03	3,099.16	1,551.88	0.47	-0.29	0.246
20.00	-9.29	-7.33	0.00	-334.53	0.00	334.53	1,931.73	965.87	3,009.15	1,506.81	0.82	-0.38	0.227
25.00	-8.74	-6.90	0.00	-297.90	0.00	297.90	1,910.79	955.40	2,919.43	1,461.88	1.26	-0.46	0.208
30.00	-8.20	-6.47	0.00	-263.39	0.00	263.39	1,889.23	944.62	2,830.03	1,417.12	1.78	-0.54	0.190
35.00	-7.66	-6.04	0.00	-231.02	0.00	231.02	1,867.06	933.53	2,741.01	1,372.54	2.38	-0.61	0.172
40.00	-7.14	-5.60	0.00	-200.83	0.00	200.83	1,844.27	922.13	2,652.43	1,328.19	3.06	-0.68	0.155
45.00	-6.63	-5.25	0.00	-172.83	0.00	172.83	1,820.86	910.43	2,564.34	1,284.08	3.80	-0.74	0.138
47.84	-6.34	-5.03	0.00	-157.90	0.00	157.90	1,807.27	903.64	2,514.51	1,259.12	4.25	-0.77	0.129
50.00	-5.99	-4.82	0.00	-147.04	0.00	147.04	1,796.83	898.42	2,476.80	1,240.24	4.60	-0.80	0.122
52.66	-5.57	-4.59	0.00	-134.23	0.00	134.23	1,181.92	590.96	1,634.85	818.64	5.05	-0.82	0.169
55.00	-5.38	-4.27	0.00	-123.48	0.00	123.48	1,176.68	588.34	1,611.12	806.76	5.47	-0.85	0.158
60.00	-5.00	-3.83	0.00	-102.12	0.00	102.12	1,165.04	582.52	1,560.37	781.35	6.38	-0.91	0.135
65.00	-4.62	-3.40	0.00	-82.96	0.00	82.96	1,152.79	576.40	1,509.51	755.88	7.36	-0.96	0.114
70.00	-4.24	-2.96	0.00	-65.98	0.00	65.98	1,139.92	569.96	1,458.59	730.38	8.39	-1.00	0.094
75.00	-3.88	-2.53	0.00	-51.17	0.00	51.17	1,126.44	563.22	1,407.67	704.88	9.45	-1.04	0.076
80.00	-3.52	-2.25	0.00	-38.50	0.00	38.50	1,112.33	556.17	1,356.80	679.41	10.56	-1.07	0.060
81.50	-3.37	-1.95	0.00	-35.12	0.00	35.12	1,107.98	553.99	1,341.56	671.78	10.89	-1.08	0.055
84.00	-3.19	-1.82	0.00	-30.25	0.00	30.25	1,100.61	550.30	1,316.18	659.07	11.46	-1.09	0.049
84.00	-3.19	-1.82	0.00	-30.25	0.00	30.25	1,168.53	584.26	139.98	118.82	11.46	-1.09	0.257
85.00	-3.07	-1.72	0.00	-28.43	0.00	28.43	1,168.53	584.26	139.98	118.82	11.69	-1.09	0.242
90.00	-2.39	-1.43	0.00	-19.83	0.00	19.83	1,168.53	584.26	139.98	118.82	13.19	-1.73	0.169
94.00	-1.95	-1.22	0.00	-14.10	0.00	14.10	1,168.53	584.26	139.98	118.82	14.80	-2.09	0.120
94.00	-1.95	-1.22	0.00	-14.10	0.00	14.10	715.69	357.85	67.10	56.95	14.80	-2.09	0.250
95.00	-1.86	-1.13	0.00	-12.88	0.00	12.88	715.69	357.85	67.10	56.95	15.24	-2.16	0.229
100.00	-0.98	-0.82	0.00	-7.22	0.00	7.22	715.69	357.85	67.10	56.95	17.91	-2.87	0.128
104.00	-0.69	-0.61	0.00	-3.93	0.00	3.93	715.69	357.85	67.10	56.95	20.46	-3.19	0.070
104.00	-0.69	-0.61	0.00	-3.93	0.00	3.93	255.19	127.60	34.57	26.17	20.46	-3.19	0.153
105.00	-0.64	-0.51	0.00	-3.32	0.00	3.32	255.19	127.60	34.57	26.17	21.14	-3.24	0.129
110.00	-0.15	-0.20	0.00	-0.78	0.00	0.78	255.19	127.60	34.57	26.17	24.65	-3.44	0.031
114.00	0.00	-0.19	0.00	0.00	0.00	0.00	255.19	127.60	34.57	26.17	27.55	-3.47	0.000

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:10 AM

Customer: KGI

<b>Load Case:</b> 1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice	24 Iterations
Gust Response Factor : 1.10	Ice Dead Load Factor : 1.00	Wind Importance Factor : 1.00
Dead Load Factor : 1.20		Ice Importance Factor : 1.00
Wind Load Factor : 1.00		

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		75.2	0.0					0.0	0.0	75.2	0.0	0.0	0.0
5.00		149.5	965.7					0.0	121.9	149.5	1,087.6	0.0	0.0
10.00		147.6	977.9					0.0	121.9	147.6	1,099.8	0.0	0.0
15.00		148.1	976.4					0.0	121.9	148.1	1,098.3	0.0	0.0
20.00		151.7	969.7					0.0	121.9	151.7	1,091.6	0.0	0.0
25.00		154.9	960.3					0.0	121.9	154.9	1,082.2	0.0	0.0
30.00		157.1	949.0					0.0	121.9	157.1	1,070.9	0.0	0.0
35.00		158.5	936.5					0.0	121.9	158.5	1,058.4	0.0	0.0
40.00		159.3	923.1					0.0	121.9	159.3	1,045.0	0.0	0.0
45.00		125.2	908.9					0.0	121.9	125.2	1,030.8	0.0	0.0
47.84	Bot - Section 2	80.2	511.0					0.0	69.3	80.2	580.3	0.0	0.0
50.00		77.6	565.3					0.0	52.6	77.6	617.9	0.0	0.0
52.66	Top - Section 1	80.5	690.0					0.0	64.8	80.5	754.8	0.0	0.0
55.00		117.9	352.3					0.0	57.1	117.9	409.5	0.0	0.0
60.00		160.1	740.8					0.0	121.9	160.1	862.7	0.0	0.0
65.00		159.1	727.7					0.0	121.9	159.1	849.6	0.0	0.0
70.00		158.0	714.3					0.0	121.9	158.0	836.3	0.0	0.0
75.00		156.6	700.7					0.0	121.9	156.6	822.6	0.0	0.0
80.00		101.2	686.8					0.0	121.9	101.2	808.7	0.0	0.0
81.50	Appertunance(s)	61.8	204.1	78.3	0.0	2.8	126.3	0.0	36.6	140.1	366.9	0.0	0.0
84.00	Top - Section 2	42.8	336.9					0.0	60.5	42.8	397.4	0.0	0.0
85.00		25.5	120.9					14.4	161.5	39.9	282.4	0.0	0.0
90.00	Appertunance(s)	38.4	605.0	0.0	0.0	0.0	422.9	72.4	808.1	110.8	1,836.0	0.0	0.0
94.00	Top - Section 3	20.9	484.4					58.5	647.4	79.4	1,131.8	0.0	0.0
95.00		22.5	77.5					15.3	162.0	37.8	239.5	0.0	0.0
100.00	Appertunance(s)	33.9	387.8	0.0	0.0	0.0	1,563.7	76.9	810.5	110.8	2,762.0	0.0	0.0
104.00	Top - Section 4	19.0	310.5					62.1	612.7	81.0	923.2	0.0	0.0
105.00		23.0	45.8					15.6	153.3	38.5	199.1	0.0	0.0
110.00	Appertunance(s)	34.6	229.3	0.0	0.0	0.0	921.9	78.4	767.1	113.0	1,918.2	0.0	0.0
114.00		15.5	183.7					63.2	554.2	78.7	737.9	0.0	0.0
				<b>Totals:</b>				<b>3,390.81</b>	<b>27,001.4</b>	<b>0.00</b>	<b>0.00</b>		



**Load Case: 1.2D + 1.0Di + 1.0Wi**

50 mph with 0.75 in Radial Ice

24 Iterations

Gust Response Factor : 1.10

Ice Dead Load Factor : 1.00

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Ice Importance Factor : 1.00

