Robinson+Cole

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Also admitted in Massachusetts
and New York

July 25, 2023

Via Electronic Mail

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

Re: **Notice of Exempt Modification – Facility Modification**
American School for the Deaf at Hartford
139 North Main Street, West Hartford, Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains an existing wireless telecommunications facility at the above-referenced property address (the "Property"). The facility consists of antennas, remote radio heads and related equipment inside a faux clock tower structure on the Property. The clock tower and Cellco's use of the clock tower were approved by the Council in June of 2013 in Docket No 434. A copy of the Docket No. 434 Decision and Order is included in Attachment 1.

Cellco now intends to modify its facility by removing three (3) antennas and installing three (3) new Samsung MT6413-77A antennas on its existing antenna mounts. A set of project plans showing Cellco's proposed facility modifications and specifications for the new antennas are included in Attachment 2.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to West Hartford's Chief Elected Official and Land Use Officer.

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

1. The proposed modifications will not result in an increase in the height of the existing clock tower. Cellco's replacement antennas will be installed on Cellco's existing antenna mounts inside the clock tower structure.

2. The proposed modifications does not involve a change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The installation of Cellco's new antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A Calculated Radio Frequency Emissions Report for Cellco's modified facility is included in Attachment 3. The modified facility will be capable of providing Cellco's 5G wireless service.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the clock tower or the Property. All modifications will be located inside the clock tower.

6. According to the July 18, 2023, Structural and Mounts Analysis ("SMA") the existing clock tower and internal antenna mounts can support the proposed facility modifications described above. A copy of the SMA is included in Attachment 4.

A copy of the parcel map and Property owner information is included in Attachment 5. A Certificate of Mailing verifying that this filing was sent to municipal officials and the property owner is included in Attachment 6.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Robinson+Cole

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Shari Cantor, Mayor for the Town of West Hartford
Todd Dumais, Town Planner
American School for the Deaf at Hartford, Property Owner
Sharon Horne, Verizon Wireless

ATTACHMENT 1

DOCKET NO. 434 – Cellco Partnership d/b/a Verizon Wireless Application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a relocated telecommunications facility at 139 North Main Street, West Hartford, Connecticut	}	Connecticut
	}	Siting
	}	Council
		June 27, 2013

Decision and Order

Pursuant to Connecticut General Statutes §16-50p and the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Cellco Partnership d/b/a Verizon Wireless, hereinafter referred to as the Certificate Holder, for a telecommunications facility at the proposed site, located at 139 North Main Street, West Hartford, Connecticut.

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

1. The tower shall be constructed as a stealth clock tower, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of the Certificate Holder and other entities, both public and private, but such tower shall not exceed a height of 90 feet above ground level at the top of the cupola dome.

2. All wireless telecommunications carriers' equipment and antennas shall be located inside the tower structure.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of (West Hartford) for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a. a final site plan(s) of site development to include specifications for the clock tower, tower foundation, antennas, equipment room configuration, backup generator, radio equipment, access/parking area, garden wall, utility line, and landscaping; and
    b. construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

4. The Eastern Box Turtle Protection Program shall be implemented to mitigate any possible impacts to Eastern Box Turtles in the event any are found in the vicinity of the site.

5. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

6. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

7. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

8. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.

9. Any request for extension of the time period referred to in Condition 8 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of West Hartford. Any proposed modifications to this Decision and Order shall likewise be so served.

10. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

11. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.

12. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.

13. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

14. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.

15. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line and landscaping in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.

16. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.

We hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed in the Service List, dated March 7, 2013, and notice of issuance published in The Hartford Courant.

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

ATTACHMENT 2

W HARTFORD W CT RELO

139 NORTH MAIN ST.
WEST HARTFORD, CT 06107

FUZE PROJECT ID: 17082760
PSLC: 472708

VICINITY MAP N.T.S.

ENGINEER

DEWBERRY ENGINEERS INC.
99 SUMMER ST.
SUITE 700
BOSTON, MA 02110

PHONE # (617) 531-0800

CONTACT: BENJAMIN REVETTE, PE

CONSTRUCTION

VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

LAND OWNER

AMERICAN SCHOOL FOR THE DEAF AT HARTFORD
139 NORTH MAIN STREET
WEST HARTFORD, CT 06107

COORDINATES*:

LATITUDE: 41° 46' 14.2" (41.770611) N
LONGITUDE: 72° 44' 58.6" (72.749611) W
*PER RFDS

GROUND ELEVATION*:

159'±
*PER GOOGLE EARTH

PROJECT INFORMATION

VZW LOCATION CODE (PSLC):	472708
FUZE NUMBER:	17082780

CONTRACTOR PMI REQUIREMENTS

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

- REMOVE (3) EXISTING MT6407-77A ANTENNAS.
- INSTALL (3) MT6413-77A WITH INTEGRATED RRH ANTENNA/RADIO UNITS.
- INSTALL NEW JUMPER CABLING BETWEEN OVPS AND ANTENNAS AS REQUIRED.

NOTE:

1. SCOPE OF WORK BASED ON ANTENNA REC FOR WEST HARTFORD CENTER CT RELO MA DATED 04/20/23. VERIFY SCOPE OF WORK WITH FINAL RFDS PRIOR TO CONSTRUCTION.

SCOPE OF WORK

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	SITE PLAN
C-2	ELEVATION
C-3	EXISTING & PROPOSED ANTENNA PLANS
C-4	CONSTRUCTION DETAILS
C-5	FINAL EQUIPMENT CONFIGURATION

SHEET INDEX

verizon WIRELESS

VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

W HARTFORD W CT RELO

ANTMO	DRAWINGS	
3	07/20/23	FOR SUBMITTAL
2	06/16/23	FOR SUBMITTAL
1	05/19/23	FOR SUBMITTAL
0	05/12/23	FOR SUBMITTAL

Dewberry
Dewberry Engineers Inc.
99 SUMMER ST.
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

STATE OF CONNECTICUT
BENJAMIN R. REVETTE
28971
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY:	07/20/2023 JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50164392

SITE NUMBER

472708

SITE ADDRESS

139 NORTH MAIN ST.
WEST HARTFORD, CT
06107

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL CONSTRUCTION NOTES :

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, AND COMPLY WITH VERIZON WIRELESS SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT "DIG SAFE" (888-344-7233) FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR WILL NOTIFY ENGINEER, VERIZON WIRELESS PROJECT CONSTRUCTION MANAGER, AND LANDLORD IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. ALL ROOF WORK SHALL BE DONE BY A QUALIFIED AND EXPERIENCED ROOFING CONTRACTOR IN COORDINATION WITH ANY CONTRACTOR WARRANTING THE ROOF TO ENSURE THAT THE WARRANTY IS MAINTAINED.
17. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
18. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
19. CONTRACTOR SHALL FURNISH VERIZON WIRELESS WITH THREE AS-BUILT SETS OF DRAWINGS UPON COMPLETION OF WORK.
20. ANTENNAS AND CABLES ARE TYPICALLY PROVIDED BY VERIZON WIRELESS. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH PROJECT MANAGER TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED BY VERIZON WIRELESS. ALL ITEMS NOT PROVIDED BY VERIZON WIRELESS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED BY VERIZON WIRELESS.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR WILL COORDINATE WITH VERIZON WIRELESS PROJECT MANAGER TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY VERIZON WIRELESS. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
22. GENERAL CONTRACTOR SHALL HAVE A LICENSED HVAC CONTRACTOR START THE HVAC UNITS, SYNCHRONIZE THE THERMOSTATS, ADJUST ALL SETTINGS ON EACH UNIT ACCORDING TO VERIZON WIRELESS CONSTRUCTION MANAGER'S SPECIFICATIONS, AND THOROUGHLY TEST AND BALANCE EACH UNIT TO ENSURE PROPER OPERATION PRIOR TO TURNING THE SITE OVER TO OWNER.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. UNLESS OTHERWISE NOTED VERIZON WIRELESS SHALL PROVIDE ALL REQUIRED RF MATERIAL FOR CONTRACTOR TO INSTALL, INCLUDING ANTENNAS, TMA'S, BIAS-T'S, COMBINERS, PDU, DC BLOCKS, SURGE ARRESTORS, GPS ANTENNA, GPS SURGE ARRESTOR, COAXIAL CABLE.
26. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO BE PROVIDED BY VERIZON WIRELESS FOR INSTALLATION BY CONTRACTOR.
27. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
28. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
29. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
30. CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE PRIOR TO CONSTRUCTION START, MORE SPECIFICALLY BEFORE; SEALING ANY FLOOR, WALL OR ROOF PENETRATION, FINAL UTILITY CONNECTIONS, POURING CONCRETE, BACKFILLING UTILITY TRENCHES AND STRUCTURAL POST OR MOUNTING CONNECTIONS, FOR ENGINEERING REVIEW AND INSPECTION.
31. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED D FIRE CODE APPROVED MATERIALS.
32. REPAIR ANY DAMAGE DURING CONSTRUCTION TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AND LANDLORD.
33. ALL DISRUPTIVE WORK AND WORK WITHIN TENANT SPACES TO BE COORDINATED WITH BUILDING REPRESENTATIVE.

CODE SPECIFICATIONS:

1. ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

   2022 CONNECTICUT STATE BUILDING CODE WITH THE FOLLOWING APPLICABLE CODES:
   2021 INTERNATIONAL RESIDENTIAL CODE (IRC)
   2021 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
   2021 INTERNATIONAL BUILDING CODE (IBC)
   2021 INTERNATIONAL MECHANICAL CODE (IMC)
   2020 NATIONAL ELECTRICAL CODE (NEC) (NFPA 70)
   2021 INTERNATIONAL PLUMBING CODE (IPC)
   2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
   ANSI/TIA-222-H STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES (TIA)

   IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL.
2. ALL STRUCTURAL WORK TO BE DONE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL, 13TH EDITION (AISC 13TH ED.)
3. ALL CONCRETE WORK TO BE DONE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE (ACI 301) SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 318) AND BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
4. ALL REINFORCING STEEL WORK TO BE DONE IN ACCORDANCE WITH THE (ACI 315) MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.

GROUNDING NOTES:

1. GROUNDING SHALL COMPLY WITH NEC ART. 250.
2. GROUNDING CONDUCTORS SHALL BE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR INDOOR USE.
3. 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.
4. ROUTE GROUNDING CONNECTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NOT BE BENT AT RIGHT ANGLE. ALWAYS MAKE 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 8" RADIUS WHEN NECESSARY.
5. CONNECTIONS TO GROUNDING BAR SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
6. TEST COMPLETED GROUNDING SYSTEM AND RECORD RESISTANCE VALUES FOR PROJECT CLOSE-OUT DOCUMENTATION. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS.
7. GROUNDING CONDUCTORS BETWEEN MGB AND WATERMAIN SHALL BE #2/0. BONDING JUMPERS FROM METALLIC SURFACES SHALL BE #2 MINIMUM. ALL GROUND CONDUCTORS AND BONDING JUMPERS SHALL BE SOFT DRAWN ANNEALED, TINNED, BARE STRANDED COPPER WIRE. COAXIAL CABLES SHALL BE GROUNDED AT A MINIMUM OF TWO LOCATIONS USING VERIZON PROVIDED GROUNDING KITS. EXACT LOCATIONS SHALL BE FINALIZED IN THE FIELD BY THE CONSTRUCTION MANAGER.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES, AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:

ASTM A-992, GRADE 50	ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE.
ASTM A-36	ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
ASTM A-500, GRADE B	HSS SECTION (SQUARE, RECTANGULAR, ROUND)
ASTM A-325, TYPE SC OR N	ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS.
F1554, GRADE 36	ALL ANCHORS BOLTS, UNLESS NOTED OTHERWISE.
ASTM A-53, GRADE B	STEEL PIPE

3. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION. WHERE WELD LENGTH IS NOT INDICATED, USE FULL LENGTH WELD. AT THE COMPLETION OF ALL WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
4. BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS (3/4" DIA.) SUPPLIED WITH A NUT AND WASHER UNDER TURNED END AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
7. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.
8. ALL EXISTING BEAM AND COLUMN DIMENSIONS SHALL BE FIELD VERIFY BY CONTRACTOR PRIOR TO FABRICATION. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THOSE SHOWN SHALL BE REPORTED TO DEWBERRY ENGINEER IMMEDIATELY.
9. CONNECTION DESIGN BY FABRICATOR WILL BE SUBJECT TO REVIEW AND APPROVAL BY ENGINEER.
10. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH SPECIFICATION ASTM A123/A123M-00 HOT-DIP GALVANIZED FINISH UNLESS OTHERWISE NOTED. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE GALVANIZED AREAS SHALL BE REPAIRED. REPAIR DAMAGED GALVANIZED COATINGS ON GALVANIZED ITEMS WITH GALVANIZED REPAIR PAINT ACCORDING TO ASTM A780 AND MANUFACTURER'S WRITTEN INSTRUCTIONS, PRIOR TO COMPLETION OF WORK. TOUCHUP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCHUP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.
11. ALL WELDED COMPONENTS TO BE SHOP WELDED PRIOR TO INSTALLATION. NO WELDING ACTIVITIES IS PERMITTED DURING INSTALLATION OF PROPOSED EQUIPMENTS AND/OR HARDWARE ON SITE.

verizon WIRELESS

VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

W HARTFORD W CT
RELO

ANTMO	DRAWINGS	
3	07/20/23	FOR SUBMITTAL
2	06/16/23	FOR SUBMITTAL
1	05/19/23	FOR SUBMITTAL
0	05/12/23	FOR SUBMITTAL

Dewberry
Dewberry Engineers Inc.
99 SUMMER ST.
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

STATE OF CONNECTICUT
BENJAMIN B. RIDDLE
28971
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY:	07/20/2023 JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50184392

SITE NUMBER

472708

SITE ADDRESS

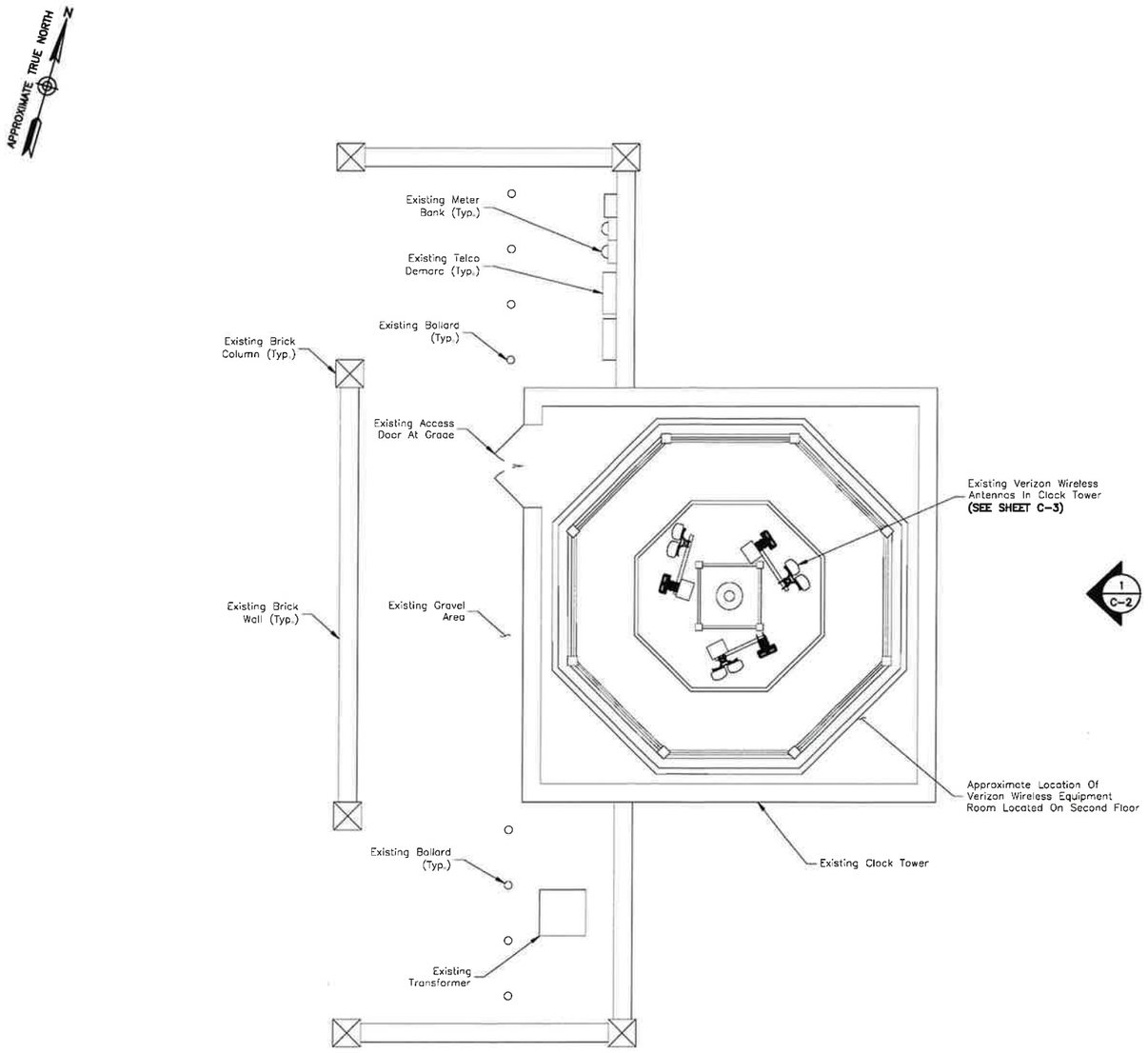
139 NORTH MAIN ST.
WEST HARTFORD, CT
06107

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-1



SITE PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

0' 5' 10'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. SITE PLAN & ELEVATION BASED ON A SITE VISIT BY DEWBERRY ENGINEERS INC. ON 08/05/22.
4. EXISTING ANTENNAS SHOWN AS APPROXIMATE. ELEVATION BASED ON EXISTING INFORMATION AND VISUAL INSPECTION AND HAVE NOT BEEN VERIFIED THROUGH AN ANTENNA MAPPING.
5. INSTALL PROPOSED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS & STRUCTURAL ANALYSIS BY DEWBERRY ENGINEERS DATED 07/18/23.
6. REUSE EXISTING MOUNTS AND COAX. INSPECT FOR DAMAGE OR DECAY AND REPLACE AS NEEDED PER STRUCTURAL ANALYSIS.

verizon WIRELESS

VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

W HARTFORD W CT RELO

ANTMO DRAWINGS		
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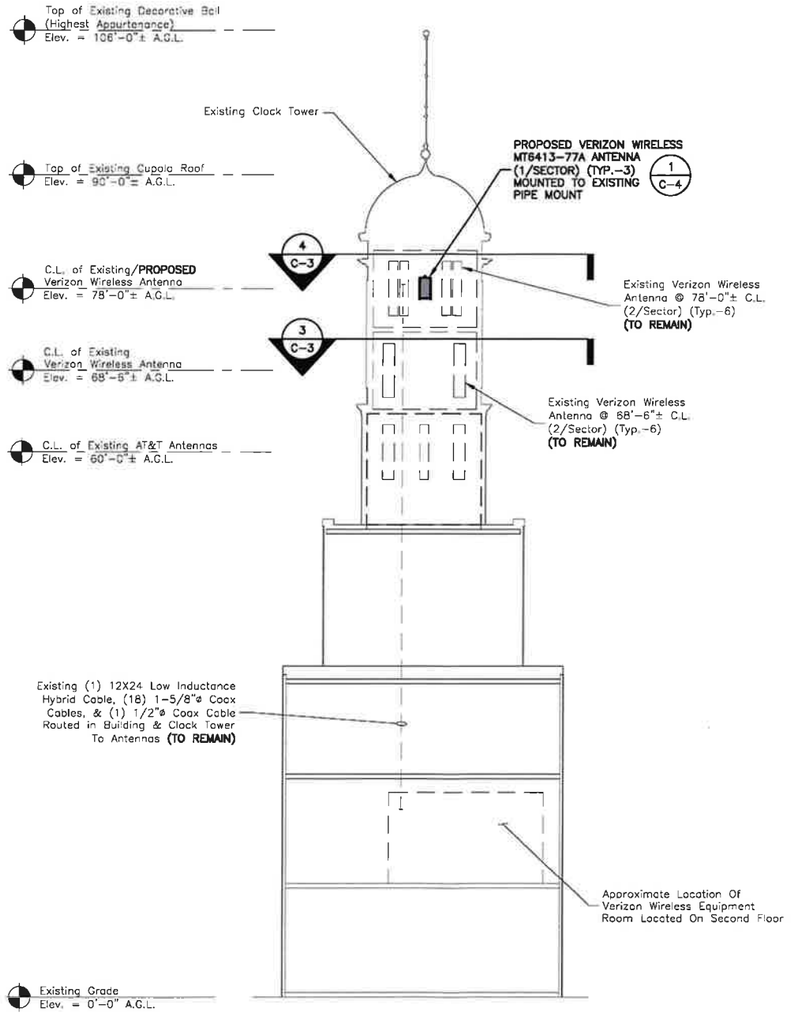
STATE OF CONNECTICUT
BENJAMIN B. RIDDLE
28971
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY: 07/20/2023 JG
REVIEWED BY: CDH
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50164392
SITE NUMBER
472708
SITE ADDRESS
139 NORTH MAIN ST.
WEST HARTFORD, CT
06107
SHEET TITLE
SITE PLAN
SHEET NUMBER
C-1



ELEVATION 1

SCALE: 1/16"=1' FOR 11"x17"
1/8"=1' FOR 22"x34"

0' 4' 8' 16'

A.G.L. = ABOVE GRADE LEVEL
C.L. = CENTER LINE
A.R.L. = ABOVE ROOF LEVEL

NOTES:

1. ELEVATION SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. SITE PLAN & ELEVATION BASED ON A SITE VISIT BY DEWBERRY ENGINEERS INC. ON 08/05/22.
4. EXISTING ANTENNAS SHOWN AS APPROXIMATE. ELEVATION BASED ON EXISTING INFORMATION AND VISUAL INSPECTION AND HAVE NOT BEEN VERIFIED THROUGH AN ANTENNA MAPPING.
5. INSTALL PROPOSED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS & STRUCTURAL ANALYSIS BY DEWBERRY ENGINEERS DATED 07/18/23.
6. REUSE EXISTING MOUNTS AND COAX. INSPECT FOR DAMAGE OR DECAY AND REPLACE AS NEEDED PER STRUCTURAL ANALYSIS.
7. CONTRACTOR TO COORDINATE PROPER VENTING WITH FIBERGLASS MANUFACTURER TO MAINTAIN AIR FLOW & THERMAL REQUIREMENTS FOR THE MT6413-77A ANTENNA.

verizon WIRELESS

VERIZON WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

W HARTFORD W CT RELO

ANTMO	DRAWINGS	
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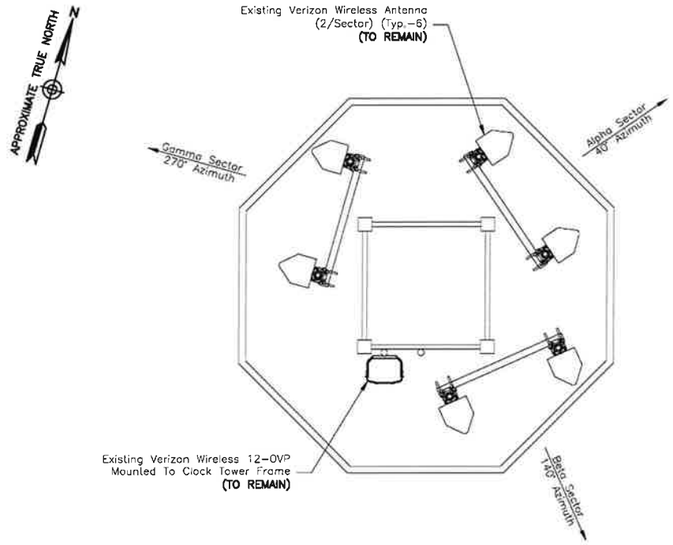
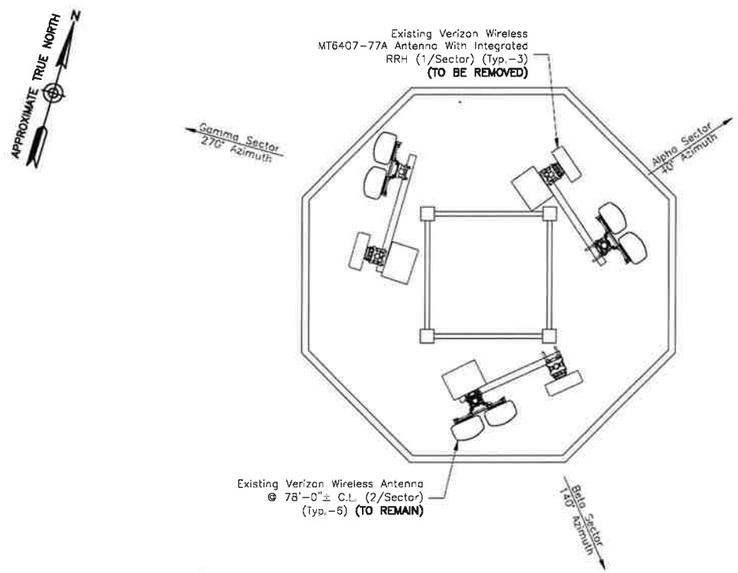
472708
SITE ADDRESS
139 NORTH MAIN ST.
WEST HARTFORD, CT
06107
SHEET TITLE
ELEVATION
SHEET NUMBER
C-2



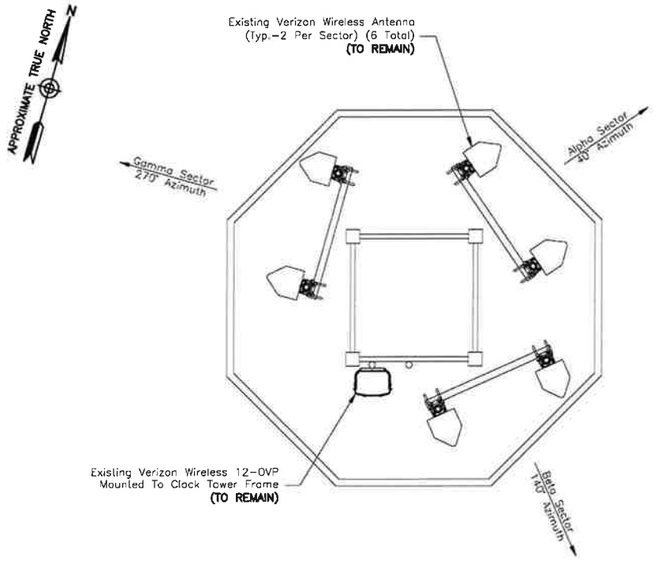
EXISTING ANTENNA PLAN @ 68'-6"± C.L. (1)

SCALE: N.T.S.



EXISTING ANTENNA PLAN @ 78'-0"± C.L. (2)

SCALE: N.T.S.

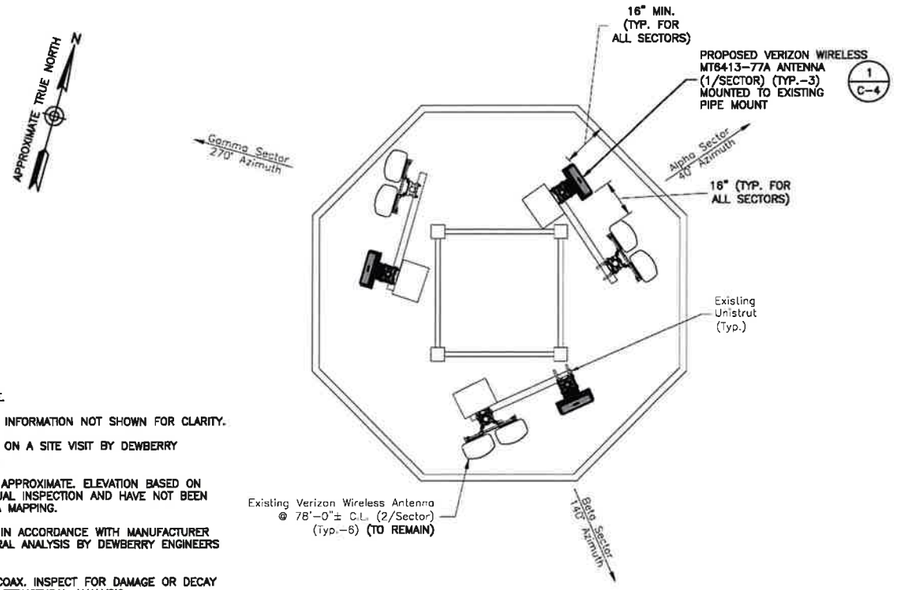


PROPOSED ANTENNA PLAN @ 68'-6"± C.L. (3)

SCALE: N.T.S.

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. SITE PLAN & ELEVATION BASED ON A SITE VISIT BY DEWBERRY ENGINEERS INC. ON 08/05/22.
4. EXISTING ANTENNAS SHOWN AS APPROXIMATE. ELEVATION BASED ON EXISTING INFORMATION AND VISUAL INSPECTION AND HAVE NOT BEEN VERIFIED THROUGH AN ANTENNA MAPPING.
5. INSTALL PROPOSED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS & STRUCTURAL ANALYSIS BY DEWBERRY ENGINEERS DATED 07/18/23.
6. REUSE EXISTING MOUNTS AND COAX. INSPECT FOR DAMAGE OR DECAY AND REPLACE AS NEEDED PER STRUCTURAL ANALYSIS.



PROPOSED ANTENNA PLAN @ 78'-0"± C.L. (4)

SCALE: N.T.S.

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STATE OF CONNECTICUT
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28971
LICENSED
PROFESSIONAL ENGINEER

DRAWN BY: 07/20/2023	JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50184392

SITE NUMBER

472708

SITE ADDRESS

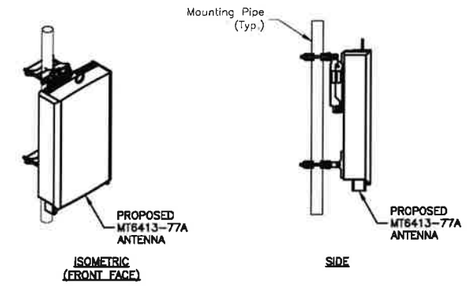
139 NORTH MAIN ST.
WEST HARTFORD, CT
06107

SHEET TITLE

EXISTING & PROPOSED ANTENNA PLANS

SHEET NUMBER

C-3



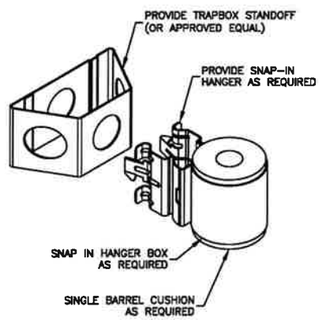
MODEL:	MT6413-77A
DIMENSIONS:	28.9"H X 15.7"W X 5.5"D (NOT TO EXCEED)
WEIGHT:	57.3 LBS (NOT TO EXCEED)

NOTE:

1. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. USE APPROPRIATE MOUNTING HARDWARE FOR CONSTRUCTION TYPE.

