Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Floor 3
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

November 8, 2019

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

**RE: Notice of Exempt Modification // Site: Cheshire North CT (ATC: 370624)**
**1338 Highland Ave, Cheshire, CT 06410**
**N 41.5369 // W 72.8933**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless currently maintains 12 antennas at the 70-foot level on the existing 78-foot concealed silo tower, located at 1338 Highland Ave, Cheshire, CT. The Council approved Verizon Wireless use of the existing silo tower in 2016. The tower is owned by American Tower. The property is owned by MUDDDM, LLC. Verizon Wireless now intends to remove 9 of its existing remote radio units (RRUs) to replace with 6 for the LTE (700/850/1900/2100 MHz) replacements for its AWS/PCS/LTE upgrade. Additionally, Verizon Wireless will remove 1 over-voltage protector (OVP) and remove and upgrade certain cabling; altogether updating leased equipment rights, as reflected by the final configuration outlined in the structural analysis and proposed hereby.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §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 Town of Portland's chief elected official, Town of Cheshire's Town Council Chairman, Rob Oris, Jr., its Town Planner, William S. Voelker, AICP, ground owner MUDDDM, LLC, as well as American Tower, which is the tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2). Enclosed to accommodate this filing are construction drawings dated October 30, 2019, structural analysis dated September 27, 2019 and antenna mount analysis dated October 10, 2019 by A.T. Engineering Service, PLLC, as well as radio

frequency (RF) analysis table showing worst-case RF emission calculation by Verizon Wireless RF Design Engineering.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications 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 operation of the new antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading, as shown in the attached structural and mount analyses by A.T. Engineering Service, PLLC, dated September 27 and October 10, 2019, respectively.

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

Sincerely,

Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Floor 3
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

Attachments

cc: Town Council Chairman, Attn: Ron Otis, Jr. - as elected official
William Voelker, Town Planner - as P&Z official
MUDDDM, LLC - as ground owner
American Tower Corporation - as tower owner

**UPS CampusShip: View/Print Label**

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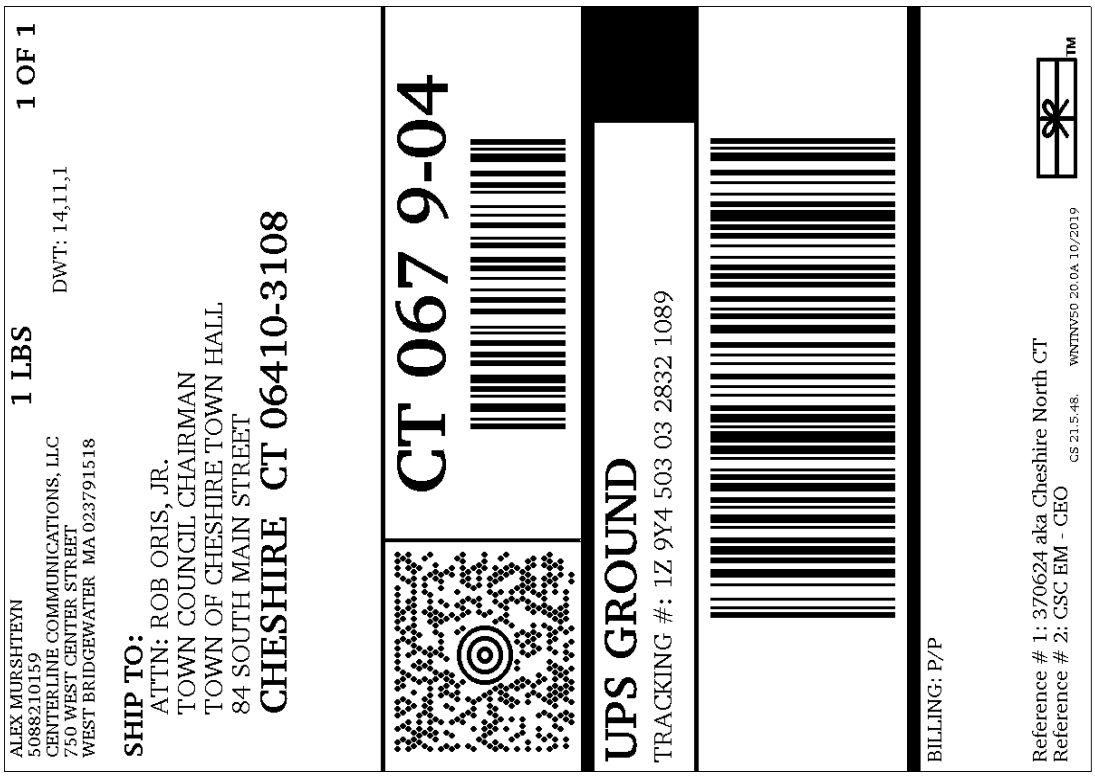

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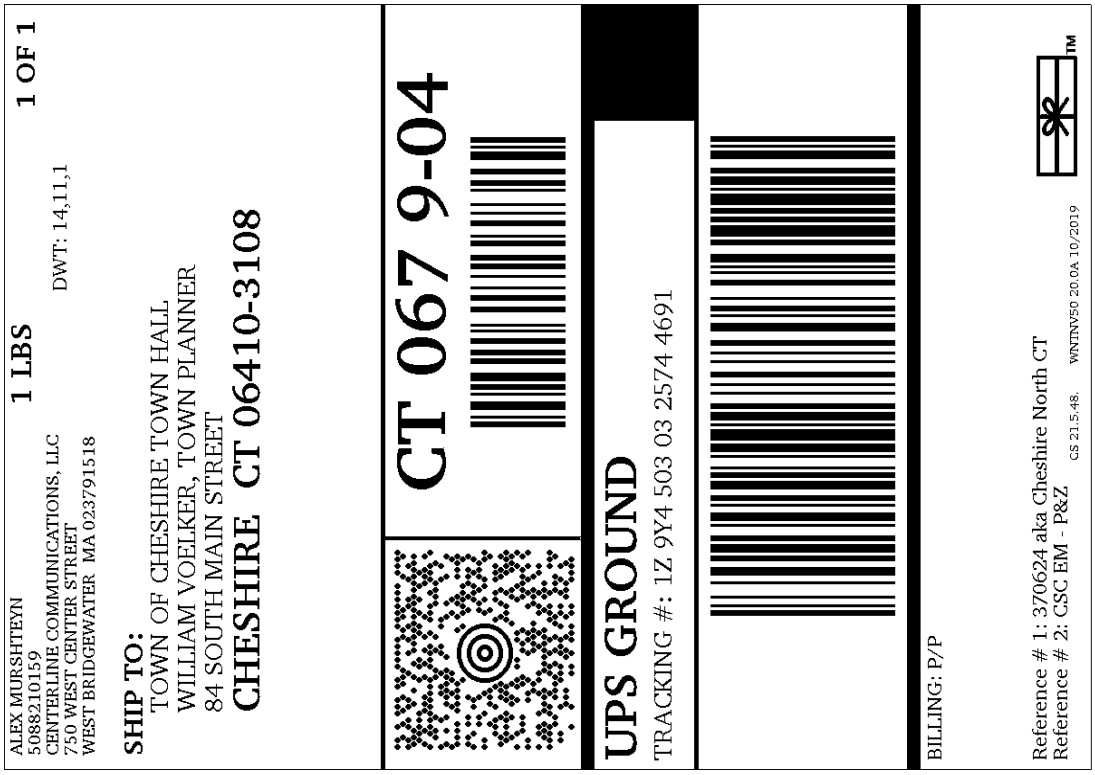

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# TOWN OF CHESHIRE

**Planning & Zoning Commission**
**84 South Main Street**
**Cheshire, Connecticut 06410**
**203-271-6670 • Fax 203-271-6664**

CERTIFIED MAIL

December 3, 1999

Springwich Cellular Limited Partnership
c/o Keith Coppins
500 Enterprise Drive -Suite 3A
Rocky Hill, CT 06067

RE: Site Plan Application MAD 12/28/99
Springwich Cellular Limited Partnership
1338 Highland Avenue
To Install a cellular antennae and placement of an Equipment cabinet

Dear Mr. Coppins:

At the regular meeting of the Planning and Zoning Commission held on November 22, 1999, the following motion was unanimously approved:

MOTION: That the Zoning Committee recommends that the Planning and Zoning Commission approve the site plan application of Springwich Cellular Limited Partnership for a cellular antennae and equipment cabinet for property located at 1338 Highland Avenue, in an I-2 zone, as shown on the current Assessor's Map No. 28, Lot No. 15, and shown on the following plans entitled:

SNET Mobility Inc., 1338 Highland Avenue
Cheshire, CT., Springwich Cellular Site, Cheshire-
Tower Farms, October 15, 1999 sheets T-1, C-1, and C-2

With the following stipulation:

1. The applicant shall comply with comments in a memo from the Police Department dated November 4, 1999 and attached hereto.

Moved by Mrs. Mouris, seconded by Mr. Gaudio and unanimously approved.

Very truly yours,

William C. Freitag

William C. Freitag, Secretary
Cheshire Planning and Zoning Commission

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# Structural Analysis Report

| | | |
|---|---|---|
| **Structure** | : | **78 ft Concealed Silo Tower** |
| **ATC Site Name** | : | **Mankes Silo, CT** |
| **ATC Asset Number** | : | **370624** |
| **Engineering Number** | : | **12984006_C3_03** |
| **Proposed Carrier** | : | **Verizon Wireless** |
| **Carrier Site Name** | : | **Cheshire North CT** |
| **Carrier Site Number** | : | **467326** |
| **Site Location** | : | **1338 Highland Ave**<br>**Cheshire, CT 06410-0000**<br>**41.536900,-72.893300** |
| **County** | : | **New Haven** |
| **Date** | : | **September 27, 2019** |
| **Max Usage** | : | **63%** |
| **Result** | : | **Pass** |

Prepared By:
Matthew Reeves, CWI
Structural Engineer III

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32595
LICENSED
PROFESSIONAL ENGINEER

Authorized by "EOR"
Sep 27 2019 5:24 PM cosign

**COA: PEC.0001553**

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## Table of Contents

## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 78 ft concealed silo tower to reflect the change in loading by Verizon Wireless.

## Supporting Documents

| | |
|---|---|
| **Tower Drawings** | Structural Components Mapping Job #140862, dated October 17, 2014 |
| **Foundation Drawing** | Structural Components Mapping Job #140862, dated October 17, 2014 |

## Analysis

The tower was analyzed using RISA 3D v.17.0.4 analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

| | |
|---|---|
| **Basic Wind Speed:** | 97 mph (3-second gust, $V_{ASD}$)/125 mph (3-second gust, $V_{ULT}$) |
| **Basic Wind Speed w/ Ice:** | 50 mph (3-Second Gust) w/ 3/4" radial ice concurrent |
| **Code:** | ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code |
| **Structure Class:** | II |
| **Exposure Category:** | B |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Spectral Response:** | $S_S = 0.19$, $S_1 = 0.06$ |
| **Site Class:** | D - Stiff Soil |

## Conclusion

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

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing and Reserved Equipment**

| Elev.[1] (ft) | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|
| 70.0 | 12 | Commscope SBNHH-1D65B (40.6 lbs) | Sector Frame | (1) 1 5/8" Hybriflex | VERIZON WIRELESS |
| | 1 | RFS DB-T1-6Z-8AB-0Z | | | |
| 57.0 | 3 | Ericsson AIR 21, 1.3M, B4A B2P (90.4 lbs) | Sector Frame | (1) 1 1/4" Hybriflex Cable<br>(6) 1 5/8" Coax<br>(7) 1 5/8" Hybriflex<br>(2) 1" (25.4mm) Hybrid | METRO PCS INC |
| | 3 | Ericsson AIR 21, 1.3M, B2A B4P (91.5 lbs) | | | |
| 54.0 | 2 | Kathrein Scala 80010966 | Sector Frame | (2) 0.39" (10mm) Fiber Trunk<br>(4) 0.78" (19.7mm) 8 AWG 6<br>(12) 1 5/8" Coax<br>(6) 1/2" Coax<br>(1) 3" conduit<br>(1) 3/8" (0.38"-9.5mm) RET Control Cable | AT&T MOBILITY |
| | 3 | Ericsson Radio 4415 B30 | | | |
| | 3 | Ericsson RRUS 4449 B5, B12 | | | |
| | 3 | Ericsson RRUS 12 w/ RRUS A2 | | | |
| | 3 | KMW AM-X-CD-16-65-00T-RET | | | |
| | 2 | CCI HPA-65R-BUU-H6 | | | |
| | 1 | CCI HPA-65R-BUU-H8 | | | |
| | 1 | Kathrein Scala 80010965 | | | |
| | 6 | Powerwave Allgon LGP21401 | | | |
| | 3 | CCI DTMABP7819VG12A | | | |
| | 6 | Powerwave Allgon LGP21901 | | | |
| | 6 | Kathrein Scala 860 10025 | | | |
| | 2 | Raycap DC6-48-60-18-8F ("Squid") | | | |

**Equipment to be Removed**

| Elev.[1] (ft) | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|
| 70.0 | 3 | Alcatel-Lucent RRH2X60-1900 | - | - | VERIZON WIRELESS |
| | 1 | RFS DB-T1-6Z-8AB-0Z | | | |
| | 3 | Alcatel-Lucent RRH2x60 700 | | | |
| | 3 | Alcatel-Lucent RRH2X60-AWS | | | |

**Proposed Equipment**

| Elev.[1] (ft) | Qty | Antenna | Mount Type | Lines | Carrier |
|---|---|---|---|---|---|
| 70.0 | 3 | Samsung B2/B66A RRH-BR049 | Sector Frame | - | VERIZON WIRELESS |
| | 3 | Samsung B5/B13 RRH-BR04C | | | |

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the silo shaft.

## Structure Usages

| Structural Component | Controlling Usage | Pass/Fail |
|---|---|---|
| Legs | 3% | Pass |
| Diagonals | 4% | Pass |
| Horizontals | 19% | Pass |
| Concrete | 35% | Pass |

## Foundations

| Reaction Component | Analysis Reactions | % of Usage |
|---|---|---|
| Moment (Kips-Ft) | 2030 | 42% |
| Axial (Kips) | 488 | 63% |
| Shear (Kips) | 50 | 37% |

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

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## Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

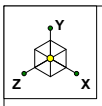
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

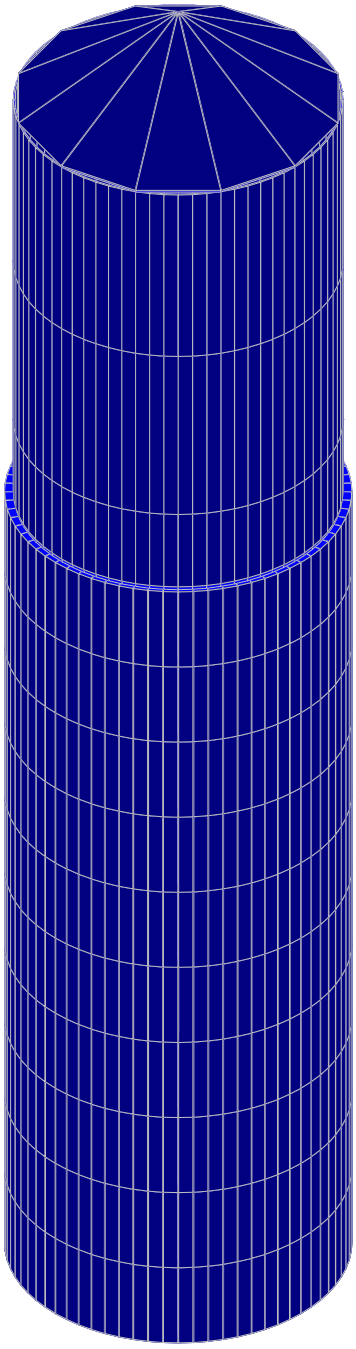
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

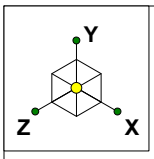
Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

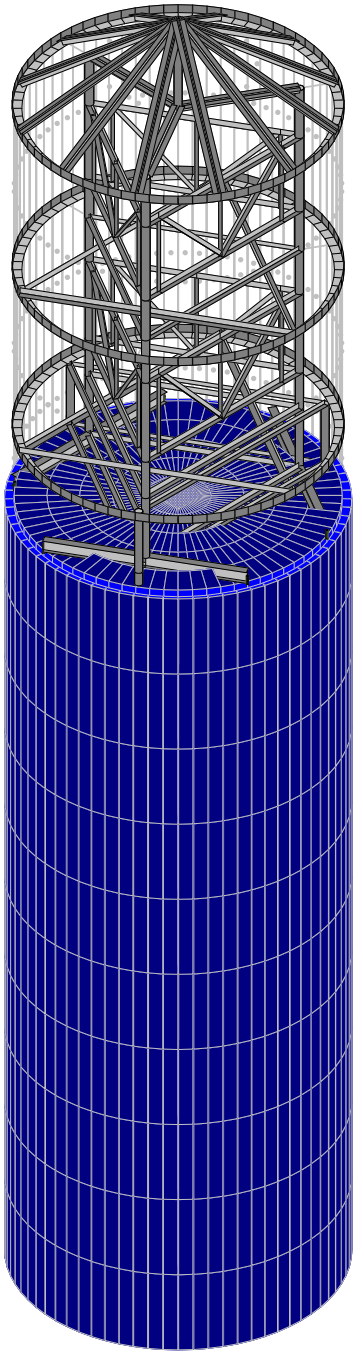
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



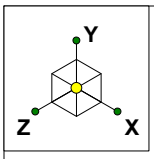



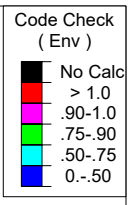
| | | |
|---|---|---|
| ATC | | SK - 1 |
| MER | Mankes Silo, CT | Sept 27, 2019 at 9:43 AM |
| 370624 - 12984006_C3_03 | ELEVATION | Verizon Wireless@ 370624 Manke... |

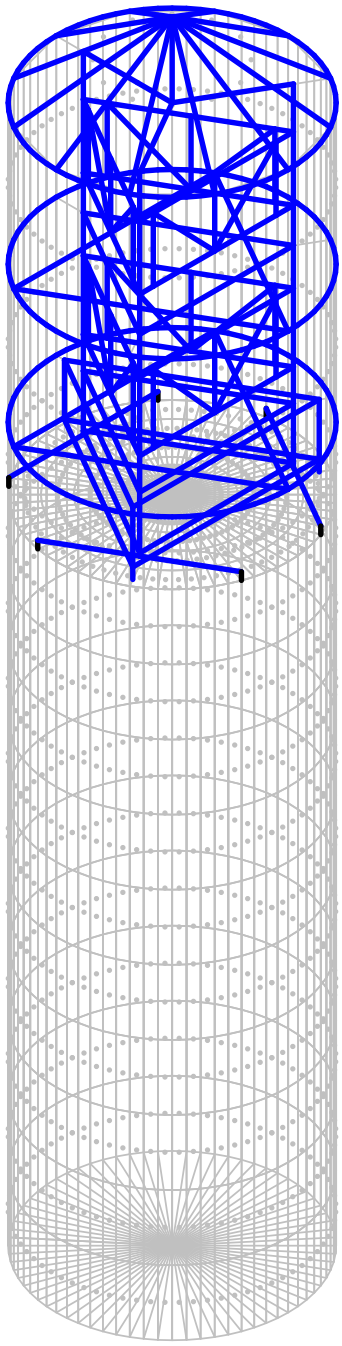


| | | |
|---|---|---|
| ATC | | SK - 2 |
| MER | Mankes Silo, CT | Sept 27, 2019 at 9:44 AM |
| 370624 - 12984006_C3_03 | ELEVATION | Verizon Wireless@ 370624 Manke... |



| | | |
|---|---|---|
| ATC | | SK - 3 |
| MER | Mankes Silo, CT | Sept 27, 2019 at 9:45 AM |
| 370624 - 12984006_C3_03 | MEMBER USAGE | Verizon Wireless@ 370624 Manke... |

## (Global) Model Settings

| | |
|---|---|
| Display Sections for Member Calcs | 5 |
| Max Internal Sections for Member Calcs | 97 |
| Include Shear Deformation? | Yes |
| Increase Nailing Capacity for Wind? | Yes |
| Include Warping? | Yes |
| Trans Load Btwn Intersecting Wood Wall? | Yes |
| Area Load Mesh (in^2) | 144 |
| Merge Tolerance (in) | .12 |
| P-Delta Analysis Tolerance | 0.50% |
| Include P-Delta for Walls? | Yes |
| Automatically Iterate Stiffness for Walls? | Yes |
| Max Iterations for Wall Stiffness | 3 |
| Gravity Acceleration (ft/sec^2) | 32.2 |
| Wall Mesh Size (in) | 12 |
| Eigensolution Convergence Tol. (1.E-) | 4 |
| Vertical Axis | Y |
| Global Member Orientation Plane | XZ |
| Static Solver | Sparse Accelerated |
| Dynamic Solver | Accelerated Solver |

| | |
|---|---|
| Hot Rolled Steel Code | AISC 13th(360-05): LRFD |
| Adjust Stiffness? | No |
| RISAConnection Code | AISC 13th(360-05): LRFD |
| Cold Formed Steel Code | AISI S100-12: LRFD |
| Wood Code | AWC NDS-12: ASD |
| Wood Temperature | < 100F |
| Concrete Code | ACI 318-11 |
| Masonry Code | ACI 530-11: Strength |
| Aluminum Code | AA ADM1-10: ASD - Building |
| Stainless Steel Code | AISC 14th(360-10): ASD |
| Adjust Stiffness? | Yes(Iterative) |

| | |
|---|---|
| Number of Shear Regions | 4 |
| Region Spacing Increment (in) | 4 |
| Biaxial Column Method | Exact Integration |
| Parme Beta Factor (PCA) | .65 |
| Concrete Stress Block | Rectangular |
| Use Cracked Sections? | Yes |
| Use Cracked Sections Slab? | No |
| Bad Framing Warnings? | No |
| Unused Force Warnings? | Yes |
| Min 1 Bar Diam. Spacing? | No |
| Concrete Rebar Set | REBAR_SET_ASTMA615 |
| Min % Steel for Column | 1 |
| Max % Steel for Column | 8 |





## (Global) Model Settings, Continued

| | |
|---|---|
| Seismic Code | ASCE 7-05 |
| Seismic Base Elevation (ft) | Not Entered |
| Add Base Weight? | Yes |
| Ct X | .02 |
| Ct Z | .02 |
| T X (sec) | .111 |
| T Z (sec) | .111 |
| R X | 3 |
| R Z | 3 |
| Ct Exp. X | .75 |
| Ct Exp. Z | .75 |
| SD1 | .101 |
| SDS | .198 |
| S1 | .063 |
| TL (sec) | 6 |
| Occupancy Cat | I or II |
| Drift Cat | Other |
| Om Z | 1 |
| Om X | 1 |
| Cd Z | 4 |
| Cd X | 4 |
| Rho Z | 1 |
| Rho X | 1 |
| | |

## Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design Rules | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | H1 | W8X18 | Beam | Wide Fla... | A992 | Typical | 5.26 | 7.97 | 61.9 | .172 |
| 2 | H2 | L3X3X4 | Beam | Single A... | A36 Gr.36 | Typical | 1.44 | 1.23 | 1.23 | .031 |
| 3 | H3 | L4X3X4 | Beam | Single A... | A36 Gr.36 | Typical | 1.69 | 1.33 | 2.75 | .039 |
| 4 | H4 | LL4x4x4x3 | Beam | Double A... | A36 Gr.36 | Typical | 3.86 | 12.2 | 6 | .088 |
| 5 | H5 | L4X4X4 | Beam | Single A... | A36 Gr.36 | Typical | 1.93 | 3 | 3 | .044 |
| 6 | H6 | L6X6X5 | Beam | Single A... | A36 Gr.36 | Typical | 3.67 | 13 | 13 | .129 |
| 7 | Column1 | HSS5x0.500 | Beam | HSS Pipe | A36 Gr.36 | Typical | 6.62 | 17.2 | 17.2 | 34.4 |
| 8 | Column2 | HSS5.563X0.375 | Beam | HSS Pipe | A36 Gr.36 | Typical | 5.72 | 19.5 | 19.5 | 39 |
| 9 | V1 | L3X3X4 | Beam | Single A... | A36 Gr.36 | Typical | 1.44 | 1.23 | 1.23 | .031 |

## Basic Load Cases

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distribu... | Area(M... | Surface... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dead | DL | | -1 | | 16 | | | | |
| 8 | Earthquake Load Z | ELZ | | | | 8 | | | | |
| 9 | Earthquake Load X | ELX | | | | 8 | | | | |
| 10 | Earthquake Load Z Plus X Eccentr | ELZ+X | | | | 8 | | | | |
| 11 | Earthquake Load Z Minus X Eccent | ELZ-X | | | | 8 | | | | |
| 12 | Earthquake Load X Plus Z Eccentr | ELX+Z | | | | 8 | | | | |
| 13 | Earthquake Load X Minus Z Eccent | ELX-Z | | | | 8 | | | | |
| 14 | Wind Load Z | WLZ | | | | 8 | | | | |
| 15 | Wind Load X | WLX | | | | 8 | | | | |
| 16 | Partial Z Wind Load 1 | WLZP1 | | | | 8 | | | | |
| 17 | Partial Z Wind Load 2 | WLZP2 | | | | 8 | | | | |
| 18 | Partial X Wind Load 1 | WLXP1 | | | | 8 | | | | |
| 19 | Partial X Wind Load 2 | WLXP2 | | | | 8 | | | | |