Wind Load Factor : 1.00

**Calculated Forces**

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 (deg)	Ratio
0.00	-27.00	-3.32	0.00	-196.12	0.00	196.12	2,009.33	1,004.66	3,370.24	1,687.62	0.00	0.00	0.130
5.00	-25.91	-3.19	0.00	-179.50	0.00	179.50	1,990.85	995.43	3,279.75	1,642.31	0.02	-0.04	0.122
10.00	-24.81	-3.06	0.00	-163.54	0.00	163.54	1,971.76	985.88	3,189.37	1,597.06	0.08	-0.08	0.115
15.00	-23.71	-2.92	0.00	-148.24	0.00	148.24	1,952.06	976.03	3,099.16	1,551.88	0.18	-0.11	0.108
20.00	-22.62	-2.78	0.00	-133.61	0.00	133.61	1,931.73	965.87	3,009.15	1,506.81	0.32	-0.15	0.100
25.00	-21.53	-2.64	0.00	-119.70	0.00	119.70	1,910.79	955.40	2,919.43	1,461.88	0.50	-0.18	0.093
30.00	-20.46	-2.49	0.00	-106.51	0.00	106.51	1,889.23	944.62	2,830.03	1,417.12	0.70	-0.21	0.086
35.00	-19.40	-2.33	0.00	-94.07	0.00	94.07	1,867.06	933.53	2,741.01	1,372.54	0.94	-0.24	0.079
40.00	-18.36	-2.18	0.00	-82.39	0.00	82.39	1,844.27	922.13	2,652.43	1,328.19	1.21	-0.27	0.072
45.00	-17.33	-2.05	0.00	-71.50	0.00	71.50	1,820.86	910.43	2,564.34	1,284.08	1.51	-0.30	0.065
47.84	-16.75	-1.98	0.00	-65.66	0.00	65.66	1,807.27	903.64	2,514.51	1,259.12	1.69	-0.31	0.061
50.00	-16.13	-1.90	0.00	-61.40	0.00	61.40	1,796.83	898.42	2,476.80	1,240.24	1.83	-0.32	0.058
52.66	-15.37	-1.82	0.00	-56.35	0.00	56.35	1,181.92	590.96	1,634.85	818.64	2.01	-0.33	0.082
55.00	-14.96	-1.70	0.00	-52.10	0.00	52.10	1,176.68	588.34	1,611.12	806.76	2.18	-0.34	0.077
60.00	-14.10	-1.54	0.00	-43.60	0.00	43.60	1,165.04	582.52	1,560.37	781.35	2.55	-0.37	0.068
65.00	-13.25	-1.38	0.00	-35.90	0.00	35.90	1,152.79	576.40	1,509.51	755.88	2.94	-0.39	0.059
70.00	-12.42	-1.22	0.00	-29.00	0.00	29.00	1,139.92	569.96	1,458.59	730.38	3.36	-0.41	0.051
75.00	-11.60	-1.06	0.00	-22.90	0.00	22.90	1,126.44	563.22	1,407.67	704.88	3.79	-0.42	0.043
80.00	-10.79	-0.95	0.00	-17.60	0.00	17.60	1,112.33	556.17	1,356.80	679.41	4.24	-0.44	0.036
81.50	-10.42	-0.81	0.00	-16.17	0.00	16.17	1,107.98	553.99	1,341.56	671.78	4.38	-0.44	0.033
84.00	-10.02	-0.77	0.00	-14.13	0.00	14.13	1,100.61	550.30	1,316.18	659.07	4.61	-0.45	0.031
84.00	-10.02	-0.77	0.00	-14.13	0.00	14.13	1,168.53	584.26	139.98	118.82	4.61	-0.45	0.128
85.00	-9.74	-0.75	0.00	-13.37	0.00	13.37	1,168.53	584.26	139.98	118.82	4.71	-0.45	0.121
90.00	-7.90	-0.66	0.00	-9.60	0.00	9.60	1,168.53	584.26	139.98	118.82	5.34	-0.75	0.088
94.00	-6.77	-0.57	0.00	-6.98	0.00	6.98	1,168.53	584.26	139.98	118.82	6.05	-0.93	0.065
94.00	-6.77	-0.57	0.00	-6.98	0.00	6.98	715.69	357.85	67.10	56.95	6.05	-0.93	0.132
95.00	-6.53	-0.55	0.00	-6.41	0.00	6.41	715.69	357.85	67.10	56.95	6.25	-0.96	0.122
100.00	-3.77	-0.40	0.00	-3.64	0.00	3.64	715.69	357.85	67.10	56.95	7.46	-1.32	0.069
104.00	-2.85	-0.30	0.00	-2.02	0.00	2.02	715.69	357.85	67.10	56.95	8.64	-1.48	0.039
104.00	-2.85	-0.30	0.00	-2.02	0.00	2.02	255.19	127.60	34.57	26.17	8.64	-1.48	0.088
105.00	-2.65	-0.26	0.00	-1.72	0.00	1.72	255.19	127.60	34.57	26.17	8.95	-1.50	0.076
110.00	-0.74	-0.10	0.00	-0.40	0.00	0.40	255.19	127.60	34.57	26.17	10.59	-1.61	0.018
114.00	0.00	-0.08	0.00	0.00	0.00	0.00	255.19	127.60	34.57	26.17	11.95	-1.62	0.000

**Load Case:** 1.0D + 1.0W

Serviceability 60 mph

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

**Applied Segment Forces Summary**

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		55.4	0.0					0.0	0.0	55.4	0.0	0.0	0.0
5.00		109.9	545.3					0.0	101.6	109.9	646.9	0.0	0.0
10.00		107.9	535.5					0.0	101.6	107.9	637.1	0.0	0.0
15.00		107.9	525.8					0.0	101.6	107.9	627.4	0.0	0.0
20.00		110.1	516.0					0.0	101.6	110.1	617.6	0.0	0.0
25.00		112.2	506.3					0.0	101.6	112.2	607.9	0.0	0.0
30.00		113.5	496.5					0.0	101.6	113.5	598.1	0.0	0.0
35.00		114.2	486.8					0.0	101.6	114.2	588.4	0.0	0.0
40.00		114.4	477.1					0.0	101.6	114.4	578.7	0.0	0.0
45.00		89.7	467.3					0.0	101.6	89.7	568.9	0.0	0.0
47.84	Bot - Section 2	57.4	261.3					0.0	57.8	57.4	319.1	0.0	0.0
50.00		55.5	345.3					0.0	43.8	55.5	389.2	0.0	0.0
52.66	Top - Section 1	57.5	421.0					0.0	54.0	57.5	475.0	0.0	0.0
55.00		84.1	158.5					0.0	47.6	84.1	206.1	0.0	0.0
60.00		113.9	333.0					0.0	101.6	113.9	434.6	0.0	0.0
65.00		112.9	325.7					0.0	101.6	112.9	427.3	0.0	0.0
70.00		111.8	318.4					0.0	101.6	111.8	420.0	0.0	0.0
75.00		110.5	311.1					0.0	101.6	110.5	412.7	0.0	0.0
80.00		71.3	303.8					0.0	101.6	71.3	405.4	0.0	0.0
81.50	Appertunance(s)	43.4	89.7	36.0	0.0	1.4	50.0	0.0	30.5	79.4	170.2	0.0	0.0
84.00	Top - Section 2	30.9	148.0					0.0	50.4	30.9	198.4	0.0	0.0
85.00		23.3	88.4					8.1	37.1	31.4	125.5	0.0	0.0
90.00	Appertunance(s)	35.1	441.8	0.0	0.0	0.0	120.0	40.9	185.5	76.0	747.4	0.0	0.0
94.00	Top - Section 3	18.8	353.4					33.0	148.4	51.8	501.9	0.0	0.0
95.00		18.6	54.1					8.7	37.1	27.3	91.2	0.0	0.0
100.00	Appertunance(s)	28.0	270.6	0.0	0.0	0.0	527.4	43.9	185.5	71.8	983.5	0.0	0.0
104.00	Top - Section 4	15.6	216.5					35.4	118.0	51.0	334.4	0.0	0.0
105.00		18.9	27.6					8.9	29.5	27.8	57.1	0.0	0.0
110.00	Appertunance(s)	28.4	137.8	0.0	0.0	0.0	280.7	44.6	147.4	73.1	566.0	0.0	0.0
114.00		12.7	110.3					35.9	67.8	48.6	178.1	0.0	0.0
<b>Totals:</b>										2,379.35	12,913.8	0.00	0.00

