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Also admitted in Massachusetts
and New York

November 6, 2024

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**
54 Meadow Street, New Haven, Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains an existing wireless telecommunications facility at 54 Meadow Street in New Haven (the "Property"). The existing facility consists of antennas and remote radio heads at various locations on the roof of the building. Radio equipment is located inside the building. The facility was originally approved by the Siting Council ("Council") in April of 1991 (Docket No. 140). Cellco proposed certain modifications to the facility in August of 2020 (Petition No. 1430). The Petition No. 1430 facility modifications were approved by the Council in December of 2020. A copy of the Council's Docket No. 140 Decision and Order and Petition No. 1430 decision and Staff Report are included in Attachment 1.

Cellco now intends to modify its facility further by installing four (4) new antennas on its existing antenna mounts. A set of project plans showing Cellco's proposed facility modifications and the specifications for Cellco's new antennas is 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 New Haven's Chief Elected Official and Land Use Officer. A copy of this letter is being sent to the owner of the Property and rooftop manager.

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 antennas. Cellco's new antennas and RRHs will be installed at the same height on the building.

2. The proposed modifications will not involve any 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. Included in Attachment 3 is a Far Field Calculation Table demonstrating that the proposed modified facility will comply with the FCC safety standards. 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 site.

6. According to the attached Structural Analysis Report ("SA") and Mount Analysis Report ("MA"), the existing tower, tower foundation and antenna mounts, with certain modifications, can support Cellco's proposed modifications. Copies of the SA and MA are 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, the property owner and rooftop manager 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).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Justin Elicker, Mayo
Laura Brown, Director of City Plan
Gateway Partners LLC, Property Owner
MCM Holdings LLC, Rooftop Manager
Ryan Hand, Verizon Wireless
Brennan Byrd, Verizon Wireless

ATTACHMENT 1

DOCKET NO. 140 - An application of Metro Mobile CTS of New Haven, Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of cellular telephone antennas and associated equipment in the City of New Haven, Connecticut.

Connecticut Siting Council

ORIGINA

April 1, 1991

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications facility at the proposed site in New Haven, Connecticut, including effects on the natural environment; ecological balance; public health and safety; scenic, historic, and recreational values; 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 proposed New Haven site in this application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by Section 16-50k of the Connecticut General Statutes (CGS), be issued to Metro Mobile CTS of New Haven, Inc., for the construction, operation, and maintenance of a cellular telephone facility at the proposed site at the Gateway Center Building, 54 Meadow Street, New Haven, Connecticut.

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

1. The facility shall be constructed in accordance with applicable sections of the State of Connecticut Basic Building Code.

2. The Certificate Holder shall notify the Council if and when any equipment other than that listed in this application is added to this facility.

3. The omnidirectional antenna bases shall be mounted no higher than 157 feet above ground level (AGL) or 167 feet above mean sea level (AMSL). The panel antennas shall not extend higher than the rooftop's parapet railing. The total height of the antennas shall not extend above 163.3 feet AGL or 173.3 feet AMSL.

4. If this facility does not initially provide, or permanently ceases to provide, cellular service following

the completion of construction, this Decision and Order shall be void, and the antennas and all associated equipment in this application shall be dismantled and removed or reapplication for any new use shall be made to the Council and approval granted before any such new use is made.

5. The Certificate Holder shall comply with any applicable radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.

6. The Certificate Holder shall provide the Council with a report of recalculated power density if and when additional channels over the proposed 90 channels, higher wattage over the proposed 100 watts per channel, or if other circumstances in operation cause change in power density above the levels originally calculated in the application.

7. The Certificate Holder shall provide a final report to the Council upon completion of construction, including the final construction costs and date of commercial operation.

Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order.

Pursuant to Section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below and notice of issuance be published in the New Haven Register.

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 State Agencies.

The parties or intervenors to this proceeding are:

(Applicant)	(Its Representative)
Metro Mobile CTS of New Haven 20 Alexander Drive Wallingford, CT 06492 Attn: David S. Malko, Mgr. Engineering & Regulatory Services	Robinson & Cole One Commercial Plaza Hartford, CT 06103-3597 Attn: Earl W. Phillips, Jr. (203) 275-8200

(Intervenor)

SNET Cellular, Inc.
237 Church Street
New Haven, CT 06506

(Its Representative)

Peter J. Tyrrell
Senior Attorney
SNET Cellular, Inc.
227 Church Street
Room 1021
New Haven, CT 06506

5200E

cp

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 140 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 1st day of April, 1991.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner Peter Boucher Designee: Mark Marcus	Yes
Commissioner Timothy R.E. Keeney Designee: Brian Emerick	Yes
Harry E. Covey	Yes
Mortimer A. Gelston	Yes
Daniel P. Lynch, Jr.	Yes
Paulann H. Sheets	Yes
William H. Smith	Yes
Colin C. Tait	Yes

5217E-2

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

VIA ELECTRONIC MAIL

December 4, 2020

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **PETITION NO. 1430** - Cellco Partnership d/b/a Verizon Wireless petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for proposed modifications to an existing rooftop telecommunications facility located at 54 Meadow Street, New Haven, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on December 3, 2020 the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need with the following conditions:

1. Approval of any project changes be delegated to Council staff;

2. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility 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 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 facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;

3. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the City of New Haven

4. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;

5. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;

6. The facility owner/operator 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;

7. If the facility ceases to provide wireless services for a period of one year the Petitioner shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council within 90 days from the one year period of cessation of service. The Petitioner may submit a written request to the Council for an extension of the 90 day period not later than 60 days prior to the expiration of the 90 day period; and

8. This Declaratory Ruling may be transferred or partially transferred, provided both the facility owner/operator/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. 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 facility within 30 days of the sale and/or transfer. Both the facility owner/operator/transferor and the transferee shall provide the Council with 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.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition dated August 26, 2020, and additional information received October 26, 2020.

Enclosed for your information is a copy of the staff report on this project.

Sincerely,

s/ Melanie A. Bachman

Melanie A. Bachman
Executive Director

MAB/CMW/emr

Enclosure: Staff Report dated December 3, 2020

c: The Honorable Justin Elicker, Mayor, City of New Haven (jelicker@newhavenct.gov)
Scott Jackson, Acting Chief Administrative Officer, City of New Haven (sjackson@newhavenct.gov)
Aïcha Woods, A.I.A., Executive Director, City Plan Department, City of New Haven (awoods@newhavenct.gov)

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

Petition No. 1430
Cellco Partnership d/b/a Verizon Wireless
54 Meadow Street, New Haven

Staff Report
December 3, 2020

Introduction

On August 26, 2020, the Connecticut Siting Council (Council) received a petition from Cellco Partnership d/b/a Verizon Wireless (Cellco) for a declaratory ruling pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed modifications to its existing wireless telecommunications facility on the roof of a building located at 54 Meadow Street, New Haven, Connecticut.

On August 26, 2020, Cellco provided notice of the project to abutting property owners and City of New Haven (City) officials.

On August 27, 2020, the Council sent correspondence to the City stating that the Council has received the petition and invited the municipality to contact the Council with any questions or comments by September 25, 2020. No comments have been received.

The Council issued interrogatories to Cellco on October 22, 2020. Cellco provided responses to the Council's interrogatories on October 26, 2020.

Existing Facility

On April 1, 1991, the Council approved the existing facility in Docket No. 140. Cellco currently maintains 12 antennas located on the façade of the rooftop penthouse of the building owned by Gateway Partners LLC located within a BE Wholesale and Distribution zone. MCM Holdings LLC manages the facility for the property owner.

Cellco's existing equipment is located in an equipment room inside the building.

The host building is an office building. Surrounding land use includes New Haven Police Department Headquarters to the east, the New Haven Train Station and a parking garage to the south, a commercial building owned by the Knights of Columbus to the north and vacant land along South Orange Street to the west.

Proposed Facility

Cellco proposes to remove nine existing antennas (leaving three antennas) and install 12 new antennas and 10 remote radio heads at various locations on the roof of the building. Three of the existing antennas would remain on the façade of the rooftop penthouse. Four new antennas would be attached to the penthouse façade. Two existing antennas and four new antennas would be attached to the existing mechanical screen wall in the northwest corner of the building rooftop. One existing antenna and one new antenna would be attached to the building façade on the southeast corner of the building.

Cellco would provide wireless services in the 850 MHz, 1900 MHz, 2100 MHz and 28 GHz frequency ranges. The facility would provide 5G services in the 850 MHz, 2100 MHz and 28 GHz frequency bands.

Emergency backup power is supplied by the facility's existing battery backup power system and is connected to the building's backup generator. No change to backup power is proposed. Commercial Mobile Radio Service (CMRS) providers are licensed by and are under the jurisdiction and authority of the Federal Communications Commission (FCC). At present, no standards for backup power for CMRS providers have been promulgated by the FCC. Every year since 2006, AT&T, T-Mobile and Verizon have certified their compliance with the CTIA Business Continuity/Disaster Recovery Program and the Communications Security, Reliability and Interoperability Council standards and best practices to ensure network reliability during power outages.

The proposed installation may be visible from surrounding properties; however, the building currently has multiple antennas and equipment installed on the penthouse façade, therefore, the proposed modifications would not increase visibility of the facility.

The installation would not be a hazard to air navigation and no notice to the Federal Aviation Administration is required.

A Professional Engineer duly licensed in the State of Connecticut has certified that the existing building and antenna mounting systems are adequate to support the proposed loading.

The highest calculated power density level for Cellco's proposed antennas would be 4.05 percent of the applicable exposure limit established by the FCC at ground level with a -10 dB off-beam adjustment.

Cellco contends that this proposed project would not have a substantial adverse environmental impact.

If approved, staff recommends the following condition:

1. Approval of any project changes be delegated to Council staff.

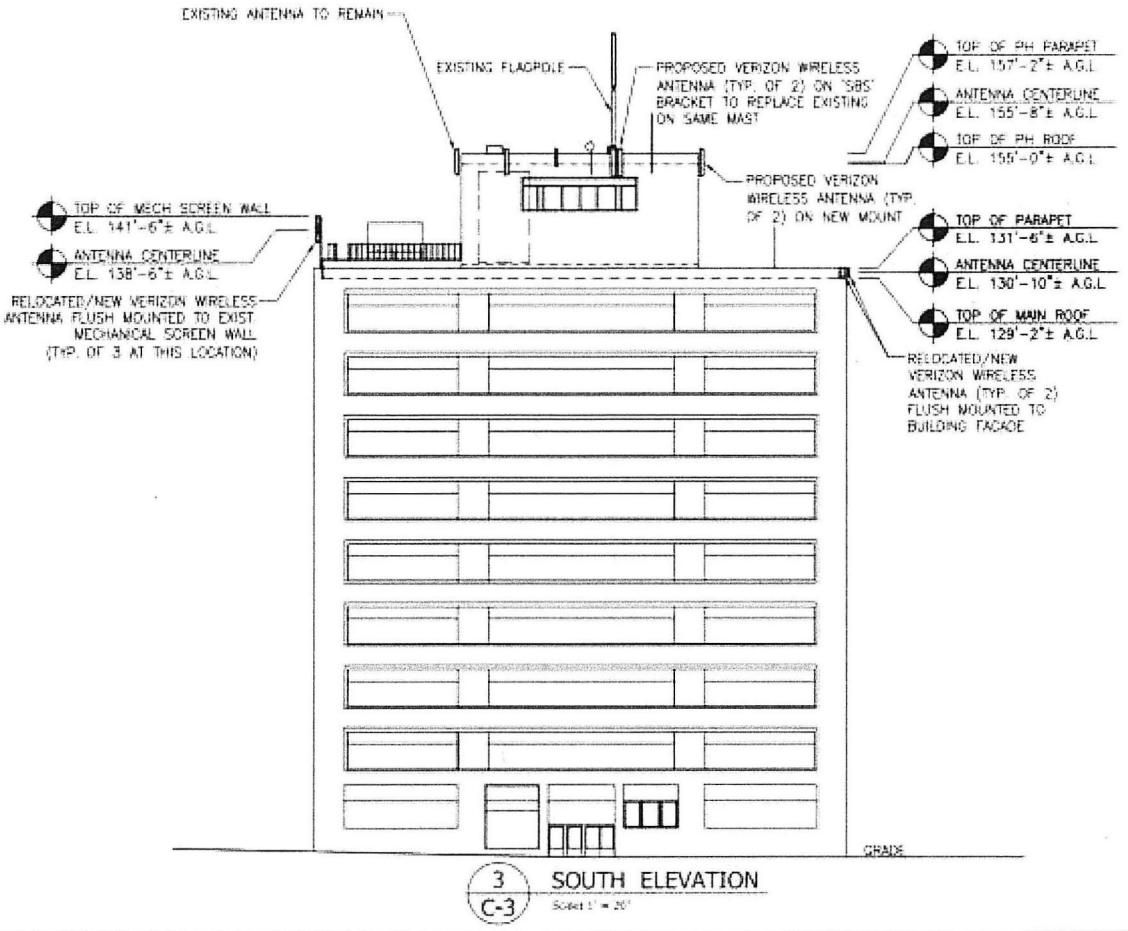


Figure 1. Facility elevation drawing.

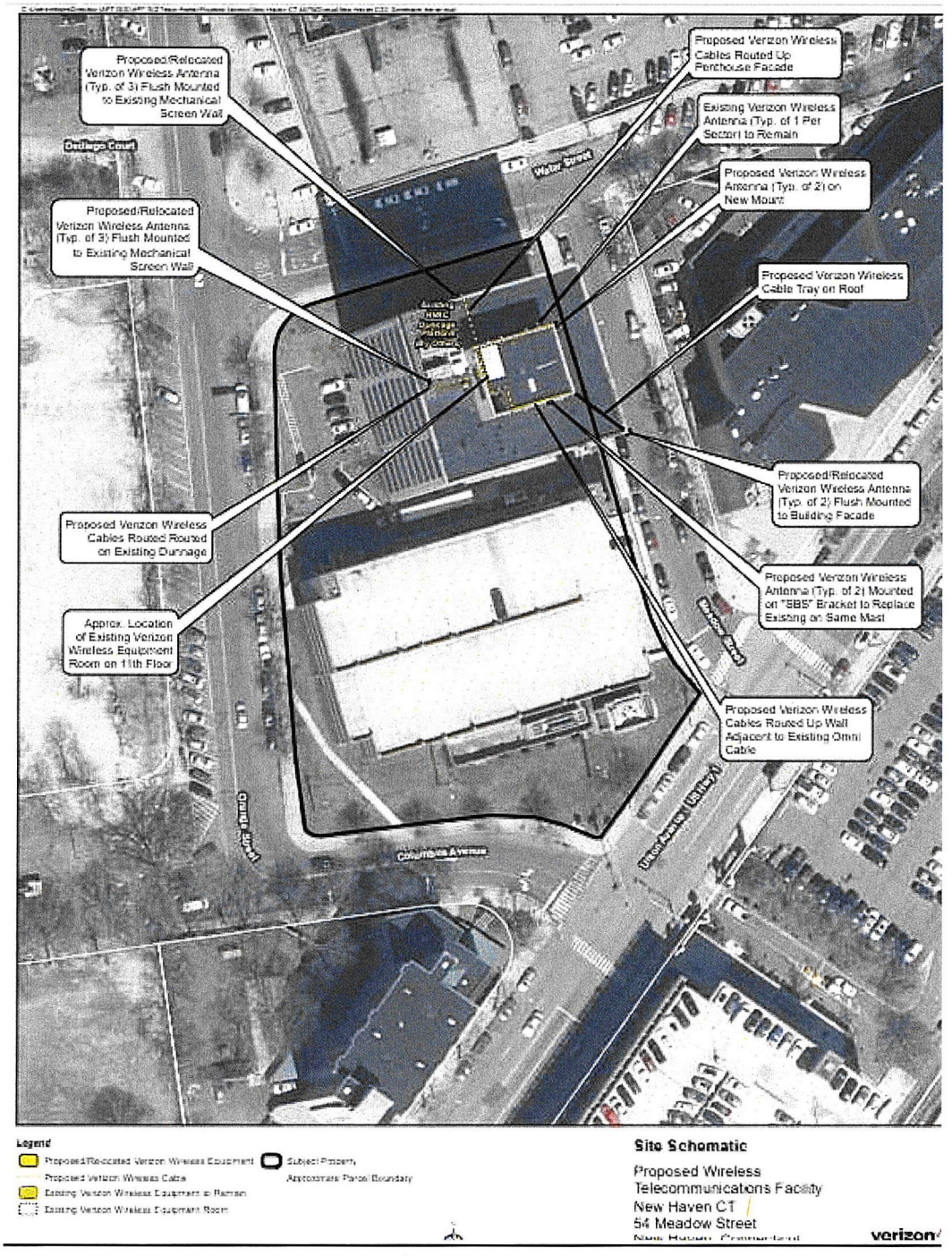


Figure 2. Site schematic

Figure 3. Existing facility.

Figure 4. Proposed facility.

ATTACHMENT 2

TANGLEWOOD

LOCATION NUMBER: 468764

FUZE PROJECT ID: 17290616

ADDRESS: 54 MEADOW STREET
NEW HAVEN, CT 06519

PROJECT INFORMATION

PROJECT DESCRIPTION:	SUB6 - CARRIER ADD
SITE NAME:	TANGLEWOOD
LOCATION #:	468764
SITE ADDRESS:	54 MEADOW STREET NEW HAVEN, CT 06519
LATITUDE:	41.299819°
LONGITUDE:	-72.926491°
PARCEL #:	238/0106/00101-00106
ZONING:	TBD
JURISDICTION:	NEW HAVEN COUNTY
POWER COMPANY:	TBD
TELCO COMPANY:	VERIZON
OCCUPANCY CLASS:	RES
CONSTRUCTION CLASS:	TYPE II-B
GROUND ELEVATION:	±2'
STRUCTURE TYPE:	ROOFTOP
STRUCTURE HEIGHT:	±155'
NUMBER OF STORIES:	9

OWNER INFORMATION

PROPERTY OWNER:
GATEWAY PARTNERS LLC
30 LEWIS ST.
HARTFORD,CT 06103
TBD

OWNER SIGNATURE: _____ DATE: _____

PROJECT CONTACTS

APPLICANT:	NEW YORK SMSA LIMITED PARTNERSHIP d/b/a VERIZON WIRELESS 4 CENTEROCK ROAD WEST NYACK, NY 10994
CONTACT:	KEROLOS BASTAWROS
EMAIL:	KEROLOS.BASTAWROS@VERIZON.COM
SITE ACQUISITION FIRM:	AMP COMMUNICATIONS, LLC
CONTACT:	DOUGLAS NURSE
EMAIL:	DOUGLASNURSE@AMPCOMMUNICATIONS.COM
ENGINEERING FIRM:	TRYLON 1825 W. WALNUT HILL LANE, SUITE 120 IRVING, TEXAS 75038 1-855-669-5421
CONTRUCTION MANAGER:	ED SIMPSON
EMAIL:	ED.SIMPSON@VERIZON.COM

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
GN-2	GENERAL NOTES
A-1	PLAN
A-2 & A-2.1	ELEVATION
A-3	EQUIPMENT PLANS
A-4	ANTENNA PLANS
A-4.1	ANTENNA PLANS
A-5	ANTENNA & CABLE SCHEDULE
D-1	EQUIPMENT AND ANTENNA SPECIFICATIONS
E-1	ELECTRICAL NOTES
E-2	ELECTRICAL GROUNDING NOTES AND DETAILS
E-3	PLUMBING DIAGRAM

PROJECT DESCRIPTION

MODIFICATION OF EXISTING VERIZON WIRELESS TELECOMMUNICATIONS ANTENNAS ON THE ROOF. ALL WORK IS IN COMPLIANCE WITH TPPN #5/98. NO CHANGE IN USE, EGRESS OR OCCUPANCY.

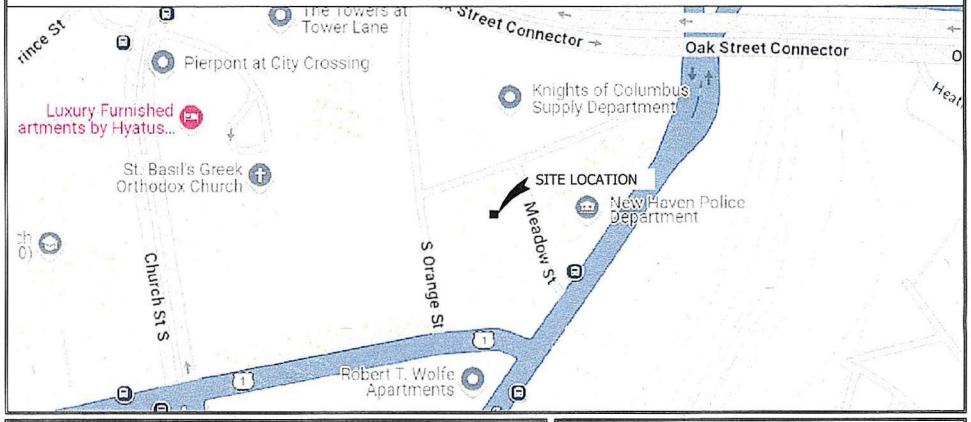
EXISTING ANTENNAS TO BE REMOVED = 0
EXISTING ANTENNAS TO REMAIN = 16
EXISTING RRHs TO BE REMOVED = 0
EXISTING RRHs TO REMAIN =12
INSTALLATION OF NEW ANTENNAS = 4
EXISTING OVP TO REMAIN = 8
INSTALLATION OF NEW RRH's = 0
INSTALLATION OF NEW OVP = 1

APPLICABLE CODES

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

2021 IBC PORTION OF THE 2022 CT STATE BUILDING CODE (IBC 2021 W/ AMENDMENTS)
2021 IRC PORTION OF THE 2022 CT STATE BUILDING CODE (IRC 2021 W/ AMENDMENTS)
2021 CONNECTICUT FIRE CODE (IFC 2021 W/ AMENDMENTS)
2021 IPC PORTION OF THE 2022 CT STATE BUILDING CODE (IPC 2021 W/ AMENDMENTS)
2021 IMC PORTION OF THE 2022 CT STATE BUILDING CODE (IMC 2021 W/ AMENDMENTS)
2020 CONNECTICUT LP GAS CODE (NFPA 58, 2020)
2021 IECC PORTION OF THE 2022 CT STATE BUILDING CODE (IECC 2021 W/ AMENDMENTS)

LOCATION MAP



verizon
4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon
1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

ALL DRAWINGS CONTAINED HEREIN ARE FORMATED FOR 11"x17". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCEPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

SHEET DESCRIPTION

TITLE SHEET

SHEET NO.

T-1

GENERAL CONSTRUCTION NOTES:

1. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL DRAWINGS HAVE BEEN REVISED TO INDICATE "ISSUED FOR CONSTRUCTION."
2. ADA COMPLIANCE: THE FACILITY IS A NORMALLY UNOCCUPIED MOBILE RADIO FACILITY.
3. THESE PLANS ARE INTENDED TO BE USED TO DIRECT THE PROPOSED LAYOUT. DRAWINGS SHOULD NOT BE SCALED UNLESS OTHERWISE NOTED. PLANS, ELEVATIONS AND DETAILS ARE INTENDED TO SHOW THE END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS.
4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AND NOTIFY THE PROJECT MANAGER OF ANY DISCREPANCIES BEFORE STARTING ANY WORK.
5. THE CLIENT AND CONTRACTOR(S) ATTENTION IS HEREBY BROUGHT TO EXISTING SITE CONDITIONS WHICH NEED TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION. TRYLON, LLC. DOES NOT TAKE ANY LIABILITY FOR AREAS THAT ARE NOT READILY ACCESSIBLE BY FIELD PERSONNEL WALKING ON THE ROOF DURING THE SITE VISIT. SUCH CONDITIONS INCLUDE BUT ARE NOT LIMITED TO ELEVATED STRUCTURES OUT OF REACH WHILE STANDING ON THE ROOF, BUILDING FACADES, STRUCTURES ADJUNTED ON BUILDING FACADES, WINDOWS, ETC. IF NOT REQUESTED BY THE CLIENT AND SUPPLIED TO THE CONTRACTOR, THE CONTRACTOR SHALL INCLUDE WITHIN THEIR BID TO OBTAIN MAPPING INFORMATION FOR ANY INACCESSIBLE AREAS WHICH ARE INCLUDED AS PART OF THIS DESIGN DRAWING PACKAGE TO ENSURE ALL EXISTING CONDITIONS ARE VERIFIED PRIOR TO CONSTRUCTION AND SHALL RELAY ALL FINDINGS TO TRYLON PRIOR TO CONSTRUCTION FOR OUR REVIEW. SUCH FINDINGS MAY REQUIRE DRAWINGS TO BE MODIFIED PRIOR TO CONSTRUCTION.
6. THESE PLANS ARE DESIGNED TO REFLECT OBSERVED FIELD CONDITIONS. CERTAIN CONDITIONS ARE ASSUMED TO COMPLY WITH GENERAL STANDARD CONSTRUCTION DESIGN METHODS AND PRINCIPLES, AND THE CONTRACTOR SHALL NOTE THAT NOT ALL AREAS OF STRUCTURAL ATTACHMENT HAVE BEEN OPENED OR SPECIFICALLY VERIFIED. THE CONTRACTOR IS THEREFORE REQUESTED TO NOTIFY THE ENGINEER IMMEDIATELY SHOULD ENCOUNTERED FIELD CONDITIONS VARY FROM THOSE DEPICTED ON THE DRAWINGS. TRYLON, LLC WILL ISSUE FIELD CHANGE DIRECTION IF REQUIRED. THE PROJECT MANAGER IS REFERENCED ON THE COVER SHEET.
7. ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS OTHERWISE NOTED BY THE ENGINEER OF RECORD.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK PERFORMED AND MATERIALS INSTALLED TO BE IN STRICT CONFORMANCE, AS A MINIMUM STANDARD, WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES HAVING JURISDICTION. ELECTRICAL SYSTEMS SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE, AND ALL OTHER LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES, AND WITH LOCAL UTILITY COMPANY SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
9. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DIRT, STUMPS, STONES, RUBBISH OR DEBRIS IN ACCORDANCE WITH ALL LOCAL AND ENVIRONMENTAL LAWS. NO MATERIALS OR EQUIPMENT SHALL BE PLACED ANYWHERE ON OR IN THE STRUCTURE WITHOUT MAKING ADEQUATE PROVISIONS TO PROTECT EXISTING PROPERTY. UPON COMPLETION, REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DURING CONSTRUCTION. REPAIR ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE AND HAVE CONTROL OVER CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO:
   A. FALL PROTECTION
   B. CONFINED SPACE
   C. ELECTRICAL SAFETY
   D. TRENCHING & EXCAVATION
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
4. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE BUILDING OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH.
5. THE CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

2014 NYC BUILDING CODE - SECTION BC 3108 - RADIO, TELEVISION, AND TELECOMMUNICATIONS TOWERS AND ANTENNAS:

3108.1 GENERAL.
SUBJECT TO THE PROVISIONS OF CHAPTER 16 AND THE REQUIREMENTS OF CHAPTER 15 GOVERNING THE FIRE-RESISTANCE RATINGS OF BUILDINGS FOR THE SUPPORT OF ROOF STRUCTURES, RADIO, TELEVISION, AND TELECOMMUNICATIONS TOWERS AND ANTENNAS SHALL BE DESIGNED AND CONSTRUCTED AS HEREIN PROVIDED. ALL SUCH TOWERS AND ANTENNAS SHALL BE COLLECTIVELY REFERRED TO AS "TOWERS" FOR THE PURPOSES OF THIS SECTION. TOWERS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF TIA-222.

3108.2 LOCATION AND ACCESS.
TOWERS SHALL BE LOCATED AND EQUIPPED WITH STEP BOLTS AND LADDERS SO AS TO PROVIDE READY ACCESS FOR INSPECTION PURPOSES. GUY WIRES OR OTHER ACCESSORIES SHALL NOT CROSS OR ENCROACH UPON ANY STREET OR OTHER PUBLIC SPACE, OR OVER ABOVE-GROUND ELECTRIC UTILITY LINES, OR ENCROACH UPON ANY PRIVATELY OWNED PROPERTY WITHOUT WRITTEN CONSENT OF THE OWNER OF THE ENCROACHED-UPON PROPERTY. SPACE OF ABOVE-GROUND ELECTRIC UTILITY LINES. TOWERS SHALL BE EQUIPPED WITH CLIMBING AND WORKING FACILITIES IN COMPLIANCE WITH TIA-222. SEE APPLICABLE OSHA, FCC AND EPA REGULATIONS RELATING TO LIMITATIONS ON ACCESS TO TOWER SITES.

3108.3 CONSTRUCTION.
TOWERS SHALL BE CONSTRUCTED OF APPROVED CORROSION-RESISTANT NONCOMBUSTIBLE MATERIAL. THE MINIMUM TYPE OF CONSTRUCTION OF ISOLATED RADIO TOWERS NOT MORE THAN 100 FEET (30,480 MM) IN HEIGHT SHALL BE TYPE IIB.

3108.4 LOADS.
TOWERS SHALL BE DESIGNED TO RESIST WIND LOADS IN ACCORDANCE WITH TIA/EIA-222. CONSIDERATION SHALL BE GIVEN TO CONDITIONS INVOLVING WIND LOAD ON ICE-COVERED SECTIONS.
3108.4.1 DEAD LOAD.
TOWERS SHALL BE DESIGNED FOR THE DEAD LOAD PLUS ICE LOAD.
3108.4.2 WIND LOAD.
TOWERS SHALL BE PROVIDED WITH ADEQUATE FOUNDATIONS AND ANCHORAGE DESIGNED TO RESIST TWO TIMES THE CALCULATED WIND LOAD.

3108.5 GROUNDING.
TOWERS SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE.

SPECIFICS FOR SIKA TOP 123 PLUS NON SHRINK GENERAL PURPOSE GROUT:

1. ALL NON-SHRINK GENERAL-PURPOSE GROUT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
2. THE NON-SHRINK GENERAL-PURPOSE GROUT SHALL BE MECHANICALLY MIXED FOR A MINIMUM OF TEN MINUTES.
3. MIX NO MORE GROUT THEN CAN BE PLACED IN 10 TO 15 MINUTES.
4. SURFACES TO RECEIVE THE GROUT SHALL BE FREE OF ANY TYPE OF FOREIGN MATERIAL AND BOND INHIBITING MATERIALS. BE SURE REPAIR AREA IS NOT LESS THAN 1/8" IN DEPTH.
5. THE SUBSTRATE SHALL BE SATURATED SURFACE DRY WITH NO STANDING WATER. MORTAR MUST BE SCRUBBED INTO SUBSTRATE FILLING ALL PORES AND VOIDS.
6. TYPICAL PROPERTIES OF THE GROUT SHALL BE AS FOLLOWS:
   - COMPRESSIVE STRENGTH (ASTM C-109 MODIFIED)
   - 1 DAY: 3500 PSI MIN (24.1 MPA)
   - 7 DAY: 6000 PSI MIN (44.8 MPA)
   - 28 DAY: 7000 PSI MIN (48.3 MPA)
   - FLEXURAL STRENGTH (ASTM C-293) @ 28 DAYS: 2000 PSI (13.8 MPA)
   - SPLITTING TENSILE STRENGTH (ASTM C-496) @ 28 DAYS: 900 PSI (6.2 MPA)
   - BOND STRENGTH (ASTM C-882 MODIFIED) @ 28 DAYS: 2200 PSI (15.2 MPA)
   - THE PORTLAND CEMENT MORTAR SHALL NOT PRODUCE A VAPOR BARRIER
   - DENSITY (WET MIX): 132 LBS/CU FT (2.2 KG/L)
   - PERMEABILITY - AASHTO T-277 @ 28 DAYS: APPROXIMATELY 500 COULOMBS
7. ALL STEEL BEARING PLATES AND MAIN SUPPORT STEEL SHALL BE INSTALLED ONCE THE GROUT HAS BEEN LEVELED AND HAS BEEN CURED FOR A MINIMUM OF 24 HOURS. THE FULL DESIGN EQUIPMENT LOAD SHALL BE INSTALLED AFTER THE GROUT HAS CURED FOR 48 HOURS.
8. SHOULD THE CONTRACTOR WISH TO PROPOSE AN ALTERNATIVE GROUT AND METHOD OF WORKING OUTSIDE THESE PARAMETERS, THIS MUST BE PRESENTED TO THE ENGINEER IN WRITING WITH A FULL METHOD STATEMENT, MATERIAL DATA SHEET AND INSTALLATION INSTRUCTIONS FOR HIS/HER APPROVAL.
9. FAILURE TO COMPLY WITH THIS SPECIFICATION COULD SERIOUSLY AFFECT THE STABILITY OF THE INSTALLATION.

GENERAL NOTES FOR POST-INSTALLED ANCHORS (HILTI OR APPROVED EQUAL):

EPOXY ANCHOR MOUNTING CHART	
WALL TYPE	METHOD OF ATTACHMENT
CONCRETE	HILTI HIT HY200, MINIMUM EMBEDMENT 6" SPACED 16" ON CENTER UNLESS NOTED OTHERWISE
MASONRY (CMU AND BRICK)	HILTI HIT HY270 WITH SCREEN TUBE, MINIMUM EMBEDMENT 6" SPACED 16" ON CENTER UNLESS NOTED OTHERWISE
THRU-BOLT MOUNTING CHART	
WALL TYPE	BOLT TYPE
CONCRETE/MASONRY	F1554 GRADE 55 THRU- BOLT UNLESS NOTED OTHERWISE

INSTALLER TRAINING:

1. INSTALLERS MUST BE CERTIFIED THROUGH THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM OR EQUIVALENT. THE GENERAL CONTRACTOR SHALL ARRANGE INSTALLATION TRAINING FOR ALL POST-INSTALLED ANCHOR PRODUCTS SPECIFIED AND SHALL PROVIDE THE ENGINEER OF RECORD DOCUMENTATION DEMONSTRATING THAT ALL PERSONNEL RESPONSIBLE FOR INSTALLING ANCHORS ARE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.
2. INSTALLERS SHALL BE TRAINED ON THE COMPLETE INSTALLATION PROCESS FOR DRILLED-IN ANCHORS, INCLUDING BUT NOT LIMITED TO:
   A. HOLE DRILLING PROCEDURE
   B. HOLE PREPARATION & CLEANING TECHNIQUE
   C. ADHESIVE INJECTION TECHNIQUE & DISPENSER TRAINING / MAINTENANCE
   D. REBAR DOWEL PREPARATION AND INSTALLATION
   E. PROOF LOADING/TENSILE TESTS/TORQUING

GENERAL PROCEDURES:
CONTRACTOR/INSTALLER TO FOLLOW ANCHOR MANUFACTURER SPECIFICATIONS AND INSTRUCTIONS FOR USE, INCLUDING BUT NOT LIMITED TO THE FOLLOWING GENERAL PROCEDURES:

1. HOLE DRILLING PROCEDURE
   A. DRILL HOLES WITH ROTARY IMPACT HAMMER DRILLS USING CARBIDE-TIPPED BITS, HOLLOW DRILL BIT SYSTEM, AND/OR CORE DRILLS USING DIAMOND CORE BITS. DRILL BITS SHALL BE OF DIAMETERS AS SPECIFIED BY THE ANCHOR MANUFACTURER. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, ALL HOLES SHALL BE DRILLED PERPENDICULAR TO THE CONCRETE OR MASONRY SURFACE.
2. HOLE PREPARATION & CLEANING
   A. HOLES MUST BE FREE OF DEBRIS, DUST, WATER, ICE, OIL, GREASE, AND OTHER CONTAMINANTS PRIOR TO ADHESIVE INJECTION. INSTALLER TO ENSURE ALL HOLES ARE PROPERLY CLEANED USING COMPRESSED AIR AND STEEL WIRE BRUSH, FOLLOWING MANUFACTURER SPECIFIED METHODS:
      - FOR BLOWING OUT THE HOLE, BLOW OUT WITH OIL FREE AIR UNTIL RETURN AIR STREAM IS FREE OF NOTICEABLE DUST.
      - FOR BRUSHING OUT THE HOLE, ONLY USE SPECIFIED WIRE BRUSH. THE BRUSH MUST RESIST INSERTION INTO THE HOLE. IF NOT, BRUSH IS TOO SMALL AND MUST BE REPLACED.
3. CARTRIDGE INJECTION ADHESIVE ANCHORS
   A. CLEAN ALL HOLES PER MANUFACTURER INSTRUCTIONS TO REMOVE LOOSE MATERIAL AND DRILLING DUST PRIOR TO INSTALLATION OF ADHESIVE. INJECT ADHESIVE INTO HOLES PROCEEDING FROM THE BOTTOM OF THE HOLE AND PROGRESSING TOWARD THE SURFACE IN SUCH A MANNER AS TO AVOID INTRODUCTION OF AIR POCKETS IN THE ADHESIVE. FOLLOW MANUFACTURER RECOMMENDATIONS TO ENSURE PROPER MIXING OF ADHESIVE COMPONENTS. SUFFICIENT ADHESIVE SHALL BE INJECTED IN THE HOLE TO ENSURE THAT THE ANNULAR GAP IS FILLED TO THE SURFACE. REMOVE EXCESS ADHESIVE FROM THE SURFACE. SHIM ANCHORS WITH SUITABLE DEVICE TO CENTER THE ANCHOR IN THE HOLE.
   B. FOR HOLLOW MASONRY APPLICATIONS, CONTRACTOR TO USE PLASTIC-MESH SCREEN TUBES AND INSERTS, FOLLOWING MANUFACTURER SPECIFICATIONS.
   C. DO NOT DISTURB OR LOAD ANCHORS BEFORE MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
   D. OBSERVE MANUFACTURER RECOMMENDATIONS WITH RESPECT TO INSTALLATION TEMPERATURES FOR CARTRIDGE INJECTION ADHESIVE ANCHORS.

POST-INSTALLED ANCHOR SPECIAL INSPECTION:

1. THE GENERAL CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD AND SPECIAL INSPECTOR OF RECORD WHEN POST-INSTALLED ANCHOR WORK IS SCHEDULED TO BE PERFORMED TO ALLOW ON-SITE INSPECTION DURING INSTALLATION.
2. THE GENERAL CONTRACTOR SHALL DOCUMENT THEIR WORK WITH PHOTOGRAPHS AND/OR VIDEO DURING THE INSTALLATION PROCESS DEMONSTRATING THE ABOVE MINIMUM GENERAL PROCEDURES HAVE BEEN PERFORMED, AND SHALL FURNISH PHOTOGRAPHS, VIDEOS, AND/OR TEST REPORTS TO THE ENGINEER OF RECORD AS PART OF THE SPECIAL INSPECTION REVIEW AND PROJECT CLOSE-OUT PROCESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLIANCE WITH ALL ITEMS NOTED. FAILURE FOR THE CONTRACTOR TO PROVIDE SUFFICIENT TRAINING DOCUMENTATION, NOTIFICATIONS TO THE ENGINEER, AND/OR TO PROVIDE SUFFICIENT PROGRESS PHOTOGRAPHS DOES NOT REMOVE THE CONTRACTOR'S LIABILITY FOR FULL COMPLIANCE AND MAY REQUIRE THE CONTRACTOR TO REMOVE AND REINSTALL ALL ANCHORS AND REPAIR ADJACENT AFFECTED AREAS.

