



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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E-Mail: siting.council@ct.gov

Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

August 5, 2022

Denise Sabo
Northeast Site Solutions
54 Main Street, Unit 3
Sturbridge, MA 01566
denise@northeastsitesolutions.com

RE: TS-DISH-116-220531 – Dish Wireless, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 63 Industrial Park Road, Putnam, Connecticut.

Dear Ms. Sabo:

The Connecticut Siting Council (Council) is in receipt of your correspondence of July 28, 2022 submitted in response to the Council's June 29, 2022 notification of an incomplete request for tower sharing with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

A handwritten signature in dark ink, appearing to read "Melanie A. Bachman".

Melanie A. Bachman
Executive Director

MAB/IN/emr

From: Denise Sabo <denise@northeastsitesolutions.com>

Sent: Thursday, July 28, 2022 5:21 PM

To: Robidoux, Evan <Evan.Robidoux@ct.gov>

Cc: CSC-DL Siting Council <Siting.Council@ct.gov>

Subject: RE: Council Incomplete Letter for TS-DISH-116-220531 (63 Industrial Park Road, Putnam)

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Good afternoon, Evan

As requested in the incomplete letter for TS-DISH-116-220531, please see attached revised structural.

Thank you

Denise



Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 196 ft Sabre Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT00802-S

Customer Site Name: Putnam Freight

Carrier Name: Dish Wireless (App#: 177006, V1)

Carrier Site ID / Name: BOBOS00043A / 0

Site Location: 63 Industrial Park Road

Putnam, Connecticut

Windham County

Latitude: 41.897141

Longitude: -71.892247

Analysis Result:

Max Structural Usage: 96.8% [Pass]

Max Foundation Usage: 41.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A



Report Prepared By: Sital Shrestha



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Report Prepared By: Sital Shrestha

Introduction

The purpose of this report is to summarize the analysis results on the 196 ft Sabre Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Sabre Communications Corporation, Job No. 99-04060. dated 04/19/1999.
Foundation Drawing	Sabre Communications Corporation, Job No. 99-04060. dated 04/19/1999.
Geotechnical Report	Jaworski Geotech, Inc. Project No. C98364G. dated 12/18/1998.
Modification Drawings	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2. In accordance with this standard, the structure was analyzed using **TESTowers**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed $V_{ult} = 130.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 101.0$ mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	$S_S = 0.172$, $S_1 = 0.063$

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
-	196.0	-	-	(3) T Frame	-	-
1	186.0	3	Kathrein 800-10966-Panel	(3) Frames MTC3615 with modifications, (3) Pipe Mast, (6) Steel Angle Brace (3"x3"x3") and (3) Pipe Brace	(12) 1 5/8" Coax (1) 3" Conduit (6) 3/4" DC* (2) 5/8" Fiber*	AT&T
2		3	Cci TPA65R-BU8D- Panel			
3		3	Powerwave 7770- Panel			
4		6	Powerwave LGP21401 TMA			
5		6	Powerwave 21401 TMA			
6		3	Ericsson RRUS 8843 B2 B66A			
7		3	Ericsson RRUS 4415 B30			
8		3	Ericsson RRUS 12			
9		3	Ericsson RRUS 4478 B14			
10		3	Ericsson RRUS 4449 B5, B12			
11		3	Ericsson RRUS A2			
12		2	Raycap DC6-48-60-18-8F-OVP			
13	176.0	6	CommScope - JAHH-65B-R3B - Panel	(3) Modified Sector Frame and (3) CommScope BSAMNT-SBS-2-2	(10) 1 5/8" (2) 1 5/8" Hybrid	Verizon
14		3	Samsung - MT6407-77A - Panel			
15		3	CommScope CBC78T-DS-43-2X			
16		3	Samsung B2/B66A			
17		3	Samsung B5/B13			
18		2	RFS DB-T1-6Z-8AB-OZ			

*Routed outside the 3" Conduit.

