CITY OF CAMBRIDGE

BOARD OF ZONING APPEAL

831 Massachusetts Avenue, Cambridge MA 02139

617-349-6100

BZA Application Form

BZA Number: 102207

General Information

The undersigned hereby petitions the Board of Zoning Appeal for the following:

Special Permit: ____X___ Variance: _____ Appeal: _____

PETITIONER: 1925 Mass Ave LLC C/O Eric Hoadland

PETITIONER'S ADDRESS: 195 Lexington Avenue, Cambridge, MA 02138

LOCATION OF PROPERTY: 1923 Massachusetts Ave , Cambridge, MA

TYPE OF OCCUPANCY: Wireless Telecommunications Facility **ZONING DISTRICT:** Business C Zone

REASON FOR PETITION:

/Telecommunication Facility (antenna)/

DESCRIPTION OF PETITIONER'S PROPOSAL:

Modification to the existing T-Mobile wireless telecommunications facility involving replace 8 existing antennas, adding 4 additional antennas, replacing 4 existing RRHs, and adding 4 additional RRHs within the existing lease area.

SECTIONS OF ZONING ORDINANCE CITED:

Article: 4.000 Section: 4.32.G.1 (Telecommunication Facility).
Article: 4.000 Section: 4.40 (Footnote 49) (Telecommunication Facility).
Article: 10.000 Section: 10.40-10.46 (Special Permit).

6409A

Original Signature(s): Eric M. Hoagland
(Petitioner (s) / Owner)

Hoagland, Eric
(Print Name)

Address:

Tel. No. 857-998-0836
E-Mail Address: ehoagie@gmail.com

BZA Application Form

SUPPORTING STATEMENT FOR A SPECIAL PERMIT

Please describe in complete detail how you meet each of the following criteria referring to the property and proposed changes or uses which are requested in your application. Attach sheets with additional information for special permits which have additional criteria, e.g.; fast food permits, comprehensive permits, etc., which must be met.

Granting the Special Permit requested for 1923 Massachusetts Ave , Cambridge, MA (location) would not be a detriment to the public interest because:

A) Requirements of the Ordinance can or will be met for the following reasons:

The proposed modification of the existing facility will have minimal visual impact compared to the existing configuration and provide an improved wireless communication system to those in the effected area.

B) Traffic generated or patterns of access or egress would not cause congestion hazard, or substantial change in established neighborhood character for the following reasons:

No physical modification of the building or parking area will be modified and no traffic patterns will be changed due to the change to the roof top cell site.

C) The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would not be adversely affected by the nature of the proposed use for the following reasons:

The proposed work will result in minimal visual impact and will not impair the use of property in the immediate vicinity.

D) Nuisance or hazard would not be created to the detriment of the health, safety, and/or welfare of the occupant of the proposed use or the citizens of the City for the following reasons:

This is a modification and improvement to an existing wireless facility which conforms to FCC regulations and standards.

E) For other reasons, the proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the intent or purpose of this ordinance for the following reasons:

The approval of this modification will lead to improved data and voice communication services within the effective range with minimal visual impact.

***If you have any questions as to whether you can establish all of the applicable legal requirements, you should consult with an attorney.**

BZA Application Form

DIMENSIONAL INFORMATION

Applicant: 1925 Mass Ave LLC
Location: 195 Lexington Avenue
Phone: 857-998-0836

Present Use/Occupancy: Wireless Telecommunications Facility
Zone: Business C Zone
Requested Use/Occupancy: Wireless Telecommunications Facility

		Existing Conditions	Requested Conditions	Ordinance Requirements	
TOTAL GROSS FLOOR AREA:		N/A	N/A	N/A	(max.)
LOT AREA:		N/A	N/A	N/A	(min.)
RATIO OF GROSS FLOOR AREA TO LOT AREA: [2]		N/A	N/A	N/A	
LOT AREA OF EACH DWELLING UNIT		N/A	N/A	N/A	
SIZE OF LOT:	WIDTH	N/A	N/A	N/A	
	DEPTH	N/A	N/A	N/A	
SETBACKS IN FEET:	FRONT	N/A	N/A	N/A	
	REAR	N/A	N/A	N/A	
	LEFT SIDE	N/A	N/A	N/A	
	RIGHT SIDE	N/A	N/A	N/A	
SIZE OF BUILDING:	HEIGHT	N/A	N/A	N/A	
	WIDTH	N/A	N/A	N/A	
RATIO OF USABLE OPEN SPACE TO LOT AREA:		N/A	N/A	N/A	
NO. OF DWELLING UNITS:		N/A	N/A	N/A	
NO. OF PARKING SPACES:		N/A	N/A	N/A	
NO. OF LOADING AREAS:		N/A	N/A	N/A	
DISTANCE TO NEAREST BLDG. ON SAME LOT		N/A	N/A	N/A	

Describe where applicable, other occupancies on the same lot, the size of adjacent buildings on same lot, and type of construction proposed, e.g; wood frame, concrete, brick, steel, etc.

1. SEE CAMBRIDGE ZONING ORDINANCE ARTICLE 5.000, SECTION 5.30 (DISTRICT OF DIMENSIONAL REGULATIONS).
2. TOTAL GROSS FLOOR AREA (INCLUDING BASEMENT 7'-0" IN HEIGHT AND ATTIC AREAS GREATER THAN 5') DIVIDED BY LOT AREA.
3. OPEN SPACE SHALL NOT INCLUDE PARKING AREAS, WALKWAYS OR DRIVEWAYS AND SHALL HAVE A MINIMUM DIMENSION OF 15'.

T-Mobile®

T-MOBILE NORTHEAST LLC
ANCHOR

SITE #: 4DE7032A
SITE NAME: BO032/1923-1925 MASS. AVE.
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

SITE CONFIGURATION: 4SEC-67D5997DB OUTDOOR

CONSTRUCTION DRAWINGS
ALL SCALES RELATIVE TO 24"X36" PAGE SIZE

APPROVED
By Ryan Monte de Ramos at 8:40 pm, Aug 28, 2020

GENERAL NOTES

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF T–MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

THE FACILITY IS AN UNMANNED, PRIVATE, AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND, THEREFORE, DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T–MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES

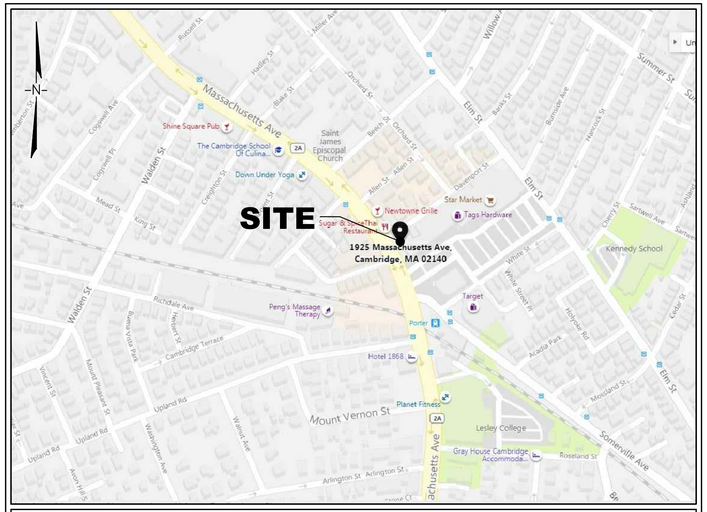
STRUCTURE OWNER SHALL BE RESPONSIBLE FOR GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE–BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.

STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY COM–EX CONSULTANTS, LLC ON BEHALF OF T–MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING PLATFORM, EXISTING ANTENNA MOUNTS, AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T–MOBILE EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.

COM–EX CONSULTANTS, LLC ASSUMES THAT THE STRUCTURE IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTIONS ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NOT DETERIORATION TO IT'S MEMBER CAPACITIES.

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQUISITION	DATE
OPERATIONS	DATE



KEY MAP
SCALE = N.T.S.

UNDERGROUND SERVICE ALERT

811 Know what's below. Call before you dig.

CALL TOLL FREE: 888-DIG-SAFE
(888-344-7233)

SITE LOCATION INFORMATION

SITE NUMBER:	4DE7032A
SITE ADDRESS:	1923–1925 MASSACHUSETTS AVE. CAMBRIDGE, MA 02140
JURISDICTION:	CITY OF CAMBRIDGE
COUNTY:	BRISTOL COUNTY
PARCEL ID:	179 81
PROPERTY OWNER:	1925 MASS AVE LLC 195 LEXINGTON AVE, 100 CAMBRIDGE, MA 02138
APPLICANT:	T–MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766

SITE CHARACTERISTICS

LATITUDE:	N 42.38949000
LONGITUDE:	W –71.11966100
STRUCTURE TYPE:	BUILDING
LOCATION OF PROPOSED EQUIPMENT:	ROOFTOP
STRUCTURE HEIGHT:	±44'–0" AGL
ANTENNA (RAD CENTER)	ALPHA – ±49'–0" AGL BETA – ±45'–0" AGL GAMMA – ±53'–0" AGL DELTA – ±45'–0" AGL

SHEET INDEX

SHEET NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
GN-1	GROUNDING & GENERAL NOTES
A-1	ROOF PLAN & ELEVATION
A-2	ANTENNA PLANS
A-3	FINAL EQUIPMENT PLAN & SCHEMATIC
A-4	DETAILS
E-1	ELECTRICAL DETAILS & NOTES

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

T-Mobile®
T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
OFFICE: (508) 286-2700
FAX: (508) 286-2893

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4		
3		
2	08/27/20	ISSUED AS FINAL
1	07/23/20	REVISED PER RF COMMENTS
0	06/30/20	INITIAL SUBMISSION

DRAWN BY:	WG
CHECKED BY:	CJT
SCALE:	AS NOTED
JOB NO:	20002-TRN

INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR OFFICIAL USE UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF A PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS · NICHOLAS D. BARILE · CIVIL · No. 51464 · REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, MA LIC. No. 51464

SITE #: 4DE7032A
BO032/1923-1925 MASS AVE
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

TITLE SHEET

DRAWING SHEET: 1 OF 7

T-1

GENERAL NOTES

1. FOR THE PURPOSE OF THE CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTORS – TO BE DETERMINED
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE PROVIDED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSED AND ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY . SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT THE EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTORS EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIAL SUCH AS COAXIAL CABLE AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNERS DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR–ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHED AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T–MOBILE SITES."

17. SUBCONTRACTORS SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. APPLICABLE BUILDING CODES:

SUBCONTRACTORS WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

- BUILDING CODE: MA STATE BUILDING CODE 780 CMR 8TH EDITION
- ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
- LIGHTNING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTORS WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

- AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENT FOR STRUCTURAL CONCRETE
- AMERICAN INSTITUTE FOR STEEL CONSTRUCTION (AISC)
- MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
- TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–G, STRUCTURAL STANDARDS FOR STEEL
- ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS A CONFLICT BETWEEN A GENERAL REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ELECTRICAL & GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO LIGHTNING PROTECTION AND AS POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO THE BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATING (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURE WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.

13. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.

14. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.

15. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.

16. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.

17. 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.

18. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.

19. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN OR THIN INSULATION.

20. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.

21. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A–1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.

22. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.

23. GROUNDING SHALL COMPLY WITH NEW ART. 250.

24. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.

25. 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 DRAWING.

26. 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.

27. 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 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.

28. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON–SURGING OBJECTS (EGB GROUND IN BTS UNIT)

29. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.

30. BOND ANTENNA MOUNTING BRACKETS. COAXIAL CABLE GROUND KITS AND ALNA TO EGB PLACES NEAR THE ANTENNA LOCATION.

31. BOND ANTENNA EGB'S AND MGB TO WATER MAIN.

32. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE–OUT DOCUMENTATION.

33. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.

34. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
OFFICE: (508) 286-2700
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SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
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3		
2	08/27/20	ISSUED AS FINAL
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DRAWN BY:	WG
CHECKED BY:	CJT
SCALE:	AS NOTED
JOB NO:	20002-TRN

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COMMONWEALTH OF MASSACHUSETTS · NICHOLAS D. BARILE · CIVIL · No. 51464 · REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, MA LIC. No. 51464

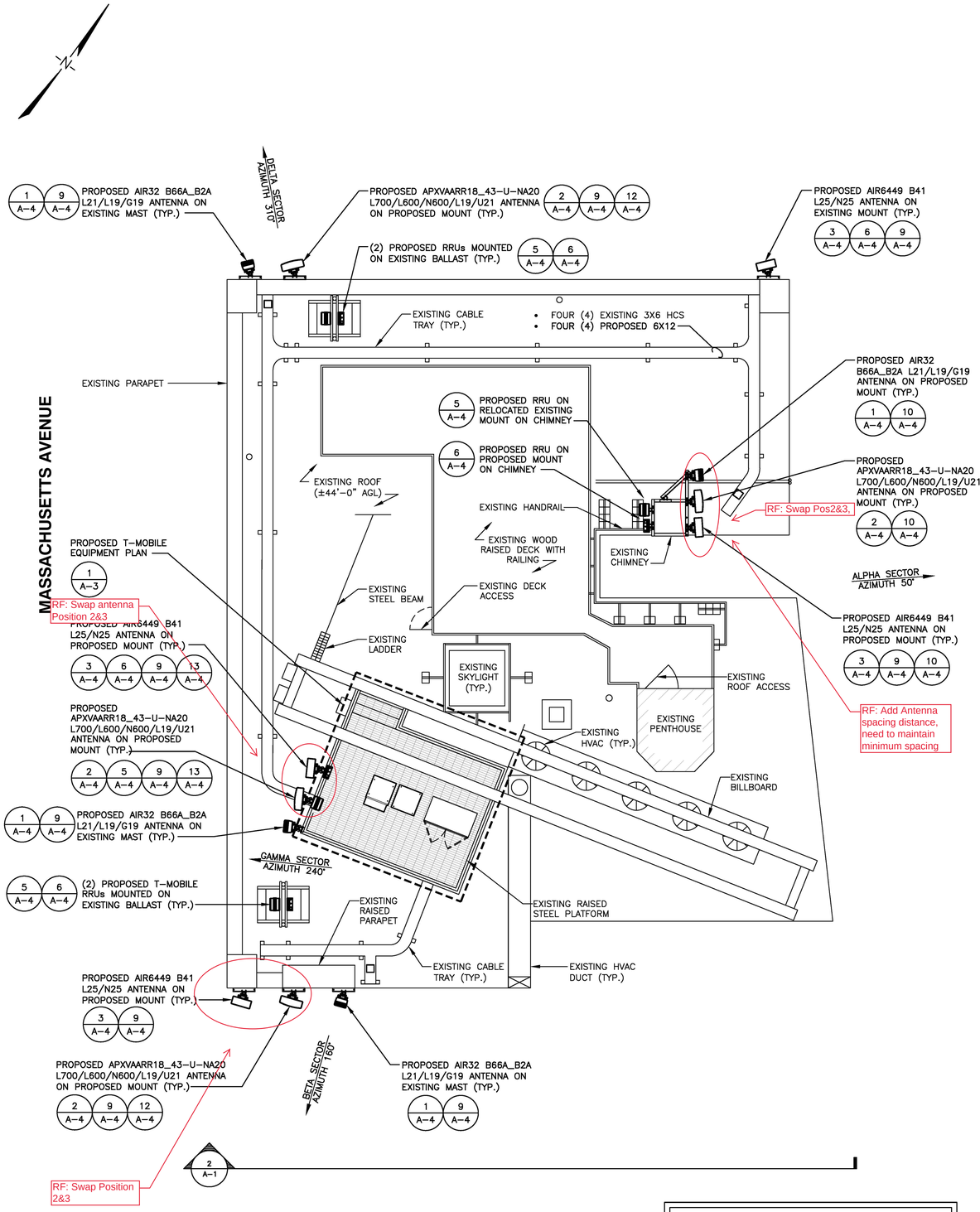
SITE #: 4DE7032A
BO032/1923-1925 MASS AVE
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

GROUNDING & GENERAL NOTES

DRAWING SHEET: 2 OF 7

GN-1



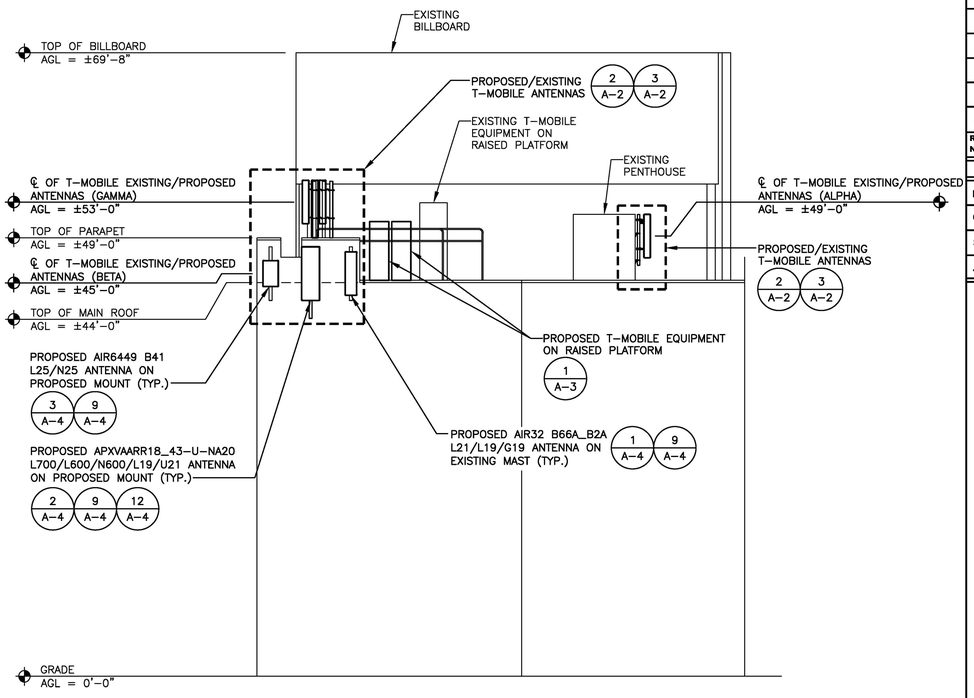
1 A-1 ROOF PLAN
SCALE: 3/16"=1'-0"

0 2'-8" 5'-4" 10'-8"

GRAPHIC SCALE: 3/16"=1'-0"

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

LOADING SHOWN ON THIS SET OF DRAWINGS IS BASED ON THE STRUCTURAL ANALYSIS & MOUNT ANALYSIS PERFORMED BY COM-EX CONSULTANTS, DATED AUGUST 27, 2020. CONTRACTOR TO NOTIFY COM-EX AND T-MOBILE IN THE EVENT SITE CONDITIONS DIFFER FROM WHAT IS REPRESENTED IN THE STRUCTURAL ANALYSIS. NO SUBSTITUTIONS ARE PERMITTED WITHOUT ADDITIONAL ANALYSIS.



2 A-1 ELEVATION
SCALE: 1/8"=1'-0"

0 4 8 16

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

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

T-Mobile
T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
OFFICE: (508) 286-2700
FAX: (508) 286-2893

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4		
3		
2	08/27/20	ISSUED AS FINAL
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0	06/30/20	INITIAL SUBMISSION

DRAWN BY:	WG
CHECKED BY:	CJT
SCALE:	AS NOTED
JOB NO:	20002-TRN

INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR OFFICIAL USE UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF A PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS NICHOLAS D. BARILE No. 51464 REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, MA LIC. No. 51464

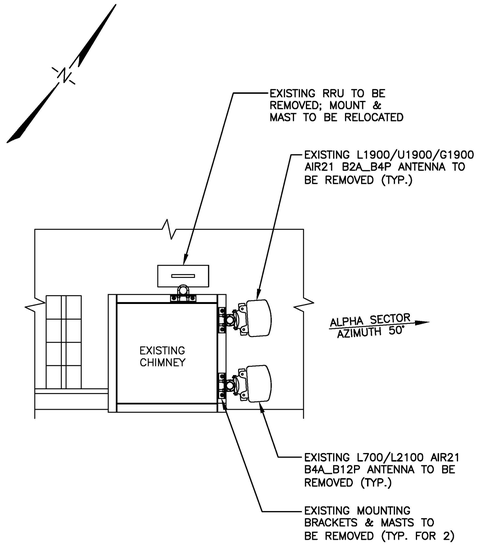
SITE #: 4DE7032A
BO032/1923-1925 MASS AVE
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

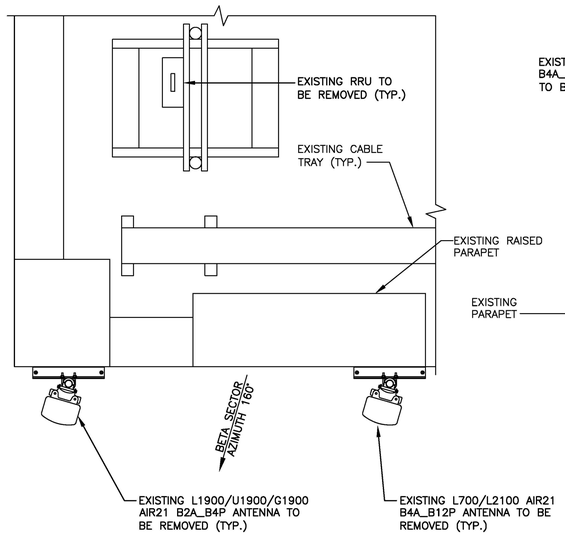
ROOF PLAN & ELEVATION

DRAWING SHEET: 3 OF 7

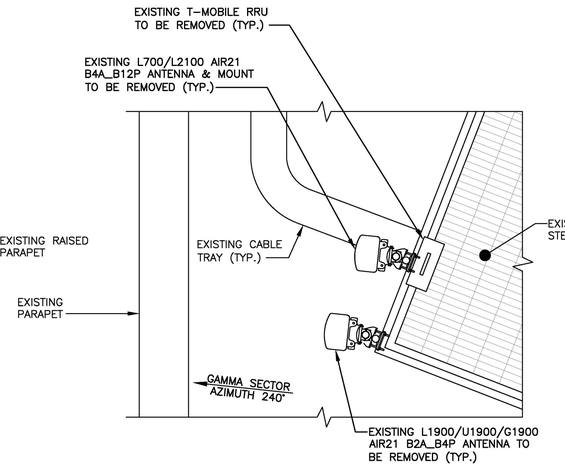
A-1



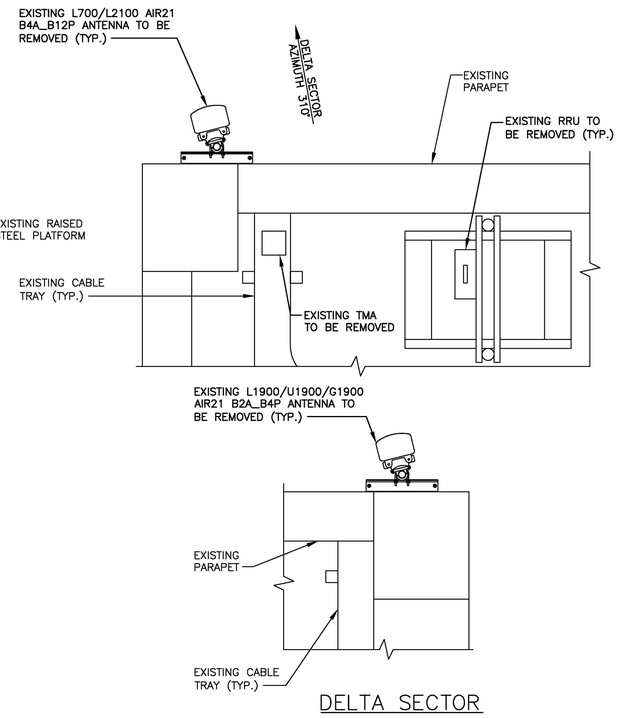
ALPHA SECTOR



BETA SECTOR



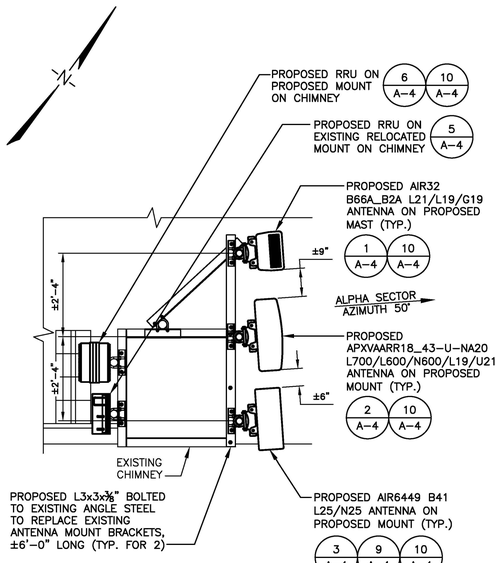
GAMMA SECTOR



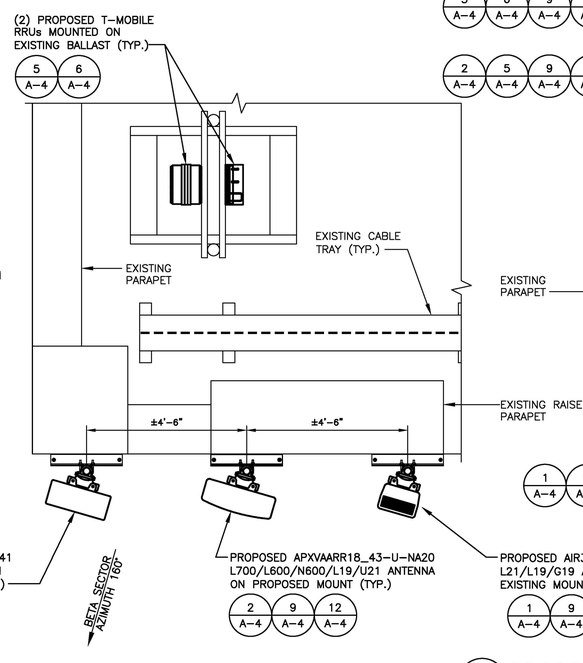
DELTA SECTOR

1 / A–2 EXISTING ANTENNA PLAN
SCALE: 1/4"=1'–0"