## Load Combinations

| | Description | S... | P... | S... | B... | Fa... | BLC | Fa... | BLC | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.0D | | Y | | DL | 1 | | | | | | | | | | | | | | | | | | |
| 2 | 1.4D | Yes | Y | | DL | 1.4 | | | | | | | | | | | | | | | | | | |
| 3 | 1.2D + 1.6W AZI 000 | Yes | Y | | DL | 1.2 | WLX | 1.6 | | | | | | | | | | | | | | | | |
| 4 | 1.2D + 1.6W AZI 090 | Yes | Y | | DL | 1.2 | WLZ | 1.6 | | | | | | | | | | | | | | | | |
| 5 | IBC 16-5 (a) | Yes | Y | | DL | 1.2 | Sds*... | .2 | Rho*... | 1 | LL | .5 | LLS | 1 | | | | | | | | | | |
| 6 | IBC 16-5 (b) | Yes | Y | | DL | 1.2 | Sds*... | .2 | Rho*... | 1 | LL | .5 | LLS | 1 | | | | | | | | | | |
| 7 | IBC 16-5 (c) | Yes | Y | | DL | 1.2 | Sds*... | .2 | Rho*... | 1 | LL | .5 | LLS | 1 | | | | | | | | | | |
| 8 | IBC 16-5 (d) | Yes | Y | | DL | 1.2 | Sds*... | .2 | Rho*... | 1 | LL | .5 | LLS | 1 | | | | | | | | | | |
| 9 | IBC 16-5 (e) | Yes | Y | | DL | 1.2 | Sds*... | .2 | Rho*... | 1 | LL | .5 | LLS | 1 | | | | | | | | | | |
| 10 | IBC 16-5 (f) | Yes | Y | | DL | 1.2 | Sds*... | .2 | Rho*... | 1 | LL | .5 | LLS | 1 | | | | | | | | | | |
| 11 | IBC 16-7 (a) | Yes | Y | | DL | .9 | Sds*... | -.2 | Rho*... | 1 | | | | | | | | | | | | | | |
| 12 | IBC 16-7 (b) | Yes | Y | | DL | .9 | Sds*... | -.2 | Rho*... | 1 | | | | | | | | | | | | | | |
| 13 | IBC 16-7 (c) | Yes | Y | | DL | .9 | Sds*... | -.2 | Rho*... | 1 | | | | | | | | | | | | | | |
| 14 | IBC 16-7 (d) | Yes | Y | | DL | .9 | Sds*... | -.2 | Rho*... | 1 | | | | | | | | | | | | | | |
| 15 | IBC 16-7 (e) | Yes | Y | | DL | .9 | Sds*... | -.2 | Rho*... | 1 | | | | | | | | | | | | | | |
| 16 | IBC 16-7 (f) | Yes | Y | | DL | .9 | Sds*... | -.2 | Rho*... | 1 | | | | | | | | | | | | | | |
| 17 | DEFL | | Y | | DL | 1.2 | WLX | .352 | | | | | | | | | | | | | | | | |

## Joint Loads and Enforced Displacements (BLC 1 : Dead)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1485 | L | Y | -.221 |
| 2 | N1486 | L | Y | -.221 |
| 3 | N1487 | L | Y | -.221 |
| 4 | N1488 | L | Y | -.221 |
| 5 | N1489 | L | Y | -.221 |
| 6 | N1490 | L | Y | -.221 |
| 7 | N1491 | L | Y | -.221 |
| 8 | N1492 | L | Y | -.221 |
| 9 | N1493 | L | Y | -.221 |
| 10 | N1656 | L | Y | -.111 |
| 11 | N1658 | L | Y | -.111 |
| 12 | N1659 | L | Y | -.111 |
| 13 | N1661 | L | Y | -.111 |
| 14 | N1662 | L | Y | -.111 |
| 15 | N1664 | L | Y | -.111 |
| 16 | N1642 | L | Y | -2.156 |

## Joint Loads and Enforced Displacements (BLC 8 : Earthquake Load Z)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1778 | L | Z | 1.811 |
| 2 | N1779 | L | Z | 1.123 |
| 3 | N1740 | L | Z | .628 |
| 4 | N1261 | L | Z | 6.094 |
| 5 | N1741 | L | Z | 6.881 |
| 6 | N1742 | L | Z | 5.16 |
| 7 | N1743 | L | Z | 3.44 |
| 8 | N1744 | L | Z | 1.72 |

## Joint Loads and Enforced Displacements (BLC 9 : Earthquake Load X)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1778 | L | X | 1.811 |
| 2 | N1779 | L | X | 1.123 |
| 3 | N1740 | L | X | .628 |





## Joint Loads and Enforced Displacements (BLC 9 : Earthquake Load X) (Continued)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 4 | N1261 | L | X | 6.094 |
| 5 | N1741 | L | X | 6.881 |
| 6 | N1742 | L | X | 5.16 |
| 7 | N1743 | L | X | 3.44 |
| 8 | N1744 | L | X | 1.72 |

## Joint Loads and Enforced Displacements (BLC 10 : Earthquake Load Z Plus X Eccentr)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1780 | L | Z | 1.811 |
| 2 | N1781 | L | Z | 1.123 |
| 3 | N1782 | L | Z | .628 |
| 4 | N1090 | L | Z | 6.094 |
| 5 | N1783 | L | Z | 6.881 |
| 6 | N1784 | L | Z | 5.16 |
| 7 | N1785 | L | Z | 3.44 |
| 8 | N1786 | L | Z | 1.72 |

## Joint Loads and Enforced Displacements (BLC 11 : Earthquake Load Z Minus X Eccent)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1787 | L | Z | 1.811 |
| 2 | N1788 | L | Z | 1.123 |
| 3 | N1789 | L | Z | .628 |
| 4 | N1432 | L | Z | 6.094 |
| 5 | N1790 | L | Z | 6.881 |
| 6 | N1791 | L | Z | 5.16 |
| 7 | N1792 | L | Z | 3.44 |
| 8 | N1793 | L | Z | 1.72 |

## Joint Loads and Enforced Displacements (BLC 12 : Earthquake Load X Plus Z Eccentr)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1794 | L | X | 1.811 |
| 2 | N1795 | L | X | 1.123 |
| 3 | N1796 | L | X | .628 |
| 4 | N1270 | L | X | 6.094 |
| 5 | N1797 | L | X | 6.881 |
| 6 | N1798 | L | X | 5.16 |
| 7 | N1799 | L | X | 3.44 |
| 8 | N1800 | L | X | 1.72 |

## Joint Loads and Enforced Displacements (BLC 13 : Earthquake Load X Minus Z Eccent)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1801 | L | X | 1.811 |
| 2 | N1802 | L | X | 1.123 |
| 3 | N1803 | L | X | .628 |
| 4 | N1252 | L | X | 6.094 |
| 5 | N1804 | L | X | 6.881 |
| 6 | N1805 | L | X | 5.16 |
| 7 | N1806 | L | X | 3.44 |
| 8 | N1807 | L | X | 1.72 |

## Joint Loads and Enforced Displacements (BLC 14 : Wind Load Z)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1665 | L | Z | 2.606 |
| 2 | N1775 | L | Z | 5.056 |

## Joint Loads and Enforced Displacements (BLC 14 : Wind Load Z) (Continued)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 3 | N1740 | L | Z | 3.566 |
| 4 | N1261 | L | Z | 3.405 |
| 5 | N1741 | L | Z | 4.47 |
| 6 | N1742 | L | Z | 4.317 |
| 7 | N1743 | L | Z | 4.116 |
| 8 | N1744 | L | Z | 4.005 |

## Joint Loads and Enforced Displacements (BLC 15 : Wind Load X)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1665 | L | X | 2.606 |
| 2 | N1775 | L | X | 5.056 |
| 3 | N1740 | L | X | 3.566 |
| 4 | N1261 | L | X | 3.405 |
| 5 | N1741 | L | X | 4.47 |
| 6 | N1742 | L | X | 4.317 |
| 7 | N1743 | L | X | 4.116 |
| 8 | N1744 | L | X | 4.005 |

## Joint Loads and Enforced Displacements (BLC 16 : Partial Z Wind Load 1)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1776 | L | Z | 1.954 |
| 2 | N1777A | L | Z | 3.792 |
| 3 | N1778A | L | Z | 2.674 |
| 4 | N1779A | L | Z | 2.554 |
| 5 | N1780A | L | Z | 3.353 |
| 6 | N1781A | L | Z | 3.238 |
| 7 | N1782A | L | Z | 3.087 |
| 8 | N1783A | L | Z | 3.004 |

## Joint Loads and Enforced Displacements (BLC 17 : Partial Z Wind Load 2)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1784A | L | Z | 1.954 |
| 2 | N1785A | L | Z | 3.792 |
| 3 | N1786A | L | Z | 2.674 |
| 4 | N1787A | L | Z | 2.554 |
| 5 | N1788A | L | Z | 3.353 |
| 6 | N1789A | L | Z | 3.238 |
| 7 | N1790A | L | Z | 3.087 |
| 8 | N1791A | L | Z | 3.004 |

## Joint Loads and Enforced Displacements (BLC 18 : Partial X Wind Load 1)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1792A | L | X | 1.954 |
| 2 | N1793A | L | X | 3.792 |
| 3 | N1794A | L | X | 2.674 |
| 4 | N1795A | L | X | 2.554 |
| 5 | N1796A | L | X | 3.353 |
| 6 | N1797A | L | X | 3.238 |
| 7 | N1798A | L | X | 3.087 |
| 8 | N1799A | L | X | 3.004 |

## Joint Loads and Enforced Displacements (BLC 19 : Partial X Wind Load 2)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 1 | N1800A | L | X | 1.954 |



Company : ATC
Designer : MER
Job Number : 370624 - 12984006_C3_03
Model Name : Mankes Silo, CT

Sept 27, 2019
9:54 AM
Checked By:_____

## Joint Loads and Enforced Displacements (BLC 19 : Partial X Wind Load 2) (Continued)

| | Joint Label | L,D,M | Direction | Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)] |
|---|---|---|---|---|
| 2 | N1801A | L | X | 3.792 |
| 3 | N1802A | L | X | 2.674 |
| 4 | N1803A | L | X | 2.554 |
| 5 | N1804A | L | X | 3.353 |
| 6 | N1805A | L | X | 3.238 |
| 7 | N1806A | L | X | 3.087 |
| 8 | N1807A | L | X | 3.004 |

## Envelope AISC 13th(360-05): LRFD Steel Code Checks

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M64 | L4X3X4 | .187 | 0 | 2 | .008 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.093 | H2-1 |
| 2 | M61 | L4X3X4 | .187 | 0 | 2 | .008 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.094 | H2-1 |
| 3 | M50 | L4X3X4 | .184 | 1 | 2 | .021 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.662 | H2-1 |
| 4 | M67 | L4X3X4 | .182 | 0 | 2 | .007 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.094 | H2-1 |
| 5 | M49 | L4X3X4 | .180 | 1 | 2 | .021 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.662 | H2-1 |
| 6 | M55 | L4X3X4 | .179 | 0 | 2 | .008 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.676 | 2.092 | H2-1 |
| 7 | M51 | L4X3X4 | .178 | 1 | 2 | .020 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.662 | H2-1 |
| 8 | M47 | L4X3X4 | .176 | 1 | 2 | .020 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.662 | H2-1 |
| 9 | M52 | L4X3X4 | .175 | 0 | 2 | .008 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.676 | 2.092 | H2-1 |
| 10 | M58 | L4X3X4 | .173 | 0 | 2 | .008 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.093 | H2-1 |
| 11 | M46 | L4X3X4 | .172 | 1 | 2 | .020 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.662 | H2-1 |
| 12 | M48 | L4X3X4 | .170 | 1 | 2 | .020 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.662 | H2-1 |
| 13 | M68 | L4X3X4 | .165 | 4.5 | 2 | .007 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.678 | 2.095 | H2-1 |
| 14 | M62 | L4X3X4 | .164 | 4.5 | 2 | .007 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.678 | 2.095 | H2-1 |
| 15 | M65 | L4X3X4 | .158 | 4.5 | 2 | .007 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.678 | 2.095 | H2-1 |
| 16 | M69 | L4X3X4 | .158 | 0 | 2 | .015 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.658 | H2-1 |
| 17 | M59 | L4X3X4 | .156 | 4.5 | 2 | .007 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.094 | H2-1 |
| 18 | M60 | L4X3X4 | .154 | 0 | 2 | .014 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.658 | H2-1 |
| 19 | M63 | L4X3X4 | .153 | 0 | 2 | .014 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.658 | H2-1 |
| 20 | M53 | L4X3X4 | .153 | 4.5 | 2 | .007 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.093 | H2-1 |
| 21 | M54 | L4X3X4 | .151 | 0 | 2 | .014 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 22 | M66 | L4X3X4 | .150 | 0 | 2 | .014 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 23 | M56 | L4X3X4 | .150 | 4.5 | 2 | .007 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.677 | 2.094 | H2-1 |
| 24 | M57 | L4X3X4 | .148 | 0 | 2 | .014 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 25 | M34 | L3X3X4 | .121 | 6.8... | 2 | .003 | 13.... | y | 2 | 4.137 | 46.656 | 1.688 | 2.46 | 1.136 | H2-1 |
| 26 | M36 | L3X3X4 | .119 | 6.8... | 2 | .003 | 0 | y | 2 | 9.792 | 46.656 | 1.688 | 2.46 | 1.136 | H2-1 |
| 27 | M35 | L3X3X4 | .119 | 6.8... | 2 | .003 | 0 | y | 2 | 9.792 | 46.656 | 1.688 | 2.46 | 1.136 | H2-1 |
| 28 | M37 | L3X3X4 | .113 | 6.8... | 2 | .003 | 13.... | y | 2 | 4.137 | 46.656 | 1.688 | 2.46 | 1.136 | H2-1 |
| 29 | M38 | L3X3X4 | .113 | 6.8... | 2 | .003 | 0 | y | 2 | 5.108 | 46.656 | 1.688 | 2.46 | 1.136 | H2-1 |
| 30 | M39 | L3X3X4 | .113 | 6.8... | 2 | .003 | 0 | y | 2 | 4.137 | 46.656 | 1.688 | 2.46 | 1.136 | H2-1 |
| 31 | M262 | L4X3X4 | .098 | 0 | 2 | .004 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.654 | 2.036 | H2-1 |
| 32 | M265 | L4X3X4 | .098 | 0 | 2 | .005 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.654 | 2.037 | H2-1 |
| 33 | M256 | L4X3X4 | .096 | 0 | 2 | .005 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.652 | 2.031 | H2-1 |
| 34 | M251 | L4X3X4 | .096 | 1 | 2 | .011 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 35 | M248 | L4X3X4 | .093 | 1 | 2 | .010 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 36 | M259 | L4X3X4 | .093 | 0 | 2 | .005 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.652 | 2.03 | H2-1 |
| 37 | M250 | L4X3X4 | .092 | 1 | 2 | .011 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 38 | M268 | L4X3X4 | .092 | 0 | 2 | .004 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.653 | 2.034 | H2-1 |
| 39 | M253 | L4X3X4 | .091 | 0 | 2 | .005 | 4.5 | y | 2 | 35.431 | 54.756 | 1.795 | 4.651 | 2.029 | H2-1 |
| 40 | M249 | L4X3X4 | .090 | 1 | 2 | .010 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 41 | M252 | L4X3X4 | .090 | 1 | 2 | .010 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 42 | M247 | L4X3X4 | .089 | 1 | 2 | .010 | 0 | y | 2 | 49.076 | 54.756 | 1.795 | 4.805 | 1.657 | H2-1 |
| 43 | M269 | L4X3X4 | .087 | 4.5 | 2 | .004 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.652 | 2.031 | H2-1 |
| 44 | M263 | L4X3X4 | .086 | 4.5 | 2 | .004 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.651 | 2.03 | H2-1 |
| 45 | M260 | L4X3X4 | .083 | 4.5 | 2 | .004 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.65 | 2.026 | H2-1 |

## Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | ... | ... | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | M270 | L4X3X4 | .082 | 0 | 2 | .008 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.65 | H2-1 |
| 47 | M261 | L4X3X4 | .081 | 0 | 2 | .008 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.649 | H2-1 |
| 48 | M264 | L4X3X4 | .081 | 0 | 2 | .008 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.649 | H2-1 |
| 49 | M266 | L4X3X4 | .080 | 4.5 | 2 | .004 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.65 | 2.026 | H2-1 |
| 50 | M257 | L4X3X4 | .078 | 4.5 | 2 | .004 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.648 | 2.022 | H2-1 |
| 51 | M254 | L4X3X4 | .078 | 4.5 | 2 | .004 | 0 | y | 2 | 35.431 | 54.756 | 1.795 | 4.648 | 2.022 | H2-1 |
| 52 | M255 | L4X3X4 | .076 | 0 | 2 | .007 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.648 | H2-1 |
| 53 | M258 | L4X3X4 | .076 | 0 | 2 | .007 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.648 | H2-1 |
| 54 | M267 | L4X3X4 | .076 | 0 | 2 | .007 | 1.2... | y | 2 | 48.553 | 54.756 | 1.795 | 4.805 | 1.648 | H2-1 |
| 55 | M162 | L3X3X4 | .075 | 5.6... | 2 | .003 | 0 | y | 2 | 6.078 | 46.656 | 1.688 | 2.675 | 1.136 | H2-1 |
| 56 | M160 | L3X3X4 | .075 | 5.6... | 2 | .003 | 0 | y | 2 | 6.078 | 46.656 | 1.688 | 2.675 | 1.136 | H2-1 |
| 57 | M161 | L3X3X4 | .075 | 5.6... | 2 | .003 | 0 | y | 2 | 6.078 | 46.656 | 1.688 | 2.675 | 1.136 | H2-1 |
| 58 | M41 | L4X3X4 | .071 | 5.6... | 2 | .002 | 0 | y | 2 | 8.511 | 54.756 | 1.795 | 3.13 | 1.136 | H2-1 |
| 59 | M42 | L4X3X4 | .071 | 5.6... | 2 | .002 | 0 | y | 2 | 8.511 | 54.756 | 1.795 | 3.13 | 1.136 | H2-1 |
| 60 | M40 | L4X3X4 | .070 | 5.6... | 2 | .002 | 0 | y | 2 | 10.508 | 54.756 | 1.795 | 3.13 | 1.136 | H2-1 |
| 61 | M45 | L4X3X4 | .070 | 5.6... | 2 | .002 | 0 | y | 2 | 8.511 | 54.756 | 1.795 | 3.13 | 1.136 | H2-1 |
| 62 | M43 | L4X3X4 | .070 | 5.6... | 2 | .002 | 0 | y | 2 | 8.511 | 54.756 | 1.795 | 3.13 | 1.136 | H2-1 |
| 63 | M44 | L4X3X4 | .070 | 5.6... | 2 | .002 | 0 | y | 2 | 8.511 | 54.756 | 1.795 | 3.13 | 1.136 | H2-1 |
| 64 | M163 | L4X4X4 | .059 | 14.... | 2 | .004 | 14.... | y | 2 | 8.564 | 62.532 | 3.138 | 5.696 | 2.395 | H2-1 |
| 65 | M165 | L4X4X4 | .059 | 0 | 2 | .004 | 0 | y | 2 | 8.564 | 62.532 | 3.138 | 5.695 | 2.394 | H2-1 |
| 66 | M85 | L4X4X4 | .059 | 0 | 2 | .004 | 0 | y | 2 | 8.564 | 62.532 | 3.138 | 5.685 | 2.379 | H2-1 |
| 67 | M87 | L4X4X4 | .059 | 14.... | 2 | .004 | 14.... | y | 2 | 8.564 | 62.532 | 3.138 | 5.685 | 2.379 | H2-1 |
| 68 | M164 | L4X4X4 | .058 | 14.... | 2 | .003 | 14.... | y | 2 | 8.564 | 62.532 | 3.138 | 5.718 | 2.429 | H2-1 |
| 69 | M86 | L4X4X4 | .058 | 0 | 2 | .003 | 0 | y | 2 | 8.564 | 62.532 | 3.138 | 5.612 | 2.271 | H2-1 |
| 70 | M81 | L3X3X4 | .035 | 3.2... | 2 | .002 | 0 | y | 2 | 17.086 | 46.656 | 1.688 | 3.16 | 1.136 | H2-1 |
| 71 | M79 | L3X3X4 | .034 | 3.2... | 2 | .002 | 0 | y | 2 | 17.086 | 46.656 | 1.688 | 3.16 | 1.136 | H2-1 |
| 72 | M83 | L3X3X4 | .034 | 3.2... | 2 | .002 | 6.7... | y | 2 | 17.086 | 46.656 | 1.688 | 3.16 | 1.136 | H2-1 |
| 73 | M371 | LL4x4x4x3 | .029 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.222 | H1-1b |
| 74 | M372 | LL4x4x4x3 | .028 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.174 | H1-1b |
| 75 | M381 | LL4x4x4x3 | .028 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.228 | H1-1b |
| 76 | M373 | LL4x4x4x3 | .028 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.169 | H1-1b |
| 77 | M241 | HSS5.563... | .028 | 0 | 2 | .005 | 0 | | 2 | 182.6... | 185.3... | 25.65 | 25.65 | 1.941 | H1-1b |
| 78 | M382 | LL4x4x4x3 | .028 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.178 | H1-1b |
| 79 | M380 | LL4x4x4x3 | .028 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.182 | H1-1b |
| 80 | M28 | HSS5x0.500 | .028 | 2.7... | 2 | .004 | 0 | | 2 | 209.9... | 214.4... | 25.92 | 25.92 | 2.146 | H1-1b |
| 81 | M379 | LL4x4x4x3 | .028 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.161 | H1-1b |
| 82 | M374 | LL4x4x4x3 | .027 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.181 | H1-1b |
| 83 | M84 | L3X3X4 | .027 | 3.4... | 2 | .002 | 0 | y | 2 | 17.086 | 46.656 | 1.688 | 3.16 | 1.136 | H2-1 |
| 84 | M378 | LL4x4x4x3 | .027 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.185 | H1-1b |
| 85 | M80 | L3X3X4 | .027 | 3.4... | 2 | .002 | 6.7... | y | 2 | 17.086 | 46.656 | 1.688 | 3.16 | 1.136 | H2-1 |
| 86 | M82 | L3X3X4 | .026 | 3.4... | 2 | .002 | 0 | y | 2 | 17.086 | 46.656 | 1.688 | 3.16 | 1.136 | H2-1 |
| 87 | M10 | W8X18 | .026 | 0 | 3 | .009 | 5.4... | y | 3 | 103.24 | 236.7 | 17.475 | 63.75 | 2.157 | H1-1b |
| 88 | M375 | LL4x4x4x3 | .026 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.247 | H1-1b |
| 89 | M377 | LL4x4x4x3 | .025 | 0 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.267 | H1-1b |
| 90 | M282 | L3X3X4 | .024 | 3.1... | 2 | .002 | 0 | y | 2 | 18.39 | 46.656 | 1.688 | 3.191 | 1.136 | H2-1 |
| 91 | M280 | L3X3X4 | .024 | 3.1... | 2 | .002 | 6.4... | y | 2 | 18.39 | 46.656 | 1.688 | 3.191 | 1.136 | H2-1 |
| 92 | M284 | L3X3X4 | .024 | 3.1... | 2 | .002 | 0 | y | 2 | 18.39 | 46.656 | 1.688 | 3.191 | 1.136 | H2-1 |
| 93 | M9 | W8X18 | .024 | 5.4... | 2 | .009 | 0 | y | 2 | 103.24 | 236.7 | 17.475 | 63.75 | 2.141 | H1-1b |
| 94 | M77 | L3X3X4 | .023 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 95 | M71 | L3X3X4 | .023 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 96 | M74 | L3X3X4 | .023 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 97 | M23 | HSS5x0.500 | .023 | 2.7... | 2 | .004 | 0 | | 4 | 209.9... | 214.4... | 25.92 | 25.92 | 1.246 | H1-1b |
| 98 | M376 | LL4x4x4x3 | .023 | 10.1 | 2 | .002 | 10.1 | y | 2 | 72.439 | 125.0... | 12.586 | 5.548 | 2.147 | H1-1b |
| 99 | M32 | HSS5x0.500 | .022 | 2.7... | 2 | .004 | 0 | | 2 | 209.9... | 214.4... | 25.92 | 25.92 | 2.035 | H1-1b |
| 100 | M12 | W8X18 | .022 | 0 | 4 | .008 | 5.4... | y | 4 | 103.24 | 236.7 | 17.475 | 63.75 | 2.144 | H1-1b |
| 101 | M195 | L6X6X5 | .022 | .742 | 3 | .009 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 13.433 | 1.339 | H2-1 |
| 102 | M11 | W8X18 | .020 | 5.4... | 4 | .008 | 0 | y | 4 | 103.24 | 236.7 | 17.475 | 63.75 | 2.143 | H1-1b |



Company : ATC
Designer : MER
Job Number : 370624 - 12984006_C3_03
Model Name : Mankes Silo, CT