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
19	166.0	3	Fujitsu TA08025-B604-RRU	(1) Commscope MTC3975083 (Platform w/HRK)	(1) 1.75" Hybrid	Dish Wireless
20		3	Fujitsu TA08025-B605-RRU			
21		1	Raycap RDIDC-9181-PF-48- OVP			
22		3	Commscope FFVV-65B-R2-Panel			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	67.7%	96.8%	54.5%
Pass/Fail	Pass	Pass	Pass

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	373.7	313.8	42.6

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.1263 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.
3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Structure: CT00802-S-SBA

Site Name: Putnam Freight

Code: TIA-222-G

7/27/2022

Type: Self Support

Base Shape: Triangle

Basic WS: 101.00

Height: 196.00 (ft)

Base Width: 27.00

Basic Ice WS: 50.00

Base Elev: 0.00 (ft)

Top Width: 7.40

Operational WS: 60.00

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Section Properties

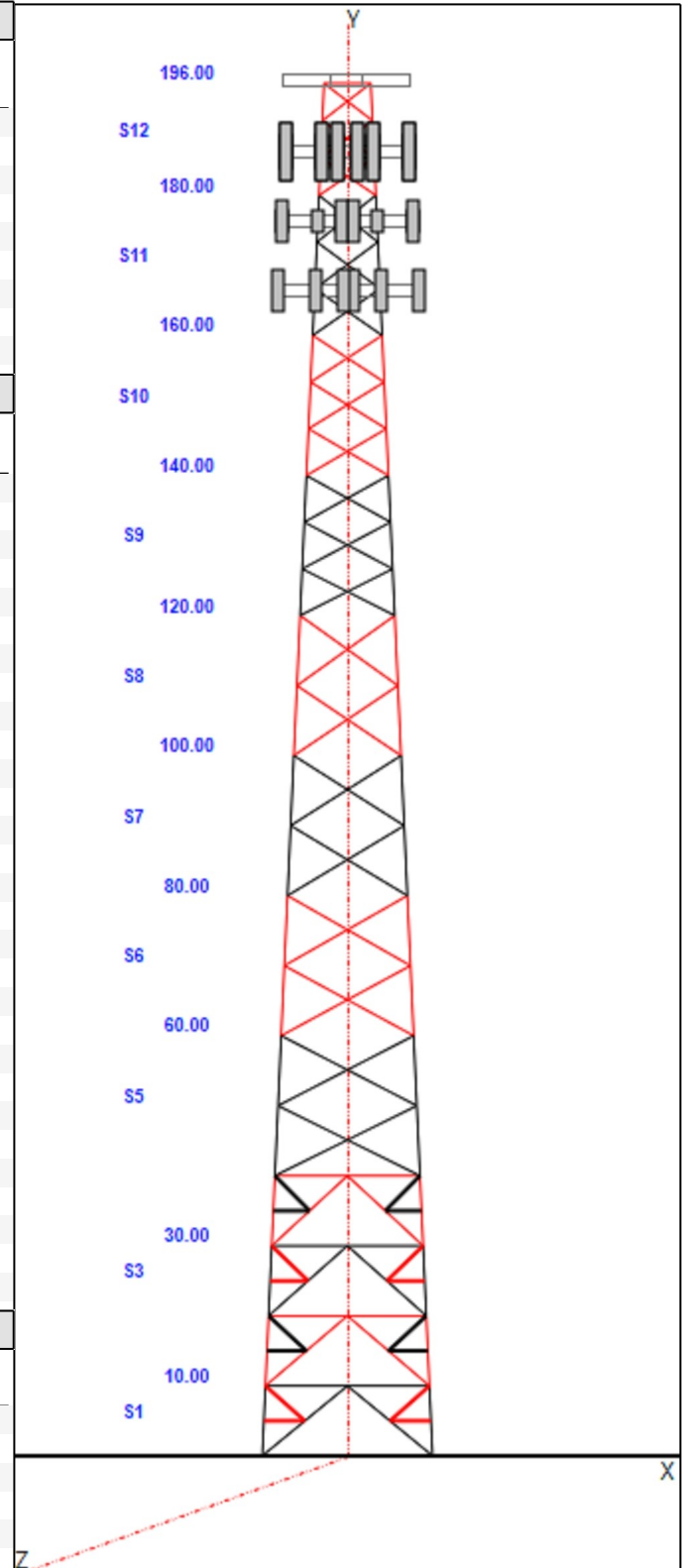
Sect	Leg Members	Diagonal Members	Horizontal Members
1-2	PST 10" DIA PIPE	SAE 3.5X3.5X0.375	SAE 4X4X0.375
3-4	PX 8" DIA PIPE	SAE 3.5X3.5X0.375	SAE 4X4X0.375
5	PX 8" DIA PIPE	SAE 4X4X0.375	
6	PX 8" DIA PIPE	SAE 3.5X3.5X0.375	
7	PST 8" DIA PIPE	SAE 3.5X3.5X0.25	
8-9	PX 6" DIA PIPE	SAE 3.5X3.5X0.25	
10	PX 5" DIA PIPE	SAE 2.5X2.5X0.25	
11	PSP 4.5 x 0.438	SAE 2.5X2.5X0.1875	
12	PX 3-1/2" DIA PIPE	SAE 2X2X0.1875	SAE 2X2X0.1875