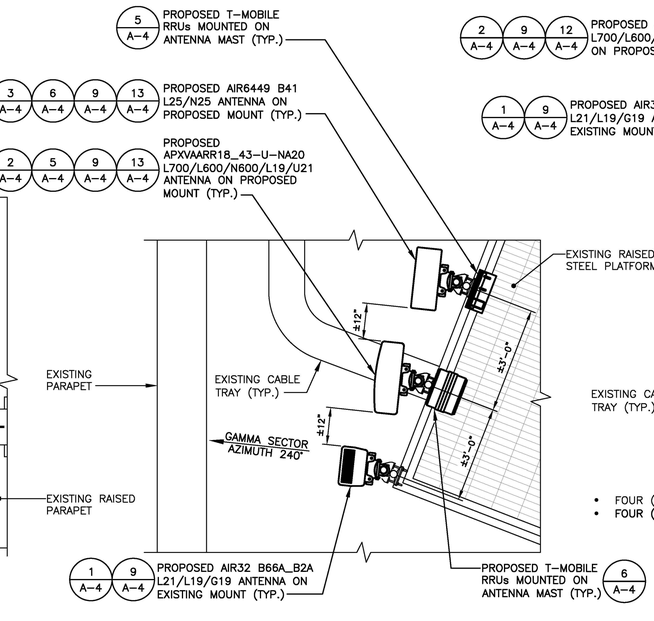
GRAPHIC SCALE: 1/4"=1'–0"



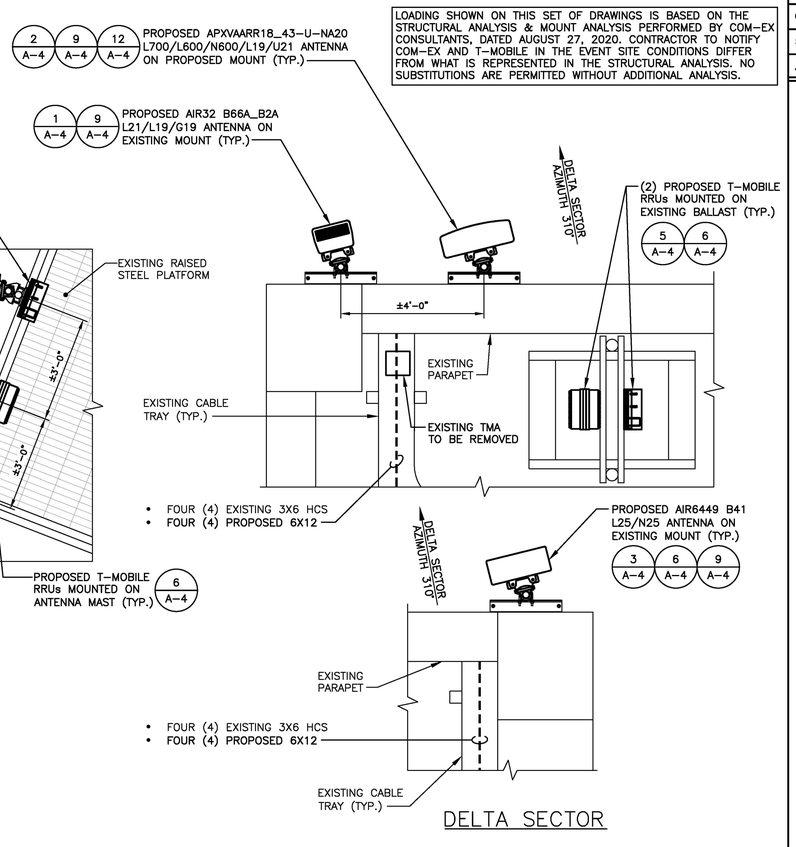
ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



DELTA SECTOR

2 / A–2 PROPOSED ANTENNA PLAN
SCALE: 1/4"=1'–0"

GRAPHIC SCALE: 1/4"=1'–0"

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COMMONWEALTH OF MASSACHUSETTS · NICHOLAS D. BARILE · No. 51464 · REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, MA LIC. No. 51464

SITE #: 4DE7032A
B0032/1923-1925 MASS AVE
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

EXISTING & PROPOSED ANTENNA PLANS

DRAWING SHEET: 4 OF 7

A-2

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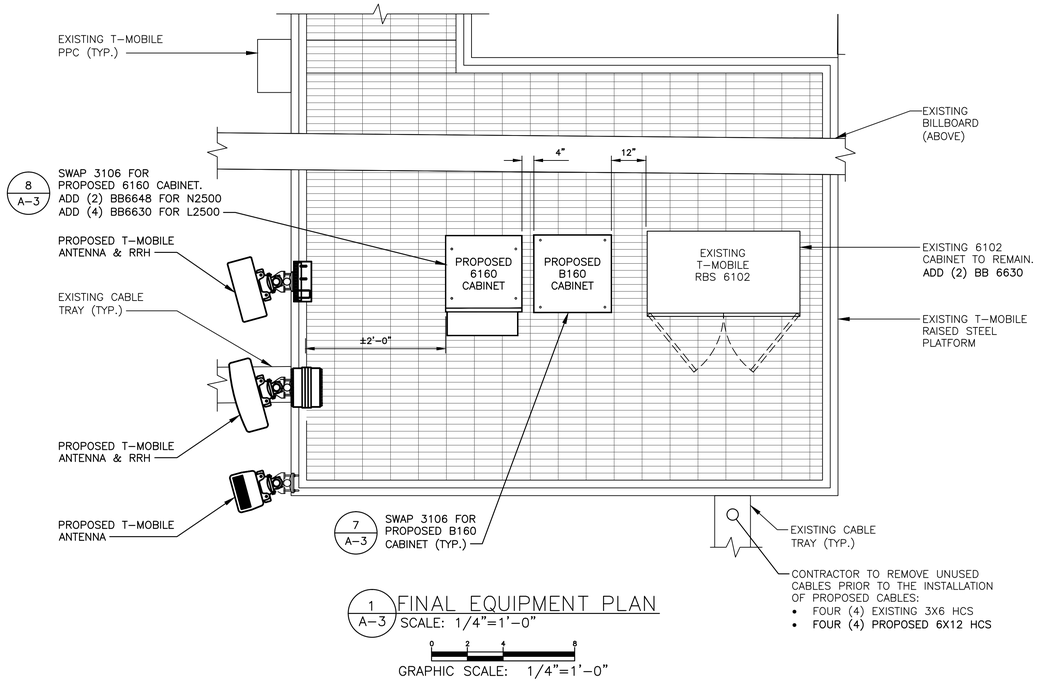
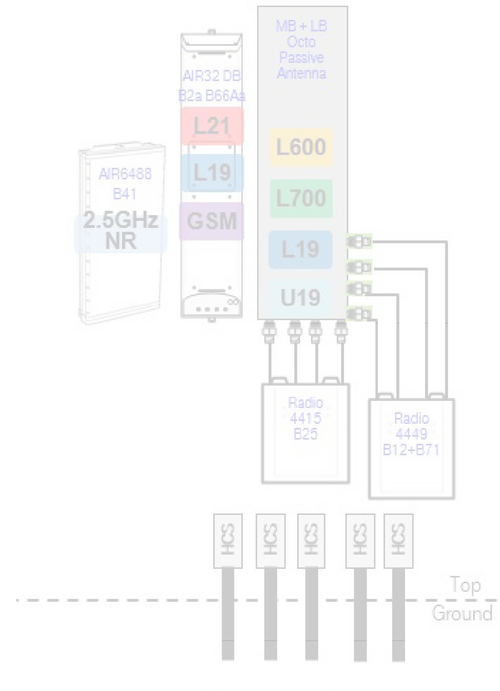


1 A–3 FINAL EQUIPMENT PLAN
SCALE: 1/4"=1'–0"

GRAPHIC SCALE: 1/4"=1'–0" (0, 2, 4, 8)

SITE CONFIGURATION: 4SEC-67D5997DB OUTDOOR



2 A–3 ANTENNA & COAX CABLE SCHEMATIC
SCALE: N.T.S.

ANTENNA INFORMATION

SECTOR	POSITION (FROM REAR LEFT TO RIGHT)	EXISTING		PROPOSED										
		MODEL	QTY.	MODEL	ANT. C.L.	SECTOR MARK	QTY.	E-TILT	M-TILT	RRU MODEL/QUANTITY	TMA	COAX/ FIBER QUANTITY	COAX/ FIBER SIZE	COAX/ FIBER LENGTH
ALPHA 50°	R1	AIR21 B2A_B4P	1	**AIR32 B66A_B2A**	49'–0"	L1900/G1900/ L2100	1	3/3/3/3	0	–	–	4 1	FIBER JUMPER 6x12 HCS	15' 100'
	R2	AIR21 B4A_B12P	1	**APXVAARR18_43-U-NA20**	49'–0"	N600/L600/L700 /L1900/U2100	1	4/4/3/3	0	(1) 4449 B71+B85 (1) 4415 B25	(1) TWIN STYLE 18–AWS	12 4 2	COAX JUMPER FIBER JUMPER ⅜" COAX	15' 15' 100'
	R3	–	–	**AIR6449 B41**	49'–0"	L2500/N2500	1	2/2	0	–	–	4 4	FIBER JUMPER COAX JUMPER	15' 15'
BETA 160°	W1	AIR21 B2A_B4P	1	**AIR32 B66A_B2A**	45'–0"	L1900/G1900/ L2100	1	3/3/3/3	0	–	–	4 1	FIBER JUMPER 6x12 HCS	15' 100'
	W2	AIR21 B4A_B12P	1	**APXVAARR18_43-U-NA20**	45'–0"	N600/L600/L700 /L1900/U2100	1	4/4/3/3	0	(1) 4449 B71+B85 (1) 4415 B25	(1) TWIN STYLE 18–AWS	12 4 2	COAX JUMPER FIBER JUMPER ⅜" COAX	15' 15' 100'
	W3	–	–	**AIR6449 B41**	45'–0"	L2500/N2500	1	2/2	0	–	–	4 4	FIBER JUMPER COAX JUMPER	15' 15'
GAMMA 240°	B1	AIR21 B2A_B4P	1	**AIR32 B66A_B2A**	53'–0"	L1900/G1900/ L2100	1	3/3/3/3	0	–	–	4 1	FIBER JUMPER 6x12 HCS	15' 100'
	B2	AIR21 B4A_B12P	1	**APXVAARR18_43-U-NA20**	53'–0"	N600/L600/L700 /L1900/U2100	1	4/4/3/3	0	(1) 4449 B71+B85 (1) 4415 B25	(1) TWIN STYLE 18–AWS	12 4 2	COAX JUMPER FIBER JUMPER ⅜" COAX	15' 15' 100'
	B3	–	–	**AIR6449 B41**	53'–0"	L2500/N2500	1	2/2	0	–	–	4 4	FIBER JUMPER COAX JUMPER	15' 15'
DELTA 310°	B1	AIR21 B4A_B12P	1	**AIR32 B66A_B2A**	45'–0"	L1900/G1900/ L2100	1	3/3/3/3	0	–	–	4 1	FIBER JUMPER 6x12 HCS	15' 100'
	B2	AIR21 B2A_B4P	1	**APXVAARR18_43-U-NA20**	45'–0"	N600/L600/L700 /L1900/U2100	1	4/4/3/3	0	(1) 4449 B71+B85 (1) 4415 B25	(1) TWIN STYLE 18–AWS	1	COAX JUMPER FIBER JUMPER ⅜" COAX	15' 15' 100'
	B3	–	–	**AIR6449 B41**	45'–0"	L2500/N2500	1	2/2	0	–	–	4 4	FIBER JUMPER COAX JUMPER	15' 15'

AT TIME OF CONSTRUCTION, CONTRACTOR TO VERIFY AZIMUTHS OF EXISTING ANTENNAS. IF DIFFERENT FROM RFDS, PLEASE NOTIFY THE RF ENGINEER AND CONSTRUCTION MANAGER WITH ACTUAL AZIMUTH TO ENSURE T–MOBILE'S DATABASE IS ACCURATE AND UP–TO–DATE.

ANTENNA LOCATIONS TO BE VERIFIED IN FIELD. RFDS TO BE REDLINED ACCORDINGLY.

INFORMATION SHOWN PROVIDED ON T–MOBILE RFDS DATE 05/21/20

NOTE:
EXISTING SITE CONDITIONS SHOW ON THIS SET OF PLANS BASED ON A VISIT BY COM–EX ON 06/16/20.

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
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COMMONWEALTH OF MASSACHUSETTS — NICHOLAS D. BARILE — No. 51464 — REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, MA LIC. No. 51464

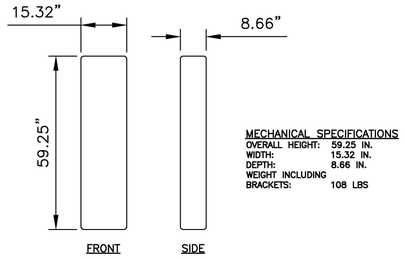
SITE #: 4DE7032A
BO032/1923-1925 MASS AVE
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

FINAL EQUIPMENT PLAN & SCHEMATIC

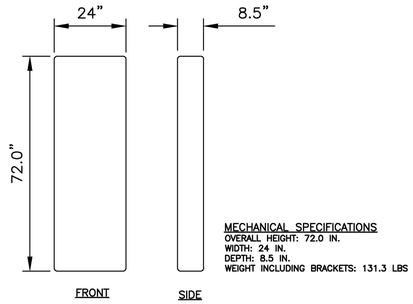
DRAWING SHEET: 4 OF 7

A-3



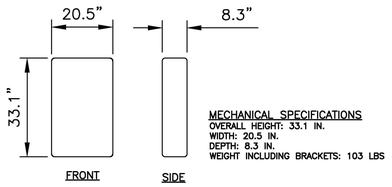
MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 59.25 IN.
WIDTH: 15.32 IN.
DEPTH: 8.66 IN.
WEIGHT INCLUDING BRACKETS: 108 LBS

1 A-4 PROPOSED ANTENNA – AIR32B66A_B2A
SCALE: 1/2"=1'



MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 72.0 IN.
WIDTH: 24 IN.
DEPTH: 8.5 IN.
WEIGHT INCLUDING BRACKETS: 131.3 LBS

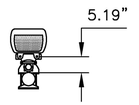
2 A-4 PROPOSED ANTENNA – APXVAARR18-43-U-NA20
SCALE: 1/2"=1'



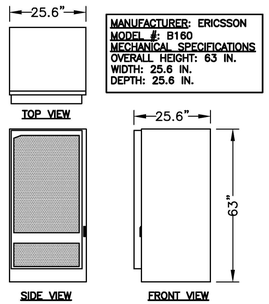
MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 33.1 IN.
WIDTH: 20.5 IN.
DEPTH: 8.3 IN.
WEIGHT INCLUDING BRACKETS: 103 LBS

3 A-4 PROPOSED ANTENNA – AIR6449 B41
SCALE: 1/2"=1'

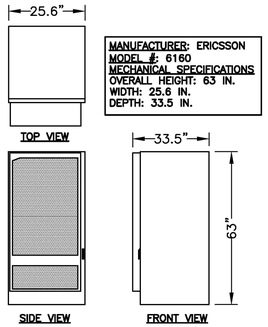
MECHANICAL SPECIFICATIONS
PART #: APM40-2
SUITABLE FOR MAST ø: 2.17" – 4.53"
WEIGHT: 9.48 LBS



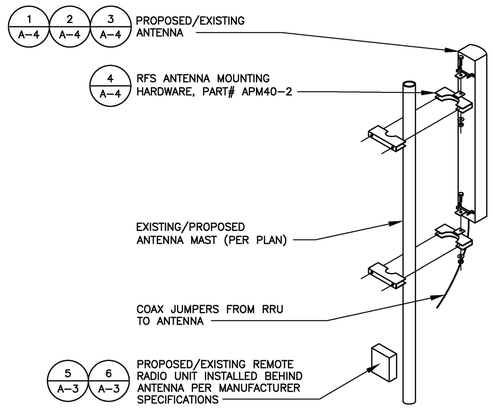
4 A-4 TYPICAL ANTENNA MOUNTING DETAIL
SCALE: 1/2"=1'

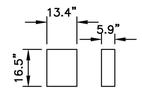


MANUFACTURER: ERICSSON
MODEL #: B160
MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 63 IN.
WIDTH: 25.6 IN.
DEPTH: 25.6 IN.

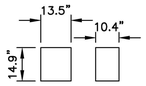


MANUFACTURER: ERICSSON
MODEL #: 6160
MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 63 IN.
WIDTH: 25.6 IN.
DEPTH: 33.5 IN.





MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 16.5 IN.
WIDTH: 13.4 IN.
DEPTH: 5.9 IN.
WEIGHT INCLUDING BRACKETS: 46 LBS



MECHANICAL SPECIFICATIONS
OVERALL HEIGHT: 14.9 IN.
WIDTH: 13.5 IN.
DEPTH: 10.4 IN.
WEIGHT INCLUDING BRACKETS: 74 LBS

5 A-4 PROPOSED RRU – 4415 B25
SCALE: 3/8"=1'

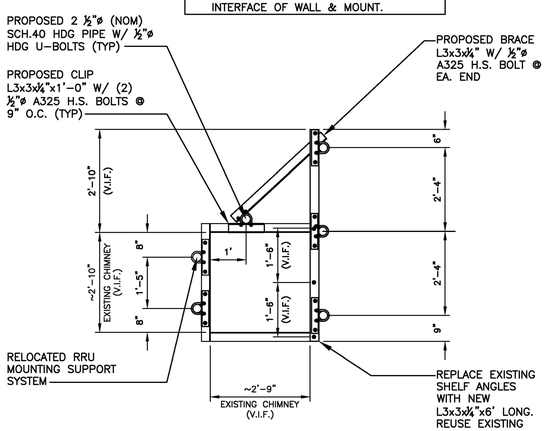
6 A-4 PROPOSED RRU – 4449 B71+B85
SCALE: 3/8"=1'

7 A-4 ERICSSON – B160 CABINET
SCALE: N.T.S.

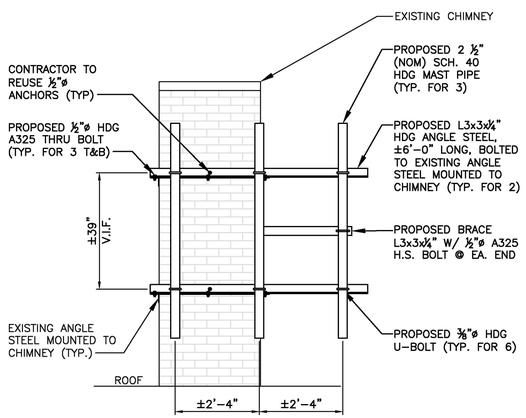
8 A-4 ERICSSON – 6160 CABINET
SCALE: N.T.S.

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

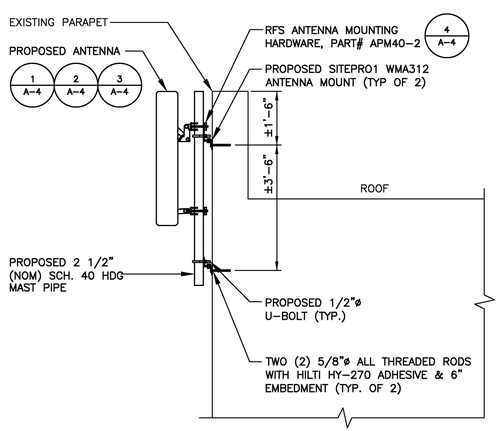
NOTE:
- ANTENNAS NOT SHOWN FOR CLARITY.
- PROPOSED ANTENNAS, FRAME & RRU TO BE PAINTED TO MATCH.
- PROVIDE NON-SHRINK GROUT AT INTERFACE OF WALL & MOUNT.



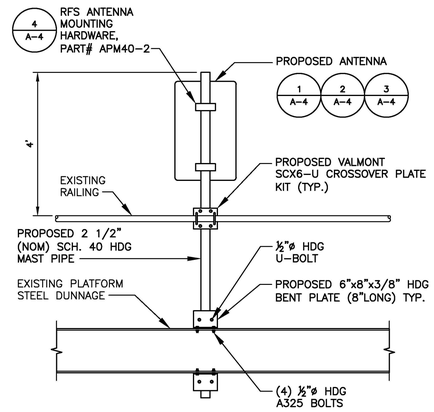
10 A-4 ALPHA SECTOR ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



11 A-4 ALPHA SECTOR ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



12 A-4 BETA & DELTA SECTOR ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



13 A-4 GAMMA SECTOR ANTENNA MOUNTING DETAIL
SCALE: N.T.S.

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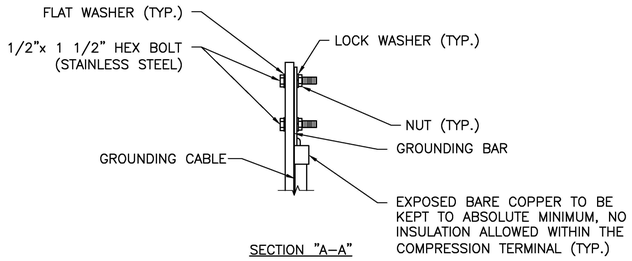
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

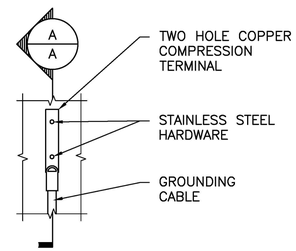
DETAILS

DRAWING SHEET: 5 OF 7

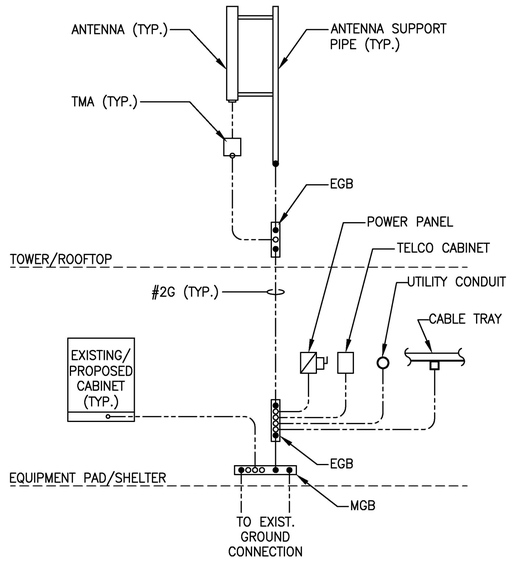
A-4



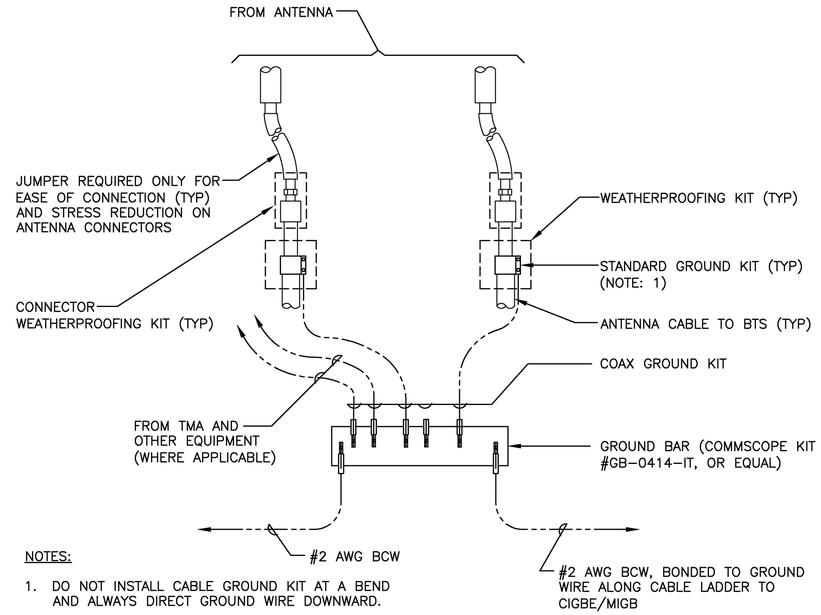
NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.