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

9/16/2019 9:52:11 AM

Customer: KGI

**Load Case:** 1.0D + 1.0W

Serviceability 60 mph

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

**Calculated Forces**

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 (deg)	Ratio
0.00	-12.91	-2.33	0.00	-130.62	0.00	130.62	2,009.33	1,004.66	3,370.24	1,687.62	0.00	0.00	0.084
5.00	-12.27	-2.22	0.00	-118.99	0.00	118.99	1,990.85	995.43	3,279.75	1,642.31	0.01	-0.03	0.079
10.00	-11.63	-2.12	0.00	-107.88	0.00	107.88	1,971.76	985.88	3,189.37	1,597.06	0.06	-0.05	0.073
15.00	-11.00	-2.01	0.00	-97.28	0.00	97.28	1,952.06	976.03	3,099.16	1,551.88	0.12	-0.08	0.068
20.00	-10.38	-1.91	0.00	-87.21	0.00	87.21	1,931.73	965.87	3,009.15	1,506.81	0.21	-0.10	0.063
25.00	-9.77	-1.80	0.00	-77.67	0.00	77.67	1,910.79	955.40	2,919.43	1,461.88	0.33	-0.12	0.058
30.00	-9.17	-1.69	0.00	-68.69	0.00	68.69	1,889.23	944.62	2,830.03	1,417.12	0.46	-0.14	0.053
35.00	-8.59	-1.57	0.00	-60.26	0.00	60.26	1,867.06	933.53	2,741.01	1,372.54	0.62	-0.16	0.049
40.00	-8.01	-1.46	0.00	-52.39	0.00	52.39	1,844.27	922.13	2,652.43	1,328.19	0.80	-0.18	0.044
45.00	-7.44	-1.37	0.00	-45.10	0.00	45.10	1,820.86	910.43	2,564.34	1,284.08	0.99	-0.19	0.039
47.84	-7.12	-1.31	0.00	-41.20	0.00	41.20	1,807.27	903.64	2,514.51	1,259.12	1.11	-0.20	0.037
50.00	-6.73	-1.26	0.00	-38.37	0.00	38.37	1,796.83	898.42	2,476.80	1,240.24	1.20	-0.21	0.035
52.66	-6.26	-1.20	0.00	-35.04	0.00	35.04	1,181.92	590.96	1,634.85	818.64	1.32	-0.21	0.048
55.00	-6.05	-1.11	0.00	-32.23	0.00	32.23	1,176.68	588.34	1,611.12	806.76	1.42	-0.22	0.045
60.00	-5.61	-1.00	0.00	-26.67	0.00	26.67	1,165.04	582.52	1,560.37	781.35	1.66	-0.24	0.039
65.00	-5.19	-0.89	0.00	-21.67	0.00	21.67	1,152.79	576.40	1,509.51	755.88	1.92	-0.25	0.033
70.00	-4.77	-0.77	0.00	-17.24	0.00	17.24	1,139.92	569.96	1,458.59	730.38	2.19	-0.26	0.028
75.00	-4.36	-0.66	0.00	-13.38	0.00	13.38	1,126.44	563.22	1,407.67	704.88	2.47	-0.27	0.023
80.00	-3.95	-0.59	0.00	-10.08	0.00	10.08	1,112.33	556.17	1,356.80	679.41	2.75	-0.28	0.018
81.50	-3.78	-0.51	0.00	-9.19	0.00	9.19	1,107.98	553.99	1,341.56	671.78	2.84	-0.28	0.017
84.00	-3.58	-0.48	0.00	-7.92	0.00	7.92	1,100.61	550.30	1,316.18	659.07	2.99	-0.28	0.015
84.00	-3.58	-0.48	0.00	-7.92	0.00	7.92	1,168.53	584.26	139.98	118.82	2.99	-0.28	0.070
85.00	-3.46	-0.45	0.00	-7.45	0.00	7.45	1,168.53	584.26	139.98	118.82	3.05	-0.28	0.066
90.00	-2.71	-0.37	0.00	-5.20	0.00	5.20	1,168.53	584.26	139.98	118.82	3.44	-0.45	0.046
94.00	-2.21	-0.32	0.00	-3.70	0.00	3.70	1,168.53	584.26	139.98	118.82	3.86	-0.55	0.033
94.00	-2.21	-0.32	0.00	-3.70	0.00	3.70	715.69	357.85	67.10	56.95	3.86	-0.55	0.068
95.00	-2.12	-0.30	0.00	-3.38	0.00	3.38	715.69	357.85	67.10	56.95	3.98	-0.57	0.062
100.00	-1.13	-0.22	0.00	-1.90	0.00	1.90	715.69	357.85	67.10	56.95	4.68	-0.75	0.035
104.00	-0.80	-0.16	0.00	-1.03	0.00	1.03	715.69	357.85	67.10	56.95	5.34	-0.83	0.019
104.00	-0.80	-0.16	0.00	-1.03	0.00	1.03	255.19	127.60	34.57	26.17	5.34	-0.83	0.043
105.00	-0.74	-0.13	0.00	-0.87	0.00	0.87	255.19	127.60	34.57	26.17	5.52	-0.85	0.036
110.00	-0.18	-0.05	0.00	-0.21	0.00	0.21	255.19	127.60	34.57	26.17	6.44	-0.90	0.009
114.00	0.00	-0.05	0.00	0.00	0.00	0.00	255.19	127.60	34.57	26.17	7.20	-0.91	0.000

**Equivalent Lateral Forces Method Analysis**

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.26
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.07
Long-Period Transition Period ( $T_L$ ):	6
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.59
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.28
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.11
Seismic Response Coefficient ( $C_s$ ):	0.05
Upper Limit $C_s$	0.05
Lower Limit $C_s$	0.03
Period based on Rayleigh Method (sec):	1.53
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.51
Total Unfactored Dead Load:	12.91 k
Seismic Base Shear (E):	0.83 k

### Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.26
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.07
Importance Factor ( $I_E$ ):	1.00
Site Coefficient $F_a$ :	1.59
Site Coefficient $F_v$ :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.28
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.11
Period Based on Rayleigh Method (sec):	1.53
Redundancy Factor ( $\rho$ ):	1.30

**Load Case (1.2 + 0.2Sds) \* DL + E EFLM**

**Seismic Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
29	112.00	178	1.824	1.651	1.020	0.470	72	150
28	107.50	285	1.681	1.050	0.785	0.348	86	241
27	104.50	57	1.588	0.742	0.654	0.277	14	48
26	102.00	334	1.513	0.534	0.558	0.223	65	283
25	97.50	456	1.382	0.252	0.414	0.139	55	385
24	94.50	91	1.299	0.119	0.335	0.092	7	77
23	92.00	502	1.231	0.036	0.278	0.058	25	424
22	87.50	627	1.113	-0.062	0.195	0.010	6	530
21	84.50	125	1.038	-0.098	0.151	-0.013	-1	106
20	82.75	198	0.996	-0.111	0.129	-0.023	-4	168
19	80.75	120	0.948	-0.119	0.107	-0.032	-3	102
18	77.50	405	0.873	-0.121	0.077	-0.040	-14	343
17	72.50	413	0.764	-0.104	0.044	-0.039	-14	349
16	67.50	420	0.663	-0.075	0.023	-0.023	-9	355
15	62.50	427	0.568	-0.041	0.011	0.000	0	361
14	57.50	435	0.481	-0.009	0.006	0.025	10	367
13	53.83	206	0.421	0.011	0.006	0.041	7	174
12	51.33	475	0.383	0.023	0.007	0.050	21	401
11	48.92	389	0.348	0.033	0.009	0.056	19	329
10	46.42	319	0.313	0.042	0.011	0.062	17	270
9	42.50	569	0.263	0.053	0.016	0.067	33	481
8	37.50	579	0.205	0.062	0.023	0.069	34	489
7	32.50	588	0.154	0.068	0.030	0.068	34	497
6	27.50	598	0.110	0.071	0.036	0.065	34	505
5	22.50	608	0.074	0.072	0.040	0.063	33	514
4	17.50	618	0.045	0.071	0.042	0.060	32	522
3	12.50	627	0.023	0.065	0.039	0.055	30	530
2	7.50	637	0.008	0.052	0.030	0.045	25	538
1	2.50	647	0.001	0.023	0.013	0.022	12	547
Flush Mount	110.00	120	1.760	1.362	0.909	0.414	43	101
DBXNH-6565A-A2M	110.00	103	1.760	1.362	0.909	0.414	37	87
TMAT1921XB6811A	110.00	53	1.760	1.362	0.909	0.414	19	45
782 11066	110.00	5	1.760	1.362	0.909	0.414	2	4
Flush Mount	100.00	120	1.454	0.395	0.490	0.184	19	101

Site Number: 27741\_B

Code: ANSI/TIA-222-G

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Site Name: Round Hill CT, Greenwich, CT

Engineering Number: REV01

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APXVSP18-C-A20	100.00	171	1.454	0.395	0.490	0.184	27	144
KIT-FD9R6004/1C-DL	100.00	38	1.454	0.395	0.490	0.184	6	32
IBC1900HG-SA	100.00	198	1.454	0.395	0.490	0.184	32	167
Flush Mount	90.00	120	1.178	-0.015	0.239	0.035	4	101
3 ft Standoff	81.50	40	0.966	-0.117	0.115	-0.029	-1	34
GPS	81.50	10	0.966	-0.117	0.115	-0.029	0	8
		12,914	36.276	11.065	11.157	4.560	813	10,912

**Load Case (1.2 + 0.2Sds) \* DL + E EMAM**

**Seismic Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
29	112.00	178	1.824	1.651	1.020	0.470	72	150
28	107.50	285	1.681	1.050	0.785	0.348	86	241
27	104.50	57	1.588	0.742	0.654	0.277	14	48
26	102.00	334	1.513	0.534	0.558	0.223	65	283
25	97.50	456	1.382	0.252	0.414	0.139	55	385
24	94.50	91	1.299	0.119	0.335	0.092	7	77
23	92.00	502	1.231	0.036	0.278	0.058	25	424
22	87.50	627	1.113	-0.062	0.195	0.010	6	530
21	84.50	125	1.038	-0.098	0.151	-0.013	-1	106
20	82.75	198	0.996	-0.111	0.129	-0.023	-4	168
19	80.75	120	0.948	-0.119	0.107	-0.032	-3	102
18	77.50	405	0.873	-0.121	0.077	-0.040	-14	343
17	72.50	413	0.764	-0.104	0.044	-0.039	-14	349
16	67.50	420	0.663	-0.075	0.023	-0.023	-9	355
15	62.50	427	0.568	-0.041	0.011	0.000	0	361
14	57.50	435	0.481	-0.009	0.006	0.025	10	367
13	53.83	206	0.421	0.011	0.006	0.041	7	174
12	51.33	475	0.383	0.023	0.007	0.050	21	401
11	48.92	389	0.348	0.033	0.009	0.056	19	329
10	46.42	319	0.313	0.042	0.011	0.062	17	270
9	42.50	569	0.263	0.053	0.016	0.067	33	481
8	37.50	579	0.205	0.062	0.023	0.069	34	489
7	32.50	588	0.154	0.068	0.030	0.068	34	497
6	27.50	598	0.110	0.071	0.036	0.065	34	505
5	22.50	608	0.074	0.072	0.040	0.063	33	514
4	17.50	618	0.045	0.071	0.042	0.060	32	522
3	12.50	627	0.023	0.065	0.039	0.055	30	530
2	7.50	637	0.008	0.052	0.030	0.045	25	538
1	2.50	647	0.001	0.023	0.013	0.022	12	547
Flush Mount	110.00	120	1.760	1.362	0.909	0.414	43	101
DBXNH-6565A-A2M	110.00	103	1.760	1.362	0.909	0.414	37	87
TMAT1921XB6811A	110.00	53	1.760	1.362	0.909	0.414	19	45
782 11066	110.00	5	1.760	1.362	0.909	0.414	2	4
Flush Mount	100.00	120	1.454	0.395	0.490	0.184	19	101
APXVSP18-C-A20	100.00	171	1.454	0.395	0.490	0.184	27	144
KIT-FD9R6004/1C-DL	100.00	38	1.454	0.395	0.490	0.184	6	32
IBC1900HG-SA	100.00	198	1.454	0.395	0.490	0.184	32	167
Flush Mount	90.00	120	1.178	-0.015	0.239	0.035	4	101
3 ft Standoff	81.50	40	0.966	-0.117	0.115	-0.029	-1	34
GPS	81.50	10	0.966	-0.117	0.115	-0.029	0	8
		12,914	36.276	11.065	11.157	4.560	813	10,912