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
196.00	196.00	3	Sector Frame
186.00	186.00	3	7770
186.00	186.00	3	800-10966
186.00	186.00	6	Powerwave LGP21401 TMA
186.00	186.00	6	Powerwave 21401TMA
186.00	186.00	3	Ericsson RRUS 4415 B30
186.00	186.00	3	Ericsson RRUS 12
186.00	186.00	3	Ericsson RRUS 4449 B5, B12
186.00	186.00	3	Ericsson RRUS A2
186.00	186.00	2	Raycap DC6-48-60-18-8F
186.00	186.00	3	Sector Frame
186.00	186.00	1	Reinforcing Kit
186.00	186.00	3	TPA65R-BU8D
186.00	186.00	3	B2 B66A 8843
186.00	186.00	3	RRUS 4478 B14
176.00	176.00	3	Sector Frame
176.00	176.00	6	JAHH-65B-R3B
176.00	176.00	3	MT6407-77A
176.00	176.00	3	Commscope CBC78T-DS-43-2X
176.00	176.00	3	Samsung B2/B66A
176.00	176.00	3	Samsung B5/B13
176.00	176.00	2	RFS DB-T1-6Z-8AB-0Z
176.00	176.00	1	Mount Mods1
176.00	176.00	1	Mount Mods2
166.00	166.00	3	TA08025-B604
166.00	166.00	3	TA08025-B605
166.00	166.00	1	RDIDC-9181-PF-48
166.00	166.00	3	Commscope FFVV-65B-R2
166.00	166.00	1	(3) MTC3975083

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	196.00	1	W/G Ladder
0.00	196.00	1	W/G Ladder
0.00	186.00	12	1 5/8" Coax
0.00	186.00	1	3" Conduit
0.00	186.00	6	3/4" DC
0.00	186.00	2	5/8" Fiber
0.00	176.00	10	1 5/8" Coax
0.00	176.00	2	1 5/8" Hybrid



Structure: CT00802-S-SBA

Site Name:	Putnam Freight	Code:	TIA-222-G	7/27/2022
Type:	Self Support	Base Shape:	Triangle	Basic WS: 101.00
Height:	196.00 (ft)	Base Width:	27.00	Basic Ice WS: 50.00
Base Elev:	0.00 (ft)	Top Width:	7.40	Operational WS: 60.00

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0.00 166.00 1 1.75" Hybrid

Base Reactions

Leg

Overturning

Max Uplift:	-313.78 (kips)	Moment:	8198.56 (ft-kips)
Max Down:	373.69 (kips)	Total Down:	69.20 (kips)
Max Shear:	42.63 (kips)	Total Shear:	72.64 (kips)

Structure: CT00802-S-SBA

Site Name: Putnam Freight

Type: Self Support

Height: 196.00 (ft)

Base Elev: 0.00 (ft)