CONSTRUCTION SPECIFICATIONS:

DIVISION 1 - GENERAL REQUIREMENTS SECTION 01010 SUMMARY OF WORK:

1. THE CONTRACTOR SHALL VISIT THE SITE OF THE PROPOSED WORK AND FULLY ACQUAINT THEMSELVES WITH THE CONDITIONS AS THEY EXIST IN ORDER THAT ANY RESTRICTIONS PERTAINING TO THE WORK ARE UNDERSTOOD. ALL AREAS AND DIMENSIONS ARE INDICATED ON THE DRAWINGS AS ACCURATELY AS POSSIBLE, BUT ALL CONDITIONS SHALL BE VERIFIED BY EACH CONTRACTOR AND/OR SUBCONTRACTOR AT THE SITE. THE FAILURE OF THE CONTRACTOR TO EXAMINE OR RECEIVE ANY FORM, INSTRUMENT OR DOCUMENT, OR TO VISIT THE SITE SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION WITH RESPECT TO THEIR QUOTED THE SUBMISSION OF A QUOTATION SHALL ACKNOWLEDGE THAT THE CONTRACTOR AND THEIR SUBCONTRACTORS HAVE FULLY EXAMINED THE SITE AND KNOW THE EXISTING CONDITIONS AND HAVE MADE PROVISIONS FOR OPERATING UNDER THE CONDITIONS AS THEY EXIST AT THE SITE AND HAVE INCLUDED ALL NECESSARY ITEMS.
4. THE GENERAL CONTRACTOR'S RESPONSIBILITIES SHALL INCLUDE, BUT NOT BE LIMITED TO, CONSTRUCTION OF THE EQUIPMENT FOUNDATION, INCLUDING ELECTRICAL SERVICE, TELEPHONE CONDUITS, GROUNDING SYSTEM AND COORDINATION WITH LOCAL UTILITY COMPANIES.
5. THE ANTENNA INSTALLERS RESPONSIBILITIES SHALL INCLUDE, BUT NOT BE LIMITED TO, CABLE TRAY INSTALLATION, ROUTING OF CABLES FROM RADIO EQUIPMENT TO ANTENNAS, ASSOCIATED HARDWARE FOR SECURING ANTENNA CABLES, ANTENNA MOUNTS, DETERMINING SUPPLIER OF ANTENNAS, GROUNDING OF ANTENNAS TO GROUNDING SYSTEM, INSTALLING ANTENNAS AND VERIFYING WITH RADIO FREQUENCY ENGINEERS, THE ALIGNMENT, LOCATION, AND PROPER ORIENTATION OF ANTENNAS.
6. THE CONTRACTORS SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE BUILDING LANDLORD IN ORDER TO AVOID CONFLICTS WITH CURRENT USE OF THE SITE.
7. THE OWNER MAY HAVE WORK PERFORMED UNDER SEPARATE CONTRACTS, CONCURRENTLY, WITH THE WORK OF THIS CONTRACT.
8. THE GENERAL CONTRACTOR SHALL PERMIT ACCESS TO THE PROJECT TO THESE CONTRACTORS TO PERFORM THEIR WORK.
9. THE CONTRACTOR SHALL CONFORM TO ALL APPLICABLE LOCAL, COUNTY, STATE, AND FEDERAL CODES, LAWS AND REQUIREMENTS, INCLUDING OSHA.
10. THE CONTRACTOR SHALL APPLY AND PAY FOR THE CONSTRUCTION PERMIT, CERTIFICATE OF OCCUPANCY AND ALL OTHER REQUIRED PERMITS OR LICENSES. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL INSPECTIONS.
11. CARE SHALL BE EXERCISED IN PROTECTING THE BUILDING OCCUPANTS DURING THE DEMOLITION AND CONSTRUCTION PERIODS OF THIS PROJECT. EVERY EFFORT SHALL BE MADE TO MAINTAIN A CLEAN OPERATION. DEBRIS SHALL NOT ACCUMULATE. ALL DEBRIS WILL BE DEPOSITED IN A SUITABLE CONTAINER ON A DAILY BASIS AND SHALL BE EMPTIED ON A REGULAR SCHEDULE. THE LOCATION OF THE CONTAINER SHALL BE COORDINATED WITH THE BUILDING MANAGER.
12. SAFETY PROCEDURES: ATTENTION IS DIRECTED TO FEDERAL, STATE, AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH STANDARDS. THE CONSTRUCTION COMPANY AWARDED THIS PROJECT SHALL ENSURE ALL WORKING SURROUNDINGS AND CONDITIONS ARE SANITARY, AND ARE NOT HAZARDOUS OR DANGEROUS TO THE HEALTH OR SAFETY OF THE WORK CREWS OR BUILDING OCCUPANTS. PRECAUTION SHALL BE EXERCISED AT ALL TIMES FOR THE PROTECTION OF PERSONS AND PROPERTY. IT IS MANDATORY THAT THE SAFETY PROVISIONS OF APPLICABLE LOCAL LAWS, OSHA REGULATIONS AND BUILDING AND CONSTRUCTION CODES, BE OBSERVED FOR ALL CONTRACTORS AND ANTENNA RIGGERS.
13. THE GENERAL CONTRACTOR MUST COORDINATE ALL ROOF RELATED WORK WITH THE LANDLORD'S PRE-APPROVED ROOFER. THE GENERAL CONTRACTOR MUST CONFIRM THE COMPATIBILITY OF ALL MATERIALS AND ENSURE THAT ALL EXISTING ROOF WARRANTIES, IF ANY, REMAIN IN EFFECT.

SECTION 01613 - DELIVERY, STORAGE AND HANDLING:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PROCEDURES AND SCHEDULING ASSOCIATED WITH HOISTING, STAGING, AND ERECTING OF MATERIALS AND EQUIPMENT TO AND/OR UPON THE SITE.
2. ALL ELEMENTS OF THE EXISTING SITE, I.E. STRUCTURES, SITE PLANTINGS, ETC. SHALL BE PROTECTED AS NECESSARY FROM SAID ACTIONS. THIS WORK MUST BE DONE IN A SAFE, SECURE NONDESTRUCTIVE MANNER FOR PROTECTING PERSONNEL AND PROPERTY.

SECTION 01740 - WARRANTIES AND BONDS:

1. THE CONTRACTOR SHALL GUARANTEE ALL LABOR AND MATERIALS USED IN THIS PROJECT FOR A MINIMUM PERIOD OF ONE (1) YEAR COMMENCING FROM THE DATE OF FINAL ACCEPTANCE BY THE CLIENT. THE CONTRACTOR IS NOT REQUIRED TO GUARANTEE MATERIAL SUPPLIED BY THE OWNER.
2. FINAL DATE OF ACCEPTANCE IS DEEMED AS THE DATE THAT ALL REQUIRED STATE AND FEDERAL APPROVAL HAVE BEEN OBTAINED INCLUDING, BUT NOT LIMITED TO:
   A. FINAL INSPECTION - D14
   B. CERTIFICATE OF OCCUPANCY
3. ANY DEFICIENCIES THAT COME EVIDENT DURING THIS ONE (1) YEAR PERIOD SHALL BE CORRECTED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

NOTES

verizon

4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11"x17". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

SHEET DESCRIPTION

GENERAL NOTES

SHEET NO.

GN-1

DIVISION 4 - MASONRY
SECTION 04520 - MASONRY RESTORATION - TUCK POINTING:

1. THIS SECTION SPECIFIES REQUIREMENTS FOR THE CLEANING, RESTORATION OF MORTAR JOINTS, REPLACEMENT OF MASONRY, AND MASONRY REPAIR. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THESE SPECIFICATIONS IN ADDITION TO:
   A. ASTM INTERNATIONAL:
      - ASTM C91 STANDARD SPECIFICATION FOR MASONRY CEMENT.
      - ASTM C144 STANDARD SPECIFICATION FOR AGGREGATE FOR MASONRY MORTAR.
      - ASTM C150 STANDARD SPECIFICATION FOR PORTLAND CEMENT.
      - ASTM C207 STANDARD SPECIFICATION FOR HYDRATED LIME FOR MASONRY PURPOSES.
      - ASTM C270 STANDARD SPECIFICATION FOR MORTAR FOR UNIT MASONRY.
      - ASTM C476 STANDARD SPECIFICATION FOR GROUT FOR MASONRY.
      - ASTM C780 STANDARD TEST METHOD FOR PRE CONSTRUCTION AND CONSTRUCTION EVALUATION OF MORTARS FOR PLAIN AND REINFORCED UNIT MASONRY.
      - ASTM C979 STANDARD SPECIFICATION FOR PIGMENTS FOR INTEGRALLY COLORED CONCRETE.
      - ASTM C1329 STANDARD SPECIFICATION FOR MORTAR CEMENT.
      - ASTM C1384 STANDARD SPECIFICATION FOR ADMIXTURES FOR MASONRY MORTARS.
      - ASTM E514 STANDARD TEST METHOD FOR WATER PENETRATION AND LEAKAGE THROUGH MASONRY.
   B. INTERNATIONAL MASONRY INDUSTRY ALL-WEATHER COUNCIL (IMIAC):
      - RECOMMENDED PRACTICES AND GUIDE SPECIFICATION FOR COLD WEATHER MASONRY CONSTRUCTION.
      - RECOMMENDED PRACTICES AND GUIDE SPECIFICATION FOR HOT WEATHER MASONRY CONSTRUCTION.
   C. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA):
      - NCMA TEK BULLETIN #8-2A REMOVAL OF STAINS FROM CONCRETE MASONRY.
      - NCMA TEK BULLETIN #8-3A CONTROL AND REMOVAL OF EFFLORESCENCE.
2. MATERIAL DELIVERY, STORAGE AND HANDLING SHALL COMPLY WITH DIVISION 1:
   A. DELIVERY: DELIVER MATERIALS IN MANUFACTURER'S ORIGINAL, UNOPENED, UNDAMAGED CONTAINERS WITH IDENTIFICATION LABELS INTACT.
   B. STORAGE AND PROTECTION:
      - STORE MATERIALS PROTECTED FROM EXPOSURE TO HARMFUL ENVIRONMENTAL CONDITIONS AND AT TEMPERATURE AND HUMIDITY CONDITIONS RECOMMENDED BY THE MANUFACTURER.
      - STORE MATERIALS IN A DRY LOCATION, COVERED WITH A TARP OR OTHER SUITABLE COVERING.
3. THE CONTRACTOR SHALL INSTALL A MERCURY THERMOMETER AT THE SITE TO MONITOR EXTERNAL TEMPERATURES. THE THERMOMETER LOCATION SHOULD BE CONTINUALLY MONITORED AND UNDER NO CIRCUMSTANCES SHOULD THE POSITIONING OF A MERCURY THERMOMETER BE AS SUCH TO ALLOW SUNLIGHT TO EVER STRIKE IT.
4. THE CONTRACTOR SHALL NOT PERFORM WORK WHEN THE AIR TEMPERATURE REACHES 40° F ON A FALLING THERMOMETER, EXCEPT WHEN THE CONTRACTOR CONFORM WITH THE IMIAC "RECOMMENDED PRACTICES AND GUIDE SPECIFICATION FOR COLD WEATHER MASONRY CONSTRUCTION" AS APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL PROTECT ALL MASONRY WORK AREAS FROM DIRECT SUNLIGHT WHEN THE AIR TEMPERATURE REACHES 99° F ON A RISING THERMOMETER WITH LESS THAN 50% RELATIVE HUMIDITY.
6. USE MORTAR WITHIN TWO HOURS AFTER MIXING AT TEMPERATURES ABOVE 50° F AND FOR 2-1/2 HOURS AT TEMPERATURES UNDER 50° F.
7. RE-TEMPER MORTAR TO MAINTAIN WORKABILITY.
8. THOROUGHLY MIX MORTAR INGREDIENTS IN QUANTITIES NEEDED FOR IMMEDIATE USE IN ACCORDANCE WITH ASTM C270 AND C780 TO PROVIDE UNIFORMITY OF MIX.
9. DO NOT USE ANTIFREEZE COMPOUNDS TO LOWER THE FREEZING POINT OF MORTAR UNLESS EXPRESSLY APPROVED BY THE ENGINEER IN WRITING.
10. IF WATER IS LOST BY EVAPORATION, RE-TEMPER ONLY WITHIN TWO HOURS OF MIXING.
11. PREPARATION:
    A. ESTABLISH LINES, LEVELS, AND COURSING. PROTECT FROM DISTURBANCE.
    B. WET CLAY MASONRY UNITS AND ALL ADJACENT EXISTING MASONRY PRIOR TO LAYING IF THE TEMPERATURE IS ABOVE 70° F TO REDUCE EXCESSIVE ABSORPTION OF MORTAR MOISTURE BY THE UNIT. DO NOT WET CONCRETE MASONRY UNITS.
12. COURSING:
    A. PLACE MASONRY TO LINES AND LEVELS INDICATED OR TO BLEND INTO THE EXISTING LINES AND LEVELS OF ADJACENT MASONRY.
    B. MAINTAIN MASONRY JOINTS TO UNIFORM WIDTH OF 3/8". MAKE VERTICAL AND HORIZONTAL JOINTS EQUAL OF UNIFORM THICKNESS, TIGHTLY TUCKED.
    C. LAY CONCRETE MASONRY UNITS IN RUNNING BOND. COURSE ONE BLOCK UNIT AND ONE MORTAR JOINT TO EQUAL 8". FORM CONCAVE MORTAR JOINTS ON EXPOSED WORK AND FLUSH JOINTS ON WORK TO RECEIVE SUBSEQUENT WALL COATING.
    D. LAY CLAY BRICK AND CONCRETE BRICK IN A BOND PATTERN IN ACCORDANCE WITH THE DRAWINGS. IF THE DRAWINGS DO NOT STIPULATE A PARTICULAR BONDING PATTERN THE BOND PATTERN SHALL MATCH AND BE KEYED INTO THE EXISTING. ALL MORTAR JOINTS SHALL CONCAVE AND SHALL NOT PROTRUDE PAST THE EDGES OF MASONRY UNITS. BONDING PATTERN IS GENERIC. BRICK WORK SHOWN SHALL CONFORM WITH EXISTING PATTERN AND SHALL HAVE FULL PENETRATION BONDING COURSES AT 24" MAX HORIZONTALLY AND VERTICALLY. THESE CAN EITHER BE THROUGH MASONRY BONDING OR REINFORCEMENT.
13. TOLERANCES:
    A. VARIATION FROM UNIT TO ADJACENT UNIT: 1/32" MAXIMUM UNLESS EXISTING CONDITIONS DO NOT PERMIT.
    B. VARIATION FROM PLANE OF WALL: 1/4" IN 10' AND 1/2" IN 20' OR MORE, UNLESS EXISTING CONDITIONS DO NOT PERMIT.
    C. VARIATION FROM LEVEL COURSING: 1/8" IN 3'; 1/4" IN 10'; 1/2" MAXIMUM UNLESS EXISTING CONDITIONS DO NOT PERMIT.
    D. VARIATION OF JOINT THICKNESS: 1/8" IN 3'.
    E. MAXIMUM VARIATION FROM CROSS SECTIONAL THICKNESS OF WALLS: PLUS OR MINUS 1/4".
14. DO NOT PERMIT MORTAR TO DROP OR ACCUMULATE INTO CAVITY AIR SPACE OR TO PLUG WEEP HOLES.
15. CLEANING:
    A. REMOVE EXCESS MORTAR AND SMEARS.
    B. REPLACE DEFECTIVE MORTAR. MATCH ADJACENT WORK.
    C. CLEAN SOILED SURFACES WITH A NON-ACIDIC SOLUTION WHICH WILL NOT HARM MASONRY OR ADJACENT MANUFACTURER FOR ACCEPTABLE CLEANERS. LEAVE SURFACES THOROUGHLY CLEAN AND FREE OF ALL MORTAR AND OTHER SOILING.
    D. USE NON-METALLIC TOOLS IN CLEANING OPERATIONS.
    E. DURING WORK PROGRESS AND AT THE COMPLETION OF WORK, CLEAN WALL, SILL, LEDGE AND OTHER SURFACES WITH STIFF NYLON BRISTLE BRUSHES AND WATER TO LEAVE ALL SURFACES CLEAN AND FREE OF MORTAR DAUBS. DO NOT USE METAL SCRAPERS OR BRUSHES.
16. CONTRACTOR BID INCLUSION - AREA OF MASONRY REPAIR:
    A. DURING THE CONTRACTORS "BID-WALK" THE CONTRACTOR SHALL REVIEW ALL EXISTING MASONRY LOCATIONS WHICH ARE TO ACCOMMODATE ATTACHMENTS. THE CONTRACTOR UNDERSTANDS THAT IN MANY CASES THEY WILL BE ENGAGED TO PERFORM SERVICES ON AGED BUILDINGS AND WEATHERED MASONRY. THE CONTRACTOR SHALL ENSURE THAT THEY HAVE THE SKILLED MASONRY STAFF TO REVIEW, EVALUATE AND REPAIR OR WILL BE ENGAGING SUCH STAFF AS A CONTRACTED THIRD PARTY. THE CONTRACTOR SHALL EVALUATE THESE AREAS GIVING FULL CONSIDERATION TO THEIR PROPOSED METHOD OF WORKING PROCEDURES TO EVALUATE WHETHER THE EXISTING MASONRY IS SATISFACTORY, REQUIRES REPOINTING, OR REQUIRES RE-BUILDING. IN MANY INSTANCES, THE MASONRY BEING ATTACHED TO IS OLD AND CAN OFTEN BECOME LOOSE DUE TO THE VIBRATION OF CONSTRUCTION ACTIVITIES WHICH INCREASES THE AREA OF REPAIR NEEDED FROM THAT PREVIOUSLY ASSESSED BY THE ENGINEER. IN ADDITION, IF THE MASONRY IS CONCEALED, A PROBE MIGHT HAVE BEEN COMPLETED TO AID WITH ESTIMATING THE CONDITION OF THE EXISTING MASONRY. PARAPET PROBES ARE LIMITED TO SMALL AREAS AND ARE INTENDED TO GIVE AN INITIAL IDEA OF CONDITIONS, HOWEVER, THESE AREAS OFTEN NEED TO BE EXTENDED DUE TO CONSTRUCTION ACTIVITIES AFTER FURTHER EXPOSURE OF THE PARAPET MASONRY CONDITIONS, THEREFORE, THE CONTRACTOR NEEDS TO TAKE THIS INTO ACCOUNT AS DETAILED BELOW WITHIN THEIR BID.
    B. THE CONTRACTOR SHALL INCLUDE WITHIN THEIR TENDERED BID PRICE TO REPOINT BOTH SIDES OF ALL ACCESSIBLE MASONRY WITHIN A 5'-0" MINIMUM RADIUS FROM ANY PROPOSED ATTACHMENT INTO THE MASONRY OR ANY UPGRADE OF AN EXISTING ATTACHMENT. FOR EXAMPLE, FOR A 3FT HIGH PARAPET WITH A STRUCTURAL ATTACHMENT LENGTH OF 12FT, REPRESENTING A SECTOR LENGTH OR LENGTH OF EQUIPMENT PLATFORM, THE OVERALL AREA FOR REPOINTING WOULD BE (5FT+12FT + 5FT) X 3FT = 66SQ.FT ON ONE OR BOTH SIDES OF THE ACCESSIBLE SECTION OF MASONRY.
    C. THE CONTRACTOR SHALL INCLUDE WITHIN THEIR TENDERED BID PRICE FOR THE COMPLETE REBUILD OF MASONRY TO THE FULL DEPTH OF EXISTING CONSTRUCTION WITHIN A 5'-0" MINIMUM RADIUS OF ANY BEAM POCKET OR MASONRY ENCASED ATTACHMENT INCLUDING DOWN TO ROOF LEVEL.
    D. WHERE SOLID MASONRY IS NOT FOUND, THE CONTRACTOR SHALL INCLUDE WITHIN THEIR TENDERED BID PRICE FOR THE COMPLETE REBUILD OF MASONRY WALL TO THE FULL DEPTH OF EXISTING CONSTRUCTION, OR AS FOUND TO BE REQUIRED PER EXISTING FIELD CONDITIONS.
    E. THE CONTRACTOR SHALL INCLUDE WITHIN THEIR TENDERED BID PRICE TO REPOINT ALL MASONRY WITHIN 2'-6" MINIMUM BELOW ANY NEWLY CONSTRUCTED WALL, OR AS NOTED BY ENGINEER ON THE DRAWINGS.
    F. THE CONTRACTOR SHALL INCLUDE WITHIN THEIR TENDERED BID PRICE TO GROUT SOLID ANY CMU WALL MINIMUM 3 COURSES BELOW AND 5'-0" IN EACH DIRECTION FROM ANY ATTACHMENT POINTS.
    G. ALL REBUILT MASONRY SHALL CONFORM WITH THE EXISTING MASONRY WITH REGARD TO COLOR, TEXTURE, AND BOND PATTERN.
    H. THE CONTRACTOR SHALL APPLY ULTRA CLEAR PRO-SEAL WEATHER MASTER IN ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS (OR APPROVED EQUIVALENT).
       - PRO-SEAL WEATHER MASTER SHALL BE APPLIED TO ALL SURFACES AFFECTED BY THE PROPOSED INSTALLATION WITHIN A RADIUS OF 2'-6" FROM ANY ATTACHMENT POINT. FOR ALL EPOXY ANCHORS ATTACHMENTS, THE CONTRACTOR SHALL LOCATE THE ANCHORS, SET THE ANCHORS AND APPLY THE COATING PRIOR TO SETTING ANY ATTACHMENT STEEL AGAINST THE BRICKWORK SURFACE.
       - PRO-SEAL WEATHER MASTER SHALL BE APPLIED TO ALL RE-BUILD SECTIONS OF BRICKWORK AND TO ALL FACES. PRO-SEAL WEATHER MASTER SHALL BE APPLIED TO THE TOP OF ALL BRICKWORK SURFACES PRIOR TO THE INSTALLATION OF ANY COPING.
       - THE CONTRACTOR SHALL PROVIDE PHOTOGRAPHIC EVIDENCE THAT PRO-SEAL WEATHER MASTER HAS BEEN APPLIED AT ALL REQUIRED LOCATIONS. PHOTOGRAPHS SHALL INCLUDE THE PRODUCT LABEL AND APPLICATION AT ALL LOCATIONS. FOLLOWING THE APPLICATION OF PRO-SEAL, THE CONTRACTOR SHALL APPLY SILICON SEALANT AROUND ALL INTERFACES OF MASONRY AND STEEL.
17. MASONRY UNITS SHALL CONFORM TO ASTM C62 AND SHALL HAVE A COMPRESSIVE STRENGTH NO LESS THAN 4500 PSI. MORTAR SHALL BE TYPE N, UNLESS OTHERWISE SPECIFICALLY NOTED ON WITHIN THE DRAWINGS, AND SHALL HAVE A COMPRESSIVE STRENGTH NO LESS THAN 1800 PSI.
18. FOLLOWING THE "BID WALK" THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AS TO THE EXTENT OF ANY LOOSE OR RECESSED MORTAR ENCOUNTERED WITHIN 10'-0" FROM THE PROPOSED ATTACHMENT POINT TO ENABLE THE ENGINEER TO INSPECT THE AREAS AND ADVISE REPAIR PRIOR TO FINALIZING BIDS AND COMMENCING CONSTRUCTION. EXISTING CONDITIONS MAY HAVE CHANGED SINCE THE DRAWINGS WERE PRODUCED AND THE SITE BID WALK DATE.
19. ALL AREAS OF BRICK REPAIR SHALL BE PHOTOGRAPHED BEFORE, DURING AND UPON COMPLETION OF CONSTRUCTION. THE CONTRACTOR SHALL LABEL AND DATE EACH PHOTOGRAPH AND SUBMIT TO THE OWNER AND ENGINEER AS PER THE SCHEDULE BELOW:
    A. BID WALK PHOTOGRAPHS OF ALL EQUIPMENT MASONRY ATTACHMENT LOCATIONS.
    B. AREAS OF BRICKWORK SHOWING THE DEPTH OF REMOVED MORTAR PRIOR TO REPOINTING.
    C. FINISHED AREAS OF REPOINTING.
    D. AREAS OF BRICKWORK PRIOR TO REMOVAL.
    E. PROGRESS PHOTOGRAPHS OF ALL REBUILT MASONRY.
    F. PROGRESS PHOTOS OF ALL GROUTED CMU BLOCKS.
    G. AREAS OF BRICK FOLLOWING REMOVAL, CLEANING AND PREPARATION PRIOR TO RE-BUILDING. PHOTOGRAPHS SHOULD CLEARLY INDICATE THE EXISTING BONDING PATTERN AND DISPLAY HOW THE NEW MASONRY WILL "KEY" AND BOND INTO THE EXISTING TO MAINTAIN STRUCTURAL INTEGRITY.
20. AS A MINIMUM AND UNLESS SPECIFIED OTHERWISE, ALL BRICKWORK PENETRATIONS SHALL BE FACED WITH 4" MINIMUM THICKNESS OF MATCHING BRICKWORK, TIED TO EXISTING. AT LEAST ONE METAL TIE "Z" SHOULD BE USED FOR EACH 3 SQ. FT. OF WALL SURFACE. TIES IN ALTERNATE COURSES SHOULD BE STAGGERED. THE DISTANCE BETWEEN ADJACENT TIES SHOULD NOT EXCEED 24" VERTICALLY NOR 24" HORIZONTALLY. TIES SHALL NOT BE LESS THAN 3/16" DIAMETER.
21. WATER SHALL BE CLEAN AND POTABLE.
22. DEFECTIVE JOINTS. "DEFECTIVE JOINTS" SHALL MEAN JOINTS WHICH HAVE ERODED 1/8" OR MORE, OR HAVE LOOSE, POWDERED OR BROKEN MORTAR. JOINTS WITH HAIRLINE CRACKS (1/64") THAT ARE OTHERWISE SOUND SHALL NOT BE CONSIDERED DEFECTIVE.
23. JOINT PREPARATION. DEFECTIVE MORTAR JOINTS SHALL BE RAKED USING A TUCK POINT RAKE WITH A WORKING TIP NO GREATER THAN 5/16" TO EXPOSE UNWEATHERED MORTAR. THE MINIMUM DEPTH FOR REPOINTING SHALL BE 1/4". REVEALS WITH SQUARE BACKS. FURROWED OR SHALLOW JOINTS ARE PROHIBITED. BRUSH, VACUUM, AIR JET OR WATER STREAM JOINTS TO REMOVE ALL LOOSE DEBRIS.
24. DAMPEN SURFACES PRIOR TO TUCK POINTING. APPLY POINTING MORTAR BY MEANS OF A TROWEL NARROWER THAN THE MORTAR JOINTS TO BE FILLED. SPREAD MORTAR INTO JOINT IN LAYERS, FIRMLY PRESSING TO FORM A COMPLETELY FILLED FULLY PACKED JOINT WITHOUT JOINT TOOLING - WHEN MORTAR IS THUMBPRINT HARD, TOOL TO MATCH ORIGINAL APPEARANCE OF ADJACENT JOINTS. BRUSH EXCESS MORTAR FROM EDGE OF JOINT.
25. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLIANCE WITH ALL ITEMS ABOVE IN DIVISION 4 MASONRY. FAILURE FOR THE CONTRACTOR TO NOTIFY THE ENGINEER, PROVIDE SUFFICIENT FUNDING WITHIN THEIR TENDERED BID PRICE TO THE CLIENT IN ACCORDANCE WITH THESE REQUIREMENTS, OR TO PROVIDE SUFFICIENT PROGRESS PHOTOGRAPHS DOES NOT REMOVE THE CONTRACTOR'S LIABILITY FOR FULL COMPLIANCE, AND THE CONTRACTOR SHALL MAKE GOOD ALL MASONRY AREAS AS DIRECTED BY THE ENGINEER DURING OR AT ANY TIME POST CONSTRUCTION COMPLETION FOR REPAIR OR REBUILDING AT THEIR OWN COST. BY BIDDING AND PERFORMING THE CONSTRUCTION SERVICES AS DEPICTED ON THESE DRAWINGS, THE CONTRACTOR AGREES TO THESE TERMS IN PERPETUITY.

DIVISION 5 - METALS
SECTION 05120 - STRUCTURAL STEEL:

1. CODES AND SPECIFICATIONS:
   A. THE FABRICATION/ERECTION SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND SPECIFICATIONS, LATEST EDITION, UNLESS OTHERWISE NOTED:
      - THE LOCAL BUILDING CODE.
      - AISC 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
      - ASTM A992 STRUCTURAL STEEL (FOR ALL W SECTIONS ONLY).
      - ASTM A36 STRUCTURAL STEEL (ALL OTHER SECTIONS).
      - ASTM A53, TYPE E, GRADE B, ELECTRIC RESISTANCE WELDED STEEL PIPE.
      - ASTM 123 ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS.
      - ASTM 153 ZINC COATED (HOT-DIP) IRON AND STEEL HARDWARE.
      - AWS D1.1 STRUCTURAL WELDING CODE.
      - EIA/TIA-222 STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. DESIGN PERAMETERS:
   A. THE STRUCTURAL STEEL ANTENNA MOUNTING FRAMES ARE DESIGNED TO PROVIDE SUPPORT FOR ANTENNAS AND ALL HARDWARE AND ACCESSORIES ASSOCIATED WITH ANTENNAS.
3. FABRICATION AND INSTALLATION REQUIREMENTS:
   A. THE ANTENNA SUPPORTS, ANTENNAS AND MOUNTING HARDWARE SHALL BE CONSTRUCTED PLUMB, LEVEL AND TRUE.
   B. ALL STRUCTURAL ELEMENTS AND FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AND A153.
   C. WELDS SHOULD BE SHOP MADE WHEREVER POSSIBLE, CONFORMING TO AISC SPECIFICATION AND AWS REQUIREMENTS. ALL WELDS ARE TO BE OF THE SIZE AND TYPE INDICATED. CONTRACTOR SHALL EMPLOY A LICENSED WELDER AND SHALL PROVIDE THE ENGINEER WITH THEIR NAME AND A COPY OF THEIR LICENSE PRIOR TO COMMENCING ANY FIELD WELDING.
   D. CONTRACTOR SHALL PROVIDE FIRE WATCH DURING ALL WELDING OPERATIONS, BRAZING AND SOLDERING AND OTHER WORK REQUIRING THE USE OF AN OPEN FLAME. TWO (2) HAND HELD 30 LB. FIRE EXTINGUISHERS AND ADEQUATE WATER SUPPLY SHALL BE MAINTAINED ON SITE. FIRE WATCH PLAN SHALL BE SUBMITTED TO THE CLIENT FOR APPROVAL PRIOR TO WELDING.
   E. ALL BOLTED CONNECTIONS SHALL BE A325 HIGH STRENGTH BOLTS 5/8" DIAMETER MINIMUM SIZE UNLESS OTHERWISE NOTED. BOLTS SHALL BE SUPPLIED WITH FLAT WASHERS. BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH THE AISC SNUG TIGHT CONDITION, UNLESS OTHERWISE NOTED.
   F. PROTECTIVE GALVANIZED COATINGS WHICH WERE DAMAGED OR REMOVED DURING ERECTION OR TRANSPORTATION SHALL BE RESTORED BY PAINTING WITH ZINC-RICH PRIMER.
   G. ALL THREADED RODS SHALL BE 1/2" DIAMETER A36 STEEL UNLESS OTHERWISE NOTED.
   H. TEMPORARY STRUCTURES FOR STAGING AND CONSTRUCTION SHALL BE CAPABLE OF WITH STANDING FORCES SPECIFIED BY THE LOCAL BUILDING CODE CURRENT EDITION.
4. INSPECTIONS:
   A. ALL STRUCTURAL STEEL ANTENNA FRAMES, AND CONNECTIONS SHALL BE INSPECTED PRIOR TO INSTALLATION OF ANTENNAS.
   B. ALL ANTENNA CABLE TRAYS, SUPPORTS, CHANNELS, AND CLAMPS SHALL BE INSPECTED PRIOR TO INSTALLATION OF ANTENNA CABLES.
   C. COORDINATE ALL INSPECTIONS WITH THE CLIENT'S CONSTRUCTION MANAGER.

STRUCTURAL STEEL NOTES:
1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND ORDINANCES.
2. FOR MATERIAL SPECIFICATIONS, SEE GENERAL NOTES.
3. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED WELDS WITH WELDING ELECTRODES E-70XX OR SPECIFIED HIGH STRENGTH BOLTS TO BE ASTM A325.
4. ALL STEEL EXPOSED TO MOISTURE, SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A-123. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH 2 COATS OF ZRC COLD GALVANIZING COMPOUND MANUFACTURED BY ZRC CHEMICAL PRODUCTS CO. QUINCY, MA OR USE THERMAL SPRAYING WITH PLATTZINC 85/15 AS MANUFACTURED BY PLATT BROTHERS & COMPANY WATERBURY,CT.
5. ALL SHOP AND FIELD WELDING SHALL BE DONE BY WELDERS QUALIFIED AS DESCRIBED IN THE "AMERICAN WELDING SOCIETY'S STANDARD QUALIFICATION PROCEDURE" TO PERFORM THE TYPE OF WORK REQUIRED.
6. ALL PIPE SIZES ARE NOMINAL DIAMETER.
7. CONTRACTOR SHALL MEASURE AND VERIFY ALL EXISTING CONDITIONS AND MEASUREMENTS IN FIELD. ANY UNUSUAL CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE PURCHASE. FABRICATION AND ERECTION OF ANY MATERIAL.
8. INCORRECTLY FABRICATED, DAMAGED, OTHERWISE MISFITTING, OR NON-CONFORMING MATERIALS AND CONDITIONS SHALL BE REPORTED TO THE OWNER, ENGINEER, AND CONSTRUCTION MANAGER PRIOR TO ANY REMEDIAL OR CORRECTIVE ACTION. ALL ACTIONS SHALL REQUIRE APPROVAL FROM THE OWNER.
9. CONTRACTOR SHALL PROMPTLY REMOVE ANY & ALL DEBRIS FROM SITE.
10. ALL STEEL TO BE ERECTED PLUMB AND LEVEL.
11. WHERE DETAILED GRATING SUPPORT ANGLES RUN THE FULL LENGTH OF THE MAIN BEAM.

NOTES

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4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon
1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11"x17". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCEPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

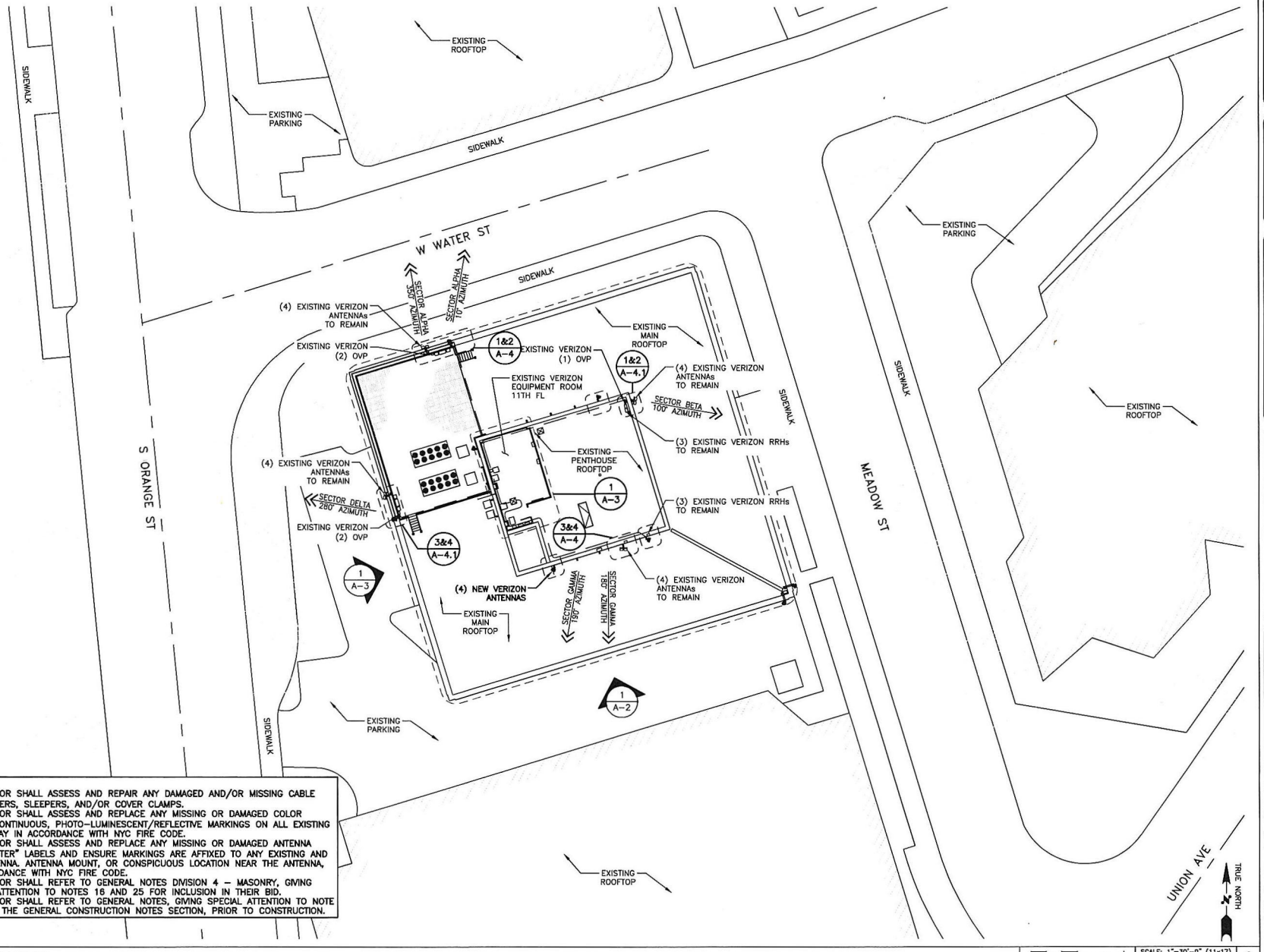
EXISTING ROOFTOP

SHEET DESCRIPTION

GENERAL NOTES

SHEET NO.

GN-2



NOTES:
1. CONTRACTOR SHALL ASSESS AND REPAIR ANY DAMAGED AND/OR MISSING CABLE TRAY COVERS, SLEEPERS, AND/OR COVER CLAMPS.
2. CONTRACTOR SHALL ASSESS AND REPLACE ANY MISSING OR DAMAGED COLOR CODED, CONTINUOUS, PHOTO-LUMINESCENT/REFLECTIVE MARKINGS ON ALL EXISTING CABLE TRAY IN ACCORDANCE WITH NYC FIRE CODE.
3. CONTRACTOR SHALL ASSESS AND REPLACE ANY MISSING OR DAMAGED ANTENNA "TRANSMITTER" LABELS AND ENSURE MARKINGS ARE AFFIXED TO ANY EXISTING AND NEW ANTENNA. ANTENNA MOUNT, OR CONSPICUOUS LOCATION NEAR THE ANTENNA, IN ACCORDANCE WITH NYC FIRE CODE.
4. CONTRACTOR SHALL REFER TO GENERAL NOTES DIVISION 4 – MASONRY, GIVING SPECIAL ATTENTION TO NOTES 16 AND 25 FOR INCLUSION IN THEIR BID.
5. CONTRACTOR SHALL REFER TO GENERAL NOTES, GIVING SPECIAL ATTENTION TO NOTE 5 UNDER THE GENERAL CONSTRUCTION NOTES SECTION, PRIOR TO CONSTRUCTION.