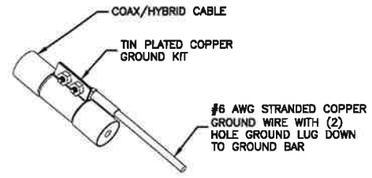
MT6413-77A ANTENNA DETAILS (1)

SCALE: N.T.S.



JUMPER MOUNT (3)

SCALE: N.T.S.

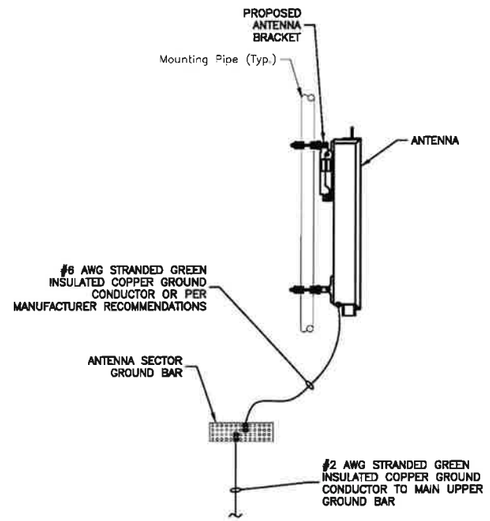


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND. ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TIN PLATED COPPER WITH TWO-HOLE LUG, SIZE PER COAX DIAMETER.
3. WEATHER SEAL GROUND KIT PER CARRIER REQUIREMENTS.
4. COAX CABLE GROUND KIT LOCATION & QUANTITY SHALL BE PER CARRIER SPECIFICATIONS & STANDARDS.

COAX/HYBRID GROUNDING DETAIL (2)

SCALE: N.T.S.



NOTES:

1. VERIFY EXISTING GROUNDING SYSTEM IS INSTALLED PER VERIZON WIRELESS STANDARDS.
2. BOND NEW EQUIPMENT INTO EXISTING GROUND SYSTEM IN ACCORDANCE WITH VERIZON WIRELESS STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.

TYPICAL ANTENNA GROUNDING DETAIL (4)

SCALE: N.T.S

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STATE OF CONNECTICUT BENJAMIN B. RIDDLE 28971 LICENSED PROFESSIONAL ENGINEER

DRAWN BY: 07/20/2023	JG
REVIEWED BY:	CDH
CHECKED BY:	BBR
PROJECT NUMBER:	50121487
JOB NUMBER:	50164392
SITE NUMBER	

472708

SITE ADDRESS

139 NORTH MAIN ST.
WEST HARTFORD, CT
06107

SHEET TITLE

CONSTRUCTION DETAILS

SHEET NUMBER

C-4

FINAL EQUIPMENT CONFIGURATION

SECTOR	POSITION	TECHNOLOGY	ANTENNA MODEL	VENDOR	RRH (QTY./MODEL)	CENTERLINE	AZIMUTH	OVP	HYBRID CABLE TYPE	FEED LINE LENGTH*
ALPHA	A1	5G	(P) MT6413-77A	SAMSUNG	(1) (P) MT6413-77A	78'-0"±	40°	(1) (E) 12-OVP BOX REPLACE EXISTING	(1) (E) 12X24 LI HYBRID CABLE TO REPLACE EXISTING	90'±
	A2	LTE 700/850	(E) SBNHH-1D65B	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A (1) (E) B5/B66A RFV01U-D1A	78'-0"±	40°			
	A3	LTE 1900/AWS	(E) SBNHH-1D65B	COMMSCOPE		78'-0"±	40°			
	A4	SPARE	(E) LPA-80063/6CF 2	ANDREW	-	68'-8"±	40°			
	A5	SPARE	(E) LPA-80063/6CF 2	ANDREW	-	68'-8"±	40°			
BETA	B1	5G	(P) MT6413-77A	SAMSUNG	(1) (P) MT6413-77A	78'-0"±	140°			
	B2	LTE 700/850	(E) SBNHH-1D65B	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A (1) (E) B5/B66A RFV01U-D1A	78'-0"±	140°			
	B3	LTE 1900/AWS	(E) SBNHH-1D65B	COMMSCOPE		78'-0"±	140°			
	B4	SPARE	(E) LPA-80063/6CF 2	ANDREW	-	68'-8"±	140°			
	B5	SPARE	(E) LPA-80063/6CF 2	ANDREW	-	68'-8"±	140°			
GAMMA	G1	5G	(P) MT6413-77A	SAMSUNG	(1) (P) MT6413-77A	78'-0"±	270°			
	G2	LTE 700/850	(E) SBNHH-1D65B	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A (1) (E) B5/B66A RFV01U-D1A	78'-0"±	270°			
	G3	LTE 1900/AWS	(E) SBNHH-1D65B	COMMSCOPE		78'-0"±	270°			
	G4	SPARE	(E) LPA-80063/6CF 2	ANDREW	-	68'-8"±	270°			
	G5	SPARE	(E) LPA-80063/6CF 2	ANDREW	-	68'-8"±	270°			

*CONTRACTOR TO FIELD VERIFY HYBRID CABLE LENGTHS PRIOR TO CONSTRUCTION. LENGTH IS ESTIMATED FROM THE BASE EQUIPMENT OVP TO SECTOR OVP WITH 15% BUFFER.

(E) = Existing
(P) = PROPOSED

FINAL EQUIPMENT CONFIGURATION (1)
SCALE: N.T.S.

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ANTMO	DRAWINGS	
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DRAWN BY: 07/20/2023 JG
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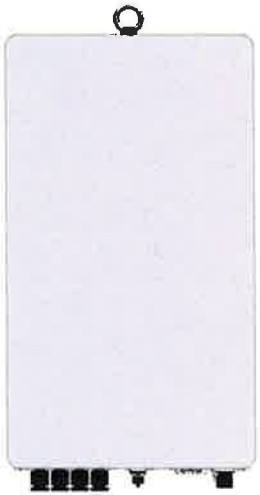
CHECKED BY: BBR
PROJECT NUMBER: 50121487
JOB NUMBER: 50164392
SITE NUMBER
472708
SITE ADDRESS
139 NORTH MAIN ST.
WEST HARTFORD, CT
06107
SHEET TITLE
FINAL EQUIPMENT CONFIGURATION
SHEET NUMBER
C-5

C-band 64T64R

SAMSUNG

Gen 2

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



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

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

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

ATTACHMENT 3

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

verizon

West Hartford W Relo

139 North Main Street, West Hartford, CT 06107

July 21, 2023

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of Verizon's antenna arrays to be mounted at 78' AGL on an existing monopole located at 139 North Main Street in West Hartford, CT. The coordinates of the monopole tower are 41° 46' 14.232" N, 72° 44' 58.56" W.

Verizon is proposing the following:

1) Replace three (3) C-band antenna, one (1) per sector.
2) Retain six (6) multi-band antennas, two (2) per sector to support its commercial LTE network.

This report considers the planned antenna configuration for Verizon[1] and the existing antennas for AT&T[2] to derive the resulting % MPE of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment C of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment C contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to Verizon's Radio Frequency Design Sheet updated 04/10/2023.

[2] As referenced to SAI's Radio Frequency Exposure Theoretical Study, Dated 03/01/2013

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{\text{GRF}^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor (GRF) of 1.6

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Antenna Inventory

Table 1 below outlines Verizon's proposed antenna configuration for the site. The associated data sheets and antenna patterns for these specific antenna models are included in Attachments C.

Operator	Sector / Call Sign	TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
Verizon	Alpha / 40°	700	160	14.9	4944	SBNHH-1D65B	68	0	6.07	78
		850	160	14.7	4722		65.5			
		1900	160	18.2	10571		66.2			
		2100	240	18.6	17386		63			
		3700	200	26.5	89937	MT6413-77A	105	0	2.46	78
	Beta / 140°	700	160	14.9	4944	SBNHH-1D65B	68	0	6.07	78
		850	160	14.7	4722		65.5			
		1900	160	18.2	10571		66.2			
		2100	240	18.6	17386		63			
		3700	320	26.5	89937	MT6413-77A	105	0	2.46	78
	Gamma / 270°	700	160	14.9	4944	SBNHH-1D65B	68	0	6.07	78
		850	160	14.7	4722		65.5			
		1900	160	18.2	10571		66.2			
		2100	240	18.6	17386		63			
		3700	320	26.5	89937	MT6413-77A	105	0	2.46	78

Table 1: Proposed Antenna Inventory[3][4]

[3] Antenna heights are in reference to Verizon's Radio Frequency Design Sheet updated 04/10/2023.

[4] Transmit power assumes 0 dB of cable loss.

5. Calculation Results

The calculated power density results are shown in Figure 1 below. For completeness, the calculations for this analysis range from 0 feet horizontal distance (directly below the antennas) to a value of 3,000 feet horizontal distance from the site. In addition to the other worst-case scenario considerations that were previously mentioned, the power density calculations to each horizontal distance point away from the antennas was completed using a local maximum off beam antenna gain (within ± 5 degrees of the true mathematical angle) to incorporate a realistic worst-case scenario.

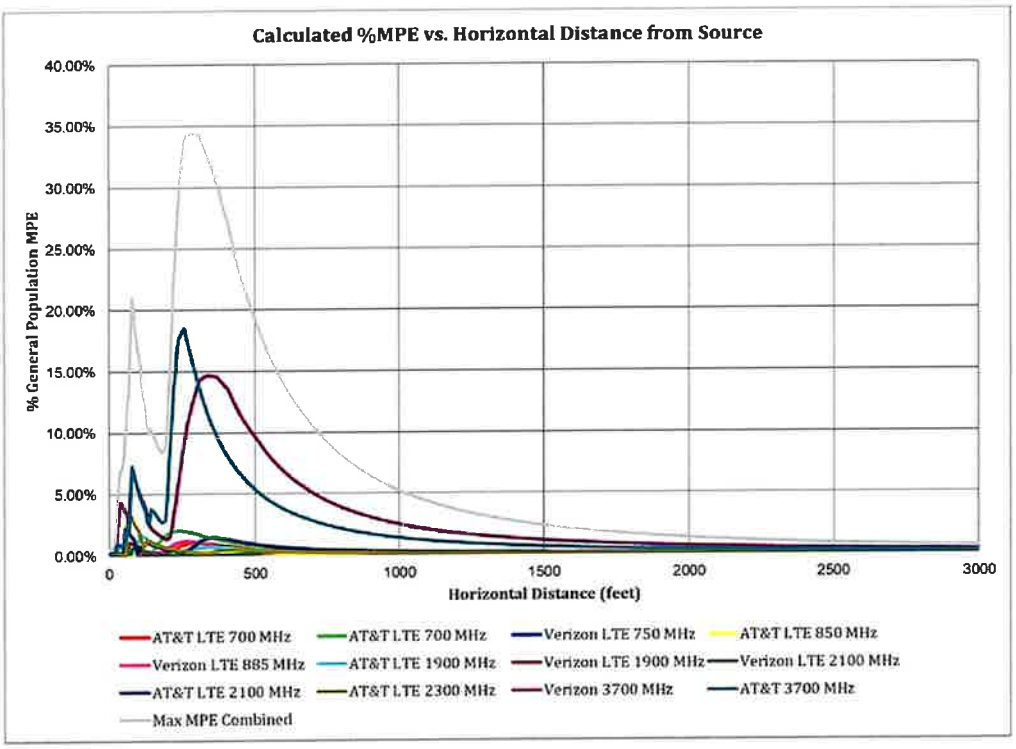


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (34.38% of the General Population limit) is calculated to occur at a horizontal distance of 288 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1500 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 288 feet from the site (reference Figure 1).

As stated in Section 3, all calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. In addition, a six foot height offset was considered in this analysis to account for average human height. As a result, the predicted signal levels are significantly higher than the actual signal levels will be from the final configuration. The results presented in Figure 1 and Table 2 assume level ground elevation from the base of the tower out to the horizontal distances calculated.

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
AT&T 3700 MHz	1	108.3	61.6	288	0.158410	1.000	15.84%
AT&T LTE 1900 MHz	1	120.0	56.3	288	0.004685	1.000	0.47%
AT&T LTE 2100 MHz	1	160.0	56.3	288	0.006934	1.000	0.69%
AT&T LTE 2300 MHz	1	100.0	58.8	288	0.002611	1.000	0.26%
AT&T LTE 700 MHz	1	80.0	58.8	288	0.004591	0.467	0.98%
AT&T LTE 700 MHz	1	160.0	56.3	288	0.008676	0.467	1.86%
AT&T LTE 850 MHz	1	40.0	58.8	288	0.002200	0.590	0.37%
Verizon 3700 MHz	1	320.0	78.0	288	0.124832	1.000	12.48%
Verizon LTE 1900 MHz	1	160.0	78.0	288	0.000329	1.000	0.03%
Verizon LTE 2100 MHz	1	240.0	78.0	288	0.000371	1.000	0.04%
Verizon LTE 750 MHz	1	160.0	78.0	288	0.001065	0.500	0.21%
Verizon LTE 885 MHz	1	160.0	78.0	288	0.006418	0.567	1.13%
						Total	**34.38%**

Table 2: Maximum Percent of General Population Exposure Values

6. Conclusion

The above analysis verifies that RF exposure levels from the site with Verizon's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all transmitters is calculated to be 34.38% of the FCC limit (General Population/Uncontrolled). This maximum cumulative percent of MPE value is calculated to occur 288 feet away from the site.

7. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Ram Acharya
RF Engineer 1
C Squared Systems, LLC

July 19, 2023
Date

Reviewed/Approved By: Martin Lavin
Senior RF Engineer
C Squared Systems, LLC

July 21, 2023
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Verizon's Radio Frequency Design Sheet updated 10/21/2022

AT&T's filing, Connecticut Siting Council Notice of Exempt Modification – Antenna Add - 139 North Main Street (aka 1 Service Road) West Hartford, CT, dated 9/23/2022

As referenced to Dish Wireless LLC's filing, Connecticut Siting Council Tower Share Application – 139 North Main Street , West Hartford, CT, dated 11/19/2021

T-Mobile's filing, Connecticut Siting Council Notice of Exempt Modification – 139 North Main Street , West Hartford, CT, dated 10/1/2020

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 3: FCC Limits for Maximum Permissible Exposure

[5] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[6] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

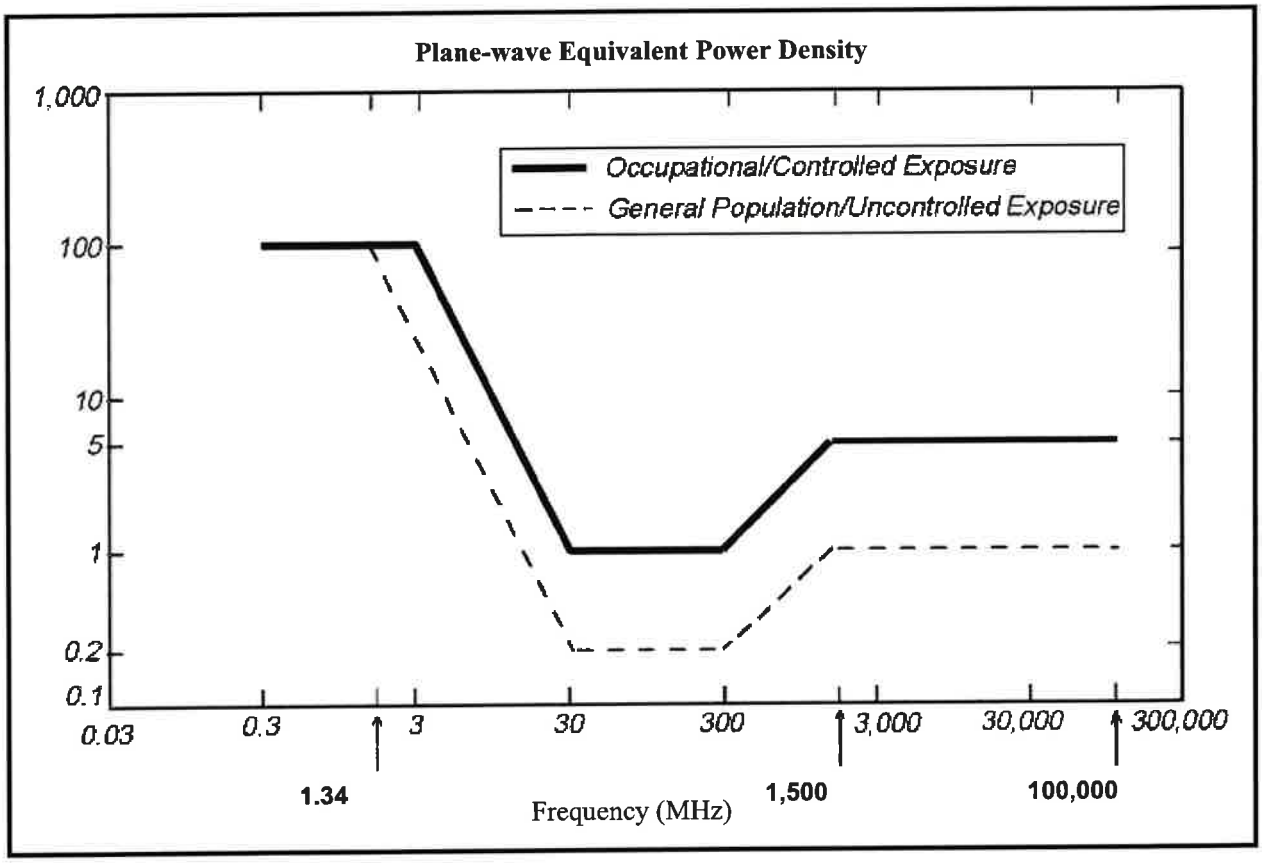
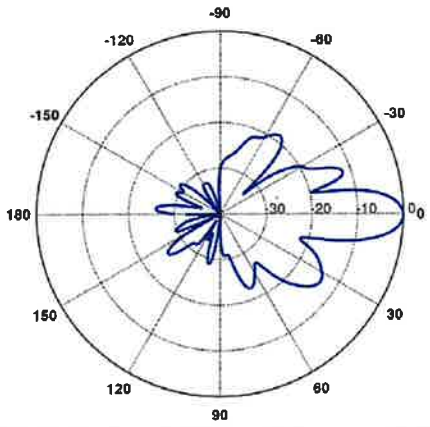


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data Sheets and Electrical Patterns

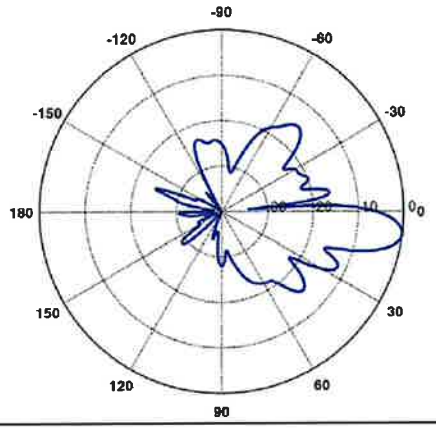
750 MHz

Manufacturer:	COMMSCOPE
Model #:	SBNHH-1D65B
Frequency Band:	698-806 MHz
Gain:	14.9 dBi
Vertical Beamwidth:	12.1°
Horizontal Beamwidth:	68.0°
Polarization:	±45°
Dimensions (L x W x D):	72.87" x 7.08" x 11.85"



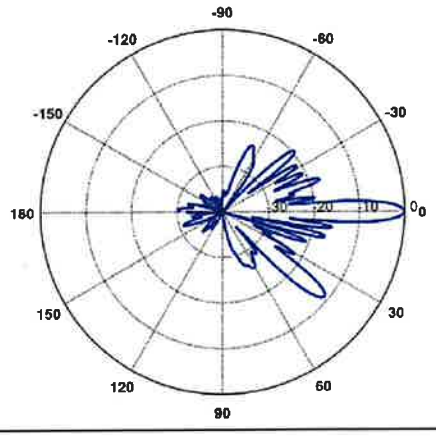
885 MHz

Manufacturer:	COMMSCOPE
Model #:	SBNHH-1D65B
Frequency Band:	806-896 MHz
Gain:	14.7 dBi
Vertical Beamwidth:	10.7°
Horizontal Beamwidth:	65.5°
Polarization:	±45°
Dimensions (L x W x D):	72.87" x 7.08" x 11.85"



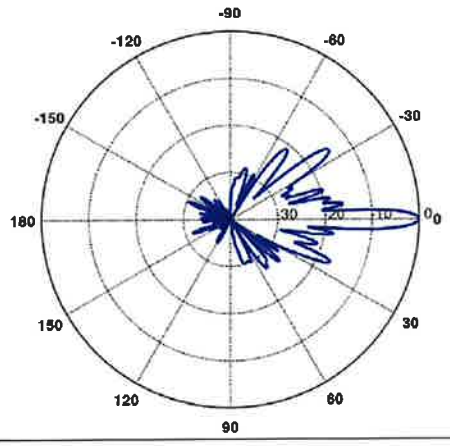
1900 MHz

Manufacturer:	COMMSCOPE
Model #:	SBNHH-1D65B
Frequency Band:	1850-1990 MHz
Gain:	18.2 dBi
Vertical Beamwidth:	5.2°
Horizontal Beamwidth:	66.2°
Polarization:	±45°
Dimensions (L x W x D):	72.87" x 7.08" x 11.85"



2100 MHz

Manufacturer:	COMMSCOPE
Model #:	SBNHH-1D65B
Frequency Band:	1920-2200 MHz
Gain:	18.6 dBi
Vertical Beamwidth:	5°
Horizontal Beamwidth:	63°
Polarization:	±45°
Dimensions (L x W x D):	72.87" x 7.08" x 11.85"



ATTACHMENT 4

Dewberry Engineers Inc.
99 Summer Street, Suite 700
Boston, MA 02110-1200

617.695.3400
617.695.3310 fax
www.dewberry.com

Dewberry

July 18, 2023

Verizon Wireless
99 East River Drive
East Hartford, CT 06108

Re: West Hartford Relo CT
Site ID: 472708
Fuze #: 17082760
139 North Main Street
West Hartford, CT 06107

To Whom It May Concern:

Verizon Wireless (VZW) has proposed to install new equipment within the VZW equipment levels within the existing clock tower at the site referenced above. The final equipment configuration according to the antenna design sheets (dated 10/04/23) is as follows:

Final (VZW) Equipment Configuration

Rad Center 78'-0"
- **(3) new MT6413-77A antennas – 87.1 lbs ea. (1 per sector)**
- (6) SBNHH-1D65B antennas – 40.6 lbs ea. (2 per sector)
  - (3) BSAMNT-SBS-1-2 side by side mounting brackets - 25.4 lbs ea. (1 per sector)
- (3) B2/B66A RRH-BR049 – 97.5 lbs ea. (1 per sector)
- (3) B5/B13 RRH BR04C – 82.0 lbs ea. (1 per sector)

Rad Center 68'-6"
- (6) LPA-80063/6CF antennas – 27.0 lbs ea. (2 per sector)
  - (6) Mounting brackets – 15 lbs ea. (2 per sector)
- (1) 12-OVP junction box – 45 lbs ea. (1 total)

Cabling
- (12) 1-5/8" COAX cables
- (1) 2" hybrid cable
- (1) 1/2" GPS COAX cable
- (1) 1/4" ground cable
- (1) 12x24 cable
- (1) 6x12 cable

AT&T has proposed to install new equipment within the AT&T equipment levels within the existing clock tower at the site referenced above. The final equipment configuration according to the Revised Structural Analysis Report by TEP Northeast dated 01/24/23 is as follows:

Final (AT&T) Equipment Configuration

Rad Center 61'-9"
- **(3) new AIR6449 antennas – 82 lbs ea. (1 per sector)**
- **(3) new TPA65R-BU6DA-K antennas – 69 lbs ea. (1 per sector)**
- **(3) new OPA65R-BU8DA antennas – 77 lbs ea. (1 per sector)**
- **(3) new 4449 B5/B12 RRHs – 73 lbs ea. (1 per sector)**
- (3) 4478 B14 RRHs – 60 lbs ea. (1 per sector)

Dewberry

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- (3) 32 B2 RRHs – 60 lbs ea. (1 per sector)
- (3) 32 B30 RRHs – 60 lbs ea. (1 per sector)
- (3) 32 B66A RRHs – 60 lbs ea. (1 per sector)
- (3) DC6-48-60-18-8F surge arrestors – 29 lbs ea. (1 per sector)

The proposed configuration as shown above represents a total decrease in load of 89.4 lbs. for Verizon and 73 lbs. for AT&T which is negligible in comparison to the overall structure loading. The analysis concludes the existing clock tower and antenna mounts, as described in the permit drawings provided, has sufficient structural capacity to support the proposed equipment configuration. Under the proposed conditions and existing design loads, the maximum utilization of a single structural member is 63.8%.

Our assessment is based on the assumption that the existing structure is in good condition, constructed according to the drawings provided and were constructed in conformance with all applicable state and local building codes. If, during construction, any damage, deterioration, and/or discrepancies are noticed, Dewberry is to be notified to assess any deviation from the assumed condition. Any alteration in equipment loading described above and on the associated plans will void any conclusions expressed herein and will require further analysis and design.

If you have any questions, please do not hesitate to call me at 617-531-0800.

Sincerely,
Dewberry Engineers Inc.

07/20/2023

Ben Revette, P.E.
Associate Vice President

Dewberry Engineers, Inc.
Structural Analysis Summary Sheet

Job No.:	50121487/50164392	**By:**	AMD	**Date:**	07/12/23
Job Name:	West Hartford Relo CT	**Checked:**	BGK	**Date:**	07/13/23

Location: 139 North Main Street, West Hartford, CT 06107
Client: Verizon

Verizon Scope of Work:

- Proposed installation of (3) new MT6413-77A antennas.
- Analysis of the existing clock tower building and existing antenna mounts.

AT&T Scope of Work:

- Proposed installation of (3) new AIR6449 antennas, (3) new TPA65R-BU6DA-K antennas, (3) new OPA65R-BU8DA antennas, and (3) new 4449 B5/B12 RRHs.

Codes / Standards / References:

- IBC 2021
- 2022 Connecticut State Building Code – Amendments to IBC 2021
- AISC 15th Ed.
- VZW RFDS dated 10/04/23.
- Site visit by Dewberry Engineers on 11/01/19.
- Existing drawings by CENTEK Engineering dated 10/21/13.
- Revised Structural Analysis Report by TEP Northeast dated 01/24/23.

Design & Analysis Assumptions:

- Assume antennas are mounted inside the existing clock tower.
- Analysis is limited to the existing clock tower only.
- Design and analysis are based on dead, wind, live, seismic and snow loads. The analysis checks for normal bending and shear stresses.
- Assumes minimum concrete compressive strength of 3000 psi and density of 115 lb/ft^3 and reinforcement strength of 60 ksi for the composite decks
- Assumes minimum concrete compressive strength of 3000 psi and density of 150 lb/ft^3 and reinforcement strength of 60 ksi for the lower level and foundation.
- Assumes composite concrete decks modeled with equivalent shear studs 1/2" dia.
- Assumes FRP panel thickness of ¼".
- Assumed exterior foundation walls to take all soil pressure loads and are designed according to soil parameters of the site.
- Assumed minimum allowable soil bearing capacity of 2500 psf

Conclusion / Recommendations:

- The existing structure and antenna mounts have sufficient capacity to support the proposed installation.