Sept 27, 2019
9:54 AM
Checked By:_____

## Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | ... | ... | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 103 | M285 | L3X3X4 | .020 | 3.3... | 2 | .001 | 0 | y | 2 | 18.39 | 46.656 | 1.688 | 3.191 | 1.136 | H2-1 |
| 104 | M281 | L3X3X4 | .020 | 3.3... | 2 | .001 | 6.4... | y | 2 | 18.39 | 46.656 | 1.688 | 3.191 | 1.136 | H2-1 |
| 105 | M238 | HSS5.563... | .020 | 0 | 2 | .004 | 0 | | 2 | 182.6... | 185.3... | 25.65 | 25.65 | 1.426 | H1-1b |
| 106 | M283 | L3X3X4 | .020 | 3.3... | 2 | .001 | 6.4... | y | 2 | 18.39 | 46.656 | 1.688 | 3.191 | 1.136 | H2-1 |
| 107 | M244 | HSS5.563... | .020 | 0 | 2 | .004 | 0 | | 2 | 182.6... | 185.3... | 25.65 | 25.65 | 1.947 | H1-1b |
| 108 | M293 | LL4x4x4x3 | .019 | 6.5... | 2 | .002 | 6.5... | y | 2 | 82.407 | 125.0... | 12.586 | 5.548 | 1 | H1-1b |
| 109 | M319 | L6X6X5 | .019 | 0 | 4 | .008 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 13.786 | 1.421 | H2-1 |
| 110 | M171 | L6X6X5 | .018 | .742 | 4 | .006 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 13.307 | 1.311 | H2-1 |
| 111 | M243 | HSS5.563... | .018 | 3.0... | 2 | .002 | 0 | | 3 | 181.5... | 185.3... | 25.65 | 25.65 | 2.155 | H1-1b |
| 112 | M73 | L3X3X4 | .018 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 113 | M324 | L6X6X5 | .018 | .742 | 2 | .008 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 14.093 | 1.499 | H2-1 |
| 114 | M330 | L6X6X5 | .018 | .742 | 2 | .007 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 14.153 | 1.515 | H2-1 |
| 115 | M70 | L3X3X4 | .018 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 116 | M76 | L3X3X4 | .018 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 117 | M7 | W8X18 | .017 | 5.4... | 2 | .007 | 0 | y | 2 | 103.24 | 236.7 | 17.475 | 63.75 | 2.098 | H1-1b |
| 118 | M292 | LL4x4x4x3 | .017 | 0 | 4 | .002 | 0 | y | 2 | 82.407 | 125.0... | 12.586 | 5.548 | 1 | H1-1b |
| 119 | M325 | L6X6X5 | .016 | 0 | 2 | .007 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 14.099 | 1.501 | H2-1 |
| 120 | M8 | W8X18 | .016 | 0 | 2 | .007 | 5.4... | y | 2 | 103.24 | 236.7 | 17.475 | 63.75 | 2.097 | H1-1b |
| 121 | M294 | LL4x4x4x3 | .015 | 0 | 2 | .002 | 0 | y | 2 | 82.407 | 125.0... | 12.586 | 5.548 | 1 | H1-1b |
| 122 | M78 | L3X3X4 | .013 | 0 | 2 | .000 | 0 | y | 3 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 123 | M348 | L6X6X5 | .013 | .742 | 3 | .005 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 13.505 | 1.355 | H2-1 |
| 124 | M72 | L3X3X4 | .013 | 0 | 2 | .000 | 0 | y | 2 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 125 | M75 | L3X3X4 | .013 | 0 | 2 | .000 | 0 | y | 9 | 26.816 | 46.656 | 1.688 | 3.294 | 1 | H2-1 |
| 126 | M354 | L6X6X5 | .012 | .742 | 3 | .004 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 13.546 | 1.364 | H2-1 |
| 127 | M295 | L6X6X5 | .012 | 0 | 2 | .005 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 14.23 | 1.536 | H2-1 |
| 128 | M336 | L6X6X5 | .012 | .742 | 4 | .005 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 13.67 | 1.393 | H2-1 |
| 129 | M24 | HSS5x0.500 | .011 | 3.7... | 3 | .001 | 0 | | 3 | 205.6... | 214.4... | 25.92 | 25.92 | 2.18 | H1-1b |
| 130 | M301 | L6X6X5 | .011 | 0 | 2 | .005 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 14.216 | 1.532 | H2-1 |
| 131 | M14 | HSS5x0.500 | .011 | 0 | 4 | .001 | 0 | | 4 | 214.4... | 214.4... | 25.92 | 25.92 | 1.951 | H1-1b |
| 132 | M313 | L6X6X5 | .010 | 0 | 2 | .006 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 14.511 | 1.616 | H2-1 |
| 133 | M342 | L6X6X5 | .010 | .742 | 4 | .004 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 13.893 | 1.448 | H2-1 |
| 134 | M29 | HSS5x0.500 | .010 | 0 | 4 | .001 | 0 | | 4 | 205.6... | 214.4... | 25.92 | 25.92 | 1.687 | H1-1b |
| 135 | M18 | HSS5x0.500 | .010 | 0 | 3 | .001 | .191 | | 3 | 214.4... | 214.4... | 25.92 | 25.92 | 1.03 | H1-1b |
| 136 | M307 | L6X6X5 | .009 | 0 | 2 | .005 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 14.578 | 1.636 | H2-1 |
| 137 | M118 | L6X6X5 | .009 | 0 | 3 | .004 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 138 | M22 | HSS5x0.500 | .009 | 5 | 2 | .001 | 0 | | 4 | 199.4 | 214.4... | 25.92 | 25.92 | 2.226 | H1-1b |
| 139 | M220 | L6X6X5 | .009 | 0 | 4 | .004 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 13.364 | 1.323 | H2-1 |
| 140 | M343 | L6X6X5 | .009 | 0 | 3 | .004 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 13.655 | 1.39 | H2-1 |
| 141 | M20 | HSS5x0.500 | .009 | 0 | 3 | .001 | 0 | | 3 | 205.6... | 214.4... | 25.92 | 25.92 | 1.994 | H1-1b |
| 142 | M16 | HSS5x0.500 | .009 | 0 | 3 | .000 | 0 | | 3 | 214.4... | 214.4... | 25.92 | 25.92 | 1.017 | H1-1b |
| 143 | M142 | L6X6X5 | .008 | 0 | 4 | .003 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 14.021 | 1.48 | H2-1 |
| 144 | M239 | HSS5.563... | .008 | 0 | 2 | .001 | 0 | | 4 | 176.5... | 185.3... | 25.65 | 25.65 | 2.233 | H1-1b |
| 145 | M240 | HSS5.563... | .008 | 0 | 2 | .001 | 0 | | 4 | 181.5... | 185.3... | 25.65 | 25.65 | 2.23 | H1-1b |
| 146 | M19 | HSS5x0.500 | .008 | 3.7... | 4 | .001 | 0 | | 4 | 205.6... | 214.4... | 25.92 | 25.92 | 1.79 | H1-1b |
| 147 | M300 | L6X6X5 | .008 | .742 | 2 | .004 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 14.6 | 1.643 | H2-1 |
| 148 | M274 | L3X3X4 | .008 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 149 | M93 | L6X6X5 | .008 | .742 | 3 | .003 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 150 | M25 | HSS5x0.500 | .008 | 0 | 3 | .001 | 0 | | 3 | 205.6... | 214.4... | 25.92 | 25.92 | 1.377 | H1-1b |
| 151 | M349 | L6X6X5 | .008 | 0 | 3 | .003 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 13.44 | 1.34 | H2-1 |
| 152 | M271 | L3X3X4 | .008 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 153 | M277 | L3X3X4 | .008 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 154 | M172 | L6X6X5 | .008 | 0 | 4 | .004 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 155 | M21 | HSS5x0.500 | .008 | 2.3... | 4 | .002 | 0 | | 4 | 211.1... | 214.4... | 25.92 | 25.92 | 1.872 | H1-1b |
| 156 | M219 | L6X6X5 | .008 | .742 | 2 | .005 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 13.297 | 1.309 | H2-1 |
| 157 | M26 | HSS5x0.500 | .008 | 2.3... | 3 | .001 | 0 | | 3 | 211.1... | 214.4... | 25.92 | 25.92 | 2.049 | H1-1b |
| 158 | M337 | L6X6X5 | .008 | 0 | 3 | .004 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 14.052 | 1.488 | H2-1 |
| 159 | M31 | HSS5x0.500 | .007 | 5 | 2 | .001 | 0 | | 2 | 199.4 | 214.4... | 25.92 | 25.92 | 2.154 | H1-1b |

## Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | | | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | M117 | L6X6X5 | .007 | .742 | 4 | .003 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 12.215 | 1.103 | H2-1 |
| 161 | M33 | HSS5x0.500 | .007 | 3.7... | 4 | .001 | 0 | | 4 | 205.6... | 214.4... | 25.92 | 25.92 | 2.001 | H1-1b |
| 162 | M141 | L6X6X5 | .007 | .742 | 4 | .003 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 163 | M272 | L3X3X4 | .007 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 164 | M278 | L3X3X4 | .007 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 165 | M275 | L3X3X4 | .007 | 0 | 2 | .000 | 0 | y | 7 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 166 | M370 | HSS5x0.500 | .007 | 5.4... | 4 | .001 | 0 | | 4 | 196.6... | 214.4... | 25.92 | 25.92 | 2.169 | H1-1b |
| 167 | M27 | HSS5x0.500 | .007 | 0 | 3 | .001 | 0 | | 3 | 199.4 | 214.4... | 25.92 | 25.92 | 2.249 | H1-1b |
| 168 | M94 | L6X6X5 | .007 | 0 | 4 | .003 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 169 | M245 | HSS5.563... | .007 | 0 | 2 | .001 | 0 | | 2 | 176.5... | 185.3... | 25.65 | 25.65 | 2.187 | H1-1b |
| 170 | M246 | HSS5.563... | .007 | 3.0... | 4 | .001 | 0 | | 4 | 181.5... | 185.3... | 25.65 | 25.65 | 2.179 | H1-1b |
| 171 | M360 | L6X6X5 | .007 | .742 | 3 | .003 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 13.844 | 1.435 | H2-1 |
| 172 | M312 | L6X6X5 | .006 | .742 | 2 | .005 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 15.197 | 1.841 | H2-1 |
| 173 | M279 | L3X3X4 | .006 | 0 | 2 | .000 | 0 | y | 3 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 174 | M129 | L6X6X5 | .006 | .742 | 4 | .002 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.926 | 1.056 | H2-1 |
| 175 | M123 | L6X6X5 | .006 | .742 | 4 | .002 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.703 | 1.022 | H2-1 |
| 176 | M273 | L3X3X4 | .006 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 177 | M124 | L6X6X5 | .006 | 0 | 4 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 11.771 | 1.032 | H2-1 |
| 178 | M306 | L6X6X5 | .006 | .742 | 2 | .004 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 15.292 | 1.875 | H2-1 |
| 179 | M276 | L3X3X4 | .006 | 0 | 2 | .000 | 0 | y | 2 | 28.8 | 46.656 | 1.688 | 3.345 | 1 | H2-1 |
| 180 | M104 | L6X6X5 | .006 | .742 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 181 | M157 | L6X6X5 | .006 | .742 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 182 | M159 | L6X6X5 | .006 | 0 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 183 | M158 | L6X6X5 | .006 | 0 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 184 | M107 | L6X6X5 | .006 | 0 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 185 | M130 | L6X6X5 | .005 | 0 | 4 | .002 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 12.067 | 1.079 | H2-1 |
| 186 | M108 | L6X6X5 | .005 | 0 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 187 | M103 | L6X6X5 | .005 | .742 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 188 | M102 | L6X6X5 | .005 | .742 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 189 | M88 | L6X6X5 | .005 | .742 | 4 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 190 | M109 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 191 | M105 | L6X6X5 | .005 | 0 | 3 | .003 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 192 | M110 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 193 | M90 | L6X6X5 | .005 | 0 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 194 | M156 | L6X6X5 | .005 | .742 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 195 | M106 | L6X6X5 | .005 | .742 | 3 | .003 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 196 | M101 | L6X6X5 | .005 | .742 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 197 | M89 | L6X6X5 | .005 | 0 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 198 | M155 | L6X6X5 | .005 | .742 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 199 | M91 | L6X6X5 | .005 | 0 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 200 | M122 | L6X6X5 | .005 | .494 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.579 | 1.004 | H2-1 |
| 201 | M111 | L6X6X5 | .005 | 0 | 3 | .002 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 202 | M92 | L6X6X5 | .005 | 0 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 203 | M317 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 204 | M100 | L6X6X5 | .005 | .742 | 3 | .002 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 205 | M95 | L6X6X5 | .005 | 0 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 206 | M315 | L6X6X5 | .005 | .742 | 3 | .000 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 207 | M316 | L6X6X5 | .005 | 0 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 208 | M140 | L6X6X5 | .005 | .556 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.598 | 1.007 | H2-1 |
| 209 | M143 | L6X6X5 | .005 | .193 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.595 | 1.006 | H2-1 |
| 210 | M121 | L6X6X5 | .005 | .456 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.572 | 1.003 | H2-1 |
| 211 | M318 | L6X6X5 | .005 | 0 | 3 | .004 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 212 | M361 | L6X6X5 | .005 | 0 | 2 | .003 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 15.116 | 1.812 | H2-1 |
| 213 | M125 | L6X6X5 | .005 | .209 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.591 | 1.006 | H2-1 |
| 214 | M139 | L6X6X5 | .005 | .463 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.573 | 1.003 | H2-1 |
| 215 | M144 | L6X6X5 | .005 | .286 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.573 | 1.003 | H2-1 |
| 216 | M120 | L6X6X5 | .005 | .587 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.611 | 1.009 | H2-1 |



Company : ATC
Designer : MER
Job Number : 370624 - 12984006_C3_03
Model Name : Mankes Silo, CT

Sept 27, 2019
9:54 AM
Checked By:_____

## Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | | | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 217 | M154 | L6X6X5 | .005 | .742 | 4 | .002 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 218 | M309 | L6X6X5 | .005 | .742 | 3 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 219 | M310 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 220 | M126 | L6X6X5 | .005 | .309 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.569 | 1.003 | H2-1 |
| 221 | M138 | L6X6X5 | .005 | .533 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.591 | 1.006 | H2-1 |
| 222 | M145 | L6X6X5 | .005 | .209 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.593 | 1.006 | H2-1 |
| 223 | M314 | L6X6X5 | .005 | .742 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 224 | M311 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 225 | M127 | L6X6X5 | .005 | .232 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.585 | 1.005 | H2-1 |
| 226 | M308 | L6X6X5 | .005 | .742 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 227 | M137 | L6X6X5 | .005 | .502 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.584 | 1.005 | H2-1 |
| 228 | M146 | L6X6X5 | .005 | .247 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.581 | 1.004 | H2-1 |
| 229 | M152 | L6X6X5 | .005 | .742 | 4 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 230 | M365 | L6X6X5 | .005 | 0 | 4 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 231 | M136 | L6X6X5 | .005 | .417 | 3 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 11.568 | 1.002 | H2-1 |
| 232 | M364 | L6X6X5 | .005 | .742 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 233 | M128 | L6X6X5 | .005 | .247 | 4 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.582 | 1.004 | H2-1 |
| 234 | M363 | L6X6X5 | .005 | .742 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 235 | M116 | L6X6X5 | .005 | .742 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.963 | 1.062 | H2-1 |
| 236 | M98 | L6X6X5 | .005 | .742 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 237 | M297 | L6X6X5 | .005 | .742 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 238 | M99 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 239 | M135 | L6X6X5 | .005 | .742 | 3 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.782 | 1.034 | H2-1 |
| 240 | M147 | L6X6X5 | .005 | 0 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.719 | 1.025 | H2-1 |
| 241 | M298 | L6X6X5 | .005 | 0 | 4 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 242 | M119 | L6X6X5 | .005 | .742 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.804 | 1.037 | H2-1 |
| 243 | M366 | L6X6X5 | .005 | 0 | 4 | .002 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 244 | M321 | L6X6X5 | .005 | .742 | 3 | .000 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 245 | M299 | L6X6X5 | .005 | 0 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 246 | M113 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 247 | M112 | L6X6X5 | .005 | .742 | 3 | .002 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 248 | M322 | L6X6X5 | .005 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 249 | M97 | L6X6X5 | .004 | .742 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 250 | M362 | L6X6X5 | .004 | .742 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 251 | M153 | L6X6X5 | .004 | 0 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 252 | M151 | L6X6X5 | .004 | .742 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 253 | M323 | L6X6X5 | .004 | 0 | 3 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 254 | M96 | L6X6X5 | .004 | 0 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 255 | M296 | L6X6X5 | .004 | .742 | 4 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 256 | M30 | HSS5x0.500 | .004 | 2.3... | 2 | .001 | 0 | | 2 | 211.1... | 214.4... | 25.92 | 25.92 | 1.684 | H1-1b |
| 257 | M114 | L6X6X5 | .004 | 0 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 258 | M320 | L6X6X5 | .004 | .742 | 3 | .002 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 259 | M150 | L6X6X5 | .004 | .742 | 4 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 260 | M148 | L6X6X5 | .004 | .201 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.602 | 1.007 | H2-1 |
| 261 | M305 | L6X6X5 | .004 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 262 | M304 | L6X6X5 | .004 | 0 | 4 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 263 | M303 | L6X6X5 | .004 | .742 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 264 | M242 | HSS5.563... | .004 | 0 | 3 | .001 | 0 | | 3 | 176.5... | 185.3... | 25.65 | 25.65 | 2.265 | H1-1b |
| 265 | M115 | L6X6X5 | .004 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 266 | M302 | L6X6X5 | .004 | .742 | 4 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 267 | M170 | L6X6X5 | .004 | .742 | 4 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 12.343 | 1.125 | H2-1 |
| 268 | M357 | L6X6X5 | .004 | .742 | 4 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 269 | M149 | L6X6X5 | .004 | .742 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 270 | M358 | L6X6X5 | .004 | 0 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 271 | M134 | L6X6X5 | .004 | .742 | 3 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.746 | 1.029 | H2-1 |
| 272 | M359 | L6X6X5 | .004 | 0 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 273 | M356 | L6X6X5 | .004 | .742 | 4 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |

## Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | | | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 274 | M131 | L6X6X5 | .004 | .077 | 4 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.683 | 1.019 | H2-1 |
| 275 | M355 | L6X6X5 | .004 | .742 | 4 | .002 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 276 | M326 | L6X6X5 | .004 | .742 | 3 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 277 | M132 | L6X6X5 | .004 | .039 | 4 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.721 | 1.025 | H2-1 |
| 278 | M133 | L6X6X5 | .004 | .687 | 3 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.707 | 1.023 | H2-1 |
| 279 | M328 | L6X6X5 | .004 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 280 | M331 | L6X6X5 | .003 | 0 | 3 | .003 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 15.925 | 2.133 | H2-1 |
| 281 | M332 | L6X6X5 | .003 | .742 | 2 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 282 | M327 | L6X6X5 | .003 | .742 | 3 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 283 | M196 | L6X6X5 | .003 | 0 | 2 | .004 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 12.75 | 1.198 | H2-1 |
| 284 | M333 | L6X6X5 | .003 | 0 | 2 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 285 | M334 | L6X6X5 | .003 | 0 | 2 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 286 | M340 | L6X6X5 | .003 | 0 | 2 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 287 | M339 | L6X6X5 | .003 | .742 | 2 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 288 | M329 | L6X6X5 | .003 | 0 | 3 | .002 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 289 | M335 | L6X6X5 | .003 | 0 | 2 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 290 | M197 | L6X6X5 | .003 | 0 | 4 | .002 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 291 | M338 | L6X6X5 | .003 | .742 | 2 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 292 | M341 | L6X6X5 | .003 | 0 | 2 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 293 | M351 | L6X6X5 | .003 | .742 | 4 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 294 | M352 | L6X6X5 | .003 | 0 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 295 | M353 | L6X6X5 | .003 | 0 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 296 | M345 | L6X6X5 | .003 | .742 | 2 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 297 | M169 | L6X6X5 | .003 | .633 | 4 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.697 | 1.021 | H2-1 |
| 298 | M346 | L6X6X5 | .003 | 0 | 2 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 299 | M350 | L6X6X5 | .003 | .742 | 4 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 300 | M344 | L6X6X5 | .003 | .742 | 2 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 301 | M201 | L6X6X5 | .003 | .742 | 4 | .002 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 302 | M235 | L6X6X5 | .003 | .394 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.577 | 1.004 | H2-1 |
| 303 | M202 | L6X6X5 | .003 | 0 | 4 | .002 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 304 | M347 | L6X6X5 | .003 | 0 | 2 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 305 | M234 | L6X6X5 | .003 | .417 | 4 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.581 | 1.004 | H2-1 |
| 306 | M190 | L6X6X5 | .003 | 0 | 2 | .003 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 307 | M236 | L6X6X5 | .003 | .185 | 4 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.64 | 1.013 | H2-1 |
| 308 | M189 | L6X6X5 | .003 | .742 | 2 | .003 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 309 | M181 | L6X6X5 | .003 | .294 | 3 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.588 | 1.005 | H2-1 |
| 310 | M180 | L6X6X5 | .003 | .386 | 3 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.578 | 1.004 | H2-1 |
| 311 | M187 | L6X6X5 | .003 | .378 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.577 | 1.004 | H2-1 |
| 312 | M186 | L6X6X5 | .003 | .471 | 3 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.597 | 1.007 | H2-1 |
| 313 | M168 | L6X6X5 | .003 | .433 | 4 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.585 | 1.005 | H2-1 |
| 314 | M188 | L6X6X5 | .003 | .17 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.659 | 1.016 | H2-1 |
| 315 | M179 | L6X6X5 | .002 | .633 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.715 | 1.024 | H2-1 |
| 316 | M194 | L6X6X5 | .002 | .742 | 3 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 12.223 | 1.104 | H2-1 |
| 317 | M167 | L6X6X5 | .002 | .595 | 4 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.683 | 1.019 | H2-1 |
| 318 | M193 | L6X6X5 | .002 | .742 | 3 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.847 | 1.044 | H2-1 |
| 319 | M182 | L6X6X5 | .002 | .108 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.72 | 1.025 | H2-1 |
| 320 | M233 | L6X6X5 | .002 | .618 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.702 | 1.022 | H2-1 |
| 321 | M185 | L6X6X5 | .002 | .687 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.79 | 1.035 | H2-1 |
| 322 | M229 | L6X6X5 | .002 | .332 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.585 | 1.005 | H2-1 |
| 323 | M228 | L6X6X5 | .002 | .348 | 4 | .000 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 11.583 | 1.005 | H2-1 |
| 324 | M237 | L6X6X5 | .002 | 0 | 4 | .002 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 14.208 | 1.53 | H2-1 |
| 325 | M232 | L6X6X5 | .002 | .742 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 13.082 | 1.263 | H2-1 |
| 326 | M230 | L6X6X5 | .002 | .124 | 4 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.725 | 1.025 | H2-1 |
| 327 | M175 | L6X6X5 | .002 | .355 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.584 | 1.005 | H2-1 |
| 328 | M183 | L6X6X5 | .002 | 0 | 3 | .003 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 14.976 | 1.763 | H2-1 |
| 329 | M176 | L6X6X5 | .002 | .17 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.675 | 1.018 | H2-1 |
| 330 | M174 | L6X6X5 | .002 | .402 | 3 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.586 | 1.005 | H2-1 |



Company : ATC
Designer : MER
Job Number : 370624 - 12984006_C3_03
Model Name : Mankes Silo, CT

Sept 27, 2019
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## Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

| | Member | Shape | Code Check | Lo... | LC | Shear ... | Lo... | | | phi*P... | phi*P... | phi*Mn y-y [k-ft] | phi*... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 331 | M231 | L6X6X5 | .002 | 0 | 4 | .001 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 13.108 | 1.269 | H2-1 |
| 332 | M227 | L6X6X5 | .002 | .541 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.656 | 1.015 | H2-1 |
| 333 | M184 | L6X6X5 | .002 | .742 | 3 | .003 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 15.391 | 1.912 | H2-1 |
| 334 | M214 | L6X6X5 | .002 | 0 | 3 | .002 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 335 | M192 | L6X6X5 | .002 | .44 | 3 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.6 | 1.007 | H2-1 |
| 336 | M213 | L6X6X5 | .002 | .742 | 3 | .002 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 337 | M166 | L6X6X5 | .002 | .742 | 4 | .002 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 14.247 | 1.541 | H2-1 |
| 338 | M191 | L6X6X5 | .002 | .687 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.848 | 1.044 | H2-1 |
| 339 | M177 | L6X6X5 | .002 | .742 | 2 | .002 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 340 | M178 | L6X6X5 | .002 | 0 | 2 | .002 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 341 | M207 | L6X6X5 | .002 | .742 | 4 | .002 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 342 | M222 | L6X6X5 | .002 | .216 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.67 | 1.017 | H2-1 |
| 343 | M17 | HSS5x0.500 | .002 | .802 | 4 | .001 | 0 | | 4 | 214.0... | 214.4... | 25.92 | 25.92 | 1.667 | H1-1b |
| 344 | M208 | L6X6X5 | .002 | 0 | 4 | .002 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 345 | M173 | L6X6X5 | .002 | 0 | 2 | .001 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 346 | M226 | L6X6X5 | .002 | .742 | 4 | .001 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 14.797 | 1.705 | H2-1 |
| 347 | M223 | L6X6X5 | .001 | .34 | 4 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.602 | 1.007 | H2-1 |
| 348 | M224 | L6X6X5 | .001 | .116 | 4 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.816 | 1.039 | H2-1 |
| 349 | M221 | L6X6X5 | .001 | 0 | 3 | .001 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 350 | M198 | L6X6X5 | .001 | .363 | 3 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.602 | 1.007 | H2-1 |
| 351 | M217 | L6X6X5 | .001 | .494 | 2 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.681 | 1.019 | H2-1 |
| 352 | M13 | HSS5x0.500 | .001 | .802 | 2 | .001 | 0 | | 2 | 214.0... | 214.4... | 25.92 | 25.92 | 1.667 | H1-1b |
| 353 | M210 | L6X6X5 | .001 | .409 | 2 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.624 | 1.011 | H2-1 |
| 354 | M204 | L6X6X5 | .001 | .348 | 2 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.62 | 1.01 | H2-1 |
| 355 | M211 | L6X6X5 | .001 | .371 | 2 | .000 | 0 | z | 4 | 25.726 | 118.9... | 9.302 | 11.618 | 1.01 | H2-1 |
| 356 | M225 | L6X6X5 | .001 | .742 | 3 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 357 | M15 | HSS5x0.500 | .001 | .802 | 3 | .001 | 0 | | 3 | 214.0... | 214.4... | 25.92 | 25.92 | 1.667 | H1-1b |
| 358 | M205 | L6X6X5 | .001 | .301 | 2 | .000 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.642 | 1.013 | H2-1 |
| 359 | M200 | L6X6X5 | .001 | .742 | 4 | .001 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 360 | M216 | L6X6X5 | .001 | .386 | 2 | .000 | .742 | z | 4 | 25.726 | 118.9... | 9.302 | 11.627 | 1.011 | H2-1 |
| 361 | M203 | L6X6X5 | .001 | .595 | 2 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.891 | 1.051 | H2-1 |
| 362 | M199 | L6X6X5 | .001 | .386 | 3 | .000 | 0 | z | 3 | 25.726 | 118.9... | 9.302 | 11.617 | 1.009 | H2-1 |
| 363 | M212 | L6X6X5 | .001 | .108 | 2 | .000 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 12.022 | 1.071 | H2-1 |
| 364 | M206 | L6X6X5 | .001 | .742 | 4 | .000 | .742 | z | 2 | 25.726 | 118.9... | 9.302 | 16.791 | 1 | H2-1 |
| 365 | M215 | L6X6X5 | .001 | .587 | 2 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 11.928 | 1.057 | H2-1 |
| 366 | M218 | L6X6X5 | .001 | .309 | 2 | .001 | .742 | z | 3 | 25.726 | 118.9... | 9.302 | 11.661 | 1.016 | H2-1 |
| 367 | M209 | L6X6X5 | .001 | .649 | 2 | .000 | 0 | z | 2 | 25.726 | 118.9... | 9.302 | 12.15 | 1.092 | H2-1 |