1 E–1 TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.

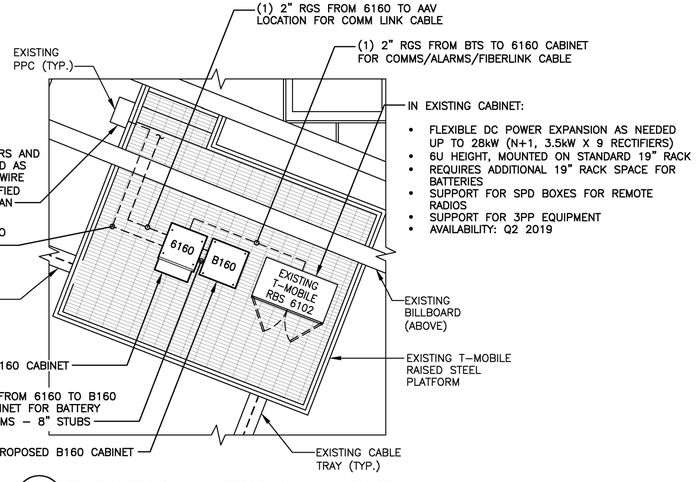


2 E–1 GROUNDING RISER DIAGRAM
SCALE: N.T.S.



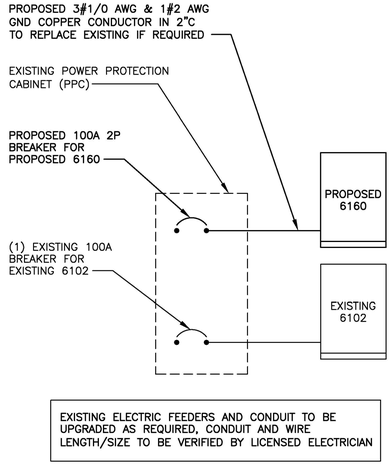
NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWNWARD.

3 E–1 GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.

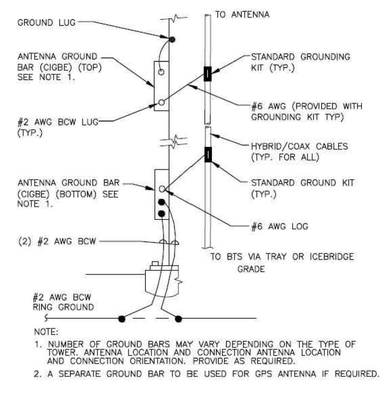


4 E–1 ELECTRICAL SERVICE DIAGRAM
SCALE: 1/4"=1'–0"

0 1'–4" 2'–8" 5'–4"
GRAPHIC SCALE: 3/8"=1'–0"



5 E–1 ONE LINE DIAGRAM
SCALE: 1/4"=1'–0"



6 E–1 ANTENNA CABLE GROUNDING
SCALE: N.T.S.

ELECTRICAL LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT – HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
G	GROUND
⏚	GROUND
MGB	MASTER GROUND BAR ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
EGB	EQUIPMENT GROUND BAR
—G—	GROUND COPPER WIRE, SIZE AS NOTED
	EXPOSED WIRING
	COAXIAL CABLE
⊙	5/8"x8" COPPER CLAD STAINLESS STEEL GROUND ROD
	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊠	OMNI–DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

T-Mobile
T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
OFFICE: (508) 286-2700
FAX: (508) 286-2893

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
7		
6		
5		
4		
3		
2	08/27/20	ISSUED AS FINAL
1	07/23/20	REVISED PER RF COMMENTS
0	06/30/20	INITIAL SUBMISSION

DRAWN BY:	WG
CHECKED BY:	CJT
SCALE:	AS NOTED
JOB NO:	20002-TRN

INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR OFFICIAL USE UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF A PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS NICHOLAS D. BARILE No. 51464 REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER, MA LIC. No. 51464

SITE #: 4DE7032A
B0032/1923-1925 MASS AVE
1923-1925 MASSACHUSETTS AVE.
CAMBRIDGE, MA 02140
MIDDLESEX COUNTY

DRAWING TITLE:

ELECTRICAL DETAILS & NOTES

DRAWING SHEET: 6 OF 7

E-1

COM EX
Consultants

4DE7032A - PHOTO SIMULATION
LOCATION - 1
DECEMBER - 2020

COM EX
Consultants

4DE7032A - PHOTO SIMULATION
LOCATION - 2
DECEMBER - 2020

COM EX
Consultants

4DE7032A - PHOTO SIMULATION
LOCATION - 3
DECEMBER - 2020

BEFORE

AFTER

COM EX
Consultants

4DE7032A - PHOTO SIMULATION
LOCATION - 4
DECEMBER - 2020

Com-Ex Consultants, LLC ● 115 Route 46, Suite E39 ● Mountain Lakes, NJ ● 07046
Office: 862-209-4300 | Fax: 862-209-4301

4DE7032A
BO032/1923-1925 Mass Ave

1923-1925 Massachusetts Ave., Cambridge, MA 02140
(Middlesex County)

Equipment Platform Structural Analysis
Anchor Project

August 27, 2020

Item	Pass/Fail	Capacity
Equipment Platform	Pass	26.0%

Nicholas D. Barile, P.E.
MA PE License No. 51464
Com-Ex Project No. 20002-TRN

Com-Ex Consultants, LLC ● 115 Route 46, Suite E39 ● Mountain Lakes, NJ ● 07046
Office: 862-209-4300 | Fax: 862-209-4301

Executive Summary

At the request of T-Mobile, Com-Ex Consultants has performed a structural analysis of the equipment platform for the proposed cabinets and ancillary equipment per the *MA STATE BUILDING CODE 780 CMR 8TH ED., ASCE 7, ANSI/TIA-222-G, and AISC (LRFD14).* Information pertaining to the equipment platform and connections was obtained from:

- Site Visit notes & photos by Com-Ex Consultants dated 06/16/20.
- T-Mobile Anchor RFDS dated 05/21/20.
- Construction Drawings completed by Com-Ex Consultants dated 08/27/20.

Discussion

Gravity loading change is less than 0.1% of overall gravity loading; therefore, a full rigorous analysis of the structure and its foundation is not required.

Conclusions

Per our analysis, the equipment platform can support proposed loading per the *MA STATE BUILDING CODE 780 CMR 8TH ED., ANSI/TIA-222-G standards.*

General Comments

If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, Com-Ex Consultants should be notified immediately to perform a revised analysis. This report is not a conditions assessment and assumes that good workmanship will be used and systems will be properly maintained.

Limitations

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of Com-Ex Consultants.

Com-Ex Consultants, LLC ● 115 Route 46, Suite E39 ● Mountain Lakes, NJ ● 07046
Office: 862-209-4300 | Fax: 862-209-4301

Attachment A
Proposed Equipment Configuration

Equipment Platform
(1) (N) 6160 Ericsson Cabinet
(1) (N) B160 Ericsson Battery Cabinet
(1) (E) RBS6102 Ericsson Cabinet

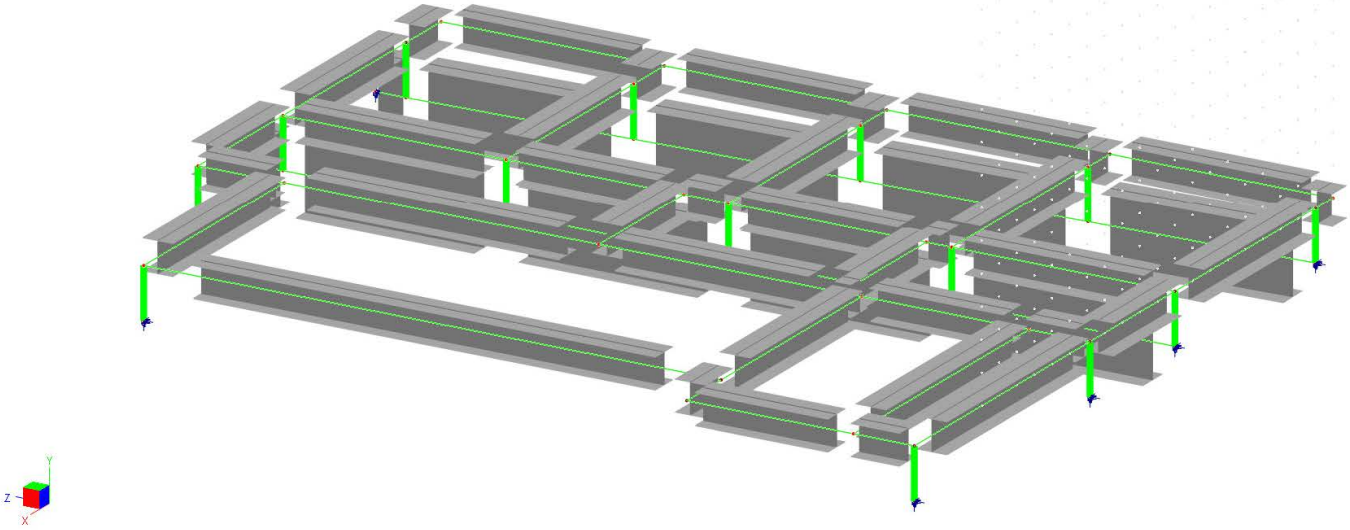
Wind Analysis F = qz x Gh x (EPA) per TIA-222-G

qz = 0.00256 x Kz x Kzt x Kd x V^2 x I

Kz=2.01 (Z/Zg)^(2/α) =	0.850		
Zg =	1200	Table 2-4	Exposure B
Alpha (α) =	7	Table 2-4	
Z=	45	ft, 49ft, 53ft	
Terrain Category	I		
Kzt = (1+KeKt/Kh)^2	1.00	for Category I	
Ke=	1.00	Table 2-4	
Kt=	0.53	Table 2-5	
Kh=e^(f * Z/H) =	0.000	for H=0	
f=	2.00	Table 2-5	
H =Height of Crest Surrounding Terrain	0.00	ft	
Kz =	0.850		
Kzt =	1.0		
Kd =	0.95		
Importance Factor Table 2-3 = I =	1.0	Use Class II	
Vult =	117	mph	
Vasd = x Vult x (0.6)^1/2 =	90.6	mph	
qz = 0.00256 x Kz x Kzt x Kd x V^2 x I =	17.0	psf	
Gh =	1.00		
qz Gh =	**17.0**	**psf**	

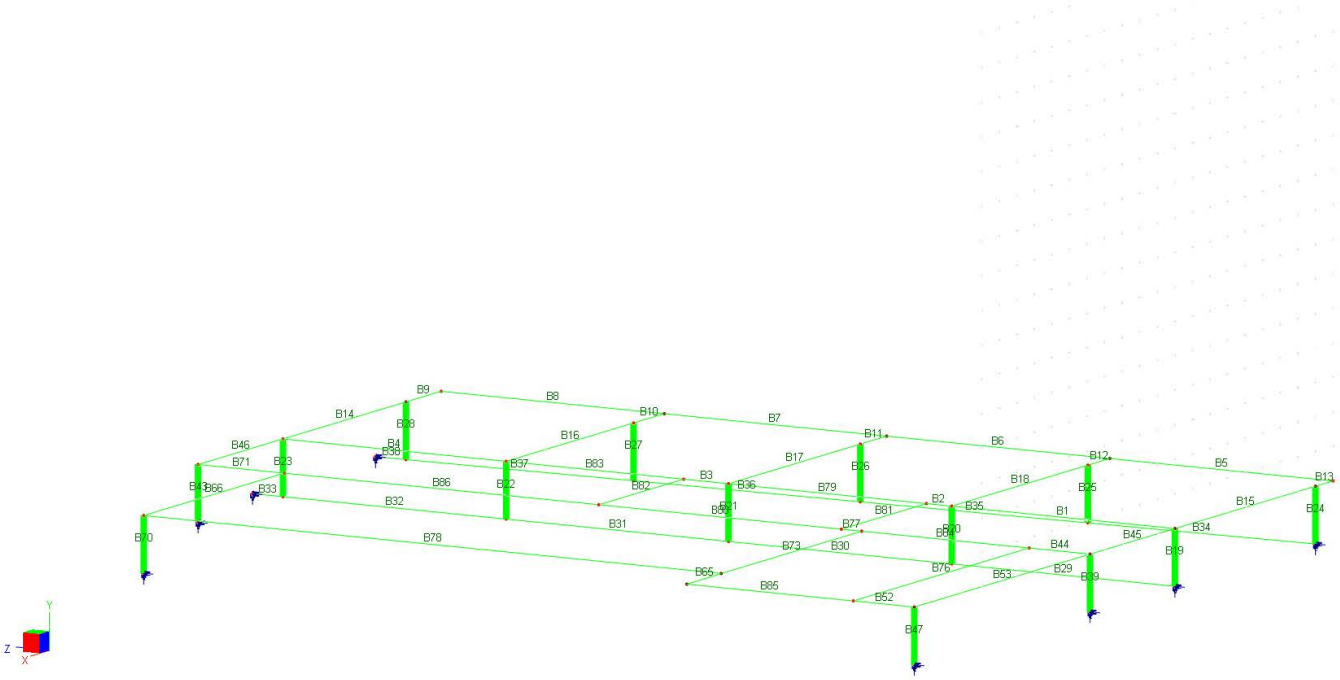
	Equipment Loading	CaAa (sf or sf/lf)	Wind (psf)	Wind Load (lb)	Weight (lb)
F_{N1}	6160 Cabinet	17.59	17.0	298.7	605
F_{N2}	B160	13.65	17.0	231.8	1883
F_{N3}	RBS6102	23.88	17.0	405.5	1331
F_{N4}					
F_{N5}					
F_{N6}					
F_{N7}					
	W6x15	1.00	17.0	17.0	
F_{T1}	6160 Cabinet	13.44	17.0	228.2	605
F_{T2}	B160	13.65	17.0	231.8	1883
F_{T3}	RBS6102	12.86	17.0	218.3	1331
F_{T4}					
F_{T5}					
F_{T6}					
F_{T7}					

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/07/20 16:30:01	



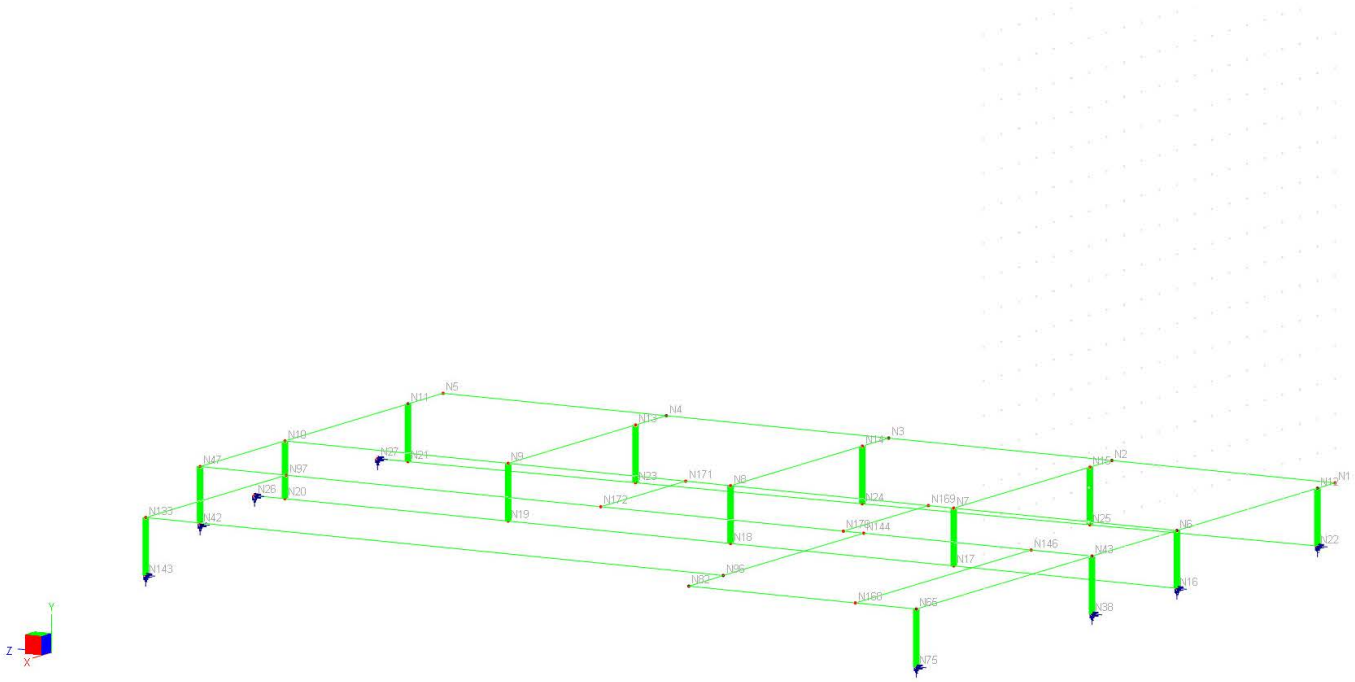
Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/07/20 16:29:11	



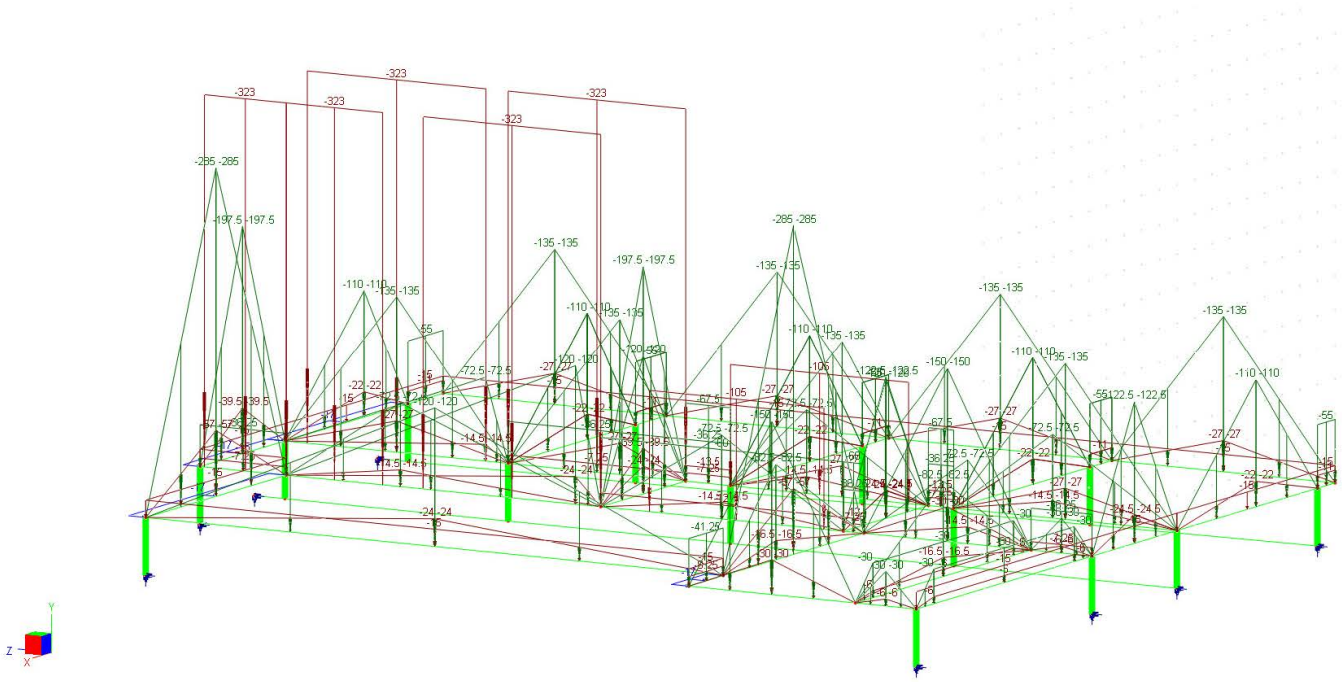
Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/07/20 16:28:57	



Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/07/20 16:28:25	



Note:

Steel Check Report

Project::	**20002-TRN**	Company:	**SZS Engineering**
Description:	**Equipment Platform**	User:	**Sam Gonzalez**
Date:	**08/07/2020 04:30 PM**	Software:	**Digital Canal VersaFrame**

Code Check Results (LRFD14)