Dewberry

Job Number	50164392
Made by:	AMD
Date:	07/11/23
Checked by:	BGK
Date:	07/12/23

(West Hartford Relo CT) - Structure Loading

\\dewberry.dewberryroot.local\Enterprise\DE\TelecomEV\Projects\VZW\50121487-NE\50164392 - W Hartford W CT Relo\4 Eng\Struct\Rev 2\Calcs\50114

Site Name: West Hartford Relo CT

Existing Building Information

- Existing Clock Tower drawings by CENTEK Engineering dated 10/21/13
- 2022 Conneticut State Building Code (IBC 2021, ASCE 7-16)
- Assumed 3000 psi concrete
- Assumed equivalent shear studs 1/2" dia. for composite action

Existing Dead Load

- Estimated building dead load:

Roof Dead Load =	18.5 psf	*(existing building drawings - slab weight- structural steel)*
Floor Dead Load =	14 psf	*(existing building drawings - slab weight- structural steel)*
Grating Platform Dead Load =	20 psf	*(estimated)*
Ext. Stud Walls w/ Brick Veneer =	48 psf	*(ASCE 7-16,Table C3-1)*
Exterior FRP Reinforced Walls =	7.5 psf	*(0.25" panel with 4x4 tube reinforcements)*

Existing Live Load

- Design building live load:

Floor =	150 psf	*(existing building drawings)*
Stairs/ Landing =	100 psf	*(existing building drawings)*
Mechanical Areas =	150 psf	*(existing building drawings)*
Platforms =	50 psf	*(assumed)*
Roof =	20 psf	*(existing building drawings)*

Snow Load

General Design Criteria

Exposure Factor, C_e =	1.0	*(ASCE 7-16, Table 7-2)*
Thermal Factor, C_t =	1.0	*(ASCE 7-16, Table 7-3)*
Importance Factor, I_s =	1.0	*(ASCE 7-16, Table 1.5-2)*
Min. Flat Roof Load, $p_{f\,min}$ =	30 psf	*(Connecticut State Building Code 2022)*
Ground Snow Load, p_g =	30 psf	*(ASCE 7-16, Hazard Tool)*
Design Snow Load, p_f =	$0.7C_eC_tI_sp_g$	*(ASCE 7-16, Eqn. 7.3-1)*
=	21.0 psf	***(Use 30 psf)***

Dewberry

Job Number	50164392
Made by:	AMD
Date:	07/11/23
Checked by:	BGK
Date:	07/12/23

(West Hartford Relo CT) - Design Wind Load on the Clock Tower

\\dewberry.dewberryroot.local\Enterprise\DEI\TelecomEV\Projects\VZW\50121487-NE\50164392 - W Hartford W CT Relo\4 Eng\Struct\Rev 2\Calcs\50114615 - Clock To

Site Name: West Hartford Relo CT

Wind Load per ASCE 7-16, Chapter 27

- wind load on the upper dome is conservativly applied as if to a flat surface

Design Criteria

Height, h =	90.00 ft	*(Mean roof height)*
Risk Category =	II	*(Table 1.5-1, ASCE 7-16)*
Basic Wind Speed, V =	125 mph	*(Connecticut State Building Code 2022, Appendix P)*
K_d =	0.85	*(Table 26.6-1, ASCE 7-16)*
Exposure Category =	B	*(Sect. 26.7.3, ASCE 7-16)*
K_{zt} =	1	*(Sect.26.8.2, ASCE 7-16)*
G =	0.85	*(Sect. 26.9.4, ASCE 7-16)*
K_h =	0.960	*(Table 27.3-1, ASCE 7-16)*

Velocity Pressure

$q_h = 0.00256*K_h*K_{zt}*K_d*V^2$ *(Eqn. 27.3-1, ASCE 7-16)*

$= 32.64$ lb/ft²

Design Wind Force

- Conservatively using q_h for all sides

$p_w = q_h GC_p - q_h(GC_{pi})$ *(Eqn. 27.4-1, ASCE 7-16)*

$p_{w(+)\ windward}$ =	16.3 psf	*(+ Internal Pressure)*
$p_{w(+)\ leeward}$ =	-19.7 psf	
$p_{w(+)\ side}$ =	-25.3 psf	
$p_{w(-)\ windward}$ =	28.1 psf	*(- Internal Pressure)*
$p_{w(-)\ leeward}$ =	-8.0 psf	
$p_{w(-)\ side}$ =	-13.5 psf	

where:

(+) GC_{pi} =	0.18	*(Table 26.11-1, ASCE 7-16)*
(-) GC_{pi} =	-0.18	*(Table 26.11-1, ASCE 7-16)*
$C_{p\ windward}$ =	0.80	*(Fig. 27.4-1, ASCE 7-16)*
$C_{p\ leeward}$ =	-0.50	*(Fig. 27.4-1, ASCE 7-16)*
$C_{p\ side}$ =	-0.70	*(Fig. 27.4-1, ASCE 7-16)*

Job Information

	Engineer	Checked	Approved
Name:	AMD	BGK	BGK
Date:	7/10/2023	7/11/2023	7/12/2023

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	246	Highest Node	275
Number of Elements	567	Highest Beam	674
Number of Plates	68	Highest Plate	652

Number of Basic Load Cases	9
Number of Combination Load Cases	23

Included in this printout are data for:

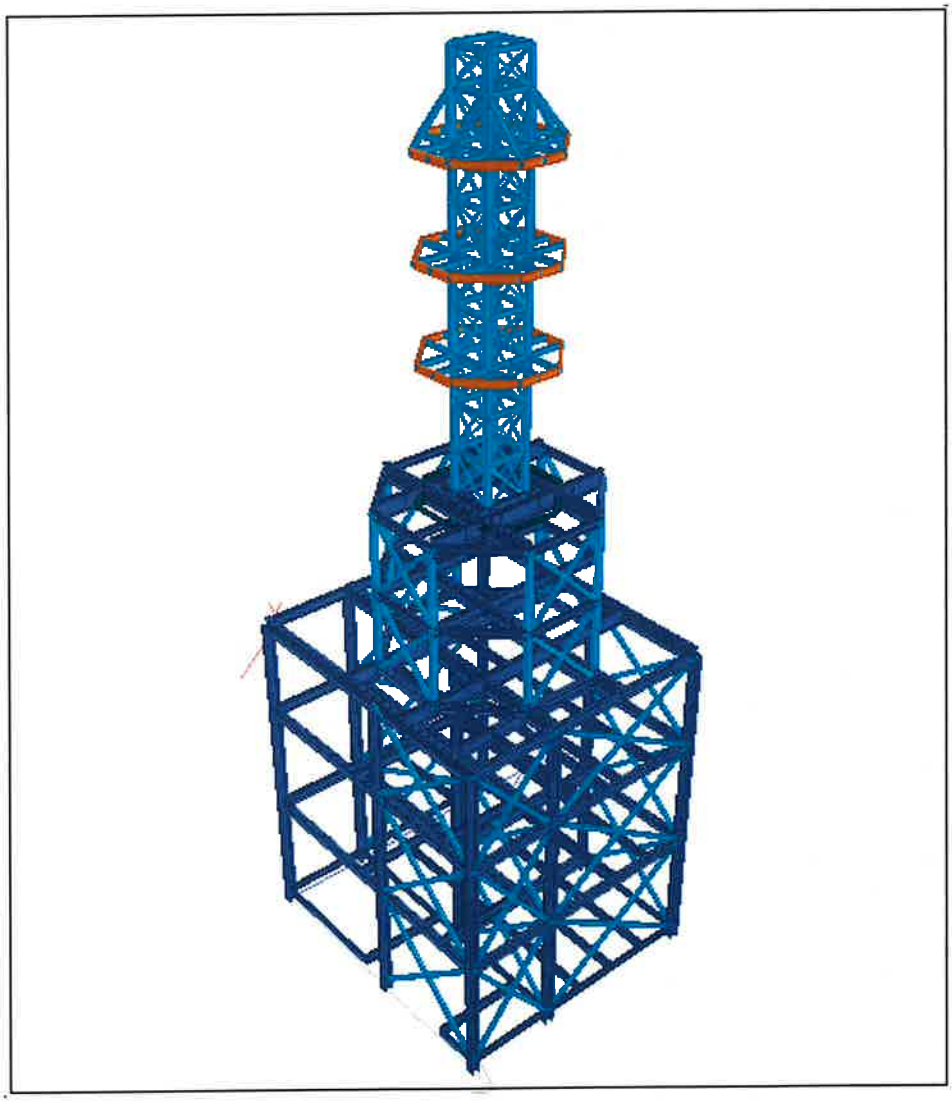
All	The Whole Structure

Included in this printout are results for load cases:

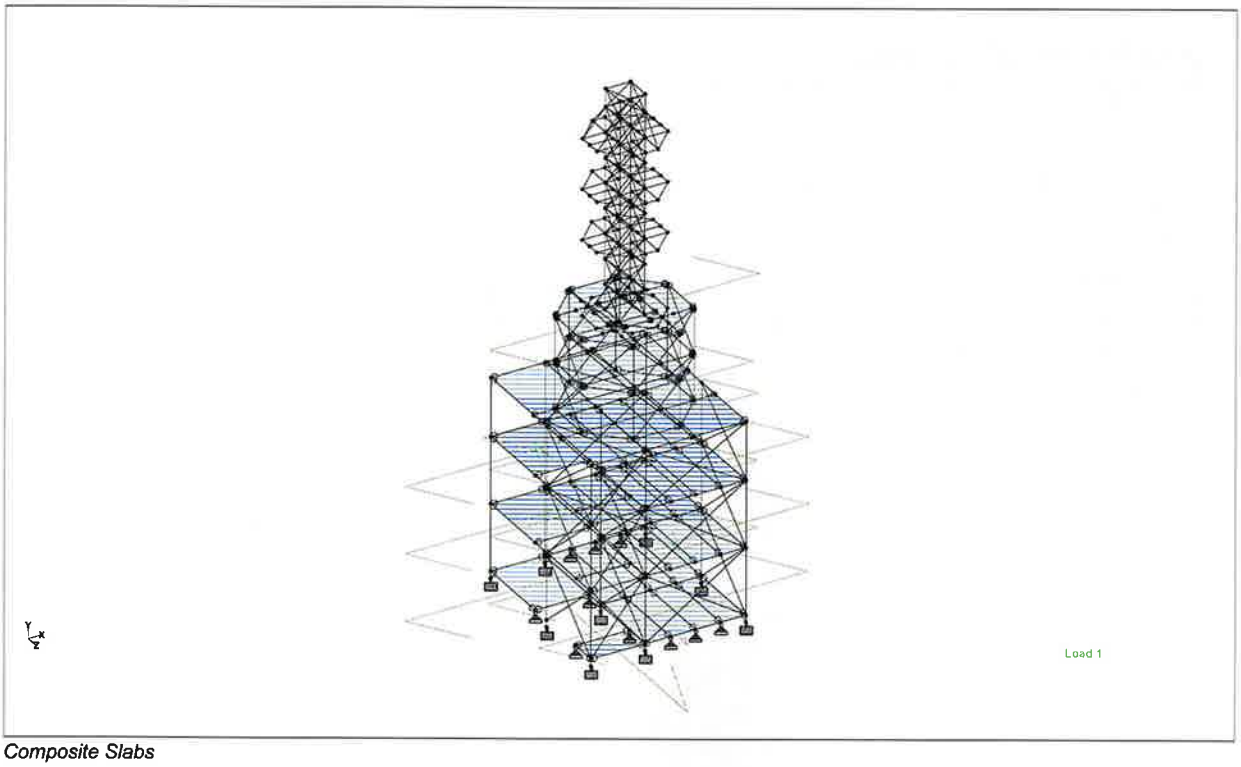
Type	L/C	Name
Primary	1	EQ(X)
Primary	2	EQ(Z)
Primary	3	DEAD
Primary	4	LIVE
Primary	5	SNOW
Primary	6	LIVE ROOF
Primary	7	WIND(X-)
Primary	8	WIND(Z-)
Combination	9	1.4D
Combination	10	1.2D+1.6L+0.5LR
Combination	12	1.2D+1.6L+0.5S
Combination	13	1.2D+1.6LR+L
Combination	14	1.2D+1.6LR+0.5W(X)
Combination	15	1.2D+1.6LR+0.5W(Z)
Combination	19	1.2D+1.6S+L
Combination	20	1.2D+1.6S+0.5W(X)
Combination	21	1.2D+1.6S+0.5W(Z)
Combination	22	1.2D+1.0W(X)+L+0.5LR
Combination	23	1.2D+1.0W(Z)+L+0.5LR
Combination	26	1.2D+1.0W(X)+L+0.5S
Combination	27	1.2D+1.0W(Z)+L+0.5S
Combination	28	1.2D+1.0E(X)+L+0.2S
Combination	29	1.2D+1.0E(Z)+L+0.2S
Combination	30	1.2D-1.0E(X)+L+0.2S

Job Information Cont...

Type	L/C	Name
Combination	31	1.2D-1.0E(Z)+L+0.2S
Combination	32	0.9D+1.0W(X)
Combination	33	0.9D+1.0W(Z)
Combination	34	0.9D+1.0E(X)
Combination	35	0.9D+1.0E(Z)
Combination	36	0.9D-1.0E(X)
Combination	37	0.9D-1.0E(Z)



3D Rendered View



Composite Slabs

Plates

Plate	Node A	Node B	Node C	Node D	Property
543	19	22	13	10	1
544	22	25	16	13	1
545	25	26	17	16	1
546	26	27	18	17	1
547	27	24	15	18	1
548	24	21	12	15	1
549	21	20	11	12	1
550	20	19	10	11	1
551	30	29	20	21	1
552	29	28	19	20	1
553	39	38	29	30	1
554	38	37	28	29	1
555	37	40	31	28	1
556	28	31	22	19	1
557	40	43	34	31	1
558	31	34	25	22	1
559	43	44	35	34	1
560	34	35	26	25	1
561	44	45	36	35	1

Plates Cont...

Plate	Node A	Node B	Node C	Node D	Property
562	35	36	27	26	1
563	45	42	33	36	1
564	36	33	24	27	1
565	33	30	21	24	1
566	42	39	30	33	1
567	92	97	89	84	1
568	97	98	90	89	1
569	98	94	86	90	1
570	94	93	85	86	1
571	93	96	88	85	1
572	96	95	87	88	1
573	95	91	83	87	1
574	91	92	84	83	1
575	103	99	91	95	1
576	99	100	92	91	1
577	100	105	97	92	1
578	105	106	98	97	1
579	106	102	94	98	1
580	102	101	93	94	1
581	101	104	96	93	1
582	104	103	95	96	1
607	175	176	235	243	1
608	176	177	246	235	1
609	177	178	237	246	1
610	178	179	245	237	1
611	179	180	239	245	1
612	180	181	244	239	1
613	181	182	241	244	1
614	182	175	243	241	1
615	184	185	175	182	1
616	185	186	176	175	1
617	186	187	177	176	1
618	187	188	178	177	1
619	188	189	179	178	1
620	189	190	180	179	1
621	190	183	181	180	1
622	183	184	182	181	1
623	172	171	184	183	1
624	171	168	185	184	1
625	168	167	186	185	1
626	167	173	187	186	1
627	173	174	188	187	1
628	174	169	189	188	1
629	169	170	190	189	1
630	170	172	183	190	1

Plates Cont...

Plate	Node A	Node B	Node C	Node D	Property
649	141	139	167	168	1
650	139	140	174	173	1
651	140	142	170	169	1
652	142	141	171	172	1

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
2	W10X54	15.800	103.000	303.000	1.820	STEEL
3	W12X22	6.480	4.660	156.000	0.293	STEEL
4	W18X50	14.700	40.100	800.000	1.240	STEEL
5	W12X30	8.790	20.300	238.000	0.457	STEEL
6	W12X26	7.650	17.300	204.000	0.300	STEEL
7	W21X50	14.700	24.900	984.000	1.140	STEEL
8	W8X35	10.300	42.600	127.000	0.769	STEEL
9	HSST6X6X0.25	5.240	28.600	28.600	44.690	STEEL
10	W8X18	5.260	7.970	61.900	0.172	STEEL
11	C8X11	3.370	1.310	32.500	0.130	STEEL
12	HSST6X3X0.25	3.840	5.700	17.000	13.904	STEEL
13	HSST2X2X0.125	0.840	0.486	0.486	0.776	STEEL
14	HSST4X4X0.25	3.370	7.800	7.800	12.455	STEEL
15	L60606	4.380	24.518	6.256	0.208	STEEL
16	W8X10	2.960	2.090	30.800	0.043	STEEL

Plate Thickness

Prop	Node A (in)	Node B (in)	Node C (in)	Node D (in)	Material
1	0.250	0.250	0.250	0.250	STEEL

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	STEEL	29E+3	0.300	0.000	6E -6
2	CONCRETE	3.15E+3	0.170	8.7e-05	5E -6
3	ALUMINUM	10E+3	0.330	9.8e-05	13E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000	9.9E -6
5	STEEL_36_KSI	29E+3	0.300	0.000	6.5E -6
6	STEEL_50_KSI	29E+3	0.300	0.000	6.5E -6
7	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
8	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6
9	Q235	29.9E+3	0.300	0.000	6.67E -6
10	Q345	29.9E+3	0.300	0.000	6.67E -6
11	Q355	29.9E+3	0.300	0.000	6.67E -6
12	Q390	29.9E+3	0.300	0.000	6.67E -6
13	Q420	29.9E+3	0.300	0.000	6.67E -6
14	Q460	29.9E+3	0.300	0.000	6.67E -6
15	TIMBER	1.5E+3	0.150	0.000	3E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip-ft/deg)	rY (kip-ft/deg)	rZ (kip-ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
2	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
3	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
5	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
6	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
7	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
8	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Releases

Beam ends not shown in this table are fixed in all directions.

Beam	Node	x	y	z	rx	ry	rz
37	19	Fixed	Fixed	Fixed	Fixed	Pin	Pin
38	22	Fixed	Fixed	Fixed	Fixed	Pin	Pin
39	25	Fixed	Fixed	Fixed	Fixed	Pin	Pin
39	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
40	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
41	27	Fixed	Fixed	Fixed	Fixed	Pin	Pin
41	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
42	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
42	21	Fixed	Fixed	Fixed	Fixed	Pin	Pin
43	21	Fixed	Fixed	Fixed	Fixed	Pin	Pin
44	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
44	19	Fixed	Fixed	Fixed	Fixed	Pin	Pin
45	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin
46	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
47	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	47	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	46	Fixed	Fixed	Fixed	Fixed	Pin	Pin
49	23	Fixed	Fixed	Fixed	Fixed	Pin	Pin
50	22	Fixed	Fixed	Fixed	Fixed	Pin	Pin
53	24	Fixed	Fixed	Fixed	Fixed	Pin	Pin
54	20	Fixed	Fixed	Fixed	Fixed	Pin	Pin
59	27	Fixed	Fixed	Fixed	Fixed	Pin	Pin
60	54	Fixed	Fixed	Fixed	Fixed	Pin	Pin
60	48	Fixed	Fixed	Fixed	Fixed	Pin	Pin
61	48	Fixed	Fixed	Fixed	Fixed	Pin	Pin
61	51	Fixed	Fixed	Fixed	Fixed	Pin	Pin
62	55	Fixed	Fixed	Fixed	Fixed	Pin	Pin
62	49	Fixed	Fixed	Fixed	Fixed	Pin	Pin
63	49	Fixed	Fixed	Fixed	Fixed	Pin	Pin
63	52	Fixed	Fixed	Fixed	Fixed	Pin	Pin
64	56	Fixed	Fixed	Fixed	Fixed	Pin	Pin
64	50	Fixed	Fixed	Fixed	Fixed	Pin	Pin
65	50	Fixed	Fixed	Fixed	Fixed	Pin	Pin
65	53	Fixed	Fixed	Fixed	Fixed	Pin	Pin
66	25	Fixed	Fixed	Fixed	Fixed	Pin	Pin
67	26	Fixed	Fixed	Fixed	Fixed	Pin	Pin
68	57	Fixed	Fixed	Fixed	Fixed	Pin	Pin
68	58	Fixed	Fixed	Fixed	Fixed	Pin	Pin
69	28	Fixed	Fixed	Fixed	Fixed	Pin	Pin
70	31	Fixed	Fixed	Fixed	Fixed	Pin	Pin
71	34	Fixed	Fixed	Fixed	Fixed	Pin	Pin
71	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
72	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
73	36	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
73	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
74	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
74	30	Fixed	Fixed	Fixed	Fixed	Pin	Pin
75	30	Fixed	Fixed	Fixed	Fixed	Pin	Pin
76	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
76	28	Fixed	Fixed	Fixed	Fixed	Pin	Pin
77	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
78	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
79	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
80	59	Fixed	Fixed	Fixed	Fixed	Pin	Pin
80	64	Fixed	Fixed	Fixed	Fixed	Pin	Pin
81	32	Fixed	Fixed	Fixed	Fixed	Pin	Pin
82	31	Fixed	Fixed	Fixed	Fixed	Pin	Pin
85	33	Fixed	Fixed	Fixed	Fixed	Pin	Pin
86	29	Fixed	Fixed	Fixed	Fixed	Pin	Pin
91	36	Fixed	Fixed	Fixed	Fixed	Pin	Pin
92	61	Fixed	Fixed	Fixed	Fixed	Pin	Pin
92	63	Fixed	Fixed	Fixed	Fixed	Pin	Pin
93	63	Fixed	Fixed	Fixed	Fixed	Pin	Pin
93	68	Fixed	Fixed	Fixed	Fixed	Pin	Pin
94	70	Fixed	Fixed	Fixed	Fixed	Pin	Pin
94	66	Fixed	Fixed	Fixed	Fixed	Pin	Pin
95	66	Fixed	Fixed	Fixed	Fixed	Pin	Pin
95	69	Fixed	Fixed	Fixed	Fixed	Pin	Pin
96	71	Fixed	Fixed	Fixed	Fixed	Pin	Pin
96	67	Fixed	Fixed	Fixed	Fixed	Pin	Pin
97	67	Fixed	Fixed	Fixed	Fixed	Pin	Pin
97	62	Fixed	Fixed	Fixed	Fixed	Pin	Pin
98	34	Fixed	Fixed	Fixed	Fixed	Pin	Pin
99	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
100	60	Fixed	Fixed	Fixed	Fixed	Pin	Pin
100	65	Fixed	Fixed	Fixed	Fixed	Pin	Pin
101	37	Fixed	Fixed	Fixed	Fixed	Pin	Pin
103	39	Fixed	Fixed	Fixed	Fixed	Pin	Pin
105	37	Fixed	Fixed	Fixed	Fixed	Pin	Pin
107	43	Fixed	Fixed	Fixed	Fixed	Pin	Pin
109	38	Fixed	Fixed	Fixed	Fixed	Pin	Pin
111	39	Fixed	Fixed	Fixed	Fixed	Pin	Pin
112	72	Fixed	Fixed	Fixed	Fixed	Pin	Pin
113	45	Fixed	Fixed	Fixed	Fixed	Pin	Pin
119	43	Fixed	Fixed	Fixed	Fixed	Pin	Pin
121	45	Fixed	Fixed	Fixed	Fixed	Pin	Pin
123	75	Fixed	Fixed	Fixed	Fixed	Pin	Pin
126	79	Fixed	Fixed	Fixed	Fixed	Pin	Pin
131	77	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
132	81	Fixed	Fixed	Fixed	Fixed	Pin	Pin
135	44	Fixed	Fixed	Fixed	Fixed	Pin	Pin
136	74	Fixed	Fixed	Fixed	Fixed	Pin	Pin
137	83	Fixed	Fixed	Fixed	Fixed	Pin	Pin
137	84	Fixed	Fixed	Fixed	Fixed	Pin	Pin
138	85	Fixed	Fixed	Fixed	Fixed	Pin	Pin
138	86	Fixed	Fixed	Fixed	Fixed	Pin	Pin
139	89	Fixed	Fixed	Fixed	Fixed	Pin	Pin
139	90	Fixed	Fixed	Fixed	Fixed	Pin	Pin
140	87	Fixed	Fixed	Fixed	Fixed	Pin	Pin
140	88	Fixed	Fixed	Fixed	Fixed	Pin	Pin
141	83	Fixed	Fixed	Fixed	Fixed	Pin	Pin
141	87	Fixed	Fixed	Fixed	Fixed	Pin	Pin
142	88	Fixed	Fixed	Fixed	Fixed	Pin	Pin
142	85	Fixed	Fixed	Fixed	Fixed	Pin	Pin
143	86	Fixed	Fixed	Fixed	Fixed	Pin	Pin
143	90	Fixed	Fixed	Fixed	Fixed	Pin	Pin
144	89	Fixed	Fixed	Fixed	Fixed	Pin	Pin
144	84	Fixed	Fixed	Fixed	Fixed	Pin	Pin
161	91	Fixed	Fixed	Fixed	Fixed	Pin	Pin
162	92	Fixed	Fixed	Fixed	Fixed	Pin	Pin
163	95	Fixed	Fixed	Fixed	Fixed	Pin	Pin
164	96	Fixed	Fixed	Fixed	Fixed	Pin	Pin
165	95	Fixed	Fixed	Fixed	Fixed	Pin	Pin
165	96	Fixed	Fixed	Fixed	Fixed	Pin	Pin
166	96	Fixed	Fixed	Fixed	Fixed	Pin	Pin
166	93	Fixed	Fixed	Fixed	Fixed	Pin	Pin
167	93	Fixed	Fixed	Fixed	Fixed	Pin	Pin
167	94	Fixed	Fixed	Fixed	Fixed	Pin	Pin
168	94	Fixed	Fixed	Fixed	Fixed	Pin	Pin
168	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
169	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
169	97	Fixed	Fixed	Fixed	Fixed	Pin	Pin
170	97	Fixed	Fixed	Fixed	Fixed	Pin	Pin
170	92	Fixed	Fixed	Fixed	Fixed	Pin	Pin
171	92	Fixed	Fixed	Fixed	Fixed	Pin	Pin
171	91	Fixed	Fixed	Fixed	Fixed	Pin	Pin
172	91	Fixed	Fixed	Fixed	Fixed	Pin	Pin
172	95	Fixed	Fixed	Fixed	Fixed	Pin	Pin
173	93	Fixed	Fixed	Fixed	Fixed	Pin	Pin
175	94	Fixed	Fixed	Fixed	Fixed	Pin	Pin
177	97	Fixed	Fixed	Fixed	Fixed	Pin	Pin
179	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
181	99	Fixed	Fixed	Fixed	Fixed	Pin	Pin
182	100	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
183	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
184	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
185	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
185	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
186	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
186	101	Fixed	Fixed	Fixed	Fixed	Pin	Pin
187	101	Fixed	Fixed	Fixed	Fixed	Pin	Pin
187	102	Fixed	Fixed	Fixed	Fixed	Pin	Pin
188	102	Fixed	Fixed	Fixed	Fixed	Pin	Pin
188	106	Fixed	Fixed	Fixed	Fixed	Pin	Pin
189	106	Fixed	Fixed	Fixed	Fixed	Pin	Pin
189	105	Fixed	Fixed	Fixed	Fixed	Pin	Pin
190	105	Fixed	Fixed	Fixed	Fixed	Pin	Pin
190	100	Fixed	Fixed	Fixed	Fixed	Pin	Pin
191	100	Fixed	Fixed	Fixed	Fixed	Pin	Pin
191	99	Fixed	Fixed	Fixed	Fixed	Pin	Pin
192	99	Fixed	Fixed	Fixed	Fixed	Pin	Pin
192	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
220	115	Fixed	Fixed	Fixed	Fixed	Pin	Pin
223	117	Fixed	Fixed	Fixed	Fixed	Pin	Pin
225	116	Fixed	Fixed	Fixed	Fixed	Pin	Pin
226	119	Fixed	Fixed	Fixed	Fixed	Pin	Pin
227	118	Fixed	Fixed	Fixed	Fixed	Pin	Pin
230	122	Fixed	Fixed	Fixed	Fixed	Pin	Pin
233	123	Fixed	Fixed	Fixed	Fixed	Pin	Pin
237	126	Fixed	Fixed	Fixed	Fixed	Pin	Pin
631	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
634	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
635	258	Fixed	Fixed	Fixed	Fixed	Pin	Pin
635	255	Fixed	Fixed	Fixed	Fixed	Pin	Pin
636	255	Fixed	Fixed	Fixed	Fixed	Pin	Pin
636	259	Fixed	Fixed	Fixed	Fixed	Pin	Pin
637	260	Fixed	Fixed	Fixed	Fixed	Pin	Pin
637	256	Fixed	Fixed	Fixed	Fixed	Pin	Pin
638	256	Fixed	Fixed	Fixed	Fixed	Pin	Pin
638	261	Fixed	Fixed	Fixed	Fixed	Pin	Pin
639	262	Fixed	Fixed	Fixed	Fixed	Pin	Pin
639	257	Fixed	Fixed	Fixed	Fixed	Pin	Pin
640	257	Fixed	Fixed	Fixed	Fixed	Pin	Pin
640	263	Fixed	Fixed	Fixed	Fixed	Pin	Pin
645	101	Fixed	Fixed	Fixed	Fixed	Pin	Pin
646	102	Fixed	Fixed	Fixed	Fixed	Pin	Pin
647	105	Fixed	Fixed	Fixed	Fixed	Pin	Pin
648	106	Fixed	Fixed	Fixed	Fixed	Pin	Pin
653	10	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Releases Cont...

Beam	Node	x	y	z	rx	ry	rz
653	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
654	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
657	12	Fixed	Fixed	Fixed	Fixed	Pin	Pin
658	12	Fixed	Fixed	Fixed	Fixed	Pin	Pin
658	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
659	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
659	18	Fixed	Fixed	Fixed	Fixed	Pin	Pin
660	18	Fixed	Fixed	Fixed	Fixed	Pin	Pin
663	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
664	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
664	16	Fixed	Fixed	Fixed	Fixed	Pin	Pin
665	10	Fixed	Fixed	Fixed	Fixed	Pin	Pin
665	273	Fixed	Fixed	Fixed	Fixed	Pin	Pin
667	273	Fixed	Fixed	Fixed	Fixed	Pin	Pin
667	272	Fixed	Fixed	Fixed	Fixed	Pin	Pin
668	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
669	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
670	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
672	14	Fixed	Fixed	Fixed	Fixed	Pin	Pin
673	275	Fixed	Fixed	Fixed	Fixed	Pin	Pin
673	16	Fixed	Fixed	Fixed	Fixed	Pin	Pin
674	274	Fixed	Fixed	Fixed	Fixed	Pin	Pin
674	275	Fixed	Fixed	Fixed	Fixed	Pin	Pin

Reference Load Cases

Number	Name	Type
R1	REF DEAD	Mass

Primary Load Cases

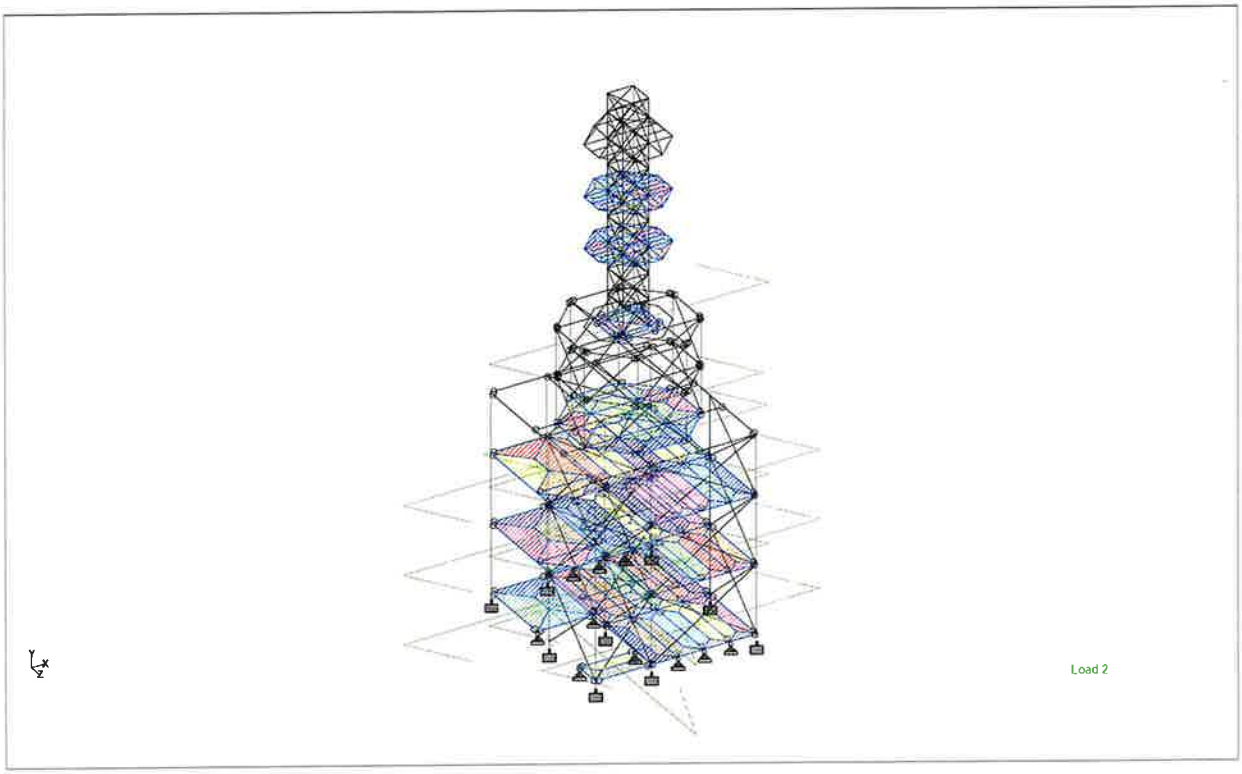
Number	Name	Type
1	EQ(X)	Seismic-H
2	EQ(Z)	Seismic-H
3	DEAD	Dead
4	LIVE	Live
5	SNOW	Snow
6	LIVE ROOF	Roof Live
7	WIND(X-)	Wind
8	WIND(Z-)	Wind

Combination Load Cases

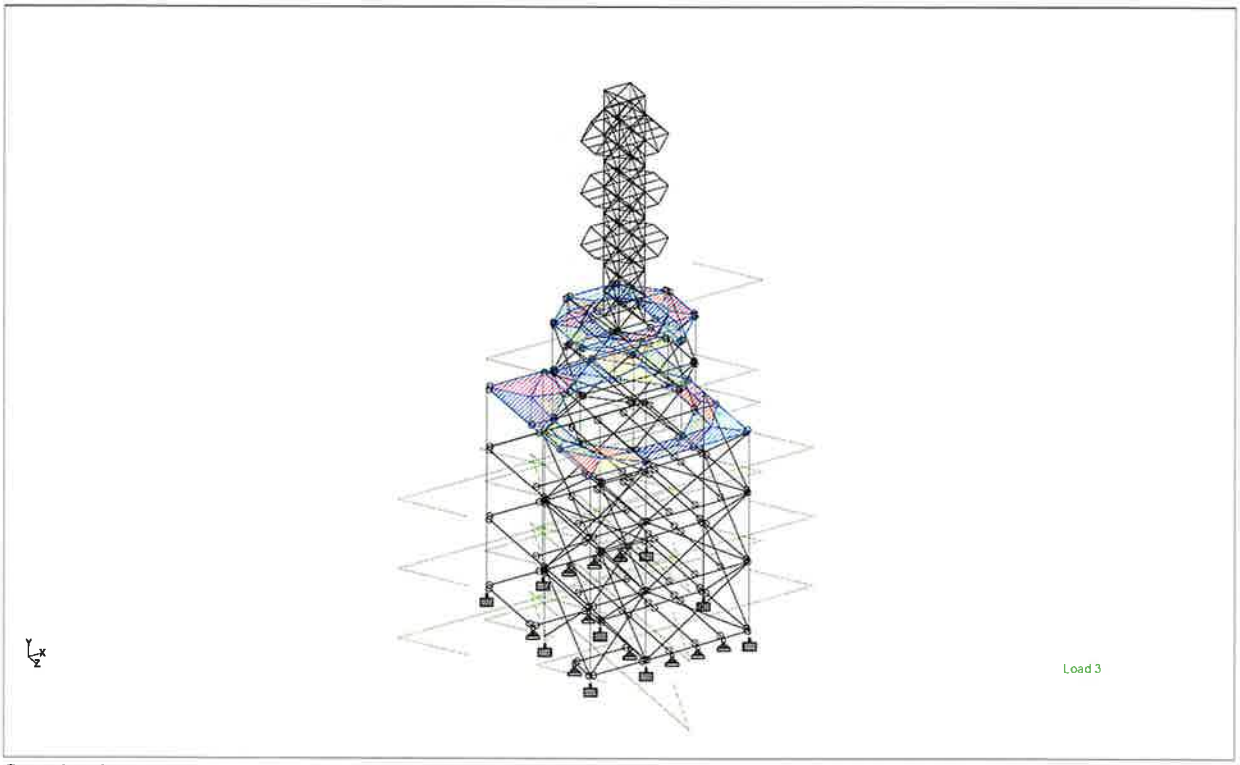
Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	1.4D	3	DEAD	1.40
10	1.2D+1.6L+0.5LR	3	DEAD	1.20
		4	LIVE	1.60
		6	LIVE ROOF	0.50
12	1.2D+1.6L+0.5S	3	DEAD	1.20
		4	LIVE	1.60
		5	SNOW	0.50
13	1.2D+1.6LR+L	3	DEAD	1.20
		4	LIVE	1.00
		6	LIVE ROOF	1.60
14	1.2D+1.6LR+0.5W(X)	3	DEAD	1.20
		6	LIVE ROOF	1.60
		7	WIND(X-)	0.50
15	1.2D+1.6LR+0.5W(Z)	3	DEAD	1.20
		6	LIVE ROOF	1.60
		8	WIND(Z-)	0.50
19	1.2D+1.6S+L	3	DEAD	1.20
		4	LIVE	1.00
		5	SNOW	1.60
20	1.2D+1.6S+0.5W(X)	3	DEAD	1.20
		7	WIND(X-)	0.50
		5	SNOW	1.60
21	1.2D+1.6S+0.5W(Z)	3	DEAD	1.20
		8	WIND(Z-)	0.50
		5	SNOW	1.60
22	1.2D+1.0W(X)+L+0.5LR	3	DEAD	1.20
		4	LIVE	1.00
		6	LIVE ROOF	0.50
		7	WIND(X-)	1.00
23	1.2D+1.0W(Z)+L+0.5LR	3	DEAD	1.20
		4	LIVE	1.00
		6	LIVE ROOF	0.50
		8	WIND(Z-)	1.00
26	1.2D+1.0W(X)+L+0.5S	3	DEAD	1.20
		4	LIVE	1.00
		7	WIND(X-)	1.00
		5	SNOW	0.50
27	1.2D+1.0W(Z)+L+0.5S	3	DEAD	1.20
		4	LIVE	1.00
		8	WIND(Z-)	1.00
		5	SNOW	0.50
28	1.2D+1.0E(X)+L+0.2S	3	DEAD	1.20
		4	LIVE	1.00
		1	EQ(X)	1.00
		5	SNOW	0.20

Combination Load Cases Cont...