## Envelope Plate/Shell Principal Stresses

| | Plate | | Sur... | Sigma1 [ksi] | LC | Sigma2 [ksi] | LC | Tau Max [... | LC | Angle [rad] | LC | Von Mises [ksi] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P1 | max | T | -.004 | 12 | -.046 | 13 | .055 | 4 | .186 | 3 | .119 | 4 |
| 2 | | min | | -.016 | 4 | -.126 | 4 | .02 | 13 | -.01 | 15 | .043 | 13 |
| 3 | | max | B | -.004 | 12 | -.045 | 13 | .048 | 4 | .194 | 3 | .103 | 4 |
| 4 | | min | | -.013 | 4 | -.109 | 4 | .02 | 13 | -.01 | 15 | .043 | 13 |
| 5 | P2 | max | T | -.005 | 12 | -.048 | 13 | .055 | 4 | .171 | 3 | .119 | 4 |
| 6 | | min | | -.016 | 4 | -.126 | 4 | .022 | 13 | -.017 | 15 | .046 | 13 |
| 7 | | max | B | -.005 | 12 | -.047 | 13 | .048 | 4 | .181 | 3 | .102 | 4 |
| 8 | | min | | -.013 | 4 | -.108 | 4 | .021 | 13 | -.019 | 15 | .045 | 13 |
| 9 | P3 | max | T | -.005 | 12 | -.051 | 13 | .055 | 4 | .157 | 3 | .118 | 4 |
| 10 | | min | | -.016 | 4 | -.125 | 4 | .023 | 13 | -.025 | 15 | .049 | 13 |
| 11 | | max | B | -.005 | 12 | -.049 | 13 | .047 | 4 | .169 | 3 | .102 | 4 |
| 12 | | min | | -.013 | 4 | -.108 | 4 | .022 | 13 | -.028 | 15 | .047 | 13 |
| 13 | P4 | max | T | -.006 | 12 | -.054 | 13 | .054 | 4 | .143 | 3 | .117 | 4 |
| 14 | | min | | -.015 | 4 | -.123 | 4 | .024 | 13 | -.033 | 15 | .051 | 13 |
| 15 | | max | B | -.005 | 12 | -.051 | 13 | .047 | 4 | .157 | 3 | .101 | 4 |

## Envelope Plate/Shell Principal Stresses (Continued)

| | Plate | | Sur... | Sigma1 [ksi] | LC | Sigma2 [ksi] | LC | Tau Max [... | LC | Angle [rad] | LC | Von Mises [ksi] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | | min | | -.013 | 4 | -.107 | 4 | .023 | 13 | -.037 | 15 | .049 | 13 |
| 17 | P5 | max | T | -.006 | 12 | -.057 | 13 | .053 | 4 | .131 | 3 | .115 | 4 |
| 18 | | min | | -.015 | 4 | -.122 | 4 | .025 | 13 | -.041 | 15 | .054 | 13 |
| 19 | | max | B | -.006 | 12 | -.053 | 13 | .046 | 4 | .145 | 3 | .1 | 4 |
| 20 | | min | | -.013 | 4 | -.105 | 4 | .024 | 13 | -.046 | 4 | .05 | 13 |
| 21 | P6 | max | T | -.007 | 12 | -.059 | 13 | .052 | 4 | .119 | 3 | .113 | 4 |
| 22 | | min | | -.015 | 4 | -.119 | 4 | .026 | 13 | -.048 | 15 | .056 | 13 |
| 23 | | max | B | -.006 | 12 | -.055 | 13 | .046 | 4 | .133 | 3 | .098 | 4 |
| 24 | | min | | -.012 | 4 | -.104 | 4 | .024 | 13 | -.057 | 4 | .052 | 13 |
| 25 | P7 | max | T | -.007 | 12 | -.062 | 13 | .051 | 4 | .107 | 3 | .11 | 4 |
| 26 | | min | | -.014 | 4 | -.117 | 4 | .027 | 13 | -.057 | 4 | .058 | 13 |
| 27 | | max | B | -.006 | 12 | -.057 | 13 | .045 | 4 | .121 | 3 | .096 | 4 |
| 28 | | min | | -.012 | 4 | -.102 | 4 | .025 | 13 | -.067 | 4 | .054 | 13 |
| 29 | P8 | max | T | -.007 | 12 | -.064 | 13 | .05 | 4 | .097 | 3 | .107 | 4 |
| 30 | | min | | -.014 | 4 | -.113 | 4 | .028 | 13 | -.067 | 4 | .061 | 13 |
| 31 | | max | B | -.007 | 12 | -.058 | 13 | .044 | 4 | .11 | 3 | .094 | 4 |
| 32 | | min | | -.012 | 4 | -.1 | 4 | .026 | 13 | -.078 | 4 | .055 | 13 |
| 33 | P9 | max | T | -.008 | 12 | -.066 | 13 | .048 | 4 | .086 | 3 | .104 | 4 |
| 34 | | min | | -.013 | 4 | -.11 | 4 | .029 | 13 | -.077 | 4 | .063 | 13 |
| 35 | | max | B | -.007 | 12 | -.06 | 13 | .043 | 4 | .099 | 3 | .092 | 4 |
| 36 | | min | | -.011 | 4 | -.097 | 4 | .026 | 13 | -.088 | 4 | .057 | 13 |
| 37 | P10 | max | T | -.008 | 15 | -.066 | 16 | .048 | 3 | .076 | 3 | .104 | 3 |
| 38 | | min | | -.013 | 3 | -.11 | 3 | .029 | 16 | -.086 | 4 | .063 | 16 |
| 39 | | max | B | -.007 | 15 | -.06 | 16 | .043 | 3 | .088 | 3 | .092 | 3 |
| 40 | | min | | -.011 | 3 | -.097 | 3 | .027 | 16 | -.099 | 4 | .057 | 16 |
| 41 | P11 | max | T | -.007 | 15 | -.064 | 16 | .05 | 3 | .067 | 3 | .107 | 3 |
| 42 | | min | | -.014 | 3 | -.114 | 3 | .028 | 16 | -.097 | 4 | .061 | 16 |
| 43 | | max | B | -.007 | 15 | -.058 | 16 | .044 | 3 | .077 | 3 | .094 | 3 |
| 44 | | min | | -.012 | 3 | -.1 | 3 | .026 | 16 | -.11 | 4 | .055 | 16 |
| 45 | P12 | max | T | -.007 | 15 | -.062 | 16 | .051 | 3 | .057 | 3 | .11 | 3 |
| 46 | | min | | -.014 | 3 | -.117 | 3 | .027 | 16 | -.108 | 4 | .059 | 16 |
| 47 | | max | B | -.006 | 15 | -.057 | 16 | .045 | 3 | .067 | 3 | .097 | 3 |
| 48 | | min | | -.012 | 3 | -.102 | 3 | .025 | 16 | -.121 | 4 | .054 | 16 |
| 49 | P13 | max | T | -.007 | 15 | -.059 | 16 | .052 | 3 | .048 | 3 | .113 | 3 |
| 50 | | min | | -.015 | 3 | -.12 | 3 | .026 | 16 | -.119 | 4 | .056 | 16 |
| 51 | | max | B | -.006 | 15 | -.055 | 16 | .046 | 3 | .056 | 3 | .098 | 3 |
| 52 | | min | | -.012 | 3 | -.104 | 3 | .024 | 16 | -.133 | 4 | .052 | 16 |
| 53 | P14 | max | T | -.006 | 15 | -.057 | 16 | .053 | 3 | .039 | 12 | .115 | 3 |
| 54 | | min | | -.015 | 3 | -.122 | 3 | .025 | 16 | -.13 | 4 | .054 | 16 |
| 55 | | max | B | -.006 | 15 | -.053 | 16 | .047 | 3 | .046 | 3 | .1 | 3 |
| 56 | | min | | -.013 | 3 | -.106 | 3 | .024 | 16 | -.144 | 4 | .051 | 16 |
| 57 | P15 | max | T | -.006 | 15 | -.054 | 16 | .054 | 3 | .032 | 12 | .117 | 3 |
| 58 | | min | | -.015 | 3 | -.124 | 3 | .024 | 16 | -.143 | 4 | .052 | 16 |
| 59 | | max | B | -.005 | 15 | -.051 | 16 | .047 | 3 | .036 | 12 | .101 | 3 |
| 60 | | min | | -.013 | 3 | -.107 | 3 | .023 | 16 | -.156 | 4 | .049 | 16 |
| 61 | P16 | max | T | -.005 | 15 | -.052 | 16 | .055 | 3 | .024 | 12 | .118 | 3 |
| 62 | | min | | -.016 | 3 | -.125 | 3 | .023 | 16 | -.156 | 4 | .049 | 16 |
| 63 | | max | B | -.005 | 15 | -.049 | 16 | .048 | 3 | .027 | 12 | .102 | 3 |
| 64 | | min | | -.013 | 3 | -.108 | 3 | .022 | 16 | -.168 | 4 | .047 | 16 |
| 65 | P17 | max | T | -.005 | 15 | -.049 | 16 | .055 | 3 | .016 | 12 | .119 | 3 |
| 66 | | min | | -.016 | 3 | -.126 | 3 | .022 | 16 | -.17 | 4 | .046 | 16 |
| 67 | | max | B | -.005 | 15 | -.047 | 16 | .048 | 3 | .018 | 12 | .103 | 3 |
| 68 | | min | | -.013 | 3 | -.109 | 3 | .021 | 16 | -.18 | 4 | .045 | 16 |
| 69 | P18 | max | T | -.005 | 15 | -.046 | 16 | .056 | 3 | .009 | 12 | .12 | 3 |
| 70 | | min | | -.016 | 3 | -.127 | 3 | .021 | 16 | -.185 | 4 | .044 | 16 |
| 71 | | max | B | -.004 | 15 | -.045 | 16 | .048 | 3 | .009 | 12 | .103 | 3 |
| 72 | | min | | -.013 | 3 | -.109 | 3 | .02 | 16 | -.192 | 4 | .043 | 16 |



Company : ATC
Designer : MER
Job Number : 370624 - 12984006_C3_03
Model Name : Mankes Silo, CT

Sept 27, 2019
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## Envelope Plate/Shell Principal Stresses (Continued)

| | Plate | | Sur... | Sigma1 [ksi] | LC | Sigma2 [ksi] | LC | Tau Max [... | LC | Angle [rad] | LC | Von Mises [ksi] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | P19 | max | T | -.004 | 15 | -.043 | 16 | .056 | 3 | 0 | 12 | .12 | 3 |
| 74 | | min | | -.016 | 3 | -.127 | 3 | .019 | 16 | -.201 | 4 | .041 | 16 |
| 75 | | max | B | -.004 | 15 | -.043 | 16 | .048 | 3 | 0 | 2 | .103 | 3 |
| 76 | | min | | -.013 | 3 | -.109 | 3 | .02 | 16 | -.205 | 4 | .041 | 16 |
| 77 | P20 | max | T | -.004 | 15 | -.04 | 16 | .055 | 3 | 0 | 2 | .119 | 3 |
| 78 | | min | | -.016 | 3 | -.127 | 3 | .018 | 16 | -.218 | 4 | .039 | 16 |
| 79 | | max | B | -.004 | 15 | -.041 | 16 | .048 | 3 | 0 | 2 | .103 | 3 |
| 80 | | min | | -.013 | 3 | -.109 | 3 | .019 | 16 | -.217 | 4 | .039 | 16 |
| 81 | P21 | max | T | -.003 | 4 | -.038 | 16 | .055 | 3 | 0 | 2 | .119 | 3 |
| 82 | | min | | -.016 | 3 | -.126 | 3 | .017 | 16 | -.237 | 4 | .036 | 16 |
| 83 | | max | B | -.003 | 4 | -.039 | 16 | .048 | 3 | 0 | 2 | .103 | 3 |
| 84 | | min | | -.013 | 3 | -.109 | 3 | .018 | 16 | -.229 | 4 | .037 | 16 |
| 85 | P22 | max | T | -.002 | 4 | -.035 | 16 | .054 | 3 | 0 | 2 | .117 | 3 |
| 86 | | min | | -.015 | 3 | -.124 | 3 | .016 | 16 | -.258 | 4 | .033 | 16 |
| 87 | | max | B | -.003 | 4 | -.037 | 16 | .047 | 3 | 0 | 2 | .102 | 3 |
| 88 | | min | | -.013 | 3 | -.107 | 3 | .017 | 16 | -.242 | 4 | .036 | 16 |
| 89 | P23 | max | T | -.001 | 4 | -.032 | 16 | .054 | 3 | 0 | 2 | .116 | 3 |
| 90 | | min | | -.015 | 3 | -.122 | 3 | .015 | 16 | -.281 | 4 | .031 | 16 |
| 91 | | max | B | -.002 | 4 | -.035 | 16 | .047 | 3 | 0 | 2 | .1 | 3 |
| 92 | | min | | -.013 | 3 | -.106 | 3 | .016 | 16 | -.254 | 4 | .034 | 16 |
| 93 | P24 | max | T | 0 | 4 | -.03 | 16 | .053 | 3 | 0 | 2 | .113 | 3 |
| 94 | | min | | -.015 | 3 | -.12 | 3 | .014 | 16 | -.307 | 4 | .028 | 16 |
| 95 | | max | B | -.002 | 4 | -.033 | 16 | .046 | 3 | 0 | 2 | .099 | 3 |
| 96 | | min | | -.012 | 3 | -.104 | 3 | .015 | 16 | -.266 | 4 | .032 | 16 |
| 97 | P25 | max | T | 0 | 4 | -.027 | 16 | .052 | 3 | 0 | 2 | .111 | 3 |
| 98 | | min | | -.014 | 3 | -.117 | 3 | .012 | 16 | -.336 | 4 | .026 | 16 |
| 99 | | max | B | -.001 | 4 | -.031 | 16 | .045 | 3 | 0 | 2 | .097 | 3 |
| 100 | | min | | -.012 | 3 | -.102 | 3 | .014 | 16 | -.276 | 4 | .03 | 16 |
| 101 | P26 | max | T | .001 | 4 | -.025 | 4 | .05 | 3 | 0 | 2 | .108 | 3 |
| 102 | | min | | -.014 | 3 | -.114 | 3 | .011 | 16 | -.368 | 4 | .024 | 16 |
| 103 | | max | B | 0 | 4 | -.03 | 16 | .044 | 3 | 0 | 2 | .095 | 3 |
| 104 | | min | | -.012 | 3 | -.1 | 3 | .013 | 16 | -.286 | 4 | .028 | 16 |
| 105 | P27 | max | T | .002 | 4 | -.02 | 4 | .049 | 3 | 0 | 2 | .105 | 3 |
| 106 | | min | | -.013 | 3 | -.111 | 3 | .01 | 16 | -.405 | 4 | .021 | 4 |
| 107 | | max | B | 0 | 4 | -.028 | 16 | .043 | 3 | 0 | 2 | .092 | 3 |
| 108 | | min | | -.011 | 3 | -.098 | 3 | .013 | 16 | -.294 | 4 | .027 | 16 |
| 109 | P28 | max | T | .002 | 4 | -.016 | 4 | .047 | 3 | 0 | 2 | .101 | 3 |
| 110 | | min | | -.012 | 3 | -.107 | 3 | .009 | 4 | -.449 | 4 | .018 | 4 |
| 111 | | max | B | 0 | 4 | -.026 | 16 | .042 | 3 | 0 | 2 | .09 | 3 |
| 112 | | min | | -.011 | 3 | -.095 | 3 | .012 | 16 | -.3 | 4 | .025 | 16 |
| 113 | P29 | max | T | .003 | 4 | -.013 | 4 | .045 | 3 | 0 | 2 | .097 | 3 |
| 114 | | min | | -.012 | 3 | -.102 | 3 | .008 | 4 | -.499 | 4 | .015 | 4 |
| 115 | | max | B | 0 | 4 | -.024 | 4 | .041 | 3 | 0 | 2 | .087 | 3 |
| 116 | | min | | -.01 | 3 | -.092 | 3 | .011 | 16 | -.303 | 4 | .024 | 16 |
| 117 | P30 | max | T | .003 | 4 | -.01 | 4 | .043 | 3 | 0 | 2 | .093 | 3 |
| 118 | | min | | -.011 | 3 | -.098 | 3 | .007 | 4 | -.559 | 4 | .012 | 4 |
| 119 | | max | B | 0 | 4 | -.021 | 4 | .039 | 3 | 0 | 2 | .084 | 3 |
| 120 | | min | | -.009 | 3 | -.088 | 3 | .011 | 4 | -.301 | 4 | .021 | 4 |
| 121 | P31 | max | T | .004 | 4 | -.007 | 4 | .041 | 3 | 0 | 2 | .088 | 3 |
| 122 | | min | | -.01 | 3 | -.093 | 3 | .005 | 4 | -.632 | 4 | .009 | 4 |
| 123 | | max | B | 0 | 4 | -.019 | 4 | .038 | 3 | 0 | 2 | .081 | 3 |
| 124 | | min | | -.009 | 3 | -.085 | 3 | .009 | 4 | -.292 | 4 | .019 | 4 |
| 125 | P32 | max | T | .004 | 4 | -.004 | 4 | .039 | 3 | 0 | 2 | .084 | 3 |
| 126 | | min | | -.009 | 3 | -.088 | 3 | .004 | 4 | -.721 | 4 | .007 | 4 |
| 127 | | max | B | 0 | 4 | -.017 | 4 | .036 | 3 | 0 | 2 | .077 | 3 |
| 128 | | min | | -.009 | 2 | -.081 | 3 | .008 | 4 | -.273 | 4 | .017 | 4 |
| 129 | P33 | max | T | .004 | 4 | -.002 | 4 | .037 | 3 | 2.307 | 4 | .079 | 3 |

## Envelope Plate/Shell Principal Stresses (Continued)

| | Plate | | Sur... | Sigma1 [ksi] | LC | Sigma2 [ksi] | LC | Tau Max [... | LC | Angle [rad] | LC | Von Mises [ksi] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | | min | | -.009 | 2 | -.083 | 3 | .003 | 4 | -.182 | 15 | .006 | 4 |
| 131 | | max | B | 0 | 4 | -.015 | 4 | .035 | 3 | 0 | 2 | .074 | 3 |
| 132 | | min | | -.009 | 2 | -.077 | 3 | .007 | 4 | -.242 | 4 | .015 | 4 |
| 133 | P34 | max | T | .004 | 4 | 0 | 4 | .035 | 3 | 2.16 | 4 | .074 | 3 |
| 134 | | min | | -.009 | 2 | -.077 | 3 | .003 | 4 | -.155 | 3 | .005 | 4 |
| 135 | | max | B | 0 | 4 | -.014 | 4 | .033 | 3 | 0 | 2 | .07 | 3 |
| 136 | | min | | -.009 | 2 | -.073 | 3 | .006 | 4 | -.194 | 4 | .013 | 4 |
| 137 | P35 | max | T | .005 | 4 | 0 | 4 | .033 | 3 | 1.969 | 4 | .069 | 3 |
| 138 | | min | | -.009 | 2 | -.072 | 3 | .002 | 4 | -.169 | 3 | .004 | 4 |
| 139 | | max | B | 0 | 4 | -.013 | 4 | .032 | 3 | 0 | 2 | .067 | 2 |
| 140 | | min | | -.009 | 2 | -.071 | 2 | .006 | 4 | -.179 | 3 | .012 | 4 |
| 141 | P36 | max | T | .005 | 4 | .001 | 4 | .031 | 2 | 1.71 | 4 | .068 | 2 |
| 142 | | min | | -.009 | 2 | -.072 | 2 | .002 | 4 | -.184 | 3 | .004 | 4 |
| 143 | | max | B | -.001 | 4 | -.012 | 4 | .031 | 2 | 0 | 2 | .067 | 2 |
| 144 | | min | | -.009 | 2 | -.071 | 2 | .005 | 4 | -.191 | 3 | .011 | 4 |
| 145 | P37 | max | T | .005 | 4 | .001 | 4 | .031 | 2 | 1.429 | 4 | .068 | 2 |
| 146 | | min | | -.009 | 2 | -.072 | 2 | .002 | 4 | -.2 | 3 | .004 | 4 |
| 147 | | max | B | -.001 | 4 | -.012 | 4 | .031 | 2 | .046 | 4 | .067 | 2 |
| 148 | | min | | -.009 | 2 | -.071 | 2 | .005 | 4 | -.204 | 3 | .011 | 4 |
| 149 | P38 | max | T | .005 | 4 | 0 | 4 | .031 | 2 | 1.176 | 4 | .068 | 2 |
| 150 | | min | | -.009 | 2 | -.072 | 2 | .002 | 4 | -.218 | 3 | .004 | 4 |
| 151 | | max | B | 0 | 4 | -.012 | 4 | .031 | 2 | .129 | 4 | .067 | 2 |
| 152 | | min | | -.009 | 2 | -.071 | 2 | .006 | 4 | -.216 | 3 | .012 | 4 |
| 153 | P39 | max | T | .005 | 4 | 0 | 4 | .031 | 2 | .989 | 4 | .068 | 2 |
| 154 | | min | | -.009 | 2 | -.072 | 2 | .003 | 4 | -.237 | 3 | .005 | 4 |
| 155 | | max | B | 0 | 4 | -.013 | 4 | .031 | 2 | .196 | 4 | .067 | 2 |
| 156 | | min | | -.009 | 2 | -.071 | 2 | .006 | 4 | -.229 | 3 | .013 | 4 |
| 157 | P40 | max | T | .004 | 4 | -.002 | 4 | .031 | 2 | .845 | 4 | .068 | 2 |
| 158 | | min | | -.009 | 2 | -.071 | 2 | .003 | 4 | -.258 | 3 | .006 | 4 |
| 159 | | max | B | 0 | 4 | -.015 | 4 | .031 | 2 | .244 | 4 | .067 | 2 |
| 160 | | min | | -.008 | 2 | -.071 | 2 | .007 | 4 | -.242 | 3 | .015 | 4 |
| 161 | P41 | max | T | .004 | 4 | -.004 | 4 | .031 | 2 | .733 | 4 | .068 | 2 |
| 162 | | min | | -.009 | 2 | -.071 | 2 | .004 | 4 | -.281 | 3 | .007 | 4 |
| 163 | | max | B | 0 | 4 | -.017 | 4 | .031 | 2 | .276 | 4 | .067 | 2 |
| 164 | | min | | -.008 | 2 | -.071 | 2 | .008 | 4 | -.254 | 3 | .017 | 4 |
| 165 | P42 | max | T | .004 | 4 | -.007 | 4 | .031 | 2 | .643 | 4 | .067 | 2 |
| 166 | | min | | -.009 | 2 | -.071 | 2 | .005 | 4 | -.308 | 3 | .009 | 4 |
| 167 | | max | B | 0 | 4 | -.019 | 4 | .031 | 2 | .295 | 4 | .067 | 2 |
| 168 | | min | | -.008 | 2 | -.071 | 2 | .009 | 4 | -.266 | 3 | .019 | 4 |
| 169 | P43 | max | T | .004 | 4 | -.009 | 4 | .031 | 2 | .569 | 4 | .067 | 2 |
| 170 | | min | | -.009 | 2 | -.071 | 2 | .006 | 4 | -.337 | 3 | .012 | 4 |
| 171 | | max | B | 0 | 4 | -.021 | 4 | .031 | 2 | .304 | 4 | .067 | 2 |
| 172 | | min | | -.008 | 2 | -.071 | 2 | .011 | 4 | -.277 | 3 | .021 | 4 |
| 173 | P44 | max | T | .003 | 4 | -.013 | 4 | .031 | 2 | .508 | 4 | .067 | 2 |
| 174 | | min | | -.009 | 2 | -.071 | 2 | .008 | 4 | -.371 | 3 | .014 | 4 |
| 175 | | max | B | 0 | 4 | -.024 | 4 | .031 | 2 | .306 | 4 | .067 | 2 |
| 176 | | min | | -.008 | 2 | -.071 | 2 | .011 | 15 | -.288 | 3 | .024 | 15 |
| 177 | P45 | max | T | .003 | 4 | -.016 | 4 | .031 | 2 | .456 | 4 | .067 | 2 |
| 178 | | min | | -.009 | 2 | -.071 | 2 | .009 | 4 | -.41 | 3 | .018 | 4 |
| 179 | | max | B | 0 | 4 | -.026 | 15 | .031 | 2 | .304 | 4 | .067 | 2 |
| 180 | | min | | -.008 | 2 | -.071 | 2 | .012 | 15 | -.297 | 3 | .025 | 15 |
| 181 | P46 | max | T | .003 | 3 | -.016 | 3 | .031 | 2 | .411 | 4 | .067 | 2 |
| 182 | | min | | -.009 | 2 | -.071 | 2 | .009 | 3 | -.456 | 3 | .017 | 3 |
| 183 | | max | B | 0 | 3 | -.026 | 12 | .031 | 2 | .298 | 4 | .067 | 2 |
| 184 | | min | | -.008 | 2 | -.071 | 2 | .012 | 12 | -.303 | 3 | .025 | 12 |
| 185 | P47 | max | T | .003 | 3 | -.012 | 3 | .031 | 2 | .373 | 4 | .067 | 2 |
| 186 | | min | | -.009 | 2 | -.071 | 2 | .008 | 3 | -.51 | 3 | .014 | 3 |