**Load Case (0.9 - 0.2Sds) \* DL + E ELFM**

**Seismic (Reduced DL) Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
29	112.00	178	1.824	1.651	1.020	0.470	72	150
28	107.50	285	1.681	1.050	0.785	0.348	86	241
27	104.50	57	1.588	0.742	0.654	0.277	14	48
26	102.00	334	1.513	0.534	0.558	0.223	65	283
25	97.50	456	1.382	0.252	0.414	0.139	55	385
24	94.50	91	1.299	0.119	0.335	0.092	7	77
23	92.00	502	1.231	0.036	0.278	0.058	25	424
22	87.50	627	1.113	-0.062	0.195	0.010	6	530
21	84.50	125	1.038	-0.098	0.151	-0.013	-1	106
20	82.75	198	0.996	-0.111	0.129	-0.023	-4	168
19	80.75	120	0.948	-0.119	0.107	-0.032	-3	102
18	77.50	405	0.873	-0.121	0.077	-0.040	-14	343
17	72.50	413	0.764	-0.104	0.044	-0.039	-14	349
16	67.50	420	0.663	-0.075	0.023	-0.023	-9	355
15	62.50	427	0.568	-0.041	0.011	0.000	0	361
14	57.50	435	0.481	-0.009	0.006	0.025	10	367
13	53.83	206	0.421	0.011	0.006	0.041	7	174
12	51.33	475	0.383	0.023	0.007	0.050	21	401
11	48.92	389	0.348	0.033	0.009	0.056	19	329
10	46.42	319	0.313	0.042	0.011	0.062	17	270
9	42.50	569	0.263	0.053	0.016	0.067	33	481
8	37.50	579	0.205	0.062	0.023	0.069	34	489
7	32.50	588	0.154	0.068	0.030	0.068	34	497
6	27.50	598	0.110	0.071	0.036	0.065	34	505
5	22.50	608	0.074	0.072	0.040	0.063	33	514
4	17.50	618	0.045	0.071	0.042	0.060	32	522
3	12.50	627	0.023	0.065	0.039	0.055	30	530
2	7.50	637	0.008	0.052	0.030	0.045	25	538
1	2.50	647	0.001	0.023	0.013	0.022	12	547
Flush Mount	110.00	120	1.760	1.362	0.909	0.414	43	101
DBXNH-6565A-A2M	110.00	103	1.760	1.362	0.909	0.414	37	87
TMAT1921XB6811A	110.00	53	1.760	1.362	0.909	0.414	19	45
782 11066	110.00	5	1.760	1.362	0.909	0.414	2	4
Flush Mount	100.00	120	1.454	0.395	0.490	0.184	19	101
APXVSP18-C-A20	100.00	171	1.454	0.395	0.490	0.184	27	144
KIT-FD9R6004/1C-DL	100.00	38	1.454	0.395	0.490	0.184	6	32
IBC1900HG-SA	100.00	198	1.454	0.395	0.490	0.184	32	167
Flush Mount	90.00	120	1.178	-0.015	0.239	0.035	4	101
3 ft Standoff	81.50	40	0.966	-0.117	0.115	-0.029	-1	34
GPS	81.50	10	0.966	-0.117	0.115	-0.029	0	8
		12,914	36.276	11.065	11.157	4.560	813	10,912

**Load Case (0.9 - 0.2Sds) \* DL + E EMAM**

**Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
29	112.00	178	1.824	1.651	1.020	0.470	72	150
28	107.50	285	1.681	1.050	0.785	0.348	86	241
27	104.50	57	1.588	0.742	0.654	0.277	14	48
26	102.00	334	1.513	0.534	0.558	0.223	65	283
25	97.50	456	1.382	0.252	0.414	0.139	55	385

Site Number: 27741\_B

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24	94.50	91	1.299	0.119	0.335	0.092	7	77
23	92.00	502	1.231	0.036	0.278	0.058	25	424
22	87.50	627	1.113	-0.062	0.195	0.010	6	530
21	84.50	125	1.038	-0.098	0.151	-0.013	-1	106
20	82.75	198	0.996	-0.111	0.129	-0.023	-4	168
19	80.75	120	0.948	-0.119	0.107	-0.032	-3	102
18	77.50	405	0.873	-0.121	0.077	-0.040	-14	343
17	72.50	413	0.764	-0.104	0.044	-0.039	-14	349
16	67.50	420	0.663	-0.075	0.023	-0.023	-9	355
15	62.50	427	0.568	-0.041	0.011	0.000	0	361
14	57.50	435	0.481	-0.009	0.006	0.025	10	367
13	53.83	206	0.421	0.011	0.006	0.041	7	174
12	51.33	475	0.383	0.023	0.007	0.050	21	401
11	48.92	389	0.348	0.033	0.009	0.056	19	329
10	46.42	319	0.313	0.042	0.011	0.062	17	270
9	42.50	569	0.263	0.053	0.016	0.067	33	481
8	37.50	579	0.205	0.062	0.023	0.069	34	489
7	32.50	588	0.154	0.068	0.030	0.068	34	497
6	27.50	598	0.110	0.071	0.036	0.065	34	505
5	22.50	608	0.074	0.072	0.040	0.063	33	514
4	17.50	618	0.045	0.071	0.042	0.060	32	522
3	12.50	627	0.023	0.065	0.039	0.055	30	530
2	7.50	637	0.008	0.052	0.030	0.045	25	538
1	2.50	647	0.001	0.023	0.013	0.022	12	547
Flush Mount	110.00	120	1.760	1.362	0.909	0.414	43	101
DBXNH-6565A-A2M	110.00	103	1.760	1.362	0.909	0.414	37	87
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782 11066	110.00	5	1.760	1.362	0.909	0.414	2	4
Flush Mount	100.00	120	1.454	0.395	0.490	0.184	19	101
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IBC1900HG-SA	100.00	198	1.454	0.395	0.490	0.184	32	167
Flush Mount	90.00	120	1.178	-0.015	0.239	0.035	4	101
3 ft Standoff	81.50	40	0.966	-0.117	0.115	-0.029	-1	34
GPS	81.50	10	0.966	-0.117	0.115	-0.029	0	8
		12,914	36.276	11.065	11.157	4.560	813	10,912



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Engineering Number: REV01

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### Analysis Summary

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	8.95	0.00	15.49	0.00	0.00	503.96	0.00	0.31
0.9D + 1.6W	8.94	0.00	11.61	0.00	0.00	501.34	0.00	0.30
1.2D + 1.0Di + 1.0Wi	3.32	0.00	27.00	0.00	0.00	196.12	94.00	0.13
(1.2 + 0.2Sds) * DL + E ELFM	0.83	0.00	15.40	0.00	0.00	67.58	84.00	0.06
(1.2 + 0.2Sds) * DL + E EMAM	0.80	0.00	15.40	0.00	0.00	61.07	94.00	0.09
(0.9 - 0.2Sds) * DL + E ELFM	0.83	0.00	10.37	0.00	0.00	67.07	84.00	0.06
(0.9 - 0.2Sds) * DL + E EMAM	0.80	0.00	10.37	0.00	0.00	60.55	94.00	0.09
1.0D + 1.0W	2.33	0.00	12.91	0.00	0.00	130.62	0.00	0.08

Site Number: 27441\_B  
 Site Name: Round Hill CT  
 Job Number: REV01  
 Engineer: JHH  
 Date: 9/16/2019

**Base Plate and Bolt Analysis**

Reinforcement: N  
 Moment: 504.0 k-ft  
 Shear/Leg: 9.0 k  
 Compression/Leg: 15.5 k

TIA-222 Code Revision (F/G): G  
 Anchor Bolt Arrangement: Corners  
 Monopole Shaft Diameter (Across Flats): 41.0 in  
 Lower Monopole Thickness: 0.250 in  
 # of Sides of Pole: 18  
 Monopole Shaft Yield Strength: 65 ksi  
 Baseplate Diameter / Length: 47.50  
 Base Plate Thickness: 2.00 in  
 Base Plate Yield Strength: 60 ksi  
 Baseplate Detail Type: D  
 Include Plate Thickness Beyond Bolt Circle: Y  
 Stress Increase: 1.00  
 Fillet Weld Size: 0.375 in  
 Weld Type (CJP or F/F): CJP  
 Weld Strength: 70 ksi

**Anchor Bolts**  
 Anchor Bolt Yield Strength: 75 ksi  
 Anchor Bolt Ultimate Strength: 100 ksi  
 Anchor Bolt Diameter: 2.25 in  
 Anchor Bolt Circle: 49.00 in  
 # of Anchor Bolts: 4  
 Minimum Anchor Bolt Separation: 6.00 in  
 Additional Anchor Bolts Installed: N

Failure Mode:	Effective Width (in)	Baseplate Flexural Capacity				Baseplate Shear Capacity			
		Moment (k-in)	S/Z (in <sup>3</sup> )	Capacity (k-in)	Usage	Shear (k)	Area (in <sup>2</sup> )	Capacity (k)	Usage
AA	29.84	468.5	29.8	1611.4	0.29	127.2	59.7	1933.7	0.07
AB	29.84	461.4	29.8	1611.4	0.29	127.2	59.7	1933.7	0.07
BA	30.83	508.7	30.8	1665.0	0.31	127.2	61.7	1998.0	0.06
BB	30.83	508.7	30.8	1665.0	0.31	127.2	61.7	1998.0	0.06