CRITICAL STRESS SUMMARY

ID	Section Name	Status	Governing Criteria	Stress Ratio	Load Combination	Distance (ft)
1	W6X15	OK	Axial-Bending	0.0480	AISC14-LRFD_LC2c	0.0000
2	W6X15	OK	Axial-Bending	0.0476	AISC14-LRFD_LC2c	0.4167
3	W6X15	OK	Axial-Bending	0.0491	AISC14-LRFD_LC2c	0.7500
4	W6X15	OK	Axial-Bending	0.0534	AISC14-LRFD_LC2c	3.6667
5	W6X15	OK	Axial-Bending	0.0227	AISC14-LRFD_LC2c	2.9333
6	W6X15	OK	Axial-Bending	0.0359	AISC14-LRFD_LC2c	1.8333
7	W6X15	OK	Axial-Bending	0.0393	AISC14-LRFD_LC2c	2.7500
8	W6X15	OK	Axial-Bending	0.0459	AISC14-LRFD_LC2c	3.6667
9	W6X15	OK	Axial-Bending	0.1126	AISC14-LRFD_LC2c	1.0000
10	W6X15	OK	Axial-Bending	0.0725	AISC14-LRFD_LC2c	0.8750
11	W6X15	OK	Axial-Bending	0.0221	AISC14-LRFD_LC2c	0.7500
12	W6X15	OK	Axial-Bending	0.0359	AISC14-LRFD_LC2c	0.6250
13	W6X15	OK	Axial-Bending	0.1037	AISC14-LRFD_LC2c	0.5000
14	W6X15	OK	Axial-Bending	0.0268	AISC14-LRFD_LC2c	0.0000
15	W6X15	OK	Axial-Bending	0.0075	AISC14-LRFD_LC2c	0.0000
16	W6X15	OK	Axial-Bending	0.0416	AISC14-LRFD_LC2c	0.0000
17	W6X15	OK	Shear Y	0.0127	AISC14-LRFD_LC2c	0.0000
18	W6X15	OK	Axial-Bending	0.0454	AISC14-LRFD_LC2c	0.0000
29	W14X30	OK	Axial-Bending	0.0529	AISC14-LRFD_LC2c	3.6667
30	W14X30	OK	Axial-Bending	0.0541	AISC14-LRFD_LC2c	3.6667
31	W14X30	OK	Axial-Bending	0.0524	AISC14-LRFD_LC2c	0.0000
32	W14X30	OK	Axial-Bending	0.0581	AISC14-LRFD_LC2c	0.0000
33	W14X30	OK	Axial-Bending	0.0363	AISC14-LRFD_LC2c	0.0000
34	W14X30	OK	Axial-Bending	0.0386	AISC14-LRFD_LC2c	3.6688
35	W14X30	OK	Axial-Bending	0.0457	AISC14-LRFD_LC2c	3.6688
36	W14X30	OK	Axial-Bending	0.0424	AISC14-LRFD_LC2c	0.0000
37	W14X30	OK	Axial-Bending	0.0467	AISC14-LRFD_LC2c	0.0000
38	W14X30	OK	Axial-Bending	0.0487	AISC14-LRFD_LC2c	0.0000
44	W6X15	OK	Axial-Bending	0.2600	AISC14-LRFD_LC2c	0.0000
45	W6X15	OK	Axial-Bending	0.0205	AISC14-LRFD_LC2c	0.0000
46	W6X15	OK	Axial-Bending	0.0591	AISC14-LRFD_LC2c	2.4167
52	W6X15	OK	Axial-Bending	0.1400	AISC14-LRFD_LC2c	0.0000
53	W6X15	OK	Axial-Bending	0.0461	AISC14-LRFD_LC2c	5.0000
65	W6X15	OK	Axial-Bending	0.1934	AISC14-LRFD_LC2c	1.0000
66	W6X15	OK	Axial-Bending	0.1062	AISC14-LRFD_LC2c	4.0000
71	W6X15	OK	Axial-Bending	0.2550	AISC14-LRFD_LC2c	1.4167
73	W6X15	OK	Axial-Bending	0.1355	AISC14-LRFD_LC2c	0.0000
76	W6X15	OK	Axial-Bending	0.0378	AISC14-LRFD_LC2c	5.0000
77	W6X15	OK	Axial-Bending	0.1083	AISC14-LRFD_LC2c	0.3333
78	W6X15	OK	Axial-Bending	0.1895	AISC14-LRFD_LC2c	9.5000
79	W6X15	OK	Axial-Bending	0.0515	AISC14-LRFD_LC2c	1.7875
80	W6X15	OK	Axial-Bending	0.1745	AISC14-LRFD_LC2c	4.0000
81	W6X15	OK	Axial-Bending	0.0175	AISC14-LRFD_LC1	0.0000
82	W6X15	OK	Shear Y	0.0097	AISC14-LRFD_LC2c	0.0000
83	W6X15	OK	Axial-Bending	0.0585	AISC14-LRFD_LC2c	0.9479
84	W6X15	OK	Axial-Bending	0.1893	AISC14-LRFD_LC2c	0.0000
85	W6X15	OK	Axial-Bending	0.1587	AISC14-LRFD_LC2c	2.7500
86	W6X15	OK	Axial-Bending	0.1740	AISC14-LRFD_LC2c	0.0000

SELECTED LOAD COMBINATIONS

Load Combination	Code Check	Total	Live	Dependent	Conditional
AISC14-LRFD_LC1	x			-	-
AISC14-LRFD_LC2a	x			-	-

AISC14-LRFD_LC2b	x			-	-
AISC14-LRFD_LC2c	x			-	-
AISC14-LRFD_LC3a	x			-	-
AISC14-LRFD_LC3b	x			-	-
AISC14-LRFD_LC3c	x			-	-
AISC14-LRFD_LC3d	x			-	-
AISC14-LRFD_LC3e	x			-	-
AISC14-LRFD_LC3f	x			-	-
AISC14-LRFD_LC3g	x			-	-
AISC14-LRFD_LC3h	x			-	-
AISC14-LRFD_LC3i	x			-	-
AISC14-LRFD_LC4a	x			-	-
AISC14-LRFD_LC4b	x			-	-
AISC14-LRFD_LC4c	x			-	-
AISC14-LRFD_LC4d	x			-	-
AISC14-LRFD_LC4e	x			-	-
AISC14-LRFD_LC4f	x			-	-
AISC14-LRFD_LC5a	x			-	-
AISC14-LRFD_LC5b	x			-	-
AISC14-LRFD_LC6a	x			-	-
AISC14-LRFD_LC6b	x			-	-
AISC14-LRFD_LC7a	x			-	-
AISC14-LRFD_LC7b	x			-	-

INPUT Contents

OUTPUT Contents

Nodes

Units: Coordinates X, Y, Z [in]

No.	X	Y	Z	No.	X	Y	Z
1	0.00	0.00	0.00	2	0.00	0.00	44.00
3	0.00	0.00	88.00	4	0.00	0.00	132.00
5	0.00	0.00	176.00	6	54.00	0.00	0.00
7	54.00	0.00	44.00	8	54.00	0.00	88.00
9	54.00	0.00	132.00	10	54.00	0.00	176.00
11	12.00	0.00	176.00	12	6.00	0.00	0.00
13	10.50	0.00	132.00	14	9.00	0.00	88.00
15	7.50	0.00	44.00	16	54.00	-10.00	0.00
17	54.00	-10.00	44.00	18	54.00	-10.00	88.00
19	54.00	-10.00	132.00	20	54.00	-10.00	176.00
21	12.00	-10.00	176.00	22	6.00	-10.00	0.00
23	10.50	-10.00	132.00	24	9.00	-10.00	88.00
25	7.50	-10.00	44.00	26	54.00	-10.00	182.00
27	12.00	-10.00	182.00	38	83.00	-10.00	0.00
42	83.00	-10.00	176.00	43	83.00	0.00	0.00
47	83.00	0.00	176.00	65	143.00	0.00	0.00
75	143.00	-10.00	0.00	82	143.00	0.00	45.00
96	131.00	0.00	45.00	97	83.00	0.00	159.00
133	131.00	0.00	159.00	143	131.00	-10.00	159.00
144	83.00	0.00	45.00	146	83.00	0.00	12.00
168	143.00	0.00	12.00	169	54.00	0.00	49.00
170	83.00	0.00	49.00	171	54.00	0.00	97.00
172	83.00	0.00	97.00				

Supports

Units: Forced Displacements Dx, Dy, Dz [in]; Dox, Doy, Doz [rad]

Node	Flag	Dx	Dy	Dz	Dox	Doy	Doz
16	111011	0.000	0.000	0.000	0.000	0.000	0.000
22	111011	0.000	0.000	0.000	0.000	0.000	0.000
26	111011	0.000	0.000	0.000	0.000	0.000	0.000
27	111011	0.000	0.000	0.000	0.000	0.000	0.000
38	111011	0.000	0.000	0.000	0.000	0.000	0.000
42	111011	0.000	0.000	0.000	0.000	0.000	0.000
75	111011	0.000	0.000	0.000	0.000	0.000	0.000
143	111011	0.000	0.000	0.000	0.000	0.000	0.000

Point Loads

Units: Force [lb]; Moment [lb-in]; Coord-Sys: Local=0, Global=1;
Direction: 0=X, 1=Y, 2=Z, 3=OX, 4=OY, 5=OZ

Line Loads

Units: Force [lb/ft]; Coord-Sys: Local=0, Global=1; Direction: 0=X, 1=Y, 2=Z

********** LOAD CASE - [Dead]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
1	1	1	-14.500	0.000	0.556818	1
1	1	1	0.000	-14.500	0	0.556818
1	1	1	-27.000	0.000	0.5	1
1	1	1	0.000	-27.000	0	0.5
2	1	1	-13.500	-13.500	0	1
2	1	1	-7.250	-7.250	0	1
3	1	1	-7.250	-7.250	0	1
3	1	1	-13.500	-13.500	0	1
4	1	1	-27.000	0.000	0.5	1
4	1	1	-323.000	-323.000	0.1	0.9
4	1	1	-14.500	0.000	0.102273	1
4	1	1	0.000	-14.500	0	0.102273
4	1	1	0.000	-27.000	0	0.5

5	1	1	-15.000	-15.000	0	1
5	1	1	0.000	-27.000	0	0.5
5	1	1	-27.000	0.000	0.5	1
6	1	1	-15.000	-15.000	0	1
6	1	1	0.000	-27.000	0	0.5
6	1	1	-27.000	0.000	0.5	1
7	1	1	-15.000	-15.000	0	1
7	1	1	0.000	-27.000	0	0.5
7	1	1	-27.000	0.000	0.5	1
8	1	1	-15.000	-15.000	0	1
8	1	1	0.000	-27.000	0	0.5
8	1	1	-27.000	0.000	0.5	1
9	1	1	-15.000	-15.000	0	1
9	1	1	-11.000	-11.000	0	1
10	1	1	-11.000	-11.000	0	1
10	1	1	-11.000	-11.000	0	1
11	1	1	-11.000	-11.000	0	1
11	1	1	-11.000	-11.000	0	1
12	1	1	-11.000	-11.000	0	1
12	1	1	-11.000	-11.000	0	1
13	1	1	-15.000	-15.000	0	1
13	1	1	-11.000	-11.000	0	1
14	1	1	-15.000	-15.000	0	1
14	1	1	0.000	-22.000	0	0.357143
14	1	1	-22.000	0.000	0.357143	1
15	1	1	-15.000	-15.000	0	1
15	1	1	0.000	-22.000	0	0.4375
15	1	1	-22.000	0.000	0.4375	1
16	1	1	0.000	-22.000	0	0.37931
16	1	1	-22.000	0.000	0.37931	1
16	1	1	0.000	-22.000	0	0.37931
16	1	1	-22.000	0.000	0.37931	1
17	1	1	0.000	-22.000	0	0.4
17	1	1	-22.000	0.000	0.4	1
17	1	1	0.000	-22.000	0	0.4
17	1	1	-22.000	0.000	0.4	1
18	1	1	-22.000	0.000	0.419355	1
18	1	1	-22.000	0.000	0.419355	1
18	1	1	0.000	-22.000	0	0.419355
18	1	1	0.000	-22.000	0	0.419355
44	1	1	-6.000	0.000	0.5	1
44	1	1	0.000	-6.000	0	0.5
44	1	1	-7.250	-7.250	0	1
45	1	1	0.000	-24.500	0	0.5
45	1	1	-15.000	-15.000	0	1
45	1	1	-24.500	0.000	0.5	1
46	1	1	-15.000	-15.000	0	1
46	1	1	0.000	-39.500	0	0.5
46	1	1	-39.500	0.000	0.5	1
52	1	1	-6.000	0.000	0.5	1
52	1	1	0.000	-6.000	0	0.5
53	1	1	-15.000	-15.000	0	1
53	1	1	-6.000	0.000	0.9	1
53	1	1	-6.000	-6.000	0.1	0.9
53	1	1	0.000	-6.000	0	0.1
65	1	1	-15.000	-15.000	0	1
65	1	1	-8.250	-8.250	0	1
66	1	1	-15.000	-15.000	0	1
66	1	1	0.000	-57.000	0	0.5
66	1	1	-57.000	0.000	0.5	1
71	1	1	-323.000	-323.000	0	0.95
71	1	1	-15.000	-15.000	0	1
71	1	1	-7.250	-7.250	0	1
73	1	1	-57.000	0.000	0.5	1
73	1	1	0.000	-16.500	0	0.375
73	1	1	-16.500	0.000	0.375	1
73	1	1	0.000	-57.000	0	0.5
76	1	1	-6.000	0.000	0.9	1
76	1	1	0.000	-16.500	0	0.5
76	1	1	-16.500	0.000	0.5	1
76	1	1	0.000	-6.000	0	0.1
74						

	1	1	-6.000	-6.000	0.1	0.9
77	1	1	-7.250	-7.250	0	1
77	1	1	-12.000	-12.000	0	1
78	1	1	-15.000	-15.000	0	1
78	1	1	0.000	-24.000	0	0.5
78	1	1	-24.000	0.000	0.5	1
79	1	1	-105.000	-105.000	0.1	1
79	1	1	0.000	-27.000	0	0.435897
79	1	1	-27.000	0.000	0.435897	1
79	1	1	-14.500	0.000	0.615385	1
79	1	1	0.000	-14.500	0	0.615385
80	1	1	0.000	-14.500	0	0.5
80	1	1	-105.000	-105.000	0.08	0.8
80	1	1	-14.500	0.000	0.5	1
80	1	1	-12.000	-12.000	0	1
81	1	1	-24.000	0.000	0.5	1
81	1	1	0.000	-24.000	0	0.5
81	1	1	-24.500	0.000	0.5	1
81	1	1	0.000	-24.500	0	0.5
82	1	1	0.000	-24.000	0	0.5
82	1	1	0.000	-39.500	0	0.5
82	1	1	-39.500	0.000	0.5	1
82	1	1	-24.000	0.000	0.5	1
83	1	1	0.000	-27.000	0	0.371429
83	1	1	-7.250	-7.250	0	1
83	1	1	-323.000	-323.000	0	1
83	1	1	-27.000	0.000	0.371429	1
84	1	1	0.000	-14.500	0	0.378788
84	1	1	-14.500	0.000	0.378788	1
84	1	1	0.000	-30.000	0	0.5
84	1	1	-30.000	0.000	0.5	1
85	1	1	-30.000	0.000	0.5	1
85	1	1	0.000	-30.000	0	0.5
86	1	1	-323.000	-323.000	0	0.565
86	1	1	0.000	-14.500	0	0.637097
86	1	1	-14.500	0.000	0.637097	1
86	1	1	-323.000	-323.000	0.6935	1
86	1	1	0.000	-24.000	0	0.0806452
86	1	1	-24.000	0.000	0.0806452	1

********** LOAD CASE - [Wind]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
14	1	2	-17.000	-17.000	0	1
46	1	2	-17.000	-17.000	0	1
65	1	2	-17.000	-17.000	0	1
66	1	2	-17.000	-17.000	0	1

********** LOAD CASE - [Live]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
1	1	1	-72.500	0.000	0.556818	1
1	1	1	0.000	-72.500	0	0.556818
1	1	1	0.000	-135.000	0	0.5
1	1	1	-135.000	0.000	0.5	1
2	1	1	-67.500	-67.500	0	1
2	1	1	-36.250	-36.250	0	1
3	1	1	-36.250	-36.250	0	1
3	1	1	-67.500	-67.500	0	1
4	1	1	-135.000	0.000	0.5	1
4	1	1	0.000	-135.000	0	0.5
4	1	1	0.000	-72.500	0	0.102273
4	1	1	-72.500	0.000	0.102273	1
5	1	1	-135.000	0.000	0.5	1
5	1	1	0.000	-135.000	0	0.5
6	1	1	0.000	-135.000	0	0.5
6	1	1	-135.000	0.000	0.5	1
7	1	1	0.000	-135.000	0	0.5
7	1	1	-135.000	0.000	0.5	1
8	1	1	-135.000	0.000	0.5	1
8	1	1	0.000	-135.000	0	0.5
9	1	1	-55.000	-55.000	0	1
10	1	1	-55.000	-55.000	0	1

10	1	1	-55.000	-55.000	0	1
11	1	1	-55.000	-55.000	0	1
11	1	1	-55.000	-55.000	0	1
12	1	1	-55.000	-55.000	0	1
12	1	1	-55.000	-55.000	0	1
13	1	1	-55.000	-55.000	0	1
14	1	1	0.000	-110.000	0	0.357143
14	1	1	-110.000	0.000	0.357143	1
15	1	1	0.000	-110.000	0	0.4375
15	1	1	-110.000	0.000	0.4375	1
16	1	1	0.000	-110.000	0	0.37931
16	1	1	0.000	-110.000	0	0.37931
16	1	1	-110.000	0.000	0.37931	1
16	1	1	-110.000	0.000	0.37931	1
17	1	1	0.000	-110.000	0	0.4
17	1	1	-110.000	0.000	0.4	1
17	1	1	-110.000	0.000	0.4	1
17	1	1	0.000	-110.000	0	0.4
18	1	1	0.000	-110.000	0	0.419355
18	1	1	-110.000	0.000	0.419355	1
18	1	1	-110.000	0.000	0.419355	1
18	1	1	0.000	-110.000	0	0.419355
44	1	1	-36.250	-36.250	0	1
44	1	1	0.000	-30.000	0	0.5
44	1	1	-30.000	0.000	0.5	1
45	1	1	0.000	-122.500	0	0.5
45	1	1	-122.500	0.000	0.5	1
46	1	1	-197.500	0.000	0.5	1
46	1	1	0.000	-197.500	0	0.5
52	1	1	0.000	-30.000	0	0.5
52	1	1	-30.000	0.000	0.5	1
53	1	1	0.000	-30.000	0	0.1
53	1	1	-30.000	-30.000	0.1	0.9
53	1	1	-30.000	0.000	0.9	1
65	1	1	-41.250	-41.250	0	1
66	1	1	0.000	-285.000	0	0.5
66	1	1	-285.000	0.000	0.5	1
71	1	1	-36.250	-36.250	0	1
73	1	1	0.000	-82.500	0	0.375
73	1	1	-82.500	0.000	0.375	1
73	1	1	0.000	-285.000	0	0.5
73	1	1	-285.000	0.000	0.5	1
76	1	1	0.000	-30.000	0	0.1
76	1	1	-30.000	-30.000	0.1	0.9
76	1	1	-30.000	0.000	0.9	1
76	1	1	0.000	-82.500	0	0.5
76	1	1	-82.500	0.000	0.5	1
77	1	1	-36.250	-36.250	0	1
77	1	1	-60.000	-60.000	0	1
78	1	1	0.000	-120.000	0	0.5
78	1	1	-120.000	0.000	0.5	1
79	1	1	0.000	-72.500	0	0.615385
79	1	1	-72.500	0.000	0.615385	1
79	1	1	-135.000	0.000	0.435897	1
79	1	1	0.000	-135.000	0	0.435897
80	1	1	0.000	-72.500	0	0.5
80	1	1	-72.500	0.000	0.5	1
80	1	1	-60.000	-60.000	0	1
81	1	1	-122.500	0.000	0.5	1
81	1	1	0.000	-122.500	0	0.5
81	1	1	0.000	-120.000	0	0.5
81	1	1	-120.000	0.000	0.5	1
82	1	1	-197.500	0.000	0.5	1
82	1	1	0.000	-120.000	0	0.5
82	1	1	-120.000	0.000	0.5	1
82	1	1	0.000	-197.500	0	0.5
83	1	1	-135.000	0.000	0.371429	1
83	1	1	0.000	-135.000	0	0.371429
83	1	1	-36.250	-36.250	0	1
84	1	1	0.000	-72.500	0	0.378788
84	1	1	0.000	-150.000	0	0.5
84						

	1	1	-72.500	0.000	0.378788	1
84	1	1	-150.000	0.000	0.5	1
85	1	1	0.000	-150.000	0	0.5
85	1	1	-150.000	0.000	0.5	1
86	1	1	0.000	-72.500	0	0.637097
86	1	1	-72.500	0.000	0.637097	1
86	1	1	0.000	-120.000	0	0.0806452
86	1	1	-120.000	0.000	0.0806452	1

Support Reactions

Units: Force Reactions Rx, Ry, Rz [lb]; Moment Reactions Rox, Roy, Roz [lb-in]

Load Combination 2: AISC14-LRFD_LC1

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	176.861	2016.445	4788.544	0.000	3372.302	-944.692
22	52.770	1244.179	1448.104	0.000	11235.527	1000.926
26	-816.854	2155.161	-4036.209	0.000	-328.229	-7.075
27	-5.282	1307.861	-1507.971	0.000	-5922.114	6.217
38	-277.154	1635.348	5262.563	0.000	-80.333	3667.091
42	853.144	3348.426	-6017.591	0.000	-4768.792	-21092.636
75	81.527	644.303	1713.891	0.000	2661.856	-2071.272
143	-65.012	1047.276	-1651.331	0.000	958.105	-21264.586

Load Combination 3: AISC14-LRFD_LC2a

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	399.160	3893.847	7275.153	0.000	14980.610	-2877.091
22	168.899	3026.183	3633.844	0.000	26863.559	2347.583
26	-1288.959	3387.401	-7205.953	0.000	827.766	-20.945
27	-399.871	2993.124	-3801.060	0.000	-11852.926	4.143
38	-895.744	3881.613	10427.805	0.000	10486.499	10221.150
42	1653.876	5024.707	-10350.579	0.000	-2680.437	-36841.584
75	199.380	1905.154	5568.134	0.000	9019.313	-4234.821
143	163.259	2559.494	-5547.344	0.000	-1440.626	-39091.892

Load Combination 4: AISC14-LRFD_LC2b

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	399.160	3893.847	7275.153	0.000	14980.610	-2877.091
22	168.899	3026.183	3633.844	0.000	26863.559	2347.583
26	-1288.959	3387.401	-7205.953	0.000	827.766	-20.945
27	-399.871	2993.124	-3801.060	0.000	-11852.926	4.143
38	-895.744	3881.613	10427.805	0.000	10486.499	10221.150
42	1653.876	5024.707	-10350.579	0.000	-2680.437	-36841.584
75	199.380	1905.154	5568.134	0.000	9019.313	-4234.821
143	163.259	2559.494	-5547.344	0.000	-1440.626	-39091.892

Load Combination 5: AISC14-LRFD_LC2c

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	399.160	3893.847	7275.153	0.000	14980.610	-2877.091
22	168.899	3026.183	3633.844	0.000	26863.559	2347.583
26	-1288.959	3387.401	-7205.953	0.000	827.766	-20.945
27	-399.871	2993.124	-3801.060	0.000	-11852.926	4.143
38	-895.744	3881.613	10427.805	0.000	10486.499	10221.150
42	1653.876	5024.707	-10350.579	0.000	-2680.437	-36841.584
75	199.380	1905.154	5568.134	0.000	9019.313	-4234.821
143	163.259	2559.494	-5547.344	0.000	-1440.626	-39091.892

Load Combination 6: AISC14-LRFD_LC3a

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	305.569	3082.246	6086.976	0.000	10409.181	-2099.530
22	121.599	2291.025	2736.410	0.000	20374.983	1789.985
26	-1067.931	2809.968	-5800.453	0.000	416.249	-15.367
27	-251.753	2291.041	-2860.001	0.000	-9303.698	4.581
38	-646.393	2951.684	8201.850	0.000	6485.428	7541.470
42	1306.772	4216.822	-8396.488	0.000	-3204.314	-29792.473
75	150.741	1397.703	4019.047	0.000	6458.950	-3311.900
143	81.396	1936.035	-3987.342	0.000	-590.152	-31255.437

Load Combination 7: AISC14-LRFD_LC3b

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	305.569	3082.246	6086.976	0.000	10409.181	-2099.530
22	121.599	2291.025	2736.410	0.000	20374.983	1789.985
26	-1067.931	2809.968	-5800.453	0.000	416.249	-15.367
27	-251.753	2291.041	-2860.001	0.000	-9303.698	4.581
38	-646.393	2951.684	8201.850	0.000	6485.428	7541.470
42	1306.772	4216.822	-8396.488	0.000	-3204.314	-29792.473
75	150.741	1397.703	4019.047	0.000	6458.950	-3311.900
143	81.396	1936.035	-3987.342	0.000	-590.152	-31255.437

Load Combination 8: AISC14-LRFD_LC3c

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	305.569	3082.246	6086.976	0.000	10409.181	-2099.530
22	121.599	2291.025	2736.410	0.000	20374.983	1789.985
26	-1067.931	2809.968	-5800.453	0.000	416.249	-15.367
27	-251.753	2291.041	-2860.001	0.000	-9303.698	4.581
38	-646.393	2951.684	8201.850	0.000	6485.428	7541.470
42	1306.772	4216.822	-8396.488	0.000	-3204.314	-29792.473
75	150.741	1397.703	4019.047	0.000	6458.950	-3311.900
143	81.396	1936.035	-3987.342	0.000	-590.152	-31255.437