## Envelope Plate/Shell Principal Stresses (Continued)

| | Plate | | Sur... | Sigma1 [ksi] | LC | Sigma2 [ksi] | LC | Tau Max [... | LC | Angle [rad] | LC | Von Mises [ksi] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 187 | | max | B | 0 | 3 | -.024 | 3 | .031 | 2 | .289 | 4 | .067 | 2 |
| 188 | | min | | -.008 | 2 | -.071 | 2 | .011 | 12 | -.307 | 3 | .023 | 12 |
| 189 | P48 | max | T | .004 | 3 | -.009 | 3 | .031 | 2 | .34 | 4 | .067 | 2 |
| 190 | | min | | -.009 | 2 | -.071 | 2 | .006 | 3 | -.575 | 3 | .011 | 3 |
| 191 | | max | B | 0 | 3 | -.021 | 3 | .031 | 2 | .279 | 4 | .067 | 2 |
| 192 | | min | | -.008 | 2 | -.07 | 2 | .01 | 3 | -.306 | 3 | .021 | 3 |
| 193 | P49 | max | T | .004 | 3 | -.006 | 3 | .031 | 2 | .311 | 4 | .067 | 2 |
| 194 | | min | | -.009 | 2 | -.071 | 2 | .005 | 3 | -.655 | 3 | .009 | 3 |
| 195 | | max | B | 0 | 3 | -.019 | 3 | .031 | 2 | .268 | 4 | .067 | 2 |
| 196 | | min | | -.008 | 2 | -.07 | 2 | .009 | 3 | -.298 | 3 | .018 | 3 |
| 197 | P50 | max | T | .004 | 3 | -.004 | 3 | .031 | 2 | .284 | 4 | .067 | 2 |
| 198 | | min | | -.009 | 2 | -.071 | 2 | .004 | 3 | -.754 | 3 | .007 | 3 |
| 199 | | max | B | 0 | 3 | -.016 | 3 | .031 | 2 | .256 | 4 | .067 | 2 |
| 200 | | min | | -.008 | 2 | -.07 | 2 | .008 | 3 | -.28 | 3 | .016 | 3 |
| 201 | P51 | max | T | .005 | 3 | -.002 | 3 | .031 | 2 | 2.263 | 3 | .067 | 2 |
| 202 | | min | | -.009 | 2 | -.071 | 2 | .003 | 3 | -.188 | 13 | .006 | 3 |
| 203 | | max | B | 0 | 3 | -.014 | 3 | .031 | 2 | .244 | 4 | .067 | 2 |
| 204 | | min | | -.008 | 2 | -.07 | 2 | .007 | 3 | -.25 | 3 | .014 | 3 |
| 205 | P52 | max | T | .005 | 3 | 0 | 3 | .031 | 2 | 2.114 | 3 | .067 | 2 |
| 206 | | min | | -.009 | 2 | -.071 | 2 | .003 | 3 | -.157 | 13 | .005 | 3 |
| 207 | | max | B | 0 | 3 | -.013 | 3 | .031 | 2 | .231 | 4 | .066 | 2 |
| 208 | | min | | -.008 | 2 | -.07 | 2 | .006 | 3 | -.2 | 3 | .013 | 3 |
| 209 | P53 | max | T | .005 | 3 | 0 | 3 | .031 | 2 | 1.911 | 3 | .067 | 2 |
| 210 | | min | | -.009 | 2 | -.071 | 2 | .002 | 3 | -.116 | 13 | .005 | 3 |
| 211 | | max | B | 0 | 3 | -.012 | 3 | .031 | 2 | .219 | 4 | .066 | 2 |
| 212 | | min | | -.008 | 2 | -.07 | 2 | .005 | 3 | -.134 | 3 | .011 | 3 |
| 213 | P54 | max | T | .005 | 3 | .001 | 3 | .031 | 2 | 1.684 | 3 | .067 | 2 |
| 214 | | min | | -.009 | 2 | -.071 | 2 | .002 | 3 | -.067 | 13 | .005 | 3 |
| 215 | | max | B | -.001 | 3 | -.011 | 3 | .031 | 2 | .206 | 4 | .066 | 2 |
| 216 | | min | | -.008 | 2 | -.07 | 2 | .005 | 3 | -.047 | 3 | .011 | 3 |
| 217 | P55 | max | T | .005 | 3 | .001 | 3 | .031 | 2 | 1.452 | 3 | .067 | 2 |
| 218 | | min | | -.009 | 2 | -.071 | 2 | .002 | 3 | -.014 | 13 | .005 | 3 |
| 219 | | max | B | -.001 | 3 | -.011 | 3 | .031 | 2 | .194 | 4 | .066 | 2 |
| 220 | | min | | -.008 | 2 | -.07 | 2 | .005 | 3 | -.006 | 13 | .011 | 3 |
| 221 | P56 | max | T | .005 | 3 | 0 | 3 | .032 | 4 | 1.235 | 3 | .068 | 4 |
| 222 | | min | | -.008 | 2 | -.071 | 4 | .002 | 3 | 0 | 2 | .005 | 3 |
| 223 | | max | B | 0 | 3 | -.012 | 3 | .031 | 4 | .181 | 4 | .066 | 2 |
| 224 | | min | | -.008 | 2 | -.07 | 2 | .005 | 3 | 0 | 2 | .011 | 3 |
| 225 | P57 | max | T | .005 | 3 | 0 | 3 | .035 | 4 | 1.041 | 3 | .073 | 4 |
| 226 | | min | | -.008 | 2 | -.076 | 4 | .003 | 3 | 0 | 2 | .005 | 3 |
| 227 | | max | B | 0 | 3 | -.013 | 3 | .033 | 4 | .205 | 3 | .069 | 4 |
| 228 | | min | | -.008 | 2 | -.072 | 4 | .006 | 3 | 0 | 2 | .013 | 3 |
| 229 | P58 | max | T | .005 | 3 | -.002 | 3 | .037 | 4 | .896 | 3 | .078 | 4 |
| 230 | | min | | -.008 | 2 | -.082 | 4 | .003 | 3 | 0 | 2 | .006 | 3 |
| 231 | | max | B | 0 | 3 | -.014 | 3 | .035 | 4 | .255 | 3 | .073 | 4 |
| 232 | | min | | -.008 | 2 | -.076 | 4 | .007 | 3 | 0 | 2 | .014 | 3 |
| 233 | P59 | max | T | .005 | 3 | -.004 | 3 | .039 | 4 | .773 | 3 | .083 | 4 |
| 234 | | min | | -.009 | 4 | -.087 | 4 | .004 | 3 | 0 | 2 | .007 | 3 |
| 235 | | max | B | 0 | 3 | -.016 | 3 | .036 | 4 | .286 | 3 | .077 | 4 |
| 236 | | min | | -.008 | 2 | -.08 | 4 | .008 | 3 | 0 | 2 | .016 | 3 |
| 237 | P60 | max | T | .004 | 3 | -.006 | 3 | .041 | 4 | .673 | 3 | .087 | 4 |
| 238 | | min | | -.01 | 4 | -.092 | 4 | .005 | 3 | 0 | 2 | .009 | 3 |
| 239 | | max | B | 0 | 3 | -.018 | 3 | .038 | 4 | .304 | 3 | .08 | 4 |
| 240 | | min | | -.009 | 4 | -.084 | 4 | .009 | 3 | 0 | 2 | .018 | 3 |
| 241 | P61 | max | T | .004 | 3 | -.009 | 3 | .043 | 4 | .592 | 3 | .092 | 4 |
| 242 | | min | | -.011 | 4 | -.097 | 4 | .006 | 3 | 0 | 2 | .011 | 3 |
| 243 | | max | B | 0 | 3 | -.021 | 3 | .039 | 4 | .312 | 3 | .083 | 4 |

## Envelope Plate/Shell Principal Stresses (Continued)

| | Plate | | Sur... | Sigma1 [ksi] | LC | Sigma2 [ksi] | LC | Tau Max [... | LC | Angle [rad] | LC | Von Mises [ksi] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 244 | | min | | -.009 | 4 | -.087 | 4 | .01 | 3 | 0 | 2 | .021 | 3 |
| 245 | P62 | max | T | .003 | 3 | -.012 | 3 | .045 | 4 | .525 | 3 | .096 | 4 |
| 246 | | min | | -.012 | 4 | -.101 | 4 | .008 | 3 | 0 | 2 | .014 | 3 |
| 247 | | max | B | 0 | 3 | -.023 | 3 | .04 | 4 | .313 | 3 | .086 | 4 |
| 248 | | min | | -.01 | 4 | -.091 | 4 | .011 | 13 | 0 | 2 | .023 | 13 |
| 249 | P63 | max | T | .003 | 3 | -.016 | 3 | .047 | 4 | .468 | 3 | .1 | 4 |
| 250 | | min | | -.012 | 4 | -.106 | 4 | .009 | 3 | 0 | 2 | .017 | 3 |
| 251 | | max | B | 0 | 3 | -.026 | 13 | .042 | 4 | .309 | 3 | .089 | 4 |
| 252 | | min | | -.011 | 4 | -.094 | 4 | .012 | 13 | 0 | 2 | .025 | 13 |
| 253 | P64 | max | T | .002 | 3 | -.019 | 3 | .048 | 4 | .421 | 3 | .104 | 4 |
| 254 | | min | | -.013 | 4 | -.109 | 4 | .01 | 13 | 0 | 2 | .021 | 3 |
| 255 | | max | B | 0 | 3 | -.027 | 13 | .043 | 4 | .302 | 3 | .092 | 4 |
| 256 | | min | | -.011 | 4 | -.097 | 4 | .012 | 13 | 0 | 2 | .026 | 13 |
| 257 | P65 | max | T | .001 | 3 | -.024 | 3 | .05 | 4 | .38 | 3 | .107 | 4 |
| 258 | | min | | -.014 | 4 | -.113 | 4 | .011 | 13 | 0 | 2 | .023 | 13 |
| 259 | | max | B | 0 | 3 | -.029 | 13 | .044 | 4 | .293 | 3 | .094 | 4 |
| 260 | | min | | -.012 | 4 | -.099 | 4 | .013 | 13 | 0 | 2 | .028 | 13 |
| 261 | P66 | max | T | 0 | 3 | -.026 | 13 | .051 | 4 | .345 | 3 | .11 | 4 |
| 262 | | min | | -.014 | 4 | -.116 | 4 | .012 | 13 | 0 | 2 | .025 | 13 |
| 263 | | max | B | -.001 | 3 | -.031 | 13 | .045 | 4 | .282 | 3 | .096 | 4 |
| 264 | | min | | -.012 | 4 | -.102 | 4 | .014 | 13 | 0 | 2 | .029 | 13 |
| 265 | P67 | max | T | 0 | 3 | -.029 | 13 | .052 | 4 | .314 | 3 | .112 | 4 |
| 266 | | min | | -.015 | 4 | -.119 | 4 | .013 | 13 | 0 | 2 | .028 | 13 |
| 267 | | max | B | -.002 | 3 | -.033 | 13 | .046 | 4 | .271 | 3 | .098 | 4 |
| 268 | | min | | -.012 | 4 | -.104 | 4 | .015 | 13 | 0 | 2 | .031 | 13 |
| 269 | P68 | max | T | -.001 | 3 | -.031 | 13 | .053 | 4 | .287 | 3 | .115 | 4 |
| 270 | | min | | -.015 | 4 | -.121 | 4 | .014 | 13 | 0 | 2 | .03 | 13 |
| 271 | | max | B | -.002 | 3 | -.034 | 13 | .046 | 4 | .258 | 3 | .1 | 4 |
| 272 | | min | | -.013 | 4 | -.105 | 4 | .016 | 13 | 0 | 2 | .033 | 13 |
| 273 | P69 | max | T | -.002 | 3 | -.034 | 13 | .054 | 4 | .263 | 3 | .116 | 4 |
| 274 | | min | | -.015 | 4 | -.123 | 4 | .016 | 13 | 0 | 2 | .033 | 13 |
| 275 | | max | B | -.003 | 3 | -.037 | 13 | .047 | 4 | .245 | 3 | .101 | 4 |
| 276 | | min | | -.013 | 4 | -.107 | 4 | .017 | 13 | 0 | 2 | .035 | 13 |
| 277 | P70 | max | T | -.003 | 3 | -.037 | 13 | .055 | 4 | .241 | 3 | .118 | 4 |
| 278 | | min | | -.016 | 4 | -.125 | 4 | .017 | 13 | 0 | 2 | .035 | 13 |
| 279 | | max | B | -.003 | 3 | -.039 | 13 | .047 | 4 | .232 | 3 | .102 | 4 |
| 280 | | min | | -.013 | 4 | -.108 | 4 | .017 | 13 | 0 | 2 | .037 | 13 |
| 281 | P71 | max | T | -.004 | 12 | -.04 | 13 | .055 | 4 | .221 | 3 | .119 | 4 |
| 282 | | min | | -.016 | 4 | -.126 | 4 | .018 | 13 | 0 | 2 | .038 | 13 |
| 283 | | max | B | -.004 | 12 | -.041 | 13 | .048 | 4 | .219 | 3 | .102 | 4 |
| 284 | | min | | -.013 | 4 | -.108 | 4 | .018 | 13 | 0 | 2 | .039 | 13 |
| 285 | P72 | max | T | -.004 | 12 | -.043 | 13 | .055 | 4 | .203 | 3 | .119 | 4 |
| 286 | | min | | -.016 | 4 | -.126 | 4 | .019 | 13 | -.002 | 15 | .041 | 13 |
| 287 | | max | B | -.004 | 12 | -.043 | 13 | .048 | 4 | .207 | 3 | .103 | 4 |
| 288 | | min | | -.013 | 4 | -.109 | 4 | .019 | 13 | -.002 | 15 | .041 | 13 |

**Site Name:** Mankes Silo, CT
**Site Number:** 370624
**Tower Type:** MP
**Design Loads (Factored) - Analysis per TIA-222-G Standards**

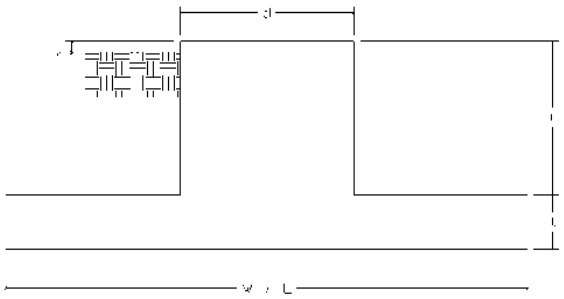
# Monolithic Mat & Pier Foundation Analysis

| Foundation Analysis Parameters | | |
|---|---|---|
| Design / Analysis / Mapping: | Mapping | - |
| Compression/Leg: | 488.3 | k |
| Uplift/Leg: | 0.0 | k |
| Total Shear: | 50.5 | k |
| Moment: | 2,030.0 | k-ft |
| Tower + Appurtenance Weight: | 488.3 | k |
| Depth to Base of Foundation (l + t - h): | 3.75 | ft |
| Diameter Base Plate (d): | 0 | ft |
| Length of Pier (l): | 0 | ft |
| Height of Pier above Ground (h): | 0 | ft |
| Width of Pad (W): | 19 | ft |
| Length of Pad (L): | 19 | ft |
| Thickness of Pad (t): | 3.75 | ft |
| Tower Leg Center to Center: | 0 | ft |
| Number of Tower Legs: | 1 | - |
| Tower Center from Mat Center: | 0 | ft |
| Depth Below Ground Surface to Water Table: | 99 | ft |
| Unit Weight of Concrete: | 150 | pcf |
| Unit Weight of Soil Above Water Table: | 100 | pcf |
| Unit Weight of Water: | 62.4 | pcf |
| Unit Weight of Soil Below Water Table: | 37.6 | pcf |
| Friction Angle of Uplift: | 15 | ° |
| Coefficient of Shear Friction: | 0.3 | - |
| Ultimate Compressive Bearing Pressure: | 10,000 | psf |
| Ultimate Passive Pressure on Pad Face: | 0 | psf |
| $f_{Soil\ and\ Concrete\ Weight}$: | 0.9 | - |
| $f_{Soil}$: | 0.75 | - |

| Overturning Moment Usage | | |
|---|---|---|
| Design OTM: | 2219.2 | k-ft |
| OTM Resistance: | 5277.6 | k-ft |
| Design OTM / OTM Resistance: | 42% | Pass |

| Soil Bearing Pressure Usage | | |
|---|---|---|
| Net Bearing Pressure: | 4706 | psf |
| Factored Nominal Bearing Pressure: | 7500 | psf |
| Factored Nominal (Net) Bearing Pressure: | 63% | Pass |
| Load Direction Controling Design Bearing Pressure: | *Diagonal to Pad Edge* | |

| Sliding Factor of Safety | | |
|---|---|---|
| Ultimate Friction Resistance: | 183.0 | k |
| Ultimate Passive Pressure Resistance: | 0.0 | k |
| Total Factored Sliding Resistance: | 137.2 | k |
| Sliding Design / Sliding Resistance: | 37% | Pass |



AMERICAN TOWER®
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# Antenna Mount Analysis Report

| | | |
|---|---|---|
| ATC Site Name | : | Mankes Silo, CT |
| ATC Site Number | : | 370624 |
| Engineering Number | : | 12984006_C8_02 |
| Mount Elevation | : | 70 ft |
| Carrier | : | Verizon Wireless |
| Carrier Site Name | : | Cheshire North CT |
| Carrier Site Number | : | 467326 |
| Site Location | : | 1338 Highland Ave<br>Cheshire, CT 06410<br>41.5369, -72.8933 |
| County | : | New Haven |
| Date | : | October 10, 2019 |
| Max Usage | : | 100% |
| Result | : | Pass |

Prepared By:
Charles Wally
Structural Engineer II

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32589
LICENSED
PROFESSIONAL ENGINEER

Authorized by "EOR"
Oct 10 2019 5:43 PM cosign

COA: PEC.0001553

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## Table of Contents

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## Introduction

The purpose of this report is to summarize results of the antenna mount analysis performed for Verizon Wireless at 70 ft.

## Analysis

| | |
|---|---|
| **Basic Wind Speed:** | 97 mph (3-Second Gust, Vasd) / 125 mph (3-Second Gust, Vult) |
| **Basic Wind Speed w/ Ice:** | 50 mph (3-Second Gust) w/ 3/4" radial ice concurrent |
| **Codes:** | ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code |
| **Structure Class:** | II |
| **Exposure Category:** | B |
| **Topographic Category:** | 1 |
| **Crest Height:** | 0 ft |
| **Spectral Response:** | $Ss = 0.19$, $S_1 = 0.06$ |
| **Site Class:** | D - Stiff Soil - Default |
| **Live Loads:** | Lm = 400 lbs, Lv = 250 lbs |

## Conclusion

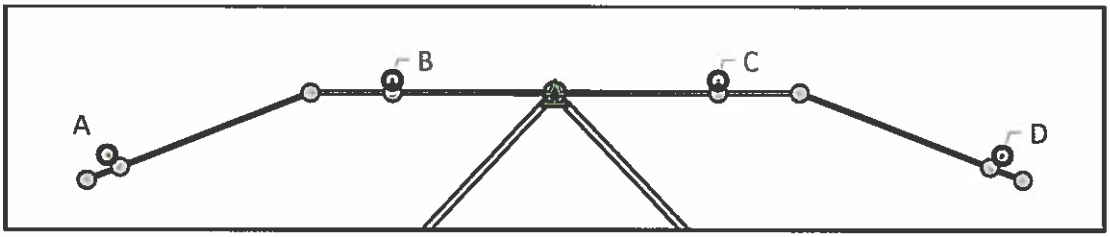
Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above. The mount can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

## Application Loading

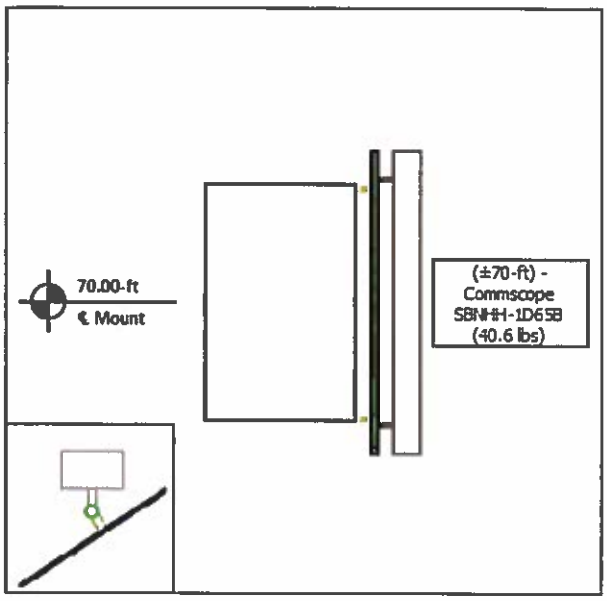
| Mount Centerline (ft) | Antenna Centerline (ft) | Qty | Antenna Model |
|---|---|---|---|
| 70.0 | 70.0 | 3 | Samsung B2/B66A RRH-BR049 |
| | | 3 | Samsung B5/B13 RRH-BR04C |
| | | 1 | RFS DB-T1-6Z-8AB-0Z |
| | | 12 | Commscope SBNHH-1D65B (40.6 lbs) |

## Mount Layout

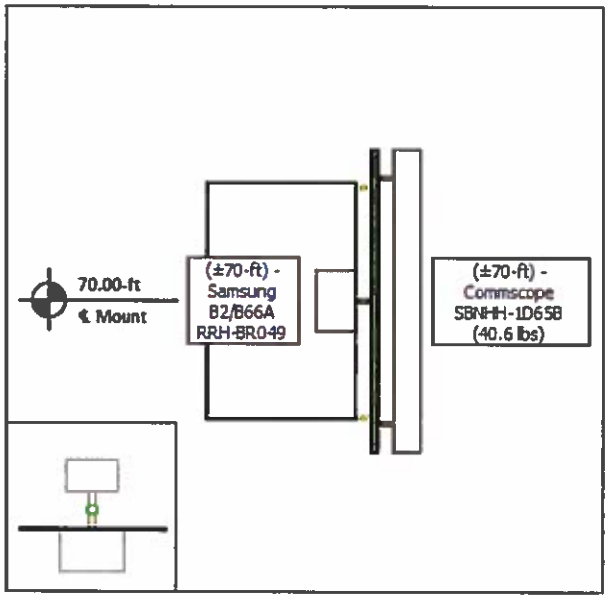


## Equipment Layout

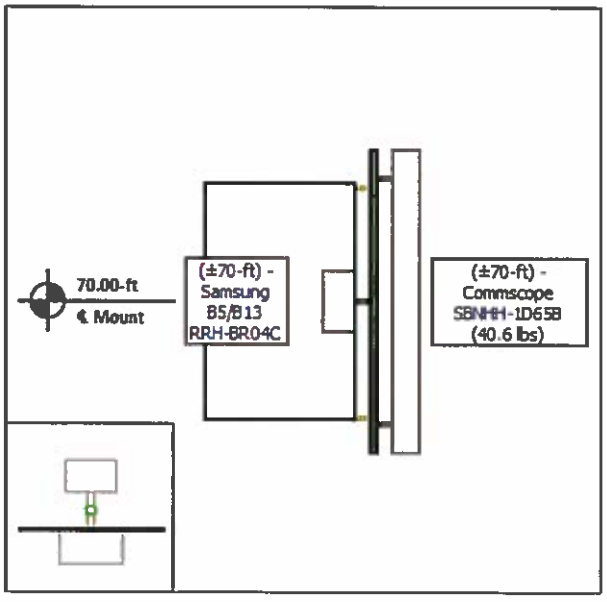
**Mount Pipe A**



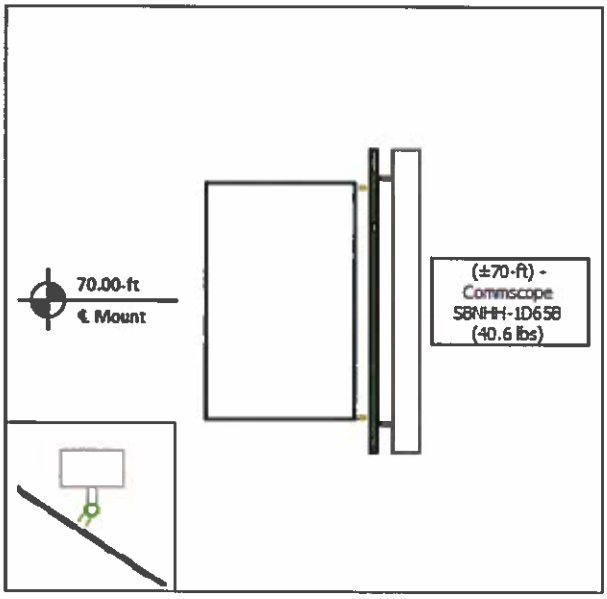

**Mount Pipe B**




**Mount Pipe C**




**Mount Pipe D**



**Standard Conditions**

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

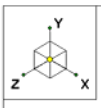
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

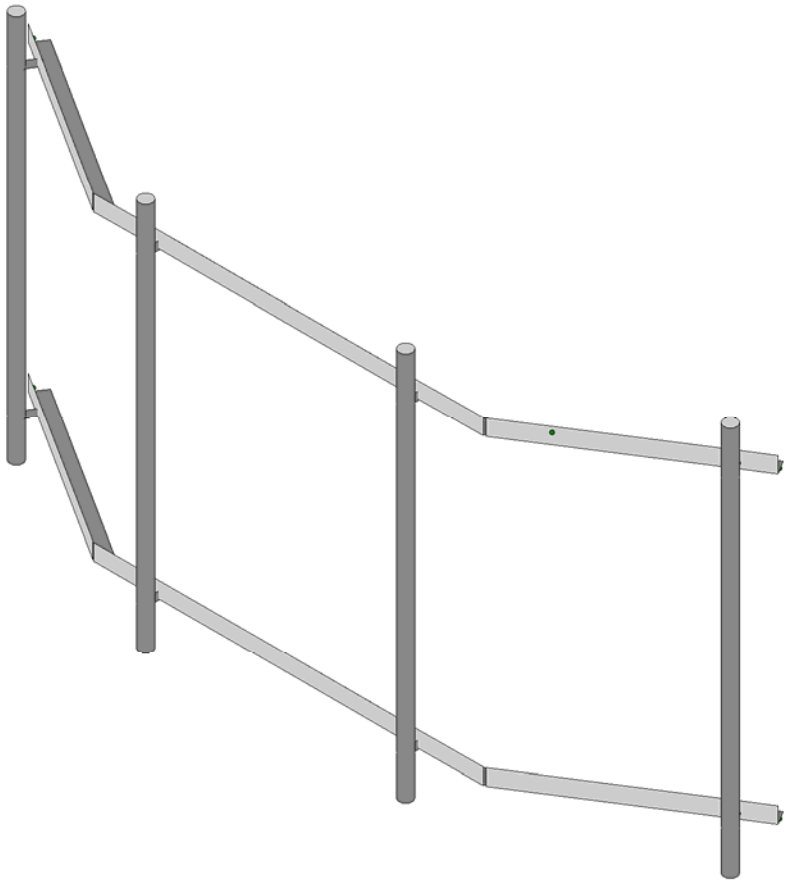
All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