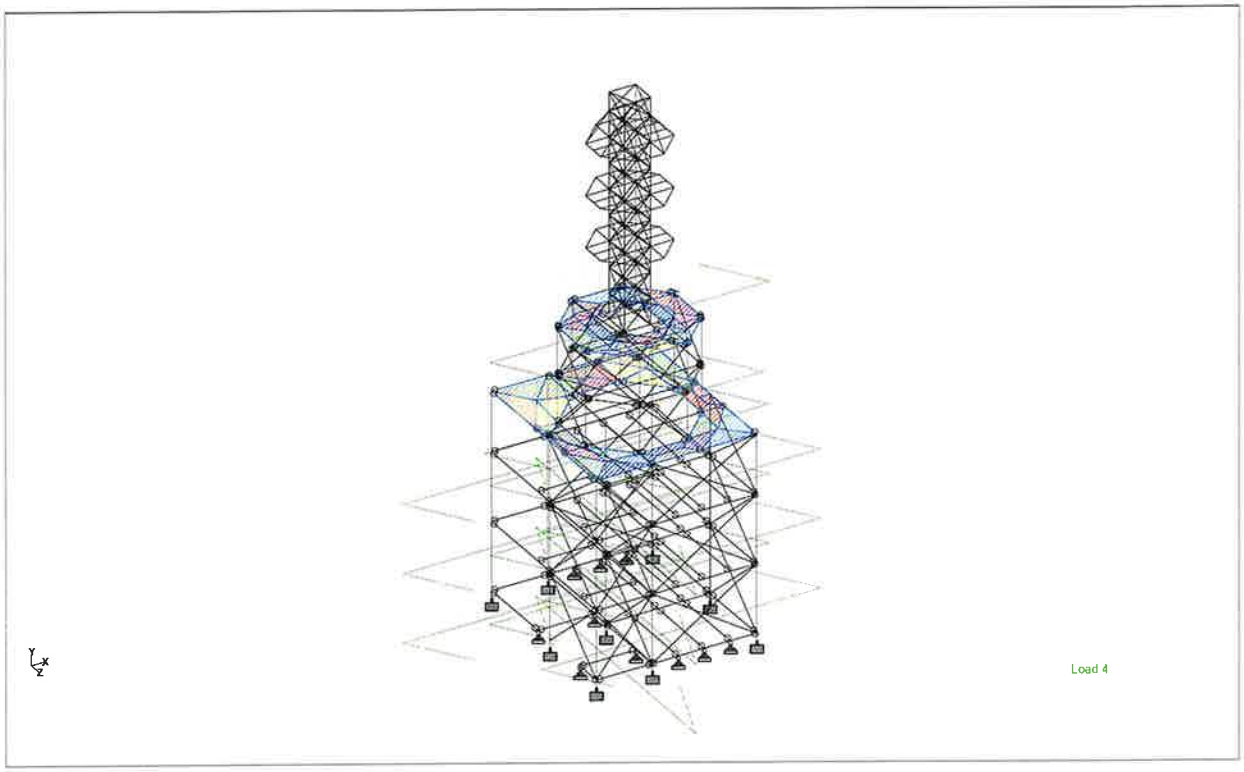
Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
29	1.2D+1.0E(Z)+L+0.2S	3	DEAD	1.20
		4	LIVE	1.00
		2	EQ(Z)	1.00
		5	SNOW	0.20
30	1.2D-1.0E(X)+L+0.2S	3	DEAD	1.20
		4	LIVE	1.00
		1	EQ(X)	-1.00
		5	SNOW	0.20
31	1.2D-1.0E(Z)+L+0.2S	3	DEAD	1.20
		4	LIVE	1.00
		2	EQ(Z)	-1.00
		5	SNOW	0.20
32	0.9D+1.0W(X)	3	DEAD	0.90
		7	WIND(X-)	1.00
33	0.9D+1.0W(Z)	3	DEAD	0.90
		8	WIND(Z-)	1.00
34	0.9D+1.0E(X)	3	DEAD	0.90
		1	EQ(X)	1.00
35	0.9D+1.0E(Z)	3	DEAD	0.90
		2	EQ(Z)	1.00
36	0.9D-1.0E(X)	3	DEAD	0.90
		1	EQ(X)	-1.00
37	0.9D-1.0E(Z)	3	DEAD	0.90
		2	EQ(Z)	-1.00



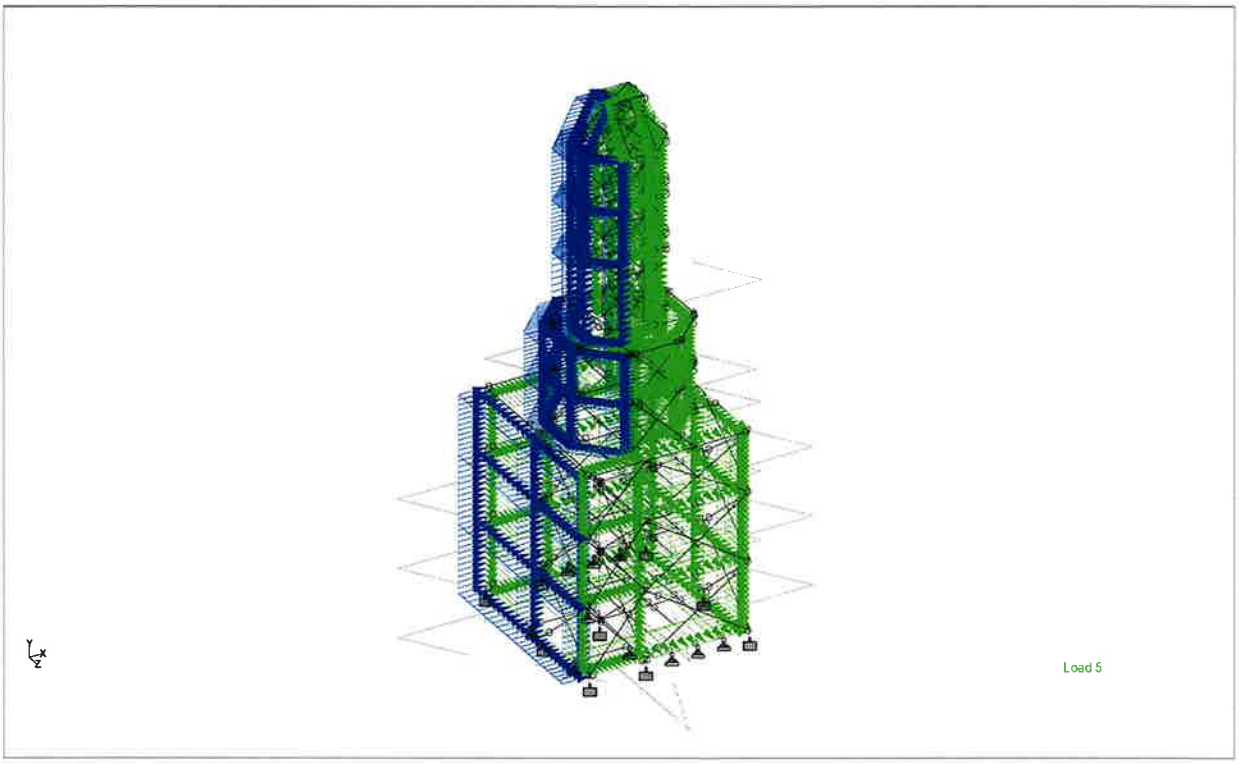
Live Loads



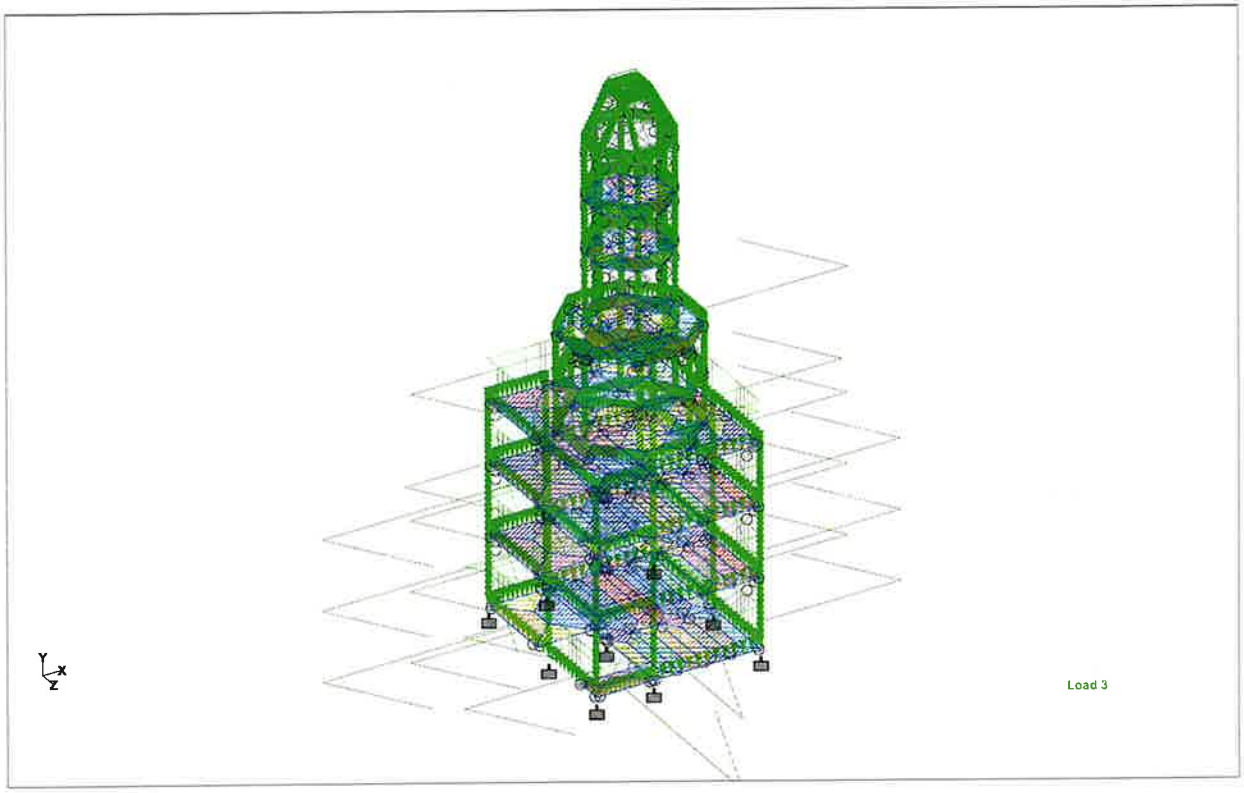
Snow Loads



Roof Live Load



Typical Wind Loads



Dead Loads

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	W10X54	W10X54	0.305	1.000	0.305	Eq.H1-1b	12	15.800	303.000	103.000	1.820
2	W10X54	W10X54	0.089	1.000	0.089	Cl.E3	12	15.800	303.000	103.000	1.820
3	W10X54	W10X54	0.061	1.000	0.061	Cl.E3	12	15.800	303.000	103.000	1.820
4	W10X54	W10X54	0.033	1.000	0.033	Eq.H1-3a(H1-	26	15.800	303.000	103.000	1.820
5	W10X54	W10X54	0.160	1.000	0.160	Cl.E4	12	15.800	303.000	103.000	1.820
6	W10X54	W10X54	0.129	1.000	0.129	Cl.E3	12	15.800	303.000	103.000	1.820
7	W10X54	W10X54	0.097	1.000	0.097	Cl.E3	12	15.800	303.000	103.000	1.820
8	W10X54	W10X54	0.068	1.000	0.068	Eq.H1-3b	19	15.800	303.000	103.000	1.820
9	W10X54	W10X54	0.481	1.000	0.481	Eq.H1-1a	26	15.800	303.000	103.000	1.820
10	W10X54	W10X54	0.167	1.000	0.167	Cl.E3	12	15.800	303.000	103.000	1.820
11	W10X54	W10X54	0.117	1.000	0.117	Cl.E3	12	15.800	303.000	103.000	1.820
12	W10X54	W10X54	0.053	1.000	0.053	Cl.E3	26	15.800	303.000	103.000	1.820
13	W10X54	W10X54	0.280	1.000	0.280	Eq.H1-1a	26	15.800	303.000	103.000	1.820
14	W10X54	W10X54	0.173	1.000	0.173	Cl.E3	12	15.800	303.000	103.000	1.820
15	W10X54	W10X54	0.150	1.000	0.150	Cl.E3	26	15.800	303.000	103.000	1.820
16	W10X54	W10X54	0.109	1.000	0.109	Cl.E3	26	15.800	303.000	103.000	1.820
17	W10X54	W10X54	0.530	1.000	0.530	Eq.H1-1a	26	15.800	303.000	103.000	1.820

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
18	W10X54	W10X54	0.160	1.000	0.160	Cl.E3	26	15.800	303.000	103.000	1.820
19	W10X54	W10X54	0.113	1.000	0.113	Cl.E3	26	15.800	303.000	103.000	1.820
20	W10X54	W10X54	0.050	1.000	0.050	Cl.E3	26	15.800	303.000	103.000	1.820
21	W10X54	W10X54	0.185	1.000	0.185	Eq.H1-1b	27	15.800	303.000	103.000	1.820
22	W10X54	W10X54	0.113	1.000	0.113	Cl.E3	27	15.800	303.000	103.000	1.820
23	W10X54	W10X54	0.093	1.000	0.093	Cl.E3	27	15.800	303.000	103.000	1.820
24	W10X54	W10X54	0.085	1.000	0.085	Eq.H1-1b	27	15.800	303.000	103.000	1.820
25	W10X54	W10X54	0.345	1.000	0.345	Eq.H1-1b	27	15.800	303.000	103.000	1.820
26	W10X54	W10X54	0.085	1.000	0.085	Cl.E3	27	15.800	303.000	103.000	1.820
27	W10X54	W10X54	0.060	1.000	0.060	Cl.E3	27	15.800	303.000	103.000	1.820
28	W10X54	W10X54	0.034	1.000	0.034	Eq.H1-1b	7	15.800	303.000	103.000	1.820
29	W10X54	W10X54	0.148	1.000	0.148	Eq.H1-3a(H1-	26	15.800	303.000	103.000	1.820
30	W10X54	W10X54	0.111	1.000	0.111	Eq.H1-3a(H1-	26	15.800	303.000	103.000	1.820
31	W10X54	W10X54	0.076	1.000	0.076	Cl.E3	12	15.800	303.000	103.000	1.820
32	W10X54	W10X54	0.066	1.000	0.066	Eq.H1-1b	7	15.800	303.000	103.000	1.820
33	W10X54	W10X54	0.345	1.000	0.345	Eq.H1-1a	12	15.800	303.000	103.000	1.820
34	W10X54	W10X54	0.403	1.000	0.403	Eq.H1-1a	12	15.800	303.000	103.000	1.820
35	W10X54	W10X54	0.328	1.000	0.328	Eq.H1-1a	12	15.800	303.000	103.000	1.820
36	W10X54	W10X54	0.224	1.000	0.224	Eq.H1-1b	26	15.800	303.000	103.000	1.820
37	W12X30	W12X30	0.107	1.000	0.107			27.522	930.617	5.27E+3	1.75E+3
38	W12X30	W12X30	0.171	1.000	0.171	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
39	W12X26	W12X26	0.023	1.000	0.023			16.693	676.427	608.128	815.956
40	W12X30	W12X30	0.419	1.000	0.419	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
41	W12X30	W12X30	0.060	1.000	0.060			17.510	741.043	550.048	796.981
42	W12X30	W12X30	0.095	1.000	0.095			17.510	741.043	550.048	796.981
43	W12X30	W12X30	0.513	1.000	0.513	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
44	W12X26	W12X26	0.096	1.000	0.096	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
45	W18X50	W18X50	0.370	1.000	0.370	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
46	W12X30	W12X30	0.240	1.000	0.240			46.254	1.07E+3	42E+3	3.74E+3
47	W12X30	W12X30	0.138	1.000	0.138			17.510	741.044	550.058	796.986
48	W12X22	W12X22	0.222	1.000	0.222	LRFD-H1-1B-	10	6.480	156.000	4.660	0.293
49	W12X30	W12X30	0.166	1.000	0.166			17.510	741.044	550.058	796.986
50	W12X30	W12X30	0.365	1.000	0.365	LRFD-H1-1B-	26	8.790	238.000	20.300	0.457
51	W18X50	W18X50	0.557	1.000	0.557	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
52	W18X50	W18X50	0.564	1.000	0.564	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
53	W18X50	W18X50	0.381	1.000	0.381	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
54	W12X30	W12X30	0.516	1.000	0.516	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
55	W12X30	W12X30	0.586	1.000	0.586	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
56	W12X30	W12X30	0.578	1.000	0.578	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
57	W12X30	W12X30	0.494	1.000	0.494	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
58	W12X30	W12X30	0.485	1.000	0.485	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
59	W12X30	W12X30	0.412	1.000	0.412	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
60	W12X22	W12X22	0.117	1.000	0.117			23.920	704.953	4.24E+3	1.66E+3
61	W12X22	W12X22	0.186	1.000	0.186			23.920	704.953	4.24E+3	1.66E+3
62	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24E+3	1.66E+3

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
63	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24E+3	1.66E+3
64	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24E+3	1.66E+3
65	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24E+3	1.66E+3
66	W12X30	W12X30	0.157	1.000	0.157	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
67	W12X30	W12X30	0.131	1.000	0.131			17.510	741.044	550.058	796.986
68	W12X22	W12X22	0.056	1.000	0.056			15.523	590.950	595.488	824.526
69	W12X30	W12X30	0.107	1.000	0.107			27.522	930.617	5.27E+3	1.75E+3
70	W12X30	W12X30	0.167	1.000	0.167	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
71	W12X26	W12X26	0.023	1.000	0.023			16.693	676.427	608.128	815.956
72	W12X26	W12X26	0.478	1.000	0.478	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
73	W12X30	W12X30	0.060	1.000	0.060			17.510	741.043	550.048	796.981
74	W12X30	W12X30	0.095	1.000	0.095			17.510	741.043	550.048	796.981
75	W12X26	W12X26	0.572	1.000	0.572	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
76	W12X26	W12X26	0.082	1.000	0.082	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
77	W18X50	W18X50	0.366	1.000	0.366	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
78	W12X30	W12X30	0.184	1.000	0.184			46.254	1.07E+3	42E+3	3.74E+3
79	W12X30	W12X30	0.136	1.000	0.136			17.510	741.044	550.058	796.986
80	W12X22	W12X22	0.223	1.000	0.223	LRFD-H1-1B-	10	6.480	156.000	4.660	0.293
81	W12X30	W12X30	0.166	1.000	0.166			17.510	741.044	550.058	796.986
82	W12X30	W12X30	0.384	1.000	0.384	LRFD-H1-1B-	26	8.790	238.000	20.300	0.457
83	W18X50	W18X50	0.576	1.000	0.576	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
84	W18X50	W18X50	0.587	1.000	0.587	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
85	W18X50	W18X50	0.384	1.000	0.384	LRFD-H1-1B-	12	14.700	800.000	40.100	1.240
86	W12X26	W12X26	0.588	1.000	0.588	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
87	W12X26	W12X26	0.638	1.000	0.638	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
88	W12X26	W12X26	0.624	1.000	0.624	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
89	W12X26	W12X26	0.538	1.000	0.538	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
90	W12X26	W12X26	0.521	1.000	0.521	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
91	W12X26	W12X26	0.456	1.000	0.456	LRFD-H1-1B-	12	7.650	204.000	17.300	0.300
92	W12X22	W12X22	0.117	1.000	0.117			23.920	704.953	4.24E+3	1.66E+3
93	W12X22	W12X22	0.186	1.000	0.186			23.920	704.953	4.24E+3	1.66E+3
94	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24E+3	1.66E+3
95	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24E+3	1.66E+3
96	W12X22	W12X22	0.117	1.000	0.117			23.920	704.952	4.24E+3	1.66E+3
97	W12X22	W12X22	0.186	1.000	0.186			23.920	704.952	4.24E+3	1.66E+3
98	W12X30	W12X30	0.146	1.000	0.146	LRFD-H1-1B-	12	8.790	238.000	20.300	0.457
99	W12X30	W12X30	0.132	1.000	0.132			17.510	741.044	550.058	796.986
100	W12X22	W12X22	0.056	1.000	0.056			15.523	590.950	595.488	824.526
101	W12X26	W12X26	0.033	1.000	0.033			25.249	816.318	4.37E+3	1.64E+3
102	W12X26	W12X26	0.151	1.000	0.151			25.249	816.318	4.37E+3	1.64E+3
103	W21X50	W21X50	0.122	1.000	0.122			32.311	2.78E+3	4.39E+3	3.09E+3
104	W21X50	W21X50	0.137	1.000	0.137			22.007	2.07E+3	336.621	1.37E+3
105	W21X50	W21X50	0.071	1.000	0.071			32.311	2.78E+3	4.39E+3	3.09E+3
106	W21X50	W21X50	0.055	1.000	0.055			22.007	2.07E+3	336.607	1.37E+3
107	W12X26	W12X26	0.001	1.000	0.001			25.249	816.318	4.37E+3	1.64E+3

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
108	W12X26	W12X26	0.186	1.000	0.186			25.249	816.318	4.37E+3	1.64E+3
109	W21X50	W21X50	0.195	1.000	0.195			30.848	2.7E+3	3.39E+3	2.83E+3
110	W21X50	W21X50	0.127	1.000	0.127			42.273	3.13E+3	16.8E+3	4.91E+3
111	W12X26	W12X26	0.130	1.000	0.130			25.249	816.318	4.37E+3	1.64E+3
112	W21X50	W21X50	0.079	1.000	0.079			30.848	2.7E+3	3.39E+3	2.83E+3
113	W12X26	W12X26	0.156	1.000	0.156			25.249	816.318	4.37E+3	1.64E+3
114	W21X50	W21X50	0.083	1.000	0.083			42.273	3.13E+3	16.8E+3	4.91E+3
115	W21X50	W21X50	0.078	1.000	0.078			22.007	2.07E+3	336.607	1.37E+3
116	W21X50	W21X50	0.131	1.000	0.131			42.273	3.13E+3	16.8E+3	4.91E+3
117	W21X50	W21X50	0.156	1.000	0.156			22.007	2.07E+3	336.621	1.37E+3
119	W21X50	W21X50	0.055	1.000	0.055			32.311	2.78E+3	4.39E+3	3.09E+3
120	W21X50	W21X50	0.241	1.000	0.241			30.848	2.7E+3	3.39E+3	2.83E+3
121	W21X50	W21X50	0.107	1.000	0.107			32.311	2.78E+3	4.39E+3	3.09E+3
122	W21X50	W21X50	0.105	1.000	0.105			30.848	2.7E+3	3.39E+3	2.83E+3
123	W21X50	W21X50	0.193	1.000	0.193			32.311	2.78E+3	4.39E+3	3.09E+3
124	W21X50	W21X50	0.194	1.000	0.194			32.311	2.78E+3	4.39E+3	3.09E+3
125	W21X50	W21X50	0.360	1.000	0.360			32.311	2.78E+3	4.39E+3	3.09E+3
126	W21X50	W21X50	0.157	1.000	0.157			32.311	2.78E+3	4.39E+3	3.09E+3
127	W21X50	W21X50	0.191	1.000	0.191			32.311	2.78E+3	4.39E+3	3.09E+3
128	W21X50	W21X50	0.352	1.000	0.352			32.311	2.78E+3	4.39E+3	3.09E+3
129	W21X50	W21X50	0.175	1.000	0.175			32.311	2.78E+3	4.39E+3	3.09E+3
130	W21X50	W21X50	0.148	1.000	0.148			32.311	2.78E+3	4.39E+3	3.09E+3
131	W21X50	W21X50	0.409	1.000	0.409			32.311	2.78E+3	4.39E+3	3.09E+3
132	W21X50	W21X50	0.397	1.000	0.397			32.311	2.78E+3	4.39E+3	3.09E+3
133	W21X50	W21X50	0.188	1.000	0.188			30.848	2.7E+3	3.39E+3	2.83E+3
134	W21X50	W21X50	0.121	1.000	0.121			30.848	2.7E+3	3.39E+3	2.83E+3
135	W21X50	W21X50	0.256	1.000	0.256			30.848	2.7E+3	3.39E+3	2.83E+3
136	W21X50	W21X50	0.057	1.000	0.057			30.848	2.7E+3	3.39E+3	2.83E+3
137	W8X35	W8X35	0.026	1.000	0.026			29.032	628.009	5.29E+3	1.14E+3
138	W8X35	W8X35	0.026	1.000	0.026			29.032	628.009	5.29E+3	1.14E+3
139	W8X35	W8X35	0.037	1.000	0.037			28.393	621.499	4.77E+3	1.1E+3
140	W8X35	W8X35	0.038	1.000	0.038			28.393	621.499	4.77E+3	1.1E+3
141	W8X35	W8X35	0.023	1.000	0.023			28.393	621.499	4.77E+3	1.1E+3
142	W8X35	W8X35	0.023	1.000	0.023			28.393	621.499	4.77E+3	1.1E+3
143	W8X35	W8X35	0.021	1.000	0.021			28.393	621.499	4.77E+3	1.1E+3
144	W8X35	W8X35	0.021	1.000	0.021			28.393	621.499	4.77E+3	1.1E+3
145	HSST6X6	HSST6X6	0.088	1.000	0.088	Eq.H1-1b	12	5.240	28.600	28.600	45.600
146	HSST6X6	HSST6X6	0.078	1.000	0.078	Eq.H1-1b	12	5.240	28.600	28.600	45.600
147	HSST6X6	HSST6X6	0.092	1.000	0.092	Eq.H1-1b	12	5.240	28.600	28.600	45.600
148	HSST6X6	HSST6X6	0.061	1.000	0.061	Eq.H1-1b	12	5.240	28.600	28.600	45.600
149	HSST6X6	HSST6X6	0.084	1.000	0.084	Eq.H1-1b	12	5.240	28.600	28.600	45.600
150	HSST6X6	HSST6X6	0.056	1.000	0.056	Eq.H1-1b	12	5.240	28.600	28.600	45.600
151	HSST6X6	HSST6X6	0.166	1.000	0.166	Eq.H1-1b	26	5.240	28.600	28.600	45.600
152	HSST6X6	HSST6X6	0.101	1.000	0.101	Eq.H1-1b	26	5.240	28.600	28.600	45.600
153	HSST6X6	HSST6X6	0.166	1.000	0.166	Eq.H1-1b	26	5.240	28.600	28.600	45.600