Load Combination 9: AISC14-LRFD_LC3d

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	151.989	1730.345	4117.326	0.000	2850.383	-811.133
22	45.206	1067.227	1243.636	0.000	9639.233	858.710
26	-701.545	1844.323	-3436.297	0.000	-272.860	-6.111
27	-5.950	1119.953	-1280.377	0.000	-5131.618	5.419
38	-237.345	1402.888	4515.909	0.000	-134.780	3140.984
42	725.734	2869.677	-5144.800	0.000	-4048.845	-18044.567
75	70.795	553.531	1473.972	0.000	2263.738	-1784.599
143	-48.884	896.913	-1396.578	0.000	953.640	-18334.261

Load Combination 10: AISC14-LRFD_LC3e

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	151.989	1730.345	4117.326	0.000	2850.383	-811.133
22	45.206	1067.227	1243.636	0.000	9639.233	858.710
26	-701.545	1844.323	-3436.297	0.000	-272.860	-6.111
27	-5.950	1119.953	-1280.377	0.000	-5131.618	5.419
38	-237.345	1402.888	4515.909	0.000	-134.780	3140.984
42	725.734	2869.677	-5144.800	0.000	-4048.845	-18044.567
75	70.795	553.531	1473.972	0.000	2263.738	-1784.599
143	-48.884	896.913	-1396.578	0.000	953.640	-18334.261

Load Combination 11: AISC14-LRFD_LC3f

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	151.989	1730.345	4117.326	0.000	2850.383	-811.133
22	45.206	1067.227	1243.636	0.000	9639.233	858.710
26	-701.545	1844.323	-3436.297	0.000	-272.860	-6.111
27	-5.950	1119.953	-1280.377	0.000	-5131.618	5.419
38	-237.345	1402.888	4515.909	0.000	-134.780	3140.984
42	725.734	2869.677	-5144.800	0.000	-4048.845	-18044.567
75	70.795	553.531	1473.972	0.000	2263.738	-1784.599
143	-48.884	896.913	-1396.578	0.000	953.640	-18334.261

Load Combination 12: AISC14-LRFD_LC3g

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	151.065	1726.430	4090.759	0.000	2921.814	-808.101
22	45.070	1065.615	1238.778	0.000	9615.432	857.100
26	-698.414	1850.497	-3482.516	0.000	-285.984	-6.024
27	-3.231	1122.077	-1304.609	0.000	-5018.108	5.237
38	-237.345	1400.610	4499.807	0.000	-9.889	3141.132
42	736.271	2870.637	-5164.648	0.000	-4116.840	-18105.482
75	68.911	550.969	1462.239	0.000	2294.806	-1765.612
143	-62.327	898.021	-1432.604	0.000	687.425	-18101.144

Load Combination 13: AISC14-LRFD_LC3h

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	151.065	1726.430	4090.759	0.000	2921.814	-808.101

22	45.070	1065.615	1238.778	0.000	9615.432	857.100
26	-698.414	1850.497	-3482.516	0.000	-285.984	-6.024
27	-3.231	1122.077	-1304.609	0.000	-5018.108	5.237
38	-237.345	1400.610	4499.807	0.000	-9.889	3141.132
42	736.271	2870.637	-5164.648	0.000	-4116.840	-18105.482
75	68.911	550.969	1462.239	0.000	2294.806	-1765.612
143	-62.327	898.021	-1432.604	0.000	687.425	-18101.144

Load Combination 14: AISC14-LRFD_LC3i

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	151.065	1726.430	4090.759	0.000	2921.814	-808.101
22	45.070	1065.615	1238.778	0.000	9615.432	857.100
26	-698.414	1850.497	-3482.516	0.000	-285.984	-6.024
27	-3.231	1122.077	-1304.609	0.000	-5018.108	5.237
38	-237.345	1400.610	4499.807	0.000	-9.889	3141.132
42	736.271	2870.637	-5164.648	0.000	-4116.840	-18105.482
75	68.911	550.969	1462.239	0.000	2294.806	-1765.612
143	-62.327	898.021	-1432.604	0.000	687.425	-18101.144

Load Combination 15: AISC14-LRFD_LC4a

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	306.490	3086.163	6113.565	0.000	10337.646	-2102.550
22	121.732	2292.636	2741.271	0.000	20398.765	1791.618
26	-1071.069	2803.790	-5754.230	0.000	429.307	-15.454
27	-254.470	2288.916	-2835.772	0.000	-9417.228	4.764
38	-646.387	2953.961	8218.014	0.000	6360.205	7541.257
42	1296.223	4215.856	-8376.705	0.000	-3136.408	-29731.480
75	152.630	1400.259	4030.734	0.000	6427.626	-3330.941
143	94.850	1934.941	-3951.294	0.000	-324.064	-31488.978

Load Combination 16: AISC14-LRFD_LC4b

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	306.490	3086.163	6113.565	0.000	10337.646	-2102.550
22	121.732	2292.636	2741.271	0.000	20398.765	1791.618
26	-1071.069	2803.790	-5754.230	0.000	429.307	-15.454
27	-254.470	2288.916	-2835.772	0.000	-9417.228	4.764
38	-646.387	2953.961	8218.014	0.000	6360.205	7541.257
42	1296.223	4215.856	-8376.705	0.000	-3136.408	-29731.480
75	152.630	1400.259	4030.734	0.000	6427.626	-3330.941
143	94.850	1934.941	-3951.294	0.000	-324.064	-31488.978

Load Combination 17: AISC14-LRFD_LC4c

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	306.490	3086.163	6113.565	0.000	10337.646	-2102.550
22	121.732	2292.636	2741.271	0.000	20398.765	1791.618
26	-1071.069	2803.790	-5754.230	0.000	429.307	-15.454
27	-254.470	2288.916	-2835.772	0.000	-9417.228	4.764
38	-646.387	2953.961	8218.014	0.000	6360.205	7541.257
42	1296.223	4215.856	-8376.705	0.000	-3136.408	-29731.480
75	152.630	1400.259	4030.734	0.000	6427.626	-3330.941
143	94.850	1934.941	-3951.294	0.000	-324.064	-31488.978

Load Combination 18: AISC14-LRFD_LC4d

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	304.648	3078.328	6060.387	0.000	10480.714	-2096.511
22	121.466	2289.414	2731.550	0.000	20351.200	1788.352
26	-1064.794	2816.145	-5846.676	0.000	403.190	-15.280
27	-249.036	2293.165	-2884.229	0.000	-9190.167	4.399
38	-646.399	2949.407	8185.686	0.000	6610.647	7541.681
42	1317.321	4217.787	-8416.271	0.000	-3272.220	-29853.466
75	148.852	1395.147	4007.359	0.000	6490.271	-3292.859
143	67.942	1937.129	-4023.389	0.000	-856.240	-31021.898

Load Combination 19: AISC14-LRFD_LC4e

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	304.648	3078.328	6060.387	0.000	10480.714	-2096.511
22	121.466	2289.414	2731.550	0.000	20351.200	1788.352
26	-1064.794	2816.145	-5846.676	0.000	403.190	-15.280
27	-249.036	2293.165	-2884.229	0.000	-9190.167	4.399

38	-646.399	2949.407	8185.686	0.000	6610.647	7541.681
42	1317.321	4217.787	-8416.271	0.000	-3272.220	-29853.466
75	148.852	1395.147	4007.359	0.000	6490.271	-3292.859
143	67.942	1937.129	-4023.389	0.000	-856.240	-31021.898

Load Combination 20: AISC14-LRFD_LC4f

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	304.648	3078.328	6060.387	0.000	10480.714	-2096.511
22	121.466	2289.414	2731.550	0.000	20351.200	1788.352
26	-1064.794	2816.145	-5846.676	0.000	403.190	-15.280
27	-249.036	2293.165	-2884.229	0.000	-9190.167	4.399
38	-646.399	2949.407	8185.686	0.000	6610.647	7541.681
42	1317.321	4217.787	-8416.271	0.000	-3272.220	-29853.466
75	148.852	1395.147	4007.359	0.000	6490.271	-3292.859
143	67.942	1937.129	-4023.389	0.000	-856.240	-31021.898

Load Combination 21: AISC14-LRFD_LC5a

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	305.569	3082.246	6086.976	0.000	10409.181	-2099.530
22	121.599	2291.025	2736.410	0.000	20374.983	1789.985
26	-1067.931	2809.968	-5800.453	0.000	416.249	-15.367
27	-251.753	2291.041	-2860.001	0.000	-9303.698	4.581
38	-646.393	2951.684	8201.850	0.000	6485.428	7541.470
42	1306.772	4216.822	-8396.488	0.000	-3204.314	-29792.473
75	150.741	1397.703	4019.047	0.000	6458.950	-3311.900
143	81.396	1936.035	-3987.342	0.000	-590.152	-31255.437

Load Combination 22: AISC14-LRFD_LC5b

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	305.569	3082.246	6086.976	0.000	10409.181	-2099.530
22	121.599	2291.025	2736.410	0.000	20374.983	1789.985
26	-1067.931	2809.968	-5800.453	0.000	416.249	-15.367
27	-251.753	2291.041	-2860.001	0.000	-9303.698	4.581
38	-646.393	2951.684	8201.850	0.000	6485.428	7541.470
42	1306.772	4216.822	-8396.488	0.000	-3204.314	-29792.473
75	150.741	1397.703	4019.047	0.000	6458.950	-3311.900
143	81.396	1936.035	-3987.342	0.000	-590.152	-31255.437

Load Combination 23: AISC14-LRFD_LC6a

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	114.493	1300.212	3104.114	0.000	2088.182	-610.112
22	33.884	801.408	935.734	0.000	7240.795	645.000
26	-527.910	1379.531	-2548.111	0.000	-194.266	-4.641
27	-6.232	838.627	-945.077	0.000	-3918.264	4.177
38	-177.767	1053.614	3393.710	0.000	-182.975	2353.225
42	537.420	2151.746	-3842.564	0.000	-2988.814	-13490.433
75	54.242	416.740	1111.759	0.000	1675.817	-1350.004
143	-28.130	671.765	-1023.983	0.000	880.833	-13886.048

Load Combination 24: AISC14-LRFD_LC6b

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	112.646	1292.383	3050.997	0.000	2230.986	-604.047
22	33.612	798.184	926.020	0.000	7193.197	641.787
26	-521.651	1391.875	-2640.545	0.000	-220.563	-4.467
27	-0.795	842.876	-993.542	0.000	-3691.254	3.812
38	-177.765	1049.058	3361.543	0.000	66.671	2353.504
42	558.490	2153.663	-3882.311	0.000	-3124.907	-13612.269
75	50.476	411.614	1088.280	0.000	1737.884	-1312.046
143	-55.012	673.990	-1096.026	0.000	348.394	-13420.100

Load Combination 25: AISC14-LRFD_LC7a

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	113.569	1296.298	3077.556	0.000	2159.585	-607.080
22	33.748	799.796	930.877	0.000	7216.997	643.394
26	-524.780	1385.703	-2594.328	0.000	-207.415	-4.554
27	-3.513	840.751	-969.309	0.000	-3804.759	3.994
38	-177.766	1051.336	3377.627	0.000	-58.151	2353.365
42	547.955	2152.705	-3862.438	0.000	-3056.860	-13551.351
75	52.359	414.177	1100.020	0.000	1706.851	-1331.025

143	-41.571	672.877	-1060.005	0.000	614.613	-13653.073

Load Combination 26: AISC14-LRFD_LC7b

Node	Rx	Ry	Rz	Rox	Roy	Roz
16	113.569	1296.298	3077.556	0.000	2159.585	-607.080
22	33.748	799.796	930.877	0.000	7216.997	643.394
26	-524.780	1385.703	-2594.328	0.000	-207.415	-4.554
27	-3.513	840.751	-969.309	0.000	-3804.759	3.994
38	-177.766	1051.336	3377.627	0.000	-58.151	2353.365
42	547.955	2152.705	-3862.438	0.000	-3056.860	-13551.351
75	52.359	414.177	1100.020	0.000	1706.851	-1331.025
143	-41.571	672.877	-1060.005	0.000	614.613	-13653.073

Hazards by Location

Search Information

Address: 1925 Massachusetts Ave, Cambridge, MA 02140, USA

Coordinates: 42.3894663, -71.11973300000001

Elevation: 37 ft

Timestamp: 2020-08-04T15:29:24.434Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	75 mph
MRI 25-Year	84 mph
MRI 50-Year	91 mph
MRI 100-Year	98 mph
Risk Category I	109 mph
Risk Category II	119 mph
Risk Category III	128 mph
Risk Category IV	⚠ 132 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	78 mph
MRI 25-Year	88 mph
MRI 50-Year	96 mph
MRI 100-Year	103 mph
Risk Category I	117 mph
Risk Category II	127 mph
Risk Category III-IV	⚠ 138 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed	104 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

Hazards by Location

Search Information

Address: 1925 Massachusetts Ave, Cambridge, MA 02140, USA

Coordinates: 42.3894663, -71.11973300000001

Elevation: 37 ft

Timestamp: 2020-08-07T04:33:42.114Z

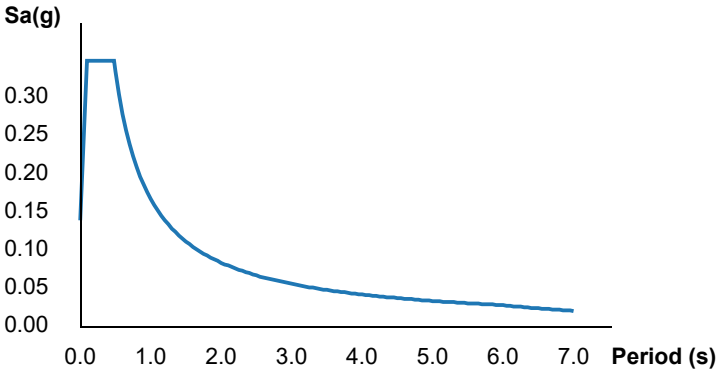
Hazard Type: Seismic

Reference Document: ASCE7-10

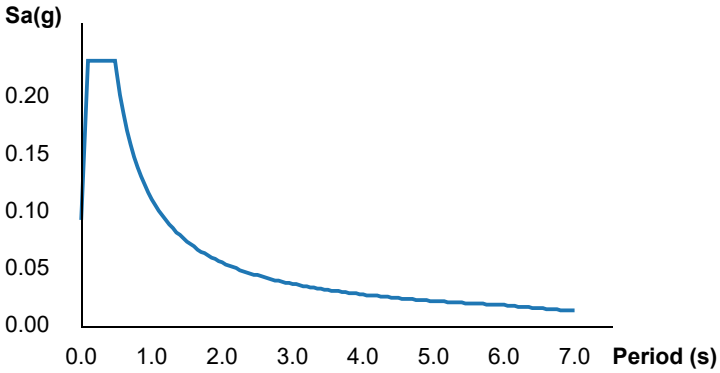
Risk Category: II

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.217	MCE_R ground motion (period=0.2s)
S_1	0.07	MCE_R ground motion (period=1.0s)
S_{MS}	0.348	Site-modified spectral acceleration value
S_{M1}	0.167	Site-modified spectral acceleration value
S_{DS}	0.232	Numeric seismic design value at 0.2s SA
S_{D1}	0.111	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.6	Site amplification factor at 0.2s
F_v	2.4	Site amplification factor at 1.0s

CR_S	0.892	Coefficient of risk (0.2s)
CR_1	0.899	Coefficient of risk (1.0s)
PGA	0.117	MCE_G peak ground acceleration
F_{PGA}	1.567	Site amplification factor at PGA
PGA_M	0.183	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	0.217	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.244	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.07	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.077	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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Com-Ex Consultants, LLC ● 115 Route 46, Suite E39 ● Mountain Lakes, NJ ● 07046
Office: 862-209-4300 | Fax: 862-209-4301

4DE7032A
BO032/1923-1925 Mass Ave

1923-1925 Massachusetts Ave., Cambridge, MA 02140
(Middlesex County)

Antenna Mount Structural Analysis
Anchor Project

August 27, 2020

Item	Pass/Fail	Capacity
Antenna Mount	Pass	20.3%
Anchor Bolts	Pass	18.2%
Parapet Wall	Pass	54.7%
Chimney	Pass	43.6%

Nicholas D. Barile, P.E.
MA PE License No. 51464
Com-Ex Project No. 20002-TRN

COM EX
Consultants

Com-Ex Consultants, LLC ● 115 Route 46, Suite E39 ● Mountain Lakes, NJ ● 07046
Office: 862-209-4300 | Fax: 862-209-4301

Executive Summary

At the request of T-Mobile, Com-Ex Consultants has performed a structural analysis of the antenna mounting system for the proposed antennas and ancillary equipment per the *MA STATE BUILDING CODE 780 CMR 8TH ED., ASCE 7, ANSI/TIA-222-G, and AISC (LRFD14).* Information pertaining to the antenna mounts and connection brackets was obtained from:

- Site Visit notes & photos by Com-Ex Consultants dated 06/16/20.
- T-Mobile Anchor RFDS dated 05/21/20.
- Construction Drawings completed by Com-Ex Consultants dated 08/27/20.

Discussion

Gravity loading change is less than 0.1% of overall gravity loading; therefore, a full rigorous analysis of the structure and its foundation is not required.

Conclusions

Per our analysis, the antenna mounts at each sector can support the proposed loading per the *MA STATE BUILDING CODE 780 CMR 8TH ED.*, *ANSI/TIA-222-G standards*.

General Comments

If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, Com-Ex Consultants should be notified immediately to perform a revised analysis. This report is not a conditions assessment and assumes that good workmanship will be used and systems will be properly maintained.

Limitations

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of Com-Ex Consultants.

Com-Ex Consultants, LLC ● 115 Route 46, Suite E39 ● Mountain Lakes, NJ ● 07046
Office: 862-209-4300 | Fax: 862-209-4301

Attachment A
Proposed Equipment Configuration

Final Alpha Sector Antenna Configuration
Rad Center for Antennas is 49'-0"
(1) (N) AIR32 KRD901146-1_B66A_B2A Ericsson Antenna
(1) (N) APXAARR18_43-U-NA20 RFS Antenna
(1) (N) AIR6449 B41 Ericsson Antenna
(1) (N) 4415 B25 Ericsson RRU
(1) (N) 4449 B71+B85 Ericsson RRU
(1) (E) Generic Twin Style 1B – AWS
(1) (N) AWS/PCS (8:4) MI-54131 Microdata Telecom Diplexer

Final Beta Sector Antenna Configuration
Rad Center for Antennas is 45'-0"
(1) (N) AIR32 KRD901146-1_B66A_B2A Ericsson Antenna
(1) (N) APXAARR18_43-U-NA20 RFS Antenna
(1) (N) AIR6449 B41 Ericsson Antenna
(1) (N) 4415 B25 Ericsson RRU
(1) (N) 4449 B71+B85 Ericsson RRU
(1) (E) Generic Twin Style 1B – AWS
(1) (N) AWS/PCS (8:4) MI-54131 Microdata Telecom Diplexer

Final Gamma Sector Antenna Configuration
Rad Center for Antennas is 53'-0"
(1) (N) AIR32 KRD901146-1_B66A_B2A Ericsson Antenna
(1) (N) APXAARR18_43-U-NA20 RFS Antenna
(1) (N) AIR6449 B41 Ericsson Antenna
(1) (N) 4415 B25 Ericsson RRU
(1) (N) 4449 B71+B85 Ericsson RRU
(1) (E) Generic Twin Style 1B – AWS
(1) (N) AWS/PCS (8:4) MI-54131 Microdata Telecom Diplexer

Final Delta Sector Antenna Configuration
Rad Center for Antennas is 45'-0"
(1) (N) AIR32 KRD901146-1_B66A_B2A Ericsson Antenna
(1) (N) APXAARR18_43-U-NA20 RFS Antenna
(1) (N) AIR6449 B41 Ericsson Antenna
(1) (N) 4415 B25 Ericsson RRU
(1) (N) 4449 B71+B85 Ericsson RRU
(1) (E) Generic Twin Style 1B – AWS
(1) (N) AWS/PCS (8:4) MI-54131 Microdata Telecom Diplexer

Wind Analysis F = qz x Gh x (EPA) per TIA-222-G

qz = 0.00256 x Kz x Kzt x Kd x V^2 x I

Kz=2.01 (Z/Zg)^(2/α) =	0.850		
Zg =	1200	Table 2-4	Exposure B
Alpha (α) =	7	Table 2-4	
Z=	45	ft, 49ft, 53ft	
Terrain Category	I		
Kzt = (1+KeKt/Kh)^2	1.00	for Category I	
Ke=	1.00	Table 2-4	
Kt=	0.53	Table 2-5	
Kh=e^(f * Z/H) =	0.000	for H=0	
f=	2.00	Table 2-5	
H =Height of Crest Surrounding Terrain	0.00	ft	
Kz =	0.850		
Kzt =	1.0		
Kd =	0.95		
Importance Factor Table 2-3 = I =	1.0	Use Class II	
Vult =	117	mph	
Vasd = x Vult x (0.6)^1/2 =	90.6	mph	
qz = 0.00256 x Kz x Kzt x Kd x V^2 x I =	17.0	psf	
Gh =	1.00		
qz Gh =	**17.0**	**psf**	

	Equipment Loading	CaAa (sf or sf/lf)	Wind (psf)	Wind Load (lb)	Weight (lb)
F_{N1}	AIR32 KRD901146-1_B66A_B2A	6.51	17.0	110.5	132.2
F_{N2}	APXAARR18_43-U-NA20	14.67	17.0	249.1	131.3
F_{N3}	AIR6449 B41	5.65	17.0	95.9	103
F_{N4}	4449 B71+B85	1.680	17.0	28.5	74
F_{N5}	4415 B25	1.84	17.0	31.2	46
F_{N6}	Generic Twin Style 1B - AWS	0.49	17.0	8.3	12.1
F_{N7}	AWS/PCS (8:4) MI-54131 Microdata Telecom D	0.29	17.0	4.9	6.61
	1-1/4" std. pipe	0.163	17.0	2.8	
	2-1/2" std. pipe	0.288	17.0	4.9	
	3"X3" Angle	0.500	17.0	8.5	
F_{T1}	AIR32 KRD901146-1_B66A_B2A	4.71	17.0	80.0	132.2
F_{T2}	APXAARR18_43-U-NA20	6.16	17.0	104.6	131.3
F_{T3}	AIR6449 B41	2.42	17.0	41.1	103
F_{T4}	4449 B71+B85	1.290	17.0	21.9	74
F_{T5}	4415 B25	0.820	17.0	13.9	46
F_{T6}	Generic Twin Style 1B - AWS	0.440	17.0	7.5	12.1
F_{T7}	AWS/PCS (8:4) MI-54131 Microdata Telecom D	0.21	17.0	3.6	6.61

ALPHA

5/8" Anchor Bolts w/ Hilti HY-270 epoxy

Tensile Capacity = Pc =	1,025.0	lb	
Shear capacity = Vc =	1,405.0	lb	
Rx =	48.8	lb	
Ry =	107.8	lb	
Rz =	287.3	lb	
Vs = (Rx^2+Ry^2)^1/2=	118.3	lb	
Capacity=[(Rz/(Pcx2bolts))+(Vs/(Vcx2bolts))]x100% =	**18.2%**		**OK**

Chimney Check

Rox=	30,301	in-lb (Allowable)	
Sx = π(do^4-d^4)/(32do) =	5,120.0	in^3	
do =	32.000	in	
d =	16	in	
Chimney Height =	102	in	
Mr2 =1.3 x b x Wind Pressure x h^2/2 =	25,516	in-lb (Parapet Wind)	
Mr = Mr1 + Mr2 =	55,817	in-lb	
σ = Mr/Sx =	10.90	psi - Stress on brick	
σ_{brick} =	25	psi	
Capacity = σ/σ_{brick} x100 % =	**43.6%**		**OK**