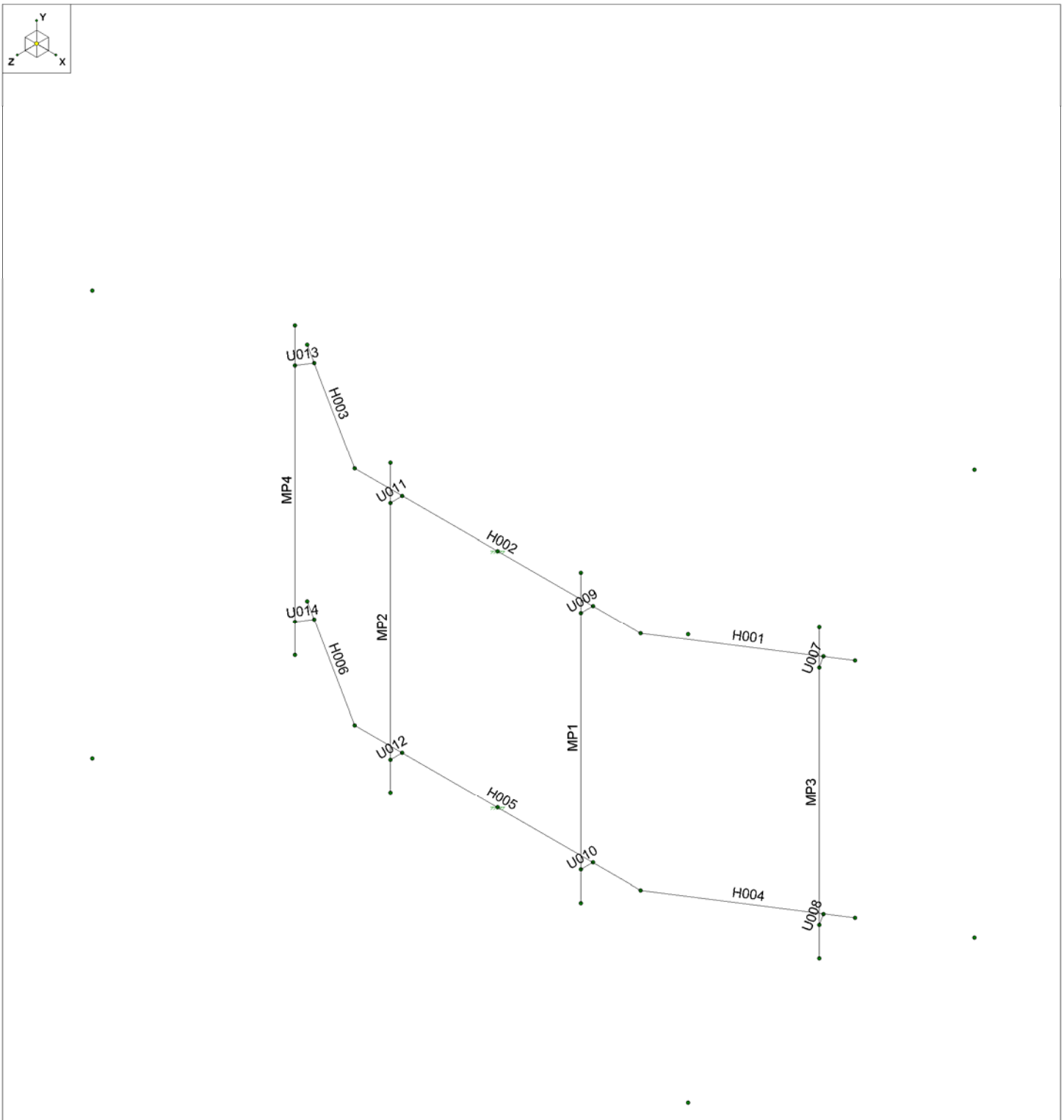
Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

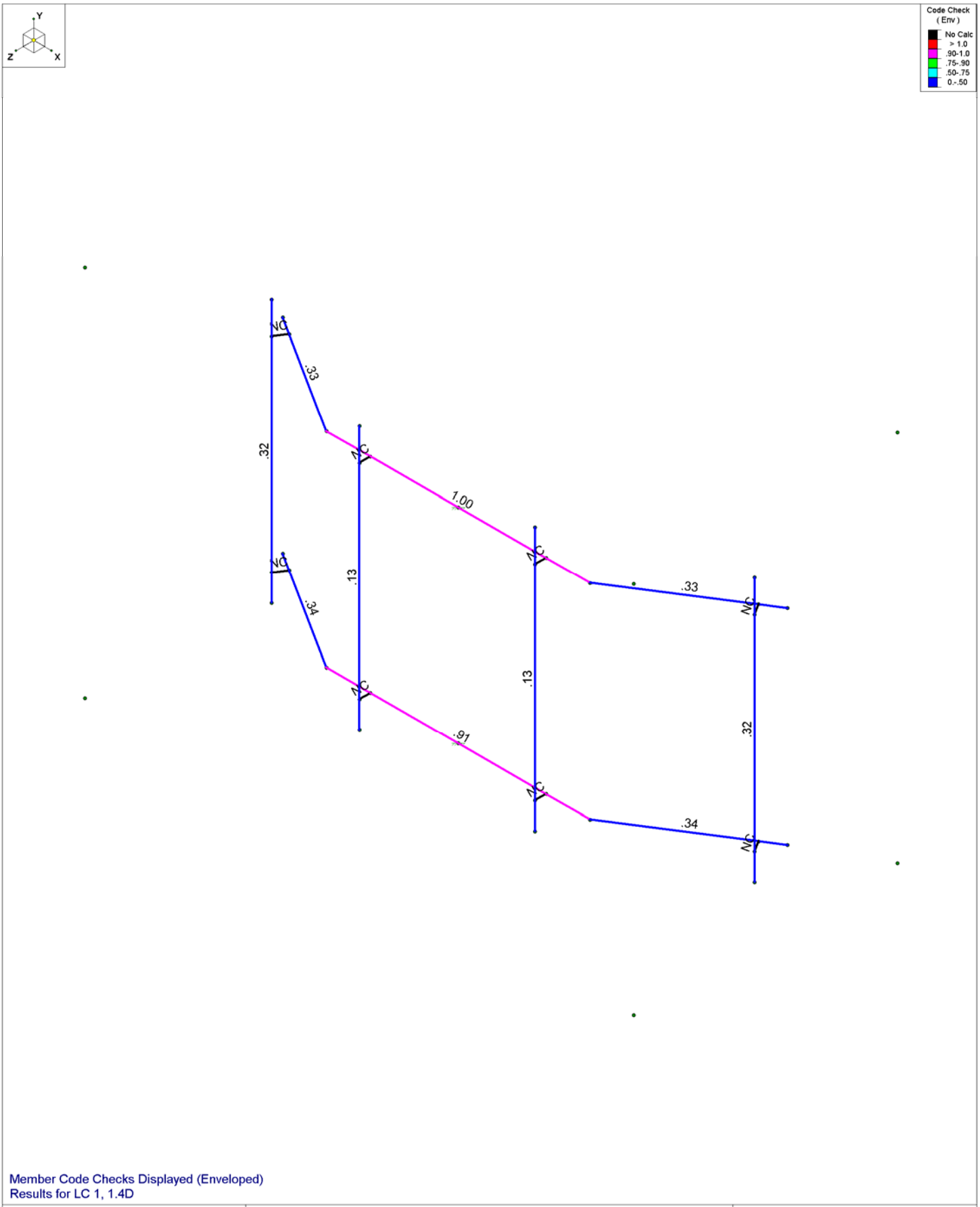


| | | |
|---|---|---|
| American Tower Corp. | | SK - 1 |
| Charles.Wally | 370624, Mankes Silo | Oct 10, 2019 at 10:07 AM |
| 12984006_C8_02 | 3D Rendering | R3D. VERIZON WIRELESS @ 370... |

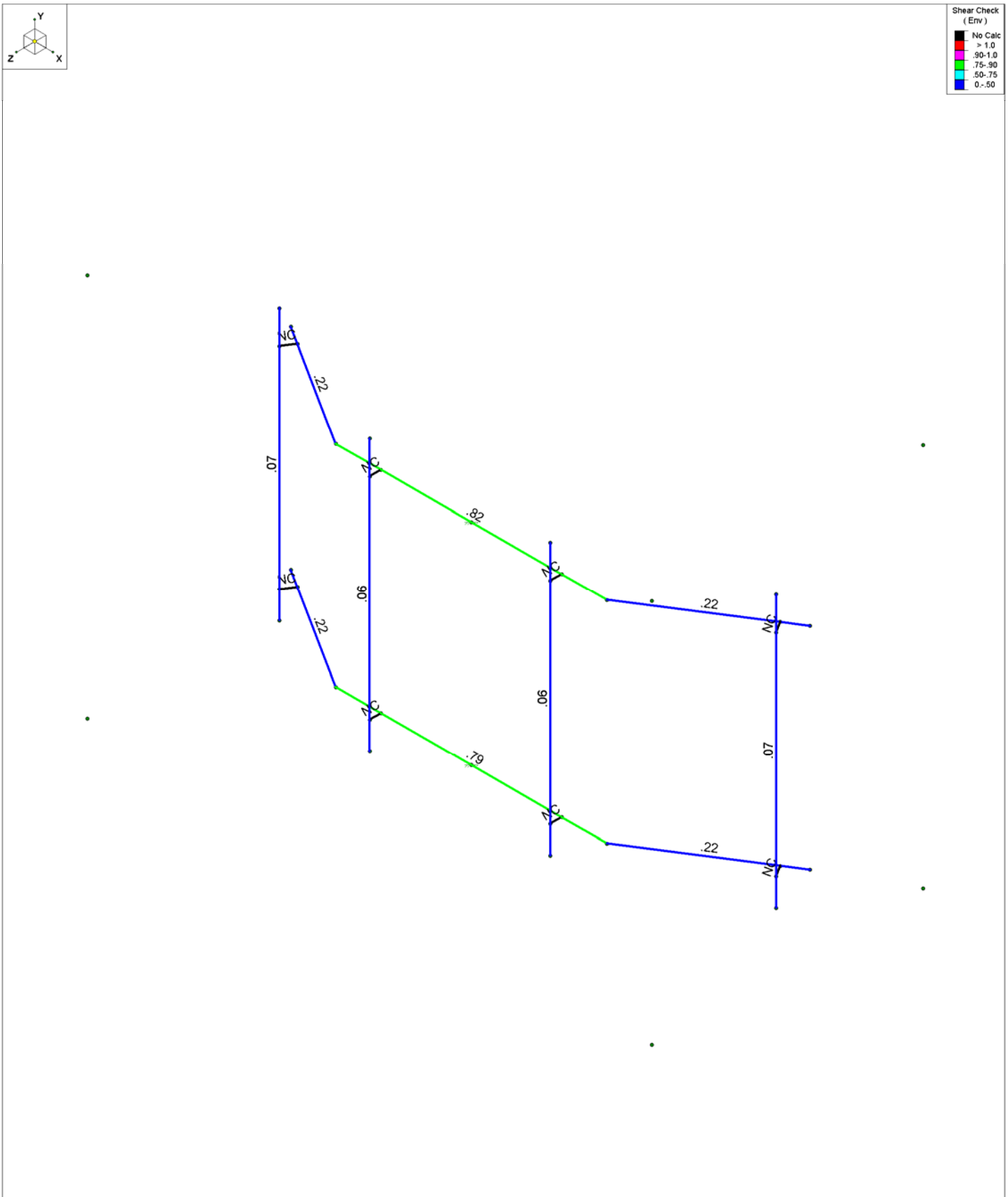



| | | |
|---|---|---|
| American Tower Corp. | | SK - 2 |
| Charles.Wally | 370624, Mankes Silo | Oct 10, 2019 at 10:13 AM |
| 12984006_C8_02 | Member Labels | R3D. VERIZON WIRELESS @ 370... |




Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.4D

| | | |
|---|---|---|
| American Tower Corp. | | SK - 3 |
| Charles.Wally | 370624, Mankes Silo | Oct 10, 2019 at 10:14 AM |
| 12984006_C8_02 | Unity Bending Checks | R3D. VERIZON WIRELESS @ 370... |




Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.4D

| | | |
|---|---|---|
| American Tower Corp. | | SK - 4 |
| Charles.Wally | 370624, Mankes Silo | Oct 10, 2019 at 10:14 AM |
| 12984006_C8_02 | Shear Checks | R3D. VERIZON WIRELESS @ 370... |

## Hot Rolled Steel Properties

| | Label | E [psi] | G [psi] | Nu | Therm (/1E.. | Density[lb/f... | Yield[psi] | Ry | Fu[psi] | Rt |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A36 | 2.9e+7 | 1.115e+7 | .3 | .65 | 490 | 36000 | 1.5 | 58000 | 1.2 |
| 2 | A572-50 | 2.9e+7 | 1.115e+7 | .3 | .65 | 490 | 50000 | 1.1 | 65000 | 1.1 |
| 3 | A500 Gr. B [RND] | 2.9e+7 | 1.115e+7 | .3 | .65 | 527 | 42000 | 1.4 | 58000 | 1.3 |
| 4 | A500 Gr. B [SQR] | 2.9e+7 | 1.115e+7 | .3 | .65 | 527 | 46000 | 1.4 | 58000 | 1.3 |
| 5 | A1085 | 2.9e+7 | 1.115e+7 | .3 | .65 | 490 | 50000 | 1.1 | 65000 | 1.1 |
| 6 | A53 Gr. B | 2.9e+7 | 1.115e+7 | .3 | .65 | 490 | 35000 | 1.6 | 60000 | 1.2 |
| 7 | A992 | 2.9e+7 | 1.115e+7 | .3 | .65 | 490 | 50000 | 1.1 | 65000 | 1.1 |
| 8 | SAE J429 Gr. 2 | 2.9e+7 | 1.115e+7 | .3 | .65 | 490 | 57000 | 1.1 | 74000 | 1.1 |

## Member Primary Data

| | Label | I Joint | J Joint | K Joint | Rotate(... | Section/Shape | Type | Design List | Material | Design Rules |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | H001 | N005 | N002 | | | L3x3x4 | Beam | None | A36 | Typical |
| 2 | H002 | N002 | N003 | | | L3x3x4 | Beam | None | A36 | Typical |
| 3 | H003 | N003 | N004 | | | L3x3x4 | Beam | None | A36 | Typical |
| 4 | H004 | N009 | N006 | | | L3x3x4 | Beam | None | A36 | Typical |
| 5 | H005 | N006 | N007 | | | L3x3x4 | Beam | None | A36 | Typical |
| 6 | H006 | N007 | N008 | | | L3x3x4 | Beam | None | A36 | Typical |
| 7 | U007 | N012 | N014 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 8 | U008 | N015 | N016 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 9 | U009 | N010 | N017 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 10 | U010 | N018 | N019 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 11 | U011 | N011 | N020 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 12 | U012 | N021 | N022 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 13 | U013 | N013 | N023 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 14 | U014 | N024 | N025 | | | (1) 1/2 U-Bolt | Beam | None | A36 | Typical |
| 15 | MP1 | MP1t | MP1b | | | PIPE_2.0 | Column | None | A53 Gr. B | Typical |
| 16 | MP2 | MP2t | MP2b | | | PIPE_2.0 | Column | None | A53 Gr. B | Typical |
| 17 | MP3 | MP3t | MP3b | | | PIPE_2.0 | Column | None | A53 Gr. B | Typical |
| 18 | MP4 | MP4t | MP4b | | | PIPE_2.0 | Column | None | A53 Gr. B | Typical |

## Basic Load Cases

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distribu.. | Area(M... | Surface... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dead | DL | | -1 | | | 10 | | | |
| 2 | Wind -Z | WLZ | | | | | 10 | | 1 | |
| 3 | Wind -X | WLX | | | | | 10 | | 1 | |
| 4 | Wind -Z (Working) | WLZP1 | | | | | 10 | | 1 | |
| 5 | Wind -X (Working) | WLXP1 | | | | | 10 | | 1 | |
| 6 | Lv (1) | LL | | | | | 1 | | | |
| 7 | Lv (2) | LL | | | | | 1 | | | |
| 8 | Lv (3) | LL | | | | | 1 | | | |
| 9 | Lv (4) | LL | | | | | 1 | | | |
| 10 | Lv (5) | LL | | | | | 1 | | | |
| 11 | Lv (6) | LL | | | | | 1 | | | |
| 12 | Lv (7) | LL | | | | 1 | | | | |
| 13 | Lv (8) | LL | | | | 1 | | | | |
| 14 | Lv (9) | LL | | | | 1 | | | | |
| 15 | Lv (10) | LL | | | | 1 | | | | |
| 16 | Lm (1) | LL | | | | 1 | | | | |
| 17 | Lm (2) | LL | | | | 1 | | | | |

## Basic Load Cases (Continued)

| | BLC Description | Category | X Gravity | Y Gravity | Z Gravity | Joint | Point | Distribu.. | Area(M... | Surface... |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Lm (3) | LL | | | | 1 | | | | |
| 19 | Lm (4) | LL | | | | 1 | | | | |
| 20 | BLC 4 Transient Area Loads | None | | | | | | 14 | | |
| 21 | BLC 5 Transient Area Loads | None | | | | | | 16 | | |

## Load Combinations

| | Description | Solve | PDe... | SRSS | B... | Fact... | BLC | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.4D | Yes | Y | | DL | 1.4 | | | | | | | | | | | | | | | | | | |
| 2 | 1.2D + 1.6Wo [0°] | | Y | | DL | 1.2 | WLX | .001 | W... | 1.6 | | | | | | | | | | | | | | |
| 3 | 1.2D + 1.6Wo [30°] | | Y | | DL | 1.2 | WLX | .8 | W... | 1.3... | | | | | | | | | | | | | | |
| 4 | 1.2D + 1.6Wo [60°] | | Y | | DL | 1.2 | WLX | 1.3... | W... | .8 | | | | | | | | | | | | | | |
| 5 | 1.2D + 1.6Wo [90°] | | Y | | DL | 1.2 | WLX | 1.6 | W... | .001 | | | | | | | | | | | | | | |
| 6 | 1.2D + 1.6Wo [120°] | | Y | | DL | 1.2 | WLX | 1.3... | W... | -.8 | | | | | | | | | | | | | | |
| 7 | 1.2D + 1.6Wo [150°] | | Y | | DL | 1.2 | WLX | .8 | W... | -1.... | | | | | | | | | | | | | | |
| 8 | 1.2D + 1.6Wo [180°] | | Y | | DL | 1.2 | WLX | .001 | W... | -1.6 | | | | | | | | | | | | | | |
| 9 | 1.2D + 1.6Wo [210°] | | Y | | DL | 1.2 | WLX | -.8 | W... | -1.... | | | | | | | | | | | | | | |
| 10 | 1.2D + 1.6Wo [240°] | | Y | | DL | 1.2 | WLX | -1.... | W... | -.8 | | | | | | | | | | | | | | |
| 11 | 1.2D + 1.6Wo [270°] | | Y | | DL | 1.2 | WLX | -1.6 | W... | .001 | | | | | | | | | | | | | | |
| 12 | 1.2D + 1.6Wo [300°] | | Y | | DL | 1.2 | WLX | -1.... | W... | .8 | | | | | | | | | | | | | | |
| 13 | 1.2D + 1.6Wo [330°] | | Y | | DL | 1.2 | WLX | -.8 | W... | 1.3... | | | | | | | | | | | | | | |
| 14 | 0.9D + 1.6Wo [0°] | | Y | | DL | .9 | WLX | .001 | W... | 1.6 | | | | | | | | | | | | | | |
| 15 | 0.9D + 1.6Wo [30°] | | Y | | DL | .9 | WLX | .8 | W... | 1.3... | | | | | | | | | | | | | | |
| 16 | 0.9D + 1.6Wo [60°] | | Y | | DL | .9 | WLX | 1.3... | W... | .8 | | | | | | | | | | | | | | |
| 17 | 0.9D + 1.6Wo [90°] | | Y | | DL | .9 | WLX | 1.6 | W... | .001 | | | | | | | | | | | | | | |
| 18 | 0.9D + 1.6Wo [120°] | | Y | | DL | .9 | WLX | 1.3... | W... | -.8 | | | | | | | | | | | | | | |
| 19 | 0.9D + 1.6Wo [150°] | | Y | | DL | .9 | WLX | .8 | W... | -1.... | | | | | | | | | | | | | | |
| 20 | 0.9D + 1.6Wo [180°] | | Y | | DL | .9 | WLX | .001 | W... | -1.6 | | | | | | | | | | | | | | |
| 21 | 0.9D + 1.6Wo [210°] | | Y | | DL | .9 | WLX | -.8 | W... | -1.... | | | | | | | | | | | | | | |
| 22 | 0.9D + 1.6Wo [240°] | | Y | | DL | .9 | WLX | -1.... | W... | -.8 | | | | | | | | | | | | | | |
| 23 | 0.9D + 1.6Wo [270°] | | Y | | DL | .9 | WLX | -1.6 | W... | .001 | | | | | | | | | | | | | | |
| 24 | 0.9D + 1.6Wo [300°] | | Y | | DL | .9 | WLX | -1.... | W... | .8 | | | | | | | | | | | | | | |
| 25 | 0.9D + 1.6Wo [330°] | | Y | | DL | .9 | WLX | -.8 | W... | 1.3... | | | | | | | | | | | | | | |
| 26 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | .001 | W... | 1 | | | | | | | | | | | | |
| 27 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | .5 | W... | .866 | | | | | | | | | | | | |
| 28 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | .866 | W... | .5 | | | | | | | | | | | | |
| 29 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | 1 | W... | .001 | | | | | | | | | | | | |
| 30 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | .866 | W... | -.5 | | | | | | | | | | | | |
| 31 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | .5 | W... | -.8... | | | | | | | | | | | | |
| 32 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | .001 | W... | -1 | | | | | | | | | | | | |
| 33 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | -.5 | W... | -.8... | | | | | | | | | | | | |
| 34 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | -.8... | W... | -.5 | | | | | | | | | | | | |
| 35 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | -1 | W... | .001 | | | | | | | | | | | | |
| 36 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | -.8... | W... | .5 | | | | | | | | | | | | |
| 37 | 1.2D + 1.0Di + 1.0Wi [... | | Y | | DL | 1.2 | IL | 1 | W... | -.5 | W... | .866 | | | | | | | | | | | | |
| 38 | 1.2D + 1.0Ev + 1.0Eh | | Y | | DL | 1.2 | ELY | 1 | ELZ | 1 | E... | 1 | | | | | | | | | | | | |
| 39 | 0.9D + 1.0Ev + 1.0Eh | | Y | | DL | 1.2 | ELY | 1 | ELZ | 1 | E... | 1 | | | | | | | | | | | | |
| 40 | 1.2D + 1.5Lv(1) | Yes | Y | | DL | 1.2 | 6 | 1.5 | | | | | | | | | | | | | | | | |
| 41 | 1.2D + 1.5Lv(2) | Yes | Y | | DL | 1.2 | 7 | 1.5 | | | | | | | | | | | | | | | | |
| 42 | 1.2D + 1.5Lv(3) | Yes | Y | | DL | 1.2 | 8 | 1.5 | | | | | | | | | | | | | | | | |
| 43 | 1.2D + 1.5Lv(4) | Yes | Y | | DL | 1.2 | 9 | 1.5 | | | | | | | | | | | | | | | | |
| 44 | 1.2D + 1.5Lv(5) | Yes | Y | | DL | 1.2 | 10 | 1.5 | | | | | | | | | | | | | | | | |
| 45 | 1.2D + 1.5Lv(6) | Yes | Y | | DL | 1.2 | 11 | 1.5 | | | | | | | | | | | | | | | | |
| 46 | 1.2D + 1.5Lv(7) | Yes | Y | | DL | 1.2 | 12 | 1.5 | | | | | | | | | | | | | | | | |
| 47 | 1.2D + 1.5Lv(8) | Yes | Y | | DL | 1.2 | 13 | 1.5 | | | | | | | | | | | | | | | | |
| 48 | 1.2D + 1.5Lv(9) | Yes | Y | | DL | 1.2 | 14 | 1.5 | | | | | | | | | | | | | | | | |

## Load Combinations (Continued)

| | Description | Solve | PDe... | SRSS | B... | Fact... | BLC | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 1.2D + 1.5Lv(10) | Yes | Y | | DL | 1.2 | 15 | 1.5 | | | | | | | | | | | | | | | | |
| 50 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | .001 | W... | 1 | | | | | | | | | | | | |
| 51 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | .5 | W... | .866 | | | | | | | | | | | | |
| 52 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | .866 | W... | .5 | | | | | | | | | | | | |
| 53 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | 1 | W... | .001 | | | | | | | | | | | | |
| 54 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | .866 | W... | -.5 | | | | | | | | | | | | |
| 55 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | .5 | W... | -.8... | | | | | | | | | | | | |
| 56 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | .001 | W... | -.5 | | | | | | | | | | | | |
| 57 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | -.5 | W... | -.8... | | | | | | | | | | | | |
| 58 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | -.8... | W... | -.5 | | | | | | | | | | | | |
| 59 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | -1 | W... | .001 | | | | | | | | | | | | |
| 60 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | -.8... | W... | .5 | | | | | | | | | | | | |
| 61 | 1.2D + 1.5Lm(1) + 1.0... | Yes | Y | | DL | 1.2 | 16 | 1.5 | W... | -.5 | W... | .866 | | | | | | | | | | | | |
| 62 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | .001 | W... | 1 | | | | | | | | | | | | |
| 63 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | .5 | W... | .866 | | | | | | | | | | | | |
| 64 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | .866 | W... | .5 | | | | | | | | | | | | |
| 65 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | 1 | W... | .001 | | | | | | | | | | | | |
| 66 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | .866 | W... | -.5 | | | | | | | | | | | | |
| 67 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | .5 | W... | -.8... | | | | | | | | | | | | |
| 68 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | .001 | W... | -.5 | | | | | | | | | | | | |
| 69 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | -.5 | W... | -.8... | | | | | | | | | | | | |
| 70 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | -.8... | W... | -.5 | | | | | | | | | | | | |
| 71 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | -1 | W... | .001 | | | | | | | | | | | | |
| 72 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | -.8... | W... | .5 | | | | | | | | | | | | |
| 73 | 1.2D + 1.5Lm(2) + 1.0... | Yes | Y | | DL | 1.2 | 17 | 1.5 | W... | -.5 | W... | .866 | | | | | | | | | | | | |
| 74 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | .001 | W... | 1 | | | | | | | | | | | | |
| 75 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | .5 | W... | .866 | | | | | | | | | | | | |
| 76 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | .866 | W... | .5 | | | | | | | | | | | | |
| 77 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | 1 | W... | .001 | | | | | | | | | | | | |
| 78 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | .866 | W... | -.5 | | | | | | | | | | | | |
| 79 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | .5 | W... | -.8... | | | | | | | | | | | | |
| 80 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | .001 | W... | -.5 | | | | | | | | | | | | |
| 81 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | -.5 | W... | -.8... | | | | | | | | | | | | |
| 82 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | -.8... | W... | -.5 | | | | | | | | | | | | |
| 83 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | -1 | W... | .001 | | | | | | | | | | | | |
| 84 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | -.8... | W... | .5 | | | | | | | | | | | | |
| 85 | 1.2D + 1.5Lm(3) + 1.0... | Yes | Y | | DL | 1.2 | 18 | 1.5 | W... | -.5 | W... | .866 | | | | | | | | | | | | |
| 86 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | .001 | W... | 1 | | | | | | | | | | | | |
| 87 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | .5 | W... | .866 | | | | | | | | | | | | |
| 88 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | .866 | W... | .5 | | | | | | | | | | | | |
| 89 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | 1 | W... | .001 | | | | | | | | | | | | |
| 90 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | .866 | W... | -.5 | | | | | | | | | | | | |
| 91 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | .5 | W... | -.8... | | | | | | | | | | | | |
| 92 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | .001 | W... | -.5 | | | | | | | | | | | | |
| 93 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | -.5 | W... | -.8... | | | | | | | | | | | | |
| 94 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | -.8... | W... | -.5 | | | | | | | | | | | | |
| 95 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | -1 | W... | .001 | | | | | | | | | | | | |
| 96 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | -.8... | W... | .5 | | | | | | | | | | | | |
| 97 | 1.2D + 1.5Lm(4) + 1.0... | Yes | Y | | DL | 1.2 | 19 | 1.5 | W... | -.5 | W... | .866 | | | | | | | | | | | | |