Anchor Bolt Capacity

Area of Bolt: 3.25 in<sup>2</sup>  
 Inertia of Bolt: 0.84 in<sup>4</sup>  
 Total Bolt Inertia: 3902.2 in<sup>4</sup>  
 Maximum Bolt Tension: 119.4 k  
 Maximum Bolt Compression: 127.2 k  
 Bolt Shear: 2.2 k  
 Tensile Bolt Capacity: 259.8 k  
 Compressive Bolt Capacity: 259.8 k  
 Shear Bolt Capacity: 140.3 k  
 Interaction Equation: 0.51 Result: OK

Base Weld Capacity

Force / Weld: 3.6 k/in  
 Weld Capacity: 23.8 k/in  
 Interaction Equation: 0.15 Result: OK  
 SES Base Plate Design Moment: 508.7 k-in  
 Design Stress: 15.8 ksi  
 SES Base Plate Allowable Stress / Moment Capacity: 1738.9 ksi / k-in  
 Usage: 0.29  
 Moment Factor: 1.00  
 Length Factor: 0.96

Site Number:	<b>SE60XC302</b>
Site Name:	<b>Splinter</b>
Job Number:	<b>REV01</b>
Engineer:	<b>AHB</b>
Date:	<b>9/16/2019</b>

**Flange @ 84'**

Reinforcement:	<b>N</b>
Moment:	<b>30.9 k-ft</b>
Shear/Leg:	<b>1.9 k</b>
Compression/Leg:	<b>4.3 k</b>

TIA-222 Code Revision (F/G):	<b>G</b>
Anchor Bolt Arrangement:	<b>Round</b>
Monopole Shaft Diameter:	<b>in</b>
Lower Monopole Thickness:	<b>in</b>
Monopole Shaft Yield Strength:	<b>ksi</b>
Baseplate Diameter / Length:	<b>in</b>
Base Plate Thickness:	<b>in</b>
Base Plate Yield Strength:	<b>ksi</b>
Fillet Weld Size:	<b>in</b>
Weld Type (CJP or F/F):	<b>ksi</b>
Weld Strength:	<b>ksi</b>
Baseplate Detail Type:	<b>C</b>
Include Plate Thickness Beyond Bolt Circle:	<b>Y</b>
Stress Increase:	<b>1.00</b>
Additional Anchor Bolts Installed:	<b>N</b>

Anchor Bolts

Anchor Bolt Yield Strength:	<b>92 ksi</b>
Anchor Bolt Ultimate Strength:	<b>120 ksi</b>
Anchor Bolt Diameter:	<b>1.00 in</b>
Anchor Bolt Circle:	<b>26.00 in</b>
# of Anchor Bolts:	<b>12</b>
Minimum Anchor Bolt Separation:	<b>6.00 in</b>
Additional Anchor Bolts Installed:	<b>N</b>

Anchor Bolt Capacity

Area of Bolt:	<b>0.61 in<sup>2</sup></b>
Inertia of Bolt:	<b>0.03 in<sup>4</sup></b>
Total Bolt Inertia:	<b>614.6 in<sup>4</sup></b>
Maximum Bolt Tension:	<b>4.4 k</b>
Maximum Bolt Compression:	<b>5.1 k</b>
Bolt Shear:	<b>0.2 k</b>
Tensile Bolt Capacity:	<b>58.2 k</b>
Compressive Bolt Capacity:	<b>58.2 k</b>
Shear Bolt Capacity:	<b>26.2 k</b>
Interaction Equation:	<b>0.09 Result:</b>
	<b>OK</b>

Site Number:	<b>SE60XC302</b>
Site Name:	<b>Splinter</b>
Job Number:	<b>REV01</b>
Engineer:	<b>AHB</b>
Date:	<b>9/16/2019</b>

**Flange @ 94'**

Reinforcement:	<b>N</b>
Moment:	<b>14.5 k-ft</b>
Shear/Leg:	<b>1.3 k</b>
Compression/Leg:	<b>2.6 k</b>

TIA-222 Code Revision (F/G):	<b>G</b>
Anchor Bolt Arrangement:	<b>Round</b>
Monopole Shaft Diameter:	<b>in</b>
Lower Monopole Thickness:	<b>in</b>
Monopole Shaft Yield Strength:	<b>ksi</b>
Baseplate Diameter / Length:	<b>in</b>
Base Plate Thickness:	<b>in</b>
Base Plate Yield Strength:	<b>ksi</b>
Fillet Weld Size:	<b>in</b>
Weld Type (CJP or F/F):	<b>ksi</b>
Weld Strength:	<b>ksi</b>
Baseplate Detail Type:	<b>C</b>
Include Plate Thickness Beyond Bolt Circle:	<b>Y</b>
Stress Increase:	<b>1.00</b>
Additional Anchor Bolts Installed:	<b>N</b>

Anchor Bolts

Anchor Bolt Yield Strength:	<b>92 ksi</b>
Anchor Bolt Ultimate Strength:	<b>120 ksi</b>
Anchor Bolt Diameter:	<b>1.00 in</b>
Anchor Bolt Circle:	<b>26.00 in</b>
# of Anchor Bolts:	<b>12</b>
Minimum Anchor Bolt Separation:	<b>6.00 in</b>
Additional Anchor Bolts Installed:	<b>N</b>

Anchor Bolt Capacity

Area of Bolt:	<b>0.61 in<sup>2</sup></b>
Inertia of Bolt:	<b>0.03 in<sup>4</sup></b>
Total Bolt Inertia:	<b>614.6 in<sup>4</sup></b>
Maximum Bolt Tension:	<b>2.0 k</b>
Maximum Bolt Compression:	<b>2.4 k</b>
Bolt Shear:	<b>0.1 k</b>
Tensile Bolt Capacity:	<b>58.2 k</b>
Compressive Bolt Capacity:	<b>58.2 k</b>
Shear Bolt Capacity:	<b>26.2 k</b>
Interaction Equation:	<b>0.04 Result:</b>
	<b>OK</b>

Site Number:	<b>SE60XC302</b>
Site Name:	<b>Splinter</b>
Job Number:	<b>REV01</b>
Engineer:	<b>AHB</b>
Date:	<b>9/16/2019</b>

**Flange @ 104'**

Reinforcement:	<b>N</b>
Moment:	4.0 k-ft
Shear/Leg:	0.6 k
Compression/Leg:	0.9 k

TIA-222 Code Revision (F/G):	<b>G</b>
Anchor Bolt Arrangement:	<b>Round</b>
Monopole Shaft Diameter:	in
Lower Monopole Thickness:	in
Monopole Shaft Yield Strength:	ksi
Baseplate Diameter / Length:	
Base Plate Thickness:	in
Base Plate Yield Strength:	ksi
Fillet Weld Size:	in
Weld Type (CJP or F/F):	
Weld Strength:	ksi
Baseplate Detail Type:	<b>C</b>
Include Plate Thickness Beyond Bolt Circle:	<b>Y</b>
Stress Increase:	1.00
Additional Anchor Bolts Installed:	<b>N</b>

Anchor Bolts

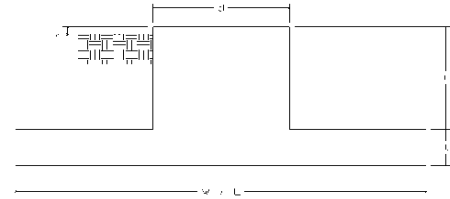
Anchor Bolt Yield Strength:	<b>92</b> ksi
Anchor Bolt Ultimate Strength:	120 ksi
Anchor Bolt Diameter:	1.00 in
Anchor Bolt Circle:	26.00 in
# of Anchor Bolts:	12
Minimum Anchor Bolt Separation:	6.00 in
Additional Anchor Bolts Installed:	<b>N</b>

Anchor Bolt Capacity

Area of Bolt:	0.61 in <sup>2</sup>
Inertia of Bolt:	0.03 in <sup>4</sup>
Total Bolt Inertia:	614.6 in <sup>4</sup>
Maximum Bolt Tension:	0.5 k
Maximum Bolt Compression:	0.7 k
Bolt Shear:	0.1 k
Tensile Bolt Capacity:	58.2 k
Compressive Bolt Capacity:	58.2 k
Shear Bolt Capacity:	26.2 k
Interaction Equation:	0.01 Result:
	OK

Site Name: Round Hill CT  
 Site Number: 27741\_B  
 Engineering Number: REV01  
 Engineer: JHH  
 Date: 09/16/19  
 Tower Type: MP