EXISTING SITE PLAN

SCALE: 1"=30'-0" (11x17)
(OR) 2"=30'-0" (22x34)

1

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4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

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SUBMITTALS

REV	DATE	DESCRIPTION	BY
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PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

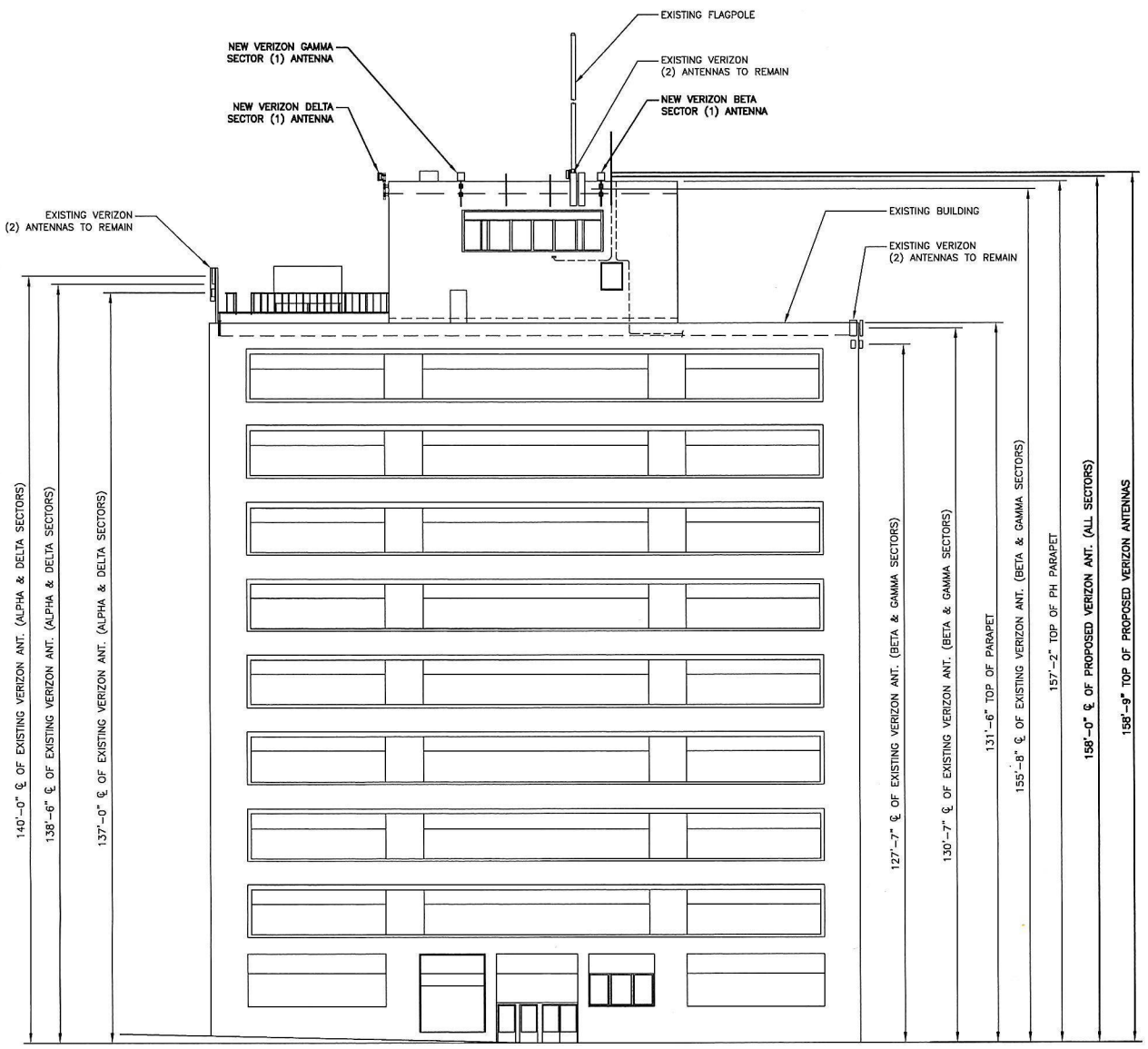
EXISTING ROOFTOP

SHEET DESCRIPTION

ROOF PLAN

SHEET NO.

A-1



PROPOSED SOUTH SIDE BUILDING ELEVATION

0 10' 20'

SCALE: 1"=20'-0" (11x17)
(OR) 2"=20'-0" (22x34)

1

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Trylon
1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

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SUBMITTALS

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PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

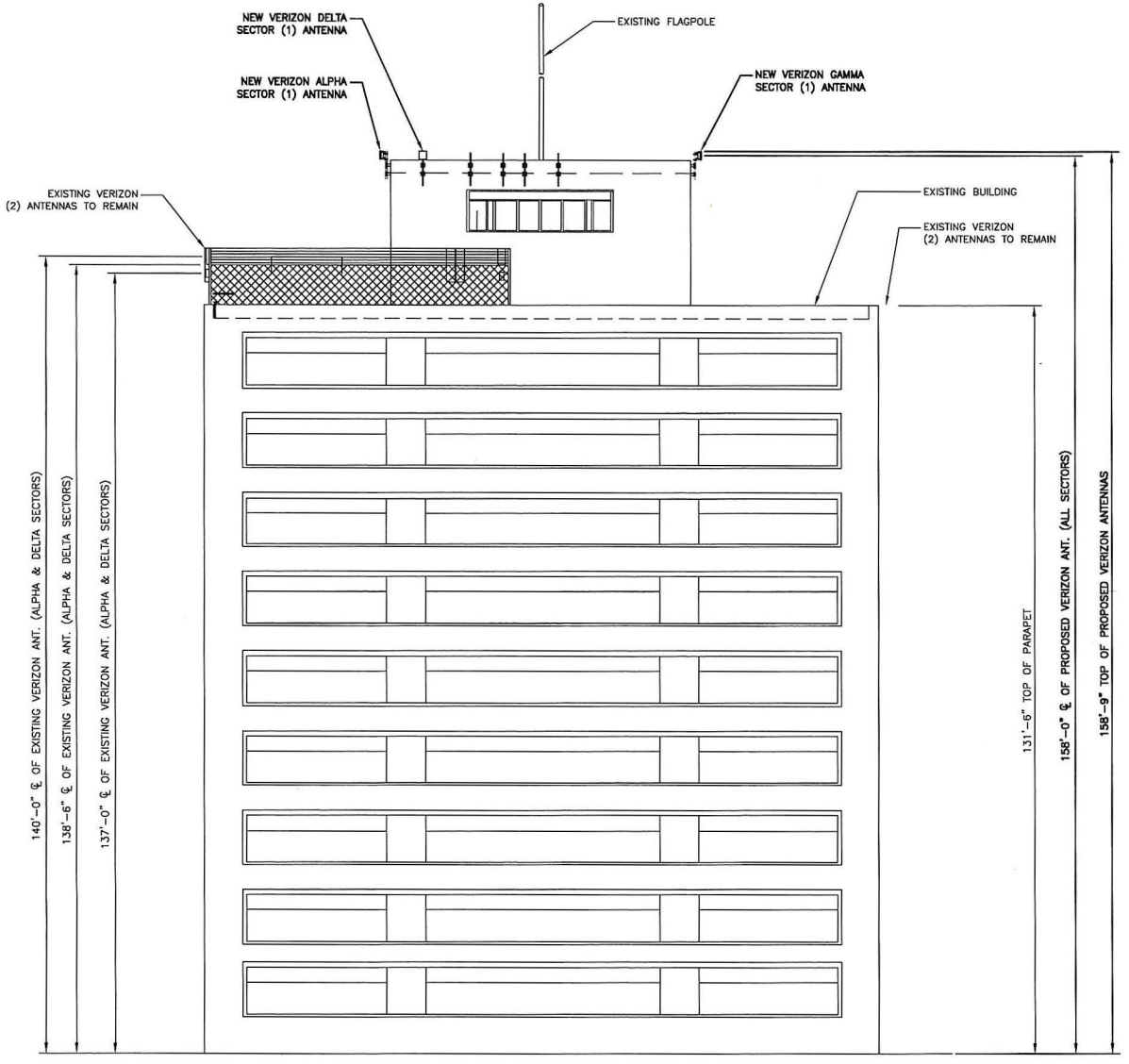
EXISTING ROOFTOP

SHEET DESCRIPTION

ELEVATIONS

SHEET NO.

A-2



PROPOSED WEST SIDE BUILDING ELEVATION

0 10' 20'

SCALE: 1"=20'-0" (11x17)
(OR) 2"=20'-0" (22x34)

1

verizon
4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon
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IRVING, TEXAS 75038

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SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

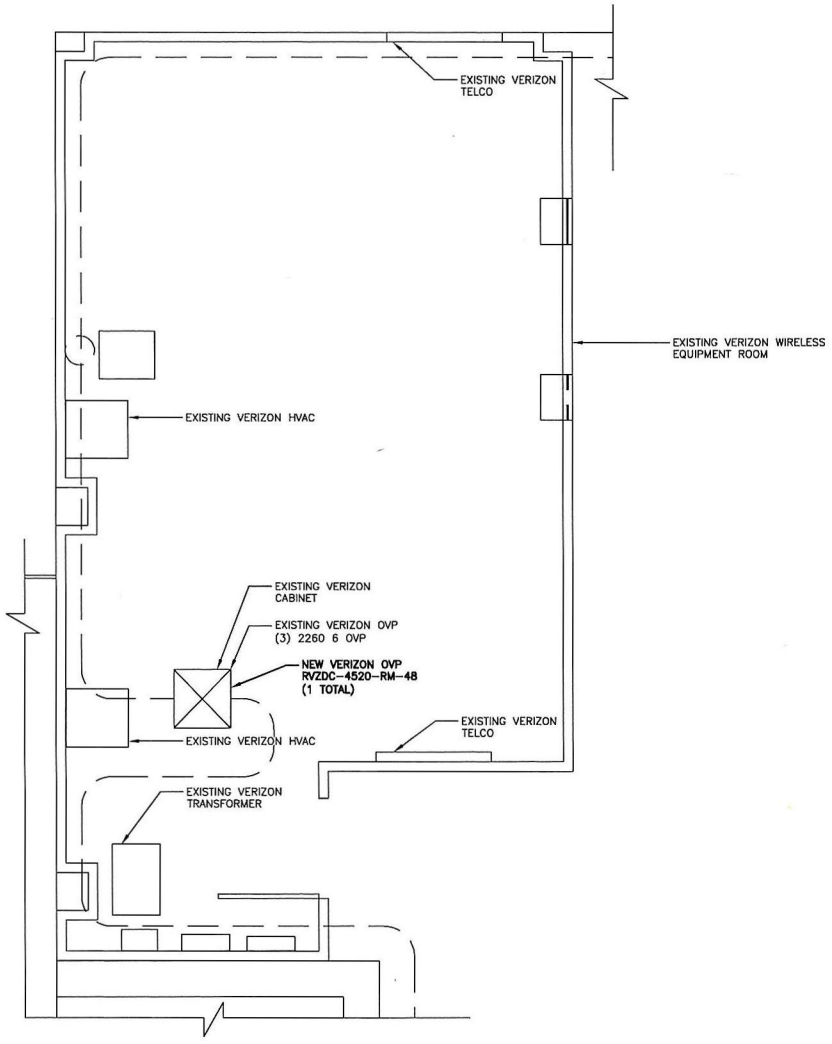
SHEET DESCRIPTION

ELEVATIONS

SHEET NO.

A-2.1

NOTE:
THERE WILL BE NO CHANGES IN THIS AREA OTHER THAN ON THE ELECTRICAL PANEL IF NECESSARY.



TRUE NORTH

EQUIPMENT PLAN

0 1' 2' 3'

SCALE: 3/8"=1'-0" (11x17)
(OR) 3/4"=1'-0" (22x34)

1

verizon

4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

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IRVING, TEXAS 75038

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SUBMITTALS

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PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

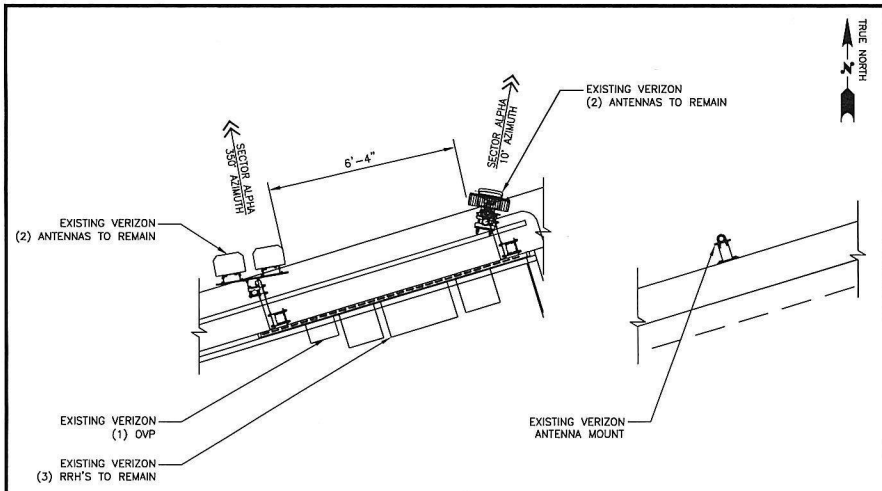
EXISTING ROOFTOP

SHEET DESCRIPTION

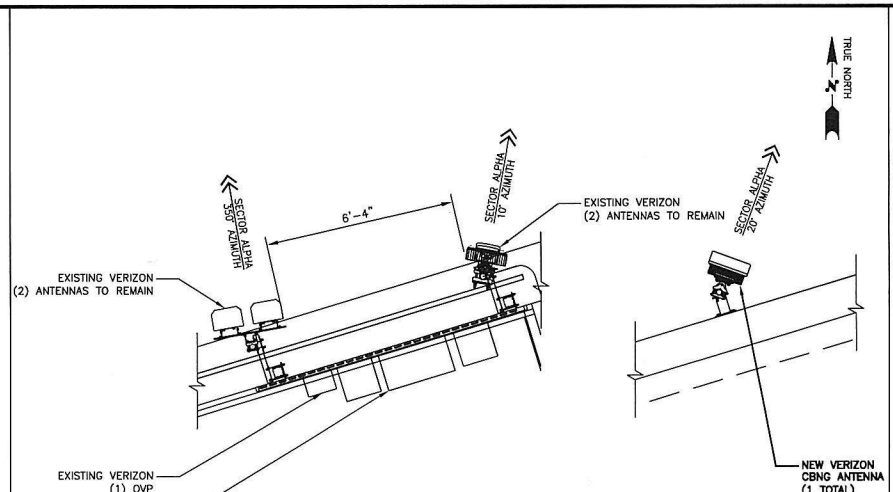
EQUIPMENT PLAN

SHEET NO.

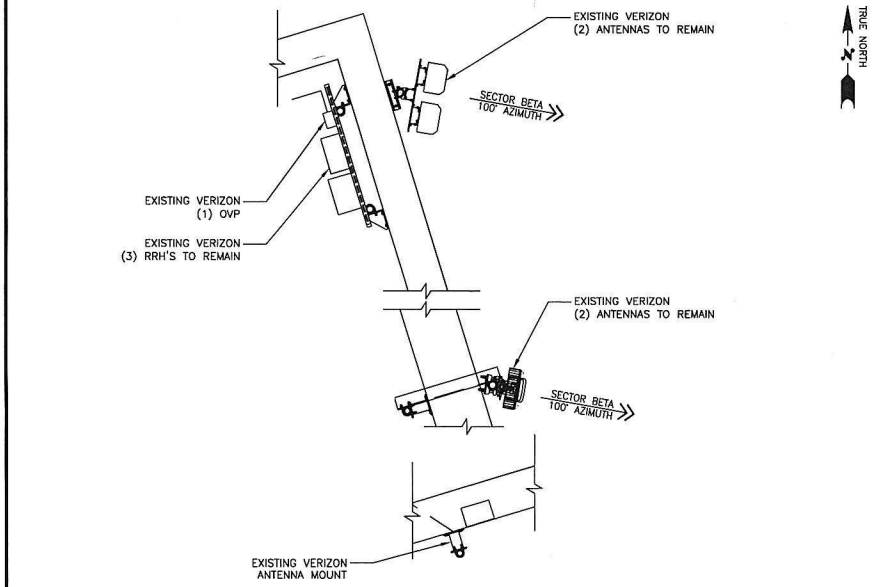
A-3



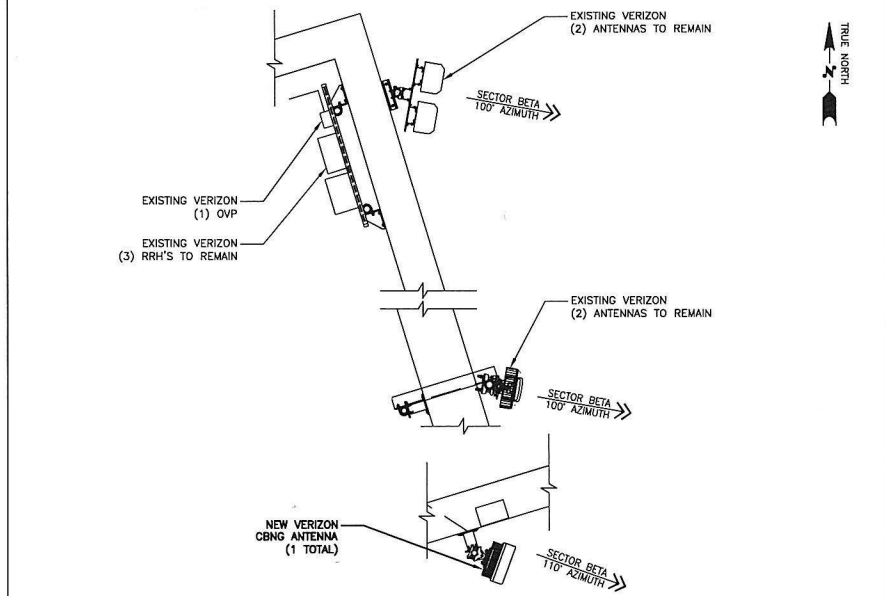
EXISTING ANTENNA LAYOUT (ALPHA SECTOR) — SCALE: 1/4"=1'-0" (11x17) (OR) 1/2"=1'-0" (22x34) — 1



PROPOSED ANTENNA LAYOUT (ALPHA SECTOR) — SCALE: 1/4"=1'-0" (11x17) (OR) 1/2"=1'-0" (22x34) — 2



EXISTING ANTENNA LAYOUT (BETA SECTOR) — SCALE: 1/4"=1'-0" (11x17) (OR) 1/2"=1'-0" (22x34) — 3



PROPOSED ANTENNA LAYOUT (BETA SECTOR) — SCALE: 1/4"=1'-0" (11x17) (OR) 1/2"=1'-0" (22x34) — 4

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Trylon
1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

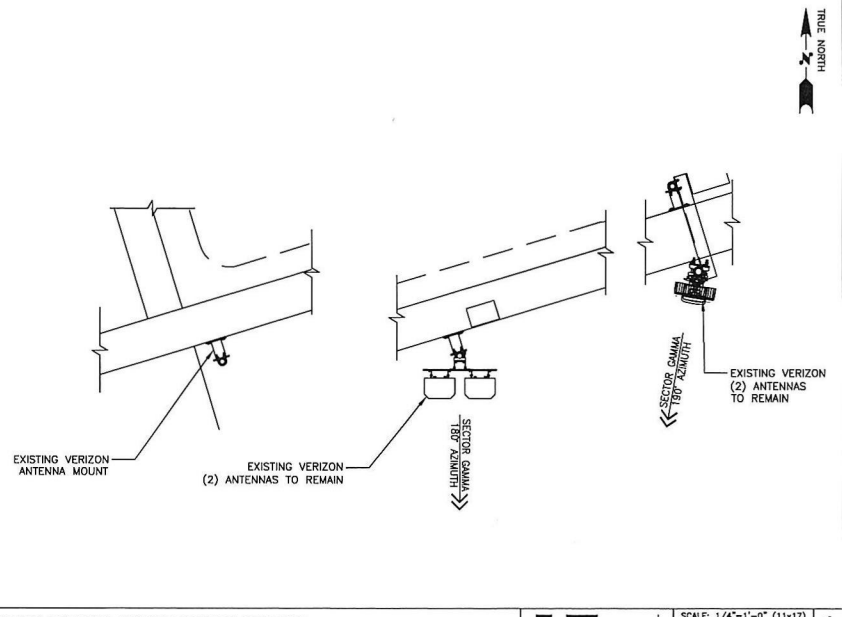
EXISTING ROOFTOP

SHEET DESCRIPTION

ANTENNA PLANS

SHEET NO.

A-4

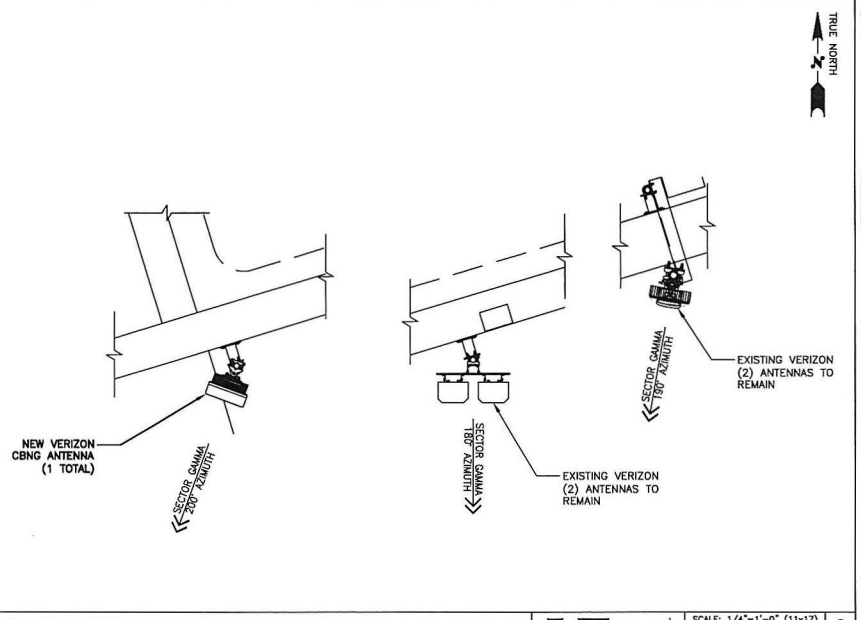


EXISTING ANTENNA LAYOUT (GAMMA SECTOR)

0 2' 4'

SCALE: 1/4"=1'-0" (11x17)
(OR) 1/2"=1'-0" (22x34)

1

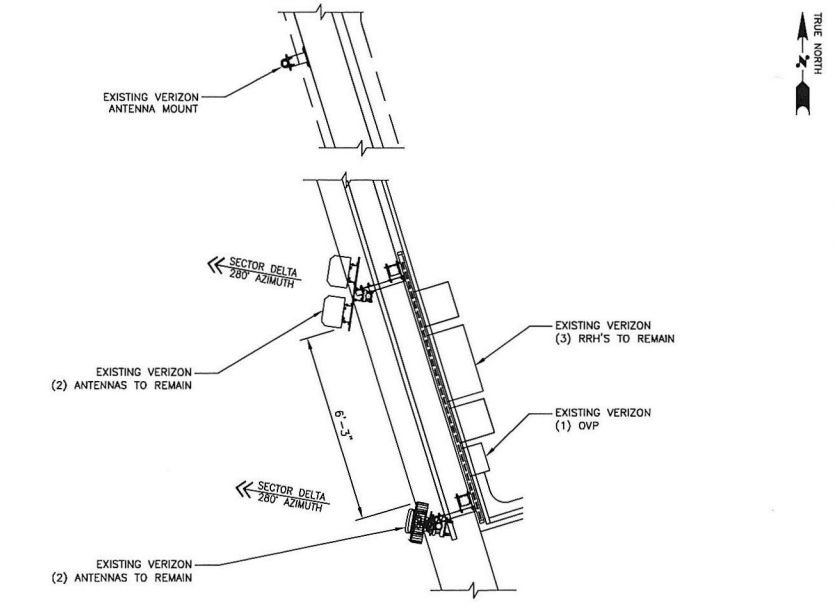


PROPOSED ANTENNA LAYOUT (GAMMA SECTOR)

0 2' 4'

SCALE: 1/4"=1'-0" (11x17)
(OR) 1/2"=1'-0" (22x34)

2

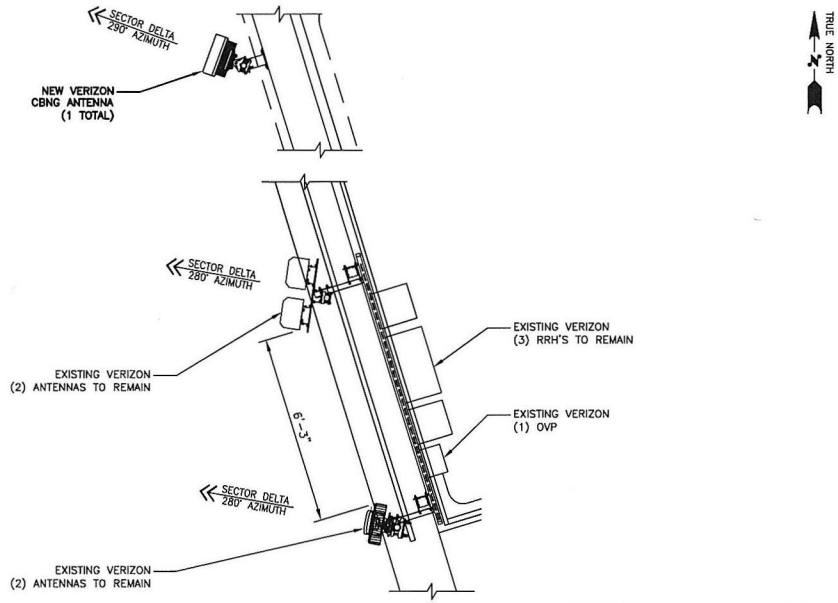


EXISTING ANTENNA LAYOUT (DELTA SECTOR)

0 2' 4'

SCALE: 1/4"=1'-0" (11x17)
(OR) 1/2"=1'-0" (22x34)

3



PROPOSED ANTENNA LAYOUT (DELTA SECTOR)

0 2' 4'

SCALE: 1/4"=1'-0" (11x17)
(OR) 1/2"=1'-0" (22x34)

4

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4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

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SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

SHEET DESCRIPTION

ANTENNA PLANS

SHEET NO.

A-4.1

ANTENNA											TOWER EQUIPMENT
SECTOR	TYPE	STATUS	MODEL	SPECIFICATIONS			QUANTITY	AZIMUTH (DEGREES)	DT ELECTRICAL (DEGREES)	DT MECH (DEGREES)	MAKE/MODEL
				LENGTH (IN)	WIDTH (IN)	DEPTH (IN)					
ALPHA	LTE 700/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	350	14,14,14,5,4,0	0	(1) B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
ALPHA	LTE 700/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	350	14,14,14,5,4,0	0	(1) CBRS RRH - RT4401-48A
ALPHA	5G L-SUB6	EXISTING	MT6407-77A	35.1	16.1	5.5	1	10	6	0	INTEGRATED RRU
ALPHA	5G 28GHz	EXISTING	VZ-AT1K04	16.8	11.0	6.4	1	10	15	0	-
ALPHA	5G 39GHz	PROPOSED	39GHz VECTASTAR NRgNB	16.7	16.1	9.0	1	20	0	0	-
BETA	LTE 700/850/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	100	14,14,14,5,4,0	0	(1) B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
BETA	LTE 700/850/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	100	14,14,14,5,4,0	0	(1) CBRS RRH - RT4401-48A
BETA	5G L-SUB6	EXISTING	MT6407-77A	35.1	16.1	5.5	1	100	6	0	INTEGRATED RRU
BETA	5G 28GHz	EXISTING	VZ-AT1K04	16.8	11.0	6.4	1	100	15	0	-
BETA	5G 39GHz	PROPOSED	39GHz VECTASTAR NRgNB	16.7	16.1	9.0	1	110	0	0	-
GAMMA	LTE 700/850/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	180	14,14,14,5,4,0	0	(1) B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
GAMMA	LTE 700/850/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	180	14,14,14,5,4,0	0	(1) CBRS RRH - RT4401-48A
GAMMA	5G L-SUB6	EXISTING	MT6407-77A	35.1	16.1	5.5	1	190	6	0	INTEGRATED RRU
GAMMA	5G 28GHz	EXISTING	VZ-AT1K04	16.8	11.0	6.4	1	190	15	0	-
GAMMA	5G 39GHz	PROPOSED	39GHz VECTASTAR NRgNB	16.7	16.1	9.0	1	200	0	0	-
DELTA	LTE 700/850/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	280	5,5,5,5,4,0	0	(1) B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
DELTA	LTE 700/850/5G850/1900/AWS/CBRS	EXISTING	MX10FIT665-02	70.9	12.2	7.5	1	280	5,5,5,5,4,0	0	(1) CBRS RRH - RT4401-48A
DELTA	5G L-SUB6	EXISTING	MT6407-77A	35.1	16.1	5.5	1	280	6	0	INTEGRATED RRU
DELTA	5G 28GHz	EXISTING	VZ-AT1K04	16.8	11.0	6.4	1	280	15	0	-
DELTA	5G 39GHz	PROPOSED	39GHz VECTASTAR NRgNB	16.7	16.1	9.0	1	290	0	0	-

SECTOR	BASE COLOR	700 LTE	AWS LTE	PCS LTE	850 LTE	850 1X	PCS 1X	GPS
SECTOR 1 (ALPHA)	WHITE	RED	YELLOW	LIGHT BLUE	PINK	GRAY	PURPLE	BROWN
SECTOR 2 (BETA)	BLUE	RED	YELLOW	LIGHT BLUE	PINK	GRAY	PURPLE	
SECTOR 3 (GAMMA)	GREEN	RED	YELLOW	LIGHT BLUE	PINK	GRAY	PURPLE	
SECTOR 4 (DELTA)	WHITE/WHITE	RED	YELLOW	LIGHT BLUE	PINK	GRAY	PURPLE	
SECTOR 5 (EPSILON)	BLUE/BLUE	RED	YELLOW	LIGHT BLUE	PINK	GRAY	PURPLE	
SECTOR 6 (ZETA)	GREEN/GREEN	RED	YELLOW	LIGHT BLUE	PINK	GRAY	PURPLE	

NOTES:

1. CONTRACTOR SHALL PROVIDE MECHANICAL DOWNTILT BRACKETS.
2. VERIFY CABLE LENGTHS IN FIELD AND COORDINATE WITH VERIZON WIRELESS PRIOR TO ORDERING.
3. VERIFY CABLE MANUFACTURER AND DIAMETER WITH VERIZON WIRELESS PRIOR TO ORDERING.
4. CONTRACTOR SHALL CONFIRM GPS MODEL AND CABLE WITH VERIZON WIRELESS.
5. VERIFY MAKES AND MODEL NUMBERS WITH VERIZON WIRELESS RF ENGINEER AND PROVIDE 1/2"ø HELIAX ANTENNA JUMPERS OF APPROPRIATE LENGTHS AT THE EQUIPMENT AND AT THE ANTENNAS.

verizon

4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

1825 W. WALNUT HILL LANE, SUITE 120
IRVING, TEXAS 75038

SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

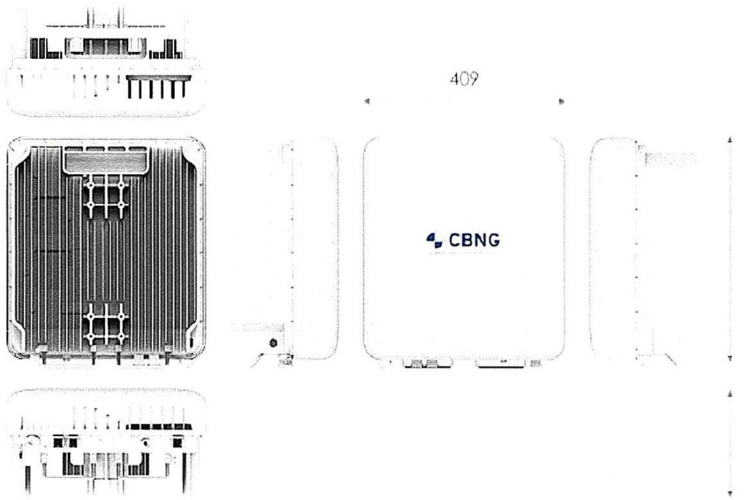
SHEET DESCRIPTION

ANTENNA & CABLE SCHEDULE

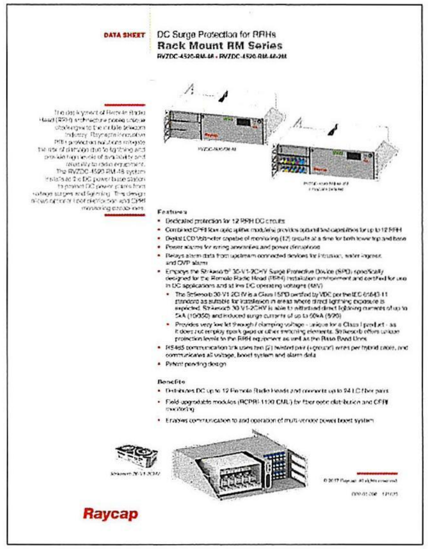
SHEET NO.

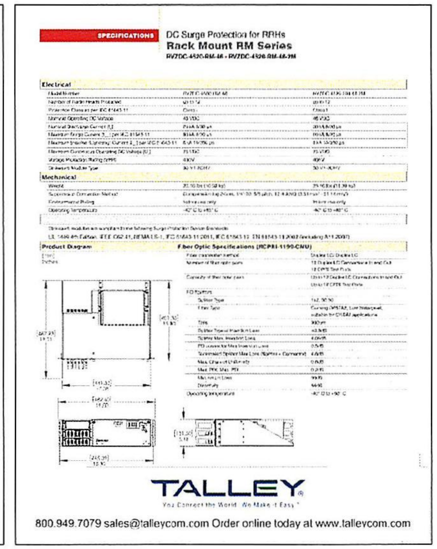
A-5

Product Dimensions: 409mm (width) x 455mm (height) x 229mm (depth)



39GHZ VECTASTAR NRGNB ANTENNA DETAILS | N.T.S. | 1





RAYCAP RVZDC-4520-RM-48 DETAIL | N.T.S. | 2

NOT USED | N.T.S. | 3

NOT USED | N.T.S. | 4

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4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

1825 W. WALNUT HILL LANE, SUITE 120
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SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

SHEET DESCRIPTION

EQUIPMENT AND ANTENNA SPECIFICATIONS

SHEET NO.

D-1

ELECTRICAL LEGEND

LIGHTING FIXTURES	
	1' X 4' SURFACE MOUNTED FLOURESCENT FIXTURE WITH WRAP AROUND ACRYLIC PRISMATIC LENS. LITHONIA PART NO. LB-332-120-SS81/3-NYC. LAMPS: (3) F32T8/35K
	50 WATT H.P.S. EXTERIOR WALL MOUNTED FIXTURE W/ PHOTOCELL. MOUNT 6'6" A.F.G. TO BOTTOM. HUBBELL NO. NRG-301-120-PC
POWER	
	HOMERUN TO DESIGNATED PANEL. CROSS LINES INDICATE NUMBER OF CONDUCTORS WHEN MORE THAN TWO (GROUND NOT INCLUDED) NUMBER DENOTES CIRCUIT
T	TRANSFORMER
WIRING DEVICES	
	DUPLEX RECEPTACLE, 20 AMP, 125 V, LEVITON NO. 5262-I MOUNT 1'6" A.F.F. TO CENTER
	DOUBLE DUPLEX RECEPTACLE, (2) 20 AMP, 125 V, LEVITON NO. 5262-I MOUNT 1'6" A.F.F. TO CENTER
GFI	20 AMP, 125 V, DUPLEX RECEPTACLE W/ GROUND FAULT INTERRUPTER LEVITON NO. 6599 W/ LOCKING COVER 5977
S1	SINGLE POLE, 20 AMP TOGGLE SWITCH LEVITON NO. CSB 1-20. MOUNT 4'-0" A.F.F. TO TOP.
S2	TWO-POLE, 20 AMP TOGGLE SWITCH LEVITON NO. CSB 2-20. MOUNT 4'-0" A.F.F. TO TOP.
S3	3-WAY, 20 AMP TOGGLE SWITCH LEVITON NO. CSB 3-20. MOUNT 4'-0" A.F.F. TO TOP.
AUXILIARY SYSTEMS	
I	CEILING-MOUNTED IONIZATION SMOKE DETECTOR
P	CEILING MOUNTED PHOTOELECTRIC SMOKE DETECTOR
EXIT	SELF-CONTAINED COMBINATION EMERGENCY LED LIGHT W/ (2) LAMPHEADS. DUAL-LITE NO.: LTSRW
F	FIRE ALARM PULL STATION, MOUNT 48" A.F.F. TO TOP.
F	FIRE ALARM HORN / STROBE. MOUNT 80" A.F.F. TO TOP.

EQUIPMENT	
	DISCONNECT SWITCH 30 = AMP RATING NF = NON-FUSED
	PULLBOX
	PANELBOARD
	MOTOR-OPERATED DAMPER
	MOTOR
GROUNDING	
	#2 SOLID TINNED COPPER UNLESS OTHERWISE NOTIFIED
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION, DOUBLE-CRIMP "C" TYPE
	MASTER GROUND BAR
	INSULATED GROUND BAR
	UNINSULATED GROUND BAR
	5/8" x 10' COPPER CLAD GROUND ROD

GENERAL SPECIFICATIONS:

1. ALL WORK SHOULD BE DONE IN A NEAT WORKMANLIKE MANNER, LEFT CLEAN AND FREE FROM DEFECTS, AND COMPLETELY OPERABLE. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AS SCHEDULED ON THE DRAWINGS. ALL MATERIALS SHALL BE NEW AND ALL WORK AND MATERIALS SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
2. ALL WORK SHALL BE CAREFULLY COORDINATED WITH THE LANDLORD AND ALL TRADES INVOLVED, AND THE CONTRACTOR SHALL PROVIDE PROPER CONNECTIONS, FITTINGS, VALVES, PIPING, ETC. FOR ALL EQUIPMENT FURNISHED BY CARRIER OR OTHER TRADES INVOLVED IN THIS CONTRACT.
3. CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY CONFLICT DISCOVERED BEFORE PERFORMING ANY WORK RELATED TO SUCH CONFLICT.
4. PROVIDE ALL REQUIRED TEMPORARY UTILITIES AND PAY ALL ASSOCIATED FEES AND OPERATING COSTS.
5. THE GENERAL CONTRACTORS SHALL PERFORM ALL CUTTING AND PATCHING AS REQUIRED FOR THEIR RESPECTIVE WORK, INCLUDING STRUCTURALLY FRAMED OPENINGS SHALL BE CUT AND FRAMED BY THE GENERAL CONTRACTOR. ALL HOLES IN MASONRY FLOORS AND WALLS SHALL BE CORE DRILLED.

GROUNDING NOTES:

1. ALL GROUNDING CONDUCTORS SHALL BE #2 SOLID TINNED COPPER, UNLESS OTHERWISE NOTED.
2. ALL EXTERIOR CONNECTIONS TO GROUND CONDUCTOR SHALL BE EXOTHERMICALLY WELDED (CADWELD).
3. ALL CONNECTIONS BELOW GRADE SHALL BE EXOTHERMICALLY WELDED (CADWELD).
4. CONNECTIONS TO GROUND BARS SHALL BE MADE UTILIZING TWO-HOLE LONG BARREL TYPE STAINLESS STEEL BOLTS, NUTS, AND LOCKWASHERS.
5. CONNECTIONS TO EQUIPMENT AND ENCLOSURES SHALL BE MADE UTILIZING TWO-HOLE GROUND LUGS WITH AN ANTI-OXIDENT COMPOUND.
6. THE GROUNDING SYSTEM SHALL BE TESTED UPON INSTALLATION. THE MAXIMUM RESISTANCE TO GROUND SHALL NOT EXCEED 5 OHMS.
7. WHERE GROUNDING CONNECTIONS ARE MADE TO PAINTED METAL, SURFACES SHALL BE SCRAPED CLEAN TO BEAR METAL TO INSURE PROPER CONTACT. SURFACES SHALL BE RESTORED TO MATCH ORIGINAL FINISHES.
8. ALL BENDS IN GROUNDING CONDUCTORS SHALL NOT BE LESS THAN A 12" RADIUS.
9. BOND ALL METALLIC RACEWAYS, EQUIPMENT ENCLOSURES, AND BOXES.
10. ALL BONDING CONDUCTORS SHALL BE #6 AWG. STRANDED INSULATED COPPER.
11. CABLE TO CABLE CONNECTIONS SHALL BE EXOTHERMICALLY WELDED (CADWELD).
12. CABLE TO STEEL CONECTIONS SHALL BE EXOTHERMICALLY WELDED (CADWELD), UNLESS OTHERWISE NOTED.
13. USE OF NINETY DEGREE BENDS SHALL BE AVOIDED. BENDS SHALL BE FORTY FIVE DEGREES WHERE POSSIBLE.
14. BOND ALL SERVICE RACEWAYS, EQUIPMENT ENCLOSURES, METER FITTINGS, BOXES, AND METALLIC RACEWAYS IN ACCORDANCE WITH SECTION 250-71 OF THE NATIONAL ELECTRIC CODE.

THE CONTRACTOR IS REQUIRED TO CONTACT AND MEET WITH THE UTILITY COMPANIES PRIOR TO STARTING CONSTRUCTION. THIS IS NECESSARY TO VERIFY THAT FOLLOWING UTILITY POINTS HAVE REMAINED CONSISTENT WITH THE CONTRACTOR DOCUMENTS: * TELEPHONE DEMARCATION POINT * ELECTRICAL SERVICE TAP POINT * NEW UTILITY METER LOCATION

ALL HIGH VOLTAGE WIRING CONDUITS ALONG ROOF SHALL BE COLOR CODED RED. ALL LOW VOLTAGE WIRING CONDUITS ALONG ROOF SHALL BE COLOR CODED ORANGE, AND ALL BARE ANTENNA CABLES SHALL BE COLOR CODED ORANGE WITH CONTINUOUS, DURABLE AND WEATHERPROOF REFLECTIVE OR LUMINESCENT MARKING AS PER SECTION 504.4.2 OF NYC FIRE CODE.