## Envelope Joint Reactions

| | Joint | | X [lb] | LC | Y [lb] | LC | Z [lb] | LC | MX [lb-ft] | LC | MY [lb-ft] | LC | MZ [lb-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N001 | max | 265.268 | 89 | 726.594 | 93 | 246.843 | 74 | 3.134 | 93 | 339.634 | 95 | 1267.116 | 78 |
| 2 | | min | -263.927 | 83 | 339.117 | 44 | -38.513 | 67 | -.686 | 62 | -342.381 | 77 | -1296.542 | 94 |
| 3 | N026 | max | 260.804 | 77 | 667.004 | 44 | 41.861 | 62 | 4.504 | 86 | 345.618 | 83 | 905.339 | 77 |

## Envelope Joint Reactions (Continued)

| | Joint | | X [lb] | LC | Y [lb] | LC | Z [lb] | LC | MX [lb-ft] | LC | MY [lb-ft] | LC | MZ [lb-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | min | -262.145 | 95 | 292.004 | 41 | -237.711 | 79 | -.615 | 57 | -342.864 | 89 | -937.344 | 95 |
| 5 | Totals: | max | 53.681 | 89 | 1231.122 | 97 | 96.156 | 86 | | | | | | |
| 6 | | min | -53.681 | 59 | 736.309 | 1 | -83.271 | 55 | | | | | | |

## Envelope AISC 15th(360-16): LRFD Steel Code Checks

| | Member | Shape | Code Check | Loc[in] | LC | Shear Ch... | Loc[in] | Dir | LC | phi*Pnc... | phi*Pnt [... | phi*Mn ... | phi*Mn z-z ... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | H001 | L3x3x4 | .333 | 6.112 | 81 | .218 | 39.115 | y | 74 | 16500.... | 46656 | 1688.1... | 3755.745 | 1.8... | H2-1 |
| 2 | H002 | L3x3x4 | .995 | 36 | 91 | .817 | 60 | y | 97 | 19367.... | 46656 | 1688.1... | 3416.143 | 1.5... | H2-1 |
| 3 | H003 | L3x3x4 | .334 | 33.003 | 91 | .218 | 0 | y | 86 | 16500.... | 46656 | 1688.1... | 3755.745 | 1.8... | H2-1 |
| 4 | H004 | L3x3x4 | .340 | 6.112 | 79 | .217 | 39.115 | y | 74 | 16500.... | 46656 | 1688.1... | 3755.745 | 1.84 | H2-1 |
| 5 | H005 | L3x3x4 | .907 | 36 | 93 | .795 | 11.25 | y | 75 | 19367.... | 46656 | 1688.1... | 3347.247 | 1.4... | H2-1 |
| 6 | H006 | L3x3x4 | .340 | 33.003 | 93 | .217 | 0 | y | 86 | 16500.... | 46656 | 1688.1... | 3755.745 | 1.84 | H2-1 |
| 7 | MP1 | PIPE_2.0 | .135 | 64.5 | 79 | .059 | 9 | | 47 | 6195.8... | 32130 | 1871.6... | 1871.625 | 1.9... | H1-1b |
| 8 | MP2 | PIPE_2.0 | .134 | 64.5 | 93 | .059 | 9 | | 46 | 6195.8... | 32130 | 1871.6... | 1871.625 | 1.9... | H1-1b |
| 9 | MP3 | PIPE_2.0 | .317 | 64.5 | 79 | .072 | 9 | | 49 | 6195.8... | 32130 | 1871.6... | 1871.625 | 1.9... | H1-1b |
| 10 | MP4 | PIPE_2.0 | .317 | 64.5 | 93 | .072 | 9 | | 48 | 6195.8... | 32130 | 1871.6... | 1871.625 | 1.9... | H1-1b |

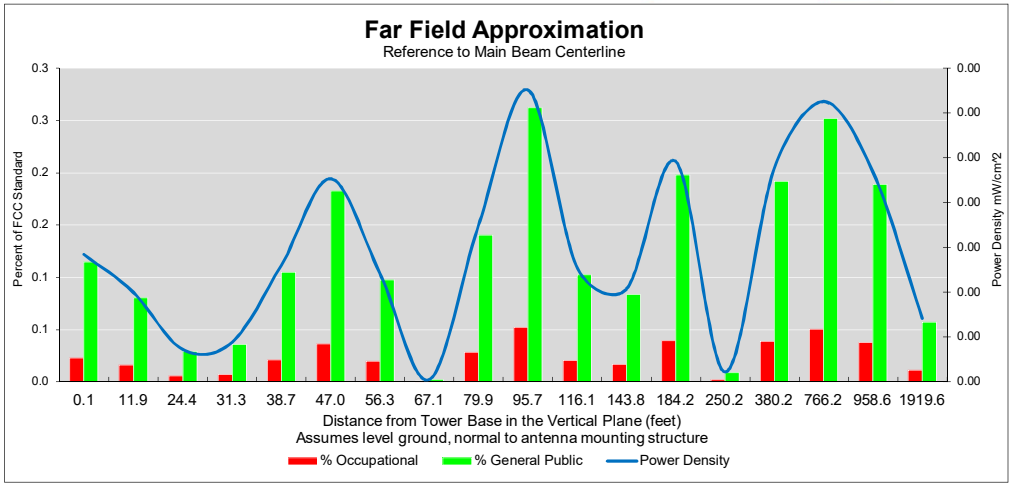
Far Field Approximation
with downtilt variation

**Estimated Radiated Emission**
**Single Emitter Far Field Model**
**Dipole/Wire/Yagi Antenna Types**

verizonwireless

| | |
|---|---|
| Location: | **CHESHIRE NORTH CT** |
| Site #: | 2-0337 |
| Date: | 11/05/19 |
| Name: | Ziad Cheiban |
| File Name: | |

| | |
|---|---|
| Operating Freq. (MHz): | **746.0** |
| Antenna Height (ft): | **70.0** |
| Antenna Gain (dBi): | **14.9** |
| Antenna Size (in.): | **72.9** |
| Downtilt (degrees): | **0.0** |
| Feedline Loss (dB): | **0.0** |
| Tx Power (W): | **160.0** |
| No. of Channels: | **1** |




| Calc Angle | 90.0 | 80.0 | 70.0 | 65.0 | 60.0 | 55.0 | 50.0 | 45.0 | 40.0 | 35.0 | 30.0 | 25.0 | 20.0 | 15.0 | 10.0 | 5.0 | 4.0 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solve for r, dx to antenna | 67.0 | 68.0 | 71.3 | 73.9 | 77.4 | 81.8 | 87.5 | 94.8 | 104.3 | 116.9 | 134.1 | 158.6 | 196.0 | 259.0 | 386.0 | 769.1 | 961.0 | 1920.8 |
| Distance from Antenna Structure Base in Horizontal plane | 0.1 | 11.9 | 24.4 | 31.3 | 38.7 | 47.0 | 56.3 | 67.1 | 79.9 | 95.7 | 116.1 | 143.8 | 184.2 | 250.2 | 380.2 | 766.2 | 958.6 | 1919.6 |
| Angle from Main Beam (reference to horizontal plane) | 90 | 80 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 4 | 2 |
| dB down from centerline (referenced to centerline) | 26.28 | 27.68 | 31.7 | 30.5 | 25.42 | 22.52 | 24.67 | 40.88 | 21.55 | 17.85 | 20.73 | 20.18 | 14.58 | 25.68 | 8.82 | 1.66 | 0.98 | 0.16 |
| Reflection Coefficient (1 to 4, 2.56 typical) | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 |
| Power Density (mW/cm^2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Percent of Occupational Standard | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Percent of General Population Standard | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.0 | 0.1 | 0.3 | 0.1 | 0.1 | 0.2 | 0.0 | 0.2 | 0.3 | 0.2 | 0.1 |

Antenna Type: **SBNHH-1D65B**

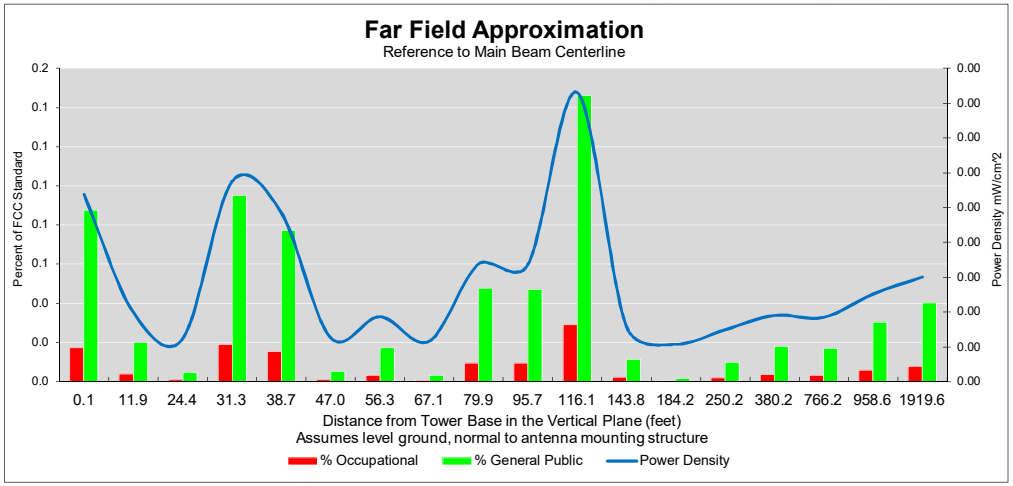
Max%: **0.26%**

Far Field Approximation
with downtilt variation

**Estimated Radiated Emission**
**Single Emitter Far Field Model**
**Dipole/Wire/Yagi Antenna Types**

| | |
|---|---|
| Location: | **CHESHIRE NORTH CT** |
| Site #: | 2-0337 |
| Date: | 11/05/19 |
| Name: | Ziad Cheiban |
| File Name: | |

| | |
|---|---|
| Operating Freq. (MHz): | **2145.0** |
| Antenna Height (ft): | **70.0** |
| Antenna Gain (dBi): | **18.6** |
| Antenna Size (in.): | **72.9** |
| Downtilt (degrees): | **0.0** |
| Feedline Loss (dB): | **0.0** |
| Tx Power (W): | **160.0** |
| No. of Channels: | **1** |




| Calc Angle | 90.0 | 80.0 | 70.0 | 65.0 | 60.0 | 55.0 | 50.0 | 45.0 | 40.0 | 35.0 | 30.0 | 25.0 | 20.0 | 15.0 | 10.0 | 5.0 | 4.0 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solve for r, dx to antenna | 67.0 | 68.0 | 71.3 | 73.9 | 77.4 | 81.8 | 87.5 | 94.8 | 104.3 | 116.9 | 134.1 | 158.6 | 196.0 | 259.0 | 386.0 | 769.1 | 961.0 | 1920.8 |
| Distance from Antenna Structure Base in Horizontal plane | 0.1 | 11.9 | 24.4 | 31.3 | 38.7 | 47.0 | 56.3 | 67.1 | 79.9 | 95.7 | 116.1 | 143.8 | 184.2 | 250.2 | 380.2 | 766.2 | 958.6 | 1919.6 |
| Angle from Main Beam (reference to horizontal plane) | 90 | 80 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 4 | 2 |
| dB down from centerline (referenced to centerline) | 28.11 | 34.42 | 40.22 | 26.9 | 27.41 | 38.56 | 32.82 | 39.33 | 26.91 | 25.96 | 19.86 | 29.41 | 36.25 | 25.84 | 19.74 | 14.02 | 9.57 | 2.35 |
| Reflection Coefficient (1 to 4, 2.56 typical) | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 |
| Power Density (mW/cm^2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Percent of Occupational Standard | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Percent of General Population Standard | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Antenna Type: **SBNHH-1D65B**

Max%: **0.15%**

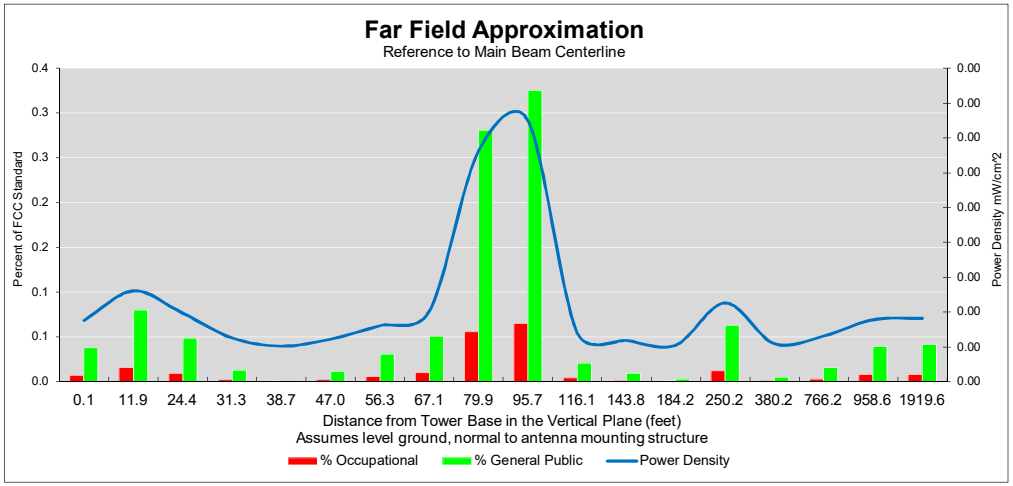
Far Field Approximation
with downtilt variation

**Estimated Radiated Emission**
**Single Emitter Far Field Model**
**Dipole/Wire/Yagi Antenna Types**

verizonwireless

| | |
|---|---|
| Location: | **CHESHIRE NORTH CT** |
| Site #: | 2-0337 |
| Date: | 11/05/19 |
| Name: | Ziad Cheiban |
| File Name: | |

| | |
|---|---|
| Operating Freq. (MHz): | **1970.0** |
| Antenna Height (ft): | **70.0** |
| Antenna Gain (dBi): | **18.2** |
| Antenna Size (in.): | **72.9** |
| Downtilt (degrees): | **0.0** |
| Feedline Loss (dB): | **0.0** |
| Tx Power (W): | **160.0** |
| No. of Channels: | **1** |




| Calc Angle | 90.0 | 80.0 | 70.0 | 65.0 | 60.0 | 55.0 | 50.0 | 45.0 | 40.0 | 35.0 | 30.0 | 25.0 | 20.0 | 15.0 | 10.0 | 5.0 | 4.0 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solve for r, dx to antenna | 67.0 | 68.0 | 71.3 | 73.9 | 77.4 | 81.8 | 87.5 | 94.8 | 104.3 | 116.9 | 134.1 | 158.6 | 196.0 | 259.0 | 386.0 | 769.1 | 961.0 | 1920.8 |
| Distance from Antenna Structure Base in Horizontal plane | 0.1 | 11.9 | 24.4 | 31.3 | 38.7 | 47.0 | 56.3 | 67.1 | 79.9 | 95.7 | 116.1 | 143.8 | 184.2 | 250.2 | 380.2 | 766.2 | 958.6 | 1919.6 |
| Angle from Main Beam (reference to horizontal plane) | 90 | 80 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 4 | 2 |
| dB down from centerline (referenced to centerline) | 31.31 | 27.94 | 29.73 | 35.14 | 45.47 | 34.86 | 29.95 | 27.04 | 18.8 | 17.18 | 27.98 | 29.89 | 33.47 | 17.38 | 25.09 | 13.97 | 8.07 | 1.83 |
| Reflection Coefficient (1 to 4, 2.56 typical) | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 |
| Power Density (mW/cm^2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Percent of Occupational Standard | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Percent of General Population Standard | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |

Antenna Type: **SBNHH-1D65B**

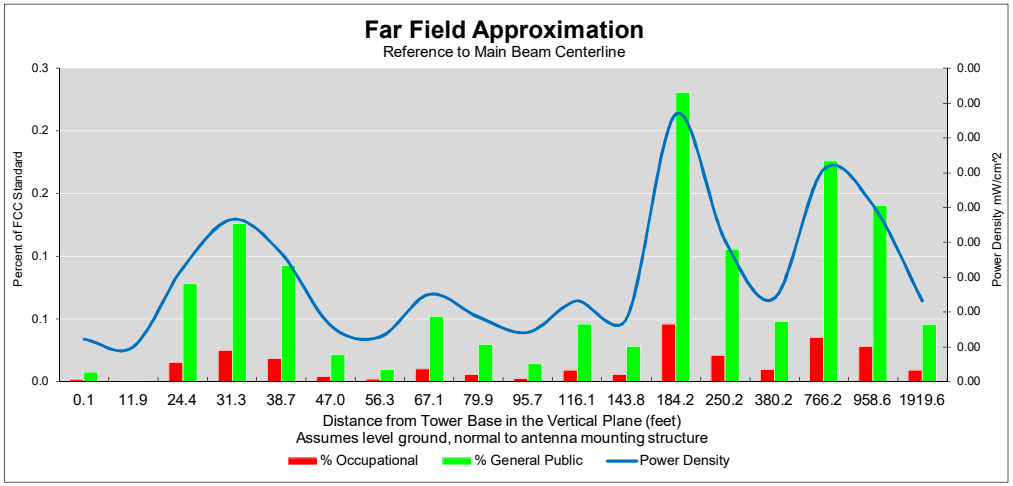
Max%: **0.33%**

Far Field Approximation
with downtilt variation

**Estimated Radiated Emission**
**Single Emitter Far Field Model**
**Dipole/Wire/Yagi Antenna Types**

| | |
|---|---|
| Location: | **CHESHIRE NORTH CT** |
| Site #: | 2-0337 |
| Date: | 11/05/19 |
| Name: | Ziad Cheiban |
| File Name: | |

| | |
|---|---|
| Operating Freq. (MHz): | **869.0** |
| Antenna Height (ft): | **70.0** |
| Antenna Gain (dBi): | **14.7** |
| Antenna Size (in.): | **72.9** |
| Downtilt (degrees): | **0.0** |
| Feedline Loss (dB): | **0.0** |
| Tx Power (W): | **160.0** |
| No. of Channels: | **1** |




| Calc Angle | 90.0 | 80.0 | 70.0 | 65.0 | 60.0 | 55.0 | 50.0 | 45.0 | 40.0 | 35.0 | 30.0 | 25.0 | 20.0 | 15.0 | 10.0 | 5.0 | 4.0 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Solve for r, dx to antenna | 67.0 | 68.0 | 71.3 | 73.9 | 77.4 | 81.8 | 87.5 | 94.8 | 104.3 | 116.9 | 134.1 | 158.6 | 196.0 | 259.0 | 386.0 | 769.1 | 961.0 | 1920.8 |
| Distance from Antenna Structure Base in Horizontal plane | 0.1 | 11.9 | 24.4 | 31.3 | 38.7 | 47.0 | 56.3 | 67.1 | 79.9 | 95.7 | 116.1 | 143.8 | 184.2 | 250.2 | 380.2 | 766.2 | 958.6 | 1919.6 |
| Angle from Main Beam (reference to horizontal plane) | 90 | 80 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 4 | 2 |
| dB down from centerline (referenced to centerline) | 37.11 | 51.2 | 26.54 | 24.13 | 25.07 | 30.98 | 33.69 | 25.81 | 27.45 | 29.54 | 23.37 | 24.04 | 13.05 | 14.02 | 13.95 | 2.35 | 1.4 | 0.25 |
| Reflection Coefficient (1 to 4, 2.56 typical) | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 | 2.56 |
| Power Density (mW/cm^2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Percent of Occupational Standard | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Percent of General Population Standard | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 |

Antenna Type: **SBNHH-1D65B**

Max%: **0.23%**

# Town of Cheshire

Geographic Information System (GIS)

Date Printed: 11/8/2019


**MAP DISCLAIMER - NOTICE OF LIABILITY**

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Cheshire and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 150 feet

0 150 Feet

N W E S

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2018.

# Town of Cheshire

*The bedding plant capital of Connecticut*

Information on the Property Records for the Municipality of Cheshire was last updated on 11/8/2019.

## Parcel Information

| | | | | | |
|---|---|---|---|---|---|
| Location: | 1338 HIGHLAND AVE | Property Use: | Industrial | Primary Use: | Warehouse |
| Unique ID: | 00158400 | Map Block Lot: | 28 15 | Acres: | 3.00 |
| Zone: | I-2 | Volume / Page: | 1672/0243 | Developers Map / Lot: | 18532 |
| Census: | 3431 | | | | |

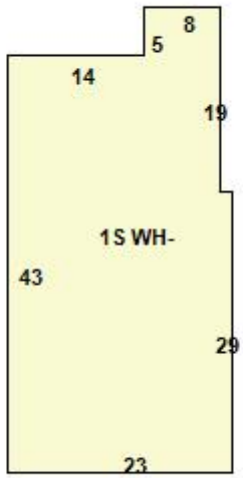
## Value Information

| | Appraised Value | Assessed Value |
|---|---|---|
| Land | 445,500 | 2,920 |
| Buildings | 240,474 | 168,330 |
| Detached Outbuildings | 66,355 | 46,450 |
| Total | 752,329 | 217,700 |

## Owner's Information

| Owner's Data |
| --- |
| MUDDDM LLC<br>1338 HIGHLAND AVE<br>CHESHIRE, CT 06410 |

## Building 1



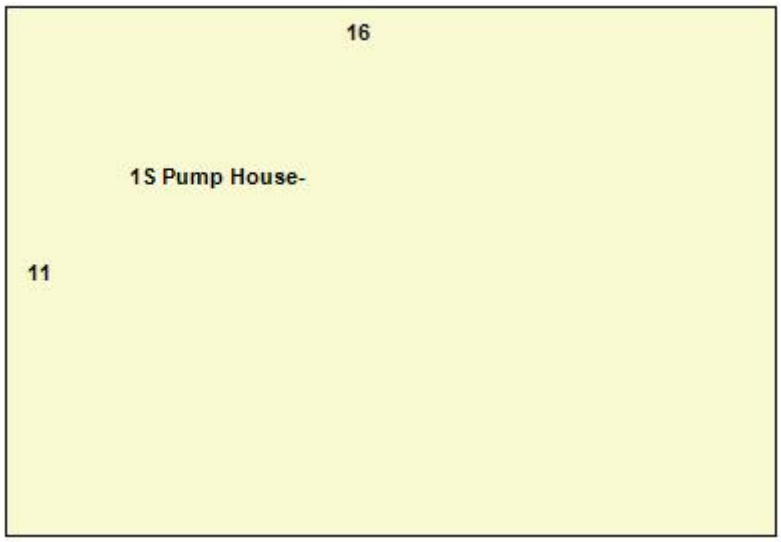

| | | | | | |
| --- | --- | --- | --- | --- | --- |
| Category: | Industrial | Use: | Warehouse | Stories: | 1.00 |
| Above Grade: | 1,015 | Below Grade: | 0 | Below Grade Finish: | 0 |
| Construction: | Low Cost | Year Built: | 1952 | Heating: | FHA |
| Fuel: | Oil | Cooling Percent: | 0% | Siding: | Concrete Block |
| Roof Material: | Composite Built Up | Beds/Units: | 0 | | |

## Special Features

| | |
| --- | --- |
| Extra Plumbing Fixtures | 4 |

## Attached Components

## Building 2




| | | | | | |
|---|---|---|---|---|---|
| Category: | Industrial | Use: | Pump House | Stories: | 1.00 |
| Above Grade: | 176 | Below Grade: | 0 | Below Grade Finish: | 0 |
| Construction: | Good | Year Built: | 2000 | Heating: | |
| Fuel: | | Cooling Percent: | 0% | Siding: | Pre-Cast Concrete |
| Roof Material: | Composite Built Up | Beds/Units: | 0 | | |

## Special Features

## Attached Components

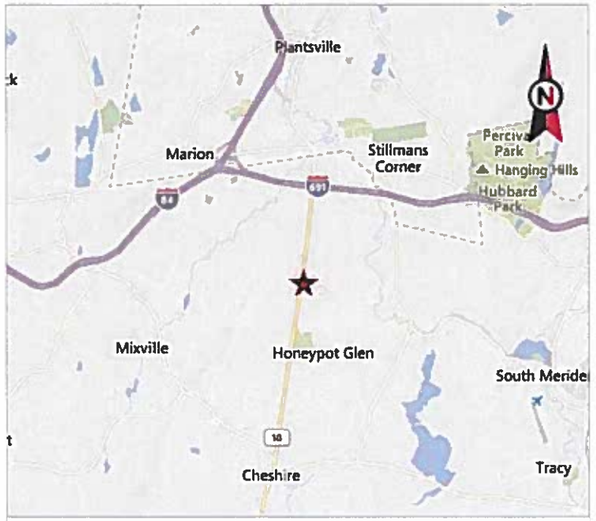
## Detached Outbuildings

| Type: | Year Built: | Length: | Width: | Area: |
|---|---|---|---|---|
| Frame Garage | 1946 | | | 756 |
| Gazebo | 2004 | | | 182 |

| Type: | Year Built: | Length: | Width: | Area: |
|---|---|---|---|---|
| Greenhouse | 1952 | | | 5,600 |
| Greenhouse | 1946 | | | 6,400 |
| Greenhouse | 1952 | | | 5,600 |
| Average Shed | 1990 | | | 100 |
| Average Shed | 1990 | | | 768 |

## Owner History - Sales

| Owner Name | Volume | Page | Sale Date | Deed Type | Valid Sale | Sale Price |
|---|---|---|---|---|---|---|
| MUDDDM LLC | 1672 | 0243 | 03/06/2003 | Quit Claim | No | $0 |
| MANKE JONATHAN D & DEBRAH P | 1401 | 0021 | 04/27/2000 | Quit Claim | No | $320,000 |
| PAPANDREA FRANK J & NORMA S | 0701 | 0255 | 12/30/1899 | Warranty Deed | No | $0 |

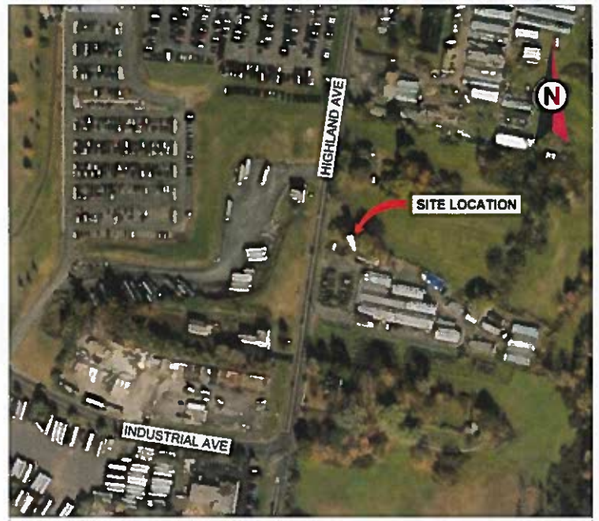



VICINITY MAP

AMERICAN TOWER®

# ATC SITE NAME: MANKES SILO
# ATC SITE NUMBER: 370624
# VERIZON SITE NAME: CHESHIRE NORTH CT
# VERIZON SITE NUMBER:467326
# SITE ADDRESS: 1338 HIGHLAND AVE CHESHIRE, CT 06410

## VERIZON WIRELESS
## ANTENNA AMENDMENT DRAWINGS




LOCATION MAP

### COMPLIANCE CODE

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

1. INTERNATIONAL BUILDING CODE (IBC)
2. NATIONAL ELECTRIC CODE (NEC)
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

### UTILITY COMPANIES

POWER COMPANY: NORTHEAST UTILITIES
PHONE: (800) 286-2000

TELEPHONE COMPANY: UNKNOWN
PHONE: N/A

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

### PROJECT SUMMARY

SITE ADDRESS:

1338 HIGHLAND AVE
CHESHIRE, CT 06410
COUNTY: NEW HAVEN

GEOGRAPHIC COORDINATES:

LATITUDE: 41.53694444
LONGITUDE: -72.89333333
GROUND ELEVATION: 197' AMSL

### PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

ENGINEER:

ATC TOWER SERVICES, LLC
3500 REGENCY PKWY STE 100
CARY, NC 27518

PROPERTY OWNER:

MUDDDM LLC
1338 HIGHLAND AVE
CHESHIRE, CT 06410

APPLICANT:

VERIZON WIRELESS
20 ALEXANDER DRIVE, 2ND FLOOR
WALLINGFORD, CT 06492

### PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

REMOVE (9) RRUs, (1) 1-5/8" HYBRID CABLE, AND (1) OVP

INSTALL (6) NEW RRUs

EXISTING (12) PANELS, (1) 1-5/8" HYBRID CABLE, AND (1) OVP TO REMAIN

### PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.

### PROJECT LOCATION DIRECTIONS

FROM NEW HAVEN DRIVE NORTH ON CHURCH STREET WHICH TURNS INTO WHITNEY AVENUE (CT-10) AT THE HAMDEN/ CHESHIRE LINE IT BECOMES HIGHLAND AVENUE CONTINUE NORTH TO ADDRESS 1338 HIGHLAND AVENUE ON THE RIGHT.