Program Last Updated: 5/13/2014



**Design Loads (Factored) - Analysis per TIA-222-G Standards**

Design / Analysis / Mapping:	Analysis		
Compression/Leg:	0.0 k	Concrete Strength ( $f'_c$ ):	4000 psi
Uplift/Leg:	0.0 k	Pad Tension Steel Depth:	32.00 in
Total Shear:	9.0 k	$\phi_{\text{Shear}}$ :	0.75
Moment:	504.0 k-ft	$\phi_{\text{Flexure / Tension}}$ :	0.90
Tower + Appurtenance Weight:	15.5 k	$\phi_{\text{Compression}}$ :	0.65
Depth to Base of Foundation (l + t - h):	5.00 ft	$\beta$ :	0.85
Diameter of Pier (d):	6.00 ft	Bottom Pad Rebar Size #:	8
Height of Pier above Ground (h):	1.00	# of Bottom Pad Rebar:	16
Width of Pad (W):	15.00 ft	Pad Bottom Steel Area:	12.64 in <sup>2</sup>
Length of Pad (L):	15.00 ft	Pad Steel $F_y$ :	60000 psi
Thickness of Pad (t):	3.00 ft	Top Pad Rebar Size #:	8
Tower Leg Center to Center:	0.00 ft	# of Top Pad Rebar:	16
Number of Tower Legs:	1.0 (1 if MP or GT)	Pad Top Steel Area:	12.64 in <sup>2</sup>
Tower Center from Mat Center:	0.00 ft	Pier Rebar Size #:	8
Depth Below Ground Surface to Water Table:	99.00 ft	Pier Steel Area (Single Bar):	0.79 in <sup>2</sup>
Unit Weight of Concrete:	150.0 pcf	# of Pier Rebar:	22
Unit Weight of Soil Above Water Table:	130.0 pcf	Pier Steel $F_y$ :	60000 psi
Unit Weight of Water:	62.4 pcf	Pier Cage Diameter:	64.0 in
Unit Weight of Soil Below Water Table:	50.0 pcf	Rebar Strain Limit:	0.008
Friction Angle of Uplift:	0.0 Degrees	Steel Elastic Modulus:	29000 ksi
Ultimate Coefficient of Shear Friction:	0.35	Tie Rebar Size #:	4
Ultimate Compressive Bearing Pressure:	12000.0 psf	Tie Steel Area (Single Bar):	0.20 in <sup>2</sup>
Ultimate Passive Pressure on Pad Face:	0.0 psf	Tie Spacing:	6 in
$\phi_{\text{Soil and Concrete Weight}}$ :	0.9	Tie Steel $F_y$ :	60000 psi
$\phi_{\text{Soil}}$ :	0.75		

**Overturning Moment Usage**

Design OTM:	557.7 k-ft
OTM Resistance:	1201.7 k-ft
Design OTM / OTM Resistance:	0.46 Result: OK

**Soil Bearing Pressure Usage**

Net Bearing Pressure:	1601 psf
Factored Nominal Bearing Pressure:	9000 psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.18 Result: OK
Load Direction Controlling Design Bearing Pressure:	Diagonal to Pad Edge

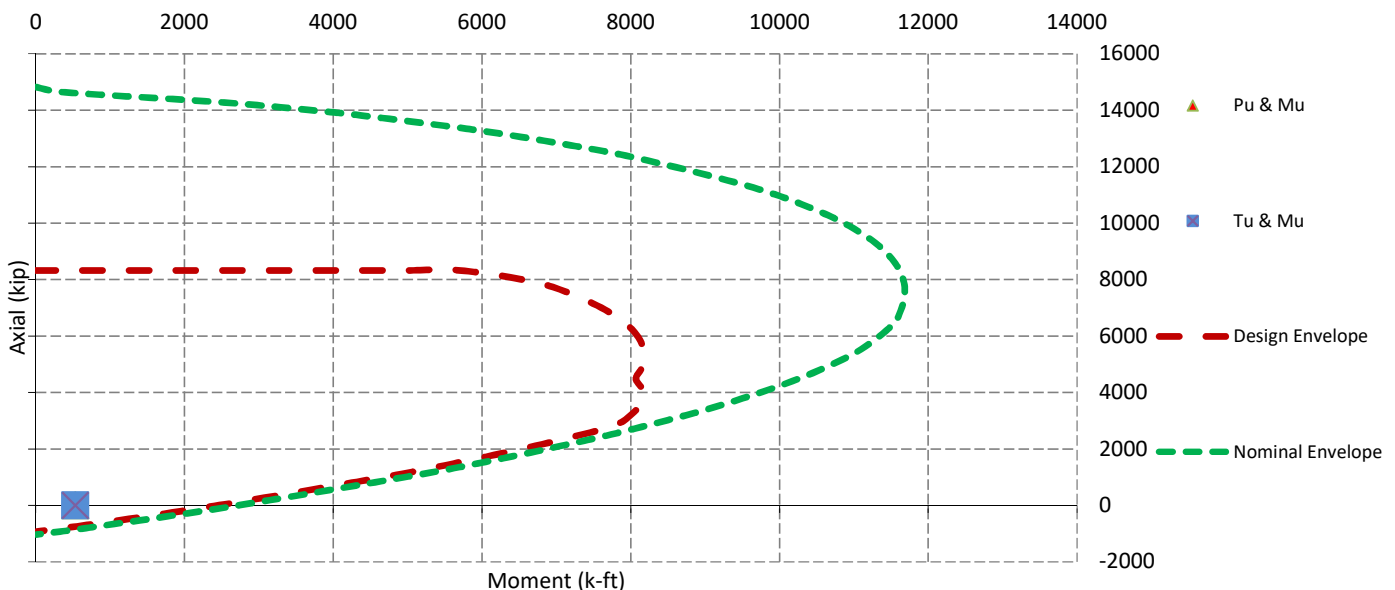
**Sliding Factor of Safety**

Total Factored Sliding Resistance:	46.7 k
Sliding Design / Sliding Resistance:	0.19 Result: OK

## One Way Shear, Flexural Capacity, and Punching Shear

Factored One Way Shear ( $V_u$ ):	28.7 k
One Way Shear Capacity ( $\phi V_c$ ):	359.9 k - ACI11.3.1.1
$V_u / \phi V_c$ :	0.08 Result: OK
Load Direction Controlling Shear Capacity:	Diagonal to Pad Edge
Lower Steel Pad Factored Moment ( $M_u$ ):	162.9 k-ft
Lower Steel Pad Moment Capacity ( $\phi M_n$ ):	1736.8 k-ft - ACI10.3
$M_u / \phi M_n$ :	0.09 Result: OK
Load Direction Controlling Flexural Capacity:	Diagonal to Pad Edge
Upper Steel Pad Factored Moment ( $M_u$ ):	100.2 k-ft
Upper Steel Pad Moment Capacity ( $\phi M_n$ ):	1790.2 k-ft
$M_u / \phi M_n$ :	0.06 Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0022 OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0022 OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	11 in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Reinforcement Spacing:	11 in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear ( $V_u$ ):	0.0 k
Nominal Punching Shear Capacity ( $\phi_c V_n$ ):	1983.7 k - ACI11.12.2.1
$V_u / \phi V_c$ :	0.00 Result: OK
Factored Moment in Pier ( $M_u$ ):	530.8 k-ft
Pier Moment Capacity ( $\phi M_n$ ):	2451.3 k-ft
$M_u / \phi M_n$ :	0.22 Result: OK
Factored Shear in Pier ( $V_u$ ):	9.0 k
Pier Shear Capacity ( $\phi V_n$ ):	386.3 k
$V_u / \phi V_c$ :	0.02 Result: OK
Pier Shear Reinforcement Ratio:	0.0005 No Ties Necessary for Shear - ACI11.5.6.1
Factored Tension in Pier ( $T_u$ ):	0.0 k
Pier Tension Capacity ( $\phi T_n$ ):	938.5 k
$T_u / \phi T_n$ :	0.00 Result: OK
Factored Compression in Pier ( $P_u$ ):	0.0 k
Pier Compression Capacity ( $\phi P_n$ ):	7167.7 k - ACI10.3.6.2
$P_u / \phi P_n$ :	0.00 Result: OK
Pier Compression Reinforcement Ratio:	0.004 NG - Increase Pier Steel - ACI10.9.1 & 10.8.4
$M_u / \phi_B M_n + T_u / \phi_T T_n$ :	0.22 Result: OK

Nominal and Design Moment Capacity and Factored Design Loads

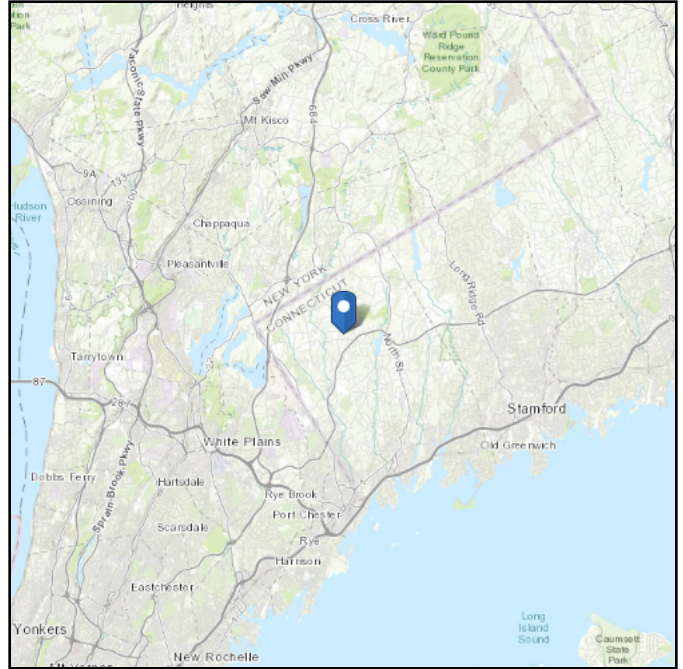


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-10  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Elevation:** 378.96 ft (NAVD 88)  
**Latitude:** 41.095117  
**Longitude:** -73.664219