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
154	HSST6X6	HSST6X6	0.100	1.000	0.100	Eq.H1-1b	26	5.240	28.600	28.600	45.600
155	HSST6X6	HSST6X6	0.075	1.000	0.075	Eq.H1-1b	12	5.240	28.600	28.600	45.600
156	HSST6X6	HSST6X6	0.071	1.000	0.071	Eq.H1-1b	27	5.240	28.600	28.600	45.600
157	HSST6X6	HSST6X6	0.127	1.000	0.127	Eq.H1-1b	27	5.240	28.600	28.600	45.600
158	HSST6X6	HSST6X6	0.084	1.000	0.084	Eq.H1-1b	27	5.240	28.600	28.600	45.600
159	HSST6X6	HSST6X6	0.086	1.000	0.086	Eq.H1-1b	12	5.240	28.600	28.600	45.600
160	HSST6X6	HSST6X6	0.078	1.000	0.078	Eq.H1-1b	12	5.240	28.600	28.600	45.600
161	W12X30	W12X30	0.017	1.000	0.017	Eq.H1-1b	9	8.790	238.000	20.300	0.457
162	W12X30	W12X30	0.018	1.000	0.018	Eq.H1-1b	9	8.790	238.000	20.300	0.457
163	W12X30	W12X30	0.018	1.000	0.018	Eq.H1-1b	9	8.790	238.000	20.300	0.457
164	W12X30	W12X30	0.026	1.000	0.026	Cl.D2	26	8.790	238.000	20.300	0.457
165	W8X18	W8X18	0.030	1.000	0.030	Cl.E3	8	5.260	61.900	7.970	0.172
166	W8X18	W8X18	0.020	1.000	0.020	Cl.D2	26	5.260	61.900	7.970	0.172
167	W8X18	W8X18	0.059	1.000	0.059	Cl.D2	26	5.260	61.900	7.970	0.172
168	W8X18	W8X18	0.018	1.000	0.018	Cl.D2	26	5.260	61.900	7.970	0.172
169	W8X18	W8X18	0.028	1.000	0.028	Cl.D2	33	5.260	61.900	7.970	0.172
170	W8X18	W8X18	0.034	1.000	0.034	Cl.D2	27	5.260	61.900	7.970	0.172
171	W8X18	W8X18	0.037	1.000	0.037	Cl.E3	7	5.260	61.900	7.970	0.172
172	W8X18	W8X18	0.023	1.000	0.023	Cl.E3	8	5.260	61.900	7.970	0.172
173	W12X30	W12X30	0.020	1.000	0.020	Eq.H1-1b	27	8.790	238.000	20.300	0.457
174	W12X30	W12X30	0.021	1.000	0.021	Eq.H1-1b	9	8.790	238.000	20.300	0.457
175	W12X30	W12X30	0.020	1.000	0.020	Eq.H1-1b	27	8.790	238.000	20.300	0.457
176	W12X30	W12X30	0.023	1.000	0.023	Eq.H1-1b	27	8.790	238.000	20.300	0.457
177	W12X30	W12X30	0.019	1.000	0.019	Eq.H1-1b	9	8.790	238.000	20.300	0.457
178	W12X30	W12X30	0.021	1.000	0.021	Eq.H1-1b	9	8.790	238.000	20.300	0.457
179	W12X30	W12X30	0.026	1.000	0.026	Cl.D2	26	8.790	238.000	20.300	0.457
180	W12X30	W12X30	0.026	1.000	0.026	Cl.D2	26	8.790	238.000	20.300	0.457
181	W21X50	W21X50	0.140	1.000	0.140			32.311	2.78E+3	4.39E+3	3.09E+3
182	W21X50	W21X50	0.141	1.000	0.141			32.311	2.78E+3	4.39E+3	3.09E+3
183	W21X50	W21X50	0.079	1.000	0.079			23.121	2.18E+3	501.996	1.55E+3
184	W21X50	W21X50	0.080	1.000	0.080			23.121	2.18E+3	501.994	1.55E+3
185	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07E+3	1.1E+3
186	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07E+3	1.1E+3
187	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07E+3	1.1E+3
188	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07E+3	1.1E+3
189	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07E+3	1.1E+3
190	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07E+3	1.1E+3
191	W8X18	W8X18	0.029	1.000	0.029			22.458	370.637	4.07E+3	1.1E+3
192	W8X18	W8X18	0.017	1.000	0.017			22.458	370.637	4.07E+3	1.1E+3
193	W21X50	W21X50	0.316	1.000	0.316			32.311	2.78E+3	4.39E+3	3.09E+3
194	W21X50	W21X50	0.281	1.000	0.281			32.311	2.78E+3	4.39E+3	3.09E+3
195	W21X50	W21X50	0.316	1.000	0.316			32.311	2.78E+3	4.39E+3	3.09E+3
196	W21X50	W21X50	0.314	1.000	0.314			32.311	2.78E+3	4.39E+3	3.09E+3
197	W21X50	W21X50	0.228	1.000	0.228			32.311	2.78E+3	4.39E+3	3.09E+3
198	W21X50	W21X50	0.171	1.000	0.171			18.414	1.65E+3	65.837	761.699

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
199	W21X50	W21X50	0.231	1.000	0.231			32.311	2.78E+3	4.39E+3	3.09E+3
200	W21X50	W21X50	0.183	1.000	0.183			18.414	1.65E+3	65.835	761.689
201	HSST4X4	HSST4X4	0.040	1.000	0.040	Cl.E3	27	3.370	7.800	7.800	12.800
202	HSST4X4	HSST4X4	0.010	1.000	0.010	Cl.E3	7	3.370	7.800	7.800	12.800
203	HSST4X4	HSST4X4	0.017	1.000	0.017	Cl.E3	26	3.370	7.800	7.800	12.800
204	HSST4X4	HSST4X4	0.028	1.000	0.028	Cl.E3	27	3.370	7.800	7.800	12.800
205	HSST4X4	HSST4X4	0.018	1.000	0.018	Cl.E3	31	3.370	7.800	7.800	12.800
206	HSST4X4	HSST4X4	0.025	1.000	0.025	Cl.E3	31	3.370	7.800	7.800	12.800
207	HSST4X4	HSST4X4	0.029	1.000	0.029	Cl.E3	27	3.370	7.800	7.800	12.800
208	HSST4X4	HSST4X4	0.027	1.000	0.027	Cl.E3	27	3.370	7.800	7.800	12.800
209	HSST4X4	HSST4X4	0.017	1.000	0.017	Cl.E3	30	3.370	7.800	7.800	12.800
210	HSST4X4	HSST4X4	0.019	1.000	0.019	Cl.E3	26	3.370	7.800	7.800	12.800
212	HSST4X4	HSST4X4	0.010	1.000	0.010	Cl.E3	32	3.370	7.800	7.800	12.800
213	HSST4X4	HSST4X4	0.022	1.000	0.022	Cl.E3	27	3.370	7.800	7.800	12.800
214	HSST4X4	HSST4X4	0.018	1.000	0.018	Cl.E3	26	3.370	7.800	7.800	12.800
215	HSST4X4	HSST4X4	0.036	1.000	0.036	Cl.E3	26	3.370	7.800	7.800	12.800
216	HSST4X4	HSST4X4	0.038	1.000	0.038	Cl.E3	26	3.370	7.800	7.800	12.800
217	HSST4X4	HSST4X4	0.019	1.000	0.019	Cl.E3	30	3.370	7.800	7.800	12.800
218	W21X50	W21X50	0.259	1.000	0.259			32.311	2.78E+3	4.39E+3	3.09E+3
219	W21X50	W21X50	0.264	1.000	0.264			32.311	2.78E+3	4.39E+3	3.09E+3
220	W12X30	W12X30	0.070	1.000	0.070			21.224	831.408	1.56E+3	1.13E+3
221	W21X50	W21X50	0.322	1.000	0.322			32.311	2.78E+3	4.39E+3	3.09E+3
222	W21X50	W21X50	0.322	1.000	0.322			32.311	2.78E+3	4.39E+3	3.09E+3
223	W12X30	W12X30	0.100	1.000	0.100			21.224	831.407	1.56E+3	1.13E+3
224	W21X50	W21X50	0.214	1.000	0.214			18.414	1.65E+3	65.837	761.699
225	W12X30	W12X30	0.118	1.000	0.118			21.224	831.408	1.56E+3	1.13E+3
226	W12X30	W12X30	0.125	1.000	0.125			26.398	916.217	4.38E+3	1.64E+3
227	W12X30	W12X30	0.118	1.000	0.118			21.224	831.407	1.56E+3	1.13E+3
228	W12X30	W12X30	0.183	1.000	0.183			26.398	916.217	4.38E+3	1.64E+3
229	W21X50	W21X50	0.215	1.000	0.215			18.414	1.65E+3	65.835	761.689
230	W12X30	W12X30	0.164	1.000	0.164			26.398	916.217	4.38E+3	1.64E+3
231	W21X50	W21X50	0.180	1.000	0.180			18.414	1.65E+3	65.837	761.699
232	W12X30	W12X30	0.161	1.000	0.161			21.224	831.408	1.56E+3	1.13E+3
233	W12X30	W12X30	0.092	1.000	0.092			26.398	916.217	4.38E+3	1.64E+3
234	W12X30	W12X30	0.161	1.000	0.161			21.224	831.407	1.56E+3	1.13E+3
235	W12X30	W12X30	0.182	1.000	0.182			26.398	916.217	4.38E+3	1.64E+3
236	W21X50	W21X50	0.181	1.000	0.181			18.414	1.65E+3	65.835	761.689
237	W12X30	W12X30	0.164	1.000	0.164			26.398	916.217	4.38E+3	1.64E+3
238	HSST6X6	HSST6X6	0.136	1.000	0.136	Eq.H1-1b	8	5.240	28.600	28.600	45.600
239	HSST6X6	HSST6X6	0.047	1.000	0.047	Cl.E3	30	5.240	28.600	28.600	45.600
240	HSST6X6	HSST6X6	0.036	1.000	0.036	Cl.E3	9	5.240	28.600	28.600	45.600
241	HSST6X6	HSST6X6	0.030	1.000	0.030	Cl.E3	9	5.240	28.600	28.600	45.600
242	HSST6X6	HSST6X6	0.225	1.000	0.225	Eq.H1-1b	26	5.240	28.600	28.600	45.600
243	HSST6X6	HSST6X6	0.062	1.000	0.062	Cl.E3	22	5.240	28.600	28.600	45.600
244	HSST6X6	HSST6X6	0.037	1.000	0.037	Cl.E3	22	5.240	28.600	28.600	45.600

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
245	HSST6X6	HSST6X6	0.031	1.000	0.031	Cl.E3	9	5.240	28.600	28.600	45.600
246	HSST6X6	HSST6X6	0.228	1.000	0.228	Eq.H1-1b	27	5.240	28.600	28.600	45.600
247	HSST6X6	HSST6X6	0.062	1.000	0.062	Cl.E3	22	5.240	28.600	28.600	45.600
248	HSST6X6	HSST6X6	0.038	1.000	0.038	Cl.E3	22	5.240	28.600	28.600	45.600
249	HSST6X6	HSST6X6	0.030	1.000	0.030	Cl.E3	9	5.240	28.600	28.600	45.600
250	HSST6X6	HSST6X6	0.230	1.000	0.230	Eq.H1-1b	27	5.240	28.600	28.600	45.600
251	HSST6X6	HSST6X6	0.062	1.000	0.062	Cl.E3	23	5.240	28.600	28.600	45.600
252	HSST6X6	HSST6X6	0.038	1.000	0.038	Cl.E3	23	5.240	28.600	28.600	45.600
253	HSST6X6	HSST6X6	0.030	1.000	0.030	Cl.E3	9	5.240	28.600	28.600	45.600
267	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
269	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
271	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
273	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
275	C8X11	C8X11	0.013	1.000	0.013	Eq.H1-1b	22	3.370	32.500	1.310	0.130
279	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
280	C8X11	C8X11	0.013	1.000	0.013	Eq.H1-1b	23	3.370	32.500	1.310	0.130
281	C8X11	C8X11	0.012	1.000	0.012	Eq.H1-1b	9	3.370	32.500	1.310	0.130
282	C8X11	C8X11	0.011	1.000	0.011	Eq.H1-1b	9	3.370	32.500	1.310	0.130
283	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
284	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
285	HSST6X3	HSST6X3	0.016	1.000	0.016	Eq.H1-1b	9	3.840	17.000	5.700	14.200
286	HSST6X3	HSST6X3	0.007	1.000	0.007	Eq.H1-1b	9	3.840	17.000	5.700	14.200
287	HSST6X3	HSST6X3	0.007	1.000	0.007	Eq.H1-1b	9	3.840	17.000	5.700	14.200
288	HSST6X3	HSST6X3	0.009	1.000	0.009	Eq.H1-1b	23	3.840	17.000	5.700	14.200
289	HSST6X3	HSST6X3	0.010	1.000	0.010	Eq.H1-1b	22	3.840	17.000	5.700	14.200
290	HSST6X3	HSST6X3	0.026	1.000	0.026	Eq.H1-1b	10	3.840	17.000	5.700	14.200
291	HSST6X3	HSST6X3	0.026	1.000	0.026	Eq.H1-1b	10	3.840	17.000	5.700	14.200
292	HSST6X3	HSST6X3	0.029	1.000	0.029	Eq.H1-1b	23	3.840	17.000	5.700	14.200
293	HSST6X3	HSST6X3	0.029	1.000	0.029	Eq.H1-1b	22	3.840	17.000	5.700	14.200
294	HSST6X3	HSST6X3	0.057	1.000	0.057	Eq.H1-1b	23	3.840	17.000	5.700	14.200
295	HSST6X3	HSST6X3	0.057	1.000	0.057	Eq.H1-1b	22	3.840	17.000	5.700	14.200
296	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	8	3.840	17.000	5.700	14.200
297	HSST6X3	HSST6X3	0.037	1.000	0.037	Eq.H1-1b	7	3.840	17.000	5.700	14.200
299	HSST6X3	HSST6X3	0.050	1.000	0.050	Eq.H1-1b	22	3.840	17.000	5.700	14.200
300	C8X11	C8X11	0.028	1.000	0.028	Eq.H1-1b	23	3.370	32.500	1.310	0.130
301	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	23	3.840	17.000	5.700	14.200
303	HSST6X3	HSST6X3	0.050	1.000	0.050	Eq.H1-1b	23	3.840	17.000	5.700	14.200
304	C8X11	C8X11	0.029	1.000	0.029	Eq.H1-1b	22	3.370	32.500	1.310	0.130
305	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	22	3.840	17.000	5.700	14.200
307	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	23	3.840	17.000	5.700	14.200
308	C8X11	C8X11	0.020	1.000	0.020	Eq.H1-1b	23	3.370	32.500	1.310	0.130
309	HSST6X3	HSST6X3	0.050	1.000	0.050	Eq.H1-1b	22	3.840	17.000	5.700	14.200
311	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	22	3.840	17.000	5.700	14.200
312	C8X11	C8X11	0.020	1.000	0.020	Eq.H1-1b	22	3.370	32.500	1.310	0.130
313	HSST6X3	HSST6X3	0.051	1.000	0.051	Eq.H1-1b	23	3.840	17.000	5.700	14.200

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
315	HSST6X3	HSST6X3	0.037	1.000	0.037	Eq.H1-1b	10	3.840	17.000	5.700	14.200
316	C8X11	C8X11	0.015	1.000	0.015	Eq.H1-1b	23	3.370	32.500	1.310	0.130
317	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
319	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
320	C8X11	C8X11	0.015	1.000	0.015	Eq.H1-1b	22	3.370	32.500	1.310	0.130
321	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
323	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
324	C8X11	C8X11	0.012	1.000	0.012	Eq.H1-1b	22	3.370	32.500	1.310	0.130
325	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
327	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
328	C8X11	C8X11	0.012	1.000	0.012	Eq.H1-1b	10	3.370	32.500	1.310	0.130
329	HSST6X3	HSST6X3	0.036	1.000	0.036	Eq.H1-1b	10	3.840	17.000	5.700	14.200
330	HSST6X6	HSST6X6	0.073	1.000	0.073	Cl.D2	7	5.240	28.600	28.600	45.600
331	HSST6X6	HSST6X6	0.061	1.000	0.061	Cl.E3	30	5.240	28.600	28.600	45.600
332	HSST6X6	HSST6X6	0.125	1.000	0.125	Cl.E3	22	5.240	28.600	28.600	45.600
333	HSST6X6	HSST6X6	0.092	1.000	0.092	Cl.E3	22	5.240	28.600	28.600	45.600
334	HSST6X6	HSST6X6	0.126	1.000	0.126	Cl.E3	22	5.240	28.600	28.600	45.600
335	HSST6X6	HSST6X6	0.093	1.000	0.093	Cl.E3	22	5.240	28.600	28.600	45.600
336	HSST6X6	HSST6X6	0.126	1.000	0.126	Cl.E3	23	5.240	28.600	28.600	45.600
337	HSST6X6	HSST6X6	0.093	1.000	0.093	Cl.E3	23	5.240	28.600	28.600	45.600
338	HSST6X3	HSST6X3	0.067	1.000	0.067	Eq.H1-1b	27	3.840	17.000	5.700	14.200
339	HSST6X3	HSST6X3	0.065	1.000	0.065	Eq.H1-1b	26	3.840	17.000	5.700	14.200
340	HSST6X3	HSST6X3	0.068	1.000	0.068	Eq.H1-1b	27	3.840	17.000	5.700	14.200
341	HSST6X3	HSST6X3	0.065	1.000	0.065	Eq.H1-1b	26	3.840	17.000	5.700	14.200
342	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	27	3.840	17.000	5.700	14.200
343	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	22	3.840	17.000	5.700	14.200
344	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	27	3.840	17.000	5.700	14.200
345	HSST6X3	HSST6X3	0.056	1.000	0.056	Eq.H1-1b	22	3.840	17.000	5.700	14.200
346	HSST2X2	HSST2X2	0.139	1.000	0.139	Cl.D2	8	0.840	0.486	0.486	0.796
347	HSST2X2	HSST2X2	0.331	1.000	0.331	Eq.H1-1a	23	0.840	0.486	0.486	0.796
348	HSST2X2	HSST2X2	0.329	1.000	0.329	Eq.H1-1a	22	0.840	0.486	0.486	0.796
349	HSST2X2	HSST2X2	0.140	1.000	0.140	Cl.D2	7	0.840	0.486	0.486	0.796
350	HSST2X2	HSST2X2	0.139	1.000	0.139	Cl.D2	8	0.840	0.486	0.486	0.796
351	HSST2X2	HSST2X2	0.330	1.000	0.330	Eq.H1-1a	23	0.840	0.486	0.486	0.796
352	HSST2X2	HSST2X2	0.329	1.000	0.329	Eq.H1-1a	22	0.840	0.486	0.486	0.796
353	HSST2X2	HSST2X2	0.139	1.000	0.139	Cl.D2	7	0.840	0.486	0.486	0.796
354	HSST2X2	HSST2X2	0.117	1.000	0.117	Cl.D2	8	0.840	0.486	0.486	0.796
355	HSST2X2	HSST2X2	0.299	1.000	0.299	Eq.H1-1a	27	0.840	0.486	0.486	0.796
356	HSST2X2	HSST2X2	0.332	1.000	0.332	Eq.H1-1a	26	0.840	0.486	0.486	0.796
357	HSST2X2	HSST2X2	0.119	1.000	0.119	Cl.D2	7	0.840	0.486	0.486	0.796
358	HSST2X2	HSST2X2	0.143	1.000	0.143	Cl.E3	23	0.840	0.486	0.486	0.796
359	HSST2X2	HSST2X2	0.299	1.000	0.299	Eq.H1-1a	26	0.840	0.486	0.486	0.796
360	HSST2X2	HSST2X2	0.141	1.000	0.141	Cl.E3	22	0.840	0.486	0.486	0.796
361	HSST2X2	HSST2X2	0.296	1.000	0.296	Eq.H1-1a	27	0.840	0.486	0.486	0.796
362	HSST2X2	HSST2X2	0.308	1.000	0.308	Eq.H1-1a	22	0.840	0.486	0.486	0.796

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
363	HSST2X2	HSST2X2	0.132	1.000	0.132	Cl.D2	7	0.840	0.486	0.486	0.796
364	HSST2X2	HSST2X2	0.131	1.000	0.131	Cl.D2	8	0.840	0.486	0.486	0.796
365	HSST2X2	HSST2X2	0.309	1.000	0.309	Eq.H1-1a	23	0.840	0.486	0.486	0.796
366	HSST2X2	HSST2X2	0.309	1.000	0.309	Eq.H1-1a	22	0.840	0.486	0.486	0.796
367	HSST2X2	HSST2X2	0.132	1.000	0.132	Cl.D2	7	0.840	0.486	0.486	0.796
368	HSST2X2	HSST2X2	0.309	1.000	0.309	Eq.H1-1a	23	0.840	0.486	0.486	0.796
369	HSST2X2	HSST2X2	0.131	1.000	0.131	Cl.D2	8	0.840	0.486	0.486	0.796
370	HSST6X6	HSST6X6	0.043	1.000	0.043	Cl.E3	30	5.240	28.600	28.600	45.600
371	HSST6X6	HSST6X6	0.032	1.000	0.032	Cl.E3	9	5.240	28.600	28.600	45.600
372	HSST6X6	HSST6X6	0.052	1.000	0.052	Cl.E3	22	5.240	28.600	28.600	45.600
373	HSST6X6	HSST6X6	0.034	1.000	0.034	Cl.E3	22	5.240	28.600	28.600	45.600
374	HSST6X6	HSST6X6	0.052	1.000	0.052	Cl.E3	22	5.240	28.600	28.600	45.600
375	HSST6X6	HSST6X6	0.033	1.000	0.033	Cl.E3	22	5.240	28.600	28.600	45.600
376	HSST6X6	HSST6X6	0.052	1.000	0.052	Cl.E3	23	5.240	28.600	28.600	45.600
377	HSST6X6	HSST6X6	0.032	1.000	0.032	Cl.E3	23	5.240	28.600	28.600	45.600
378	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	23	3.840	17.000	5.700	14.200
379	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	22	3.840	17.000	5.700	14.200
380	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	23	3.840	17.000	5.700	14.200
381	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	22	3.840	17.000	5.700	14.200
382	HSST2X2	HSST2X2	0.053	1.000	0.053	Cl.E3	31	0.840	0.486	0.486	0.796
383	HSST2X2	HSST2X2	0.110	1.000	0.110	Cl.E3	23	0.840	0.486	0.486	0.796
384	HSST2X2	HSST2X2	0.123	1.000	0.123	Cl.E3	22	0.840	0.486	0.486	0.796
385	HSST2X2	HSST2X2	0.052	1.000	0.052	Cl.E3	30	0.840	0.486	0.486	0.796
386	HSST2X2	HSST2X2	0.053	1.000	0.053	Cl.E3	30	0.840	0.486	0.486	0.796
387	HSST2X2	HSST2X2	0.111	1.000	0.111	Cl.E3	22	0.840	0.486	0.486	0.796
388	HSST2X2	HSST2X2	0.053	1.000	0.053	Cl.E3	31	0.840	0.486	0.486	0.796
389	HSST2X2	HSST2X2	0.109	1.000	0.109	Cl.E3	23	0.840	0.486	0.486	0.796
390	HSST2X2	HSST2X2	0.099	1.000	0.099	Cl.E3	22	0.840	0.486	0.486	0.796
391	HSST2X2	HSST2X2	0.050	1.000	0.050	Cl.E3	30	0.840	0.486	0.486	0.796
392	HSST2X2	HSST2X2	0.097	1.000	0.097	Cl.E3	23	0.840	0.486	0.486	0.796
393	HSST2X2	HSST2X2	0.050	1.000	0.050	Cl.E3	31	0.840	0.486	0.486	0.796
394	HSST2X2	HSST2X2	0.049	1.000	0.049	Cl.E3	30	0.840	0.486	0.486	0.796
395	HSST2X2	HSST2X2	0.100	1.000	0.100	Cl.E3	22	0.840	0.486	0.486	0.796
396	HSST2X2	HSST2X2	0.098	1.000	0.098	Cl.E3	23	0.840	0.486	0.486	0.796
397	HSST2X2	HSST2X2	0.050	1.000	0.050	Cl.E3	31	0.840	0.486	0.486	0.796
398	HSST6X3	HSST6X3	0.006	1.000	0.006	Eq.H1-1b	22	3.840	17.000	5.700	14.200
399	HSST6X3	HSST6X3	0.005	1.000	0.005	Eq.H1-1b	23	3.840	17.000	5.700	14.200
400	HSST6X3	HSST6X3	0.006	1.000	0.006	Eq.H1-1b	22	3.840	17.000	5.700	14.200
401	HSST6X3	HSST6X3	0.006	1.000	0.006	Eq.H1-1b	23	3.840	17.000	5.700	14.200
402	HSST2X2	HSST2X2	0.050	1.000	0.050	Cl.E3	23	0.840	0.486	0.486	0.796
403	HSST2X2	HSST2X2	0.034	1.000	0.034	Cl.E3	31	0.840	0.486	0.486	0.796
404	HSST2X2	HSST2X2	0.051	1.000	0.051	Cl.E3	22	0.840	0.486	0.486	0.796
405	HSST2X2	HSST2X2	0.033	1.000	0.033	Cl.E3	30	0.840	0.486	0.486	0.796
406	HSST2X2	HSST2X2	0.034	1.000	0.034	Cl.E3	31	0.840	0.486	0.486	0.796
407	HSST2X2	HSST2X2	0.049	1.000	0.049	Cl.E3	23	0.840	0.486	0.486	0.796

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
408	HSST2X2	HSST2X2	0.032	1.000	0.032	Cl.E3	30	0.840	0.486	0.486	0.796
409	HSST2X2	HSST2X2	0.052	1.000	0.052	Cl.E3	22	0.840	0.486	0.486	0.796
410	HSST2X2	HSST2X2	0.030	1.000	0.030	Cl.E3	30	0.840	0.486	0.486	0.796
411	HSST2X2	HSST2X2	0.048	1.000	0.048	Cl.E3	22	0.840	0.486	0.486	0.796
412	HSST2X2	HSST2X2	0.033	1.000	0.033	Cl.E3	31	0.840	0.486	0.486	0.796
413	HSST2X2	HSST2X2	0.045	1.000	0.045	Cl.E3	23	0.840	0.486	0.486	0.796
414	HSST2X2	HSST2X2	0.047	1.000	0.047	Cl.E3	22	0.840	0.486	0.486	0.796
415	HSST2X2	HSST2X2	0.031	1.000	0.031	Cl.E3	30	0.840	0.486	0.486	0.796
416	HSST2X2	HSST2X2	0.046	1.000	0.046	Cl.E3	23	0.840	0.486	0.486	0.796
418	HSST2X2	HSST2X2	0.031	1.000	0.031	Cl.E3	31	0.840	0.486	0.486	0.796
419	HSST6X6	HSST6X6	0.019	1.000	0.019	Cl.E3	9	5.240	28.600	28.600	45.600
421	HSST6X6	HSST6X6	0.019	1.000	0.019	Cl.E3	9	5.240	28.600	28.600	45.600
423	HSST6X6	HSST6X6	0.019	1.000	0.019	Cl.E3	9	5.240	28.600	28.600	45.600
425	HSST6X6	HSST6X6	0.019	1.000	0.019	Cl.E3	9	5.240	28.600	28.600	45.600
427	HSST6X3	HSST6X3	0.009	1.000	0.009	Cl.D2	9	3.840	17.000	5.700	14.200
428	HSST6X3	HSST6X3	0.010	1.000	0.010	Cl.D2	22	3.840	17.000	5.700	14.200
429	HSST6X3	HSST6X3	0.009	1.000	0.009	Cl.D2	23	3.840	17.000	5.700	14.200
430	HSST6X3	HSST6X3	0.009	1.000	0.009	Cl.D2	9	3.840	17.000	5.700	14.200
431	HSST2X2	HSST2X2	0.030	1.000	0.030	Cl.E3	23	0.840	0.486	0.486	0.796
432	HSST2X2	HSST2X2	0.026	1.000	0.026	Cl.E3	9	0.840	0.486	0.486	0.796
433	HSST2X2	HSST2X2	0.030	1.000	0.030	Cl.E3	22	0.840	0.486	0.486	0.796
434	HSST2X2	HSST2X2	0.026	1.000	0.026	Cl.E3	9	0.840	0.486	0.486	0.796
435	HSST2X2	HSST2X2	0.027	1.000	0.027	Cl.E3	9	0.840	0.486	0.486	0.796
436	HSST2X2	HSST2X2	0.029	1.000	0.029	Cl.E3	23	0.840	0.486	0.486	0.796
437	HSST2X2	HSST2X2	0.025	1.000	0.025	Cl.E3	9	0.840	0.486	0.486	0.796
438	HSST2X2	HSST2X2	0.031	1.000	0.031	Cl.E3	22	0.840	0.486	0.486	0.796
439	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	9	3.370	7.800	7.800	12.800
440	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	23	3.370	7.800	7.800	12.800
441	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	9	3.370	7.800	7.800	12.800
442	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	23	3.370	7.800	7.800	12.800
443	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	22	3.370	7.800	7.800	12.800
444	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	9	3.370	7.800	7.800	12.800
445	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	9	3.370	7.800	7.800	12.800
446	HSST4X4	HSST4X4	0.012	1.000	0.012	Cl.D2	22	3.370	7.800	7.800	12.800
447	HSST6X3	HSST6X3	0.004	1.000	0.004	Cl.E3	23	3.840	17.000	5.700	14.200
448	HSST6X3	HSST6X3	0.003	1.000	0.003	Cl.E3	23	3.840	17.000	5.700	14.200
449	HSST6X3	HSST6X3	0.004	1.000	0.004	Cl.E3	22	3.840	17.000	5.700	14.200
450	HSST6X3	HSST6X3	0.003	1.000	0.003	Cl.E3	22	3.840	17.000	5.700	14.200
451	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	22	0.840	0.486	0.486	0.796
452	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	9	0.840	0.486	0.486	0.796
453	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	22	0.840	0.486	0.486	0.796
454	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	9	0.840	0.486	0.486	0.796
455	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	23	0.840	0.486	0.486	0.796
456	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	9	0.840	0.486	0.486	0.796
457	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	23	0.840	0.486	0.486	0.796