ELECTRICAL SPECIFICATIONS:

1. GENERAL:
   - A. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, TRANSPORTATION EQUIPMENT, SERVICES AND FACILITIES REQUIRED FOR THE COMPLETE, PROPER AND SUBSTANTIAL INSTALLATION OF ALL ELECTRICAL WORK. ALL FIXTURES, DEVICES, AND EQUIPMENT SHOWN, NOTED OR REQUIRED ON THESE DRAWINGS, AND/OR CONTAINED HEREIN SHALL BE CONNECTED FROM THE SOURCE OF ELECTRIC POWER TO THE FINAL CONNECTION, TESTED AND MADE READY FOR SATISFACTORY OPERATION.
   - B. ALL CONTROL WIRING SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR. OTHER CONTRACTORS SHALL PROVIDE STARTERS, ETC. FOR ALL EQUIPMENT THEY FURNISH, UNLESS SPECIFICALLY INDICATED ON THE ELECTRICAL DRAWINGS.
   - C. UNLESS OTHERWISE INDICATED, THE ARRANGEMENT, POSITION, CONNECTIONS, ETC. SHOWN ON THE DRAWINGS SHALL BE TAKEN DIAGRAMMATIC. THE RIGHT IS RESERVED BY THE ENGINEER TO MAKE MINOR CHANGES IN LOCATIONS AND ARRANGEMENTS WHEN REQUIRED BY JOB DEVELOPMENT WITHOUT ADDITIONAL COMPENSATION TO THE CONTRACTOR.
   - D. REFER TO THE GENERAL SPECIFICATION, THIS SHEET.
   - E. ALL WORK SHALL CONFORM TO THE ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE AND LOCAL, STATE AND APPLICABLE CODES.
   - F. PROVIDE AS-BUILT DRAWINGS TO OWNER AT CONCLUSION OF PROJECT.
   - G. OBTAIN ALL PERMITS AND APPROVALS FROM AUTHORITIES HAVING JURISDICTION AND PAYING ALL FEES REQUIRED.
   - H. WHEN A UTILITY COMPANY METER IS SPECIFIED, THE CONTRACTOR SHALL OBTAIN ALL ASSOCIATED CUT-IN CARDS, INSPECTIONS, ETC., NECESSARY TO HAVE THE METER SET. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MEET WITH UTILITY COMPANY PRIOR TO CONSTRUCTION TO VERIFY SOURCE OF ELECTRIC SERVICE, TAP AND METER LOCATION.
   - I. GROUND RING DEPTH SHALL BE 30 INCHES MINIMUM BELOW FINISHED GRADE, OR 6 INCHES BELOW FROST LINE, WHICHEVER IS THE GREATER DISTANCE.
2. IDENTIFICATION:
   - A. PROVIDE TYPEWRITTEN DIRECTORIES FOR PANELS, INDICATING USE OF EACH BRANCH CIRCUIT AND DESIGNATING SPARE CIRCUITS. HANDWRITTEN DIRECTORIES ARE NOT ACCEPTABLE.
   - B. LABEL ALL CONDUITS AND WIRES WITH THEIR ASSOCIATED CONDUIT AND CIRCUIT/TERMINAL NUMBERS. MARKERS TO BE AS MANUFACTURED BY SETON NAMEPLATE CORP., OR EQUAL.
   - C. ALL PANELBOARDS, SWITCHES AND OTHER EQUIPMENT ENCLOSURES SHALL BEAR ENGRAVED NAMEPLATES AS MANUFACTURED BY SETON NAMEPLATE CORP., OR EQUAL LETTERING TO BE 1/2 INCH HIGH WHITE LETTERS ON BLACK BACKGROUND UNLESS NOTED OTHERWISE.
3. RACEWAYS:
   - A. MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS OTHERWISE NOTED ON THE DRAWINGS.
   - B. EXPOSED RACEWAYS SHALL BE RUN TRUE, PLUMB, AND PARALLEL OR PERPENDICULAR TO BUILDING LINES.
   - C. CONDUIT SUPPORTS SHALL BE SPACED AT A MAXIMUM DISTANCE OF 10 FEET APART.
4. WIRING METHODS:
   - A. SINGLE CONDUCTOR CABLES SHALL BE USED FOR FEEDERS AND BRANCH CIRCUIT WIRING. MINIMUM SIZE WIRE SHALL BE #12 AWG UNLESS OTHERWISE INDICATED AND SHALL BE SIZED TO CONFORM TO NORMAL NEC VOLTAGE DROPS. WIRE SIZES #10AWG AND SMALLER SHALL BE SOLID, #8 AWG AND LARGER SHALL BE STRANDED. ALL CONDUCTORS SHALL BE COPPER.
   - B. CONDUCTORS SHALL BE CONTINUOUS FROM ORIGIN TO PANEL OR EQUIPMENT WITHOUT SPLICES. WHERE TAP SPLICES ARE NECESSARY AND APPROVED, THEY SHALL BE MADE WITH SUITABLE CONNECTORS IN JUNCTION BOXES.
   - C. PHASE CONDUCTORS SHALL BE IDENTIFIED WITH THE FOLLOWING COLOR CODED TAPE AT BOTH ENDS:

120/208 VOLTS		277/480 VOLTS
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	WHITE W/ GREY STRIPE
GROUND	GREEN	GREEN

   - D. PROVIDE FIRESTOPPING AROUND ALL CONDUITS AT WALL AND FLOOR PENETRATIONS.
   - E. SEAL ALL EXTERIOR WALL PENETRATIONS AS REQUIRED.
   - F. THE CONTRACTOR SHALL CONCEAL ALL CONDUIT ROUTING PASSING THROUGH FINISHED AREAS. CONDUIT ROUTING THROUGH UNFINISHED AREAS SHALL BE SUPPORTED AS SPECIFIED IN DRAWINGS. UNLESS CLEARLY SPECIFIED, NO CONDUITS SHALL BE ROUTED ON EXTERIOR SURFACE OF BUILDING.
   - G. UNDERGROUND CONDUITS SHALL BE A MINIMUM OF 24" BELOW FINISHED GRADE. ALL UNDERGROUND WORK SHALL BE DOCUMENTED BY PHOTOGRAPH BEFORE ANY BACKFILL IS BEGUN. PHOTOS WILL BE REQUIRED AT TIME PUNCHLIST IS PERFORMED. FEEDERS SHALL BE INDIVIDUAL CONDUCTORS IN SCHEDULE 40 PVC, DIRECT BURIAL CONDUIT. WHEN BURIED CONDUITS ARE SUBJECT TO VEHICULAR TRAFFIC, CONDUITS SHALL BE ENCASED IN CONCRETE. ALL SWEEPS BELOW GRADE SHALL BE SCHEDULE 80 PVC.
   - H. ALL FEEDERS RUN INDOORS SHALL CONSIST OF EMT WITH INDIVIDUAL CONDUCTORS. FLEXIBLE METALLIC CONDUIT (MC) SHALL BE USED WHERE STRUCTURAL MEMBER PROHIBIT CONDUIT. MC MAY ALSO BE UTILIZED FOR LIGHTING WHIPS, BRANCH CIRCUITS AND OTHER MISCELLANEOUS APPLICATIONS PERMITTED BY CODE.
   - I. ALL FEEDERS IN "DAMP" OR "WET" LOCATIONS SHALL CONSIST OF INDIVIDUAL CONDUCTOR IN RIGID GALVANIZED STEEL OR RIGID ALUMINUM CONDUIT. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE UTILIZED WHEN CONNECTING TO EQUIPMENT CABINETS AND VIBRATING EQUIPMENT. THE MAXIMUM LENGTH FOR FLEXIBLE CONDUIT SHALL BE 6'-0".
5. WIRING DEVICES:
   - A. SWITCHES, RECEPTACLES AND OTHER WIRING DEVICES SHALL BE SPECIFICATION GRADE OF TYPE, SIZE AND RATING INDICATED ON THE DRAWINGS.
6. DISCONNECT SWITCHES:
   - A. SWITCHES SHALL BE QUICK-MAKE, QUICK-BREAK NEMA 1 FOR INDOOR USE AND NEMA 3R FOR OUTDOOR USE AS MANUFACTURED BY GENERAL ELECTRIC, SQUARE D OR EQUAL. ELECTRICAL CONTRACTOR TO PROVIDE ALL SAFETY DISCONNECTS.
7. SPECIAL REQUIREMENTS:
   - A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL POWER AND CONTROL WIRING FOR EQUIPMENT FURNISHED UNDER HVAC, PLUMBING AND GENERAL TRADE SECTIONS.
   - B. ALL WORK REQUIRING AN OUTAGE OR INTERRUPTION OF SERVICE (POWER, TELEPHONE) SHALL BE SCHEDULED ONLY AT SUCH TIME PERMITTED BY OWNER.
   - C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FILING THE PROJECT WITH THE ADVISORY BOARD OF THE CITY OF NEW YORK (IF REQUIRED) THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARATION OF NECESSARY DRAWINGS, FORMS AND ALL ASSOCIATED FEES.
8. LIGHTING FIXTURES AND LAMPS:
   - A. LIGHTING FIXTURES SHALL BE FURNISHED COMPLETE WITH NECESSARY HARDWARE AND LAMPS.
9. PANELBOARDS:
   - A. PANELS SHALL BE BOLTED- ON MOLDED CASE CIRCUIT BREAKER TYPE WITH DOORS AND LOCKS.
   - B. ALL CONDUCTOR TERMINALS SHALL BE U.L. LISTED FOR MINIMUM OF 75°
10. TRANSFORMERS:
   - A. TRANSFORMERS SHALL BE DRY TYPE WITH AVERAGE TEMPERATURE RISE NOT TO EXCEED 150° C (115° C) (80° C).
   - B. TRANSFORMERS SHALL BE AS MANUFACTURED BY SQUARE D, GENERAL ELECTRIC OR SIEMENS.
   - C. TRANSFORMER TO BE INSTALLED WITH A NEMA 3R WEATHERSHIELD.

DRAWING INDEX

DWG #	DRAWING TITLES
E-001	GENERAL INFORMATION
E-010	ELECTRICAL & GROUNDING DETAILS

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4 CENTEROCK ROAD
WEST NYACK, NY 10994

Trylon

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IRVING, TEXAS 75038

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SUBMITTALS

REV	DATE	DESCRIPTION	BY
A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

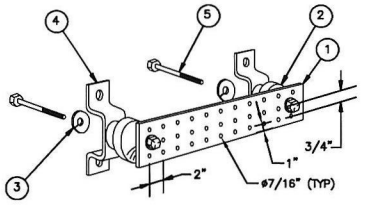
EXISTING ROOFTOP

SHEET DESCRIPTION

ELECTRICAL NOTES

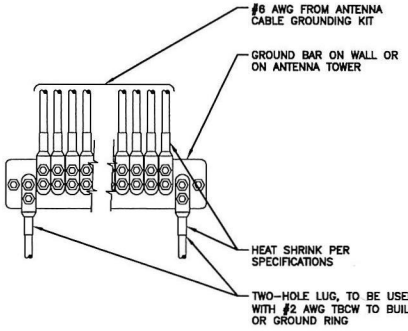
SHEET NO.

E-1



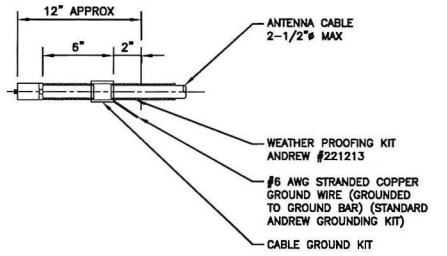
ITEM NO	REQ.	DESCRIPTION	NEWTON #
1	1	GALVANIZED STEEL GROUND BAR 1/4"x1/4"x20". HAGER PART NO TGB-14420C OR ALT PART NO 382227. HOLES CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.	–
2	2	INSULATORS	3061-4
3	4	5/8" LOCK WASHER	3015-8
4	2	WALL MTG. BRKT (OR FLOOR)	A-6056
5	4	5/8"-11 x 1 H.H.C.S. BOLTS	3012-1

GROUND BAR DETAIL | N.T.S. | 1



NOTE:
CONTRACTOR TO UTILIZE KOPR-SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS

GROUND LUG TO GROUND BAR CONNECTION DETAIL | N.T.S. | 2



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

CABLE GROUND KIT CONNECTION DETAIL | N.T.S. | 3

GROUNDING NOTES: #2 STRANDED GREEN JACKET ON NEW PROPOSED EQUIPMENT. LUGS: NON INSPECTION WINDOW ON OUTDOOR LUGS. INSPECTION WINDOW LUGS WITH CLEAR HEAT SHRINK FOR INDOOR LUG

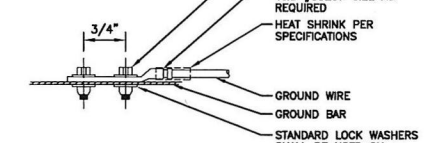
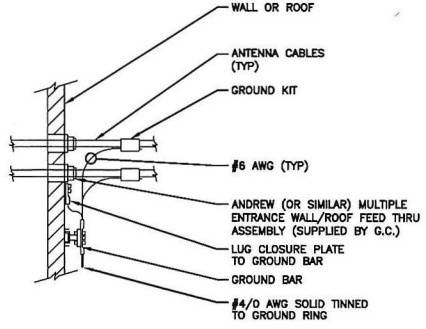


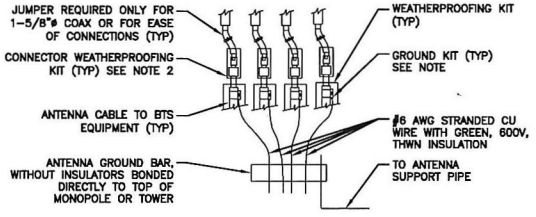
TABLE		
WIRE SIZE	LUG #	BOLT SIZE
#4/0	53212	1/2" – 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#2	53207	1/4" – 20 NC x 1/2" S.S. BOLT & NUT W/ LOCK WASHERS
#6	53205	

GROUND LUG CONNECTION DETAIL | N.T.S. | 4

NOT USED | N.T.S. | 5



CABLE GROUNDING DETAIL | N.T.S. | 6



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.
3. ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH COAX GROUND POINT OR BACK-A-LITE PLATE ON GROUND BAR.

GROUND BAR CONNECTION DETAIL | N.T.S. | 7

NOT USED | N.T.S. | 8

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SUBMITTALS

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A	09/26/24	90% CD	RC

PROJECT TITLE

LOCATION #: 468764

TANGLEWOOD

54 MEADOW STREET
NEW HAVEN, CT 06519

EXISTING ROOFTOP

SHEET DESCRIPTION

ELECTRICAL GROUNDING NOTES AND DETAILS

SHEET NO.

E-2

PENDING

PLUMBING DIAGRAM

N.T.S. 1

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NEW HAVEN, CT 06519

EXISTING ROOFTOP

SHEET DESCRIPTION

PLUMBING DIAGRAM

SHEET NO.

E-3

39GHz VectaStar NR gNB Product Specification

Cambridge Broadband Networks Group Ltd
Suites 1a & 1b, Ground Floor, Enterprise House, Vision Park, Histon, CB24 9ZR

Contents

Version History

Issue Number	Author(s)	Version Date	Summary & Comments
0.1	Justin Clark	31st May 2024	DRAFT – Subject to Review
1	Justin Clark	6th June 2024	1st version
2			

1 Introduction

This product specification document is for the VectaStar NR 39GHz n260 3GPP gNB which shall be referred to as the AP or Access Point forming the donor end point for a 5G NR Point to Multi-Point Fixed Wireless Access system. The AP is designed and manufactured by Delta Electronics to CBNG's requirements and is based on a NXP Layerscape® LX2160 Host processor and LS1235 programmable modem.

2 Product Specification

The following table defines the key product specifications for the VectaStar NR gNB.

Description	Specification	Notes
RF Performance		
Frequency Range 1	37 - 40 GHz	n260 FR2 Band
EIRP	+64dBmi ± 3dB	
Antenna Type	Phased array	
Antenna Beam Width	>4.5°	Half Power Beam width
Antenna Scan Range	Azimuth ±45°, Elevation ±10°	
Antenna Scan Loss	3dB max @ ±45°	
Main Beam Sidelobes	20dBc min	
Features		
Channel Bandwidth	100, 200, 400, 800MHz	Contiguous
# of Layers	2	Horizontal & Vertical Antenna Polarization, 2x2 MIMO
Carrier Aggregation	Up to 8CC	800MHz aggregated BW per layer
Component Carrier Bandwidth	100, 200, 400MHz	800MHz aggregated BW per layer
Modulation UL & DL	QPSK, 16QAM, 64QAM, 256QAM	
Duplex Mode	TDD	
Time Sync	IEEE 1588 PTP v2 (Microchip DPLL) GPS with External Antenna Holdover – 8hrs	Holdover occurs when IEEE 1588 Grandmaster and GPS unavailable
MIMO	2T2R	
Interfaces		
Back Haul	2x 10GbE Fiber (SFP+) 1x 1GbE RJ45 as LMT (Local Management)	
Power	DC 54V (Option with External AC Adaptor, 100-240 VAC, 54V ±5%, 6.48A)	Peak Power consumption ~320W
LED Indicators	System & Front Haul	
Environmental/Certification		
Operating Temperature Range	-40°C to +55°C	
Operating Humidity Range	5% to 95% RH	
IP Rating	IP67	
Certification	UL, FCC	

	3GPP compliant RoSH and WEEE	
Weight	gNB 18kg AC/DC Power Adaptor 3.2kg Mounting Bracket 2.6kg	
Size	455mm (height) x 409mm (width) x 229mm (depth)	
Software		
Management	HTTPS / Netconf	
Firmware Upgrade	FOTA & Local (via Ethernet)	
LAN	IEEE 802.1Q-1998 / IEEE 802.1AD (VLAN, QinQ) IEEE 802.1P (DSCP QOS) IPv4/IPv6 Dual-Stack NAPT, DNS Proxy, Port Forwarding, VPN Pass-through, DHCP Server/Client MAC/IP Packet Filtering, Stateless Firewall	PDU Type Ethernet supported

2.1 Ethernet Ports

The device supports one 10Gbps Ethernet port for data in an SFP+ format to support LC or RJ45 connector formats via selection of the appropriate transceiver embedded in the data connector housing.

The device supports one 1Gbps Ethernet port for management interface in an RJ45 format supporting 10/100/1000 Base-T.

2.2 Power Supply

The device is powered by a -48V nominal DC Input Power Rating TBC:

2.3 Status & Signal Strength LED Functionality

The device has two LEDs whose functionality is described in the following table.

LED Behaviour

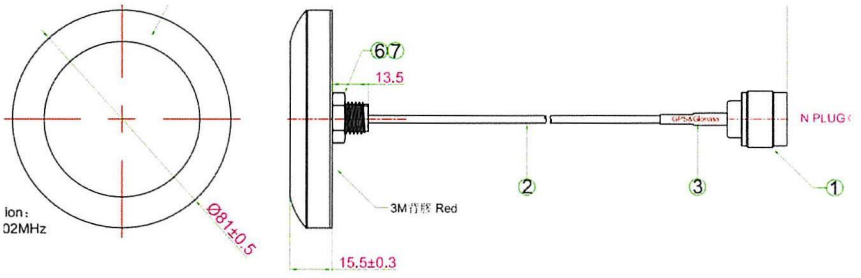
LED		Description
System	Off	Power Off
	Green - Solid	Operating
	Amber - Solid	System Crash
	Amber – Flashing Slow	PTP Unlock
	Amber – Flashing Fast	HW Failure
Front Haul	Green - Solid	Link Established
	Amber - Flashing	TX Active

2.4 GNSS

The device integrates global navigation satellite system solution that supports L1:

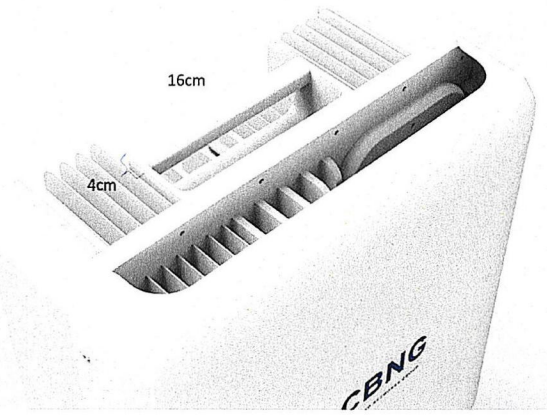
- GPS (North America)
- Galileo (Europe)
- GLONASS (Russia)
- QZSS (Japan)

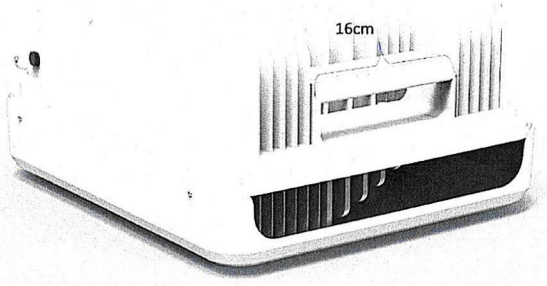
An external antenna is supplied affixed to a bracket attached to the unit, drawing below:

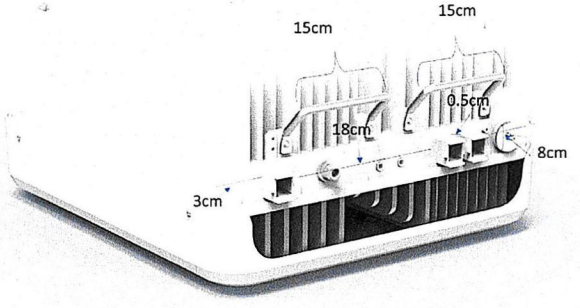


3 Mechanical

3.1 Device Images

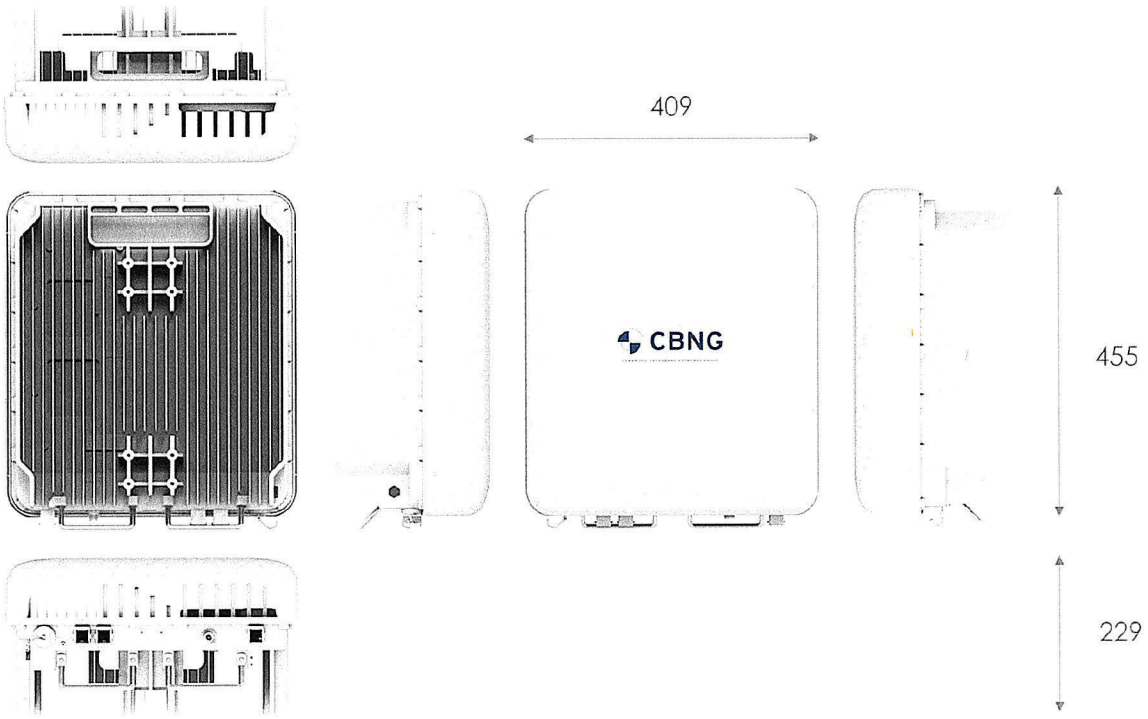

16cm
4cm
CBNG


16cm


15cm
15cm
0.5cm
18cm
8cm
3cm

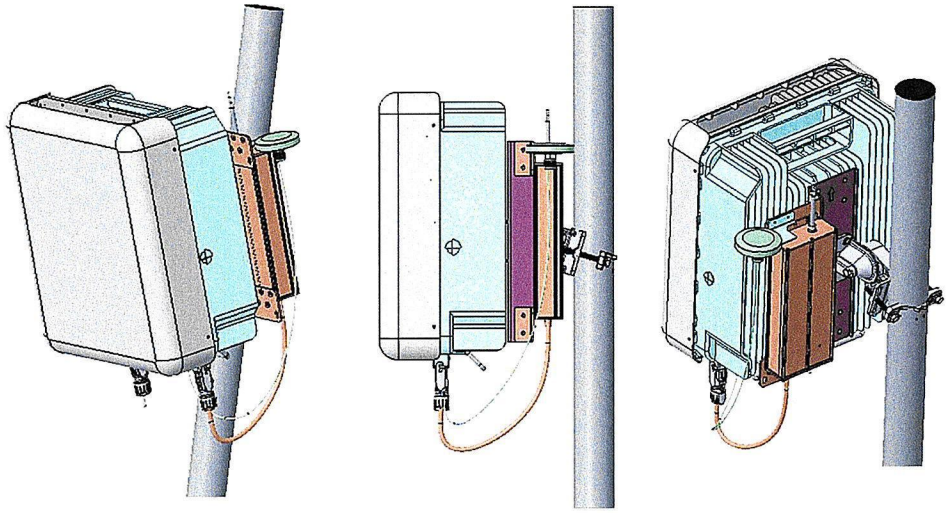
3.2 Device Dimensions

Product Dimensions: 409mm (width) x 455mm (height) x 229mm (depth)

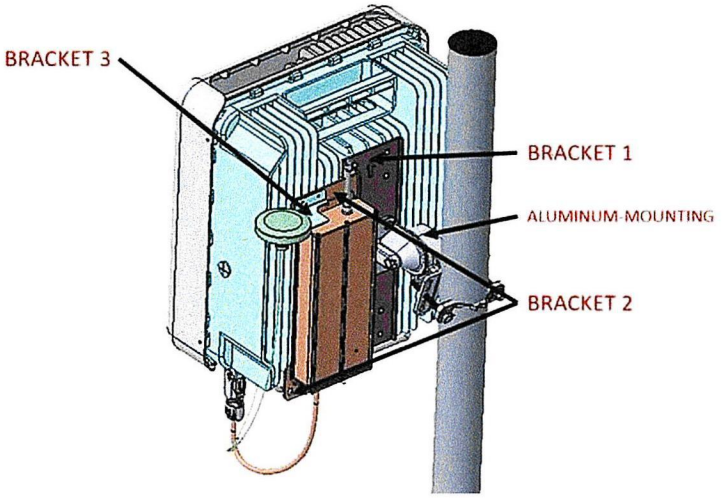


3.3 Mounting Options

Pole Mount

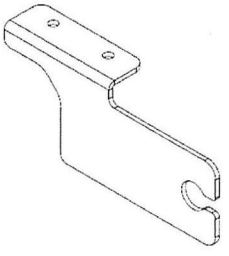


3.4 Mounting Bracket Details

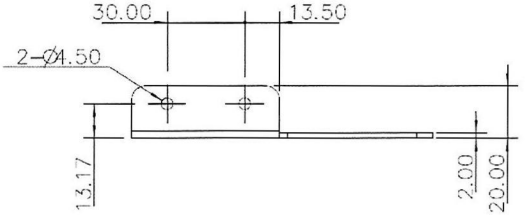


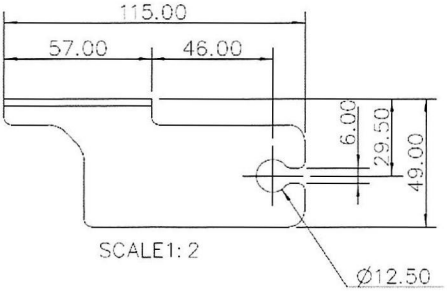
Technical Drawings:

Bracket 3



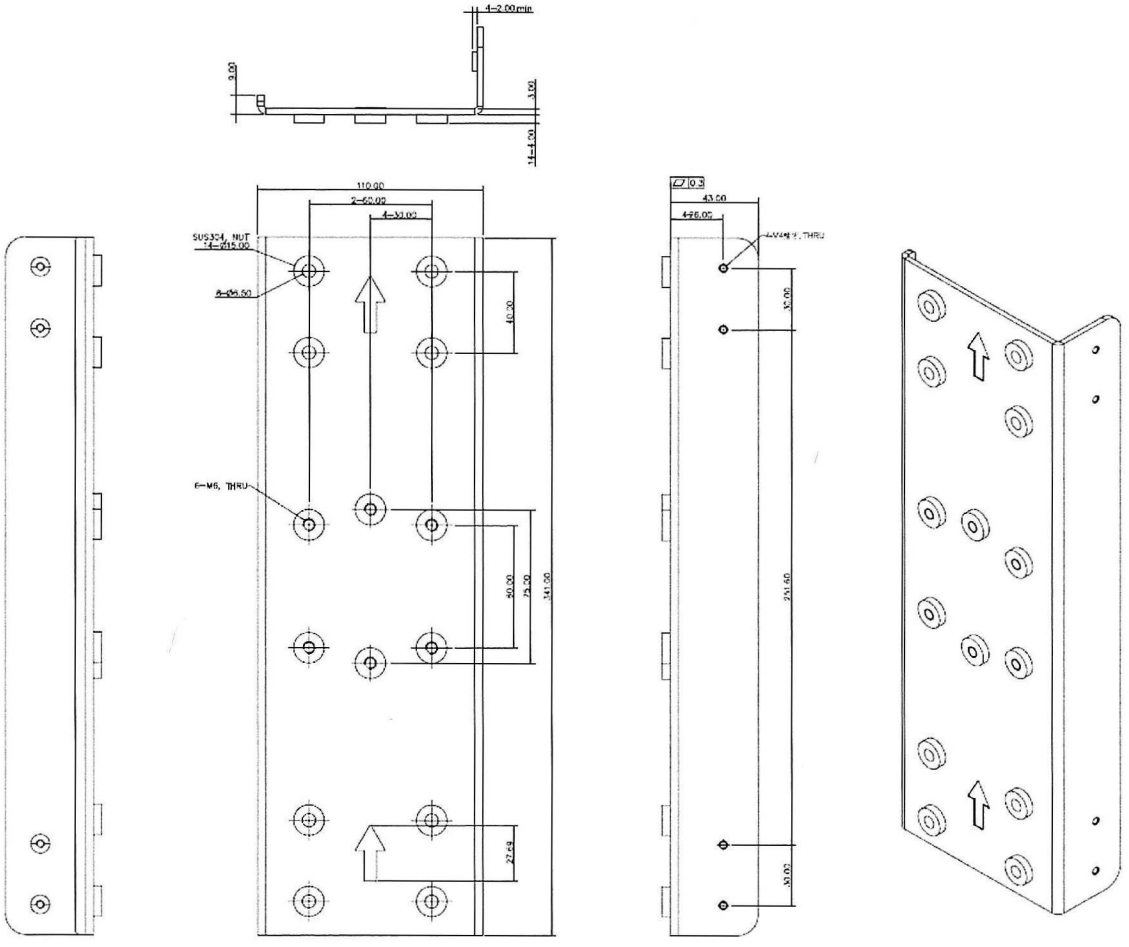
SCALE1: 2



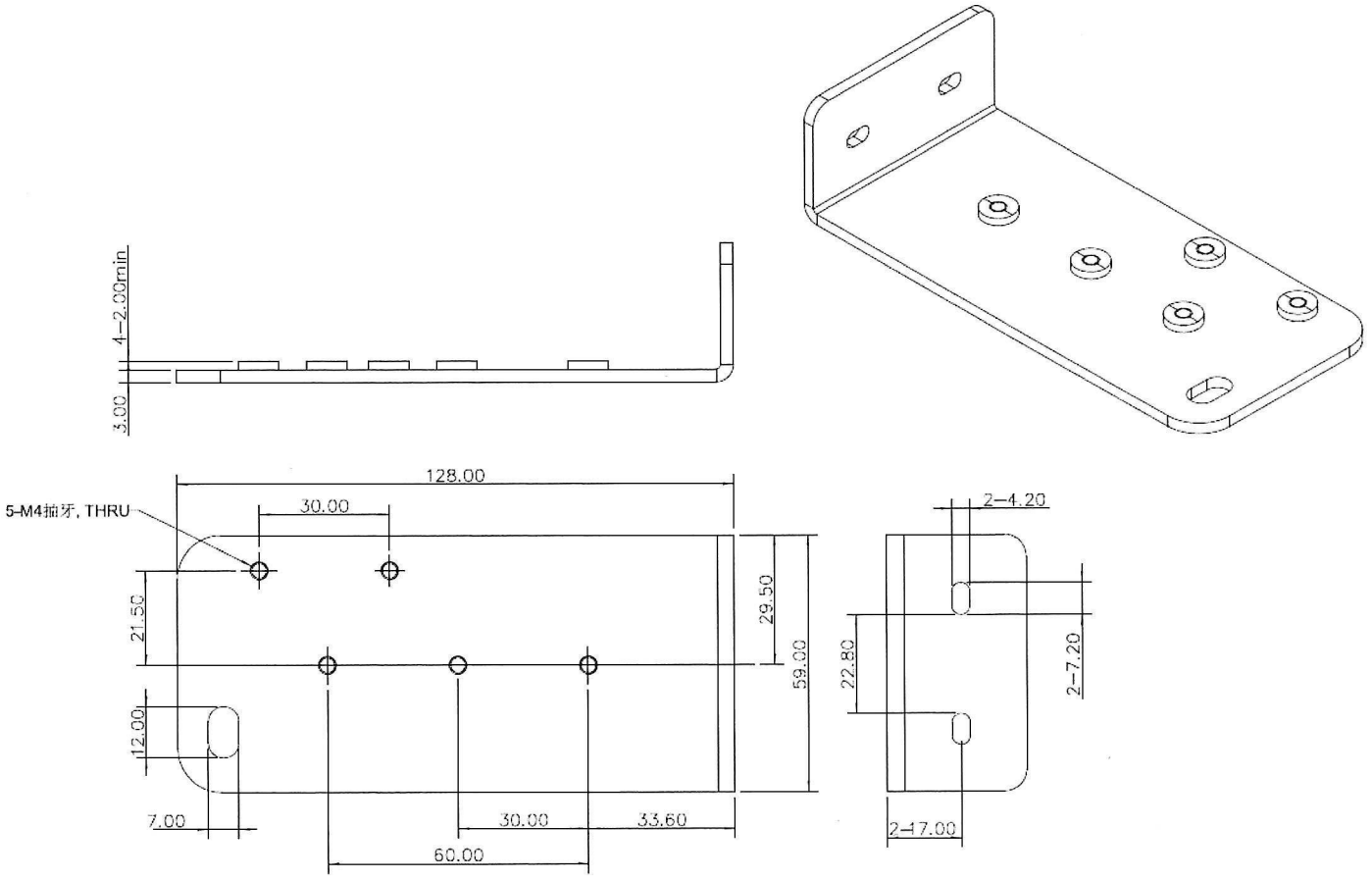


SCALE1: 2

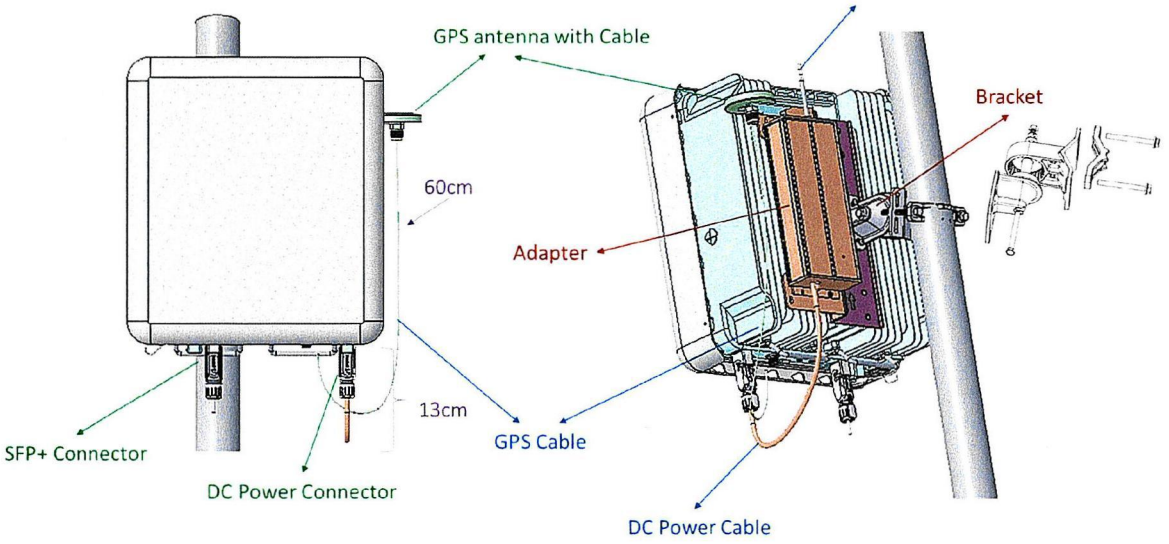
Bracket 1:



Bracket 2


4-2.00min
3.00
128.00
30.00
5-M4抽牙, THRU
21.50
29.50
59.00
12.00
7.00
30.00
33.60
60.00
2-4.20
22.80
2-7.20
2-17.00

3.5 Connectors and Accessories



SFP/SPF+

- *SFP transceiver inside the plug*
- *Direct heat dissipation to the chassis*
- *5 cm² surface savings on the PCB*
- *Easy access to the SFP for replacement*
- *No exposure of optical fibers*
- *EMI shielded*
- *IP67*

Power

- *Available with 2 or 4 contacts + cable braid grounding*
- *Crimped contacts or screw terminal blocks*
- *Wire size from 1.5 to 6 mm² (10-16AWG)*
- *Current rating up to 20A per contact*
- *Lightning protection*
- *EMI shielded*
- *IP67*

4 Qualification & Certification

The following qualification and certification standards are applicable, Item 6 is under investigation and as the design is in prototype phase compliance to standards has yet to be proven.