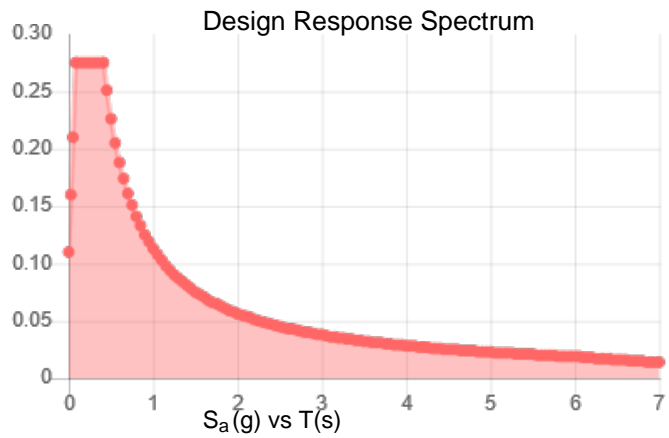
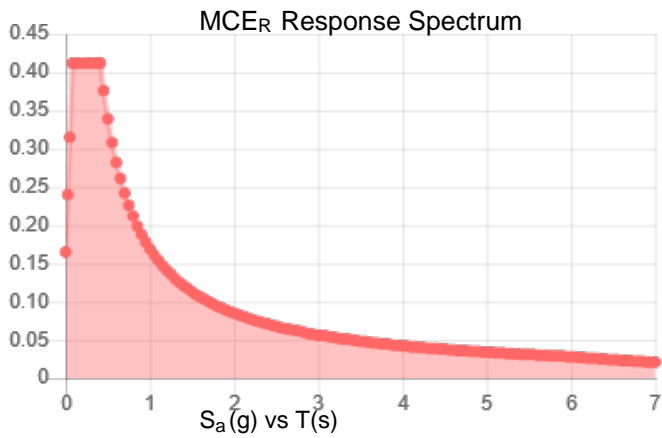


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.259	$S_{DS}$ :	0.275
$S_1$ :	0.071	$S_{D1}$ :	0.113
$F_a$ :	1.593	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.152
$S_{MS}$ :	0.412	PGA <sub>M</sub> :	0.228
$S_{M1}$ :	0.169	F <sub>PGA</sub> :	1.495
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Wed Sep 11 2019

**Date Source:**

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

## Ice

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**Results:**

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Wed Sep 11 2019

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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**(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS**

Municipality	Ground Snow Load	MCE Spectral Accelerations (%g)		Wind Design Parameters								
		S <sub>s</sub>	S <sub>1</sub>	Ultimate Design Wind Speeds, V <sub>ult</sub> (mph)			Nominal Design Wind Speeds, V <sub>asd</sub> (mph)			Wind-Borne Debris Regions <sup>1</sup>		Hurricane-Prone Regions
				Risk Cat. I	Risk Cat. II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Enfield	35	0.176	0.065	110	125	130	85	97	101			Yes
Essex	30	0.168	0.059	120	135	145	93	105	112		Type A	Yes
Fairfield	30	0.215	0.065	115	125	135	89	97	105		Type B	Yes
Farmington	35	0.183	0.064	115	125	135	89	97	105			Yes
Franklin	30	0.171	0.061	120	130	140	93	101	108		Type A	Yes
Glastonbury	30	0.180	0.063	115	125	135	89	97	105			Yes
Goshen	40	0.181	0.065	105	115	125	81	89	97			
Granby	35	0.176	0.065	110	120	130	85	93	101			Yes
Greenwich	30	0.259	0.070	110	120	130	85	93	101			Yes
Griswold	30	0.168	0.060	125	135	145	97	105	112		Type A	Yes
Groton	30	0.160	0.058	125	135	145	97	105	112	Type B	Type A	Yes
Guilford	30	0.176	0.061	120	130	140	93	101	108		Type B	Yes
Haddam	30	0.175	0.061	120	130	140	93	101	108			Yes
Hamden	30	0.185	0.063	115	125	135	89	97	105			Yes
Hampton	35	0.172	0.062	120	130	140	93	101	108			Yes
Hartford	30	0.181	0.064	115	125	135	89	97	105			Yes
Hartland	40	0.175	0.065	110	120	125	85	93	97			Yes
Harwinton	35	0.183	0.065	110	120	130	85	93	101			Yes
Hebron	30	0.177	0.063	120	130	140	93	101	108			Yes
Kent	40	0.188	0.065	105	115	120	81	89	93			
Killingly	40	0.171	0.062	120	130	140	93	101	108			Yes
Killingworth	30	0.173	0.061	120	130	140	93	101	108			Yes
Lebanon	30	0.173	0.062	120	130	140	93	101	108			Yes
Ledyard	30	0.163	0.059	125	135	145	97	105	112		Type A	Yes
Lisbon	30	0.169	0.061	125	135	145	97	105	112		Type A	Yes
Litchfield	40	0.184	0.065	110	120	125	85	93	97			Yes
Lyme	30	0.164	0.059	125	135	145	97	105	112		Type A	Yes
Madison	30	0.173	0.060	120	130	140	93	101	108		Type B	Yes
Manchester	30	0.178	0.064	115	125	135	89	97	105			Yes
Mansfield	35	0.173	0.062	120	130	140	93	101	108			Yes
Marlborough	30	0.177	0.062	120	130	140	93	101	108			Yes
Meriden	30	0.183	0.063	115	125	135	89	97	105			Yes
Middlebury	35	0.191	0.064	110	120	130	85	93	101			Yes
Middlefield	30	0.181	0.063	115	125	135	89	97	105			Yes
Middletown	30	0.180	0.063	115	130	135	89	101	105			Yes
Milford	30	0.194	0.063	115	125	135	89	97	105		Type B	Yes
Monroe	30	0.205	0.065	110	120	130	85	93	101			Yes
Montville	30	0.165	0.059	125	135	145	97	105	112		Type A	Yes
Morris	35	0.187	0.065	110	120	125	85	93	97			Yes
Naugatuck	30	0.190	0.064	110	125	135	85	97	105			Yes
New Britain	30	0.183	0.064	115	125	135	89	97	105			Yes
New Canaan	30	0.240	0.068	110	120	130	85	93	101			Yes
New Fairfield	35	0.212	0.067	105	115	125	81	89	97			
New Hartford	40	0.180	0.065	110	120	130	85	93	101			Yes

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT  
EVALUATION OF HUMAN EXPOSURE POTENTIAL  
TO NON-IONIZING EMISSIONS

Sprint Existing Facility

Site ID: CT43XC856

Round Hill Community Ranch  
395 Round Hill Road  
Greenwich, Connecticut 06831

**October 7, 2019**

**EBI Project Number: 6219005060**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>14.94%</b>

October 7, 2019

Sprint

Attn: RF Engineering Manager

1 International Boulevard, Suite 800

Mahwah, New Jersey 07495

Emissions Analysis for Site: CT43XC856 - Round Hill Community Ranch

EBI Consulting was directed to analyze the proposed Sprint facility located at **395 Round Hill Road in Greenwich, Connecticut** for the purpose of determining whether the emissions from the Proposed Sprint Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately  $400 \mu\text{W}/\text{cm}^2$  and  $467 \mu\text{W}/\text{cm}^2$ , respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed Sprint Wireless antenna facility located at 395 Round Hill Road in Greenwich, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Sprint is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 CDMA channels (800 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.
- 2) 4 PCS channels (1900 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 4) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused

- parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 5) The antennas used in this modeling are the RFS APXVSPP18-C-A20 for the 800 MHz / 1900 MHz channel(s) in Sector A, the RFS APXVSPP18-C-A20 for the 800 MHz / 1900 MHz channel(s) in Sector B, the RFS APXVSPP18-C-A20 for the 800 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
  - 6) The antenna mounting height centerline of the proposed antennas is 100 feet above ground level (AGL).
  - 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
  - 8) All calculations were done with respect to uncontrolled / general population threshold limits.

## Sprint Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Frequency Bands:	800 MHz / 1900 MHz	Frequency Bands:	800 MHz / 1900 MHz	Frequency Bands:	800 MHz / 1900 MHz
Gain:	13.4 dBd / 15.9 dBd	Gain:	13.4 dBd / 15.9 dBd	Gain:	13.4 dBd / 15.9 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	260 Watts	Total TX Power (W):	260 Watts	Total TX Power (W):	260 Watts
ERP (W):	8,412.48	ERP (W):	8,412.48	ERP (W):	8,412.48
Antenna AI MPE %:	<b>3.71%</b>	Antenna BI MPE %:	<b>3.71%</b>	Antenna CI MPE %:	<b>3.71%</b>



Site Composite MPE %	
Carrier	MPE %
Sprint (Max at Sector A):	3.71%
AT&T	4.89%
T-Mobile	2.58%
Verizon	3.76%
<b>Site Total MPE % :</b>	<b>14.94%</b>

Sprint MPE % Per Sector	
Sprint Sector A Total:	3.71%
Sprint Sector B Total:	3.71%
Sprint Sector C Total:	3.71%
<b>Site Total MPE % :</b>	
	<b>14.94%</b>

Sprint Maximum MPE Power Values (Sector A)							
Sprint Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 800 MHz CDMA	2	1093.88	100.0	7.87	800 MHz CDMA	533	1.48%
Sprint 1900 MHz PCS	4	1556.18	100.0	22.38	1900 MHz PCS	1000	2.24%
						<b>Total:</b>	<b>3.71%</b>

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

## Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Sprint facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Sprint Sector	Power Density Value (%)
Sector A:	3.71%
Sector B:	3.71%
Sector C:	3.71%
Sprint Maximum MPE % (Sector A):	3.71%
Site Total:	14.94%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **14.94%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

**DOCKET NO. 309** - Cellco Partnership d/b/a Verizon Wireless }  
application for a Certificate of Environmental Compatibility and }  
Public Need for the construction, maintenance, and operation of a }  
wireless telecommunications facility located at the Round Hill }  
Community Church, 395 Round Hill Road, Greenwich, }  
Connecticut. }

Connecticut

Siting

Council

February 6, 2007

### **Decision and Order**

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Cellco Partnership d/b/a Verizon Wireless, hereinafter referred to as the Certificate Holder, for a telecommunications facility at 395 Round Hill Road Greenwich, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The facility shall be constructed as a two-monopole facility with internally mounted antennas, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Cellco Partnership d/b/a Verizon Wireless and other entities, both public and private, but such towers shall not exceed a height of 115 feet above ground level.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Greenwich for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a) a final site plan(s) of site development to include specifications for the towers, tower foundations, antennas, equipment compound, radio equipment, access road, utility line, and landscaping; and
  - b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the base of the facility, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed facility for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. The Certificate Holder shall provide reasonable space within one of the towers for no compensation for any Town of Greenwich public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.
7. If the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle both towers and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.
8. If the one or both towers of the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the unused portion of the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
9. The Certificate Holder shall remove any nonfunctioning antenna, and associated antenna mounting equipment, within 60 days of the date the antenna ceased to function.
10. Any request for extension of the time periods referred to in Conditions 7 & 8 shall be filed with the Council not later than sixty days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Greenwich. Any proposed modifications to this Decision and Order shall likewise be so served.
11. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

Pursuant to General Statutes § 16-50p, the Council hereby directs that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Greenwich Time.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

**Applicant**

Cellco Partnership d/b/a  
Verizon Wireless

**Intervenor**

Omnipoint Communications, Inc.  
(T-Mobile USA, Inc.)