Base Shape: Triangle

Base Width: 27.00

Top Width: 7.40

Code: TIA-222-G

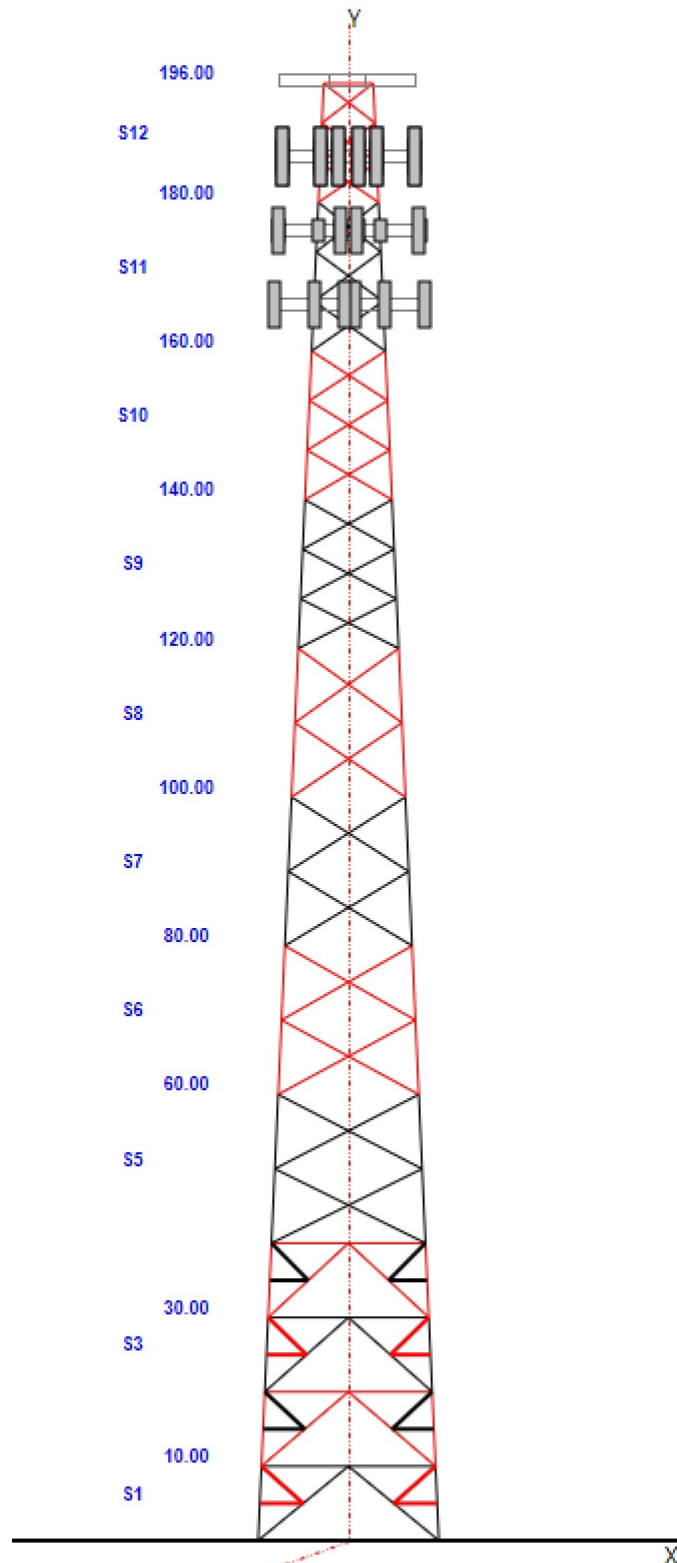
Basic WS: 101.00

Basic Ice WS: 50.00

Operational WS: 60.00

7/27/2022

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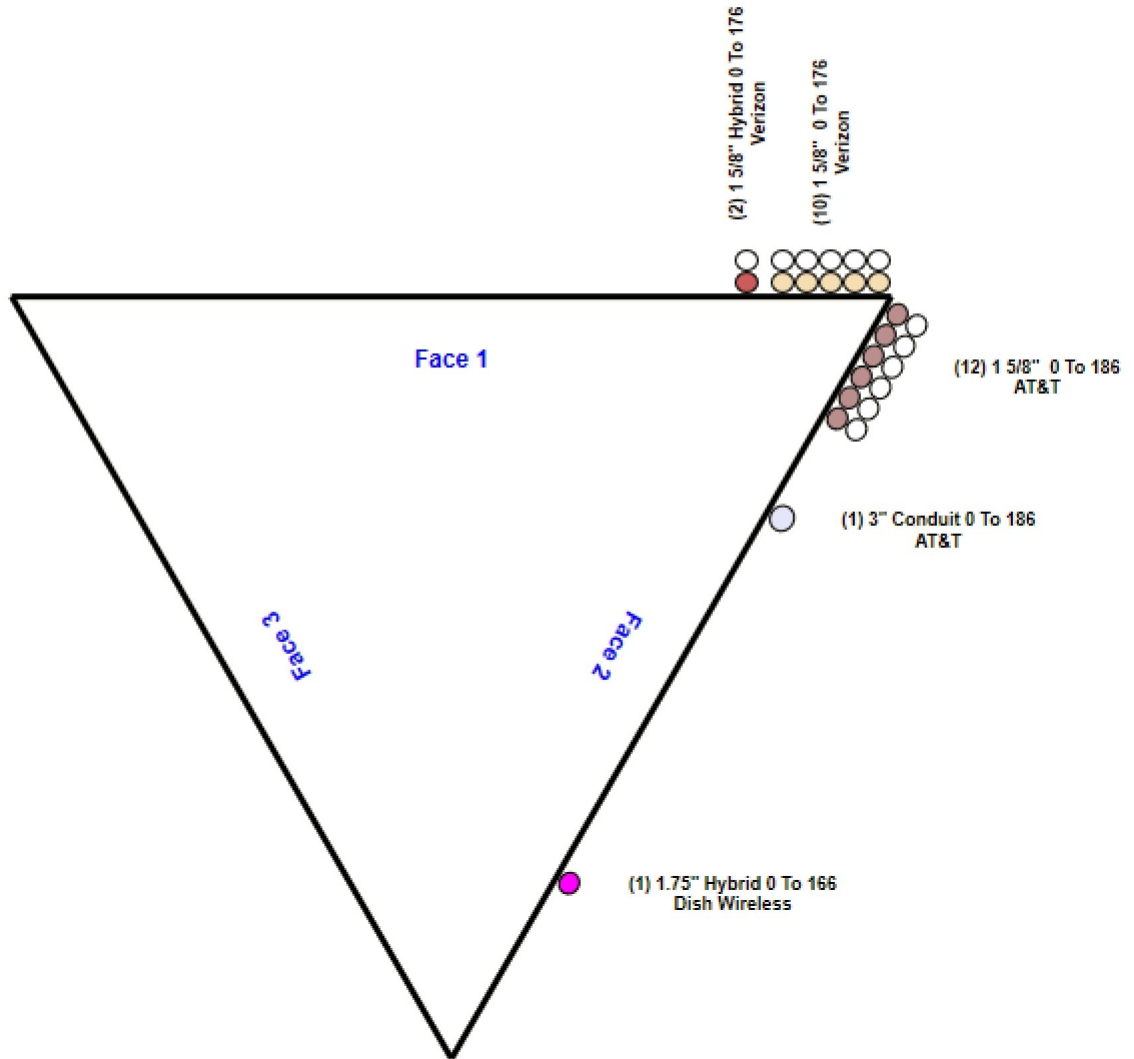


Structure: CT00802-S-SBA - Coax Line Placement

Type: Self Support
Site Name: Putnam Freight
Height: 196.00 (ft)

7/27/2022

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Loading Summary

Structure: CT00802-S-SBA	Code: TIA-222-G	7/27/2022
Site Name: Putnam Freight	Exposure: C	
Height: 196.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II
		Page: 5



Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice		Ice		Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
			Weight (lb)	CaAa (sf)	Weight (lb)	CaAa (sf)						
196.00	Sector Frame	3	450.00	14.000	929.83	23.596	0.000	0.000	0.000	0.75	0.75	0.000
186.00	7770	3	39.00	5.500	238.87	6.987	55.000	11.000	5.000	0.80	0.73	0.000
186.00	800-10966	3	114.60	17.360	628.01	19.864	96.000	20.000	6.900	0.80	0.72	0.000
186.00	Powerwave LGP21401 TMA	6	17.50	1.290	59.82	2.430	14.400	9.200	2.600	0.80	1.00	0.000
186.00	Powerwave 21401TMA	6	25.00	1.290	85.45	2.430	14.400	9.200	2.600	0.80	1.00	0.000
186.00	Ericsson RRUS 4415 B30	3	46.00	1.640	102.06	2.343	15.000	13.200	5.400	0.80	0.67	0.000
186.00	Ericsson RRUS 12	3	50.70	3.150	191.50	4.155	20.400	18.500	7.500	0.80	0.67	0.000
186.00	Ericsson RRUS 4449 B5, B12	3	71.00	1.970	143.80	2.716	17.900	13.200	9.400	0.80	0.67	0.000
186.00	Ericsson RRUS A2	3	22.04	1.860	73.24	3.188	12.800	15.000	3.400	0.80	0.67	0.000
186.00	Raycap DC6-48-60-18-8F	2	32.80	0.920	119.77	1.517	24.000	11.000	11.000	0.80	1.00	0.000
186.00	Sector Frame	3	500.00	17.500	1452.04	36.493	0.000	0.000	0.000	0.75	0.75	0.000
186.00	Reinforcing Kit	1	650.00	15.500	1763.88	37.635	0.000	0.000	0.000	1.00	1.00	0.000
186.00	TPA65R-BU8D	3	87.10	17.870	658.10	20.320	96.000	20.700	7.700	0.80	0.72	0.000
186.00	B2 B66A 8843	3	72.00	1.640	136.50	2.344	15.000	13.200	9.300	0.80	0.67	0.000
186.00	RRUS 4478 B14	3	59.40	1.650	115.95	2.357	15.000	13.200	7.300	0.80	0.67	0.000
176.00	Sector Frame	3	500.00	17.500	1442.50	36.303	0.000	0.000	0.000	0.75	0.75	0.000
176.00	JAHH-65B-R3B	6	63.30	9.110	393.53	10.966	72.000	13.800	8.200	0.80	0.83	0.000
176.00	MT6407-77A	3	79.40	4.690	252.91	5.990	35.100	16.100	5.500	0.80	0.70	0.000
176.00	Commscope CBC78T-DS-43-2X	3	10.40	0.370	43.31	0.781	6.400	6.900	4.800	0.80	0.85	0.000
176.00	Samsung B2/B66A	3	84.40	1.880	153.61	2.624	15.000	15.000	10.000	0.80	0.67	0.000
176.00	Samsung B5/B13	3	70.30	1.880	135.96	2.624	15.000	15.000	8.100	0.80	0.67	0.000
176.00	RFS DB-T1-6Z-8AB-0Z	2	18.90	4.800	182.37	6.157	24.000	24.000	10.000	0.80	0.71	0.000
176.00	Mount Mods1	1	650.00	15.500	1752.73	37.413	0.000	0.000	0.000	0.75	1.00	0.000
176.00	Mount Mods2	1	140.00	3.700	377.51	8.931	0.000	0.000	0.000	0.75	1.00	0.000
166.00	TA08025-B604	3	63.90	1.960	132.26	2.717	15.800	15.000	7.900	0.80	0.67	0.000
166.00	TA08025-B605	3	75.00	1.960	145.62	2.717	15.800	15.000	9.100	0.80	0.67	0.000
166.00	RDIDC-9181-PF-48	1	21.90	2.010	93.79	2.777	16.600	14.600	8.500	1.00	1.00	0.000
166.00	Commscope FFFV-65B-R2	3	73.60	11.400	440.94	13.381	72.000	18.000	7.000	0.80	0.75	0.000
166.00	(3) MTC3975083	1	1242.0	28.050	2880.83	75.637	0.000	0.000	0.000	0.75	1.00	0.000
Totals:		84	10,848.62		32,956.88		Number of Appurtenances :					29

Loading Summary

Structure: CT00802-S-SBA	Code: TIA-222-G	7/27/2022
Site Name: Putnam Freight	Exposure: C	
Height: 196.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II



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Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	196.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	196.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	
0.00	186.00	1 5/8" Coax	12	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	186.00	3" Conduit	1	3.00	1.61	100.00	2	Individual NR		N	1.00	1.00	
0.00	186.00	3/4" DC	6	0.75	0.40	100.00	2	Individual NR		N	1.00	1.00	
0.00	186.00	5/8" Fiber	2	0.87	0.15	100.00	2	Individual NR		N	1.00	1.00	
0.00	176.00	1 5/8" Coax	10	1.98	1.04	50.00	1	Block		N	1.00	1.00	
0.00	176.00	1 5/8" Hybrid	2	2.00	1.10	50.00	1	Block		N	1.00	1.00	
0.00	166.00	1.75" Hybrid	1	1.75	1.99	100.00	2	Individual NR		N	1.00	1.00	

Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

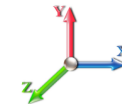
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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Load Case: 1.2D + 1.6W Normal Wind