1. US UL
    a. CFR 29 - Part 1910,
    b. EN 62368-1
2. US FCC
    a. FCC Title 47 CFR parts 15B,
    b. part 18,
    c. part 30,
    d. CFR 47 - Part 1 §1310

3. 3GPP Rel 16
    a. TS 38.104,
    b. TS 38.113,
    c. TS 38.141-1,
    d. TS 38.141-2
4. Customer Compliance Requirements (under investigation for compliance)
    a. TL 9000 Quality Management System - Requirements Handbook,
    b. TL 9000 Quality Management System - Measurements Handbook,
    c. GR-63 Network Equipment - Building System (NEBS) Requirements: Physical Protection
    d. GR-78 Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment
    e. GR-282 Software Reliability And Quality Acceptance Criteria (SRQAC), A Module Of RQGR, FR-796 Issue 4
    f. GR-383 COMMON LANGUAGE® Equipment Codes (CLEITM Codes) - Generic Requirements for Bar Code Labels Issue 3
    g. GR-485 Common Language® Equipment Codes (CLEITM Codes)- Generic Requirements for Processes and Guidelines Issue 5
    h. GR-929 Reliability and Quality Measurements for Telecommunications Systems RQMS-Wire line), A Module of RQMS, FR-929 and RQGR, FR-796 Issue 8
    i. GR-1089 Electromagnetic Compatibility and Electrical Safety Generic Criteria for Network Telecommunications Equipment Issue 4
    j. GR-1315 In-Process Quality Metrics (IPQM)
    k. GR-1421 Generic Requirements for ESD Protective Circuit Packet Containers
    l. SR-NWT-2759 A View of Packaging, Palletization and Marking Requirements
    m. SR-332 Reliability Prediction Procedure for Electronic Equipment
    n. TR-NWT-000357 Generic Requirements for Assuring Reliability of Components Used in Telecommunications Equipment
    o. GR-418 Generic Reliability Assurance Requirements For Fiber Optic Transport Systems A Module Of RQGR, FR-796 Issue 2
    p. GR-840 Supplier Support Generic Requirements (SSGR), A Module of LSSGR, FR-64; OTGR, FR-439; and TSGR, FR-440 Issue 1
    q. TR-NWT-000870 Electrostatic Discharge Control in the Manufacture of Telecommunications Equipment

ATTACHMENT 3

Location	New Haven CT							
Date	10/23/2024							
Band	39GHZ	28GHZ	C-Band	CBRS	AWS	PCS	850	700
Operating Frequency (MHz)	38,500	27,500	3,700	3,550	2,145	1,970	869	746
General Population MPE (mW/cm^2)	1	1	1	1	1	1	0.57933333	0.49733333
ERP Per Transmitter (Watts)	1,303	153	21,751	52	1,396	1,303	638	556
Number of Transmitters	2	4	2	4	4	4	4	4
Antenna Centerline (CL) (feet)	158	127.8	130.8	138.5	138.5	138.5	138.5	138.5
Total ERP (Watts)	2,606	612	43,501	208	5,585	5,213	2,553	2,224
Total ERP (dBm)	64	58	76	53	67	67	64	63
Maximum % of General Population Limit	6.8%							

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.1310 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:
1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period;
3. calculation takes into account a point of interest of 2m or 6.56ft

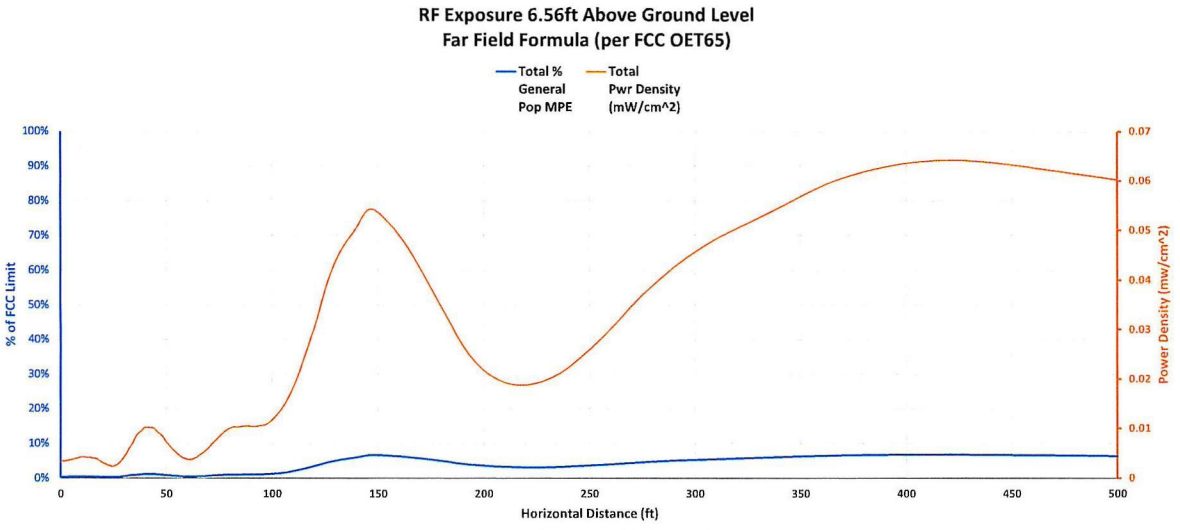
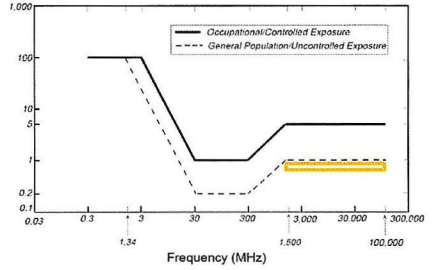
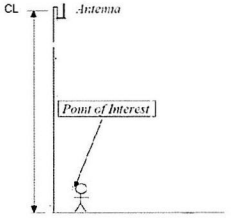


Figure 1. *FCC Limits for Maximum Permissible Exposure (MPE)*
Plane-wave Equivalent Power Density





Angle Below Horizon	Power Density (mW/cm^2)								Percent of General Population MPE									Distance	Total Pwr Density (mW/cm^2)	Total % General Pop MPE
	39GHz	28GHz	C-Band	CBRS	AWS	PCS	850	700 MHz	39GHz	28GHz	C-Band	CBRS	AWS	PCS	Cellular	CDMA	700 MHz			
90	2E-06	1E-05	0.00320497	1.8358E-06	4.4994E-05	2.5832E-05	2.0519E-05	1.4228E-05	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0.003327967	0.34%
89	1E-06	1E-05	0.00320475	2.4763E-06	6.3405E-05	3.2518E-05	2.3021E-05	1.5245E-05	0.00%	0.00%	0.32%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	1.029848831	0.003357267	0.34%
88	1E-06	1E-05	0.00320409	3.3398E-06	7.6392E-05	3.9088E-05	2.5237E-05	1.6674E-05	0.00%	0.00%	0.32%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	2.0603254	0.003380948	0.34%
87	1E-06	2E-05	0.00327759	4.0141E-06	7.6368E-05	4.4969E-05	2.7034E-05	1.8703E-05	0.00%	0.00%	0.33%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	3.092058978	0.003465088	0.35%
86	1E-06	2E-05	0.00335232	4.7141E-06	7.2732E-05	5.2811E-05	2.7652E-05	2.0976E-05	0.00%	0.00%	0.34%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	4.125681905	0.003547838	0.36%
85	1E-06	2E-05	0.00342827	5.6644E-06	7.9705E-05	6.6449E-05	2.828E-05	2.4126E-05	0.00%	0.00%	0.34%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	5.161831148	0.003649305	0.37%
84	1E-06	2E-05	0.00350545	7.1263E-06	0.00010028	8.3405E-05	2.7618E-05	2.8326E-05	0.00%	0.00%	0.35%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%	6.201149881	0.003769119	0.38%
83	2E-06	2E-05	0.00358385	8.9643E-06	0.00012614	0.00010043	2.7596E-05	3.1684E-05	0.00%	0.00%	0.36%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%	7.244289093	0.003895712	0.39%
82	3E-06	1E-05	0.00366348	1.1018E-05	0.0001414	0.00011761	2.757E-05	3.5517E-05	0.00%	0.00%	0.37%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%	8.291909247	0.004013971	0.41%
81	5E-06	1E-05	0.00374433	1.2637E-05	0.0001517	0.00013803	2.8839E-05	3.8902E-05	0.00%	0.00%	0.37%	0.00%	0.02%	0.01%	0.00%	0.00%	0.01%	9.344681979	0.004132536	0.42%
80	8E-06	1E-05	0.00373929	1.4492E-05	0.00016575	0.00016198	3.0864E-05	4.1635E-05	0.00%	0.00%	0.37%	0.00%	0.02%	0.02%	0.01%	0.00%	0.01%	10.40329186	0.004173518	0.42%
79	1E-05	1E-05	0.00364871	1.74E-05	0.00019049	0.00019006	3.4584E-05	4.3539E-05	0.00%	0.00%	0.36%	0.00%	0.02%	0.02%	0.01%	0.00%	0.01%	11.46843824	0.004148128	0.42%
78	2E-05	1E-05	0.00355976	1.9495E-05	0.00021343	0.00021293	3.965E-05	4.5524E-05	0.00%	0.00%	0.36%	0.00%	0.02%	0.02%	0.01%	0.00%	0.01%	12.54083714	0.004121339	0.42%
77	2E-05	2E-05	0.00347244	2.1838E-05	0.0002278	0.0002278	4.651E-05	4.7593E-05	0.00%	0.00%	0.35%	0.00%	0.02%	0.02%	0.01%	0.00%	0.01%	13.62122328	0.004083465	0.42%
76	3E-05	2E-05	0.00338671	2.503E-05	0.00023269	0.00024366	5.4549E-05	4.9749E-05	0.00%	0.00%	0.34%	0.00%	0.02%	0.02%	0.01%	0.00%	0.01%	14.71035217	0.004042499	0.41%
75	4E-05	2E-05	0.00322737	2.8031E-05	0.00024886	0.00026059	6.5457E-05	5.4445E-05	0.00%	0.00%	0.32%	0.00%	0.02%	0.03%	0.01%	0.00%	0.01%	15.80900235	0.003946914	0.40%
74	6E-05	2E-05	0.003075	2.9291E-05	0.00026673	0.0002793	7.8536E-05	5.9712E-05	0.01%	0.00%	0.31%	0.00%	0.03%	0.03%	0.01%	0.00%	0.01%	16.91797776	0.003863607	0.40%
73	7E-05	2E-05	0.00279746	2.9227E-05	0.00027171	0.00029115	9.4212E-05	6.825E-05	0.01%	0.00%	0.28%	0.00%	0.03%	0.03%	0.02%	0.00%	0.01%	18.03811021	0.003640846	0.38%
72	8E-05	3E-05	0.00242999	2.5987E-05	0.00025887	0.00029046	0.00011043	7.8176E-05	0.01%	0.00%	0.24%	0.00%	0.03%	0.03%	0.02%	0.00%	0.02%	19.17026208	0.003299468	0.35%
71	9E-05	3E-05	0.0021104	2.2062E-05	0.00024659	0.00027732	0.00013243	9.3966E-05	0.01%	0.00%	0.21%	0.00%	0.02%	0.03%	0.02%	0.00%	0.02%	20.31532918	0.003003135	0.32%
70	9E-05	4E-05	0.00183248	1.961E-05	0.00024592	0.00026351	0.00015516	0.00011241	0.01%	0.00%	0.18%	0.00%	0.02%	0.03%	0.03%	0.00%	0.02%	21.47424382	0.002761823	0.30%
69	0.0001	4E-05	0.00159084	1.7832E-05	0.00024521	0.00024578	0.00017764	0.00013789	0.01%	0.00%	0.16%	0.00%	0.02%	0.02%	0.03%	0.00%	0.03%	22.64797807	0.002560203	0.28%
68	0.0001	5E-05	0.00138078	1.8192E-05	0.00023889	0.00022814	0.0001987	0.00017306	0.01%	0.00%	0.14%	0.00%	0.02%	0.02%	0.03%	0.00%	0.03%	23.83754732	0.002399297	0.27%
67	0.0001	5E-05	0.00125466	2.5029E-05	0.00023811	0.00022222	0.00022222	0.00021716	0.01%	0.01%	0.13%	0.00%	0.02%	0.02%	0.04%	0.00%	0.04%	25.04401416	0.002362558	0.27%

66	0.0002	5E-05	0.00130867	3.7839E-05	0.00023728	0.00022145	0.00023728	0.00027878	0.02%	0.01%	0.13%	0.00%	0.02%	0.02%	0.04%	0.00%	0.06%	26.26849243	0.002533182	0.30%
65	0.0002	5E-05	0.0015312	4.9584E-05	0.00022063	0.00024248	0.00025332	0.00034967	0.02%	0.00%	0.15%	0.00%	0.02%	0.02%	0.04%	0.00%	0.07%	27.51215183	0.002898518	0.34%
64	0.0003	5E-05	0.00187555	4.939E-05	0.00017457	0.00027667	0.00025821	0.0004385	0.03%	0.01%	0.19%	0.00%	0.02%	0.03%	0.04%	0.00%	0.09%	28.77622273	0.003391106	0.40%
63	0.0004	6E-05	0.00235025	3.7397E-05	0.00012308	0.00033126	0.00026313	0.00054975	0.04%	0.01%	0.24%	0.00%	0.01%	0.03%	0.05%	0.00%	0.11%	30.06200152	0.004064902	0.48%
62	0.0005	6E-05	0.00301288	2.2384E-05	8.877E-05	0.00039652	0.00025602	0.00067339	0.05%	0.01%	0.30%	0.00%	0.01%	0.04%	0.04%	0.00%	0.14%	31.37085647	0.004965786	0.58%
61	0.0006	5E-05	0.00377335	1.4058E-05	8.0771E-05	0.00046372	0.00024336	0.00082462	0.06%	0.01%	0.38%	0.00%	0.01%	0.05%	0.04%	0.00%	0.17%	32.70423404	0.006004232	0.70%
60	0.0006	4E-05	0.00440906	1.3671E-05	8.2059E-05	0.00053104	0.00022601	0.00098883	0.06%	0.00%	0.44%	0.00%	0.01%	0.05%	0.04%	0.00%	0.20%	34.06366588	0.006906111	0.81%
59	0.0006	4E-05	0.00539299	1.7929E-05	8.7474E-05	0.00059276	0.00020983	0.00112687	0.06%	0.00%	0.54%	0.00%	0.01%	0.06%	0.04%	0.00%	0.23%	35.45077652	0.008086668	0.94%
58	0.0006	4E-05	0.00615421	1.9551E-05	9.1096E-05	0.00064491	0.00018599	0.00128676	0.06%	0.00%	0.62%	0.00%	0.01%	0.06%	0.03%	0.00%	0.26%	36.86729176	0.008991235	1.04%
57	0.0004	5E-05	0.0065519	1.544E-05	9.7049E-05	0.00067141	0.00016481	0.00140277	0.04%	0.00%	0.66%	0.00%	0.01%	0.07%	0.03%	0.00%	0.28%	38.315048	0.009397978	1.09%
56	0.0003	4E-05	0.00730138	1.0139E-05	0.000111	0.00068287	0.00014599	0.00153226	0.03%	0.00%	0.73%	0.00%	0.01%	0.07%	0.03%	0.00%	0.31%	39.79600249	0.010124626	1.18%
55	0.0002	4E-05	0.00741785	1.0074E-05	0.00014175	0.00067847	0.00012928	0.00159048	0.02%	0.00%	0.74%	0.00%	0.01%	0.07%	0.02%	0.00%	0.32%	41.31224475	0.010163062	1.19%
54	9E-05	5E-05	0.00736168	1.6605E-05	0.00018992	0.00068956	0.00011444	0.00157967	0.01%	0.01%	0.74%	0.00%	0.02%	0.07%	0.02%	0.00%	0.32%	42.86600915	0.010098895	1.18%
53	7E-05	7E-05	0.00713661	2.5534E-05	0.00025436	0.00073357	9.8955E-05	0.00156833	0.01%	0.01%	0.71%	0.00%	0.03%	0.07%	0.02%	0.00%	0.32%	44.45968896	0.009953929	1.16%
52	6E-05	8E-05	0.00630684	3.4183E-05	0.0003413	0.00076232	8.1683E-05	0.00148981	0.01%	0.01%	0.63%	0.00%	0.03%	0.08%	0.01%	0.00%	0.30%	46.09585196	0.009152667	1.07%
51	5E-05	0.0001	0.00570067	3.9022E-05	0.00046627	0.00081029	6.4363E-05	0.00137606	0.01%	0.01%	0.57%	0.00%	0.05%	0.08%	0.01%	0.00%	0.28%	47.77725796	0.008615182	1.01%
50	6E-05	0.0001	0.00459009	4.4322E-05	0.00065305	0.00082214	4.6232E-05	0.00124435	0.01%	0.01%	0.46%	0.00%	0.07%	0.08%	0.01%	0.00%	0.25%	49.50687824	0.00757811	0.89%
49	8E-05	0.0001	0.00360981	5.4164E-05	0.0009163	0.00081477	2.9582E-05	0.00107407	0.01%	0.01%	0.36%	0.01%	0.09%	0.08%	0.01%	0.00%	0.22%	51.28791753	0.006693584	0.78%
48	0.0001	9E-05	0.00258762	6.7542E-05	0.00119372	0.00077251	1.5378E-05	0.00088491	0.01%	0.01%	0.26%	0.01%	0.12%	0.08%	0.00%	0.00%	0.18%	53.12383861	0.005755146	0.67%
47	0.0002	1E-04	0.00173003	8.2072E-05	0.00142405	0.00069587	5.5274E-06	0.00069586	0.02%	0.01%	0.17%	0.01%	0.14%	0.07%	0.00%	0.00%	0.14%	55.01839008	0.004976169	0.57%
46	0.0003	0.0001	0.00103022	9.7625E-05	0.00158085	0.00061361	1.4057E-06	0.00051155	0.03%	0.01%	0.10%	0.01%	0.16%	0.06%	0.00%	0.00%	0.10%	56.97563771	0.004282622	0.48%
45	0.0004	0.0001	0.00058547	0.00011876	0.00175381	0.0005164	4.6024E-06	0.00034993	0.04%	0.01%	0.06%	0.01%	0.18%	0.05%	0.00%	0.00%	0.07%	59	0.00384316	0.42%
44	0.0005	8E-05	0.00040904	0.00012573	0.00198509	0.0004157	7.7228E-06	0.00021766	0.05%	0.01%	0.04%	0.01%	0.20%	0.04%	0.00%	0.00%	0.04%	61.09628851	0.003691073	0.39%
43	0.0005	0.0001	0.00049623	0.00012132	0.00225042	0.00031788	1.3251E-05	0.0001181	0.05%	0.01%	0.05%	0.01%	0.23%	0.03%	0.00%	0.00%	0.02%	63.26975389	0.003873882	0.40%
42	0.0005	0.0002	0.00084964	0.00011431	0.0024912	0.00026086	2.3249E-05	5.326E-05	0.05%	0.02%	0.08%	0.01%	0.25%	0.03%	0.00%	0.00%	0.01%	65.52613837	0.004460194	0.45%
41	0.0005	0.0003	0.00148731	0.00012074	0.00251299	0.00026927	3.9828E-05	1.8629E-05	0.05%	0.03%	0.15%	0.01%	0.25%	0.03%	0.01%	0.00%	0.00%	67.87173603	0.005226739	0.53%
40	0.0005	0.0003	0.00226544	0.00012452	0.00247506	0.00036609	6.51E-05	7.1381E-06	0.05%	0.03%	0.23%	0.01%	0.25%	0.04%	0.01%	0.00%	0.00%	70.31346196	0.006147166	0.62%
39	0.0005	0.0003	0.00336864	0.00011701	0.00237991	0.00055791	0.00010152	1.0631E-05	0.05%	0.03%	0.34%	0.01%	0.24%	0.06%	0.02%	0.00%	0.00%	72.85893224	0.007366743	0.75%
38	0.0005	0.0002	0.00435789	0.00010251	0.00218317	0.00081112	0.00015104	2.0421E-05	0.05%	0.02%	0.44%	0.01%	0.22%	0.08%	0.03%	0.00%	0.00%	75.5165563	0.008410727	0.85%
37	0.0006	0.0003	0.00537751	8.9701E-05	0.0017829	0.00112494	0.00020947	2.8257E-05	0.06%	0.03%	0.54%	0.01%	0.18%	0.11%	0.04%	0.00%	0.01%	78.29564448	0.009500552	0.97%
36	0.0006	0.0003	0.00618487	6.9874E-05	0.00132631	0.00138882	0.0002708	2.8356E-05	0.06%	0.03%	0.62%	0.01%	0.13%	0.14%	0.05%	0.00%	0.01%	81.20653331	0.010218041	1.04%
35	0.0007	0.0002	0.00647859	4.3178E-05	0.0008782	0.0015653	0.00031885	2.4751E-05	0.07%	0.02%	0.65%	0.00%	0.09%	0.16%	0.06%	0.00%	0.00%	84.2607324	0.01020907	1.05%
34	0.0007	0.0007	0.00662191	2.43E-05	0.00055454	0.00156652	0.00034989	2.844E-05	0.07%	0.07%	0.66%	0.00%	0.06%	0.16%	0.06%	0.00%	0.01%	87.47109714	0.010472789	1.08%
33	0.0007	0.0016	0.00602265	1.842E-05	0.00033389	0.00133232	0.00034963	6.3622E-05	0.07%	0.16%	0.60%	0.00%	0.03%	0.13%	0.06%	0.00%	0.01%	90.85203287	0.010326407	1.06%
32	0.0006	0.0028	0.00546809	1.7957E-05	0.00019167	0.00096065	0.00030378	0.00016694	0.06%	0.28%	0.55%	0.00%	0.02%	0.10%	0.05%	0.00%	0.03%	94.41973721	0.010502328	1.09%
31	0.0005	0.0042	0.00495525	1.8298E-05	8.9277E-05	0.00060359	0.00021915	0.00038171	0.05%	0.42%	0.50%	0.00%	0.01%	0.06%	0.04%	0.00%	0.08%	98.19248946	0.010988941	1.15%
30	0.0005	0.0055	0.00538774	2.5103E-05	2.8712E-05	0.00032966	0.0001143	0.00075519	0.05%	0.55%	0.54%	0.00%	0.00%	0.03%	0.02%	0.00%	0.15%	102.1909976	0.012627736	1.35%
29	0.0005	0.0063	0.00671093	3.4366E-05	9.0044E-05	0.00016385	2.16E-05	0.00130153	0.05%	0.63%	0.67%	0.00%	0.01%	0.02%	0.00%	0.00%	0.26%	106.4388176	0.015154123	1.65%
28	0.0005	0.0065	0.00957436	4.6937E-05	0.0003889	8.3338E-05	1.2298E-05	0.00204098	0.05%	0.65%	0.96%	0.00%	0.04%	0.01%	0.00%	0.00%	0.41%	110.9628615	0.019149817	2.12%
27	0.0004	0.006	0.01426572	8.8266E-05	0.00090182	6.67E-05	3.1924E-05	0.00305575	0.04%	0.60%	1.43%	0.01%	0.09%	0.01%	0.01%	0.00%	0.61%	115.7940198	0.024862844	2.80%
26	0.0004	0.0058	0.01932993	0.00016938	0.00146958	0.00010919	0.00018932	0.00424804	0.04%	0.58%	1.93%	0.02%	0.15%	0.01%	0.03%	0.00%	0.85%	120.9679267	0.031665083	3.61%
25	0.0003	0.0059	0.02551547	0.00025154	0.00177393	0.0002393	0.00045597	0.00548193	0.03%	0.59%	2.55%	0.03%	0.18%	0.02%	0.08%	0.00%	1.10%	126.5259083	0.039955728	4.58%
24	0.0003	0.0054	0.02991465	0.00031688	0.00169522	0.00051195	0.00081138	0.00692183	0.03%	0.54%	2.99%	0.03%	0.17%	0.05%	0.14%	0.00%	1.39%	132.5161697	0.04585676	5.34%
23	0.0003	0.0049	0.03260814	0.00041647	0.00125577	0.00093091	0.00119648	0.00829669	0.03%	0.49%	3.26%	0.04%	0.13%	0.09%	0.21%	0.00%	1.67%	138.9952896	0.049854704	5.91%
22	0.0003	0.0052	0.03459129	0.00057081	0.00068363	0.00139902	0.00153046	0.00990421	0.03%	0.52%	3.46%	0.06%	0.07%	0.14%	0.26%	0.00%	1.99%	146.0301244	0.054220587	6.53%
21	0.0003	0.005	0.03109007	0.00071196	0.00028892	0.00178149	0.00177738	0.01124032	0.03%	0.50%	3.11%	0.07%	0.03%	0.18%	0.31%	0.00%	2.26%	153.7002548	0.052191444	6.48%
20	0.0003	0.0042	0.02655106	0.0008227	0.00024186	0.00183051	0.0018305	0.01212184	0.03%	0.42%	2.66%	0.08%	0.02%	0.18%	0.32%	0.00%	2.44%	162.1011677	0.047860252	6.14%
19	0.0003	0.0044	0.01919149	0.00090079	0.00042949	0.00152388	0.00167089	0.01300012	0.03%	0.44%	1.92%	0.09%	0.04%	0.15%	0.29%	0.00%	2.61%	171.3484418	0.041362186	5.57%
18	0.0004	0.0041	0.01146644	0.00093823	0.00056317	0.00097868	0.00135094	0.01354056	0.04%	0.41%	1.15%	0.09%	0.06%	0.10%	0.23%	0.00%	2.72%	181.5833287	0.03333371	4.80%
17	0.0007	0.0033	0.00481644	0.00095058	0.00046272	0.00043184	0.00094475	0.01337562	0.07%	0.33%	0.48%	0.10%	0.05%	0.04%	0.16%	0.00%	2.69%	192.9803045	0.025026127	3.92%
16	0.0011	0.0034	0.00069604	0.00097561	0.00024923	9.9222E-05	0.00050887	0.01311004	0.11%	0.34%	0.07%	0.10%	0.02%	0.01%	0.09%	0.00%	2.64%	205.7574522	0.0201124	3.37%
15	0.0016	0.0033	0.0004997	0.00096993	0.00014291	4.0186E-06	0.00018796	0.01213574	0.16%	0.33%	0.05%	0.10%	0.01%	0.00%	0.03%	0.00%	2.44%	220.1909976	0.018810978	3.12%
14	0.0024	0.0028	0.00398522	0.00095247	0.00026803	9.51E-06	7.0336E-05	0.01089372	0.24%	0.28%	0.40%	0.10%	0.03%	0.00%	0.01%	0.00%	2.19%	236.6360751	0.021318083	3.24%
13	0.0038	0.0024	0.0108951	0.00088711	0.00047458	1.3345E-06	0.0001885	0.00946897	0.38%	0.24%	1.09%	0.09%	0.05%	0.00%	0.03%	0.00%	1.90%	255.5570766	0.028120833	3.78%
12	0.0056	0.0023	0.02033702	0.00079314	0.00046631	4.6632E-05	0.00054661	0.00791909	0.56%	0.23%	2.03%	0.08%	0.05%	0.00%	0.09%	0.00%	1.59%	277.5731765	0.038004765	4.64%
11	0.0059	0.0018	0.03038608	0.0006699	0.00017961	0.00039295	0.00107979	0.00622782	0.59%	0.18%	3.04%	0.07%	0.02%	0.04%	0.19%	0.00%	1.25%	303.5286869	0.046668049	5.37%
10	0.0056	0.0016	0.03794802	0.00056721	4.0933E-06	0.00129442	0.00166368	0.00480917	0.56%	0.16%	3.79%	0.06%	0.00%	0.13%	0.29%	0.00%	0.97%	334.6056274	0.053420544	5.95%
9	0.0048	0.0014	0.04531704	0.00045917	0.00047786	0.00275613	0.0021345	0.00355054	0.48%	0.14%	4.53%	0.05%	0.05%	0.28%	0.37%	0.00%	0.71%	372.5113394	0.060926459	6.61%
8	0.0039	0.0011	0.04806013	0.00036105	0.00172542	0.00423542	0.00243161	0.00243721	0.39%	0.11%	4.81%	0.04%	0.17%	0.42%	0.42%	0.00%	0.49%	419.8068136	0.064204265	6.84%
7	0.003	0.0008	0.04496002	0.0002689	0.00322048	0.00511589	0.00249987	0.00154496	0.30%	0.08%	4.50%	0.03%	0.32%	0.51%	0.43%	0.00%	0.31%	480.5164393	0.061371157	6.47%
6	0.0022	0.0006	0.04028227	0.0001922	0.00409343	0.00502445	0.00224432	0.0009164	0.22%	0.06%	4.03%	0.02%	0.41%	0.50%	0.39%	0.00%	0.18%	561.3475028	0.055612086	5.82%
5	0.0017	0.0004	0.03104921	0.00012344	0.00388857	0.00397	0.00177332	0.00048954	0.17%	0.04%	3.10%	0.01%	0.39%	0.40%	0.31%	0.00%	0.10%	674.3730859	0.043439746	4.52%
4	0.0012	0.0003	0.0210191	7.2722E-05	0.0027542	0.00251765	0.00123025	0.00022387	0.12%	0.03%	2.10%	0.01%	0.28%	0.25%	0.21%	0.00%	0.05%	843.7393091	0.029328956	3.04%
3	0.0007	0.0002	0.01219486	3.6036E-05	0.00145904	0.00118869	0.0007146	8.4152E-05	0.07%	0.02%	1.22%	0.00%	0.15%	0.12%	0.12%	0.00%	0.02%	1125.787065	0.016575369	1.72%
2	0.0003	7E-05	0.00508708	1.369E-05	0.00048498	0.00037647	0.0003053	2.2117E-05	0.03%	0.01%	0.51%	0.00%	0.05%	0.04%	0.05%	0.00%	0.00%	1689.538944	0.006669438	0.69%
1	8E-05	2E-05	0.00119097	2.8645E-06	7.1677E-05	5.6935E-05	6.9884E-05	2.7821E-06	0.01%	0.00%	0.12%	0.00%	0.01%	0.01%	0.01%	0.00%	0.00%	3380.107736	0.001490887	0.15%

ATTACHMENT 4

Structural Analysis Report

Trylon Project # 244236

October 31, 2024

Rev. 1

Client: Smartlink

Carrier Info: **Verizon Wireless**

Site ID:	324458
Site Name:	Tanglewood
Site Address:	54 Meadow Street, New Haven. CT 06519
Site Coordinates:	41.299819 -72.926491
Structure Type:	Building- Rooftop
Structure Height:	131.6 ft.

STRUCTURE RATING =	**PASS**

Reviewed and Approved by:

Cliff Abernathy, P.E.

Structural Analysis Report

Subject: Analysis of the Existing Building Wall

Dear **Smartlink**,

We have been provided with RF information, photos and sketches of the structure for the above referenced site. Verizon is proposing to change the equipment configuration on the Existing Building Wall.

Revised antenna, coax and miscellaneous equipment schematics have been provided to us. We have been asked to evaluate this information to determine whether the building penthouse is adequate to safely support the proposed loading change.

1. Source Data

Document Type	Source	Reference	Date
RFDS	Verizon Wireless	Site Name: Tanglewood	09/05/2024
Structural Analysis	On Air Engineering, LLC	Site Name: Tanglewood	03/22/2023
Construction Drawings	Trylon	Site Name: Tanglewood	09/26/2024

2. Analysis Criteria

Building Code / Local Code:	2022 CT State Building Code
Code Standard:	TIA-222-H
Design Wind Speed (mph):	120
Design Wind Speed with Ice (mph):	50
Design Ice Thickness (in):	1.0
Risk Category/Structure Class:	II
Exposure Category:	C
Topographic Factor, Kzt:	1.0
Seismic Response Acceleration, Ss (g):	0.201
Seismic Response Acceleration, S1 (g):	0.054

3. Assumptions

1) We assume that the structure has been previously studied for structural integrity and that the carrier equipment was included in any structural study indicating that the building is adequate to support its overall load.
2) The mount hardware has appropriate strength and that is has been proven adequate to support the proposed loading.
3) All structural members and their connections are in good condition and are free of defects with no significant deterioration in their structural capacities.

This assessment may not be valid if any of the assumptions and statements are found not to be accurate and Trylon should be contacted immediately.

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

4. Final Loading Configuration- Antennas

Mount CL (ft)	Equipment CL (ft)	Qty.	Manufacturer	Model	Feedlines	Carrier
127.8	127.8	2	Samsung	VZ-AT1K04	(5) 1-5/8"	Verizon
		2	Samsung	AT1K04 DC		
130.8	130.8	2	Samsung	MT6407-77A		
137.0	137.0	2	Samsung	VZ-AT1K04		
		2	Samsung	AT1K04 DC		
138.5	138.5	4	JMA	MX10FIT665-02		
		4	Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)		
		4	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)		
		4	Samsung	CBRS RRH - RT4401-48A		
		5	Raycap	RVZDC-3315-PF-48		
140.0	140.0	2	Samsung	MT6407-77A		
155.7	155.7	4	JMA	MX10FIT665-02		
158.0	158.0	4	CBNG	39GHz VectaStar NR gNB		

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5. Standard Conditions for Providing Structural Consulting Services on Existing Structures

4) Mounting hardware is analyzed to the best of our ability using all information that is provided or can be obtained during fieldwork (if authorized by client). If the existing conditions are not as we have represented in this analysis, we should be contacted to evaluate the significance of the deviation and revise the assessment accordingly.
5) The structural analysis has been performed assuming that hardware is in "like new" condition. No allowance was made for excessive corrosion, damaged or missing structural members, loose bolts, misaligned parts, or any reduction in strength due to the age or fatigue of the product.
6) The structural analysis provided is an assessment of the primary load carrying capacity of the hardware. We provide a limited scope of service. In some cases, we cannot verify the capacity of every weld, plate, connection detail, etc. In some cases, structural fabrication details are unknown at the time of our analysis, and the detailed field measurement of some of the required details may not be possible. In instances where we cannot perform connection capacity calculations, it is assumed that the existing manufactured connections develop the full capacity of the primary members being connected.
7) We cannot be held responsible for mounting hardware that is installed improperly or hardware that is loose or has a tendency of working loose over the lifetime of the mounting hardware. Our analysis has been performed assuming fully tightened connections, and proper installation and symmetry of the mounting hardware per manufacturer's instructions.
8) The structural analysis has been performed using information currently provided by the client and potentially field verified. We have been provided with a mounting arrangement for all telecommunications equipment, including antennas RRH's, TMA's, RRU's, diplexers, surge protection devices, etc. Our analysis has been based upon a particular mounting arrangement. We are not responsible for deviations in the mounting arrangement that may occur over time. If deviations in equipment type or mounting arrangements are proposed, then we should be contacted to revise the recommendations of this structural report.
9) We cannot be held responsible for temporary and unbalanced loads on mounting hardware. Our analysis is based on a particular mounting arrangement or as-built field condition. We are not responsible for the methods and means of how the mounting arrangement is accomplished by the contractor. These methods and means may include rigging of equipment or hardware to lift and locate, temporary hanging of equipment in locations other than the final arrangement, movement and tie off of tower riggers, personnel, and their equipment, etc.
10) Steel grade and strength is unknown and cannot be field tested. We cannot be held responsible for equipment manufactured from inferior steel or bolts. Our analysis assumes that standard structural grade steel has been used by the equipment manufacturer for all assembled parts of the mounting apparatus. Acceptable steels and connection components are specified by the American Institute of Steel Construction. It is assumed all welded connections are performed in the shop under the latest American Welding Society Code. No field welds are permitted or assumed for the existing premanufactured equipment.
11) Steel grades have been assumed as follows, unless noted otherwise:

Assumed Steel Grades

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325
U-Bolts, Threaded Rods	SAE J429 Gr. 2

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

5. Analysis Results

Component	% Capacity	Pass/Fail	Notes
Building Wall	--	Pass	1

Structure Rating =	Pass

Notes:
1) See additional documentation in "Appendix A – Additional Calculations" for calculations supporting the % capacity consumed.

6. Conclusions and Recommendations

Based on the information provided, our calculations conclude that the Existing Verizon Building Penthouse wall and existing pipe mast has sufficient capacity to carry the final loading configuration.

The size of the proposed antennas is so small that the increase in lateral and gravity loads caused by their installation will be structurally insignificant to the overall stability of the existing building walls. Also, the wall mount connection was evaluated and found to be adequate. The construction of the walls is such that the installation of these antennas will not cause undue stress or impose loads above their capacity to withstand. Per the 2022 CT State Building Code Section 806.2 and 806.3, any existing load carrying structural element whose lateral demand-capacity ratio is increased no more than 10% and any existing gravity load carrying structural element whose loads increase no more than 5% shall be permitted to remain unaltered. Therefore, we conclude that the Existing Building wall is adequate under the proposed carrier equipment.

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

APPENDIX

ADDITIONAL CALCULATIONS

1825 W. Walnut Hill Lane, Suite 120
Irving, Texas 75038

Trylon
1825 W. Walnut Hill Lane Suite 120
Irving, TX 75038

TIA LOAD CALCULATOR 2.1

PROJECT DATA	
Job Code:	0
Carrier Site ID:	17290616
Carrier Site Name:	Tanglewood

CODES AND STANDARDS	
Building Code:	2022 CT SBC
Local Building Code:	0
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Rooftop	--
Mount Elevation:	158.0	ft.
Number of Sectors:	4	--
Structure Type:	Building	--
Structure Height:	131.5	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	10.8	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	120	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.39	--
Directionality Factor (K_d):	0.85	--
Gust Effect Factor (Gh):	0.85	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	43.65	psf
Ground Elevation Factor (K_e):	1.00	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	43.65	psf
Mount Ice Thickness (t_{iz}):	1.17	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	66.78	psf
Round Member Pressure:	40.07	psf
Ice Wind Pressure:	5.84	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.20	g
1 Second Accel (S_1):	0.05	g
Short Period Des. (S_{DS}):	0.21	g
1 Second Des. (S_{D1}):	0.09	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.11	--
Amplification Factor (A_S):	3.00	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA$_N$ (ft2)	EPA$_T$ (ft2)	Weight (lbs)
39GHZ VECTASAR NRGNB	1	158	No Ice	2.24	1.25	40.00
--	--	--	w/ Ice	2.54	1.49	50.58
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
9GHZ VECTASAR NRGNI	1	158	1.00	1.39	0.85	1.17	43.65	7.58

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
39GHZ VECTASAR NRGNB	1	No Ice	74.82	50.07	66.57	41.82	66.57	50.07
--	--	w/ Ice	14.70	10.15	13.18	8.64	13.18	10.15
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
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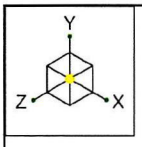
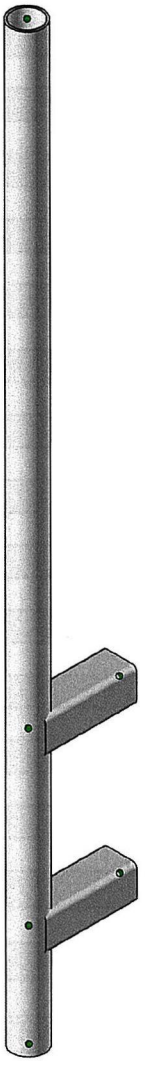
EQUIPMENT SEISMIC FORCE CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
39GHZ VECTASAR NRGNB	1	158	40	12.86





Verizon	Tanglewood	SK-1
Trylon		Tanglewood.r3d
17290616		

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N9	max	208.967	6	305.055	2	295.063	18	38.983	18	117.338	6	131.186	14
2		min	-208.967	14	-211.807	26	-321.781	10	-80.675	10	-117.338	14	-131.186	6
3	N10	max	82.966	13	300.366	10	184.563	10	77.573	18	40.817	13	11.325	6
4		min	-82.966	7	-215.331	18	-157.846	18	-114.888	10	-40.817	7	-11.325	14
5	Totals:	max	126.485	6	197.891	43	137.218	18						
6		min	-126.485	14	72.702	72	-137.218	26						

Envelope AISI S100-20: LRFD Member Cold Formed Steel Code Checks

No Data to Print...