**Intervenor**

Cliff Berger

**Intervenor**

New Cingular Wireless PCS, LLC

**Intervenor**

Sprint Nextel Corporation

**Intervenor**

Elizabeth Galt

**Representatives**

Sandy Carter, Regulatory Manager  
Verizon Wireless  
99 East River Drive  
East Hartford, CT 06108

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Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103-3597

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Pullman & Comley  
80 State House Square  
Hartford, CT 06103

**Representative**

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Wake, See, Dimes, Brynizcka, Day &  
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27 Imperial Avenue, P.O. Box 777  
Westport, CT 06881-0777

**Representative**

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Cuddy & Feder LLP  
90 Maple Avenue  
White Plains, New York 10601

**Representative**

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CityPlace I, 185 Asylum Street  
Hartford, CT 06103-3402

**Representative**

Ira W. Bloom, Esq.  
Wake, See, Dimes, Brynizcka, Day &  
Bloom  
27 Imperial Avenue, P.O. Box 777  
Westport, CT 06881-0777

10-3689

ROUND HILL COMMUNITY CHURCH INC

ROUND HILL ROAD 0395

270

ADMINISTRATIVE INFORMATION

PARCEL NUMBER 10-3689
Parent Parcel Number 10-4013

Property Address ROUND HILL ROAD 0395
Neighborhood 2800 PARKWAY NORTH

Property Class 270 Telecommunications

TAXING DISTRICT INFORMATION

Jurisdiction 57 Greenwich, CT
Area 001
Corporation 057
District 10
Section & Plat 183
Routing Number 7424E0066

Site Description

Topography:

Public Utilities:

Electric

Street or Road:

Neighborhood:

Zoning: RA-4 Single Family 4
1 Primary Commercial

Legal Acres: 0.2296

OWNERSHIP

ROUND HILL COMMUNITY CHURCH INC
1MR TIMOTHY PARKS-VERIZON WIRELESS
99 EAST RIVER DR-9TH FLOOR
EAST HARTFORD, CT 06108
LOT NO PT 27 ROUND HILL RD E66

Tax ID 098

TRANSFER OF OWNERSHIP

Date

Printed 06/19/2018 Card No. 1 of 1

COMMERCIAL

VALUATION RECORD

Table with columns: Assessment Year (10/01/2010 to 10/01/2017), Reason for Change, and Valuation (2010 Reval, 2012 List, 2013 List, 2015 Prelim, 2015 Final, 2016 List, 2017 List).

LAND DATA AND CALCULATIONS

Table with columns: Land Type, Rating, Measured Acreage, Table, Prod. Factor, Depth Factor, Base Rate, Adjusted Rate, Extended Value, Influence Factor, Value.

DBA: Cell Tower Site. Two 115' monopoles and supporting facilities.
Tenant: Verizon. Users: Verizon PCS, Cingular, T-Mobile, Sprint-Nextel.
GEN: Equip strg bldg partitioned for indiv users and common area.
Served by 6 air compressors.
SPLT: Split from 10-4013 for cellular tower site containing 10,000 sf per P&Z FSP # 2715Site Plan. RCS - 10/7/10.

Permit Number FilingDate Est. Cost Field Visit
Type Est. SqFt

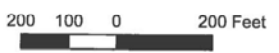
Supplemental Cards
TRUE TAX VALUE 328100

Supplemental Cards
TOTAL LAND VALUE 328100



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### TOWN OF GREENWICH TAX MAP 098 VOL 2



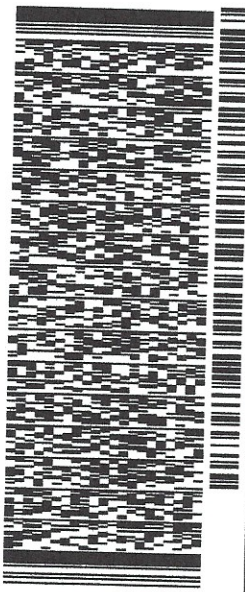
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RYAN BAILEY  
CHARLES CHERUNDOLLO CONSULTING  
3 PROSPECT PL  
B  
MADISON, NJ 07940  
UNITED STATES US

SHIP DATE: 04NOV19  
ACTWGT: 1.00 LB  
CAD: 111040781/IN/ET/4180  
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TO **MS. MELANIE BACHMAN, EXEC. DIR.**  
**CT SITING COUNCIL**  
**TEN FRANKLIN SQUARE**

**NEW BRITAIN CT 06051**  
(860) 827-2935  
INV: REF: CT43X856 CSC SUBMISSION  
PO: DEPT:

567J1/F33005A2



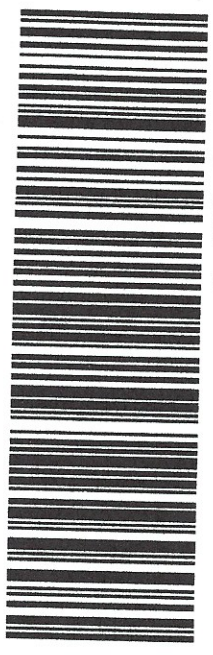
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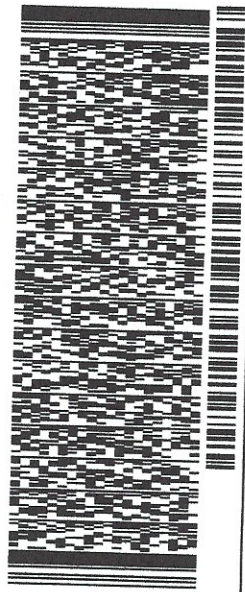
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STEVE SOFMAN  
CHARLES CHERUNDOLLO CONSULTING  
976 TABOR ROAD  
SUITE 4B  
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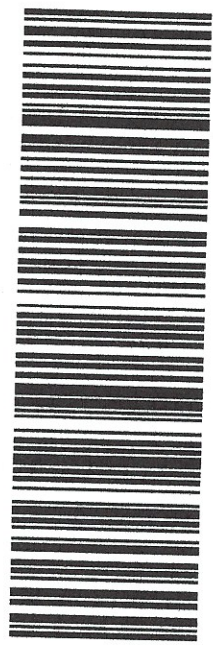


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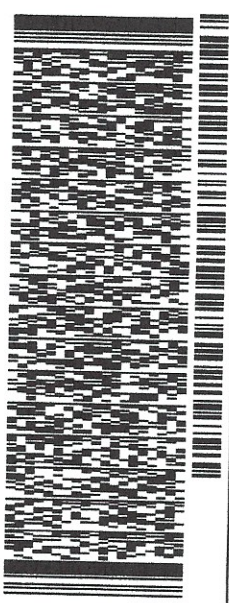
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UNITED STATES US

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CAD: 111040781/NET/4160  
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TOWN OF GREENWICH  
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(203) 622-7700  
REF: CT43X0866 CSC FILING  
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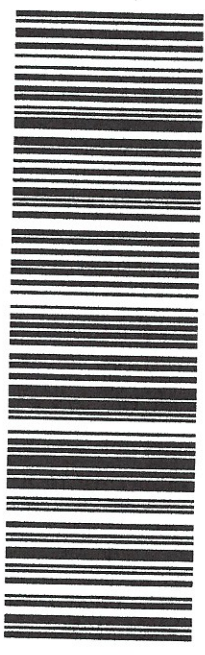


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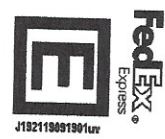
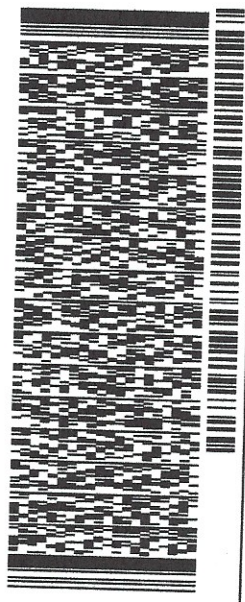
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CAD: 11104078/FIN/ET4160  
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395 ROUND HILL RD

GREENWICH CT 06831  
(203) 866-1091  
REF: CT43X0365 CSC SUBMISSION  
DEPT:

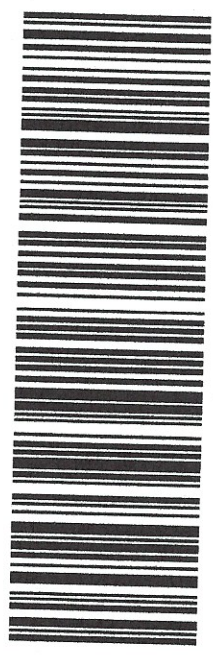


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