### SHEET INDEX

| SHEET NO: | DESCRIPTION: | REV: | DATE: | BY: |
|---|---|---|---|---|
| G-001 | COVER SHEET | 0 | 10/30/19 | AZ |
| G-002 | GENERAL NOTES | 0 | 10/30/19 | AZ |
| C-101 | DETAILED SITE PLAN AND TOWER ELEVATION | 0 | 10/30/19 | AZ |
| C-501 | RF SCHEDULE AND ANTENNA INSTALLATION | 0 | 10/30/19 | AZ |
| C-502 | CONSTRUCTION DETAILS | 0 | 10/30/19 | AZ |

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A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553



| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | AZ | 10/30/19 |

ATC SITE NUMBER:
370624

ATC SITE NAME:
MANKES SILO

SITE ADDRESS:
1338 HIGHLAND AVE
CHESHIRE, CT 06410

SEAL:


Not Valid Until Signed

verizon cosign

| | |
|---|---|
| DRAWN BY: | AZ |
| APPROVED BY: | PPB |
| DATE DRAWN: | 10/30/19 |
| ATC JOB NO: | 12984006 |
| CUSTOMER ID: | CHESHIRE NORTH CT |
| CUSTOMER #: | 467326 |

COVER SHEET

| SHEET NUMBER: | REVISION: |
|---|---|
| G-001 | 0 |

## GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE VERIZON WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE VERIZON WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE VERIZON WIRELESS REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE VERIZON WIRELESS REP IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
17. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
18. CONTRACTOR SHALL FURNISH VERIZON WIRELESS WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
19. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
20. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO VERIZON WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
24. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
25. CONTRACTOR SHALL NOTIFY VERIZON WIRELESS REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
27. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
28. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE VERIZON WIRELESS REP. ANY WORK FOUND BY THE VERIZON WIRELESS REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
29. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.

## STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   - A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
   - B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
   - C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
   - D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
   - E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
   - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
   - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
   - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
   - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
   - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
   - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
   - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.


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CARY, NC 27518
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COA: PEC.0001553




| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | AZ | 10/30/19 |
| △ | | | |
| △ | | | |
| △ | | | |
| △ | | | |

ATC SITE NUMBER:
370624

ATC SITE NAME:
MANKES SILO

SITE ADDRESS:
1338 HIGHLAND AVE
CHESHIRE, CT 06410

SEAL:


Not for Construction verizon Design

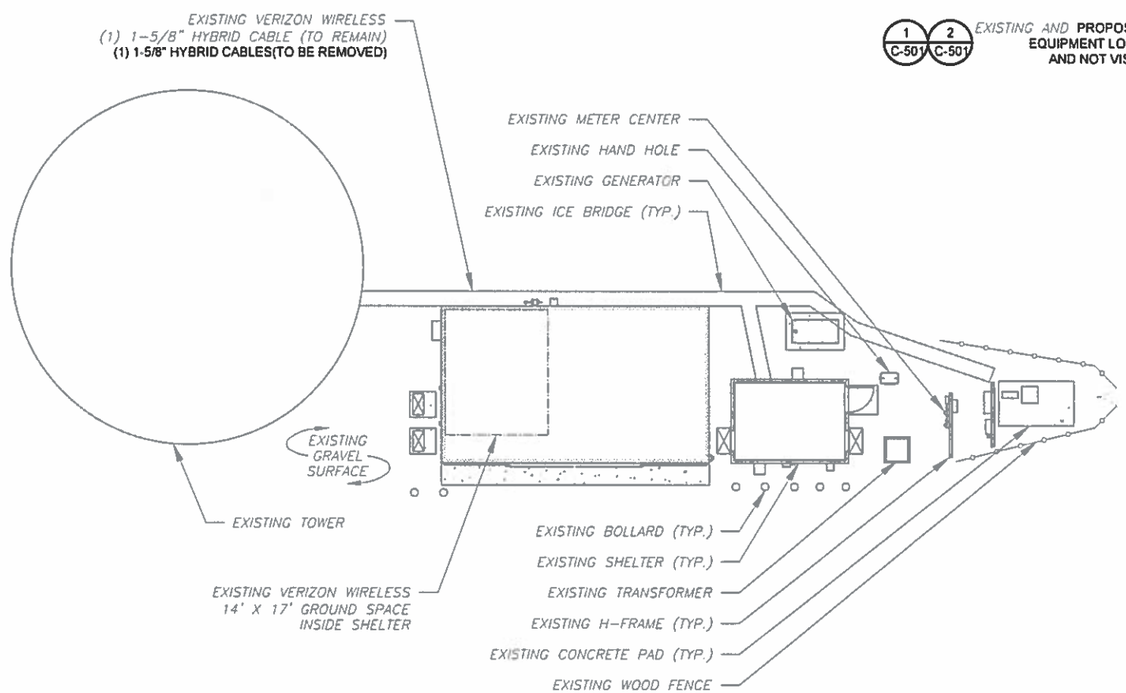
| | |
|---|---|
| DRAWN BY: | AZ |
| APPROVED BY: | PPB |
| DATE DRAWN: | 10/30/19 |
| ATC JOB NO: | 12984006 |
| CUSTOMER ID: | CHESHIRE NORTH CT |
| CUSTOMER #: | 467326 |

GENERAL NOTES

| SHEET NUMBER: | REVISION: |
|---|---|
| G-002 | 0 |

SITE PLAN NOTES:

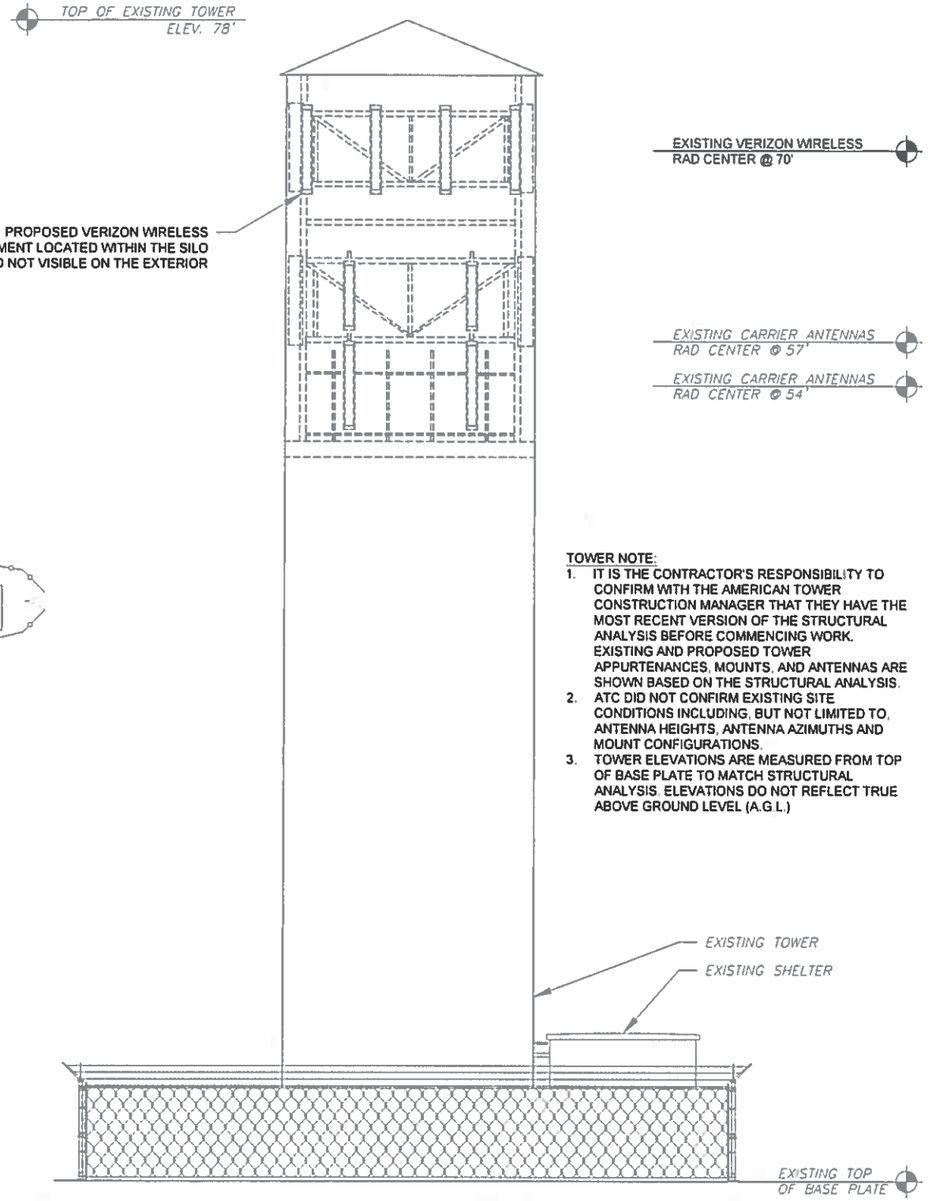
1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.
2. ICE BRIDGE, CABLE LADDER, COAX PORT, CABLE SUPPORTS, AND CABLES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE INSTALLING NEW CABLE SUPPORT STRUCTURES, COAX PORTS, OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.




1 DETAILED SITE PLAN

0 10' 20'

SCALE: 1"=10' (11X17)
1"=5' (22X34)




TOWER NOTE:
1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA HEIGHTS, ANTENNA AZIMUTHS AND MOUNT CONFIGURATIONS.
3. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

2 TOWER ELEVATION
SCALE: NOT TO SCALE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SUITE 100
CARY, NC 27518
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COA: PEC.0001553




| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | AZ | 10/30/19 |

ATC SITE NUMBER:
370624

ATC SITE NAME:
MANKES SILO

SITE ADDRESS:
1338 HIGHLAND AVE
CHESHIRE, CT 06410

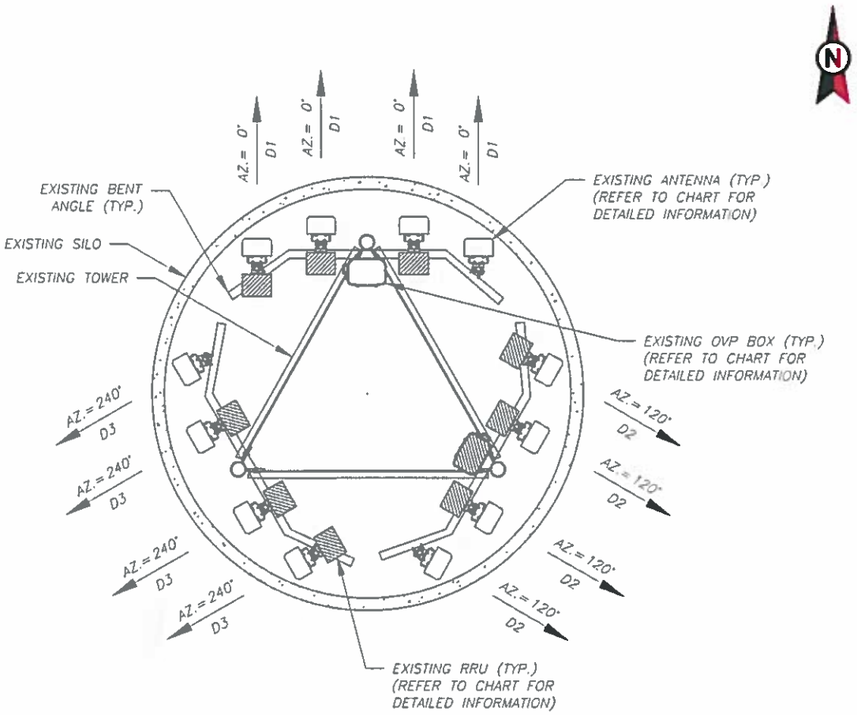
SEAL:


verizon design

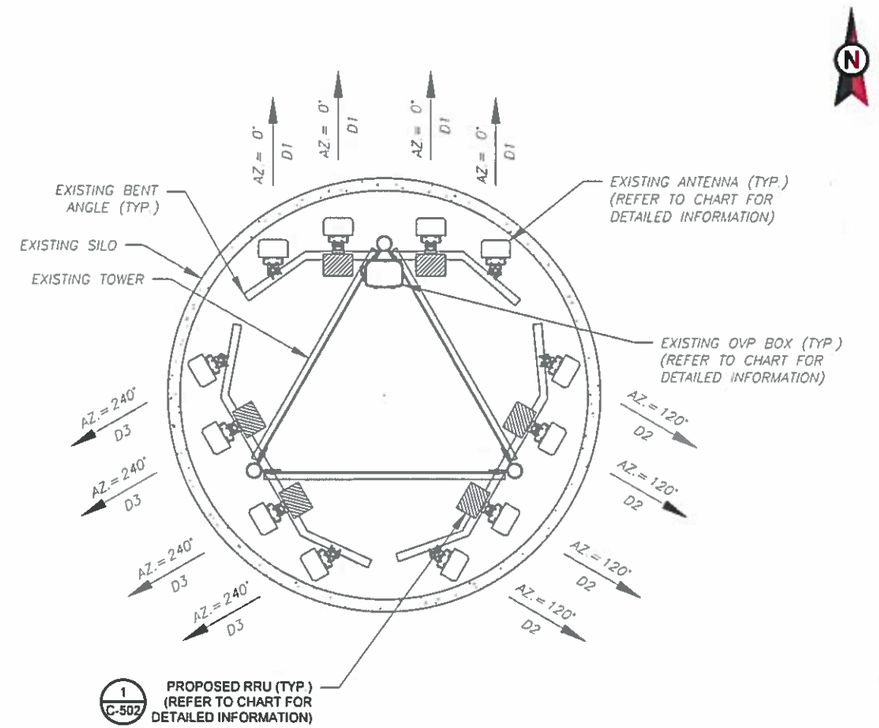
| | |
|---|---|
| DRAWN BY: | AZ |
| APPROVED BY: | PPB |
| DATE DRAWN: | 10/30/19 |
| ATC JOB NO: | 12984006 |
| CUSTOMER ID: | CHESHIRE NORTH CT |
| CUSTOMER #: | 467326 |

DETAILED SITE PLAN AND TOWER ELEVATION

| SHEET NUMBER: | REVISION: |
|---|---|
| C-101 | 0 |




1 CURRENT ANTENNA PLAN




2 FINAL ANTENNA PLAN

**EXISTING ANTENNA SCHEDULE**

| LOCATION | | | ANTENNA SUMMARY | | | | NON ANTENNA SUMMARY | |
|---|---|---|---|---|---|---|---|---|
| SECTOR | RAD | AZ | POS | ANTENNA | BAND | STATUS | ADDITIONAL TOWER MOUNTED EQUIPMENT | STATUS |
| D1 | 70' | 0° | A1 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60-1900 | RMV |
| | | | A2 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60 700 | RMV |
| | | | A3 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60-AWS | RMV |
| | | | A4 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| D2 | 70' | 120° | B1 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60-1900 | RMV |
| | | | B2 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60 700 | RMV |
| | | | B3 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60-AWS | RMV |
| | | | B4 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| D3 | 70' | 240° | C1 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60-1900 | RMV |
| | | | C2 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60 700 | RMV |
| | | | C3 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | RRH2X60-AWS | RMV |
| | | | C4 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |

**NOTES**

1. BASED ON APPROVED ATC APPLICATION 12984006, DATED 08/28/19. CONFIRM WITH VERIZON WIRELESS REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
2. ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIG OR MOUNT CONFIG. CONTRACTOR TO VERIFY MOUNT CONFIG HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (EQUIP) (I.E. CLEARANCES, MOUNT PIPE, SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.
3. ALL PROPOSED EQUIP INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH ATC'S CM.
4. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.
5. POSITIONS START WITH FIRST PIPE ON THE LEFT SIDE (AS VIEWED FROM BEHIND THE MOUNT).

**FINAL ANTENNA SCHEDULE**

| LOCATION | | | ANTENNA SUMMARY | | | | NON ANTENNA SUMMARY | |
|---|---|---|---|---|---|---|---|---|
| SECTOR | RAD | AZ | POS | ANTENNA | BAND | STATUS | ADDITIONAL TOWER MOUNTED EQUIPMENT | STATUS |
| D1 | 70' | 0° | A1 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| | | | A2 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | B5/B13 RRH-BR04C | ADD |
| | | | A3 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | B2/B66A RRH-BR049 | ADD |
| | | | A4 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| D2 | 70' | 120° | B1 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| | | | B2 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | B5/B13 RRH-BR04C | ADD |
| | | | B3 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | B2/B66A RRH-BR049 | ADD |
| | | | B4 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| D3 | 70' | 240° | C1 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |
| | | | C2 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | B5/B13 RRH-BR04C | ADD |
| | | | C3 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | B2/B66A RRH-BR049 | ADD |
| | | | C4 | SBNHH-1D65B | 700/850/1900/2100 LTE | RMN | - | - |

| EXISTING FIBER DISTRIBUTION/OVP BOX | | EXISTING CABLING SUMMARY | | |
|---|---|---|---|---|
| MODEL NUMBER | STATUS | COAX | HYBRID | STATUS |
| (1) DB-T1-6Z-8AB-0Z | RMN | - | (1) 1-5/8" | RMN |
| (1) DB-T1-6Z-8AB-0Z | RMV | - | (1) 1-5/8" | RMV |

**STATUS ABBREVIATIONS**
RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
DSC: TO BE DISCONNECTED & REMAIN
ADD: TO BE ADDED

3 EQUIPMENT SCHEDULES

**CABLE LENGTHS FOR JUMPERS**
FIBER DISTRIBUTION/OVP TO RRU: 15'
RRU TO ANTENNA: 10'

| FINAL FIBER DISTRIBUTION/OVP BOX | | FINAL CABLING SUMMARY | | |
|---|---|---|---|---|
| MODEL NUMBER | STATUS | COAX | HYBRID | STATUS |
| (1) DB-T1-6Z-8AB-0Z | RMN | - | (1) 1-5/8" | RMN |
| - | - | - | - | - |

AMERICAN TOWER®
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| 0 | FOR CONSTRUCTION | AZ | 10/30/19 |
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| | | | |
| | | | |
| | | | |

ATC SITE NUMBER:
370624

ATC SITE NAME:
MANKES SILO

SITE ADDRESS:
1338 HIGHLAND AVE
CHESHIRE, CT 06410

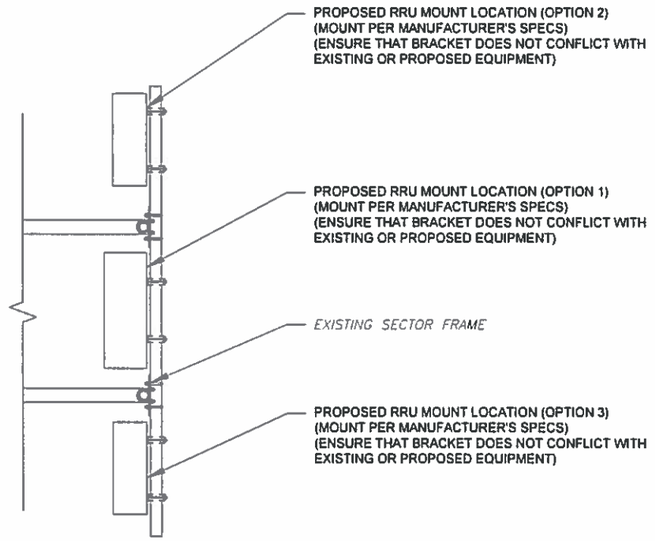
SEAL:


verizon design

| | |
|---|---|
| DRAWN BY: | AZ |
| APPROVED BY: | PPB |
| DATE DRAWN: | 10/30/19 |
| ATC JOB NO: | 12984006 |
| CUSTOMER ID: | CHESHIRE NORTH CT |
| CUSTOMER #: | 457326 |

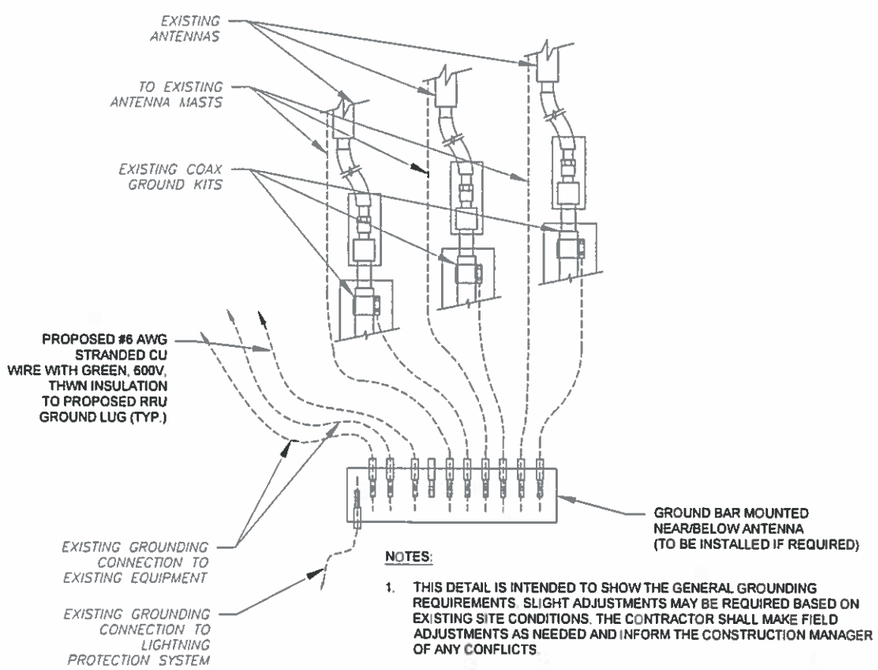
RF SCHEDULE AND ANTENNA INSTALLATION

| SHEET NUMBER: | REVISION: |
|---|---|
| C-501 | 0 |




1 PROPOSED RRU MOUNTING DETAIL - TYPICAL

SCALE: NOT TO SCALE




NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH VERIZON WIRELESS GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH VERIZON WIRELESS GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

2 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: NOT TO SCALE

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553



| REV. | DESCRIPTION | BY | DATE |
|---|---|---|---|
| 0 | FOR CONSTRUCTION | AZ | 10/30/19 |

ATC SITE NUMBER:
370624

ATC SITE NAME:
MANKES SILO

SITE ADDRESS:
1338 HIGHLAND AVE
CHESHIRE, CT 06410

SEAL:


Not Approved for Construction

| | |
|---|---|
| DRAWN BY: | AZ |
| APPROVED BY: | PPB |
| DATE DRAWN: | 10/30/19 |
| ATC JOB NO: | 12984006 |
| CUSTOMER ID: | CHESHIRE NORTH CT |
| CUSTOMER #: | 467326 |

CONSTRUCTION DETAILS

| SHEET NUMBER: | REVISION: |
|---|---|
| C-502 | 0 |