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	MP1	PIPE 2.5	0.105	53.368	10	0.016	55.421		11	35890.384	50715	3596.25	3596.25	1	H1-1b
2	M3	HSS3X3X3	0.036	0	2	0.033	8	z	14	77987.62	78246	6796.5	6796.5	1.508	H1-1b
3	M4	HSS3X3X3	0.019	8	11	0.014	8	y	10	77987.62	78246	6796.5	6796.5	2.223	H1-1b

Hilti PROFIS Engineering 3.1.4

www.hilti.com

Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Tanglewood	Date:	10/23/2024
Fastening point:			

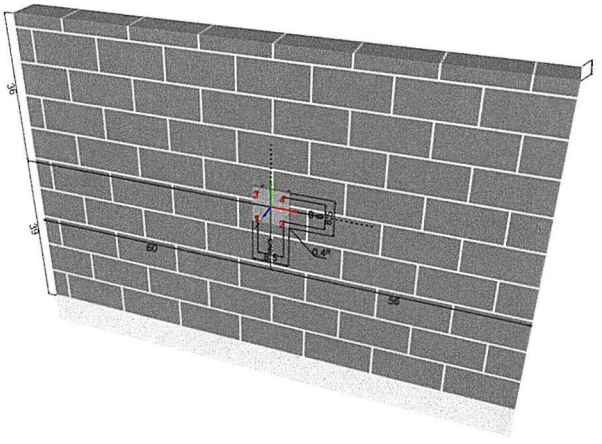
Specifier's comments:

1 Input data

Anchor type and diameter:	**HY 270 + threaded rod 5.8 1/2**
Item number:	385423 HAS 5.8 1/2"x4-1/2" (element) / 2194247 HIT-HY 270 (adhesive)
Specification text:	Hilti HIT-V 5.8 threaded rod with HIT-HY 270 injection mortar with 2.75 in embedment hef, 1/2, Steel galvanized, Hammer drilled installation per ESR-4143
Effective embedment depth:	h_{ef} = 2.750 in.
Material:	5.8
Evaluation Service Report:	ESR-4143
Issued I Valid:	11/1/2023 | 1/1/2025
Proof:	Design Method LRFD (AC58) Masonry + ACI 318-19
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.400 in.
Anchor plate[R] :	l_x x l_y x t = 8.500 in. x 8.500 in. x 0.400 in.; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	uncracked Grout-filled CMU, f=1500, f = 1,500 psi, L x W x H: 16.000 in. x 8.000 in. x 8.000 in.; Solid Head Joint: no; open ended unit: no
Temp. short/long:	32 °F / 32 °F
	Joints: vertical: 0.375 in.; horizontal: 0.375 in.
Installation:	Face installation, Drill hole: Hammer drilled, Installation condition: Dry

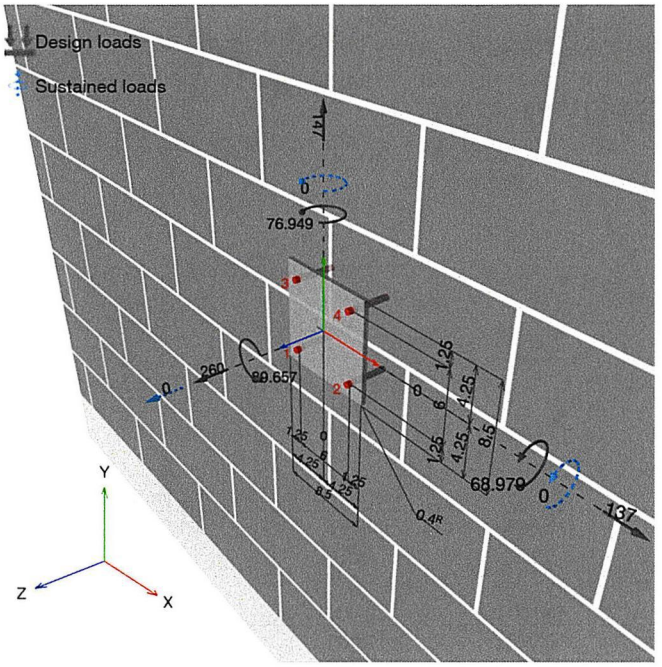
[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.]



Company:		Page:	2
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Tanglewood	Date:	10/23/2024
Fastening point:			

Geometry [in.] & Loading [lb, ft.lb]



1.1 Load combination and design results

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 322	N = 18; V_x = 0; V_y = -62; M_x = 27.789; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
2	Combination 323	N = -18; V_x = 0; V_y = -57; M_x = 24.863; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
3	Combination 324	N = -291; V_x = 0; V_y = -305; M_x = -33.044; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
4	Combination 325	N = 154; V_x = 0; V_y = 203; M_x = -72.271; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
5	Combination 326	N = -230; V_x = -137; V_y = -253; M_x = -21.346; M_y = 76.957; M_z = -89.657; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
6	Combination 327	N = 118; V_x = 61; V_y = 152; M_x = -53.043; M_y = 30.247; M_z = 7.719; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11

4.4 Masonry breakout strength y-

$V_{mbg} = \left(\frac{A_{Vm}}{A_{Vm0}}\right) \Psi_{ec,V,m} \Psi_{ed,V,m} \Psi_{m,V} \Psi_{h,V,m} \Psi_{parallel,V} V_{b,m}$ — ACI 318-19 Eq. (17.7.2.1b)

$\phi V_{mbg} \geq V_{ua}$ — AC58 Table 3.2 + ACI 318-19 Table 17.5.2

A_{Vm} see ACI 318-19 , Section 17.7.2.1, Fig. R 17.7.2.1(b)

$A_{Vm0} = 4.5 c_{a1}^2$ — ACI 318-19 Eq. (17.7.2.1.3)

$\Psi_{ec,V,m} = \left(\frac{1}{1 + \frac{2e_v'}{3c_{a1}}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.7.2.3.1)

$\Psi_{ed,V,m} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.7.2.4.1b)

$\Psi_{h,V,m} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ — ACI 318-19 Eq. (17.7.2.6.1)

$V_{b,m} = \left(7\left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda_a \sqrt{f_m'} c_{a1}^{1.5}$ — ACI 318-19 Eq. (17.7.2.2.1a)

Variables

l_e [in.]	d_a [in.]	c_{a1} [in.]	c_{a2} [in.]	A_{Vm} [in.^{2}]	A_{Vm0} [in.^{2}]	f_m' [psi]
2.750	0.500	5.083	3.187	61.00	116.28	1,500

Calculations

$\Psi_{ed,V,m}$	$\Psi_{parallel,V}$	$e_{c,V}$ [in.]	$\Psi_{ec,V,m}$	$\Psi_{m,V}$	$\Psi_{h,V,m}$
0.825	1.000	0.000	1.000	1.400	1.000

Results

$V_{b,m}$ [lb]	ϕ	ϕV_{mbg} [lb]	V_{ua} [lb]
3,089	0.700	1,311	81

5 Required verifications under combined tension and shear forces

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.195	0.062	5/3	8	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- The min. sizes of the bricks, the masonry compressive strength, the type / strength of the mortar and the grout (in case of fully grouted CMU walls) has to fulfill the requirements given in the relevant ESR-approval or in the PTG.
- Only the local load transfer from the anchor(s) to the wall is considered, a further load transfer in the wall is not covered by PROFIS!
- Wall is assumed as being perfectly aligned vertically – checking required(!): Noncompliance can lead to significantly different distribution of forces and higher tension loads than those calculated by PROFIS. Masonry wall must not have any damages (neither visible nor not visible)! While installation, the positioning of the anchors needs to be maintained as in the design phase i.e. either relative to the brick or relative to the mortar joints.
- The effect of the joints on the compressive stress distribution on the plate / bricks was not taken into consideration.
- If no significant resistance is felt over the entire depth of the hole when drilling (e.g. in unfilled butt joints), the anchor should not be set at this position or the area should be assessed and reinforced. Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.
- The accessories and installation remarks listed on this report are for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- The compliance with current standards (e.g. 2018, 2015, 2012, 2009 and 2006 IBC) is the responsibility of the user.
- Drilling method (hammer, rotary) to be in accordance with the approval!
- Masonry needs to be built in a regular way in accordance with state-of the art guidelines!

Fastening meets the design criteria!

Company:		Page:	30
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Tanglewood	Date:	10/23/2024
Fastening point:			

7 Installation data

Anchor plate, steel: ASTM A36; E = 29,000,001 psi; f_{yk} = 36,000 psi

Profile: no profile

Hole diameter in the fixture: d_f = 0.562 in.

Plate thickness (input): 0.400 in.

Recommended plate thickness: not calculated

Drilling method: Drilled in hammer mode

Cleaning: No cleaning of the drilled hole is required

Anchor type and diameter: HY 270 + threaded rod 5.8 1/2

Item number: 385423 HAS 5.8 1/2"x4-1/2" (element) / 2194247 HIT-HY 270 (adhesive)

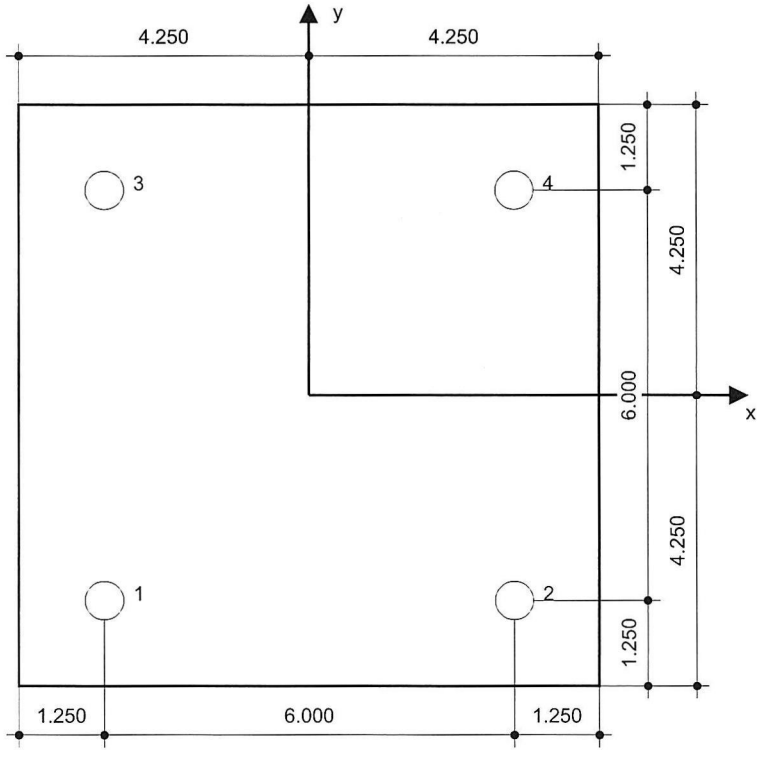
Maximum installation torque: 7.501 ft.lb

Hole diameter in the base material: 0.562 in.

Hole depth in the base material: 2.750 in.

Minimum thickness of the base material: 7.625 in.

Hilti HIT-V 5.8 threaded rod with HIT-HY 270 injection mortar with 2.75 in embedment hef, 1/2, Steel galvanized, Hammer drilled installation per ESR-4143



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-3.000	-3.000	57.000	59.000	36.000	39.000
2	3.000	-3.000	63.000	53.000	36.000	39.000
3	-3.000	3.000	57.000	59.000	42.000	33.000
4	3.000	3.000	63.000	53.000	42.000	33.000

8 Remarks; Your Cooperation Duties

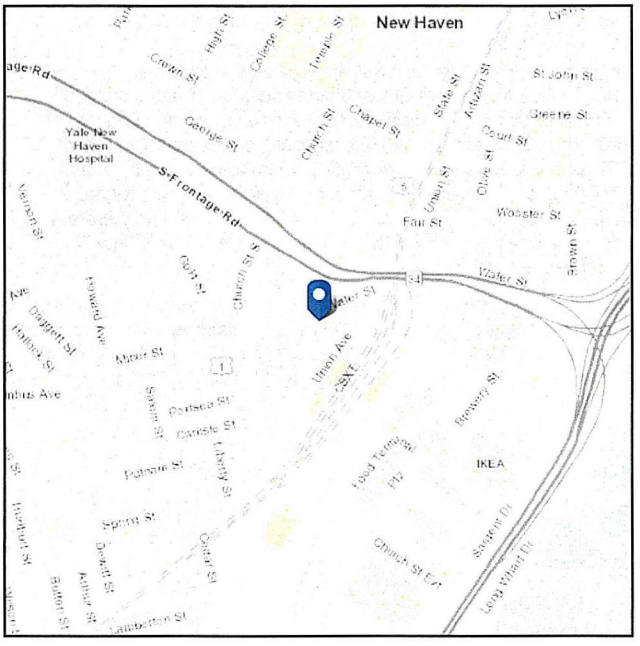
- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

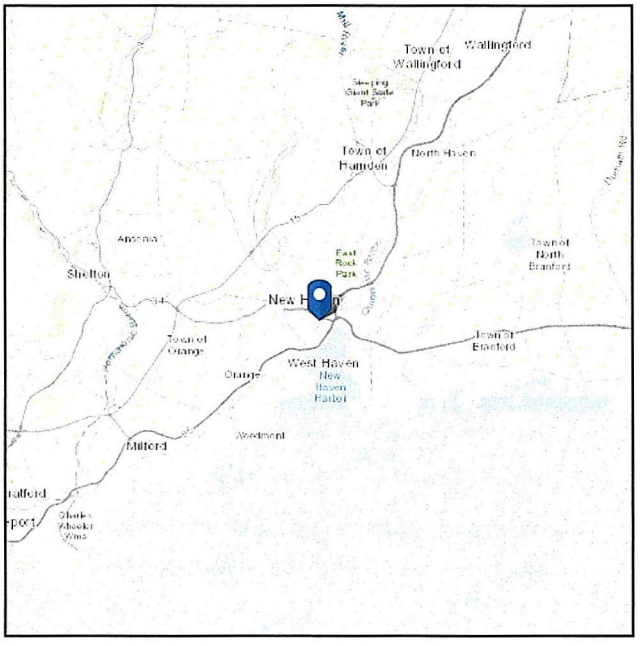
ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Latitude: 41.299819
Longitude: -72.926491
Elevation: 10.79639615913296 ft (NAVD 88)





Wind

Results:

Wind Speed	120 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	91 Vmph
100-year MRI	99 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Wed Oct 23 2024

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

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

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

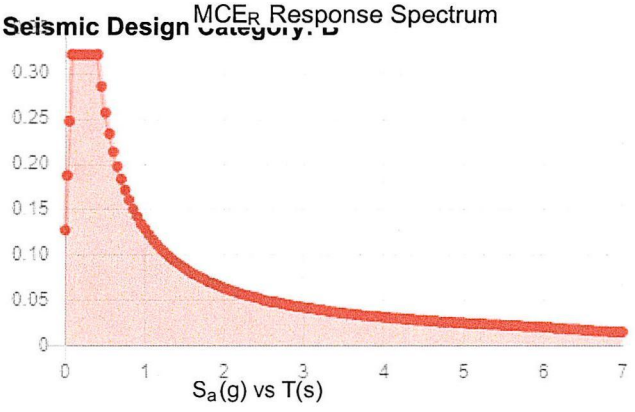
Seismic

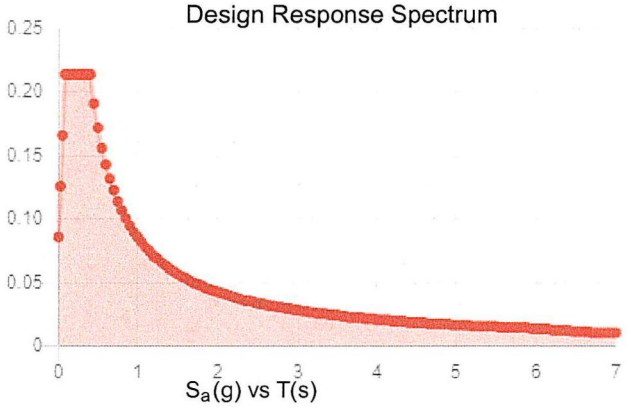
Site Soil Class: D - Stiff Soil

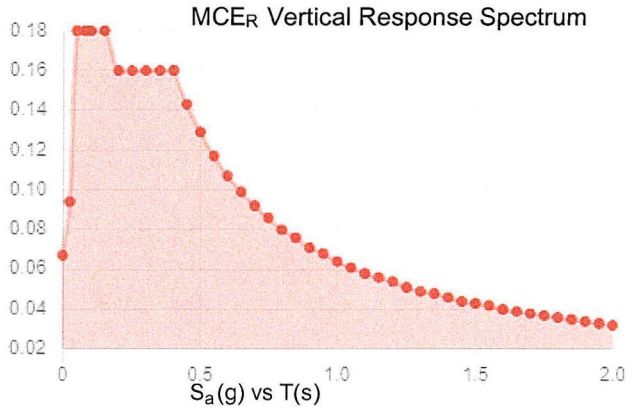
Results:

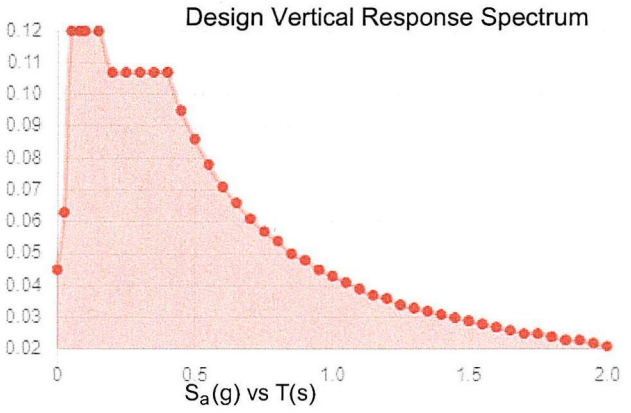
S_S :	0.201	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.112
F_v :	2.4	PGA_M :	0.177
S_{MS} :	0.321	F_{PGA} :	1.576
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.214	C_v :	0.701

Seismic Design Category: B









Data Accessed: **Wed Oct 23 2024**

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.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Oct 23 2024

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

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

Mount Analysis Report

Trylon Project # 244235

October 31, 2024

Rev. 1

Client: Verizon Wireless

Carrier Info:

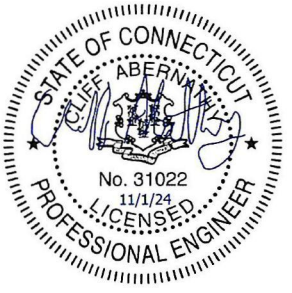
Verizon Wireless

Site ID:	324458
Site Name:	Tanglewood
Site Address:	54 Meadow Street, New Haven. CT 06519
Site Coordinates:	41.299819 -72.926491
Structure Type:	Building- Rooftop
Structure Height:	131.5 ft.
Mount Type:	Pipe Mounts
Mount Elevation:	127.8 ft., 130.8 ft., 137.0, 138.5 ft., 140.0 ft., 155.7 ft., 158 ft.

STRUCTURE RATING =	**20.0%**	**PASS**

Reviewed and Approved by:

Cliff Abernathy, P.E.



Mount Analysis Report

Subject: Analysis of the Existing Pipe Mounts.

Dear **Verizon Wireless**,

We have been provided with RF information, photos and sketches of the structure for the above referenced site. Verizon Wireless is proposing to change the equipment configuration on the Existing mounting hardware.

Revised antenna, coax and miscellaneous equipment schematics have been provided to us. We have been asked to evaluate this information to determine whether the mounting apparatus is adequate to safely support the proposed loading change.

RISA 3D (Version 22.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

1. Source Data

Document Type	Source	Reference	Date
RFDS	Verizon Wireless	Site Name: Tanglewood	09/05/2024
Structural Analysis	On Air Engineering, LLC	Site Name: Tanglewood	03/22/2023
Construction Drawings	Trylon	Site Name: Tanglewood	09/26/2024

2. Analysis Criteria

Building Code / Local Code:	2022 CT State Building Code
Code Standard:	TIA-222-H
Design Wind Speed (mph):	120
Design Wind Speed with Ice (mph):	50
Design Ice Thickness (in):	1.0
Risk Category/Structure Class:	II
Exposure Category:	C
Topographic Factor, Kzt:	1.0
Seismic Response Acceleration, Ss (g):	0.201
Seismic Response Acceleration, S1 (g):	0.054

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3. Final Loading Configuration

Mount CL (ft)	Equipment CL (ft)	Qty.	Manufacturer	Model	Carrier
158	127.8	2	Samsung	VZ-AT1K04	Verizon Wireless
		2	Samsung	AT1K04 DC	
130.8	130.8	2	Samsung	MT6407-77A	
137.0	137.0	2	Samsung	VZ-AT1K04	
		2	Samsung	AT1K04 DC	
138.5	138.5	4	JMA	MX10FIT665-02	
		4	Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)	
		4	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)	
		4	Samsung	CBRS RRH -RT4401-48A	
		5	Raycap	RVZDC-3315-PF-48	
140.0	140.0	2	Samsung	MT6407-77A	
155.7	155.7	4	JMA	MX10FIT665-02	
158.0	158.0	4	CBNG	39GHz VectaStar NR gNB	

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4. Standard Conditions for Providing Structural Consulting Services

1) Mounting hardware is analyzed to the best of our ability using all information that is provided or can be obtained during fieldwork (if authorized by client). If the existing conditions are not as we have represented in this analysis, we should be contacted immediately to evaluate the significance of the deviation and revise the assessment accordingly.
2) The structural analysis has been performed assuming that hardware is in "like new" condition. No allowance has been made for excessive corrosion, damaged or missing structural members, loose bolts, misaligned parts, or any reduction in strength due to the age or fatigue of the product.
3) The structural analysis is an assessment of the primary load carrying capacity of the hardware. In some cases, we cannot verify the capacity of every weld, plate, connection detail, etc. In some cases, structural fabrication details are unknown at the time of our analysis, and the detailed field measurements or some of the required details may not be obtainable. In instances where we cannot perform connection capacity calculations, it is assumed that the existing manufactured connections develop the full capacity of the primary members being connected.
4) We cannot be held responsible for mounting hardware that is installed improperly or hardware that is loose or has a tendency of working loose over the lifetime of the mounting hardware. Our analysis has been performed assuming fully tightened connections, and proper installation and symmetry of the mounting hardware per manufacturers' instructions.
5) The structural analysis has been performed using information currently provided by the client and potentially field verified. We have been provided with a mounting arrangement for all telecommunications equipment, including antennas RRH's, TMA's, RRU's, diplexers, surge protection devices, etc. Our analysis has been based upon a particular mounting arrangement. We are not responsible for deviations in the mounting arrangement that may occur over time. If deviations in equipment type or mounting arrangements are proposed, then we should be contacted to revise the recommendations of this structural report.
6) We cannot be held responsible for temporary and unbalanced loads on mounting hardware. Our analysis is based on a particular mounting arrangement or as-built field condition. We are not responsible for the methods and means of how the mounting arrangement is accomplished by the contractor. These methods and means may include rigging of equipment or hardware to lift and locate, temporary hanging of equipment in locations other than the final arrangement, movement and tie-off of tower riggers, personnel, and their equipment, etc.
7) Steel grade and strength is unknown and cannot be field verified. We cannot be held responsible for equipment manufactured from inferior steel or bolts. Our analysis assumes that standard structural grade steel has been used by the equipment manufacturer for all assembled parts of the mounting apparatus. Acceptable steels and connection components are specified by the American Institute of Steel Construction. It is assumed all welded connections are performed under the latest American Welding Society Code.
8) Steel grades have been assumed as follows, unless noted otherwise:

Assumed Steel Grades

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325
U-Bolts, Threaded Rods	SAE J429 Gr. 2

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5. Analysis Results

Mount CL (ft.)	Component	% Capacity	Pass/Fail	Notes
158	Pipe(s)	10.5%	Pass	1
	Standoff(s)	3.6%	Pass	
	Connection(s)	20.0%	Pass	

Structure Rating (max from all components) =	20.0%

Notes:
1) See additional documentation in "Appendix A – Additional Calculations" for calculations supporting the % capacity consumed.

6. Conclusions and Recommendations

Based on the information provided, our calculations conclude that the Existing Verizon Wireless Pipe Mounts installed at 158 ft. elevation has sufficient capacity to carry the final loading configuration.

The evaluation of the supporting building structure is outside of the scope of work of this report. Therefore, Trylon is not responsible for providing calculations for the supporting building structure or commenting on its current capacity due to the loading from carrier equipment. Should any concerns arise related to the installation of the carrier loading on the building, please contact Verizon Wireless.

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APPENDIX

ADDITIONAL CALCULATIONS

1825 W. Walnut Hill Lane, Suite 120
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Trylon
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Irving, TX 75038

TIA LOAD CALCULATOR 2.1

PROJECT DATA	
Job Code:	0
Carrier Site ID:	17290616
Carrier Site Name:	Tanglewood

CODES AND STANDARDS	
Building Code:	2018 IBC
Local Building Code:	0
Design Standard:	TIA-222-H

STRUCTURE DETAILS		
Mount Type:	Rooftop	--
Mount Elevation:	158.0	ft.
Number of Sectors:	4	--
Structure Type:	Building	--
Structure Height:	131.5	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	10.8	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor (K_{zt}):	1.00	--
Mount Topo Factor (K_{zt}):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	120	mph
Wind Escalation Factor (K_s):	1.00	--
Velocity Coefficient (K_z):	1.39	--
Directionality Factor (K_d):	0.85	--
Gust Effect Factor (Gh):	0.85	--
Shielding Factor (K_a):	0.90	--
Velocity Pressure (q_z):	43.65	psf
Ground Elevation Factor (K_e):	1.00	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness (t_i):	1.00	in
Importance Factor (I_i):	1.00	--
Ice Velocity Pressure (q_{zi}):	43.65	psf
Mount Ice Thickness (t_{iz}):	1.17	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	66.78	psf
Round Member Pressure:	40.07	psf
Ice Wind Pressure:	5.84	psf

SEISMIC PARAMETERS		
Importance Factor (I_e):	1.00	--
Short Period Accel .(S_s):	0.20	g
1 Second Accel (S_1):	0.05	g
Short Period Des. (S_{DS}):	0.21	g
1 Second Des. (S_{D1}):	0.09	g
Short Period Coeff. (F_a):	1.60	--
1 Second Coeff. (F_v):	2.40	--
Response Coefficient (Cs):	0.11	--
Amplification Factor (A_S):	3.00	--

LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1

#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site

EQUIPMENT LOADING

Appurtenance Name	Qty.	Elevation [ft]	--	EPA_N (ft2)	EPA_T (ft2)	Weight (lbs)
39GHZ VECTASAR NRGNB	1	158	No Ice	2.24	1.25	40.00
--	--	--	w/ Ice	2.54	1.49	50.58
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
--	--	--	w/ Ice			
			No Ice			
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			No Ice			
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			No Ice			
--	--	--	w/ Ice			

EQUIPMENT WIND CALCULATIONS

Appurtenance Name	Qty.	Elevation [ft]	K_{zt}	K_z	K_d	t_d	q_z [psf]	q_{zi} [psf]
9GHZ VECTASAR NRGNI	1	158	1.00	1.39	0.85	1.17	43.65	7.58

EQUIPMENT LATERAL WIND FORCE CALCULATIONS

Appurtenance Name	Qty.	--	0° 180°	30° 210°	60° 240°	90° 270°	120° 300°	150° 330°
39GHZ VECTASAR NRGNB	1	No Ice	74.82	50.07	66.57	41.82	66.57	50.07
--	--	w/ Ice	14.70	10.15	13.18	8.64	13.18	10.15
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
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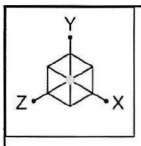
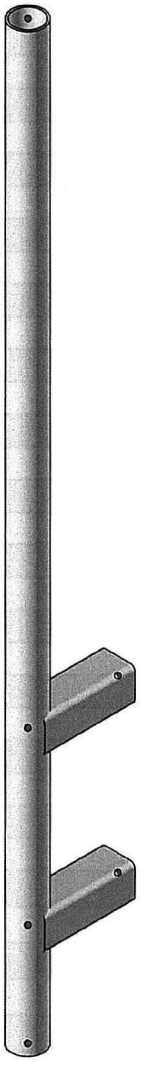
		No Ice						
--	--	w/ Ice						

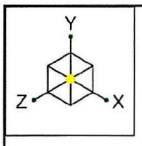
EQUIPMENT SEISMIC FORCE CALCULATIONS

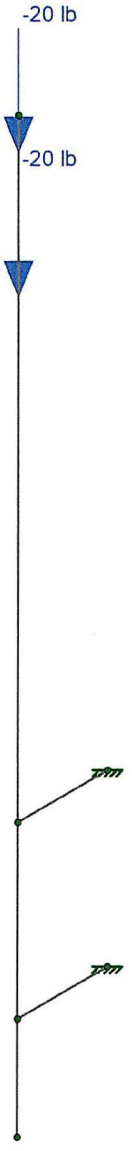
Appurtenance Name	Qty.	Elevation [ft]	Weight [lbs]	F_p [lbs]
39GHZ VECTASAR NRGNB	1	158	40	12.86





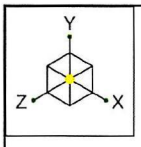
Verizon	Tanglewood	SK-1
Trylon		Tanglewood.r3d
17290616		

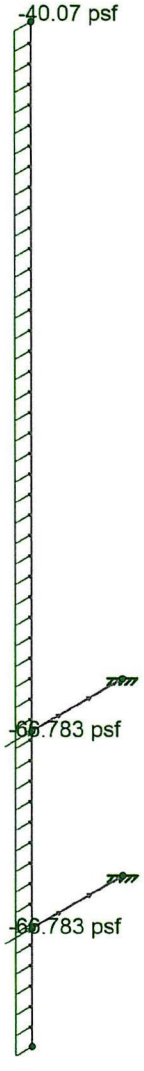




Loads: BLC 1, Self Weight

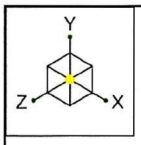
Verizon	Tanglewood	SK-2
Trylon		Tanglewood.r3d
17290616		

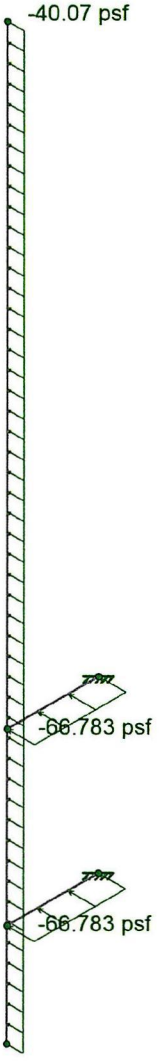




Loads: BLC 2, Structure Wind Z

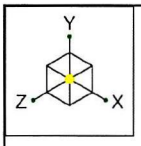
Verizon	Tanglewood	SK-3
Trylon		Tanglewood.r3d
17290616		

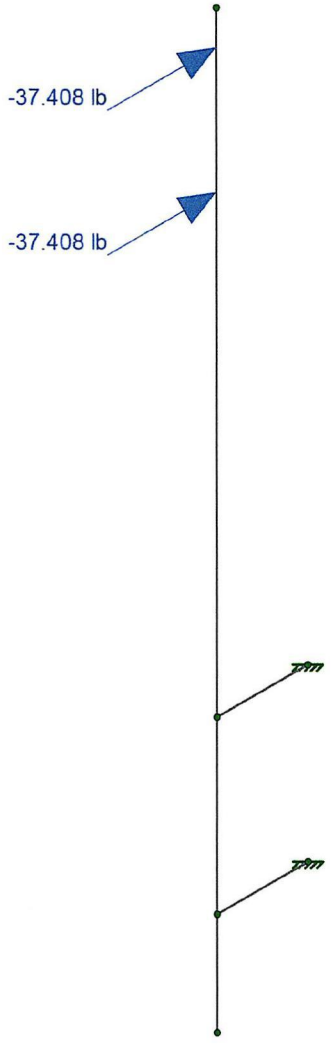




Loads: BLC 3, Structure Wind X

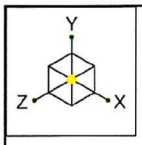
Verizon	Tanglewood	SK-4
Trylon		Tanglewood.r3d
17290616		

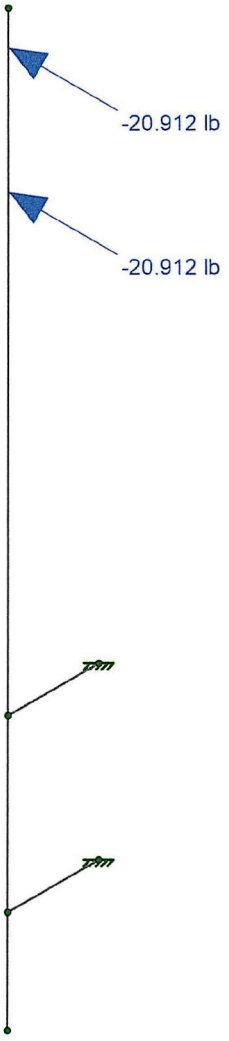




Loads: BLC 4, Wind Load 0 AZI

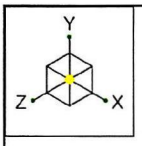
Verizon	Tanglewood	SK-5
Trylon		Tanglewood.r3d
17290616		

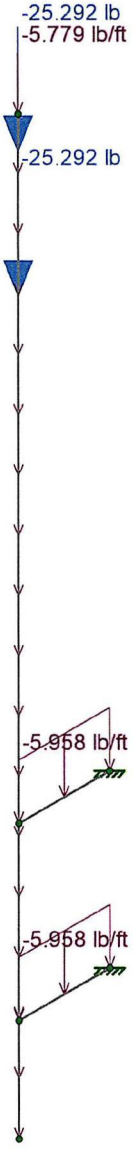




Loads: BLC 8, Wind Load 90 AZI

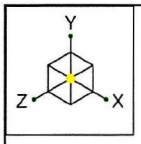
Verizon	Tanglewood	SK-6
Trylon		Tanglewood.r3d
17290616		

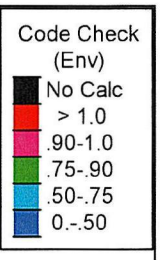


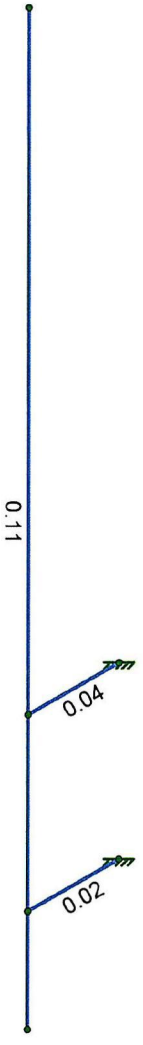


Loads: BLC 12, Ice Weight

Verizon	Tanglewood	SK-7
Trylon		Tanglewood.r3d
17290616		

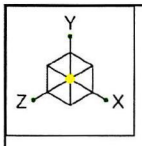




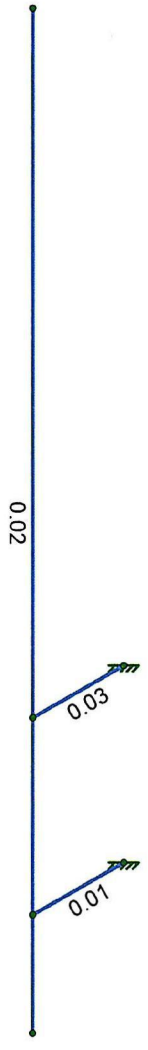


Member Code Checks Displayed (Enveloped)

Verizon	Tanglewood	SK-8
Trylon		Tanglewood.r3d
17290616		



Shear Check
(Env)
No Calc
> 1.0
.90-1.0
.75-.90
.50-.75
0.-.50



Member Shear Checks Displayed (Enveloped)

Verizon	Tanglewood	SK-9
Trylon		Tanglewood.r3d
17290616		

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Pipe 2.0	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
2	Pipe 2.5	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	HSS3X3X3	HSS3X3X3	Beam	SquareTube	A500 Gr.B Rect	Typical_1	1.89	2.46	2.46	4.03

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Unistrut	P1000	Column	CS	A653 SS Gr.33	Typical	0.48	0.149	0.203	0.002
2	Z3x6x3x3	Z3X6X3X3	Beam	None	A653 SS Gr33	Typical_1	2.009	3.087	10.64	0.024

Member Primary Data

	Label	I Node	J Node	Section/Shape	Type	Design List	Material	Design Rule
1	MP1	N3	N1	Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
2	M3	N5	N9	HSS3X3X3	Beam	SquareTube	A500 Gr.B Rect	Typical_1
3	M4	N4	N10	HSS3X3X3	Beam	SquareTube	A500 Gr.B Rect	Typical_1

Nodal Loads and Enforced Displacements

No Data to Print...

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Y	-20	3
2	MP1	Y	-20	14

Member Point Loads (BLC 4 : Wind Load 0 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-37.408	3
2	MP1	Z	-37.408	14

Member Point Loads (BLC 5 : Wind Load 30 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-28.825	3
2	MP1	Z	-28.825	14
3	MP1	X	-16.642	3
4	MP1	X	-16.642	14

Member Point Loads (BLC 6 : Wind Load 45 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-20.619	3
2	MP1	Z	-20.619	14
3	MP1	X	-20.619	3
4	MP1	X	-20.619	14

Member Point Loads (BLC 7 : Wind Load 60 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-12.518	3
2	MP1	Z	-12.518	14
3	MP1	X	-21.682	3
4	MP1	X	-21.682	14

Member Point Loads (BLC 8 : Wind Load 90 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-20.912	3
2	MP1	X	-20.912	14

Member Point Loads (BLC 9 : Wind Load 120 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	12.518	3
2	MP1	Z	12.518	14
3	MP1	X	-21.682	3
4	MP1	X	-21.682	14

Member Point Loads (BLC 10 : Wind Load 135 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	20.619	3
2	MP1	Z	20.619	14
3	MP1	X	-20.619	3
4	MP1	X	-20.619	14

Member Point Loads (BLC 11 : Wind Load 150 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	28.825	3
2	MP1	Z	28.825	14
3	MP1	X	-16.642	3
4	MP1	X	-16.642	14

Member Point Loads (BLC 12 : Ice Weight)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Y	-25.292	3
2	MP1	Y	-25.292	14

Member Point Loads (BLC 15 : Ice Wind Load 0 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-7.35	3
2	MP1	Z	-7.35	14

Member Point Loads (BLC 16 : Ice Wind Load 30 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-5.709	3
2	MP1	Z	-5.709	14

Member Point Loads (BLC 16 : Ice Wind Load 30 AZI) (Continued)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
3	MP1	X	-3.296	3
4	MP1	X	-3.296	14

Member Point Loads (BLC 17 : Ice Wind Load 45 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-4.126	3
2	MP1	Z	-4.126	14
3	MP1	X	-4.126	3
4	MP1	X	-4.126	14

Member Point Loads (BLC 18 : Ice Wind Load 60 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-2.539	3
2	MP1	Z	-2.539	14
3	MP1	X	-4.397	3
4	MP1	X	-4.397	14

Member Point Loads (BLC 19 : Ice Wind Load 90 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-4.32	3
2	MP1	X	-4.32	14

Member Point Loads (BLC 20 : Ice Wind Load 120 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	2.539	3
2	MP1	Z	2.539	14
3	MP1	X	-4.397	3
4	MP1	X	-4.397	14

Member Point Loads (BLC 21 : Ice Wind Load 135 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	4.126	3
2	MP1	Z	4.126	14
3	MP1	X	-4.126	3
4	MP1	X	-4.126	14

Member Point Loads (BLC 22 : Ice Wind Load 150 AZI)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	5.709	3
2	MP1	Z	5.709	14
3	MP1	X	-3.296	3
4	MP1	X	-3.296	14

Member Point Loads (BLC 23 : Seismic Load Z)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	Z	-6.432	3
2	MP1	Z	-6.432	14

Member Point Loads (BLC 24 : Seismic Load X)

	Member Label	Direction	Magnitude [lb, lb-ft]	Location [(in, %)]
1	MP1	X	-6.432	3
2	MP1	X	-6.432	14

Member Area Loads

No Data to Print...