BETA

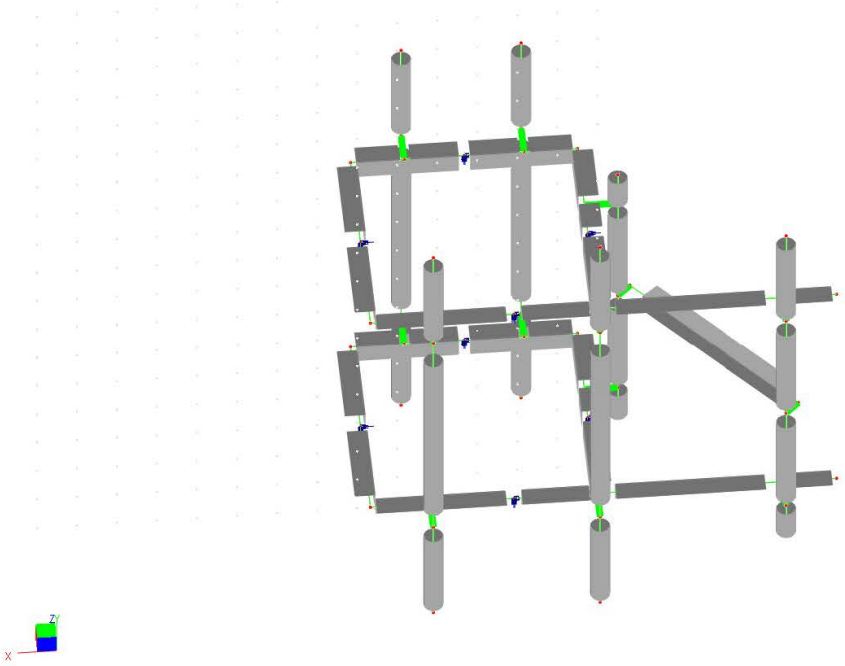
5/8" Anchor Bolts w/ Hilti HY-270 epoxy

Tensile Capacity = Pc =	1,025.0	lb	
Shear capacity = Vc =	1,405.0	lb	
Rx =	-	lb	
Ry =	105.3	lb	
Rz =	86.9	lb	
Vs = (Rx^2+Ry^2)^1/2=	105.3	lb	
Capacity=[(Rz/(Pcx2bolts))+(Vs/(Vcx2bolts))]x100% =	**8.0%**		**OK**

Parapet Wall Check

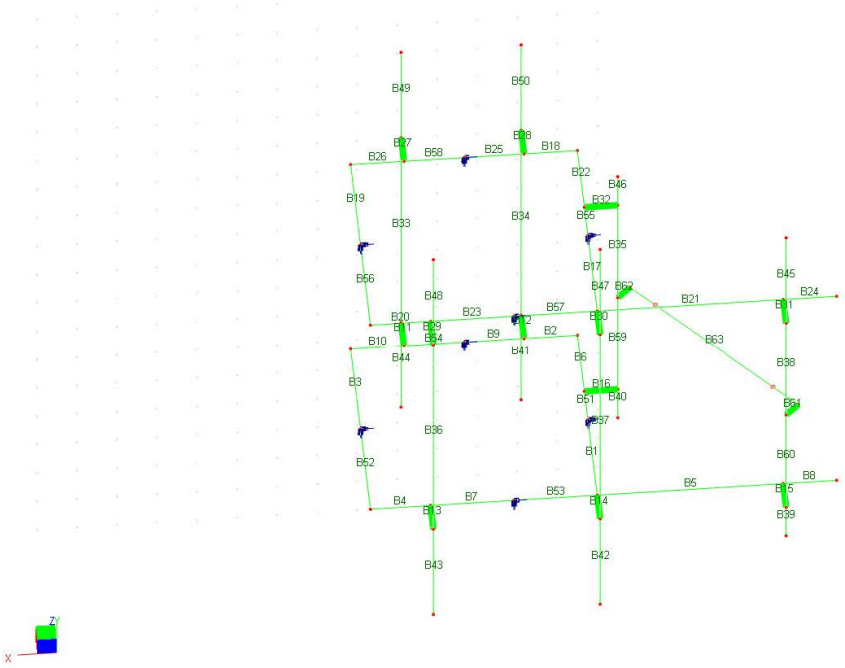
Rox=	2,183.8	in-lb (Allowable)	
Sx = b x t^2 /6 =	1,296	in^3	
b=	54	in - Parapet support section	
t =	12	in - Parapet thickness	
h =	60	in - Parapet Height Average	
Mr2 =1.3 x b x Wind Pressure x h^2/2 =	14,899	in-lb (Parapet Wind)	
Mr = Mr1 + Mr2 =	17,083	in-lb	
σ = Mr/Sx =	13.18	psi - Stress on brick	
σ_{brick} =	25	psi	
Capacity = σ/σ_{brick} x100 % =	**52.7%**		**OK**

Company/Project: SZS Engineering / 20002-TRA		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 11:05:44	



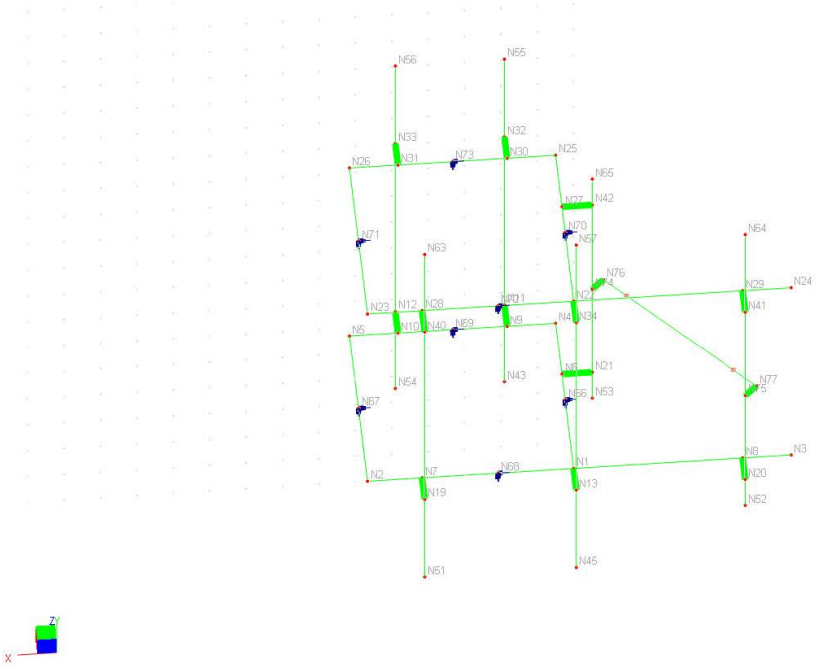
Note:

Company/Project: SZS Engineering / 20002-TRA		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 11:05:22	



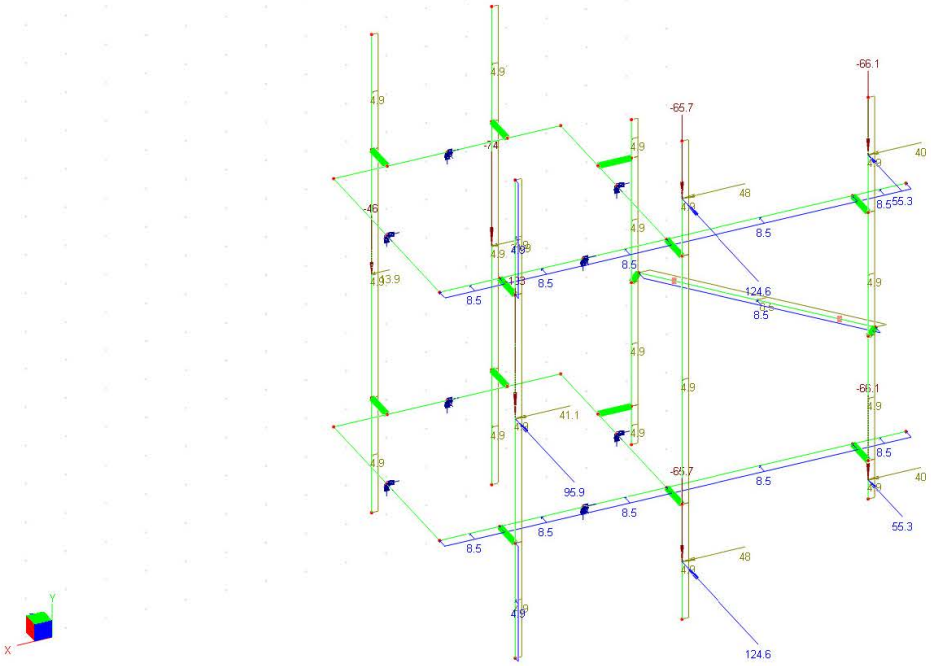
Note:

Company/Project: SZS Engineering / 20002-TRA		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 11:05:04	



Note:

Company/Project: SZS Engineering / 20002-TRA		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 11:09:35	



Note:

TIA-222-G-2.3.1_30	x			-	-
TIA-222-G-2.3.1_60	x			-	-
TIA-222-G-2.3.1_90	x			-	-
TIA-222-G-2.3.1_120	x			-	-
TIA-222-G-2.3.1_150	x			-	-
TIA-222-G-2.3.1_180	x			-	-
TIA-222-G-2.3.1_210	x			-	-
TIA-222-G-2.3.1_240	x			-	-
TIA-222-G-2.3.1_270	x			-	-
TIA-222-G-2.3.1_300	x			-	-
TIA-222-G-2.3.1_330	x			-	-

INPUT Contents

OUTPUT Contents

Nodes

Units: Coordinates X, Y, Z [in]

No.	X	Y	Z	No.	X	Y	Z
1	0.00	0.00	0.00	2	34.00	0.00	0.00
3	-36.00	0.00	0.00	4	0.00	0.00	34.00
5	34.00	0.00	34.00	6	0.00	0.00	22.00
7	25.00	0.00	0.00	8	-28.00	0.00	0.00
9	8.00	0.00	34.00	10	26.00	0.00	34.00
11	8.00	0.00	39.00	12	26.00	0.00	39.00
13	0.00	0.00	-5.00	19	25.00	0.00	-5.00
20	-28.00	0.00	-5.00	21	-5.00	0.00	22.00
22	0.00	39.00	0.00	23	34.00	39.00	0.00
24	-36.00	39.00	0.00	25	0.00	39.00	34.00
26	34.00	39.00	34.00	27	0.00	39.00	22.00
28	25.00	39.00	0.00	29	-28.00	39.00	0.00
30	8.00	39.00	34.00	31	26.00	39.00	34.00
32	8.00	39.00	39.00	33	26.00	39.00	39.00
34	0.00	39.00	-5.00	40	25.00	39.00	-5.00
41	-28.00	39.00	-5.00	42	-5.00	39.00	22.00
43	8.00	-18.00	39.00	45	0.00	-18.00	-5.00
51	25.00	-18.00	-5.00	52	-28.00	-6.00	-5.00
53	-5.00	-6.00	22.00	54	26.00	-18.00	39.00
55	8.00	57.00	39.00	56	26.00	57.00	39.00
57	0.00	57.00	-5.00	63	25.00	57.00	-5.00
64	-28.00	57.00	-5.00	65	-5.00	45.00	22.00
66	0.00	0.00	16.00	67	34.00	0.00	17.00
68	12.50	0.00	0.00	69	17.00	0.00	34.00
70	0.00	39.00	16.00	71	34.00	39.00	17.00
72	12.50	39.00	0.00	73	17.00	39.00	34.00
74	-5.00	19.50	22.00	75	-28.00	19.50	-5.00
76	-7.00	19.50	24.00	77	-30.00	19.50	-3.00

Supports

Units: Forced Displacements Dx, Dy, Dz [in]; Dox, Doy, Doz [rad]

Node	Flag	Dx	Dy	Dz	Dox	Doy	Doz
66	111110	0.000	0.000	0.000	0.000	0.000	0.000
67	111110	0.000	0.000	0.000	0.000	0.000	0.000
68	111011	0.000	0.000	0.000	0.000	0.000	0.000
69	111011	0.000	0.000	0.000	0.000	0.000	0.000
70	111110	0.000	0.000	0.000	0.000	0.000	0.000
71	111110	0.000	0.000	0.000	0.000	0.000	0.000
72	111011	0.000	0.000	0.000	0.000	0.000	0.000
73	111011	0.000	0.000	0.000	0.000	0.000	0.000

Moment Releases

Member ID	Begin OZ	End OZ	Begin OY	End OY	Torsion OX
63	1	1	0	0	0

Point Loads

Units: Force [lb]; Moment [lb-in]; Coord-Sys: Local=0, Global=1;
Direction: 0=X, 1=Y, 2=Z, 3=OX, 4=OY, 5=OZ

********** LOAD CASE - [Dead]**********

Member	Coord-Sys	Direction	Value	Distance
33	1	1	-46.000	0.5
34	1	1	-74.000	0.5
36	1	1	-103.000	0.5
39	1	1	-66.100	0.5
42	1	1	-65.700	0.5
45	1	1	-66.100	0.5
47	1	1	-65.700	0.5

********** LOAD CASE - [Wind]**********

Member	Coord-Sys	Direction	Value	Distance
36	1	2	95.900	0.5
39	1	2	55.300	0.5
42	1	2	124.600	0.5
45	1	2	55.300	0.5
47	1	2	124.600	0.5

********** LOAD CASE - [WindTransverse]**********

Member	Coord-Sys	Direction	Value	Distance
33	1	0	13.900	0.5
34	1	0	21.900	0.5
36	1	0	41.100	0.5
39	1	0	40.000	0.5
42	1	0	48.000	0.5
45	1	0	40.000	0.5
47	1	0	48.000	0.5

Line Loads

Units: Force [lb/ft]; Coord-Sys: Local=0, Global=1; Direction: 0=X, 1=Y, 2=Z

********** LOAD CASE - [Wind]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
4	1	2	8.500	8.500	0	1
5	1	2	8.500	8.500	0	1
7	1	2	8.500	8.500	0	1
8	1	2	8.500	8.500	0	1
20	1	2	8.500	8.500	0	1
21	1	2	8.500	8.500	0	1
23	1	2	8.500	8.500	0	1
24	1	2	8.500	8.500	0	1
43	1	2	4.900	4.900	0	1
48	1	2	4.900	4.900	0	1
53	1	2	8.500	8.500	0	1
57	1	2	8.500	8.500	0	1

********** LOAD CASE - [WindTransverse]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
33	1	0	4.900	4.900	0	1
34	1	0	4.900	4.900	0	1
35	1	0	4.900	4.900	0	1
36	1	0	4.900	4.900	0	1
37	1	0	4.900	4.900	0	1
38	1	0	4.900	4.900	0	1
39	1	0	4.900	4.900	0	1
40	1	0	4.900	4.900	0	1
41	1	0	4.900	4.900	0	1
42	1	0	4.900	4.900	0	1
43	1	0	4.900	4.900	0	1
44	1	0	4.900	4.900	0	1
45	1	0	4.900	4.900	0	1
46	1	0	4.900	4.900	0	1
47	1	0	4.900	4.900	0	1
48	1	0	4.900	4.900	0	1
49	1	0	4.900	4.900	0	1
50	1	0	4.900	4.900	0	1
59	1	0	4.900	4.900	0	1
60	1	0	4.900	4.900	0	1
63	1	0	8.500	8.500	0	1

Support Reactions

Units: Force Reactions Rx, Ry, Rz [lb]; Moment Reactions Rox, Roy, Roz [lb-in]

Load Combination 14: TIA-222-G-2.3.1_0_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-48.769	107.803	-287.297	136.170	36.692	0.000

67	-12.280	46.590	-39.896	371.804	58.838	0.000
68	-68.101	237.968	-25.109	0.000	337.340	-489.903
69	-28.101	124.454	14.941	0.000	-26.172	-199.333
70	-48.157	168.518	-214.627	1786.400	73.583	0.000
71	-5.857	24.205	-30.927	0.996	41.638	0.000
72	237.110	169.703	42.276	0.000	363.592	-1363.322
73	-25.846	113.793	-28.928	0.000	-54.329	32.107

Load Combination 15: TIA-222-G-2.3.1_30_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-44.325	118.350	-250.179	282.828	-1.658	0.000
67	-12.514	47.808	-36.542	372.489	54.251	0.000
68	-161.465	213.363	-30.427	0.000	225.082	-495.416
69	-46.062	124.500	16.962	0.000	6.704	-168.015
70	-41.376	157.035	-171.606	1630.402	23.739	0.000
71	-6.091	22.986	-27.573	0.305	37.051	0.000
72	132.103	195.244	33.028	0.000	236.000	-1354.887
73	-43.807	113.748	-26.907	0.000	-21.453	0.779

Load Combination 16: TIA-222-G-2.3.1_60_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-29.801	134.014	-160.474	609.494	-35.485	0.000
67	-10.255	45.700	-24.600	323.311	37.434	0.000
68	-250.876	186.386	-34.126	0.000	58.577	-616.080
69	-51.982	123.106	20.315	0.000	41.556	-114.083
70	-21.710	140.317	-68.169	1293.366	-36.551	0.000
71	-3.833	25.094	-15.631	49.470	20.235	0.000
72	31.017	223.273	21.454	0.000	39.101	-1231.335
73	-49.725	115.144	-23.554	0.000	13.399	-53.169

Load Combination 17: TIA-222-G-2.3.1_90_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-9.088	150.607	-42.201	1028.666	-55.733	0.000
67	-6.109	40.833	-7.267	237.449	12.889	0.000
68	-312.392	164.260	-35.216	0.000	-117.590	-819.563
69	-44.275	120.645	24.103	0.000	69.050	-51.984
70	5.574	122.834	67.988	865.566	-91.140	0.000
71	0.313	29.962	1.702	135.315	-4.308	0.000
72	-39.080	246.286	10.656	0.000	-174.377	-1025.769
73	-42.017	117.608	-19.766	0.000	40.895	-115.287

Load Combination 18: TIA-222-G-2.3.1_120_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	12.261	163.686	72.939	1427.953	-56.980	0.000
67	-1.186	34.509	10.812	137.917	-12.804	0.000
68	-329.506	152.921	-33.401	0.000	-256.186	-1051.341
69	-25.006	117.777	27.309	0.000	81.811	1.626
70	33.161	109.269	200.369	461.715	-125.392	0.000
71	5.236	36.287	19.780	234.831	-30.000	0.000
72	-59.378	258.108	3.534	0.000	-347.188	-793.273
73	-22.746	120.478	-16.560	0.000	53.657	-168.913

Load Combination 19: TIA-222-G-2.3.1_150_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	28.525	169.746	154.091	1700.332	-38.908	0.000
67	3.194	28.425	24.791	51.390	-32.761	0.000
68	-297.646	155.407	-29.168	0.000	-320.075	-1249.305
69	0.655	115.271	29.074	0.000	76.418	32.371
70	53.655	103.258	293.492	190.057	-130.130	0.000
71	9.615	42.373	33.759	321.347	-49.957	0.000
72	-24.450	255.570	1.999	0.000	-433.011	-596.146
73	2.916	122.985	-14.794	0.000	48.266	-199.669

Load Combination 20: TIA-222-G-2.3.1_180_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	35.350	167.159	179.524	1772.901	-6.353	0.000
67	5.858	24.207	30.928	1.026	-41.638	0.000
68	-225.344	171.053	-23.651	0.000	-292.151	-1360.469
69	25.837	113.799	28.926	0.000	54.317	32.025

70	61.570	106.415	322.424	123.300	-104.087	0.000
71	12.280	46.591	39.896	371.708	-58.834	0.000
72	56.351	239.352	6.462	0.000	-408.869	-487.150
73	28.099	124.457	-14.943	0.000	26.166	-199.323

Load Combination 21: TIA-222-G-2.3.1_210_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	30.906	156.610	142.404	1626.191	31.973	0.000
67	6.091	22.989	27.574	0.331	-37.052	0.000
68	-131.974	195.666	-18.329	0.000	-179.878	-1355.004
69	43.791	113.755	26.904	0.000	21.431	0.683
70	54.785	117.903	279.392	279.355	-54.236	0.000
71	12.514	47.810	36.542	372.409	-54.248	0.000
72	161.370	213.801	15.724	0.000	-281.222	-495.535
73	46.053	124.501	-16.965	0.000	-6.720	-167.972

Load Combination 22: TIA-222-G-2.3.1_240_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	16.388	140.930	52.700	1299.609	65.806	0.000
67	3.833	25.096	15.631	49.479	-20.235	0.000
68	-42.568	222.644	-14.631	0.000	-13.378	-1234.394
69	49.712	115.149	23.551	0.000	-13.419	-53.237
70	35.124	134.637	175.956	616.305	6.052	0.000
71	10.255	45.704	24.600	323.274	-37.433	0.000
72	262.450	185.770	27.295	0.000	-84.333	-619.031
73	51.972	123.104	-20.318	0.000	-41.570	-114.035

Load Combination 23: TIA-222-G-2.3.1_270_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-4.320	124.323	-65.570	880.571	86.083	0.000
67	-0.313	29.963	-1.702	135.321	4.309	0.000
68	18.936	244.764	-13.546	0.000	162.768	-1030.916
69	42.012	117.609	19.765	0.000	-40.903	-115.301
70	7.850	152.131	39.812	1043.961	60.635	0.000
71	6.109	40.836	7.267	237.449	-12.890	0.000
72	332.529	162.767	38.078	0.000	129.082	-824.593
73	44.271	120.642	-24.104	0.000	-69.055	-51.951

Load Combination 24: TIA-222-G-2.3.1_300_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-25.670	111.246	-180.708	481.335	87.354	0.000
67	-5.236	36.287	-19.781	234.863	30.003	0.000
68	36.045	256.095	-15.364	0.000	301.349	-799.088
69	22.750	120.475	16.560	0.000	-53.654	-168.886
70	-19.732	165.692	-92.558	1447.754	94.881	0.000
71	1.187	34.510	-10.811	137.923	12.803	0.000
72	352.815	150.956	45.188	0.000	301.839	-1057.139
73	25.007	117.774	-27.309	0.000	-81.807	1.651

Load Combination 25: TIA-222-G-2.3.1_330_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
66	-41.939	105.201	-261.861	208.873	69.276	0.000
67	-9.616	42.373	-33.760	321.420	49.961	0.000
68	4.191	253.607	-19.596	0.000	365.244	-601.070
69	-2.911	122.980	14.795	0.000	-48.262	-199.644
70	-40.231	171.687	-185.683	1719.498	99.620	0.000
71	-3.193	28.423	-24.790	51.378	32.760	0.000
72	317.892	153.495	46.725	0.000	387.671	-1254.322
73	-0.656	115.267	-29.074	0.000	-76.418	32.417

Steel Check Report

Project::	**20002-TRN**	Company:	**SZS Engineering**
Description:	**Antenna Mount**	User:	**Sam Gonzalez**
Date:	**08/04/2020 11:07 AM**	Software:	**Digital Canal VersaFrame**

Code Check Results (LRFD14)