1.2D + 1.6W 101 mph Wind at Normal To Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	1.00	1.00	0.00	31.86	39.81	0.00	4,735.1	0.0	2253.39	902.70	3,156.09
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	1.00	1.00	0.00	31.12	39.81	0.00	4,646.8	0.0	2192.24	902.70	3,094.94
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	1.00	1.00	0.00	28.84	39.81	0.00	4,665.3	0.0	2288.34	1003.87	3,292.21
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	1.00	1.00	0.00	28.16	39.81	0.00	4,577.9	0.0	2387.73	1077.56	3,465.29
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	1.00	1.00	0.00	43.07	79.62	0.00	7,584.0	0.0	4036.19	2323.18	6,359.37
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	1.00	1.00	0.00	37.03	79.62	0.00	6,910.6	0.0	3733.80	2493.71	6,227.51
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	1.00	1.00	0.00	35.09	79.62	0.00	4,820.2	0.0	3688.04	2629.20	6,317.24
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	1.00	1.00	0.00	30.45	79.62	0.00	4,677.8	0.0	3373.07	2742.65	6,115.72
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	1.00	1.00	0.00	35.62	79.62	0.00	5,044.6	0.0	3902.88	2840.83	6,743.71
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	1.00	1.00	0.00	25.06	79.62	0.00	3,755.8	0.0	2924.83	2927.71	5,852.55
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	1.00	1.00	0.00	22.13	72.28	0.00	3,114.8	0.0	2646.36	2739.30	5,385.66
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	1.00	1.00	0.00	16.28	18.39	0.00	1,653.2	0.0	1953.15	755.91	2,709.06
														56,186.3	0.0	58,719.36		

Load Case: 1.2D + 1.6W 60° Wind

1.2D + 1.6W 101 mph Wind at 60° From Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.80	1.00	0.00	27.00	39.81	0.00	4,735.1	0.0	1909.54	902.70	2,812.24
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.80	1.00	0.00	26.41	39.81	0.00	4,646.8	0.0	1860.59	902.70	2,763.29
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.80	1.00	0.00	24.28	39.81	0.00	4,665.3	0.0	1926.06	1003.87	2,929.93
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.80	1.00	0.00	23.73	39.81	0.00	4,577.9	0.0	2012.54	1077.56	3,090.10
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.80	1.00	0.00	36.82	79.62	0.00	7,584.0	0.0	3450.18	2323.18	5,773.35
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.80	1.00	0.00	31.98	79.62	0.00	6,910.6	0.0	3224.57	2493.71	5,718.28
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.80	1.00	0.00	30.45	79.62	0.00	4,820.2	0.0	3200.54	2629.20	5,829.74
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.80	1.00	0.00	26.18	79.62	0.00	4,677.8	0.0	2900.62	2742.65	5,643.28
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.80	1.00	0.00	30.38	79.62	0.00	5,044.6	0.0	3329.28	2840.83	6,170.11
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.80	1.00	0.00	21.75	79.62	0.00	3,755.8	0.0	2538.11	2927.71	5,465.82
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.80	1.00	0.00	19.22	72.28	0.00	3,114.8	0.0	2298.52	2739.30	5,037.81
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.80	1.00	0.00	14.16	18.39	0.00	1,653.2	0.0	1698.24	755.91	2,454.15
														56,186.3	0.0	53,688.11		

Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

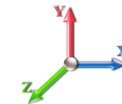
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



Page: 8



Load Case: 1.2D + 1.6W 90° Wind

1.2D + 1.6W 101 mph Wind at 90° From Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.85	1.00	0.00	28.22	39.81	0.00	4,735.1	0.0	1995.51	902.70	2,898.21
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.85	1.00	0.00	27.59	39.81	0.00	4,646.8	0.0	1943.50	902.70	2,846.20
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.85	1.00	0.00	25.42	39.81	0.00	4,665.3	0.0	2016.63	1003.87	3,020.50
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.85	1.00	0.00	24.84	39.81	0.00	4,577.9	0.0	2106.34	1077.56	3,183.90
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.85	1.00	0.00	38.38	79.62	0.00	7,584.0	0.0	3596.68	2323.18	5,919.86
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.85	1.00	0.00	33.24	79.62	0.00	6,910.6	0.0	3351.88	2493.71	5,845.59
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.85	1.00	0.00	31.61	79.62	0.00	4,820.2	0.0	3322.42	2629.20	5,951.62
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.85	1.00	0.00	27.25	79.62	0.00	4,677.8	0.0	3018.73	2742.65	5,761.39
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.85	1.00	0.00	31.69	79.62	0.00	5,044.6	0.0	3472.68	2840.83	6,313.51
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.85	1.00	0.00	22.57	79.62	0.00	3,755.8	0.0	2634.79	2927.71	5,562.50
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.85	1.00	0.00	19.95	72.28	0.00	3,114.8	0.0	2385.48	2739.30	5,124.77
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.85	1.00	0.00	14.69	18.39	0.00	1,653.2	0.0	1761.97	755.91	2,517.88
														56,186.3	0.0	54,945.92		