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
458	HSST2X2	HSST2X2	0.009	1.000	0.009	Eq.H1-1b	9	0.840	0.486	0.486	0.796
459	HSST4X4	HSST4X4	0.030	1.000	0.030	Cl.E3	30	3.370	7.800	7.800	12.800
460	HSST4X4	HSST4X4	0.080	1.000	0.080	Cl.E3	26	3.370	7.800	7.800	12.800
461	HSST4X4	HSST4X4	0.065	1.000	0.065	Cl.E3	27	3.370	7.800	7.800	12.800
462	HSST4X4	HSST4X4	0.053	1.000	0.053	Cl.E3	26	3.370	7.800	7.800	12.800
463	HSST4X4	HSST4X4	0.008	1.000	0.008	Cl.E3	31	3.370	7.800	7.800	12.800
464	HSST4X4	HSST4X4	0.051	1.000	0.051	Cl.E3	27	3.370	7.800	7.800	12.800
465	HSST4X4	HSST4X4	0.340	1.000	0.340	Cl.E3	27	3.370	7.800	7.800	12.800
466	HSST4X4	HSST4X4	0.165	1.000	0.165	Cl.E3	12	3.370	7.800	7.800	12.800
467	HSST4X4	HSST4X4	0.066	1.000	0.066	Cl.E3	26	3.370	7.800	7.800	12.800
468	HSST4X4	HSST4X4	0.032	1.000	0.032	Cl.E3	30	3.370	7.800	7.800	12.800
469	HSST4X4	HSST4X4	0.011	1.000	0.011	Cl.E3	36	3.370	7.800	7.800	12.800
470	HSST4X4	HSST4X4	0.049	1.000	0.049	Cl.E3	26	3.370	7.800	7.800	12.800
471	HSST4X4	HSST4X4	0.009	1.000	0.009	Cl.D2	27	3.370	7.800	7.800	12.800
472	HSST4X4	HSST4X4	0.047	1.000	0.047	Cl.E3	27	3.370	7.800	7.800	12.800
473	HSST4X4	HSST4X4	0.018	1.000	0.018	Cl.E3	26	3.370	7.800	7.800	12.800
474	HSST4X4	HSST4X4	0.045	1.000	0.045	Cl.E3	27	3.370	7.800	7.800	12.800
475	HSST4X4	HSST4X4	0.013	1.000	0.013	Cl.E3	36	3.370	7.800	7.800	12.800
476	HSST4X4	HSST4X4	0.070	1.000	0.070	Cl.E3	26	3.370	7.800	7.800	12.800
477	HSST4X4	HSST4X4	0.094	1.000	0.094	Cl.E3	27	3.370	7.800	7.800	12.800
478	HSST4X4	HSST4X4	0.041	1.000	0.041	Cl.E3	26	3.370	7.800	7.800	12.800
479	HSST4X4	HSST4X4	0.075	1.000	0.075	Cl.E3	27	3.370	7.800	7.800	12.800
480	HSST4X4	HSST4X4	0.007	1.000	0.007	Cl.D2	23	3.370	7.800	7.800	12.800
483	C8X11	C8X11	0.026	1.000	0.026	Eq.H1-1b	10	3.370	32.500	1.310	0.130
484	C8X11	C8X11	0.028	1.000	0.028	Eq.H1-1b	22	3.370	32.500	1.310	0.130
485	C8X11	C8X11	0.028	1.000	0.028	Eq.H1-1b	23	3.370	32.500	1.310	0.130
486	C8X11	C8X11	0.028	1.000	0.028	Eq.H1-1b	23	3.370	32.500	1.310	0.130
487	HSST6X3	HSST6X3	0.037	1.000	0.037	Eq.H1-1b	8	3.840	17.000	5.700	14.200
488	HSST6X3	HSST6X3	0.037	1.000	0.037	Eq.H1-1b	7	3.840	17.000	5.700	14.200
489	HSST6X3	HSST6X3	0.057	1.000	0.057	Eq.H1-1b	23	3.840	17.000	5.700	14.200
490	HSST6X3	HSST6X3	0.057	1.000	0.057	Eq.H1-1b	22	3.840	17.000	5.700	14.200
491	C8X11	C8X11	0.020	1.000	0.020	Eq.H1-1b	23	3.370	32.500	1.310	0.130
492	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	22	3.840	17.000	5.700	14.200
493	C8X11	C8X11	0.029	1.000	0.029	Eq.H1-1b	22	3.370	32.500	1.310	0.130
494	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	22	3.840	17.000	5.700	14.200
495	C8X11	C8X11	0.020	1.000	0.020	Eq.H1-1b	23	3.370	32.500	1.310	0.130
496	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	23	3.840	17.000	5.700	14.200
497	C8X11	C8X11	0.029	1.000	0.029	Eq.H1-1b	23	3.370	32.500	1.310	0.130
498	HSST6X3	HSST6X3	0.014	1.000	0.014	Eq.H1-1b	23	3.840	17.000	5.700	14.200
499	C8X11	C8X11	0.019	1.000	0.019	Eq.H1-1b	23	3.370	32.500	1.310	0.130
500	C8X11	C8X11	0.020	1.000	0.020	Eq.H1-1b	23	3.370	32.500	1.310	0.130
501	C8X11	C8X11	0.018	1.000	0.018	Eq.H1-1b	23	3.370	32.500	1.310	0.130
502	C8X11	C8X11	0.019	1.000	0.019	Eq.H1-1b	22	3.370	32.500	1.310	0.130
503	HSST6X3	HSST6X3	0.029	1.000	0.029	Eq.H1-1b	22	3.840	17.000	5.700	14.200
504	C8X11	C8X11	0.012	1.000	0.012	Eq.H1-1b	23	3.370	32.500	1.310	0.130

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
505	HSST6X3	HSST6X3	0.012	1.000	0.012	Eq.H1-1b	12	3.840	17.000	5.700	14.200
506	HSST6X3	HSST6X3	0.025	1.000	0.025	Eq.H1-1b	10	3.840	17.000	5.700	14.200
507	C8X11	C8X11	0.015	1.000	0.015	Eq.H1-1b	23	3.370	32.500	1.310	0.130
508	HSST6X3	HSST6X3	0.012	1.000	0.012	Eq.H1-1b	12	3.840	17.000	5.700	14.200
509	HSST6X3	HSST6X3	0.029	1.000	0.029	Eq.H1-1b	23	3.840	17.000	5.700	14.200
510	C8X11	C8X11	0.015	1.000	0.015	Eq.H1-1b	22	3.370	32.500	1.310	0.130
511	HSST6X3	HSST6X3	0.012	1.000	0.012	Eq.H1-1b	12	3.840	17.000	5.700	14.200
512	HSST6X3	HSST6X3	0.026	1.000	0.026	Eq.H1-1b	10	3.840	17.000	5.700	14.200
513	C8X11	C8X11	0.013	1.000	0.013	Eq.H1-1b	23	3.370	32.500	1.310	0.130
514	HSST6X3	HSST6X3	0.012	1.000	0.012	Eq.H1-1b	12	3.840	17.000	5.700	14.200
515	C8X11	C8X11	0.020	1.000	0.020	Cl.E3	22	3.370	32.500	1.310	0.130
516	C8X11	C8X11	0.021	1.000	0.021	Cl.E3	23	3.370	32.500	1.310	0.130
517	C8X11	C8X11	0.016	1.000	0.016	Cl.E3	31	3.370	32.500	1.310	0.130
518	C8X11	C8X11	0.020	1.000	0.020	Cl.E3	22	3.370	32.500	1.310	0.130
519	HSST6X3	HSST6X3	0.009	1.000	0.009	Eq.H1-1b	22	3.840	17.000	5.700	14.200
520	C8X11	C8X11	0.012	1.000	0.012	Eq.H1-1b	9	3.370	32.500	1.310	0.130
521	HSST6X3	HSST6X3	0.002	1.000	0.002	Eq.H1-1b	9	3.840	17.000	5.700	14.200
522	HSST6X3	HSST6X3	0.006	1.000	0.006	Eq.H1-1b	9	3.840	17.000	5.700	14.200
523	C8X11	C8X11	0.013	1.000	0.013	Eq.H1-1b	23	3.370	32.500	1.310	0.130
524	HSST6X3	HSST6X3	0.003	1.000	0.003	Eq.H1-1b	9	3.840	17.000	5.700	14.200
525	HSST6X3	HSST6X3	0.009	1.000	0.009	Eq.H1-1b	23	3.840	17.000	5.700	14.200
526	C8X11	C8X11	0.013	1.000	0.013	Eq.H1-1b	22	3.370	32.500	1.310	0.130
527	HSST6X3	HSST6X3	0.002	1.000	0.002	Eq.H1-1b	9	3.840	17.000	5.700	14.200
528	HSST6X3	HSST6X3	0.007	1.000	0.007	Eq.H1-1b	9	3.840	17.000	5.700	14.200
529	C8X11	C8X11	0.012	1.000	0.012	Eq.H1-1b	9	3.370	32.500	1.310	0.130
530	HSST6X3	HSST6X3	0.003	1.000	0.003	Eq.H1-1b	9	3.840	17.000	5.700	14.200
531	HSST4X4	HSST4X4	0.134	1.000	0.134	Cl.E3	26	3.370	7.800	7.800	12.800
532	HSST4X4	HSST4X4	0.050	1.000	0.050	Cl.E3	30	3.370	7.800	7.800	12.800
533	HSST4X4	HSST4X4	0.109	1.000	0.109	Cl.E3	27	3.370	7.800	7.800	12.800
534	HSST4X4	HSST4X4	0.071	1.000	0.071	Cl.E3	27	3.370	7.800	7.800	12.800
535	HSST4X4	HSST4X4	0.030	1.000	0.030	Cl.E3	31	3.370	7.800	7.800	12.800
536	HSST4X4	HSST4X4	0.080	1.000	0.080	Cl.E3	27	3.370	7.800	7.800	12.800
537	HSST4X4	HSST4X4	0.157	1.000	0.157	Cl.E3	27	3.370	7.800	7.800	12.800
538	HSST4X4	HSST4X4	0.077	1.000	0.077	Cl.E3	26	3.370	7.800	7.800	12.800
539	HSST4X4	HSST4X4	0.058	1.000	0.058	Cl.E3	30	3.370	7.800	7.800	12.800
540	HSST4X4	HSST4X4	0.133	1.000	0.133	Cl.E3	26	3.370	7.800	7.800	12.800
541	HSST4X4	HSST4X4	0.274	1.000	0.274	Cl.E3	12	3.370	7.800	7.800	12.800
542	HSST4X4	HSST4X4	0.478	1.000	0.478	Cl.E3	27	3.370	7.800	7.800	12.800
583	L60606	N/A						4.380	6.203	24.571	0.205
584	L60606	N/A						4.380	6.203	24.571	0.205
585	L60606	N/A						4.380	6.203	24.571	0.205
586	L60606	N/A						4.380	6.203	24.571	0.205
587	L60606	N/A						4.380	6.203	24.571	0.205
588	L60606	N/A						4.380	6.203	24.571	0.205
589	L60606	N/A						4.380	6.203	24.571	0.205

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
590	L60606	N/A						4.380	6.203	24.571	0.205
591	W21X50	W21X50	0.246	1.000	0.246			32.311	2.78E+3	4.39E+3	3.09E+3
592	W21X50	W21X50	0.247	1.000	0.247			32.311	2.78E+3	4.39E+3	3.09E+3
593	W21X50	W21X50	0.159	1.000	0.159			32.311	2.78E+3	4.39E+3	3.09E+3
594	W21X50	W21X50	0.160	1.000	0.160			32.311	2.78E+3	4.39E+3	3.09E+3
595	W21X50	W21X50	0.297	1.000	0.297			32.311	2.78E+3	4.39E+3	3.09E+3
596	W21X50	W21X50	0.297	1.000	0.297			32.311	2.78E+3	4.39E+3	3.09E+3
597	W21X50	W21X50	0.170	1.000	0.170			23.121	2.18E+3	501.993	1.55E+3
598	W21X50	W21X50	0.172	1.000	0.172			23.121	2.18E+3	501.990	1.55E+3
599	L60606	N/A						4.380	6.203	24.571	0.205
600	L60606	N/A						4.380	6.203	24.571	0.205
601	L60606	N/A						4.380	6.203	24.571	0.205
602	L60606	N/A						4.380	6.203	24.571	0.205
603	L60606	N/A						4.380	6.203	24.571	0.205
604	L60606	N/A						4.380	6.203	24.571	0.205
605	L60606	N/A						4.380	6.203	24.571	0.205
606	L60606	N/A						4.380	6.203	24.571	0.205
631	W18X50	W18X50	0.104	1.000	0.104	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
632	W18X50	W18X50	0.225	1.000	0.225	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
633	W18X50	W18X50	0.225	1.000	0.225	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
634	W18X50	W18X50	0.105	1.000	0.105	LRFD-H1-1B-	10	14.700	800.000	40.100	1.240
635	W12X22	W12X22	0.032	1.000	0.032			23.920	704.953	4.24E+3	1.66E+3
636	W12X22	W12X22	0.050	1.000	0.050			23.920	704.953	4.24E+3	1.66E+3
637	W12X22	W12X22	0.032	1.000	0.032			23.920	704.952	4.24E+3	1.66E+3
638	W12X22	W12X22	0.050	1.000	0.050			23.920	704.952	4.24E+3	1.66E+3
639	W12X22	W12X22	0.032	1.000	0.032			23.920	704.952	4.24E+3	1.66E+3
640	W12X22	W12X22	0.050	1.000	0.050			23.920	704.952	4.24E+3	1.66E+3
641	W21X50	W21X50	0.225	1.000	0.225			32.311	2.78E+3	4.39E+3	3.09E+3
642	W21X50	W21X50	0.226	1.000	0.226			32.311	2.78E+3	4.39E+3	3.09E+3
643	W21X50	W21X50	0.116	1.000	0.116			23.121	2.18E+3	501.996	1.55E+3
644	W21X50	W21X50	0.117	1.000	0.117			23.121	2.18E+3	501.994	1.55E+3
645	W21X50	W21X50	0.184	1.000	0.184			32.311	2.78E+3	4.39E+3	3.09E+3
646	W21X50	W21X50	0.184	1.000	0.184			32.311	2.78E+3	4.39E+3	3.09E+3
647	W21X50	W21X50	0.115	1.000	0.115			23.121	2.18E+3	501.993	1.55E+3
648	W21X50	W21X50	0.116	1.000	0.116			23.121	2.18E+3	501.990	1.55E+3
653	W8X10	N/A						2.960	30.800	2.090	0.043
654	W8X10	N/A						2.960	30.800	2.090	0.043
655	W8X10	N/A						2.960	30.800	2.090	0.043
656	W8X10	N/A						2.960	30.800	2.090	0.043
657	W8X10	N/A						2.960	30.800	2.090	0.043
658	W8X10	N/A						11.680	194.944	531.838	535.752
659	W8X10	N/A						11.680	194.944	531.838	535.752
660	W8X10	N/A						2.960	30.800	2.090	0.043
661	W8X10	N/A						2.960	30.800	2.090	0.043
662	W8X10	N/A						2.960	30.800	2.090	0.043

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
663	W8X10	N/A						2.960	30.800	2.090	0.043
664	W8X10	N/A						12.326	198.231	658.482	579.586
665	W8X10	N/A						21.692	227.145	5.25E+3	1.24E+3
667	W12X22	W12X22	0.025	1.000	0.025	LRFD-H1-1B-	10	6.480	156.000	4.660	0.293
668	W8X10	N/A						11.680	194.944	531.848	535.756
669	W8X10	N/A						11.680	194.944	531.848	535.756
670	W8X10	N/A						40.424	254.542	42E+3	2.62E+3
672	W8X10	N/A						11.680	194.944	531.848	535.756
673	W8X10	N/A						2.960	30.800	2.090	0.043
674	W12X22	W12X22	0.009	1.000	0.009			15.846	597.443	661.052	854.763

Failed Members

There is no data of this type.

Reaction Summary

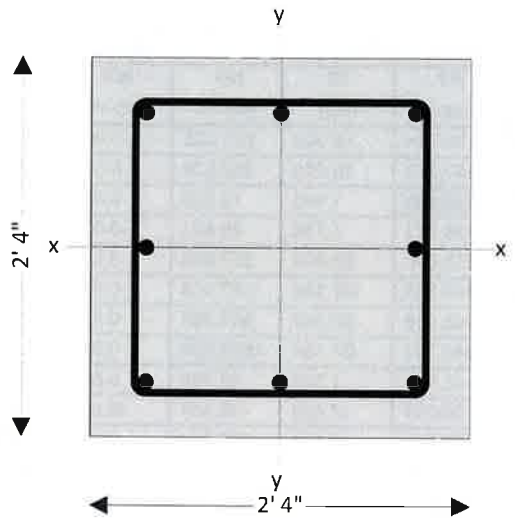
	Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)	
Max FX	1	12:1.2D+1.6L+	**21.086**	96.714	15.390	201.805	-0.000	-279.890	
Min FX	3	26:1.2D+1.0W(	**-26.713**	153.272	19.076	250.928	0.000	359.004	
Max FY	5	12:1.2D+1.6L+	0.012	**236.669**	1.105	13.852	0.000	-6.664	
Min FY	7	7:WIND(X-)	-11.077	**-36.371**	4.786	58.404	-0.000	155.374	
Max FZ	3	12:1.2D+1.6L+	-19.988	150.030	**20.349**	267.956	0.000	266.060	
Min FZ	9	27:1.2D+1.0W(	-16.333	148.769	**-27.184**	-357.768	-0.000	217.060	
Max MX	3	12:1.2D+1.6L+	-19.988	150.030	20.349	**267.956**	0.000	266.060	
Min MX	9	27:1.2D+1.0W(	-16.333	148.769	-27.184	**-357.768**	-0.000	217.060	29.814 k-ft
Max MY	4	26:1.2D+1.0W(	-5.443	49.884	1.382	18.399	**0.004**	338.241	
Min MY	8	31:1.2D-1.0E(Z	1.248	86.001	-2.498	-36.344	**-0.001**	-15.376	
Max MZ	3	26:1.2D+1.0W(	-26.713	153.272	19.076	250.928	0.000	**359.004**	29.917 k-ft
Min MZ	1	12:1.2D+1.6L+	21.086	96.714	15.390	201.805	-0.000	**-279.890**	

Maximum reactions used in column analysis on following pages.

Tekla Tedds	Project				Job Ref.	
Dewberry Engineers Inc. 99 Summer St. Boston, MA 02110	West Hartford Relo CT				50114615	
	Section				Sheet no./rev.	
	Concrete Column				1	
	Calc. by	Date	Chk'd by	Date	App'd by	Date
	AMD	7/10/2023	BGK	7/11/2023	BGK	7/12/2023

RC RECTANGULAR COLUMN DESIGN (ACI318-19)

Tedds calculation version 2.2.03



8 × No. 9 longitudinal bars

No. 4 ties @ 12 in c/c

Applied loads

Ultimate axial force acting on column	P_{u_act} = **236.669** kips
Ultimate moment about major (X) axis	M_{ux_act} = **29.814** kips_ft
Ultimate moment about minor (Y) axis	M_{uy_act} = **29.917** kips_ft
Contour beta factor	β = **0.650**

Geometry of column

Depth of column (larger dimension of column)	h = **28.0** in
Width of column (smaller dimension of column)	b = **28.0** in
Clear cover to reinforcement (both sides)	c_c = **3.0** in
Unsupported height of column about x axis	l_{ux} = **10.5** ft
Effective height factor about x axis	k_x = **0.65**
Column state about the x axis	Unbraced
Unsupported height of column about y axis	l_{uy} = **10.5** ft
Effective height factor about y axis	k_y = **1.20**
Column state about the y axis	Unbraced

Check on overall column dimensions

Column dimensions are OK - h < 4b

Reinforcement of column

Numbers of bars of longitudinal steel	N = **8**
Longitudinal steel bar diameter number	D_{bar_num} = **9**
Diameter of longitudinal bar	D_{long} = **1.128** in
Stirrup bar diameter number	D_{stir_num} = **4**
Diameter of stirrup bar	D_{stir} = **0.500** in
Specified yield strength of reinforcement	f_y = **60000** psi
Specified compressive strength of concrete	f'_c = **3000** psi

Modulus of elasticity of bar reinforcement	E_s = **29 × 10⁶** psi
Modulus of elasticity of concrete	$E_c = 57000 \times f'^{1/2}_c \times (1psi)^{1/2}$ = **3122019** psi
Yield strain	$\varepsilon_y = f_y / E_s$ = **0.00207**
Ultimate design strain	ε_c = **0.003** in/in

Check for minimum area of steel - 10.6.1.1

Gross area of column	$A_g = h \times b$ = **784.000** in²
Area of steel	$A_{st} = N \times (\pi \times D_{long}^2) / 4$ = **7.995** in²
Minimum area of steel required	$A_{st\_min} = 0.01 \times A_g$ = **7.840** in²

$A_{st} > A_{st\_min}$, PASS- Minimum steel check

Check for maximum area of steel - 10.6.1.1

Permissible maximum area of steel	$A_{st\_max} = 0.08 \times A_g$ = **62.720** in²

$A_{st} < A_{st\_max}$, PASS - Maximum steel check

Slenderness check about x axis

Radius of gyration	$r_x = 0.3 \times h$ = **8.4** in
Actual slenderness ratio	$s_{rx\_act} = k_x \times l_{ux} / r_x$ = **9.75**

Slenderness ratio is less than 22, slenderness effects may be neglected

Slenderness check about y axis

Radius of gyration	$r_y = 0.3 \times b$ = **8.4** in
Actual slenderness ratio	$s_{ry\_act} = k_y \times l_{uy} / r_y$ = **18**

Slenderness ratio is less than 22, slenderness effects may be neglected

Axial load capacity of axially loaded column

Strength reduction factor	ϕ = 0.65
Area of steel on compression face	$A'_s = A_{st} / 2$ = **3.997** in²
Area of steel on tension face	$A_s = A_{st} / 2$ = **3.997** in²
Net axial load capacity of column	$P_n = 0.8 \times (0.85 \times f'_c \times (A_g - A_{st}) + f_y \times A_{st})$ = **1966.793** kips
Ultimate axial load capacity of column	$P_u = \phi \times P_n$ = **1278.415** kips

PASS : Column is safe in axial loading

Net moments for biaxial column

Assuming strength reduction factor	ϕ = 0.65
Net moment about major (X) axis	$M_{nx} = M_{ux\_act} / \phi$ = **45.87** kips_ft
Net moment about minor (Y) axis	$M_{ny} = M_{uy\_act} / \phi$ = **46.03** kips_ft

Axial load capacity with zero moment

Nominal axial load capacity	$P_{n0} = 0.85 \times f'_c \times (A_g - A_{st}) + A_{st} \times f_y$ = **2458** kips
Strength reduction factor	ϕ = **0.650**
Ultimate axial load capacity	$P_{u0} = \phi \times P_{n0}$ = **1598** kips
Maximum nominal axial load capacity	$P_{n,max} = 0.8 \times P_{n0}$ = **1967** kips
Maximum ultimate axial load capacity	$P_{u,max} = 0.8 \times P_{u0}$ = **1278** kips

Axial and bending capacity at maximum axial capacity (bending about x axis)

Moment of resistance of concrete

Depth to neutral axis	c_{x0} = **27.7** in

Depth of equivalent rectangular stress block	$a_{x0} = \min((\beta_1 \times c_{x0}), h) = \mathbf{24}$ in
Concrete compression force	$P_{xcon0} = 0.85 \times f'_c \times b \times a_{x0} = \mathbf{1678.7}$ kips
Concrete moment of resistance	$M_{xcon0} = P_{xcon0} \times (h / 2 - (a_{x0} / 2)) = \mathbf{314.0}$ kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{x10} = \varepsilon_c \times (1 - x_{x1} / c_{x0}) = \mathbf{0.00256}$
Stress in layer 1	$\sigma_{x10} = \min(f_y, E_s \times \varepsilon_{x10}) - 0.85 \times f'_c = \mathbf{57450.00}$ psi
Force carried by layer 1	$P_{x10} = N_x \times A_{bar} \times \sigma_{x10} = \mathbf{172.234}$ kips
Moment carried by steel layer 1	$M_{x10} = P_{x10} \times ((h / 2) - x_{x1}) = \mathbf{142.610}$ kip_ft
Strain in layer 2	$\varepsilon_{x20} = \varepsilon_c \times (1 - x_{x2} / c_{x0}) = \mathbf{0.00148}$
Stress in layer 2	$\sigma_{x20} = \min(f_y, E_s \times \varepsilon_{x20}) - 0.85 \times f'_c = \mathbf{40414.96}$ psi
Force carried by layer 2	$P_{x20} = 2 \times A_{bar} \times \sigma_{x20} = \mathbf{80.776}$ kips
Moment carried by steel layer 2	$M_{x20} = P_{x20} \times ((h / 2) - x_{x2}) = \mathbf{0.000}$ kip_ft
Strain in layer 3	$\varepsilon_{x30} = \varepsilon_c \times (1 - x_{x3} / c_{x0}) = \mathbf{0.00040}$
Stress in layer 3	$\sigma_{x30} = \min(f_y, E_s \times \varepsilon_{x30}) = \mathbf{11712.67}$ psi
Force carried by layer 3	$P_{x30} = N_x \times A_{bar} \times \sigma_{x30} = \mathbf{35.114}$ kips
Moment carried by steel layer 3	$M_{x30} = P_{x30} \times ((h / 2) - x_{x3}) = \mathbf{-29.075}$ kip_ft

Combined axial load and moment resistance

Sum of forces	$P_{nx0} = \mathbf{1966.8}$ kips
Sum of moments	$M_{ox0} = \mathbf{427.5}$ kip_ft
Strength reduction factor	$\phi_x = \mathbf{0.650}$
Utilmate axial load capacity	$P_{ux0} = \phi_x \times P_{nx0} = \mathbf{1278.4}$ kips
Utilmate moment load capacity	$M_{uox0} = \phi_x \times M_{ox0} = \mathbf{277.9}$ kip_ft

Axial and bending capacity with zero strain in tension face reinforcement (bending about x axis)

Moment of resistance of concrete

Depth to neutral axis	$c_{x1} = \mathbf{23.9}$ in
Depth of equivalent rectangular stress block	$a_{x1} = \min((\beta_1 \times c_{x1}), h) = \mathbf{20}$ in
Concrete compression force	$P_{xcon1} = 0.85 \times f'_c \times b \times a_{x1} = \mathbf{1452.7}$ kips
Concrete moment of resistance	$M_{xcon1} = P_{xcon1} \times (h / 2 - (a_{x1} / 2)) = \mathbf{463.3}$ kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{x11} = \varepsilon_c \times (1 - x_{x1} / c_{x1}) = \mathbf{0.00249}$
Stress in layer 1	$\sigma_{x11} = \min(f_y, E_s \times \varepsilon_{x11}) - 0.85 \times f'_c = \mathbf{57450.00}$ psi
Force carried by layer 1	$P_{x11} = N_x \times A_{bar} \times \sigma_{x11} = \mathbf{172.234}$ kips
Moment carried by steel layer 1	$M_{x11} = P_{x11} \times ((h / 2) - x_{x1}) = \mathbf{142.610}$ kip_ft
Strain in layer 2	$\varepsilon_{x21} = \varepsilon_c \times (1 - x_{x2} / c_{x1}) = \mathbf{0.00125}$
Stress in layer 2	$\sigma_{x21} = \min(f_y, E_s \times \varepsilon_{x21}) - 0.85 \times f'_c = \mathbf{33564.30}$ psi
Force carried by layer 2	$P_{x21} = 2 \times A_{bar} \times \sigma_{x21} = \mathbf{67.084}$ kips
Moment carried by steel layer 2	$M_{x21} = P_{x21} \times ((h / 2) - x_{x2}) = \mathbf{0.000}$ kip_ft
Strain in layer 3	$\varepsilon_{x31} = \varepsilon_c \times (1 - x_{x3} / c_{x1}) = \mathbf{0.00000}$
Stress in layer 3	$\sigma_{x31} = \min(f_y, E_s \times \varepsilon_{x31}) = \mathbf{0.00}$ psi
Force carried by layer 3	$P_{x31} = N_x \times A_{bar} \times \sigma_{x31} = \mathbf{0.000}$ kips
Moment carried by steel layer 3	$M_{x31} = P_{x31} \times ((h / 2) - x_{x3}) = \mathbf{0.000}$ kip_ft

Combined axial load and moment resistance

Sum of forces	P_{nx1} = **1692.0** kips
Sum of moments	M_{ox1} = **605.9** kip_ft
Strength reduction factor	ϕ_x = **0.650**
Utilmate axial load capacity	$P_{ux1} = \phi_x \times P_{nx1}$ = **1099.8** kips
Utilmate moment load capacity	$M_{uox1} = \phi_x \times M_{ox1}$ = **393.8** kip_ft

Axial and bending capacity with tension face reinforcement at half yield strain (bending about x axis)

Moment of resistance of concrete

Depth to neutral axis	c_{x2} = **17.8** in
Depth of equivalent rectangular stress block	$a_{x2} = \min((\beta_1 \times c_{x2}), h)$ = **15** in
Concrete compression force	$P_{xcon2} = 0.85 \times f'_c \times b \times a_{x2}$ = **1080.2** kips
Concrete moment of resistance	$M_{xcon2} = P_{xcon2} \times (h / 2 - (a_{x2} / 2))$ = **579.3** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{x12} = \varepsilon_c \times (1 - x_{x1} / c_{x2})$ = **0.00232**
Stress in layer 1	$\sigma_{x12} = \min(f_y, E_s \times \varepsilon_{x12}) - 0.85 \times f'_c$ = **57450.00** psi
Force carried by layer 1	$P_{x12} = N_x \times A_{bar} \times \sigma_{x12}$ = **172.234** kips
Moment carried by steel layer 1	$M_{x12} = P_{x12} \times ((h / 2) - x_{x1})$ = **142.610** kip_ft
Strain in layer 2	$\varepsilon_{x22} = \varepsilon_c \times (1 - x_{x2} / c_{x2})$ = **0.00064**
Stress in layer 2	$\sigma_{x22} = \min(f_y, E_s \times \varepsilon_{x22}) - 0.85 \times f'_c$ = **16017.51** psi
Force carried by layer 2	$P_{x22} = 2 \times A_{bar} \times \sigma_{x22}$ = **32.014** kips
Moment carried by steel layer 2	$M_{x22} = P_{x22} \times ((h / 2) - x_{x2})$ = **0.000** kip_ft
Strain in layer 3	$\varepsilon_{x32} = \varepsilon_c \times (1 - x_{x3} / c_{x2})$ = **-0.00103**
Stress in layer 3	$\sigma_{x32} = \max(-1 \times f_y, E_s \times \varepsilon_{x32})$ = **-30000.00** psi
Force carried by layer 3	$P_{x32} = N_x \times A_{bar} \times \sigma_{x32}$ = **-89.940** kips
Moment carried by steel layer 3	$M_{x32} = P_{x32} \times ((h / 2) - x_{x3})$ = **74.470** kip_ft

Combined axial load and moment resistance

Sum of forces	P_{nx2} = **1194.5** kips
Sum of moments	M_{ox2} = **796.4** kip_ft
Strength reduction factor	ϕ_x = **0.650**
Utilmate axial load capacity	$P_{ux2} = \phi_x \times P_{nx2}$ = **776.4** kips
Utilmate moment load capacity	$M_{uox2} = \phi_x \times M_{ox2}$ = **517.7** kip_ft

Axial and bending capacity with tension face reinforcement at yield strain (bending about x axis)

Moment of resistance of concrete

Depth to neutral axis	c_{x3} = **14.2** in
Depth of equivalent rectangular stress block	$a_{x3} = \min((\beta_1 \times c_{x3}), h)$ = **12** in
Concrete compression force	$P_{xcon3} = 0.85 \times f'_c \times b \times a_{x3}$ = **859.7** kips
Concrete moment of resistance	$M_{xcon3} = P_{xcon3} \times (h / 2 - (a_{x3} / 2))$ = **571.7** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{x13} = \varepsilon_c \times (1 - x_{x1} / c_{x3})$ = **0.00214**
Stress in layer 1	$\sigma_{x13} = \min(f_y, E_s \times \varepsilon_{x13}) - 0.85 \times f'_c$ = **57450.00** psi