CRITICAL STRESS SUMMARY

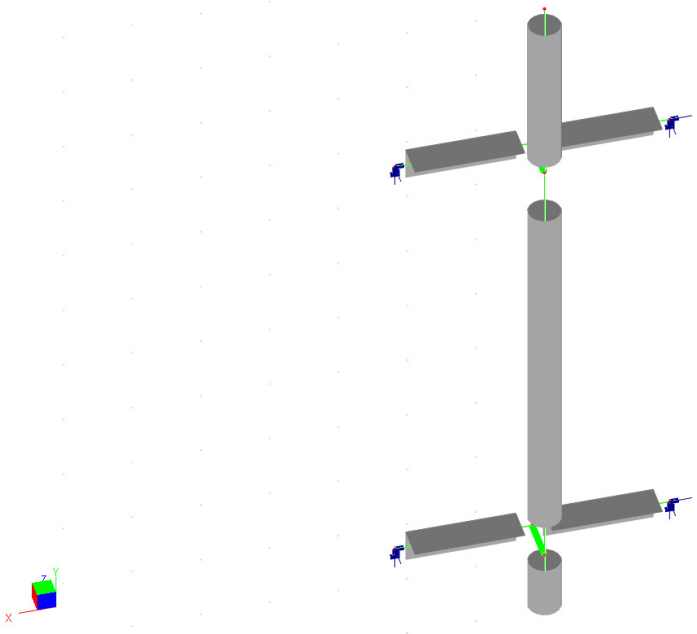
ID	Section Name	Status	Governing Criteria	Stress Ratio	Load Combination	Distance (ft)
1	L3X3X1/4	OK	Axial-Bending	0.0840	TIA-222-G-2.3.1_180	1.3333
2	L3X3X1/4	OK	Axial-Bending	0.0095	TIA-222-G-2.3.1_180	0.6669
3	L3X3X1/4	OK	Axial-Bending	0.0068	TIA-222-G-2.3.1_90	1.4167
4	L3X3X1/4	OK	Axial-Bending	0.0196	TIA-222-G-2.3.1_30	0.7500
5	L3X3X1/4	OK	Axial-Bending	0.0981	TIA-222-G-2.3.1_180	2.3333
6	L3X3X1/4	OK	Axial-Bending	0.0224	TIA-222-G-2.3.1_180	0.0000
7	L3X3X1/4	OK	Axial-Bending	0.0507	TIA-222-G-2.3.1_0	1.0417
8	L3X3X1/4	OK	Axial-Bending	0.0018	TIA-222-G-2.3.1_0	0.0000
9	L3X3X1/4	OK	Axial-Bending	0.0239	TIA-222-G-2.3.1_330	0.7497
10	L3X3X1/4	OK	Axial-Bending	0.0050	TIA-222-G-2.3.1_90	0.0000
17	L3X3X1/4	OK	Axial-Bending	0.0860	TIA-222-G-2.3.1_0	0.0000
18	L3X3X1/4	OK	Axial-Bending	0.0099	TIA-222-G-2.3.1_0	0.6669
19	L3X3X1/4	OK	Axial-Bending	0.0079	TIA-222-G-2.3.1_270	1.4167
20	L3X3X1/4	OK	Axial-Bending	0.0127	TIA-222-G-2.3.1_210	0.7500
21	L3X3X1/4	OK	Axial-Bending	0.1001	TIA-222-G-2.3.1_0	0.0000
22	L3X3X1/4	OK	Axial-Bending	0.0149	TIA-222-G-2.3.1_180	0.0000
23	L3X3X1/4	OK	Axial-Bending	0.0425	TIA-222-G-2.3.1_180	1.0417
24	L3X3X1/4	OK	Axial-Bending	0.0018	TIA-222-G-2.3.1_0	0.0000
25	L3X3X1/4	OK	Axial-Bending	0.0263	TIA-222-G-2.3.1_180	0.7497
26	L3X3X1/4	OK	Axial-Bending	0.0042	TIA-222-G-2.3.1_270	0.0000
33	Pipe2-1/2STD	OK	Axial-Bending	0.0132	TIA-222-G-2.3.1_270	3.2500
34	Pipe2-1/2STD	OK	Axial-Bending	0.0174	TIA-222-G-2.3.1_90	3.2500
35	Pipe2-1/2STD	OK	Axial-Bending	0.0341	TIA-222-G-2.3.1_180	1.6250
36	Pipe2-1/2STD	OK	Axial-Bending	0.0330	TIA-222-G-2.3.1_330	3.2500
37	Pipe2-1/2STD	OK	Axial-Bending	0.0649	TIA-222-G-2.3.1_240	0.0000
38	Pipe2-1/2STD	OK	Axial-Bending	0.0593	TIA-222-G-2.3.1_240	0.0000
39	Pipe2-1/2STD	OK	Axial-Bending	0.0085	TIA-222-G-2.3.1_210	0.0000
40	Pipe2-1/2STD	OK	Axial-Bending	0.0003	TIA-222-G-2.3.1_270	0.0000
41	Pipe2-1/2STD	OK	Axial-Bending	0.0025	TIA-222-G-2.3.1_270	0.0000
42	Pipe2-1/2STD	OK	Axial-Bending	0.0461	TIA-222-G-2.3.1_210	0.0000
43	Pipe2-1/2STD	OK	Axial-Bending	0.0034	TIA-222-G-2.3.1_210	0.0000
44	Pipe2-1/2STD	OK	Axial-Bending	0.0025	TIA-222-G-2.3.1_90	0.0000
45	Pipe2-1/2STD	OK	Axial-Bending	0.0248	TIA-222-G-2.3.1_210	0.0000
46	Pipe2-1/2STD	OK	Axial-Bending	0.0003	TIA-222-G-2.3.1_270	0.0000
47	Pipe2-1/2STD	OK	Axial-Bending	0.0462	TIA-222-G-2.3.1_210	0.0000
48	Pipe2-1/2STD	OK	Axial-Bending	0.0034	TIA-222-G-2.3.1_120	0.0000
49	Pipe2-1/2STD	OK	Axial-Bending	0.0026	TIA-222-G-2.3.1_90	0.0000
50	Pipe2-1/2STD	OK	Axial-Bending	0.0026	TIA-222-G-2.3.1_270	0.0000
51	L3X3X1/4	OK	Axial-Bending	0.0374	TIA-222-G-2.3.1_0	0.0000
52	L3X3X1/4	OK	Axial-Bending	0.0251	TIA-222-G-2.3.1_30	0.0000
53	L3X3X1/4	OK	Axial-Bending	0.0764	TIA-222-G-2.3.1_240	0.0000
54	L3X3X1/4	OK	Axial-Bending	0.0145	TIA-222-G-2.3.1_90	0.0000
55	L3X3X1/4	OK	Axial-Bending	0.0299	TIA-222-G-2.3.1_180	0.0000
56	L3X3X1/4	OK	Axial-Bending	0.0302	TIA-222-G-2.3.1_210	0.0000
57	L3X3X1/4	OK	Axial-Bending	0.0775	TIA-222-G-2.3.1_30	0.0000
58	L3X3X1/4	OK	Axial-Bending	0.0133	TIA-222-G-2.3.1_270	0.0000
59	Pipe2-1/2STD	OK	Axial-Bending	0.0342	TIA-222-G-2.3.1_0	0.0000
60	Pipe2-1/2STD	OK	Axial-Bending	0.0575	TIA-222-G-2.3.1_180	1.6250
63	L3X3X1/4	OK	Axial-Bending	0.0127	TIA-222-G-2.3.1_150	2.9557

SELECTED LOAD COMBINATIONS

Load Combination	Code Check	Total	Live	Dependent	Conditional
TIA-222-G-2.3.1_0	x			-	-

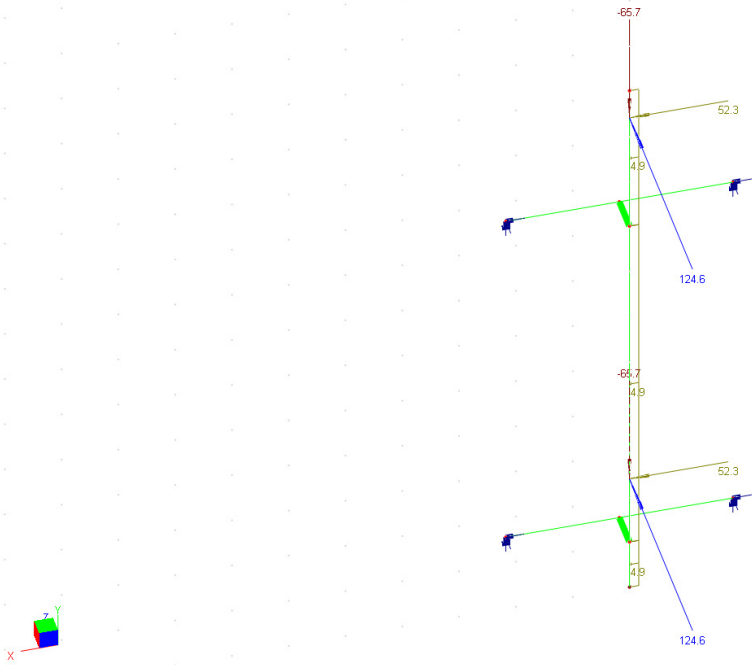
	Node Id	Rx [lb]	Ry [lb]	Rz [lb]	Rox [lb-in]	Roy [lb-in]	Roz [lb-in]
1	78	-26.585	226.932	471.806	19366.796	189.080	769.522
2	79	9.013	-26.277	118.764	2688.962	-108.120	-282.004
3	80	-127.417	854.753	-21.494	-575.089	132.334	-3289.113
4	81	144.989	-62.374	25.614	912.227	235.998	-2542.847
5	Sum	0.000	993.034	594.690	22392.897	449.291	-5344.441

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 09:46:12	



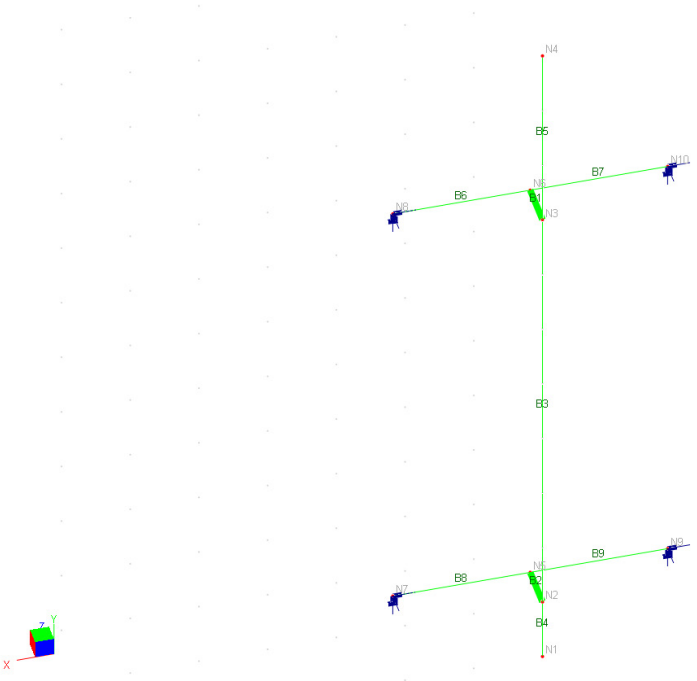
Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 10:08:20	



Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 09:45:34	



Note:

Steel Check Report

Project::	**20002-TRN**	Company:	**SZS Engineering**
Description:	**Antenna Mount**	User:	**Sam Gonzalez**
Date:	**08/04/2020 10:10 AM**	Software:	**Digital Canal VersaFrame**

Code Check Results (LRFD14)

CRITICAL STRESS SUMMARY

ID	Section Name	Status	Governing Criteria	Stress Ratio	Load Combination	Distance (ft)
3	Pipe2-1/2STD	OK	Axial-Bending	0.0628	TIA-222-G-2.3.1_180	0.0000
4	Pipe2-1/2STD	OK	Axial-Bending	0.0003	TIA-222-G-2.3.1_270	0.0000
5	Pipe2-1/2STD	OK	Axial-Bending	0.0737	TIA-222-G-2.3.1_210	0.0000
6	L3X3X3/8	OK	Axial-Bending	0.0338	TIA-222-G-2.3.1_30	1.0000
7	L3X3X3/8	OK	Axial-Bending	0.0338	TIA-222-G-2.3.1_330	0.0000
8	L3X3X3/8	OK	Axial-Bending	0.0232	TIA-222-G-2.3.1_150	1.0000
9	L3X3X3/8	OK	Axial-Bending	0.0232	TIA-222-G-2.3.1_210	0.0000

SELECTED LOAD COMBINATIONS

Load Combination	Code Check	Total	Live	Dependent	Conditional
TIA-222-G-2.3.1_0	x			-	-
TIA-222-G-2.3.1_30	x			-	-
TIA-222-G-2.3.1_60	x			-	-
TIA-222-G-2.3.1_90	x			-	-
TIA-222-G-2.3.1_120	x			-	-
TIA-222-G-2.3.1_150	x			-	-
TIA-222-G-2.3.1_180	x			-	-
TIA-222-G-2.3.1_210	x			-	-
TIA-222-G-2.3.1_240	x			-	-
TIA-222-G-2.3.1_270	x			-	-
TIA-222-G-2.3.1_300	x			-	-
TIA-222-G-2.3.1_330	x			-	-

	Node Id	Rx [lb]	Ry [lb]	Rz [lb]	Rox [lb-in]	Roy [lb-in]	Roz [lb-in]
1	11	0.000	227.712	-249.200	-2183.796	0.000	-0.000
2	Sum	0.000	227.712	-249.200	-2183.796	0.000	-0.000

INPUT Contents

OUTPUT Contents

Nodes

Units: Coordinates X, Y, Z [in]

No.	X	Y	Z	No.	X	Y	Z
1	0.00	0.00	0.00	2	0.00	6.00	0.00
3	0.00	48.00	0.00	4	0.00	66.00	0.00
5	0.00	6.00	4.00	6	0.00	48.00	4.00
7	12.00	6.00	4.00	8	12.00	48.00	4.00
9	-12.00	6.00	4.00	10	-12.00	48.00	4.00

Supports

Units: Forced Displacements Dx, Dy, Dz [in]; Dox, Doy, Doz [rad]

Node	Flag	Dx	Dy	Dz	Dox	Doy	Doz
7	111011	0.000	0.000	0.000	0.000	0.000	0.000
8	111011	0.000	0.000	0.000	0.000	0.000	0.000
9	111011	0.000	0.000	0.000	0.000	0.000	0.000
10	111011	0.000	0.000	0.000	0.000	0.000	0.000

Point Loads

Units: Force [lb]; Moment [lb-in]; Coord-Sys: Local=0, Global=1;
Direction: 0=X, 1=Y, 2=Z, 3=OX, 4=OY, 5=OZ

********** LOAD CASE - [Dead]**********

Member	Coord-Sys	Direction	Value	Distance
3	1	1	-65.700	0.8
5	1	1	-65.700	0.8

********** LOAD CASE - [Wind]**********

Member	Coord-Sys	Direction	Value	Distance
3	1	2	124.600	0.8
5	1	2	124.600	0.8

********** LOAD CASE - [WindTransverse]**********

Member	Coord-Sys	Direction	Value	Distance
3	1	0	52.300	0.8
5	1	0	52.300	0.8

Line Loads

Units: Force [lb/ft]; Coord-Sys: Local=0, Global=1; Direction: 0=X, 1=Y, 2=Z

********** LOAD CASE - [WindTransverse]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
3	1	0	4.900	4.900	0	1
4	1	0	4.900	4.900	0	1
5	1	0	4.900	4.900	0	1

Support Reactions

Units: Force Reactions Rx, Ry, Rz [lb]; Moment Reactions Rox, Roy, Roz [lb-in]

Load Combination 14: TIA-222-G-2.3.1_0_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	-0.000	8.025	-37.680	0.000	-226.081	-30.951
8	0.000	105.831	-86.920	0.000	-521.519	-617.791
9	-0.000	8.025	-37.680	0.000	226.081	30.951
10	0.000	105.831	-86.920	0.000	521.519	617.791

Load Combination 15: TIA-222-G-2.3.1_30_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz

7	-13.572	22.901	-40.713	0.000	-230.582	-103.445
8	-19.316	118.197	-83.634	0.000	-482.615	-654.263
9	-13.572	6.139	-27.017	0.000	175.797	36.399
10	-19.316	80.476	-64.443	0.000	405.849	503.378

Load Combination 16: TIA-222-G-2.3.1_60_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	-23.506	46.775	-35.305	0.000	-188.107	-234.421
8	-33.455	114.263	-55.476	0.000	-299.616	-603.051
9	-23.506	17.744	-11.583	0.000	93.219	118.297
10	-33.455	48.931	-22.237	0.000	166.659	341.717

Load Combination 17: TIA-222-G-2.3.1_90_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	-27.143	73.253	-22.903	0.000	-110.023	-388.798
8	-38.632	95.086	-9.985	0.000	-21.527	-477.877
9	-27.143	39.730	4.490	0.000	0.452	254.707
10	-38.632	19.643	28.397	0.000	-132.002	176.104

Load Combination 18: TIA-222-G-2.3.1_120_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	-23.506	95.237	-6.829	0.000	-17.249	-525.194
8	-33.455	65.802	40.648	0.000	277.127	-312.279
9	-23.506	66.207	16.894	0.000	-77.639	409.071
10	-33.455	0.468	73.887	0.000	-410.082	50.941

Load Combination 19: TIA-222-G-2.3.1_150_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	-13.572	106.837	8.608	0.000	65.343	-607.065
8	-19.316	34.261	82.852	0.000	516.304	-150.645
9	-13.572	90.076	22.304	0.000	-120.129	540.019
10	-19.316	-3.461	102.043	0.000	-593.067	-0.244

Load Combination 20: TIA-222-G-2.3.1_180_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	-0.000	104.949	19.272	0.000	115.635	-612.499
8	0.000	8.907	105.328	0.000	631.965	-36.243
9	-0.000	104.949	19.272	0.000	-115.635	612.499
10	0.000	8.907	105.328	0.000	-631.965	36.243

Load Combination 21: TIA-222-G-2.3.1_210_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	13.572	90.076	22.304	0.000	120.129	-540.019
8	19.316	-3.461	102.043	0.000	593.067	0.244
9	13.572	106.837	8.608	0.000	-65.343	607.065
10	19.316	34.261	82.852	0.000	-516.304	150.645

Load Combination 22: TIA-222-G-2.3.1_240_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	23.506	66.207	16.894	0.000	77.639	-409.071
8	33.455	0.468	73.887	0.000	410.082	-50.941
9	23.506	95.237	-6.829	0.000	17.249	525.194
10	33.455	65.802	40.648	0.000	-277.127	312.279

Load Combination 23: TIA-222-G-2.3.1_270_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	27.143	39.730	4.490	0.000	-0.452	-254.707
8	38.632	19.643	28.397	0.000	132.002	-176.104
9	27.143	73.253	-22.903	0.000	110.023	388.798
10	38.632	95.086	-9.985	0.000	21.527	477.877

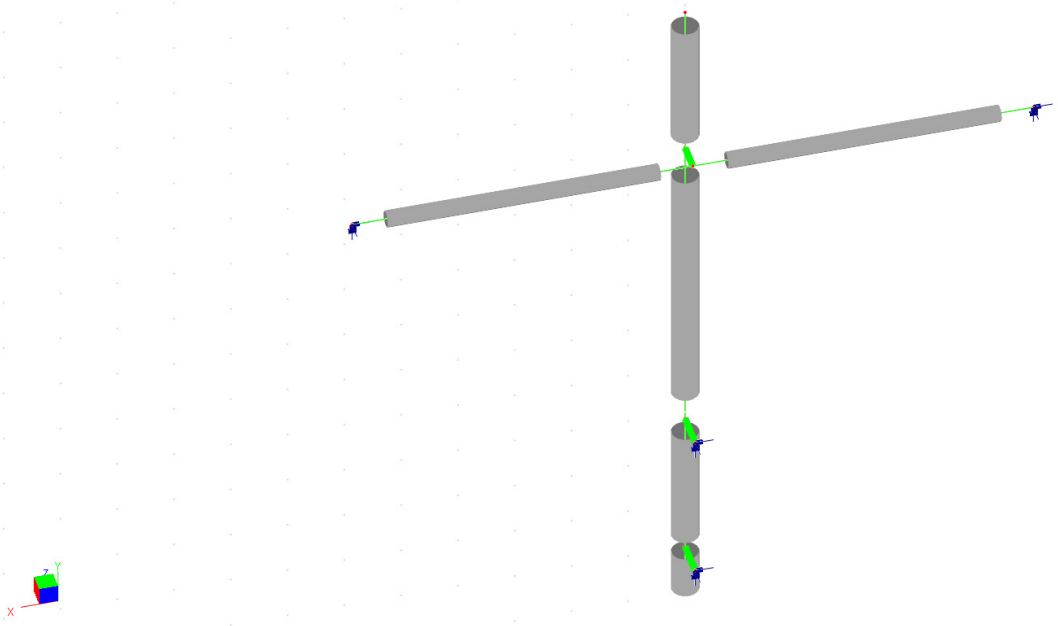
Load Combination 24: TIA-222-G-2.3.1_300_ALLOWABLE

Node	Rx	Ry	Rz	Rox	Roy	Roz
7	23.506	17.744	-11.583	0.000	-93.219	-118.297
8	33.455	48.931	-22.237	0.000	-166.659	-341.717
9	23.506	46.775	-35.305	0.000	188.107	234.421
10	33.455	114.263	-55.476	0.000	299.616	603.051

Load Combination 25: TIA-222-G-2.3.1_330_ALLOWABLE

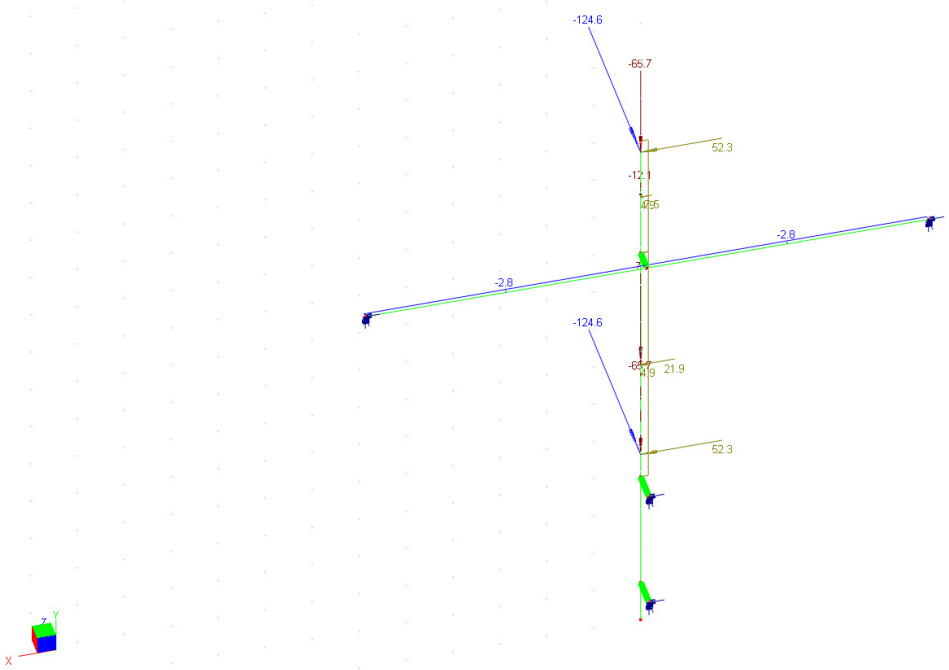
Node	Rx	Ry	Rz	Rox	Roy	Roz
7	13.572	6.139	-27.017	0.000	-175.797	-36.399
8	19.316	80.476	-64.443	0.000	-405.849	-503.378
9	13.572	22.901	-40.713	0.000	230.582	103.445
10	19.316	118.197	-83.634	0.000	482.615	654.263

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 09:36:18	



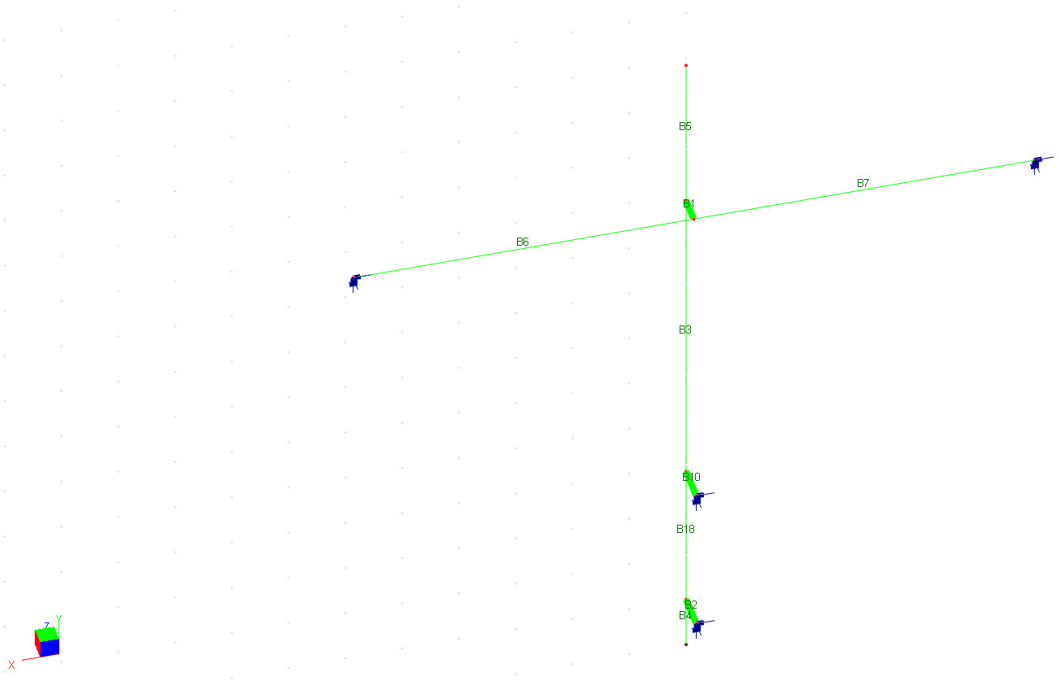
Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 09:43:16	