Member Distributed Loads (BLC 2 : Structure Wind Z)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	MP1	SZ	-40.07	-40.07	0	%100
2	M3	SZ	-66.783	-66.783	0	%100
3	M4	SZ	-66.783	-66.783	0	%100

Member Distributed Loads (BLC 3 : Structure Wind X)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	MP1	SX	-40.07	-40.07	0	%100
2	M3	SX	-66.783	-66.783	0	%100
3	M4	SX	-66.783	-66.783	0	%100

Member Distributed Loads (BLC 12 : Ice Weight)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	MP1	Y	-5.779	-5.779	0	%100
2	M3	Y	-5.958	-5.958	0	%100
3	M4	Y	-5.958	-5.958	0	%100

Member Distributed Loads (BLC 13 : Structure Ice Wind Z)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	MP1	SZ	-5.838	-5.838	0	%100
2	M3	SZ	-5.838	-5.838	0	%100
3	M4	SZ	-5.838	-5.838	0	%100

Member Distributed Loads (BLC 14 : Structure Ice Wind X)

	Member Label	Direction	Start Magnitude [lb/ft, F, psf, lb-ft/in]	End Magnitude [lb/ft, F, psf, lb-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	MP1	SX	-5.838	-5.838	0	%100
2	M3	SX	-5.838	-5.838	0	%100
3	M4	SX	-5.838	-5.838	0	%100

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Self Weight	DL		-1		2	
2	Structure Wind Z	WLZ					3
3	Structure Wind X	WLX					3
4	Wind Load 0 AZI	WLZ				2	
5	Wind Load 30 AZI	None				4	
6	Wind Load 45 AZI	None				4	
7	Wind Load 60 AZI	None				4	
8	Wind Load 90 AZI	WLX				2	
9	Wind Load 120 AZI	None				4	
10	Wind Load 135 AZI	None				4	
11	Wind Load 150 AZI	None				4	
12	Ice Weight	OL1				2	3
13	Structure Ice Wind Z	OL2					3
14	Structure Ice Wind X	OL3					3
15	Ice Wind Load 0 AZI	OL2				2	
16	Ice Wind Load 30 AZI	None				4	
17	Ice Wind Load 45 AZI	None				4	
18	Ice Wind Load 60 AZI	None				4	
19	Ice Wind Load 90 AZI	OL3				2	
20	Ice Wind Load 120 AZI	None				4	
21	Ice Wind Load 135 AZI	None				4	
22	Ice Wind Load 150 AZI	None				4	
23	Seismic Load Z	ELZ			-0.322	2	
24	Seismic Load X	ELX	-0.322			2	
25	Maintenance Load 1 (Lm)	None					
26	Maintenance Load 2 (Lm)	None					
27	Maintenance Load 3 (Lm)	None					

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4DL	Yes	Y	DL	1.4								
2	1.2DL + 1WL 0 AZI	Yes	Y	DL	1.2	2	1	3		4	1		
3	1.2DL + 1WL 30 AZI	Yes	Y	DL	1.2	2	0.866	3	0.5	5	1		
4	1.2DL + 1WL 45 AZI	Yes	Y	DL	1.2	2	0.707	3	0.707	6	1		
5	1.2DL + 1WL 60 AZI	Yes	Y	DL	1.2	2	0.5	3	0.866	7	1		
6	1.2DL + 1WL 90 AZI	Yes	Y	DL	1.2	2		3	1	8	1		
7	1.2DL + 1WL 120 AZI	Yes	Y	DL	1.2	2	-0.5	3	0.866	9	1		
8	1.2DL + 1WL 135 AZI	Yes	Y	DL	1.2	2	-0.707	3	0.707	10	1		
9	1.2DL + 1WL 150 AZI	Yes	Y	DL	1.2	2	-0.866	3	0.5	11	1		
10	1.2DL + 1WL 180 AZI	Yes	Y	DL	1.2	2	-1	3		4	-1		
11	1.2DL + 1WL 210 AZI	Yes	Y	DL	1.2	2	-0.866	3	-0.5	5	-1		
12	1.2DL + 1WL 225 AZI	Yes	Y	DL	1.2	2	-0.707	3	-0.707	6	-1		
13	1.2DL + 1WL 240 AZI	Yes	Y	DL	1.2	2	-0.5	3	-0.866	7	-1		
14	1.2DL + 1WL 270 AZI	Yes	Y	DL	1.2	2		3	-1	8	-1		
15	1.2DL + 1WL 300 AZI	Yes	Y	DL	1.2	2	0.5	3	-0.866	9	-1		
16	1.2DL + 1WL 315 AZI	Yes	Y	DL	1.2	2	0.707	3	-0.707	10	-1		
17	1.2DL + 1WL 330 AZI	Yes	Y	DL	1.2	2	0.866	3	-0.5	11	-1		
18	0.9DL + 1WL 0 AZI	Yes	Y	DL	0.9	2	1	3		4	1		
19	0.9DL + 1WL 30 AZI	Yes	Y	DL	0.9	2	0.866	3	0.5	5	1		
20	0.9DL + 1WL 45 AZI	Yes	Y	DL	0.9	2	0.707	3	0.707	6	1		
21	0.9DL + 1WL 60 AZI	Yes	Y	DL	0.9	2	0.5	3	0.866	7	1		
22	0.9DL + 1WL 90 AZI	Yes	Y	DL	0.9	2		3	1	8	1		
23	0.9DL + 1WL 120 AZI	Yes	Y	DL	0.9	2	-0.5	3	0.866	9	1		
24	0.9DL + 1WL 135 AZI	Yes	Y	DL	0.9	2	-0.707	3	0.707	10	1		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
25	0.9DL + 1WL 150 AZI	Yes	Y	DL	0.9	2	-0.866	3	0.5	11	1		
26	0.9DL + 1WL 180 AZI	Yes	Y	DL	0.9	2	-1	3		4	-1		
27	0.9DL + 1WL 210 AZI	Yes	Y	DL	0.9	2	-0.866	3	-0.5	5	-1		
28	0.9DL + 1WL 225 AZI	Yes	Y	DL	0.9	2	-0.707	3	-0.707	6	-1		
29	0.9DL + 1WL 240 AZI	Yes	Y	DL	0.9	2	-0.5	3	-0.866	7	-1		
30	0.9DL + 1WL 270 AZI	Yes	Y	DL	0.9	2		3	-1	8	-1		
31	0.9DL + 1WL 300 AZI	Yes	Y	DL	0.9	2	0.5	3	-0.866	9	-1		
32	0.9DL + 1WL 315 AZI	Yes	Y	DL	0.9	2	0.707	3	-0.707	10	-1		
33	0.9DL + 1WL 330 AZI	Yes	Y	DL	0.9	2	0.866	3	-0.5	11	-1		
34	1.2DL + 1DLi + 1WLi 0 AZI	Yes	Y	DL	1.2	OL1	1	13	1	14		15	1
35	1.2DL + 1DLi + 1WLi 30 AZI	Yes	Y	DL	1.2	OL1	1	13	0.866	14	0.5	16	1
36	1.2DL + 1DLi + 1WLi 45 AZI	Yes	Y	DL	1.2	OL1	1	13	0.707	14	0.707	17	1
37	1.2DL + 1DLi + 1WLi 60 AZI	Yes	Y	DL	1.2	OL1	1	13	0.5	14	0.866	18	1
38	1.2DL + 1DLi + 1WLi 90 AZI	Yes	Y	DL	1.2	OL1	1	13		14	1	19	1
39	1.2DL + 1DLi + 1WLi 120 AZI	Yes	Y	DL	1.2	OL1	1	13	-0.5	14	0.866	20	1
40	1.2DL + 1DLi + 1WLi 135 AZI	Yes	Y	DL	1.2	OL1	1	13	-0.707	14	0.707	21	1
41	1.2DL + 1DLi + 1WLi 150 AZI	Yes	Y	DL	1.2	OL1	1	13	-0.866	14	0.5	22	1
42	1.2DL + 1DLi + 1WLi 180 AZI	Yes	Y	DL	1.2	OL1	1	13	-1	14		15	-1
43	1.2DL + 1DLi + 1WLi 210 AZI	Yes	Y	DL	1.2	OL1	1	13	-0.866	14	-0.5	16	-1
44	1.2DL + 1DLi + 1WLi 225 AZI	Yes	Y	DL	1.2	OL1	1	13	-0.707	14	-0.707	17	-1
45	1.2DL + 1DLi + 1WLi 240 AZI	Yes	Y	DL	1.2	OL1	1	13	-0.5	14	-0.866	18	-1
46	1.2DL + 1DLi + 1WLi 270 AZI	Yes	Y	DL	1.2	OL1	1	13		14	-1	19	-1
47	1.2DL + 1DLi + 1WLi 300 AZI	Yes	Y	DL	1.2	OL1	1	13	0.5	14	-0.866	20	-1
48	1.2DL + 1DLi + 1WLi 315 AZI	Yes	Y	DL	1.2	OL1	1	13	0.707	14	-0.707	21	-1
49	1.2DL + 1DLi + 1WLi 330 AZI	Yes	Y	DL	1.2	OL1	1	13	0.866	14	-0.5	22	-1
50	(1.2+0.2Sds) + 1.0E 0 AZI	Yes	Y	DL	1.243	ELZ	1	ELX					
51	(1.2+0.2Sds) + 1.0E 30 AZI	Yes	Y	DL	1.243	ELZ	0.866	ELX	0.5				
52	(1.2+0.2Sds) + 1.0E 45 AZI	Yes	Y	DL	1.243	ELZ	0.707	ELX	0.707				
53	(1.2+0.2Sds) + 1.0E 60 AZI	Yes	Y	DL	1.243	ELZ	0.5	ELX	0.866				
54	(1.2+0.2Sds) + 1.0E 90 AZI	Yes	Y	DL	1.243	ELZ		ELX	1				
55	(1.2+0.2Sds) + 1.0E 120 AZI	Yes	Y	DL	1.243	ELZ	-0.5	ELX	0.866				
56	(1.2+0.2Sds) + 1.0E 135 AZI	Yes	Y	DL	1.243	ELZ	-0.707	ELX	0.707				
57	(1.2+0.2Sds) + 1.0E 150 AZI	Yes	Y	DL	1.243	ELZ	-0.866	ELX	0.5				
58	(1.2+0.2Sds) + 1.0E 180 AZI	Yes	Y	DL	1.243	ELZ	-1	ELX					
59	(1.2+0.2Sds) + 1.0E 210 AZI	Yes	Y	DL	1.243	ELZ	-0.866	ELX	-0.5				
60	(1.2+0.2Sds) + 1.0E 225 AZI	Yes	Y	DL	1.243	ELZ	-0.707	ELX	-0.707				
61	(1.2+0.2Sds) + 1.0E 240 AZI	Yes	Y	DL	1.243	ELZ	-0.5	ELX	-0.866				
62	(1.2+0.2Sds) + 1.0E 270 AZI	Yes	Y	DL	1.243	ELZ		ELX	-1				
63	(1.2+0.2Sds) + 1.0E 300 AZI	Yes	Y	DL	1.243	ELZ	0.5	ELX	-0.866				
64	(1.2+0.2Sds) + 1.0E 315 AZI	Yes	Y	DL	1.243	ELZ	0.707	ELX	-0.707				
65	(1.2+0.2Sds) + 1.0E 330 AZI	Yes	Y	DL	1.243	ELZ	0.866	ELX	-0.5				
66	(0.9-0.2Sds) + 1.0E 0 AZI	Yes	Y	DL	0.857	ELZ	1	ELX					
67	(0.9-0.2Sds) + 1.0E 30 AZI	Yes	Y	DL	0.857	ELZ	0.866	ELX	0.5				
68	(0.9-0.2Sds) + 1.0E 45 AZI	Yes	Y	DL	0.857	ELZ	0.707	ELX	0.707				
69	(0.9-0.2Sds) + 1.0E 60 AZI	Yes	Y	DL	0.857	ELZ	0.5	ELX	0.866				
70	(0.9-0.2Sds) + 1.0E 90 AZI	Yes	Y	DL	0.857	ELZ		ELX	1				
71	(0.9-0.2Sds) + 1.0E 120 AZI	Yes	Y	DL	0.857	ELZ	-0.5	ELX	0.866				
72	(0.9-0.2Sds) + 1.0E 135 AZI	Yes	Y	DL	0.857	ELZ	-0.707	ELX	0.707				
73	(0.9-0.2Sds) + 1.0E 150 AZI	Yes	Y	DL	0.857	ELZ	-0.866	ELX	0.5				
74	(0.9-0.2Sds) + 1.0E 180 AZI	Yes	Y	DL	0.857	ELZ	-1	ELX					
75	(0.9-0.2Sds) + 1.0E 210 AZI	Yes	Y	DL	0.857	ELZ	-0.866	ELX	-0.5				
76	(0.9-0.2Sds) + 1.0E 225 AZI	Yes	Y	DL	0.857	ELZ	-0.707	ELX	-0.707				
77	(0.9-0.2Sds) + 1.0E 240 AZI	Yes	Y	DL	0.857	ELZ	-0.5	ELX	-0.866				
78	(0.9-0.2Sds) + 1.0E 270 AZI	Yes	Y	DL	0.857	ELZ		ELX	-1				
79	(0.9-0.2Sds) + 1.0E 300 AZI	Yes	Y	DL	0.857	ELZ	0.5	ELX	-0.866				

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
80	(0.9-0.2Sds) + 1.0E 315 AZI	Yes	Y	DL	0.857	ELZ	0.707	ELX	-0.707				
81	(0.9-0.2Sds) + 1.0E 330 AZI	Yes	Y	DL	0.857	ELZ	0.866	ELX	-0.5				
82	1.2D + 1.5 Lv1	Yes	Y	DL	1.2	25	1.5						
83	1.2D + 1.5 Lv2	Yes	Y	DL	1.2	26	1.5						
84	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1	Yes	Y	DL	1.2	27	1.5	4	0.062	2	0.062	3	
85	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1	Yes	Y	DL	1.2	27	1.5	5	0.062	2	0.054	3	0.031
86	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1	Yes	Y	DL	1.2	27	1.5	6	0.062	2	0.044	3	0.044
87	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1	Yes	Y	DL	1.2	27	1.5	7	0.062	2	0.031	3	0.054
88	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1	Yes	Y	DL	1.2	27	1.5	8	0.062	2		3	0.062
89	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1	Yes	Y	DL	1.2	27	1.5	9	0.062	2	-0.031	3	0.054
90	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1	Yes	Y	DL	1.2	27	1.5	10	0.062	2	-0.044	3	0.044
91	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1	Yes	Y	DL	1.2	27	1.5	11	0.062	2	-0.054	3	0.031
92	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1	Yes	Y	DL	1.2	27	1.5	4	0.062	2	-0.062	3	
93	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1	Yes	Y	DL	1.2	27	1.5	5	0.062	2	-0.054	3	-0.031
94	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1	Yes	Y	DL	1.2	27	1.5	6	0.062	2	-0.044	3	-0.044
95	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1	Yes	Y	DL	1.2	27	1.5	7	0.062	2	-0.031	3	-0.054
96	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1	Yes	Y	DL	1.2	27	1.5	8	0.062	2		3	-0.062
97	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1	Yes	Y	DL	1.2	27	1.5	9	0.062	2	0.031	3	-0.054
98	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1	Yes	Y	DL	1.2	27	1.5	10	0.062	2	0.044	3	-0.044
99	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1	Yes	Y	DL	1.2	27	1.5	11	0.062	2	0.054	3	-0.031
100	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2	Yes	Y	DL	1.2	28	1.5	4	0.062	2	0.062	3	
101	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2	Yes	Y	DL	1.2	28	1.5	5	0.062	2	0.054	3	0.031
102	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2	Yes	Y	DL	1.2	28	1.5	6	0.062	2	0.044	3	0.044
103	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2	Yes	Y	DL	1.2	28	1.5	7	0.062	2	0.031	3	0.054
104	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2	Yes	Y	DL	1.2	28	1.5	8	0.062	2		3	0.062
105	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2	Yes	Y	DL	1.2	28	1.5	9	0.062	2	-0.031	3	0.054
106	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2	Yes	Y	DL	1.2	28	1.5	10	0.062	2	-0.044	3	0.044
107	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2	Yes	Y	DL	1.2	28	1.5	11	0.062	2	-0.054	3	0.031
108	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2	Yes	Y	DL	1.2	28	1.5	4	0.062	2	-0.062	3	
109	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2	Yes	Y	DL	1.2	28	1.5	5	0.062	2	-0.054	3	-0.031
110	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2	Yes	Y	DL	1.2	28	1.5	6	0.062	2	-0.044	3	-0.044
111	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2	Yes	Y	DL	1.2	28	1.5	7	0.062	2	-0.031	3	-0.054
112	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2	Yes	Y	DL	1.2	28	1.5	8	0.062	2		3	-0.062
113	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2	Yes	Y	DL	1.2	28	1.5	9	0.062	2	0.031	3	-0.054
114	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2	Yes	Y	DL	1.2	28	1.5	10	0.062	2	0.044	3	-0.044
115	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2	Yes	Y	DL	1.2	28	1.5	11	0.062	2	0.054	3	-0.031
116	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3	Yes	Y	DL	1.2	29	1.5	4	0.062	2	0.062	3	
117	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3	Yes	Y	DL	1.2	29	1.5	5	0.062	2	0.054	3	0.031
118	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3	Yes	Y	DL	1.2	29	1.5	6	0.062	2	0.044	3	0.044
119	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3	Yes	Y	DL	1.2	29	1.5	7	0.062	2	0.031	3	0.054
120	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3	Yes	Y	DL	1.2	29	1.5	8	0.062	2		3	0.062
121	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3	Yes	Y	DL	1.2	29	1.5	9	0.062	2	-0.031	3	0.054
122	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3	Yes	Y	DL	1.2	29	1.5	10	0.062	2	-0.044	3	0.044
123	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3	Yes	Y	DL	1.2	29	1.5	11	0.062	2	-0.054	3	0.031
124	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3	Yes	Y	DL	1.2	29	1.5	4	0.062	2	-0.062	3	
125	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3	Yes	Y	DL	1.2	29	1.5	5	0.062	2	-0.054	3	-0.031
126	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3	Yes	Y	DL	1.2	29	1.5	6	0.062	2	-0.044	3	-0.044
127	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3	Yes	Y	DL	1.2	29	1.5	7	0.062	2	-0.031	3	-0.054
128	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3	Yes	Y	DL	1.2	29	1.5	8	0.062	2		3	-0.062
129	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3	Yes	Y	DL	1.2	29	1.5	9	0.062	2	0.031	3	-0.054
130	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3	Yes	Y	DL	1.2	29	1.5	10	0.062	2	0.044	3	-0.044
131	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3	Yes	Y	DL	1.2	29	1.5	11	0.062	2	0.054	3	-0.031

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N9	max	208.967	6	305.055	2	295.063	18	38.983	18	117.338	6	131.186	14
2		min	-208.967	14	-211.807	26	-321.781	10	-80.675	10	-117.338	14	-131.186	6
3	N10	max	82.966	13	300.366	10	184.563	10	77.573	18	40.817	13	11.325	6
4		min	-82.966	7	-215.331	18	-157.846	18	-114.888	10	-40.817	7	-11.325	14
5	Totals:	max	126.485	6	197.891	43	137.218	18						
6		min	-126.485	14	72.702	72	-137.218	26						

Envelope AISI S100-20: LRFD Member Cold Formed Steel Code Checks

No Data to Print...

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	MP1	PIPE 2.5	0.105	53.368	10	0.016	55.421		11	35890.384	50715	3596.25	3596.25	1	H1-1b
2	M3	HSS3X3X3	0.036	0	2	0.033	8	z	14	77987.62	78246	6796.5	6796.5	1.508	H1-1b
3	M4	HSS3X3X3	0.019	8	11	0.014	8	y	10	77987.62	78246	6796.5	6796.5	2.223	H1-1b

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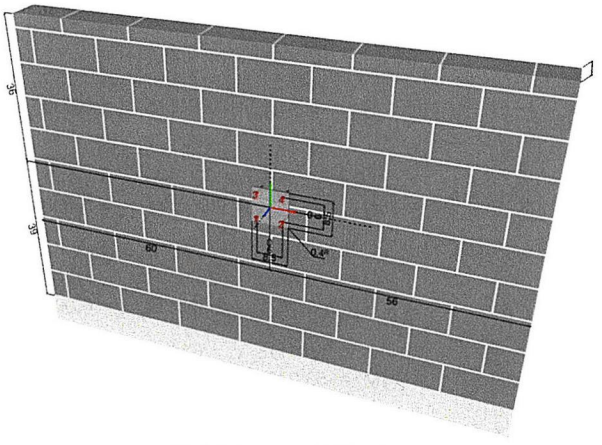
Specifier's comments:

1 Input data

Anchor type and diameter:	**HY 270 + threaded rod 5.8 1/2**
Item number:	385423 HAS 5.8 1/2"x4-1/2" (element) / 2194247 HIT-HY 270 (adhesive)
Specification text:	Hilti HIT-V 5.8 threaded rod with HIT-HY 270 injection mortar with 2.75 in embedment hef, 1/2, Steel galvanized, Hammer drilled installation per ESR-4143
Effective embedment depth:	h_{ef} = 2.750 in.
Material:	5.8
Evaluation Service Report:	ESR-4143
Issued I Valid:	11/1/2023 | 1/1/2025
Proof:	Design Method LRFD (AC58) Masonry + ACI 318-19
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.400 in.
Anchor plate[R] :	l_x x l_y x t = 8.500 in. x 8.500 in. x 0.400 in.; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	uncracked Grout-filled CMU, f=1500, f = 1,500 psi, L x W x H: 16.000 in. x 8.000 in. x 8.000 in.; Solid Head Joint: no; open ended unit: no
Temp. short/long:	32 °F / 32 °F
	Joints: vertical: 0.375 in.; horizontal: 0.375 in.
Installation:	Face installation, Drill hole: Hammer drilled, Installation condition: Dry

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.]



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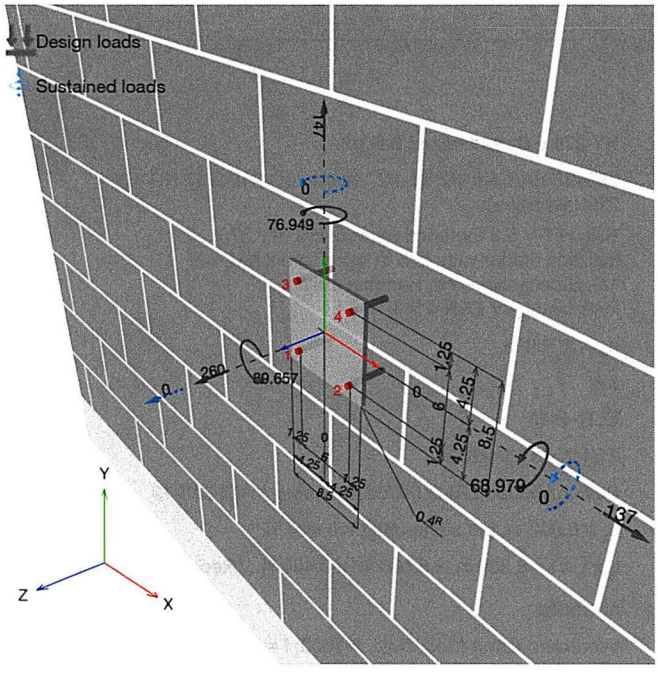
Geometry [in.] & Loading [lb, ft.lb]



1.1 Load combination and design results

Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 322	N = 18; V_x = 0; V_y = -62; M_x = 27.789; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
2	Combination 323	N = -18; V_x = 0; V_y = -57; M_x = 24.863; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
3	Combination 324	N = -291; V_x = 0; V_y = -305; M_x = -33.044; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
4	Combination 325	N = 154; V_x = 0; V_y = 203; M_x = -72.271; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
5	Combination 326	N = -230; V_x = -137; V_y = -253; M_x = -21.346; M_y = 76.957; M_z = -89.657; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
6	Combination 327	N = 118; V_x = 61; V_y = 152; M_x = -53.043; M_y = 30.247; M_z = 7.719; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
7	Combination 328	N = -168; V_x = -178; V_y = -202; M_x = -9.726; M_y = 100.206; M_z = -115.445; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
8	Combination 329	N = 83; V_x = 77; V_y = 100; M_x = -33.935; M_y = 38.047; M_z = 9.946; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
9	Combination 330	N = -103; V_x = -200; V_y = -148; M_x = 2.454; M_y = 112.175; M_z = -127.502; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	10
10	Combination 331	N = 47; V_x = 83; V_y = 46; M_x = -13.893; M_y = 40.808; M_z = 10.995; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
11	Combination 332	N = 15; V_x = -209; V_y = -53; M_x = 23.819; M_y = 117.338; M_z = -131.186; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	14
12	Combination 333	N = -15; V_x = 82; V_y = -49; M_x = 21.311; M_y = 40.436; M_z = 11.325; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
13	Combination 334	N = 133; V_x = -200; V_y = 42; M_x = 45.183; M_y = 112.169; M_z = -127.503; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
14	Combination 335	N = -77; V_x = 83; V_y = -143; M_x = 56.515; M_y = 40.817; M_z = 10.995; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
15	Combination 336	N = 199; V_x = -178; V_y = 96; M_x = 57.361; M_y = 100.199; M_z = -115.445; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
16	Combination 337	N = -114; V_x = 77; V_y = -197; M_x = 76.555; M_y = 38.060; M_z = 9.946; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
17	Combination 338	N = 260; V_x = -137; V_y = 147; M_x = 68.979; M_y = 76.949; M_z = -89.657; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	20
18	Combination 339	N = -149; V_x = 61; V_y = -249; M_x = 95.662; M_y = 30.260; M_z = 7.718; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11
19	Combination 340	N = 322; V_x = 0; V_y = 199; M_x = 80.675; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	17

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
20	Combination 341	N = -185; V_x = 0; V_y = -300; M_x = 114.888; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
21	Combination 342	N = 260; V_x = 137; V_y = 147; M_x = 68.979; M_y = 76.949; M_z = 89.657; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	20
22	Combination 343	N = -149; V_x = -61; V_y = -249; M_x = 95.662; M_y = 30.260; M_z = -7.718; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11
23	Combination 344	N = 199; V_x = 178; V_y = 96; M_x = 57.361; M_y = 100.199; M_z = 115.445; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
24	Combination 345	N = -114; V_x = -77; V_y = -197; M_x = 76.555; M_y = 38.060; M_z = -9.946; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
25	Combination 346	N = 133; V_x = 200; V_y = 42; M_x = 45.183; M_y = 112.169; M_z = 127.503; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
26	Combination 347	N = -77; V_x = -83; V_y = -143; M_x = 56.515; M_y = 40.817; M_z = -10.995; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
27	Combination 348	N = 15; V_x = 209; V_y = -53; M_x = 23.819; M_y = 117.338; M_z = 131.186; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	16
28	Combination 349	N = -15; V_x = -82; V_y = -49; M_x = 21.311; M_y = 40.436; M_z = -11.325; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
29	Combination 350	N = -103; V_x = 200; V_y = -148; M_x = 2.454; M_y = 112.175; M_z = 127.502; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
30	Combination 351	N = 47; V_x = -83; V_y = 46; M_x = -13.893; M_y = 40.808; M_z = -10.995; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
31	Combination 352	N = -168; V_x = 178; V_y = -202; M_x = -9.726; M_y = 100.206; M_z = 115.445; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
32	Combination 353	N = 83; V_x = -77; V_y = 100; M_x = -33.935; M_y = 38.047; M_z = -9.946; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
33	Combination 354	N = -230; V_x = 137; V_y = -253; M_x = -21.346; M_y = 76.957; M_z = 89.657; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
34	Combination 355	N = 118; V_x = -61; V_y = 152; M_x = -53.043; M_y = 30.247; M_z = -7.719; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11
35	Combination 356	N = -295; V_x = 0; V_y = -292; M_x = -38.983; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
36	Combination 357	N = 158; V_x = 0; V_y = 215; M_x = -77.573; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
37	Combination 358	N = -234; V_x = -137; V_y = -240; M_x = -27.288; M_y = 76.944; M_z = -89.631; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
38	Combination 359	N = 122; V_x = 61; V_y = 164; M_x = -58.351; M_y = 30.234; M_z = 7.716; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11
39	Combination 360	N = -172; V_x = -178; V_y = -189; M_x = -15.671; M_y = 100.191; M_z = -115.412; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
40	Combination 361	N = 87; V_x = 77; V_y = 112; M_x = -39.248; M_y = 38.031; M_z = 9.942; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
41	Combination 362	N = -107; V_x = -200; V_y = -135; M_x = -3.496; M_y = 112.158; M_z = -127.467; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	10
42	Combination 363	N = 51; V_x = 83; V_y = 58; M_x = -19.212; M_y = 40.790; M_z = 10.991; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
43	Combination 364	N = 11; V_x = -209; V_y = -40; M_x = 17.864; M_y = 117.320; M_z = -131.150; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	13
44	Combination 365	N = -11; V_x = 82; V_y = -36; M_x = 15.983; M_y = 40.418; M_z = 11.321; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
45	Combination 366	N = 130; V_x = -200; V_y = 55; M_x = 39.223; M_y = 112.152; M_z = -127.467; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	17

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
46	Combination 367	N = -73; V_x = 83; V_y = -131; M_x = 51.178; M_y = 40.799; M_z = 10.991; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
47	Combination 368	N = 195; V_x = -178; V_y = 109; M_x = 51.397; M_y = 100.183; M_z = -115.413; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
48	Combination 369	N = -110; V_x = 77; V_y = -185; M_x = 71.213; M_y = 38.043; M_z = 9.942; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
49	Combination 370	N = 257; V_x = -137; V_y = 160; M_x = 63.013; M_y = 76.936; M_z = -89.632; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
50	Combination 371	N = -145; V_x = 61; V_y = -237; M_x = 90.314; M_y = 30.247; M_z = 7.715; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	10
51	Combination 372	N = 318; V_x = 0; V_y = 212; M_x = 74.705; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	17
52	Combination 373	N = -181; V_x = 0; V_y = -288; M_x = 109.535; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	12
53	Combination 374	N = 257; V_x = 137; V_y = 160; M_x = 63.013; M_y = 76.936; M_z = 89.632; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
54	Combination 375	N = -145; V_x = -61; V_y = -237; M_x = 90.314; M_y = 30.247; M_z = -7.715; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11
55	Combination 376	N = 195; V_x = 178; V_y = 109; M_x = 51.397; M_y = 100.183; M_z = 115.413; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	19
56	Combination 377	N = -110; V_x = -77; V_y = -185; M_x = 71.213; M_y = 38.043; M_z = -9.942; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
57	Combination 378	N = 130; V_x = 200; V_y = 55; M_x = 39.223; M_y = 112.152; M_z = 127.467; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	17
58	Combination 379	N = -73; V_x = -83; V_y = -131; M_x = 51.178; M_y = 40.799; M_z = -10.991; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
59	Combination 380	N = 11; V_x = 209; V_y = -40; M_x = 17.864; M_y = 117.320; M_z = 131.150; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	15
60	Combination 381	N = -11; V_x = -82; V_y = -36; M_x = 15.983; M_y = 40.418; M_z = -11.321; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
61	Combination 382	N = -107; V_x = 200; V_y = -135; M_x = -3.496; M_y = 112.158; M_z = 127.467; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
62	Combination 383	N = 51; V_x = -83; V_y = 58; M_x = -19.212; M_y = 40.790; M_z = -10.991; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
63	Combination 384	N = -172; V_x = 178; V_y = -189; M_x = -15.671; M_y = 100.191; M_z = 115.412; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
64	Combination 385	N = 87; V_x = -77; V_y = 112; M_x = -39.248; M_y = 38.031; M_z = -9.942; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	9
65	Combination 386	N = -234; V_x = 137; V_y = -240; M_x = -27.288; M_y = 76.944; M_z = 89.631; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	18
66	Combination 387	N = 122; V_x = -61; V_y = 164; M_x = -58.351; M_y = 30.234; M_z = -7.716; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	11
67	Combination 388	N = -26; V_x = 0; V_y = -150; M_x = 36.151; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
68	Combination 389	N = 2; V_x = 0; V_y = -48; M_x = 24.404; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
69	Combination 390	N = -14; V_x = -24; V_y = -140; M_x = 38.303; M_y = 13.688; M_z = -16.471; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
70	Combination 391	N = -5; V_x = 12; V_y = -58; M_x = 27.939; M_y = 5.939; M_z = 1.416; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
71	Combination 392	N = -3; V_x = -31; V_y = -131; M_x = 40.441; M_y = 17.773; M_z = -21.207; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
72	Combination 393	N = -11; V_x = 15; V_y = -67; M_x = 31.453; M_y = 7.528; M_z = 1.825; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
73	Combination 394	N = 9; V_x = -35; V_y = -121; M_x = 42.682; M_y = 19.828; M_z = -23.419; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
74	Combination 395	N = -18; V_x = 17; V_y = -77; M_x = 35.139; M_y = 8.155; M_z = 2.016; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
75	Combination 396	N = 30; V_x = -36; V_y = -104; M_x = 46.615; M_y = 20.655; M_z = -24.092; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
76	Combination 397	N = -30; V_x = 17; V_y = -94; M_x = 41.614; M_y = 8.186; M_z = 2.076; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
77	Combination 398	N = 51; V_x = -35; V_y = -86; M_x = 50.549; M_y = 19.828; M_z = -23.419; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
78	Combination 399	N = -42; V_x = 17; V_y = -112; M_x = 48.089; M_y = 8.155; M_z = 2.016; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
79	Combination 400	N = 63; V_x = -31; V_y = -76; M_x = 52.790; M_y = 17.773; M_z = -21.207; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
80	Combination 401	N = -48; V_x = 15; V_y = -122; M_x = 51.774; M_y = 7.529; M_z = 1.825; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
81	Combination 402	N = 74; V_x = -24; V_y = -67; M_x = 54.928; M_y = 13.688; M_z = -16.471; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
82	Combination 403	N = -55; V_x = 12; V_y = -131; M_x = 55.288; M_y = 5.939; M_z = 1.416; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
83	Combination 404	N = 85; V_x = 0; V_y = -57; M_x = 57.080; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
84	Combination 405	N = -62; V_x = 0; V_y = -141; M_x = 58.824; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
85	Combination 406	N = 74; V_x = 24; V_y = -67; M_x = 54.928; M_y = 13.688; M_z = 16.471; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
86	Combination 407	N = -55; V_x = -12; V_y = -131; M_x = 55.288; M_y = 5.939; M_z = -1.416; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
87	Combination 408	N = 63; V_x = 31; V_y = -76; M_x = 52.790; M_y = 17.773; M_z = 21.207; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
88	Combination 409	N = -48; V_x = -15; V_y = -122; M_x = 51.774; M_y = 7.529; M_z = -1.825; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
89	Combination 410	N = 51; V_x = 35; V_y = -86; M_x = 50.549; M_y = 19.828; M_z = 23.419; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	8
90	Combination 411	N = -42; V_x = -17; V_y = -112; M_x = 48.089; M_y = 8.155; M_z = -2.016; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
91	Combination 412	N = 30; V_x = 36; V_y = -104; M_x = 46.615; M_y = 20.655; M_z = 24.092; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
92	Combination 413	N = -30; V_x = -17; V_y = -94; M_x = 41.614; M_y = 8.186; M_z = -2.076; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
93	Combination 414	N = 9; V_x = 35; V_y = -121; M_x = 42.682; M_y = 19.828; M_z = 23.419; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
94	Combination 415	N = -18; V_x = -17; V_y = -77; M_x = 35.139; M_y = 8.155; M_z = -2.016; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
95	Combination 416	N = -3; V_x = 31; V_y = -131; M_x = 40.441; M_y = 17.773; M_z = 21.207; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7
96	Combination 417	N = -11; V_x = -15; V_y = -67; M_x = 31.453; M_y = 7.528; M_z = -1.825; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
97	Combination 418	N = -14; V_x = 24; V_y = -140; M_x = 38.303; M_y = 13.688; M_z = 16.471; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	7

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
98	Combination 419	$N = -5$; $V_x = -12$; $V_y = -58$; $M_x = 27.939$; $M_y = 5.939$; $M_z = -1.416$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	3
99	Combination 420	$N = -40$; $V_x = 0$; $V_y = -99$; $M_x = 14.732$; $M_y = 0.000$; $M_z = 0.000$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	4
100	Combination 421	$N = 12$; $V_x = 0$; $V_y = -6$; $M_x = 5.711$; $M_y = 0.000$; $M_z = 0.000$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	1
101	Combination 422	$N = -32$; $V_x = -26$; $V_y = -93$; $M_x = 16.064$; $M_y = 14.508$; $M_z = -17.084$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	6
102	Combination 423	$N = 8$; $V_x = 12$; $V_y = -12$; $M_x = 7.904$; $M_y = 5.908$; $M_z = 1.470$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	2
103	Combination 424	$N = -23$; $V_x = -36$; $V_y = -86$; $M_x = 17.644$; $M_y = 20.514$; $M_z = -24.157$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	6
104	Combination 425	$N = 4$; $V_x = 17$; $V_y = -19$; $M_x = 10.506$; $M_y = 8.354$; $M_z = 2.079$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	2
105	Combination 426	$N = -12$; $V_x = -44$; $V_y = -77$; $M_x = 19.702$; $M_y = 25.128$; $M_z = -29.590$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	6
106	Combination 427	$N = -2$; $V_x = 21$; $V_y = -28$; $M_x = 13.893$; $M_y = 10.233$; $M_z = 2.547$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	3
107	Combination 428	$N = 16$; $V_x = -51$; $V_y = -55$; $M_x = 24.672$; $M_y = 29.016$; $M_z = -34.169$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	6
108	Combination 429	$N = -16$; $V_x = 24$; $V_y = -50$; $M_x = 22.075$; $M_y = 11.817$; $M_z = 2.941$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	3
109	Combination 430	$N = 43$; $V_x = -44$; $V_y = -33$; $M_x = 29.643$; $M_y = 25.128$; $M_z = -29.590$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	6
110	Combination 431	$N = -30$; $V_x = 21$; $V_y = -72$; $M_x = 30.256$; $M_y = 10.233$; $M_z = 2.547$; $N_{sus} = 0$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	4

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
111	Combination 432	N = 55; V_x = -36; V_y = -24; M_x = 31.700; M_y = 20.514; M_z = -24.157; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
112	Combination 433	N = -36; V_x = 17; V_y = -81; M_x = 33.643; M_y = 8.355; M_z = 2.079; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
113	Combination 434	N = 64; V_x = -26; V_y = -17; M_x = 33.281; M_y = 14.508; M_z = -17.084; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
114	Combination 435	N = -40; V_x = 12; V_y = -88; M_x = 36.245; M_y = 5.909; M_z = 1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
115	Combination 436	N = 71; V_x = 0; V_y = -11; M_x = 34.613; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
116	Combination 437	N = -44; V_x = 0; V_y = -94; M_x = 38.438; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
117	Combination 438	N = 64; V_x = 26; V_y = -17; M_x = 33.281; M_y = 14.508; M_z = 17.084; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
118	Combination 439	N = -40; V_x = -12; V_y = -88; M_x = 36.245; M_y = 5.909; M_z = -1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
119	Combination 440	N = 55; V_x = 36; V_y = -24; M_x = 31.700; M_y = 20.514; M_z = 24.157; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
120	Combination 441	N = -36; V_x = -17; V_y = -81; M_x = 33.643; M_y = 8.355; M_z = -2.079; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
121	Combination 442	N = 43; V_x = 44; V_y = -33; M_x = 29.643; M_y = 25.128; M_z = 29.590; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
122	Combination 443	N = -30; V_x = -21; V_y = -72; M_x = 30.256; M_y = 10.233; M_z = -2.547; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
123	Combination 444	N = 16; V_x = 51; V_y = -55; M_x = 24.672; M_y = 29.016; M_z = 34.169; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
124	Combination 445	N = -16; V_x = -24; V_y = -50; M_x = 22.075; M_y = 11.817; M_z = -2.941; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
125	Combination 446	N = -12; V_x = 44; V_y = -77; M_x = 19.702; M_y = 25.128; M_z = 29.590; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
126	Combination 447	N = -2; V_x = -21; V_y = -28; M_x = 13.893; M_y = 10.233; M_z = -2.547; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
127	Combination 448	N = -23; V_x = 36; V_y = -86; M_x = 17.644; M_y = 20.514; M_z = 24.157; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
128	Combination 449	N = 4; V_x = -17; V_y = -19; M_x = 10.506; M_y = 8.354; M_z = -2.079; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
129	Combination 450	N = -32; V_x = 26; V_y = -93; M_x = 16.064; M_y = 14.508; M_z = 17.084; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
130	Combination 451	N = 8; V_x = -12; V_y = -12; M_x = 7.904; M_y = 5.908; M_z = -1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
131	Combination 452	N = -44; V_x = 0; V_y = -82; M_x = 7.073; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
132	Combination 453	N = 17; V_x = 0; V_y = 9; M_x = -1.138; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	1
133	Combination 454	N = -37; V_x = -26; V_y = -76; M_x = 8.405; M_y = 14.505; M_z = -17.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
134	Combination 455	N = 13; V_x = 12; V_y = 3; M_x = 1.054; M_y = 5.905; M_z = 1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	1
135	Combination 456	N = -28; V_x = -36; V_y = -69; M_x = 9.985; M_y = 20.510; M_z = -24.148; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
136	Combination 457	N = 9; V_x = 17; V_y = -4; M_x = 3.655; M_y = 8.350; M_z = 2.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
137	Combination 458	N = -17; V_x = -44; V_y = -60; M_x = 12.042; M_y = 25.123; M_z = -29.579; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
138	Combination 459	N = 3; V_x = 21; V_y = -13; M_x = 7.041; M_y = 10.228; M_z = 2.545; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
139	Combination 460	N = 11; V_x = -51; V_y = -38; M_x = 17.011; M_y = 29.010; M_z = -34.156; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
140	Combination 461	N = -11; V_x = 24; V_y = -35; M_x = 15.220; M_y = 11.810; M_z = 2.939; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
141	Combination 462	N = 39; V_x = -44; V_y = -16; M_x = 21.979; M_y = 25.122; M_z = -29.579; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
142	Combination 463	N = -25; V_x = 21; V_y = -57; M_x = 23.398; M_y = 10.228; M_z = 2.545; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
143	Combination 464	N = 50; V_x = -36; V_y = -7; M_x = 24.036; M_y = 20.510; M_z = -24.148; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
144	Combination 465	N = -31; V_x = 17; V_y = -66; M_x = 26.784; M_y = 8.350; M_z = 2.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
145	Combination 466	N = 59; V_x = -26; V_y = 0; M_x = 25.616; M_y = 14.505; M_z = -17.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
146	Combination 467	N = -35; V_x = 12; V_y = -73; M_x = 29.385; M_y = 5.905; M_z = 1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
147	Combination 468	N = 66; V_x = 0; V_y = 6; M_x = 26.948; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
148	Combination 469	N = -39; V_x = 0; V_y = -79; M_x = 31.577; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
149	Combination 470	N = 59; V_x = 26; V_y = 0; M_x = 25.616; M_y = 14.505; M_z = 17.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
150	Combination 471	N = -35; V_x = -12; V_y = -73; M_x = 29.385; M_y = 5.905; M_z = -1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
151	Combination 472	N = 50; V_x = 36; V_y = -7; M_x = 24.036; M_y = 20.510; M_z = 24.148; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
152	Combination 473	N = -31; V_x = -17; V_y = -66; M_x = 26.784; M_y = 8.350; M_z = -2.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
153	Combination 474	N = 39; V_x = 44; V_y = -16; M_x = 21.979; M_y = 25.122; M_z = 29.579; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	6
154	Combination 475	N = -25; V_x = -21; V_y = -57; M_x = 23.398; M_y = 10.228; M_z = -2.545; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
155	Combination 476	N = 11; V_x = 51; V_y = -38; M_x = 17.011; M_y = 29.010; M_z = 34.156; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
156	Combination 477	N = -11; V_x = -24; V_y = -35; M_x = 15.220; M_y = 11.810; M_z = -2.939; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
157	Combination 478	N = -17; V_x = 44; V_y = -60; M_x = 12.042; M_y = 25.123; M_z = 29.579; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
158	Combination 479	N = 3; V_x = -21; V_y = -13; M_x = 7.041; M_y = 10.228; M_z = -2.545; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
159	Combination 480	N = -28; V_x = 36; V_y = -69; M_x = 9.985; M_y = 20.510; M_z = 24.148; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
160	Combination 481	N = 9; V_x = -17; V_y = -4; M_x = 3.655; M_y = 8.350; M_z = -2.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
161	Combination 482	N = -37; V_x = 26; V_y = -76; M_x = 8.405; M_y = 14.505; M_z = 17.078; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	5
162	Combination 483	N = 13; V_x = -12; V_y = 3; M_x = 1.054; M_y = 5.905; M_z = -1.470; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	1