Force carried by layer 1	$P_{x13} = N_x \times A_{bar} \times \sigma_{x13}$ = **172.234** kips
Moment carried by steel layer 1	$M_{x13} = P_{x13} \times ((h / 2) - x_{x1})$ = **142.610** kip_ft
Strain in layer 2	$\varepsilon_{x23} = \varepsilon_c \times (1 - x_{x2} / c_{x3})$ = **0.00004**
Stress in layer 2	$\sigma_{x23} = \min(f_y, E_s \times \varepsilon_{x23})$ = **1020.72** psi
Force carried by layer 2	$P_{x23} = 2 \times A_{bar} \times \sigma_{x23}$ = **2.040** kips
Moment carried by steel layer 2	$M_{x23} = P_{x23} \times ((h / 2) - x_{x2})$ = **0.000** kip_ft
Strain in layer 3	$\varepsilon_{x33} = \varepsilon_c \times (1 - x_{x3} / c_{x3})$ = **-0.00207**
Stress in layer 3	$\sigma_{x33} = \max(-1 \times f_y, E_s \times \varepsilon_{x33})$ = **-60000.00** psi
Force carried by layer 3	$P_{x33} = N_x \times A_{bar} \times \sigma_{x33}$ = **-179.879** kips
Moment carried by steel layer 3	$M_{x33} = P_{x33} \times ((h / 2) - x_{x3})$ = **148.940** kip_ft

Combined axial load and moment resistance

Sum of forces	P_{nx3} = **854.1** kips
Sum of moments	M_{ox3} = **863.2** kip_ft
Strength reduction factor	ϕ_x = **0.650**
Utilmate axial load capacity	$P_{ux3} = \phi_x \times P_{nx3}$ = **555.2** kips
Utilmate moment load capacity	$M_{uox3} = \phi_x \times M_{ox3}$ = **561.1** kip_ft

Axial and bending capacity with tension face reinforcement strain of 0.005 (bending about x axis)

Moment of resistance of concrete

Depth to neutral axis	c_{x4} = **9.0** in
Depth of equivalent rectangular stress block	$a_{x4} = \min((\beta_1 \times c_{x4}), h)$ = **8** in
Concrete compression force	$P_{xcon4} = 0.85 \times f'_c \times b \times a_{x4}$ = **544.8** kips
Concrete moment of resistance	$M_{xcon4} = P_{xcon4} \times (h / 2 - (a_{x4} / 2))$ = **462.4** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{x14} = \varepsilon_c \times (1 - x_{x1} / c_{x4})$ = **0.00164**
Stress in layer 1	$\sigma_{x14} = \min(f_y, E_s \times \varepsilon_{x14}) - 0.85 \times f'_c$ = **45059.63** psi
Force carried by layer 1	$P_{x14} = N_x \times A_{bar} \times \sigma_{x14}$ = **135.088** kips
Moment carried by steel layer 1	$M_{x14} = P_{x14} \times ((h / 2) - x_{x1})$ = **111.853** kip_ft
Strain in layer 2	$\varepsilon_{x24} = \varepsilon_c \times (1 - x_{x2} / c_{x4})$ = **-0.00168**
Stress in layer 2	$\sigma_{x24} = \max(-1 \times f_y, E_s \times \varepsilon_{x24})$ = **-48695.19** psi
Force carried by layer 2	$P_{x24} = 2 \times A_{bar} \times \sigma_{x24}$ = **-97.325** kips
Moment carried by steel layer 2	$M_{x24} = P_{x24} \times ((h / 2) - x_{x2})$ = **0.000** kip_ft
Strain in layer 3	$\varepsilon_{x34} = \varepsilon_c \times (1 - x_{x3} / c_{x4})$ = **-0.00500**
Stress in layer 3	$\sigma_{x34} = \max(-1 \times f_y, E_s \times \varepsilon_{x34})$ = **-60000.00** psi
Force carried by layer 3	$P_{x34} = N_x \times A_{bar} \times \sigma_{x34}$ = **-179.879** kips
Moment carried by steel layer 3	$M_{x34} = P_{x34} \times ((h / 2) - x_{x3})$ = **148.940** kip_ft

Combined axial load and moment resistance

Sum of forces	P_{nx4} = **402.6** kips
Sum of moments	M_{ox4} = **723.2** kip_ft
Strength reduction factor	ϕ_x = **0.894**
Utilmate axial load capacity	$P_{ux4} = \phi_x \times P_{nx4}$ = **360.1** kips
Utilmate moment load capacity	$M_{uox4} = \phi_x \times M_{ox4}$ = **646.7** kip_ft

Axial and bending capacity with axial capacity of zero (bending about x axis)

Moment of resistance of concrete

Depth to neutral axis: c_{x5} = **4.5** in

Depth of equivalent rectangular stress block: $a_{x5} = \min((\beta_1 \times c_{x5}), h)$ = **4** in

Concrete compression force: $P_{xcon5} = 0.85 \times f'_c \times b \times a_{x5}$ = **273.9** kips

Concrete moment of resistance: $M_{xcon5} = P_{xcon5} \times (h / 2 - (a_{x5} / 2))$ = **275.7** kip_ft

Moment of resistance of reinforcement

Strain in layer 1: $\varepsilon_{x15} = \varepsilon_c \times (1 - x_{x1} / c_{x5})$ = **0.00030**

Stress in layer 1: $\sigma_{x15} = \min(f_y, E_s \times \varepsilon_{x15})$ = **8649.87** psi

Force carried by layer 1: $P_{x15} = N_x \times A_{bar} \times \sigma_{x15}$ = **25.932** kips

Moment carried by steel layer 1: $M_{x15} = P_{x15} \times ((h / 2) - x_{x1})$ = **21.472** kip_ft

Strain in layer 2: $\varepsilon_{x25} = \varepsilon_c \times (1 - x_{x2} / c_{x5})$ = **-0.00631**

Stress in layer 2: $\sigma_{x25} = \max(-1 \times f_y, E_s \times \varepsilon_{x25})$ = **-60000.00** psi

Force carried by layer 2: $P_{x25} = 2 \times A_{bar} \times \sigma_{x25}$ = **-119.919** kips

Moment carried by steel layer 2: $M_{x25} = P_{x25} \times ((h / 2) - x_{x2})$ = **0.000** kip_ft

Strain in layer 3: $\varepsilon_{x35} = \varepsilon_c \times (1 - x_{x3} / c_{x5})$ = **-0.01291**

Stress in layer 3: $\sigma_{x35} = \max(-1 \times f_y, E_s \times \varepsilon_{x35})$ = **-60000.00** psi

Force carried by layer 3: $P_{x35} = N_x \times A_{bar} \times \sigma_{x35}$ = **-179.879** kips

Moment carried by steel layer 3: $M_{x35} = P_{x35} \times ((h / 2) - x_{x3})$ = **148.940** kip_ft

Combined axial load and moment resistance

Sum of forces: P_{nx5} = **0.0** kips

Sum of moments: M_{ox5} = **446.2** kip_ft

Strength reduction factor: ϕ_x = **0.900**

Utilmate axial load capacity: $P_{ux5} = \phi_x \times P_{nx5}$ = **0.0** kips

Utilmate moment load capacity: $M_{uox5} = \phi_x \times M_{ox5}$ = **401.5** kip_ft

Axial and bending capacity at maximum axial capacity (bending about y axis)

Moment of resistance of concrete

Depth to neutral axis: c_{y0} = **27.7** in

Depth of equivalent rectangular stress block: $a_{y0} = \min((\beta_1 \times c_{y0}), b)$ = **24** in

Concrete compression force: $P_{ycon0} = 0.85 \times f'_c \times h \times a_{y0}$ = **1678.7** kips

Concrete moment of resistance: $M_{ycon0} = P_{ycon0} \times (b / 2 - (a_{y0} / 2))$ = **314.0** kip_ft

Moment of resistance of reinforcement

Strain in layer 1: $\varepsilon_{y10} = \varepsilon_c \times (1 - x_{y1} / c_{y0})$ = **0.00256**

Stress in layer 1: $\sigma_{y10} = \min(f_y, E_s \times \varepsilon_{y10}) - 0.85 \times f'_c$ = **57450.00** psi

Force carried by layer 1: $P_{y10} = N_y \times A_{bar} \times \sigma_{y10}$ = **172.234** kips

Moment carried by steel layer 1: $M_{y10} = P_{y10} \times ((b / 2) - x_{y1})$ = **142.610** kip_ft

Strain in layer 2: $\varepsilon_{y20} = \varepsilon_c \times (1 - x_{y2} / c_{y0})$ = **0.00148**

Stress in layer 2: $\sigma_{y20} = \min(f_y, E_s \times \varepsilon_{y20}) - 0.85 \times f'_c$ = **40414.96** psi

Force carried by layer 2: $P_{y20} = 2 \times A_{bar} \times \sigma_{y20}$ = **80.776** kips

Moment carried by steel layer 2: $M_{y20} = P_{y20} \times ((b / 2) - x_{y2})$ = **0.000** kip_ft

Strain in layer 3 $\varepsilon_{y30} = \varepsilon_c \times (1 - x_{y3} / c_{y0}) = \mathbf{0.00040}$

Stress in layer 3 $\sigma_{y30} = \min(f_y, E_s \times \varepsilon_{y30}) = \mathbf{11712.67}$ psi

Force carried by layer 3 $P_{y30} = N_y \times A_{bar} \times \sigma_{y30} = \mathbf{35.114}$ kips

Moment carried by steel layer 3 $M_{y30} = P_{y30} \times ((b / 2) - x_{y3}) = \mathbf{-29.075}$ kip_ft

Combined axial load and moment resistance

Sum of forces $P_{ny0} = \mathbf{1966.8}$ kips

Sum of moments $M_{oy0} = \mathbf{427.5}$ kip_ft

Strength reduction factor $\phi_y = \mathbf{0.650}$

Utilmate axial load capacity $P_{uy0} = \phi_y \times P_{ny0} = \mathbf{1278.4}$ kips

Utilmate moment load capacity $M_{uoy0} = \phi_y \times M_{oy0} = \mathbf{277.9}$ kip_ft

Axial and bending capacity with zero strain in tension face reinforcement (bending about y axis)

Moment of resistance of concrete

Depth to neutral axis $c_{y1} = \mathbf{23.9}$ in

Depth of equivalent rectangular stress block $a_{y1} = \min((\beta_1 \times c_{y1}), b) = \mathbf{20}$ in

Concrete compression force $P_{ycon1} = 0.85 \times f'_c \times h \times a_{y1} = \mathbf{1452.7}$ kips

Concrete moment of resistance $M_{ycon1} = P_{ycon1} \times (b / 2 - (a_{y1} / 2)) = \mathbf{463.3}$ kip_ft

Moment of resistance of reinforcement

Strain in layer 1 $\varepsilon_{y11} = \varepsilon_c \times (1 - x_{y1} / c_{y1}) = \mathbf{0.00249}$

Stress in layer 1 $\sigma_{y11} = \min(f_y, E_s \times \varepsilon_{y11}) - 0.85 \times f'_c = \mathbf{57450.00}$ psi

Force carried by layer 1 $P_{y11} = N_y \times A_{bar} \times \sigma_{y11} = \mathbf{172.234}$ kips

Moment carried by steel layer 1 $M_{y11} = P_{y11} \times ((b / 2) - x_{y1}) = \mathbf{142.610}$ kip_ft

Strain in layer 2 $\varepsilon_{y21} = \varepsilon_c \times (1 - x_{y2} / c_{y1}) = \mathbf{0.00125}$

Stress in layer 2 $\sigma_{y21} = \min(f_y, E_s \times \varepsilon_{y21}) - 0.85 \times f'_c = \mathbf{33564.30}$ psi

Force carried by layer 2 $P_{y21} = 2 \times A_{bar} \times \sigma_{y21} = \mathbf{67.084}$ kips

Moment carried by steel layer 2 $M_{y21} = P_{y21} \times ((b / 2) - x_{y2}) = \mathbf{0.000}$ kip_ft

Strain in layer 3 $\varepsilon_{y31} = \varepsilon_c \times (1 - x_{y3} / c_{y1}) = \mathbf{0.00000}$

Stress in layer 3 $\sigma_{y31} = \min(f_y, E_s \times \varepsilon_{y31}) = \mathbf{0.00}$ psi

Force carried by layer 3 $P_{y31} = N_y \times A_{bar} \times \sigma_{y31} = \mathbf{0.000}$ kips

Moment carried by steel layer 3 $M_{y31} = P_{y31} \times ((b / 2) - x_{y3}) = \mathbf{0.000}$ kip_ft

Combined axial load and moment resistance

Sum of forces $P_{ny1} = \mathbf{1692.0}$ kips

Sum of moments $M_{oy1} = \mathbf{605.9}$ kip_ft

Strength reduction factor $\phi_y = \mathbf{0.650}$

Utilmate axial load capacity $P_{uy1} = \phi_y \times P_{ny1} = \mathbf{1099.8}$ kips

Utilmate moment load capacity $M_{uoy1} = \phi_y \times M_{oy1} = \mathbf{393.8}$ kip_ft

Axial and bending capacity with tension face reinforcement at half yield strain (bending about y axis)

Moment of resistance of concrete

Depth to neutral axis $c_{y2} = \mathbf{17.8}$ in

Depth of equivalent rectangular stress block $a_{y2} = \min((\beta_1 \times c_{y2}), b) = \mathbf{15}$ in

Concrete compression force $P_{ycon2} = 0.85 \times f'_c \times h \times a_{y2} = \mathbf{1080.2}$ kips

Concrete moment of resistance	$M_{ycon2} = P_{ycon2} \times (b / 2 - (a_{y2} / 2)) =$ **579.3** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{y12} = \varepsilon_c \times (1 - x_{y1} / c_{y2}) =$ **0.00232**
Stress in layer 1	$\sigma_{y12} = \min(f_y, E_s \times \varepsilon_{y12}) - 0.85 \times f'_c =$ **57450.00** psi
Force carried by layer 1	$P_{y12} = N_y \times A_{bar} \times \sigma_{y12} =$ **172.234** kips
Moment carried by steel layer 1	$M_{y12} = P_{y12} \times ((b / 2) - x_{y1}) =$ **142.610** kip_ft
Strain in layer 2	$\varepsilon_{y22} = \varepsilon_c \times (1 - x_{y2} / c_{y2}) =$ **0.00064**
Stress in layer 2	$\sigma_{y22} = \min(f_y, E_s \times \varepsilon_{y22}) - 0.85 \times f'_c =$ **16017.51** psi
Force carried by layer 2	$P_{y22} = 2 \times A_{bar} \times \sigma_{y22} =$ **32.014** kips
Moment carried by steel layer 2	$M_{y22} = P_{y22} \times ((b / 2) - x_{y2}) =$ **0.000** kip_ft
Strain in layer 3	$\varepsilon_{y32} = \varepsilon_c \times (1 - x_{y3} / c_{y2}) =$ **-0.00103**
Stress in layer 3	$\sigma_{y32} = \max(-1 \times f_y, E_s \times \varepsilon_{y32}) =$ **-30000.00** psi
Force carried by layer 3	$P_{y32} = N_y \times A_{bar} \times \sigma_{y32} =$ **-89.940** kips
Moment carried by steel layer 3	$M_{y32} = P_{y32} \times ((b / 2) - x_{y3}) =$ **74.470** kip_ft

Combined axial load and moment resistance

Sum of forces	$P_{ny2} =$ **1194.5** kips
Sum of moments	$M_{oy2} =$ **796.4** kip_ft
Strength reduction factor	$\phi_y =$ **0.650**
Utilmate axial load capacity	$P_{uy2} = \phi_y \times P_{ny2} =$ **776.4** kips
Utilmate moment load capacity	$M_{uoy2} = \phi_y \times M_{oy2} =$ **517.7** kip_ft

Axial and bending capacity with tension face reinforcement at yield strain (bending about y axis)

Moment of resistance of concrete

Depth to neutral axis	$c_{y3} =$ **14.2** in
Depth of equivalent rectangular stress block	$a_{y3} = \min((\beta_1 \times c_{y3}), b) =$ **12** in
Concrete compression force	$P_{ycon3} = 0.85 \times f'_c \times h \times a_{y3} =$ **859.7** kips
Concrete moment of resistance	$M_{ycon3} = P_{ycon3} \times (b / 2 - (a_{y3} / 2)) =$ **571.7** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{y13} = \varepsilon_c \times (1 - x_{y1} / c_{y3}) =$ **0.00214**
Stress in layer 1	$\sigma_{y13} = \min(f_y, E_s \times \varepsilon_{y13}) - 0.85 \times f'_c =$ **57450.00** psi
Force carried by layer 1	$P_{y13} = N_y \times A_{bar} \times \sigma_{y13} =$ **172.234** kips
Moment carried by steel layer 1	$M_{y13} = P_{y13} \times ((b / 2) - x_{y1}) =$ **142.610** kip_ft
Strain in layer 2	$\varepsilon_{y23} = \varepsilon_c \times (1 - x_{y2} / c_{y3}) =$ **0.00004**
Stress in layer 2	$\sigma_{y23} = \min(f_y, E_s \times \varepsilon_{y23}) =$ **1020.72** psi
Force carried by layer 2	$P_{y23} = 2 \times A_{bar} \times \sigma_{y23} =$ **2.040** kips
Moment carried by steel layer 2	$M_{y23} = P_{y23} \times ((b / 2) - x_{y2}) =$ **0.000** kip_ft
Strain in layer 3	$\varepsilon_{y33} = \varepsilon_c \times (1 - x_{y3} / c_{y3}) =$ **-0.00207**
Stress in layer 3	$\sigma_{y33} = \max(-1 \times f_y, E_s \times \varepsilon_{y33}) =$ **-60000.00** psi
Force carried by layer 3	$P_{y33} = N_y \times A_{bar} \times \sigma_{y33} =$ **-179.879** kips
Moment carried by steel layer 3	$M_{y33} = P_{y33} \times ((b / 2) - x_{y3}) =$ **148.940** kip_ft

Combined axial load and moment resistance

Sum of forces	$P_{ny3} =$ **854.1** kips

Sum of moments	M_{oy3} = **863.2** kip_ft
Strength reduction factor	ϕ_y = **0.650**
Utilmate axial load capacity	$P_{uy3} = \phi_y \times P_{ny3}$ = **555.2** kips
Utilmate moment load capacity	$M_{uoy3} = \phi_y \times M_{oy3}$ = **561.1** kip_ft

Axial and bending capacity with tension face reinforcement strain of 0.005 (bending about y axis)

Moment of resistance of concrete

Depth to neutral axis	c_{y4} = **9.0** in
Depth of equivalent rectangular stress block	$a_{y4} = \min((\beta_1 \times c_{y4}), b)$ = **8** in
Concrete compression force	$P_{ycon4} = 0.85 \times f'_c \times h \times a_{y4}$ = **544.8** kips
Concrete moment of resistance	$M_{ycon4} = P_{ycon4} \times (b / 2 - (a_{y4} / 2))$ = **462.4** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{y14} = \varepsilon_c \times (1 - x_{y1} / c_{y4})$ = **0.00164**
Stress in layer 1	$\sigma_{y14} = \min(f_y, E_s \times \varepsilon_{y14}) - 0.85 \times f'_c$ = **45059.63** psi
Force carried by layer 1	$P_{y14} = N_y \times A_{bar} \times \sigma_{y14}$ = **135.088** kips
Moment carried by steel layer 1	$M_{y14} = P_{y14} \times ((b / 2) - x_{y1})$ = **111.853** kip_ft
Strain in layer 2	$\varepsilon_{y24} = \varepsilon_c \times (1 - x_{y2} / c_{y4})$ = **-0.00168**
Stress in layer 2	$\sigma_{y24} = \max(-1 \times f_y, E_s \times \varepsilon_{y24})$ = **-48695.19** psi
Force carried by layer 2	$P_{y24} = 2 \times A_{bar} \times \sigma_{y24}$ = **-97.325** kips
Moment carried by steel layer 2	$M_{y24} = P_{y24} \times ((b / 2) - x_{y2})$ = **0.000** kip_ft
Strain in layer 3	$\varepsilon_{y34} = \varepsilon_c \times (1 - x_{y3} / c_{y4})$ = **-0.00500**
Stress in layer 3	$\sigma_{y34} = \max(-1 \times f_y, E_s \times \varepsilon_{y34})$ = **-60000.00** psi
Force carried by layer 3	$P_{y34} = N_y \times A_{bar} \times \sigma_{y34}$ = **-179.879** kips
Moment carried by steel layer 3	$M_{y34} = P_{y34} \times ((b / 2) - x_{y3})$ = **148.940** kip_ft

Combined axial load and moment resistance

Sum of forces	P_{ny4} = **402.6** kips
Sum of moments	M_{oy4} = **723.2** kip_ft
Strength reduction factor	ϕ_y = **0.894**
Utilmate axial load capacity	$P_{uy4} = \phi_y \times P_{ny4}$ = **360.1** kips
Utilmate moment load capacity	$M_{uoy4} = \phi_y \times M_{oy4}$ = **646.7** kip_ft

Axial and bending capacity with axial capacity of zero (bending about y axis)

Moment of resistance of concrete

Depth to neutral axis	c_{y5} = **4.5** in
Depth of equivalent rectangular stress block	$a_{y5} = \min((\beta_1 \times c_{y5}), b)$ = **4** in
Concrete compression force	$P_{ycon5} = 0.85 \times f'_c \times h \times a_{y5}$ = **273.9** kips
Concrete moment of resistance	$M_{ycon5} = P_{ycon5} \times (b / 2 - (a_{y5} / 2))$ = **275.7** kip_ft

Moment of resistance of reinforcement

Strain in layer 1	$\varepsilon_{y15} = \varepsilon_c \times (1 - x_{y1} / c_{y5})$ = **0.00030**
Stress in layer 1	$\sigma_{y15} = \min(f_y, E_s \times \varepsilon_{y15})$ = **8649.87** psi
Force carried by layer 1	$P_{y15} = N_y \times A_{bar} \times \sigma_{y15}$ = **25.932** kips
Moment carried by steel layer 1	$M_{y15} = P_{y15} \times ((b / 2) - x_{y1})$ = **21.472** kip_ft

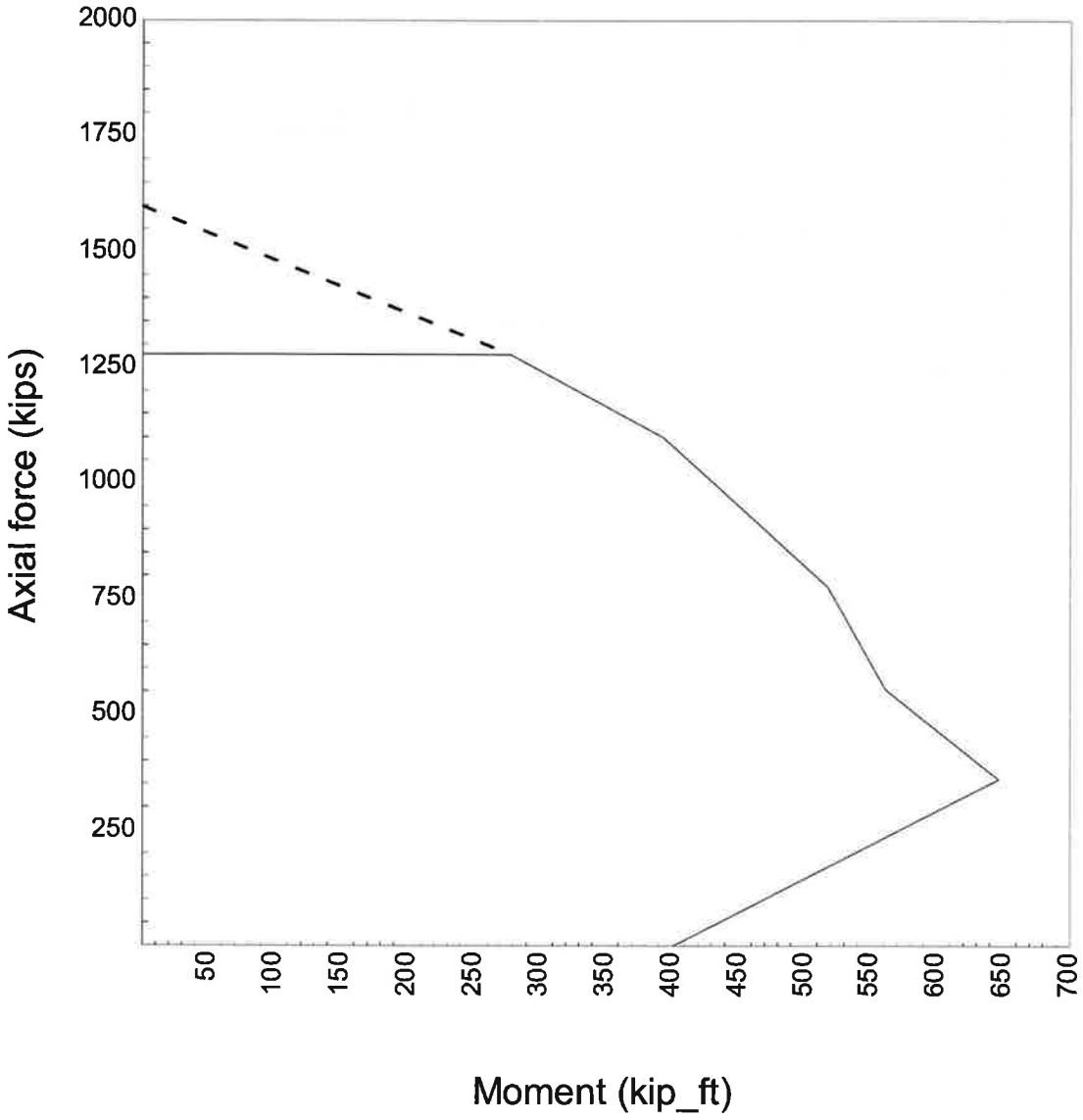
Strain in layer 2	$\varepsilon_{y25} = \varepsilon_c \times (1 - x_{y2} / c_{y5}) =$ **-0.00631**
Stress in layer 2	$\sigma_{y25} = \max(-1 \times f_y, E_s \times \varepsilon_{y25}) =$ **-60000.00** psi
Force carried by layer 2	$P_{y25} = 2 \times A_{bar} \times \sigma_{y25} =$ **-119.919** kips
Moment carried by steel layer 2	$M_{y25} = P_{y25} \times ((b / 2) - x_{y2}) =$ **0.000** kip_ft
Strain in layer 3	$\varepsilon_{y35} = \varepsilon_c \times (1 - x_{y3} / c_{y5}) =$ **-0.01291**
Stress in layer 3	$\sigma_{y35} = \max(-1 \times f_y, E_s \times \varepsilon_{y35}) =$ **-60000.00** psi
Force carried by layer 3	$P_{y35} = N_y \times A_{bar} \times \sigma_{y35} =$ **-179.879** kips
Moment carried by layer 3	$M_{y35} = P_{y35} \times ((b / 2) - x_{y3}) =$ **148.940** kip_ft

Combined axial load and moment resistance

Sum of forces	$P_{ny5} =$ **0.0** kips
Sum of moments	$M_{oy5} =$ **446.2** kip_ft
Strength reduction factor	$\phi_y =$ **0.900**
Utilmate axial load capacity	$P_{uy5} = \phi_y \times P_{ny5} =$ **0.0** kips
Utilmate moment load capacity	$M_{uoy5} = \phi_y \times M_{oy5} =$ **401.5** kip_ft

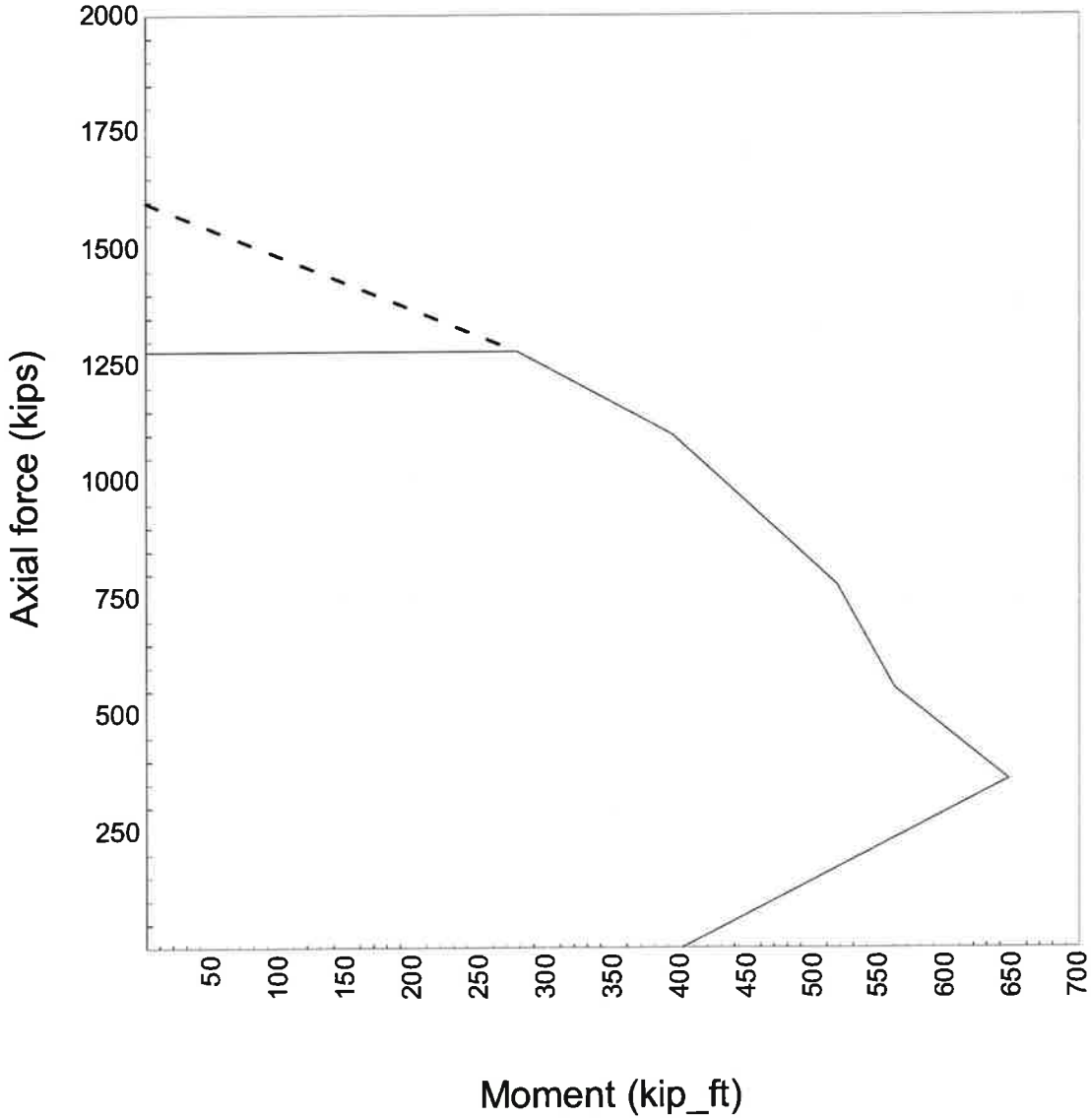
Interaction diagram for bending about x axis