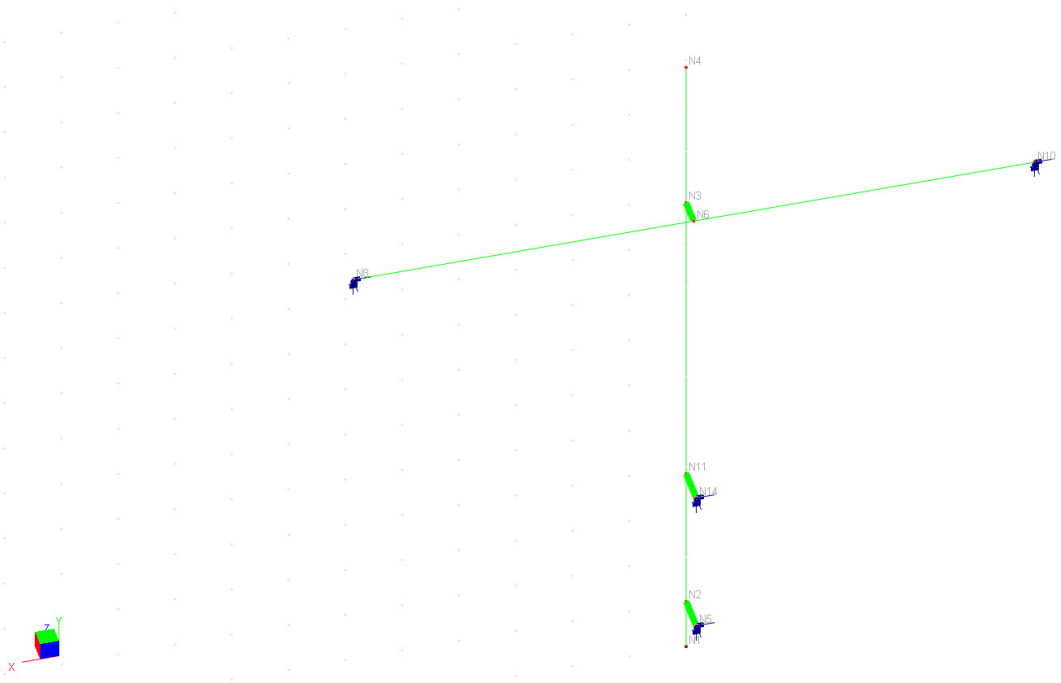
Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 09:37:25	



Note:

Company/Project: SZS Engineering / 20002-TRN		**VersaFrame V8.11 (608.0)** (C) Digital Canal Corp.
Engineer: Sam Gonzalez	Date/Time: 08/04/20 09:36:56	



Note:

Steel Check Report

Project::	**20002-TRN**	Company:	**SZS Engineering**
Description:	**Antenna Mount**	User:	**Sam Gonzalez**
Date:	**08/04/2020 09:43 AM**	Software:	**Digital Canal VersaFrame**

Code Check Results (LRFD14)

CRITICAL STRESS SUMMARY

ID	Section Name	Status	Governing Criteria	Stress Ratio	Load Combination	Distance (ft)
3	Pipe2-1/2STD	OK	Axial-Bending	0.1184	TIA-222-G-2.3.1_0	3.0000
4	Pipe2-1/2STD	OK	Axial-Bending	0.0000	TIA-222-G-2.3.1_180	0.0000
5	Pipe2-1/2STD	OK	Axial-Bending	0.0841	TIA-222-G-2.3.1_330	0.0000
6	Pipe1-1/4STD	OK	Axial-Bending	0.2027	TIA-222-G-2.3.1_0	0.0000
7	Pipe1-1/4STD	OK	Axial-Bending	0.2027	TIA-222-G-2.3.1_0	3.0000
18	Pipe2-1/2STD	OK	Axial-Bending	0.0824	TIA-222-G-2.3.1_180	0.0000

SELECTED LOAD COMBINATIONS

Load Combination	Code Check	Total	Live	Dependent	Conditional
TIA-222-G-2.3.1_0	x			-	-
TIA-222-G-2.3.1_30	x			-	-
TIA-222-G-2.3.1_60	x			-	-
TIA-222-G-2.3.1_90	x			-	-
TIA-222-G-2.3.1_120	x			-	-
TIA-222-G-2.3.1_150	x			-	-
TIA-222-G-2.3.1_180	x			-	-
TIA-222-G-2.3.1_210	x			-	-
TIA-222-G-2.3.1_240	x			-	-
TIA-222-G-2.3.1_270	x			-	-
TIA-222-G-2.3.1_300	x			-	-
TIA-222-G-2.3.1_330	x			-	-

INPUT Contents

OUTPUT Contents

Nodes

Units: Coordinates X, Y, Z [in]

No.	X	Y	Z	No.	X	Y	Z
1	0.00	0.00	0.00	2	0.00	6.00	0.00
3	0.00	59.00	0.00	4	0.00	77.00	0.00
5	0.00	6.00	-4.00	6	0.00	59.00	-3.00
8	36.00	59.00	-3.00	10	-36.00	59.00	-3.00
11	0.00	23.00	0.00	14	0.00	23.00	-4.00

Supports

Units: Forced Displacements Dx, Dy, Dz [in]; Dox, Doy, Doz [rad]

Node	Flag	Dx	Dy	Dz	Dox	Doy	Doz
5	111011	0.000	0.000	0.000	0.000	0.000	0.000
8	111011	0.000	0.000	0.000	0.000	0.000	0.000
10	111011	0.000	0.000	0.000	0.000	0.000	0.000
14	111011	0.000	0.000	0.000	0.000	0.000	0.000

Point Loads

Units: Force [lb]; Moment [lb-in]; Coord-Sys: Local=0, Global=1;
Direction: 0=X, 1=Y, 2=Z, 3=OX, 4=OY, 5=OZ

********** LOAD CASE - [Dead]**********

Member	Coord-Sys	Direction	Value	Distance
3	1	1	-65.700	0.9
3	1	1	-74.000	0.5
5	1	1	-65.700	0.9
5	1	1	-12.100	0.5

********** LOAD CASE - [Wind]**********

Member	Coord-Sys	Direction	Value	Distance
3	1	2	-124.600	0.9
5	1	2	-124.600	0.9

********** LOAD CASE - [WindTransverse]**********

Member	Coord-Sys	Direction	Value	Distance
3	1	0	52.300	0.9
3	1	0	21.900	0.5
5	1	0	52.300	0.9
5	1	0	7.500	0.5

Line Loads

Units: Force [lb/ft]; Coord-Sys: Local=0, Global=1; Direction: 0=X, 1=Y, 2=Z

********** LOAD CASE - [Wind]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
6	1	2	-2.800	-2.800	0	1
7	1	2	-2.800	-2.800	0	1

********** LOAD CASE - [WindTransverse]**********

Member	Coord-Sys	Direction	Value1	Value2	Distance1	Distance2
3	1	0	4.900	4.900	0	1
5	1	0	4.900	4.900	0	1

Support Reactions

Units: Force Reactions Rx, Ry, Rz [lb]; Moment Reactions Rox, Roy, Roz [lb-in]

Load Combination 2: TIA-222-G-2.3.1_0

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	-0.000	-454.518	-226.283	0.000	-0.000	0.000
8	-0.000	16.989	98.207	0.000	1687.092	-260.322
10	0.000	16.989	98.207	0.000	-1687.092	260.322
14	0.000	738.277	455.469	0.000	0.000	-0.000

Load Combination 3: TIA-222-G-2.3.1_30

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	0.000	-375.294	-186.879	0.000	-0.000	-0.000
8	-44.655	18.429	88.032	0.000	1496.919	-267.457
10	-44.655	12.126	81.829	0.000	-1420.943	191.605
14	-35.530	662.476	385.598	0.000	-257.640	29.672

Load Combination 4: TIA-222-G-2.3.1_60

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	0.000	-158.854	-79.224	0.000	-0.000	-0.000
8	-77.345	16.068	54.089	0.000	901.513	-211.116
10	-77.346	5.136	43.228	0.000	-769.657	79.699
14	-61.539	455.387	194.707	0.000	-446.060	51.336

Load Combination 5: TIA-222-G-2.3.1_90

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	0.000	136.798	67.836	0.000	-0.000	-0.000
8	-89.311	10.541	5.474	0.000	60.413	-106.397
10	-89.312	-2.108	-7.251	0.000	92.254	-45.408
14	-71.057	172.505	-66.059	0.000	-514.773	59.189

Load Combination 6: TIA-222-G-2.3.1_120

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	0.000	432.438	214.897	0.000	-0.000	-0.000
8	-77.347	3.322	-44.843	0.000	-801.137	18.661
10	-77.347	-7.654	-56.023	0.000	933.707	-150.177
14	-61.535	-110.369	-326.831	0.000	-445.553	51.182

Load Combination 7: TIA-222-G-2.3.1_150

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	0.000	648.853	322.554	0.000	-0.000	-0.000
8	-44.657	-3.664	-83.440	0.000	-1452.416	130.564
10	-44.657	-10.011	-89.962	0.000	1529.107	-206.516
14	-35.527	-317.441	-517.732	0.000	-257.134	29.517

Load Combination 8: TIA-222-G-2.3.1_180

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	0.000	728.066	361.959	0.000	0.000	-0.000
8	-0.000	-8.547	-99.976	0.000	-1718.920	199.331
10	0.000	-8.547	-99.976	0.000	1718.920	-199.331
14	0.000	-393.234	-587.608	0.000	0.000	-0.000

Load Combination 9: TIA-222-G-2.3.1_210

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	-0.000	648.853	322.554	0.000	0.000	0.000
8	44.657	-10.011	-89.962	0.000	-1529.107	206.516
10	44.657	-3.664	-83.440	0.000	1452.416	-130.564
14	35.527	-317.441	-517.732	0.000	257.134	-29.517

Load Combination 10: TIA-222-G-2.3.1_240

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	-0.000	432.438	214.897	0.000	0.000	0.000
8	77.347	-7.654	-56.023	0.000	-933.707	150.177
10	77.347	3.322	-44.843	0.000	801.137	-18.661
14	61.535	-110.369	-326.831	0.000	445.553	-51.182

Load Combination 11: TIA-222-G-2.3.1_270

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	-0.000	136.798	67.836	0.000	0.000	0.000
8	89.312	-2.108	-7.251	0.000	-92.254	45.408
10	89.311	10.541	5.474	0.000	-60.413	106.397
14	71.057	172.505	-66.059	0.000	514.773	-59.189

Load Combination 12: TIA-222-G-2.3.1_300

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	-0.000	-158.854	-79.224	0.000	0.000	0.000
8	77.346	5.136	43.228	0.000	769.657	-79.699
10	77.345	16.068	54.089	0.000	-901.513	211.116
14	61.539	455.387	194.707	0.000	446.060	-51.336

Load Combination 13: TIA-222-G-2.3.1_330

Node	Rx	Ry	Rz	Rox	Roy	Roz
5	-0.000	-375.294	-186.879	0.000	0.000	0.000
8	44.655	12.126	81.829	0.000	1420.943	-191.605
10	44.655	18.429	88.032	0.000	-1496.919	267.457
14	35.530	662.476	385.598	0.000	257.640	-29.672

Hazards by Location

Search Information

Address: 1925 Massachusetts Ave, Cambridge, MA 02140, USA

Coordinates: 42.3894663, -71.11973300000001

Elevation: 37 ft

Timestamp: 2020-08-04T15:29:24.434Z

Hazard Type: Wind

ASCE 7-16

MRI 10-Year	75 mph
MRI 25-Year	84 mph
MRI 50-Year	91 mph
MRI 100-Year	98 mph
Risk Category I	109 mph
Risk Category II	119 mph
Risk Category III	128 mph
Risk Category IV	⚠ 132 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	78 mph
MRI 25-Year	88 mph
MRI 50-Year	96 mph
MRI 100-Year	103 mph
Risk Category I	117 mph
Risk Category II	127 mph
Risk Category III-IV	⚠ 138 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed	104 mph

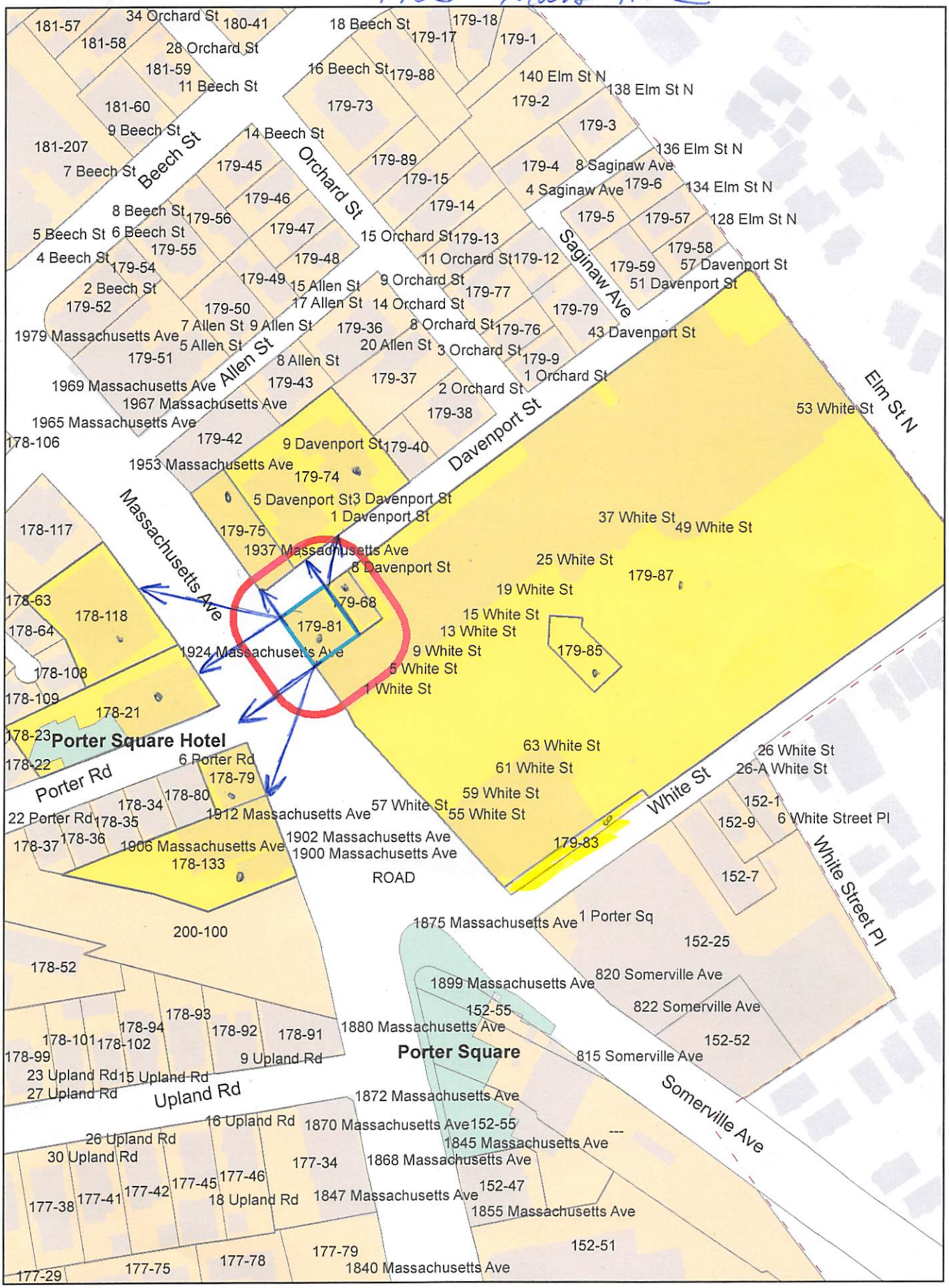
The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

1923 Mass Ave



1923 Mass Ave

Petitioner

179-75
BOYER, BURTON
TRUSTEE OF LISA II REALTY TRUST
P.O. BOX 67398
CHESTNUT HILL, MA 02467

179-85-83
MASSACHUSETTS BAY TRANSPORTATION
AUTHORITY
10 PARK PLAZA
BOSTON, MA 02116

JAKE SHAPPY
10 INDUSTRIAL AVE – SUITE 3
MAHWAH, NJ 07430

179-74
DAVENPORT STREET, LLC
75 RIVER STREET
CAMBRIDGE, MA 02139

179-74
REESE, REGINALD P., JR. &
MARIE T. MURPHY REESE
1-15 DAVENPORT ST UNIT 12
CAMBRIDGE, MA 02140

179-81
1925 MASS AVE, LLC.
C/O ERIC HOAGLAND
195 LEXINGTON AVE.
CAMBRIDGE, MA 02138

178-21
PORTER SQUARE HOTEL, LLC
1924 MASS AVE
CAMBRIDGE, MA 02140

178-79
TOADMAN, LLC
1920 MASSACHUSETTS AVE
CAMBRIDGE, MA 02140

178-118
CAMBRIDGE MASONIC HALL ASSOCIATION
1950 MASS AVE
CAMBRIDGE, MA 02140

179-87
PORTER SQUARE LLC
C/O GRAVESTAR, INC.
160 SECOND ST
CAMBRIDGE, MA 02142

179-74
GREGORY, STEVEN, MARY KATHRYN BRATUN &
CITY OF CAMBRIDGE TAX TITLE
141 FEDERAL STREET
SALEM, MA 01970

179-74
KULSHRESTHA, ANKIT
15 DAVENPORT ST., #8/1
CAMBRIDGE, MA 02140

179-74
JEFFERSON, MARILYN W. &
PHILIP O. JEFFERSON, TRS
1-15 DAVENPORT ST., #9/1
CAMBRIDGE, MA 02140

178-133
PKH PROPERTIES, LLC
P.O. BOX 621 BROOKLINE
BROOKLINE, MA 02446

179-74
GREGORY, STEVEN K. , MARY KATHRYN BRATUN
& CITY OF CAMBRIDGE TAX TITLE
141 FEDERAL STREET
SALEM, MA 01970

179-74
HUANG, HON-REN & YU-HSIN CHIU
15 GOFFE ROAD
LEXINGTON, MA 02421

179-74
LEE, CHOONG I. & BYUNG SOOK LEE KIM
1 DAVENPORT ST UNIT 10
CAMBRIDGE, MA 02140

179-74
LIN, LENNOX
1-15 DAVENPORT ST UNIT 6
CAMBRIDGE, MA 02140

179-74
KUO,BOBBY F
179 LARCH RD, APT #2
CAMBRIDGE, MA 02138

179-68
8 DAVENPORT LLC.
195 LEXINGTON AVE
CAMBRIDGE, MA 02138

179-74
PORTER, JOHN MIKAEL &
ADIA ALEXANDRA PORTER
1 DAVENPORT ST UNIT #5
CAMBRIDGE, MA 02140

179-74
MORSE, STEPHEN P. STEPHEN P. MORSE
DECLARATION OF TRUST
1 DAVENPORT ST UNIT 11
CAMBRIDGE, MA 02140

179-74
SENGUPTA RITA SENGUPTA HIRAK ET AL
3 DAVENPORT ST #3
CAMBRIDGE, MA 02140

BZA APPLICATION FORM - OWNERSHIP INFORMATION

To be completed by OWNER, signed before a notary and returned to The Secretary of the Board of Zoning Appeals.

I/We 1925 Mass Ave, LLC - Eric Hoagland, Manager
(OWNER)

Address: 195 Lexington Avenue, Cambridge, MA

State that I/We own the property located at 1923-1925 Mass Ave, Cambridge which is the subject of this zoning application.

The record title of this property is in the name of 1925 Mass Ave LLC

*Pursuant to a deed of duly recorded in the date 8-10-11, Middlesex South County Registry of Deeds at Book 57277, Page 496; or

Middlesex Registry District of Land Court, Certificate No. _____

Book _____ Page _____

Eric W. Hoagland, Mgr.
SIGNATURE BY LAND OWNER OR AUTHORIZED TRUSTEE, OFFICER OR AGENT*

Written evidence of Agent's standing to represent petitioner may be requested.

Commonwealth of Massachusetts, County of Suffolk

The above-name Eric Hoagland personally appeared before me, this 22nd of July, 2021, and made oath that the above statement is true.

Notary

My commission expires _____ (Notary Seal).

ROBERT W. LEVY
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS
MY COMMISSION EXPIRES FEBRUARY 10, 2023

- If ownership is not shown in recorded deed, e.g. if by court order, recent deed, or inheritance, please include documentation.


ROBERT W. LEVY
NOTARY PUBLIC

2

2011 00138457
Bk: 57277 Pg: 496 Doc: DEED
Page: 1 of 2 08/10/2011 02:25 PM

QUITCLAIM DEED

Address: 1925 Massachusetts Ave. Cambridge, MA.

The undersigned Charles R. Laverty, Jr. and Paul R. Lohnes, of 75 Cambridge Parkway, Suite 100, Cambridge, Massachusetts 02141 ("Grantors"), for consideration paid of Five Million and Twenty-five Thousand Dollars ($5,025,000.00), grant to 1925 Mass Ave, LLC, a Massachusetts Limited Liability Company with a principal office located at 195 Lexington Avenue, Cambridge, Massachusetts 02138 ("Grantee"),

With Quitclaim Covenants,

A certain parcel of land with the buildings thereon, situated in that part of Cambridge called North Cambridge, being shown as Lot B on a plan entitled "Plan of Premises in North Cambridge belonging to Helena V. Wilder", by W.A. Mason & Son, Surveyors, recorded in the Middlesex County South District Registry of Deeds at the end of Book 3076.

Beginning at the Southeasterly corner thereof; thence turning

NORTHEASTERLY:	by land now or formerly of James H. Cutter, 60.01 feet; thence turning and running
NORTHWESTERLY:	by a line parallel to Massachusetts Avenue, formerly called North Avenue, to land held formerly in common by Cutter heirs, now Davenport Street, 63.59 feet, thence turning and running
SOUIHWESTERLY:	by Davenport Street, 60.06 feet; thence turning and running
SOUTHEASTERLY:	by said Massachusetts Avenue, 62.97 feet to the point of beginning.

Excepted from the foregoing is approximately eighteen (18) square feet of land referred to in a certain deed from Lazar D. Nasson to Stephen P. Mugar, Trustee dated June 6, 1957 and recorded at Middlesex Deeds Book 8981, page 158. See also confirmatory deed recorded at book 9073, page 116.

The premises are conveyed subject to the provisions of the local zoning laws; to existing rights created by instruments of record in party or partition walls, if any, and to outstanding leases, of record, if any.

For Grantors' title see Deed dated April 12, 1984, and recorded with the Middlesex County South District Registry of Deeds in Book 15522, Page 241.

MASSACHUSETTS EXCISE TAX
Southern Middlesex District ROD # 001
Date: 08/10/2011 02:25 PM
Ctrl# 167500 13772 Doc# 00138457
Fee: $22,914.00 Cons: $5,025,000.00

Gerard Fong, Esq.
Fong & Kaston, LLP
24 School Street
Suite 720
Boston, MA 02108

Executed under seal this 4th day of August, 2011.

Charles R. Laverty, Jr.

Paul R. Lohnes

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this 4th day of August, 2011, before me, the undersigned notary public, personally appeared **Charles R. Laverty, Jr.**, personally known to me and proved to me through satisfactory evidence of identification, which was a Massachusetts driver's license, to be the person whose name is signed upon the preceding or attached document, and acknowledged to me that he signed said Quitclaim Deed voluntarily for its stated purpose.

Notary Public: John N. Santangelo
My Commission Expires: December 8, 2017

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this 4th day of August, 2011, before me, the undersigned notary public, personally appeared **Paul R. Lohnes**, personally known to me and proved to me through satisfactory evidence of identification, which was a Massachusetts driver's license, to be the person whose name is signed upon the preceding or attached document, and acknowledged to me that he signed said Quitclaim Deed voluntarily for its stated purpose.

Notary Public: John N. Santangelo
My Commission Expires: December 8, 2017