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
163	Combination 484	N = 15; V_x = 0; V_y = -53; M_x = 23.819; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
164	Combination 485	N = -15; V_x = 0; V_y = -49; M_x = 21.311; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
165	Combination 486	N = 15; V_x = 0; V_y = -53; M_x = 23.819; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
166	Combination 487	N = -15; V_x = 0; V_y = -49; M_x = 21.311; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
167	Combination 488	N = -4; V_x = 0; V_y = -69; M_x = 20.265; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
168	Combination 489	N = -5; V_x = 0; V_y = -33; M_x = 15.462; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
169	Combination 490	N = -0; V_x = -9; V_y = -66; M_x = 20.996; M_y = 4.810; M_z = -5.604; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
170	Combination 491	N = -7; V_x = 4; V_y = -36; M_x = 16.664; M_y = 1.891; M_z = 0.482; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
171	Combination 492	N = 4; V_x = -11; V_y = -63; M_x = 21.722; M_y = 6.263; M_z = -7.216; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
172	Combination 493	N = -9; V_x = 5; V_y = -39; M_x = 17.858; M_y = 2.378; M_z = 0.622; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
173	Combination 494	N = 8; V_x = -12; V_y = -59; M_x = 22.484; M_y = 7.011; M_z = -7.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
174	Combination 495	N = -11; V_x = 5; V_y = -43; M_x = 19.111; M_y = 2.551; M_z = 0.687; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
175	Combination 496	N = 15; V_x = -13; V_y = -53; M_x = 23.819; M_y = 7.334; M_z = -8.199; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
176	Combination 497	N = -15; V_x = 5; V_y = -49; M_x = 21.311; M_y = 2.527; M_z = 0.708; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
177	Combination 498	N = 23; V_x = -12; V_y = -47; M_x = 25.154; M_y = 7.011; M_z = -7.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
178	Combination 499	N = -19; V_x = 5; V_y = -55; M_x = 23.511; M_y = 2.551; M_z = 0.687; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
179	Combination 500	N = 27; V_x = -11; V_y = -44; M_x = 25.915; M_y = 6.263; M_z = -7.216; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
180	Combination 501	N = -21; V_x = 5; V_y = -58; M_x = 24.764; M_y = 2.378; M_z = 0.622; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
181	Combination 502	N = 31; V_x = -9; V_y = -41; M_x = 26.642; M_y = 4.810; M_z = -5.604; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
182	Combination 503	N = -24; V_x = 4; V_y = -61; M_x = 25.958; M_y = 1.891; M_z = 0.482; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
183	Combination 504	N = 8; V_x = 0; V_y = -61; M_x = 22.032; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
184	Combination 505	N = -9; V_x = 0; V_y = -41; M_x = 18.403; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
185	Combination 506	N = 10; V_x = -2; V_y = -59; M_x = 22.527; M_y = 1.339; M_z = -2.488; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
186	Combination 507	N = -10; V_x = 3; V_y = -43; M_x = 19.210; M_y = 1.484; M_z = 0.209; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
187	Combination 508	N = 12; V_x = -2; V_y = -57; M_x = 22.972; M_y = 1.354; M_z = -2.810; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
188	Combination 509	N = -12; V_x = 3; V_y = -45; M_x = 19.937; M_y = 1.803; M_z = 0.235; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
189	Combination 510	N = 14; V_x = -2; V_y = -55; M_x = 23.367; M_y = 0.999; M_z = -2.573; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
190	Combination 511	N = -13; V_x = 4; V_y = -47; M_x = 20.581; M_y = 1.846; M_z = 0.213; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
191	Combination 512	N = 15; V_x = -1; V_y = -53; M_x = 23.819; M_y = 0.392; M_z = -1.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
192	Combination 513	N = -15; V_x = 3; V_y = -49; M_x = 21.311; M_y = 1.713; M_z = 0.161; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
193	Combination 514	N = 17; V_x = -2; V_y = -51; M_x = 24.271; M_y = 0.999; M_z = -2.573; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
194	Combination 515	N = -17; V_x = 4; V_y = -50; M_x = 22.041; M_y = 1.846; M_z = 0.213; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
195	Combination 516	N = 18; V_x = -2; V_y = -50; M_x = 24.666; M_y = 1.354; M_z = -2.810; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
196	Combination 517	N = -19; V_x = 3; V_y = -52; M_x = 22.685; M_y = 1.803; M_z = 0.235; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
197	Combination 518	N = 20; V_x = -2; V_y = -48; M_x = 25.111; M_y = 1.339; M_z = -2.488; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
198	Combination 519	N = -20; V_x = 3; V_y = -54; M_x = 23.412; M_y = 1.484; M_z = 0.209; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
199	Combination 520	N = -4; V_x = 0; V_y = -69; M_x = 20.265; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
200	Combination 521	N = -5; V_x = 0; V_y = -33; M_x = 15.462; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
201	Combination 522	N = -0; V_x = -9; V_y = -66; M_x = 20.996; M_y = 4.810; M_z = -5.604; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
202	Combination 523	N = -7; V_x = 4; V_y = -36; M_x = 16.664; M_y = 1.891; M_z = 0.482; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
203	Combination 524	N = 4; V_x = -11; V_y = -63; M_x = 21.722; M_y = 6.263; M_z = -7.216; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
204	Combination 525	N = -9; V_x = 5; V_y = -39; M_x = 17.858; M_y = 2.378; M_z = 0.622; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
205	Combination 526	N = 8; V_x = -12; V_y = -59; M_x = 22.484; M_y = 7.011; M_z = -7.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
206	Combination 527	N = -11; V_x = 5; V_y = -43; M_x = 19.111; M_y = 2.551; M_z = 0.687; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
207	Combination 528	N = 15; V_x = -13; V_y = -53; M_x = 23.819; M_y = 7.334; M_z = -8.199; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
208	Combination 529	N = -15; V_x = 5; V_y = -49; M_x = 21.311; M_y = 2.527; M_z = 0.708; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
209	Combination 530	N = 23; V_x = -12; V_y = -47; M_x = 25.154; M_y = 7.011; M_z = -7.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
210	Combination 531	N = -19; V_x = 5; V_y = -55; M_x = 23.511; M_y = 2.551; M_z = 0.687; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
211	Combination 532	N = 27; V_x = -11; V_y = -44; M_x = 25.915; M_y = 6.263; M_z = -7.216; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
212	Combination 533	N = -21; V_x = 5; V_y = -58; M_x = 24.764; M_y = 2.378; M_z = 0.622; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
213	Combination 534	N = 31; V_x = -9; V_y = -41; M_x = 26.642; M_y = 4.810; M_z = -5.604; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
214	Combination 535	N = -24; V_x = 4; V_y = -61; M_x = 25.958; M_y = 1.891; M_z = 0.482; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
215	Combination 536	N = 8; V_x = 0; V_y = -61; M_x = 22.032; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
216	Combination 537	N = -9; V_x = 0; V_y = -41; M_x = 18.403; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
217	Combination 538	N = 10; V_x = -2; V_y = -59; M_x = 22.527; M_y = 1.339; M_z = -2.488; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
218	Combination 539	N = -10; V_x = 3; V_y = -43; M_x = 19.210; M_y = 1.484; M_z = 0.209; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
219	Combination 540	N = 12; V_x = -2; V_y = -57; M_x = 22.972; M_y = 1.354; M_z = -2.810; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
220	Combination 541	N = -12; V_x = 3; V_y = -45; M_x = 19.937; M_y = 1.803; M_z = 0.235; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
221	Combination 542	N = 14; V_x = -2; V_y = -55; M_x = 23.367; M_y = 0.999; M_z = -2.573; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
222	Combination 543	N = -13; V_x = 4; V_y = -47; M_x = 20.581; M_y = 1.846; M_z = 0.213; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
223	Combination 544	N = 15; V_x = -1; V_y = -53; M_x = 23.819; M_y = 0.392; M_z = -1.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
224	Combination 545	N = -15; V_x = 3; V_y = -49; M_x = 21.311; M_y = 1.713; M_z = 0.161; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
225	Combination 546	N = 17; V_x = -2; V_y = -51; M_x = 24.271; M_y = 0.999; M_z = -2.573; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
226	Combination 547	N = -17; V_x = 4; V_y = -50; M_x = 22.041; M_y = 1.846; M_z = 0.213; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
227	Combination 548	N = 18; V_x = -2; V_y = -50; M_x = 24.666; M_y = 1.354; M_z = -2.810; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
228	Combination 549	N = -19; V_x = 3; V_y = -52; M_x = 22.685; M_y = 1.803; M_z = 0.235; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
229	Combination 550	N = 20; V_x = -2; V_y = -48; M_x = 25.111; M_y = 1.339; M_z = -2.488; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
230	Combination 551	N = -20; V_x = 3; V_y = -54; M_x = 23.412; M_y = 1.484; M_z = 0.209; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
231	Combination 552	N = -4; V_x = 0; V_y = -69; M_x = 20.265; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
232	Combination 553	N = -5; V_x = 0; V_y = -33; M_x = 15.462; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
233	Combination 554	N = -0; V_x = -9; V_y = -66; M_x = 20.996; M_y = 4.810; M_z = -5.604; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
234	Combination 555	N = -7; V_x = 4; V_y = -36; M_x = 16.664; M_y = 1.891; M_z = 0.482; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
235	Combination 556	N = 4; V_x = -11; V_y = -63; M_x = 21.722; M_y = 6.263; M_z = -7.216; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
236	Combination 557	N = -9; V_x = 5; V_y = -39; M_x = 17.858; M_y = 2.378; M_z = 0.622; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
237	Combination 558	N = 8; V_x = -12; V_y = -59; M_x = 22.484; M_y = 7.011; M_z = -7.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
238	Combination 559	N = -11; V_x = 5; V_y = -43; M_x = 19.111; M_y = 2.551; M_z = 0.687; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
239	Combination 560	N = 15; V_x = -13; V_y = -53; M_x = 23.819; M_y = 7.334; M_z = -8.199; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
240	Combination 561	N = -15; V_x = 5; V_y = -49; M_x = 21.311; M_y = 2.527; M_z = 0.708; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
241	Combination 562	N = 23; V_x = -12; V_y = -47; M_x = 25.154; M_y = 7.011; M_z = -7.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
242	Combination 563	N = -19; V_x = 5; V_y = -55; M_x = 23.511; M_y = 2.551; M_z = 0.687; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
243	Combination 564	N = 27; V_x = -11; V_y = -44; M_x = 25.915; M_y = 6.263; M_z = -7.216; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
244	Combination 565	N = -21; V_x = 5; V_y = -58; M_x = 24.764; M_y = 2.378; M_z = 0.622; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
245	Combination 566	N = 31; V_x = -9; V_y = -41; M_x = 26.642; M_y = 4.810; M_z = -5.604; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	4
246	Combination 567	N = -24; V_x = 4; V_y = -61; M_x = 25.958; M_y = 1.891; M_z = 0.482; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
247	Combination 568	N = 8; V_x = 0; V_y = -61; M_x = 22.032; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
248	Combination 569	N = -9; V_x = 0; V_y = -41; M_x = 18.403; M_y = 0.000; M_z = 0.000; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
249	Combination 570	N = 10; V_x = -2; V_y = -59; M_x = 22.527; M_y = 1.339; M_z = -2.488; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
250	Combination 571	N = -10; V_x = 3; V_y = -43; M_x = 19.210; M_y = 1.484; M_z = 0.209; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
251	Combination 572	N = 12; V_x = -2; V_y = -57; M_x = 22.972; M_y = 1.354; M_z = -2.810; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
252	Combination 573	N = -12; V_x = 3; V_y = -45; M_x = 19.937; M_y = 1.803; M_z = 0.235; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
253	Combination 574	N = 14; V_x = -2; V_y = -55; M_x = 23.367; M_y = 0.999; M_z = -2.573; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3

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Case	Description	Forces [lb] / Moments [ft.lb]	Seismic	Max. Util. Anchor [%]
254	Combination 575	N = -13; V_x = 4; V_y = -47; M_x = 20.581; M_y = 1.846; M_z = 0.213; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
255	Combination 576	N = 15; V_x = -1; V_y = -53; M_x = 23.819; M_y = 0.392; M_z = -1.969; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
256	Combination 577	N = -15; V_x = 3; V_y = -49; M_x = 21.311; M_y = 1.713; M_z = 0.161; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
257	Combination 578	N = 17; V_x = -2; V_y = -51; M_x = 24.271; M_y = 0.999; M_z = -2.573; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
258	Combination 579	N = -17; V_x = 4; V_y = -50; M_x = 22.041; M_y = 1.846; M_z = 0.213; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	2
259	Combination 580	N = 18; V_x = -2; V_y = -50; M_x = 24.666; M_y = 1.354; M_z = -2.810; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
260	Combination 581	N = -19; V_x = 3; V_y = -52; M_x = 22.685; M_y = 1.803; M_z = 0.235; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
261	Combination 582	N = 20; V_x = -2; V_y = -48; M_x = 25.111; M_y = 1.339; M_z = -2.488; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3
262	Combination 583	N = -20; V_x = 3; V_y = -54; M_x = 23.412; M_y = 1.484; M_z = 0.209; N_{sus} = 0; $M_{x,sus}$ = 0.000; $M_{y,sus}$ = 0.000;	no	3

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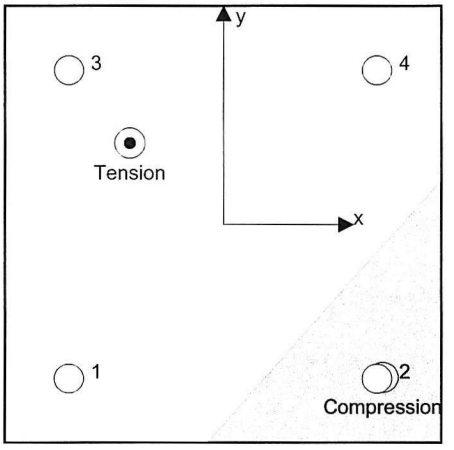
2 Load case/Resulting anchor forces

Controlling load case: 21 Combination 342



Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	83	79	79	-8
2	0	114	79	82
3	200	13	-11	-8
4	69	82	-11	82

Max. concrete compressive strain: 0.02 [‰]
Max. concrete compressive stress: 23 [psi]
Resulting tension force in (x/y)=(-1.822/1.585): 351 [lb]
Resulting compression force in (x/y)=(3.111/-2.975): 91 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load [lb]	Capacity [lb]	Utilization β_N [%]	Status
Steel	200	6,688	3	OK
Bond	282	1,451	20	OK
Masonry breakout	282	2,141	14	OK

3.1 Steel strength

N_{sa} = ESR value refer to ICC-ES ESR-4143
$\phi\ N_{sa} \geq N_{ua}$ AC58 Table 3.2 + ACI 318-19 Table 17.5.2

N_{sa} [lb]	ϕ	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
10,289	0.650	6,688	200

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3.2 Bond strength

$N_{mag} = \left(\frac{A_{Na}}{A_{Na0}}\right) \cdot \psi_{ec1,Na} \cdot \psi_{ec2,Na} \cdot \psi_{ed,Na} \cdot N_{ba,m}$ ACI 318-19 Eq. (17.6.5.1b)

$\phi\ N_{mag} \geq N_{ua}$ AC58 Table 3.2 + ACI 318-19 Table D.4.1.1

A_{Na} see ACI 318-19, Section 17.6.5.1, Fig. R 17.6.5.1(b)

$A_{Na0} = (2\ c_{Na})^2$ ACI 318-19 Eq. (17.6.5.1.2a)

$c_{Na} = 10\ d_a \sqrt{\frac{\tau_{uncr,m}}{1100}}$ ACI 318-19 Eq. (17.6.5.1.2b)

$\psi_{ec,Na} = \left(\frac{1}{1 + \frac{e'_N}{c_{Na}}}\right) \leq 1.00$ ACI 318-19 Eq. (17.6.5.3.1)

$\psi_{ed,Na} = 0.7 + 0.3 \left(\frac{c_{a,min}}{c_{Na}}\right) \leq 1.00$ ACI 318-19 Eq. (17.6.5.4.1b)

$N_{ba,m} = \lambda_a \cdot \tau_{uncr,m} \cdot \pi \cdot d_a \cdot h_{ef}$ ACI 318-19 Eq. (17.6.5.2.1)

Variables

d_a [in.]	h_{ef} [in.]	$c_{a,min}$ [in.]	$\tau_{uncr,m}$ [psi]	α_{sat}	α_{top}
0.500	2.750	3.187	435	1.000	1.000

$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	λ_a
0.000	1.239	1.000

Calculations

c_{Na} [in.]	A_{Na} [in.^{2}]	A_{Na0} [in.^{2}]	$\psi_{ed,Na}$
3.131	76.77	39.20	1.000

$\psi_{ec1,Na}$	$\psi_{ec2,Na}$	$N_{ba,m}$ [lb]
1.000	0.716	1,880

Results

N_{mag} [lb]	ϕ	$\phi\ N_{mag}$ [lb]	$\phi\ N_{ua}$ [lb]
2,637	0.550	1,451	282

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3.3 Masonry breakout strength

$N_{mbg} = \frac{A_{Nm}}{A_{Nm0}} \cdot \psi_{ec,N,m} \cdot \psi_{ed,N,m} \cdot \psi_{c,N,m} \cdot N_{b,m}$ ACI 318-19 Eq. (17.6.5.1b)

$\phi N_{mbg} \geq N_{ua}$ AC58 Table 3.2 + ACI 318-19 Table 17.5.2

A_{Nm} see ACI 318-19, Section 17.4.2.1, Fig. R 17.4.2.1(b)

$A_{Nm0} = 9 \cdot h_{ef}^2$ ACI 318-19 Eq. (17.6.2.2.1)

$\psi_{ec,N,m} = \left(\frac{1}{1 + \frac{2 e'_N}{3 \cdot h_{ef}}} \right) \leq 1.00$ ACI 318-19 Eq. (17.6.2.3.1)

$\psi_{ed,N} = 0.7 + 0.3 \frac{c_{a,min}}{1.5 \cdot h_{ef}} \leq 1.0$ ACI 318-19 Eq. (17.6.2.4.1b)

$N_{b,m} = k_m \cdot \lambda_a \cdot \sqrt{f'_m} \cdot h_{ef}^{1.5}$ ACI 318-19 Eq. (17.6.2.2.1)

Variables

h_{ef} [in.]	$e_{c1,N,m}$ [in.]	$e_{c2,N,m}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N,m}$	k_c
2.750	0.000	1.239	3.187	1.000	17

λ_a	f'_m [psi]
1.000	1,500

Calculations

A_{Nm} [in.^{2}]	A_{Nm0} [in.^{2}]	$\psi_{ec1,N,m}$	$\psi_{ec2,N,m}$	$\psi_{ed,N,m}$	$N_{b,m}$ [lb]
104.20	68.06	1.000	0.769	0.932	3,002

Results

N_{mbg} [lb]	ϕ	ϕN_{mbg} [lb]	N_{ua} [lb]
3,294	0.650	2,141	282

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4 Shear load

	Load [lb]	Capacity [lb]	Utilization β_V [%]	Status
Steel	79	3,705	3	OK
Pryout bond	79	2,577	4	OK
Masonry crushing strength	79	3,342	3	OK
Masonry breakout in direction y-	81	1,311	7	OK

4.1 Steel strength

V_{sa} = ESR value — refer to ICC-ES ESR-4143
$\phi\ V_{sa} \geq V_{ua}$ — AC58 Table 3.2 + ACI 318-19 Table 17.5.2

V_{sa} [lb]	ϕ	$\phi\ V_{sa}$ [lb]	V_{ua} [lb]
6,175	0.600	3,705	79

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4.2 Pryout strength (Bond strength controls)

V_{mpg} $= \min(k_{cp} \cdot N_{mag}, k_{cp} \cdot N_{mbg})$

$\phi\ V_{mpg} \geq V_{ua}$ AC58 Table 3.2 + ACI 318-19 Table 17.5.2

A_{Na} see ACI 318-19, Section 17.6.5.1, Fig. 17.6.5.1(b)

$A_{Na0} = (2\ c_{Na})^2$ ACI 318-19 Eq. (17.6.5.1.2a)

$c_{Na} = 10\ d_a \sqrt{\frac{\tau_{uncr,m}}{1100}}$ ACI 318-19 Eq. (17.6.5.1.2b)

$\psi_{ec,Na} = \left(\frac{1}{1 + \frac{e'_N}{c_{Na}}}\right) \leq 1.0$ ACI 318-19 Eq. (17.6.5.3.1)

$\psi_{ed,Na} = 0.7 + 0.3 \left(\frac{c_{a,min}}{c_{ac}}\right) \leq 1.0$ ACI 318-19 Eq. (17.6.5.4.1b)

$N_{ba,m} = \lambda_a \cdot \tau_{uncr,m} \cdot \pi \cdot d_a \cdot h_{ef}$ ACI 318-19 Eq. (17.6.5.2.1)

Variables

k_{cp}	d_a [in.]	h_{ef} [in.]	$c_{a,min}$ [in.]	$\tau_{uncr,m}$ [psi]
2	0.500	2.750	3.187	435

α_{sat}	α_{top}	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	λ_a
1.000	1.000	0.000	0.000	1.000

Calculations

c_{Na} [in.]	A_{Na} [in.^{2}]	A_{Na0} [in.^{2}]	$\psi_{ed,Na}$	$\psi_{ec1,Na}$	$\psi_{ec2,Na}$
3.131	38.38	39.20	1.000	1.000	1.000

$\psi_{cp,Na}$	$N_{ba,m}$ [lb]
1.000	1,880

Results

V_{mpg} [lb]	ϕ	$\phi\ V_{mpg}$ [lb]	V_{ua} [lb]
3,681	0.700	2,577	79

4.3 Masonry crushing strength

$\phi\ V_{mc} \geq V_{ua}$ AC58 Table 3.2

$V_{mc} = 1750 \cdot (f'_m \cdot A_{se,V})^{\frac{1}{4}}$ AC58 Eq. 3-1

Variables

f'_m [psi]	$A_{se,v}$ [in.^{2}]
1,500	0.14

Results

V_{mc} [lb]	ϕ	$\phi\ V_{mc}$ [lb]	V_{ua} [lb]
6,684	0.500	3,342	79

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4.4 Masonry breakout strength y-

$V_{mbg} = \left(\frac{A_{Vm}}{A_{Vm0}}\right) \Psi_{ec,V,m} \Psi_{ed,V,m} \Psi_{m,V} \Psi_{h,V,m} \Psi_{parallel,V} V_{b,m}$ ACI 318-19 Eq. (17.7.2.1b)

$\phi V_{mbg} \geq V_{ua}$ AC58 Table 3.2 + ACI 318-19 Table 17.5.2

A_{Vm} see ACI 318-19 , Section 17.7.2.1, Fig. R 17.7.2.1(b)

$A_{Vm0} = 4.5 c_{a1}^2$ ACI 318-19 Eq. (17.7.2.1.3)

$\Psi_{ec,V,m} = \left(\frac{1}{1 + \frac{2e_v'}{3c_{a1}}}\right) \leq 1.0$ ACI 318-19 Eq. (17.7.2.3.1)

$\Psi_{ed,V,m} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ ACI 318-19 Eq. (17.7.2.4.1b)

$\Psi_{h,V,m} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ ACI 318-19 Eq. (17.7.2.6.1)

$V_{b,m} = \left(7\left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda_a \sqrt{f_m'} c_{a1}^{1.5}$ ACI 318-19 Eq. (17.7.2.2.1a)

Variables

l_e [in.]	d_a [in.]	c_{a1} [in.]	c_{a2} [in.]	A_{Vm} [in.^{2}]	A_{Vm0} [in.^{2}]	f_m' [psi]
2.750	0.500	5.083	3.187	61.00	116.28	1,500

Calculations

$\Psi_{ed,V,m}$	$\Psi_{parallel,V}$	$e_{c,V}$ [in.]	$\Psi_{ec,V,m}$	$\Psi_{m,V}$	$\Psi_{h,V,m}$
0.825	1.000	0.000	1.000	1.400	1.000

Results

$V_{b,m}$ [lb]	ϕ	ϕV_{mbg} [lb]	V_{ua} [lb]
3,089	0.700	1,311	81

5 Required verifications under combined tension and shear forces

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.195	0.062	5/3	8	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/
- The min. sizes of the bricks, the masonry compressive strength, the type / strength of the mortar and the grout (in case of fully grouted CMU walls) has to fulfill the requirements given in the relevant ESR-approval or in the PTG.
- Only the local load transfer from the anchor(s) to the wall is considered, a further load transfer in the wall is not covered by PROFIS!
- Wall is assumed as being perfectly aligned vertically – checking required(!): Noncompliance can lead to significantly different distribution of forces and higher tension loads than those calculated by PROFIS. Masonry wall must not have any damages (neither visible nor not visible)! While installation, the positioning of the anchors needs to be maintained as in the design phase i.e. either relative to the brick or relative to the mortar joints.
- The effect of the joints on the compressive stress distribution on the plate / bricks was not taken into consideration.
- If no significant resistance is felt over the entire depth of the hole when drilling (e.g. in unfilled butt joints), the anchor should not be set at this position or the area should be assessed and reinforced. Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.
- The accessories and installation remarks listed on this report are for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- The compliance with current standards (e.g. 2018, 2015, 2012, 2009 and 2006 IBC) is the responsibility of the user.
- Drilling method (hammer, rotary) to be in accordance with the approval!
- Masonry needs to be built in a regular way in accordance with state-of the art guidelines!

Fastening meets the design criteria!

7 Installation data

Anchor plate, steel: ASTM A36; E = 29,000,001 psi; f_{yk} = 36,000 psi

Profile: no profile

Hole diameter in the fixture: d_f = 0.562 in.

Plate thickness (input): 0.400 in.

Recommended plate thickness: not calculated

Drilling method: Drilled in hammer mode

Cleaning: No cleaning of the drilled hole is required

Anchor type and diameter: HY 270 + threaded rod 5.8 1/2

Item number: 385423 HAS 5.8 1/2"x4-1/2" (element) / 2194247 HIT-HY 270 (adhesive)

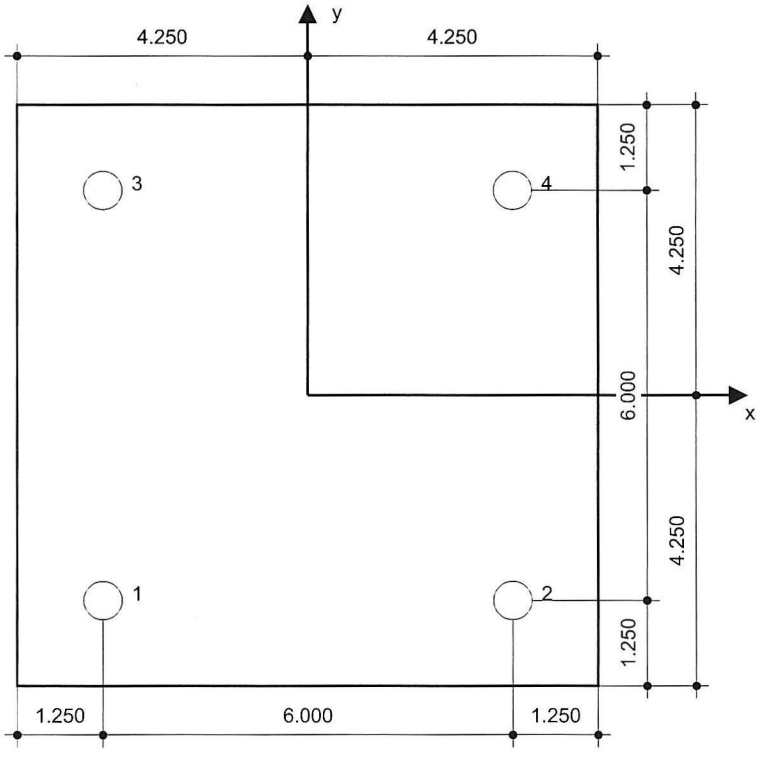
Maximum installation torque: 7.501 ft.lb

Hole diameter in the base material: 0.562 in.

Hole depth in the base material: 2.750 in.

Minimum thickness of the base material: 7.625 in.

Hilti HIT-V 5.8 threaded rod with HIT-HY 270 injection mortar with 2.75 in embedment hef, 1/2, Steel galvanized, Hammer drilled installation per ESR-4143



Coordinates Anchor [in.]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-3.000	-3.000	57.000	59.000	36.000	39.000
2	3.000	-3.000	63.000	53.000	36.000	39.000
3	-3.000	3.000	57.000	59.000	42.000	33.000
4	3.000	3.000	63.000	53.000	42.000	33.000

8 Remarks; Your Cooperation Duties

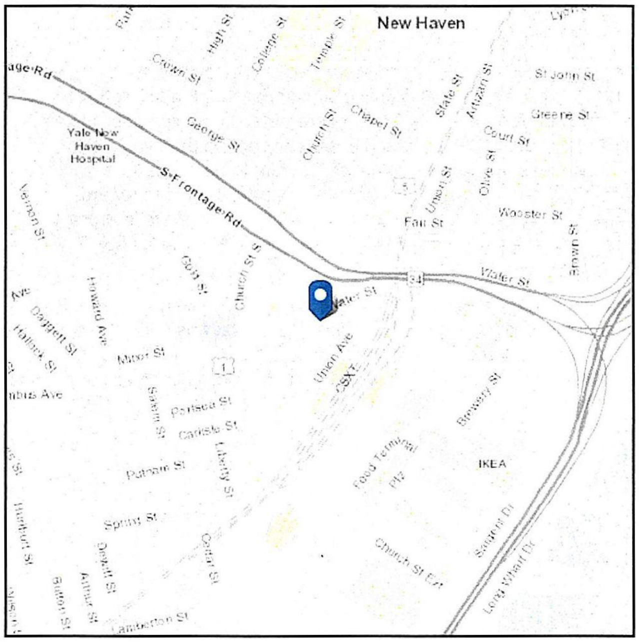
- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

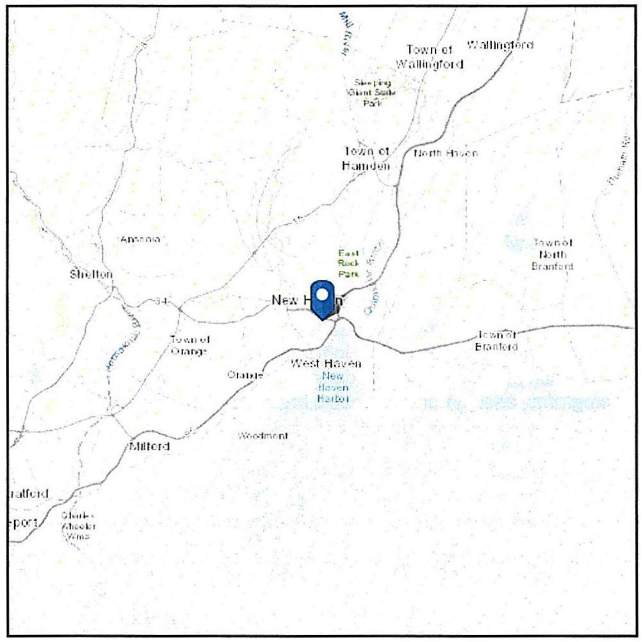
ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Latitude: 41.299819
Longitude: -72.926491
Elevation: 10.79639615913296 ft (NAVD 88)





Wind

Results:

Wind Speed	120 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	91 Vmph
100-year MRI	99 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed Oct 23 2024

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

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

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

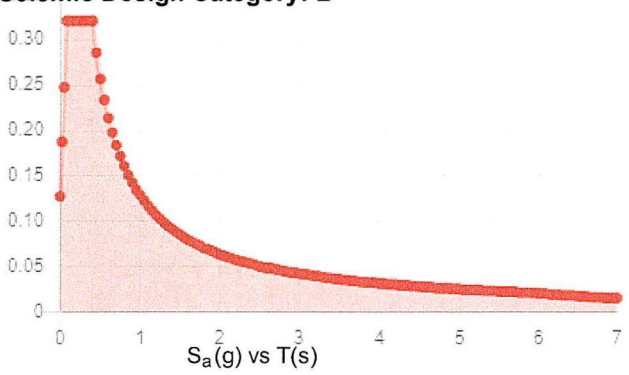
Site Soil Class: D - Stiff Soil

Results:

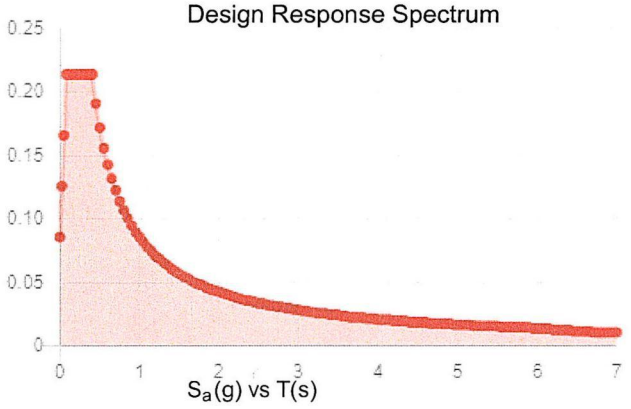
S_S :	0.201	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.112
F_v :	2.4	PGA_M :	0.177
S_{MS} :	0.321	F_{PGA} :	1.576
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.214	C_v :	0.701

Seismic Design Category: B

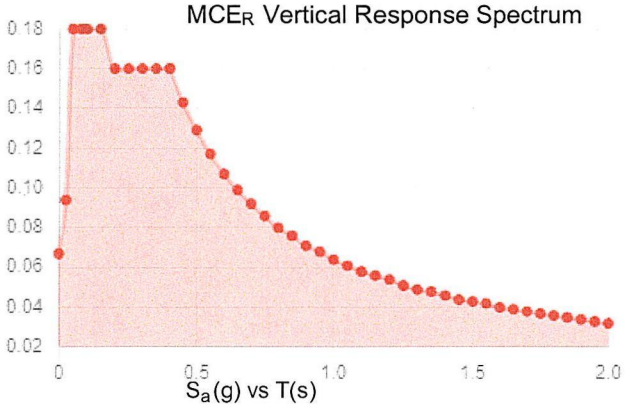
MCE$_R$ Response Spectrum



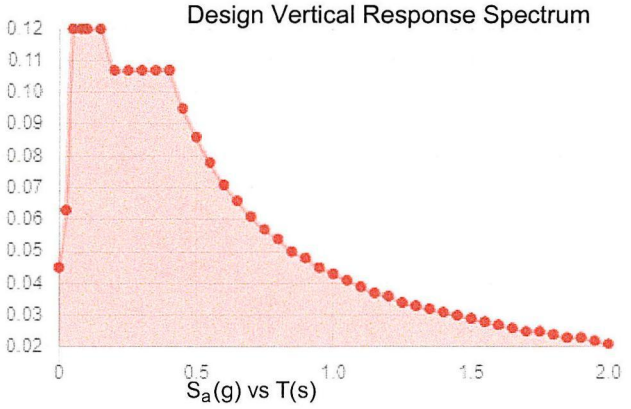
Design Response Spectrum



MCE$_R$ Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: **Wed Oct 23 2024**

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.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Oct 23 2024

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

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

ATTACHMENT 5


54 MEADOW ST #1
Show search results for 54 ME
De Diego Ct
238 0109 00200
1.37Ac.
78
West Water St
Meadow St
238 0107 00100
1.35Ac.
1
Union Ave
238 0110 00300
0.25Ac.
1
Little Green Ct
South Orange St
238 0110 00404
2.73Ac.
90
Little Green Ct
(1 of 10)
NH Parcels Web: 54-54 MEADOW ST
Vision PID: 103 735
MBLU:
Location: 54-54 MEADOW ST
Owner Name:
Owner Mailing Address:
Owner Mailing City:
Owner Mailing State:
Owner Mailing Zip:
Last Sale Date:
Last Sale Price:
Parcel Area
Zoom to
0Ac.
54-54
238 0110 00200
1.46Ac.
86
South Orange St
Union Ave
237 1300 00200
7.33Ac.
170
0110 00100
Ac.
Columbus Ave
238 0086 00400
0.77Ac.
49
238 0086 00300
1.66Ac.

New Haven, CT

VISION
GOVERNMENT SOLUTIONS

54 MEADOW ST

Sales | Print | Map It

Location	54 MEADOW ST	**Mblu**	238/ 0106/ 00112/ /
Acct#	238 0106 00112	**Owner**	GATEWAY PARTNERS LLC
Assessment	$231,000	**Appraisal**	$330,000
PID	105992	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$330,000	$0	$330,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$231,000	$0	$231,000

Owner of Record

Owner	GATEWAY PARTNERS LLC	**Sale Price**	$0
Co-Owner	C/O LEXINGTON PROPERTY MGT	**Certificate**	
Address	755 MAIN ST STE 1245 HARTFORD, CT 06103	**Book & Page**	6973/0194
		Sale Date	10/18/2004
		Instrument	

ATTACHMENT 6

Verizon/New Haven

UNITED STATES POSTAL SERVICE®

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Kenneth C. Baldwin, Esq. Robinson & Cole LLP One State Street Hartford, CT 06103	4	4	quadient CORRECTION IMI $003.80 11/06/2024 ZIP 06103 043M32206619 US POSTAGE

Postmaster, per *(name of receiving employee)*

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NOV - 6 2024
USPS

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1.	Justin Elicker, Mayor City of New Haven 165 Church Street New Haven, CT 06510				
2.	Laura Brown, Director of City Plan City of New Haven 165 Church Street New Haven, CT 06510				
3.	Gateway Partners, LLC c/o Lexington Property Management 30 Lewis Street Hartford, CT 06103				
4.	MCM Holdings, LLC 40 Woodland Street Hartford, CT 06105				
5.					
6.					