28 in x 28 in column, 8 × No. 9 longitudinal bars



Interaction diagram for bending about y axis

28 in x 28 in column, 8 × No. 9 longitudinal bars



ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

D - Default (see Section 11.4.3)

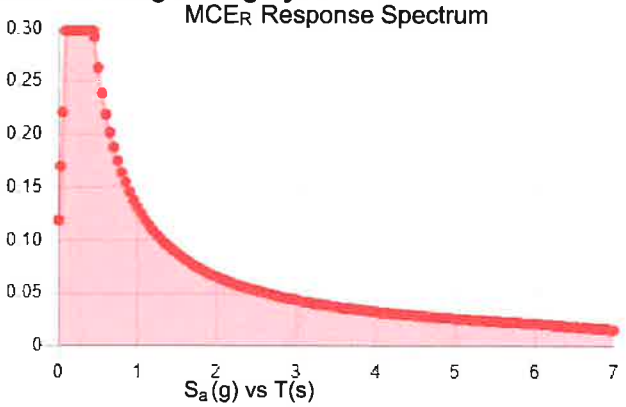
Site Soil Class:

Results:

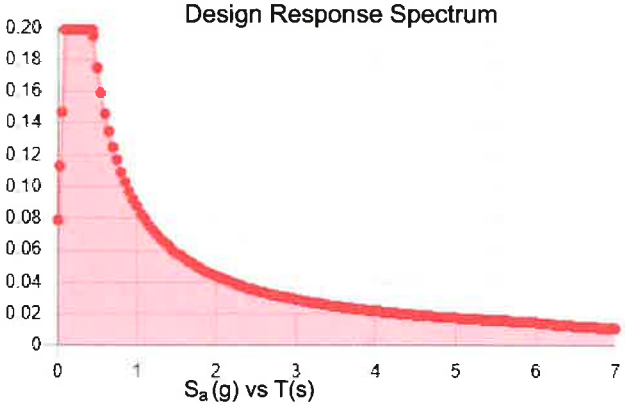
S_S :	0.186	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.1
F_v :	2.4	PGA_M :	0.16
S_{MS} :	0.298	F_{PGA} :	1.6
S_{M1} :	0.131	I_e :	1
S_{DS} :	0.199	C_v :	0.7

Seismic Design Category: B

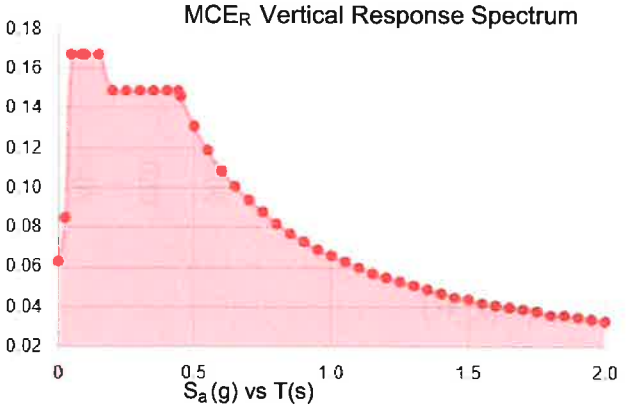
MCE_R Response Spectrum



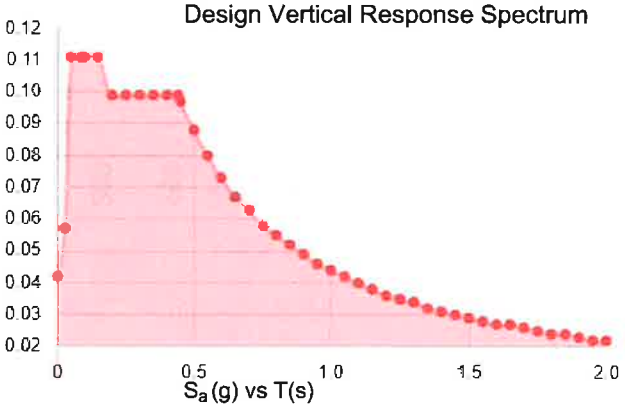
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: **Wed Jul 19 2023**

Date Source:

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

verizon
NPP RFDS

EAST > New England > > North East > W HARTFORD W CT RELO

Latorre. Juan - jay.latorre@verizonwireless.com - 10042023

Project Details

Carrier Aggregation:	☐
Eclp	☐
Project Name:	RADIO SWAP
Project Alt Name:	W HARTFORD W CT RELO - C BAND GEN 2 MMU FOA
Project ID:	17082760
Designed Sector Carrier 4G:	12
Designed Sector Carrier 5G:	6
Additional Sector Carrier 4G:	0
Additional Sector Carrier 5G:	0
Suffix:	
FP Solution Type & Tech Type:	MODIFICATION;5G_Radio Swap
RFDS Project Scope	

Location Information

Site ID:	1339019
Search Ring#:	
E-NodeB ID#:	068846|0689552
PSLC#:	472708
Switch Name:	Windsor-3
Tower Type:	
Site Type:	MACRO
Street Address:	139 North Main Street
City:	West Hartford
State:	CT
Zip Code:	06107
County:	Hartford
Latitude:	41.77062
Longitude:	-72.7496

RFDS Project Scope

C Band Gen 1 to Gen 2 MMU Swap.

Antenna Summary

Added Antennas

L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	Install Type	Quantity
5G	Samsung	MT6413-77A	78	79.2	40(310),140(311),270(312)	PHYSICAL	3

All items per page 1 - 1 of 1 items

Removed Antennas

L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	Install Type	Quantity
5G	Samsung	MT6407-77A	78	79.5	40(310),140(311),270(312)	PHYSICAL	3

All items per page 1 - 1 of 1 items

Retained Antennas

700	850	1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	Install Type	Quantity
LTE	5G,LTE	LTE	LTE	ANDREW	SBNHH-1D65B	78	81	40(1),140(2),270(3),40(310),140(311),270(3	PHYSICAL	6

All items per page 1 - 1 of 1 items

Added : 3 Removed : 3 Retained : 6

Non Antenna Summary

Added Non Antennas

Equipment Type	Location	L-Sub6	Make	Model	Install Type	Hide on PDF

All items per page

1 - 1 of 1 items

Removed Non Antennas

Equipment Type	Location	L-Sub6	Make	Model	Install Type	Hide on PDF

All items per page

1 - 1 of 1 items

Retained Non Antennas

Equipment Type	Location	700	850	1900	AWS	Make	Model	Install Type	Quantity
RRU	Tower			LTE	LTE	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)	PHYSICAL	3
RRU	Tower	LTE	5G,LTE			Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)	PHYSICAL	3

All items per page

1 - 2 of 2 items

Added : 0 Removed : 0 Retained : 6

	Current Version			Proposed Version		
	0000			0002		
	Site Record Id:1129647 Last Import:2023-04-10 08:46:34			Site Record Id:8595125 Last Import:2023-04-10 08:46:34		
1900 LTE	0000			0002		
Sector:	01	02	03	01	02	03
Azimuth:	40	140	270	40	140	270
Cell/E-NodeB Id:	068846	068846	068846	068846	068846	068846
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	78	78	78	78	78	78
DLEARFCN:	1050	1050	1050	1050	1050	1050
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	0	3	0	0	3	0
Tip Height:	81	81	81	81	81	81
Regulatory Power:	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	2 , 4	4 , 4	4 , 4	2 , 4
Position:	null	null	null	null	null	null
Transmitter Id:	7477208	7477209	7477210	16564986	16564989	16564992
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

700 LTE		0000			0002	
Sector:	01	02	03	01	02	03
Azimuth:	40	140	270	40	140	270
Cell/E-NodeB Id:	068846	068846	068846	068846	068846	068846
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	78	78	78	78	78	78
DLEARFCN:	5230	5230	5230	5230	5230	5230
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	0	0	0	0	0	0
Tip Height:	81	81	81	81	81	81
Regulatory Power:	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP	117.24 (W/MHz) ERP	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP	117.24 (W/MHz) ERP
Cell Max Power:	46 dBm	46 dBm	47.8 dBm	46 dBm	46 dBm	47.8 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	2 , 4	4 , 4	4 , 4	2 , 4
Position:	null	null	null	null	null	null
Transmitter Id:	7477214	7477216	7477218	16564985	16564988	16564991
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

850 LTE		0000			0002	
Sector:	01	02	03	01	02	03
Azimuth:	40	140	270	40	140	270
Cell/E-NodeB Id:	068846	068846	068846	068846	068846	068846
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	78	78	78	78	78	78
DLEARFCN:	2450	2450	2450	2450	2450	2450
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	7	0	0	7	0	0
Tip Height:	81	81	81	81	81	81
Regulatory Power:	366.87 (W/MHz) ERPSD	305.36 (W/MHz) ERPSD	152.68 (W/MHz) ERPSD	366.87 (W/MHz) ERPSD	305.36 (W/MHz) ERPSD	152.68 (W/MHz) ERPSD
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	2 , 4	4 , 4	4 , 4	2 , 4
Position:	null	null	null	null	null	null
Transmitter Id:	10970620	10970621	10970622	16564997	16564998	16564999
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

850 NR	0000			0002		
Sector:	0310	0311	0312	0310	0311	0312
Azimuth:	40	140	270	40	140	270
Cell/E-NodeB Id:	0689552	0689552	0689552	0689552	0689552	0689552
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	78	78	78	78	78	78
DLEARFCN:	2450	2450	2450	2450	2450	2450
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	7	0	0	7	0	0
Tip Height:	81	81	81	81	81	81
Regulatory Power:	366.87 (W/MHz) ERPSD	305.36 (W/MHz) ERPSD	152.68 (W/MHz) ERPSD	366.87 (W/MHz) ERPSD	305.36 (W/MHz) ERPSD	152.68 (W/MHz) ERPSD
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	2 , 4	4 , 4	4 , 4	2 , 4
Position:	null	null	null	null	null	null
Transmitter Id:	10970620	10970621	10970622	16564997	16564998	16564999
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

AWS LTE		0000			0002	
Sector:	01	02	03	01	02	03
Azimuth:	40	140	270	40	140	270
Cell/E-NodeB Id:	068846	068846	068846	068846	068846	068846
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	78	78	78	78	78	78
DLEARFCN:	2050	2050	2050	2050	2050	2050
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	0	3	0	0	3	0
Tip Height:	81	81	81	81	81	81
Regulatory Power:	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	2 , 4	4 , 4	4 , 4	2 , 4
Position:	null	null	null	null	null	null
Transmitter Id:	7477215	7477217	7477219	16564987	16564990	16564993
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	20	20	20	20	20	20

CBAND NR	0000			0002		
Sector:	0310	0311	0312	0310	0311	0312
Azimuth:	40	140	270	40	140	270
Cell/E-NodeB Id:	0689552	0689552	0689552	0689552	0689552	0689552
Antenna Model:	MT6407-77A	MT6407-77A	MT6407-77A	MT6413-77A	MT6413-77A	MT6413-77A
Antenna Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
Antenna CenterLine(Ft):	78	78	78	78	78	78
DLEARFCN:	648672	648672	648672	648672	648672	648672
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	1	1	1	3	3	3
Tip Height:	79.5	79.5	79.5	79.2	79.2	79.2
Regulatory Power:	767.64 (W/MHz) EIRP	767.64 (W/MHz) EIRP	767.64 (W/MHz) EIRP	1603.82 (W/MHz) EIRP	1603.82 (W/MHz) EIRP	1603.82 (W/MHz) EIRP
Cell Max Power:	47.8 dBm	47.8 dBm	47.8 dBm	51.1 dBm	51.1 dBm	51.1 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	MT6407-77A	MT6407-77A	MT6407-77A	MT6413-77A	MT6413-77A	MT6413-77A
Number of Tx, Rx Lines:	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Position:	null	null	null	null	null	null
Transmitter Id:	7477238	7477239	7477240	16564994	16564995	16564996
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	60	60	60	60	60	60

Callsigns per Antenna - Propose ☐ Select PSD/non PSD per sector

Sector	Antenna Make	Antenna Model	Ant CL	Tip Height	Azimuth	Electrical Tilt	Mechanical Tilt	Gain	Beam	Regulatory Power	Callsigns 700	850	1900	2100	28 GHz	31 GHz	39 GHz	L-Sub6	CBRS
03	ANDREW	SBNHH-1E	78	81	270	0	0	12.508	68.5	117.24	WQJQ689								
0310	ANDREW	SBNHH-1E	78	81	40	7	0	12.311	64.75	366.87 - PSD		KNKA404							
01	ANDREW	SBNHH-1E	78	81	40	7	0	12.311	64.75	366.87 - PSD		KNKA404							
0311	ANDREW	SBNHH-1E	78	81	140	0	0	12.57	64.5	305.36 - PSD		KNKA404							
03	ANDREW	SBNHH-1E	78	81	270	0	0	16.188	60.25	144.05				WQGA906,WQ					
02	ANDREW	SBNHH-1E	78	81	140	0	0	12.508	68.5	77.46	WQJQ689								
03	ANDREW	SBNHH-1E	78	81	270	0	0	16.188999	53	290.31			KNLH251,WPO						
02	ANDREW	SBNHH-1E	78	81	140	3	0	16.122	53	290.31			KNLH251,WPO						
02	ANDREW	SBNHH-1E	78	81	140	0	0	12.57	64.5	305.36 - PSD		KNKA404							
03	ANDREW	SBNHH-1E	78	81	270	0	0	12.57	64.5	152.68 - PSD		KNKA404							
02	ANDREW	SBNHH-1E	78	81	140	3	0	16.077	61.75	144.05				WQGA906,WQ					
01	ANDREW	SBNHH-1E	78	81	40	0	0	16.188999	53	290.31			KNLH251,WPO						
0312	ANDREW	SBNHH-1E	78	81	270	0	0	12.57	64.5	152.68 - PSD		KNKA404							
01	ANDREW	SBNHH-1E	78	81	40	0	0	16.188	60.25	144.05				WQGA906,WQ					
01	ANDREW	SBNHH-1E	78	81	40	0	0	12.508	68.5	77.46	WQJQ689								

All items per page 1 - 15 of 15 items

Callsigns

Callsign	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range	Freq Range	Freq Range	Freq Range	Regulatory Power	Threshold	POPs/Sq MI	Action	Approved for Insvc
WQJQ689	Northeast	WU	REA001	G	CT	Hartford	Cellco Partnership	Yes	22.000	746.000 - 757.000/775.000 - .000	776.000 - 787.000/805.000 - .000	746.000 - 757.000/775.000 - .000	776.000 - 787.000/805.000 - .000	117.24	1000	1223.64	retained	1
KNKA404	Hartford-New Britain-Bristol, CT	CL	CMA032	A	CT	Hartford	Cellco Partnership	Yes	25.000	824.000 - 835.000/845 - 846.500	869.000 - 880.000/890 - 891.500	824.000 - 835.000/845 - 846.500	869.000 - 880.000/890 - 891.500	152.68	400	1223.64	retained	1
										1895.000 -	1975.000 -	1895.000 -	1975.000 -					

WPQJ730	Hartford, CT	CW	BTA184	C	CT	Hartford	Cellco Partnership	Yes	10.000	1900.000/.00 - .000	1980.000/.00 - .000	1900.000/.00 - .000	1980.000/.00 - .000	290.31	1640	1223.64	retained	1
KNLH251	Hartford, CT	CW	BTA184	F	CT	Hartford	Cellco Partnership	Yes	10.000	1890.000 - 1895.000/.00 - .000	1970.000 - 1975.000/.00 - .000	1890.000 - 1895.000/.00 - .000	1970.000 - 1975.000/.00 - .000	290.31	1640	1223.64	retained	1
WQGB276	Hartford-New Britain-Bristol, CT	AW	CMA032	A	CT	Hartford	Cellco Partnership	Yes	20.000	1710.000 - 1720.000/.00 - .000	2110.000 - 2120.000/.00 - .000	1710.000 - 1720.000/.00 - .000	2110.000 - 2120.000/.00 - .000	144.05	1640	1223.64	retained	1
WRNE581	New York, NY	PM	PEA001	A1	CT	Hartford	Cellco Partnership	Yes	20.000	3700.000 - 3720.000/.00 - .000	.000 -000/.000 -000	3700.000 - 3720.000/.00 - .000	.000 -000/.000 -000		1640	1223.64		1
WRNE582	New York, NY	PM	PEA001	A2	CT	Hartford	Cellco Partnership	Yes	20.000	3720.000 - 3740.000/.00 - .000	.000 -000/.000 -000	3720.000 - 3740.000/.00 - .000	.000 -000/.000 -000		1640	1223.64		1
WRNE583	New York, NY	PM	PEA001	A3	CT	Hartford	Cellco Partnership	Yes	20.000	3740.000 - 3760.000/.00 - .000	.000 -000/.000 -000	3740.000 - 3760.000/.00 - .000	.000 -000/.000 -000		1640	1223.64		1
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	Hartford	Cellco Partnership	Yes	20.000	1720.000 - 1730.000/.00 - .000	2120.000 - 2130.000/.00 - .000	1720.000 - 1730.000/.00 - .000	2120.000 - 2130.000/.00 - .000	144.05	1640	1223.64	retained	1
WRBA708	Hartford, CT	UU	BTA184	L1	CT	Hartford	Cellco Partnership	Yes	325.000	27500.000 - 27600.000/.0 - .000	27700.000 - 27925.000/.0 - .000	27500.000 - 27600.000/.0 - .000	27700.000 - 27925.000/.0 - .000			1223.64		1
WRBA709	Hartford, CT	UU	BTA184	L2	CT	Hartford	Cellco Partnership	Yes	325.000	27925.000 - 28050.000/.0 - .000	28150.000 - 28350.000/.0 - .000	27925.000 - 28050.000/.0 - .000	28150.000 - 28350.000/.0 - .000			1223.64		1
WRHD609	New York, NY	UU	PEA001	M1	CT	Hartford	Cellco Partnership	Yes	100.000	37600.000 - 37700.000/.0 - .000	.000 -000/.000 -000	37600.000 - 37700.000/.0 - .000	.000 -000/.000 -000			1223.64		1
WRHD610	New York, NY	UU	PEA001	M10	CT	Hartford	Cellco Partnership	Yes	100.000	38500.000 - 38600.000/.0 - .000	000 -000/.000 -000	38500.000 - 38600.000/.0 - .000	000 -000/.000 -000			1223.64		1
WRHD611	New York, NY	UU	PEA001	M2	CT	Hartford	Cellco Partnership	Yes	100.000	37700.000 - 37800.000/.0 - .000	.000 -000/.000 -000	37700.000 - 37800.000/.0 - .000	.000 -000/.000 -000			1223.64		1
WRHD612	New York, NY	UU	PEA001	M3	CT	Hartford	Cellco Partnership	Yes	100.000	37800.000 - 37900.000/.0 - .000	000 -000/.000 -000	37800.000 - 37900.000/.0 - .000	000 -000/.000 -000			1223.64		1
WRHD613	New York, NY	UU	PEA001	M4	CT	Hartford	Cellco Partnership	Yes	100.000	37900.000 - 38000.000/.0 - .000	.000 -000/.000 -000	37900.000 - 38000.000/.0 - .000	.000 -000/.000 -000			1223.64		1

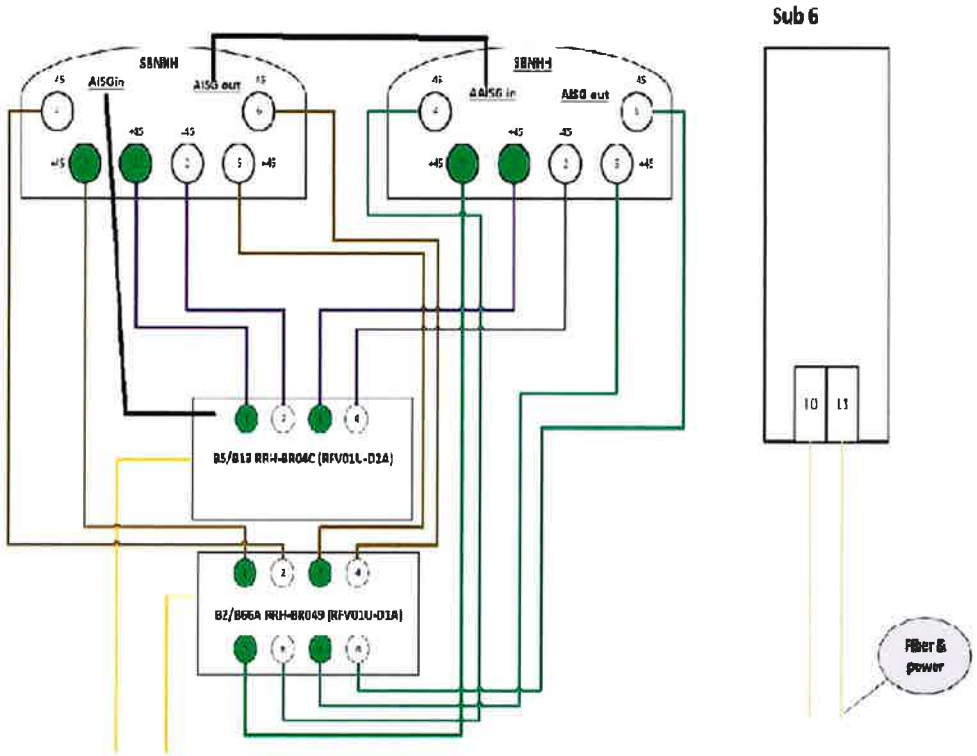
WRHD614	New York, NY	UU	PEA001	M5	CT	Hartford	Cellco Partnership	Yes	100.000	38000.000 - 38100.000/.0 - .000	.000 -000/.000 -000	38000.000 - 38100.000/.0 - .000	000 -000/.000 -000		1223.64	1
WRHD615	New York, NY	UU	PEA001	M6	CT	Hartford	Cellco Partnership	Yes	100.000	38100.000 - 38200.000/.0 - .000	.000 -000/.000 -000	38100.000 - 38200.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD616	New York, NY	UU	PEA001	M7	CT	Hartford	Cellco Partnership	Yes	100.000	38200.000 - 38300.000/.0 - .000	000 -000/.000 -000	38200.000 - 38300.000/.0 - .000	000 -000/.000 -000		1223.64	1
WRHD617	New York, NY	UU	PEA001	M8	CT	Hartford	Cellco Partnership	Yes	100.000	38300.000 - 38400.000/.0 - .000	.000 -000/.000 -000	38300.000 - 38400.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD618	New York, NY	UU	PEA001	M9	CT	Hartford	Cellco Partnership	Yes	100.000	38400.000 - 38500.000/.0 - .000	000 -000/.000 -000	38400.000 - 38500.000/.0 - .000	000 -000/.000 -000		1223.64	1
WRHD619	New York, NY	UU	PEA001	N1	CT	Hartford	Cellco Partnership	Yes	100.000	38600.000 - 38700.000/.0 - .000	.000 -000/.000 -000	38600.000 - 38700.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRLD513	D09003 - Hartford, CT	PL	D09003	0	CT	Hartford	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 - 3650.000/.00 - .000	000 -000/.000 -000	3550.000 - 3650.000/.00 - .000	000 -000/.000 -000	501	1223.64	1
WRLD514	D09003 - Hartford, CT	PL	D09003	0	CT	Hartford	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000	501	1223.64	1
WRLD515	D09003 - Hartford, CT	PL	D09003	0	CT	Hartford	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 - 3650.000/.00 - .000	000 -000/.000 -000	3550.000 - 3650.000/.00 - .000	000 -000/.000 -000	501	1223.64	1
PEND1050	Northeast	CC	REA001	A	CT	Hartford	Cellco Partnership	Yes	.000	.000 -000/.000 -000	.000 -000/.000 -000	.000 -000/.000 -000	.000 -000/.000 -000	1640	1223.64	0
WRNE584	New York, NY	PM	PEA001	A4	CT	Hartford	Cellco Partnership	Yes	20.000	3760.000 - 3780.000/.00 - .000	000 -000/.000 -000	3760.000 - 3780.000/.00 - .000	000 -000/.000 -000	1640	1223.64	0
WRNE585	New York, NY	PM	PEA001	A5	CT	Hartford	Cellco Partnership	Yes	20.000	3780.000 - 3800.000/.00 - .000	.000 -000/.000 -000	3780.000 - 3800.000/.00 - .000	.000 -000/.000 -000	1640	1223.64	0
WRNE586	New York, NY	PM	PEA001	B1	CT	Hartford	Cellco Partnership	Yes	20.000	3800.000 - 3820.000/.00 - .000	000 -000/.000 -000	3800.000 - 3820.000/.00 - .000	000 -000/.000 -000	1640	1223.64	0

WRNE587	New York, NY	PM	PEA001	B2	CT	Hartford	Cellco Partnership	Yes	20.000	3820.000 - 3840.000/.00 - .000	.000 -000/.000 -000	3820.000 - 3840.000/.00 - .000	.000 -000/.000 -000	1640	1223.64	0
WRNE588	New York, NY	PM	PEA001	B3	CT	Hartford	Cellco Partnership	Yes	20.000	3840.000 - 3860.000/.00 - .000	.000 -000/.000 -000	3840.000 - 3860.000/.00 - .000	.000 -000/.000 -000	1640	1223.64	0

All items per page

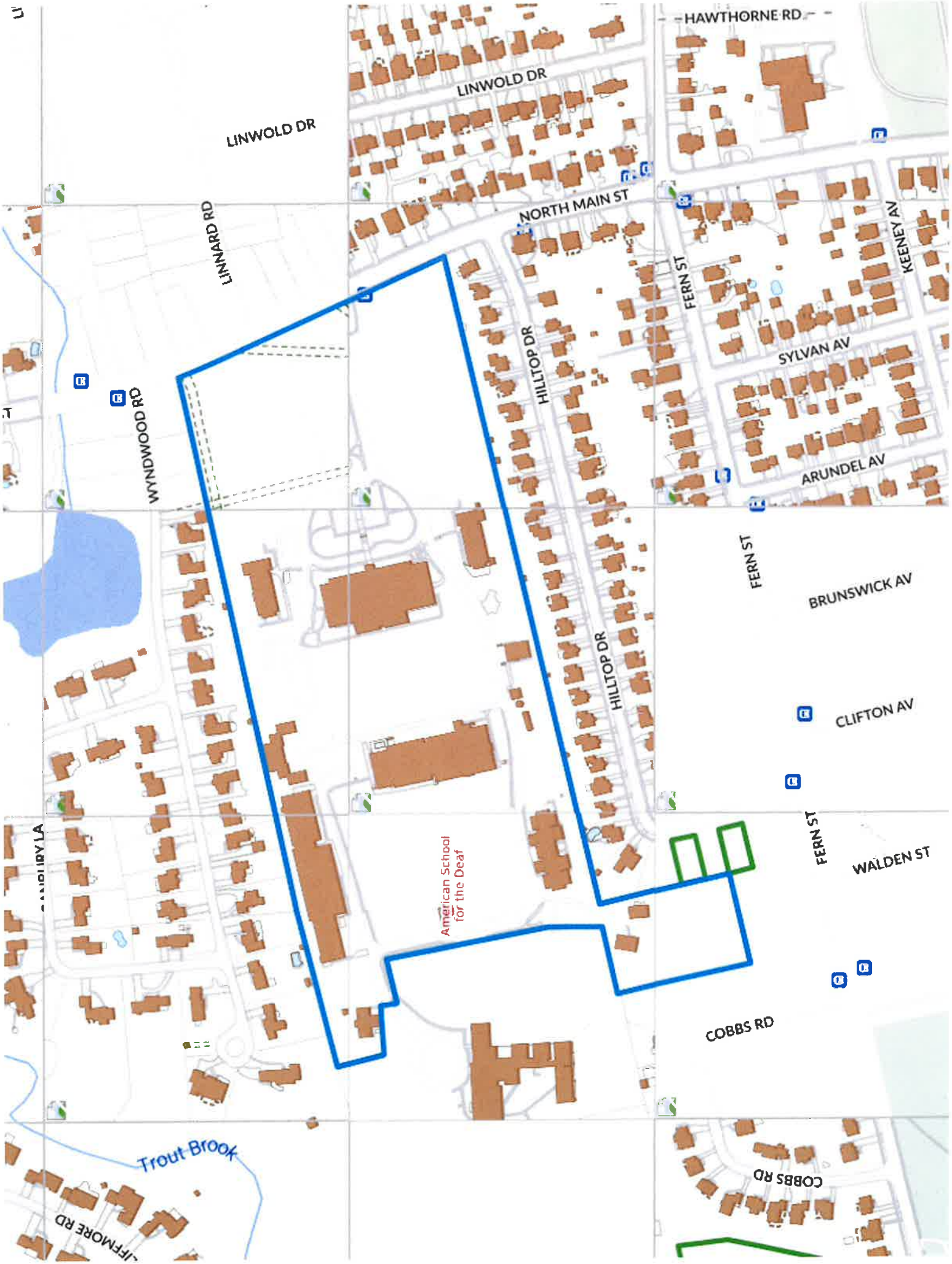
1 - 31 of 31 items

Upper centerline



Lower Centerline

ATTACHMENT 5


HAWTHORNE RD
LINWOLD DR
LINWOLD DR
NORTH MAIN ST
LINNARD RD
WYNDWOOD RD
HILLTOP DR
FERN ST
KEENEY AV
SYLVAN AV
ARUNDEL AV
FERN ST
BRUNSWICK AV
HILLTOP DR
CLIFTON AV
FERN ST
WALDEN ST
American School for the Deaf
COBBS RD
Trout Brook
COBBS RD

WEST HARTFORD,CT

VISION GOVERNMENT SOLUTIONS

137 NORTH MAIN STREET

Sales | Print | Map It

Location	137 NORTH MAIN STREET	**Mblu**	F7/ 3836/ 137/ /
Parcel ID	3836 1 137 0001	**Owner**	AMERICAN SCHOOL FOR THE
Assessment	$32,079,390	**Appraisal**	$45,827,700
Vision Id #	20037	**Building Count**	16

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$38,073,700	$7,754,000	$45,827,700
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$26,651,590	$5,427,800	$32,079,390

Owner of Record

Owner	AMERICAN SCHOOL FOR THE	**Sale Price**	$0
Co-Owner	DEAF AT HARTFORD	**Book & Page**	0382/0423
Address	139 NORTH MAIN STREET	**Sale Date**	
	WEST HARTFORD, CT 06107	**Instrument**	U

ATTACHMENT 6

VW/West Hartford West Relo

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	3	3	neopost 07/25/2023 US POSTAGE $003.19⁰ ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Shari Cantor, Mayor Town of West Hartford 50 South Main Street West Hartford, CT 06107				
2.	Todd Dumais, Town Planner Town of West Hartford 50 South Main Street West Hartford, CT 06107				
3.	American School for the Deaf at Hartford 139 North Main Street West Hartford, CT 06107				
4.					
5.					
6.					

OLD STATE HOUSE POST OFFICE
JUL 25 2023
HARTFORD, CT 06103