Load Case: 0.9D + 1.6W Normal Wind

0.9D + 1.6W 101 mph Wind at Normal To Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	1.00	1.00	0.00	31.86	39.81	0.00	3,551.3	0.0	2253.39	902.70	3,156.09
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	1.00	1.00	0.00	31.12	39.81	0.00	3,485.1	0.0	2192.24	902.70	3,094.94
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	1.00	1.00	0.00	28.84	39.81	0.00	3,499.0	0.0	2288.34	1003.87	3,292.21
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	1.00	1.00	0.00	28.16	39.81	0.00	3,433.4	0.0	2387.73	1077.56	3,465.29
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	1.00	1.00	0.00	43.07	79.62	0.00	5,688.0	0.0	4036.19	2323.18	6,359.37
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	1.00	1.00	0.00	37.03	79.62	0.00	5,183.0	0.0	3733.80	2493.71	6,227.51
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	1.00	1.00	0.00	35.09	79.62	0.00	3,615.2	0.0	3688.04	2629.20	6,317.24
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	1.00	1.00	0.00	30.45	79.62	0.00	3,508.4	0.0	3373.07	2742.65	6,115.72
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	1.00	1.00	0.00	35.62	79.62	0.00	3,783.5	0.0	3902.88	2840.83	6,743.71
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	1.00	1.00	0.00	25.06	79.62	0.00	2,816.9	0.0	2924.83	2927.71	5,852.55
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	1.00	1.00	0.00	22.13	72.28	0.00	2,336.1	0.0	2646.36	2739.30	5,385.66
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	1.00	1.00	0.00	16.28	18.39	0.00	1,239.9	0.0	1953.15	755.91	2,709.06
														42,139.7	0.0	58,719.36		

Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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Load Case: 0.9D + 1.6W 60° Wind

0.9D + 1.6W 101 mph Wind at 60° From Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 0.90

Ice Importance Factor: 1.00

Ice Dead Load Factor: 0.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.80	1.00	0.00	27.00	39.81	0.00	3,551.3	0.0	1909.54	902.70	2,812.24
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.80	1.00	0.00	26.41	39.81	0.00	3,485.1	0.0	1860.59	902.70	2,763.29
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.80	1.00	0.00	24.28	39.81	0.00	3,499.0	0.0	1926.06	1003.87	2,929.93
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.80	1.00	0.00	23.73	39.81	0.00	3,433.4	0.0	2012.54	1077.56	3,090.10
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.80	1.00	0.00	36.82	79.62	0.00	5,688.0	0.0	3450.18	2323.18	5,773.35
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.80	1.00	0.00	31.98	79.62	0.00	5,183.0	0.0	3224.57	2493.71	5,718.28
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.80	1.00	0.00	30.45	79.62	0.00	3,615.2	0.0	3200.54	2629.20	5,829.74
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.80	1.00	0.00	26.18	79.62	0.00	3,508.4	0.0	2900.62	2742.65	5,643.28
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.80	1.00	0.00	30.38	79.62	0.00	3,783.5	0.0	3329.28	2840.83	6,170.11
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.80	1.00	0.00	21.75	79.62	0.00	2,816.9	0.0	2538.11	2927.71	5,465.82
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.80	1.00	0.00	19.22	72.28	0.00	2,336.1	0.0	2298.52	2739.30	5,037.81
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.80	1.00	0.00	14.16	18.39	0.00	1,239.9	0.0	1698.24	755.91	2,454.15
														42,139.7	0.0	53,688.11		

Load Case: 0.9D + 1.6W 90° Wind

0.9D + 1.6W 101 mph Wind at 90° From Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 0.90

Ice Importance Factor: 1.00

Ice Dead Load Factor: 0.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	18.87	24.312	17.95	0.00	0.15	2.76	0.85	1.00	0.00	28.22	39.81	0.00	3,551.3	0.0	1995.51	902.70	2,898.21
2	15.0	18.87	23.540	17.95	0.00	0.16	2.75	0.85	1.00	0.00	27.59	39.81	0.00	3,485.1	0.0	1943.50	902.70	2,846.20
3	25.0	20.98	22.832	14.40	0.00	0.15	2.78	0.85	1.00	0.00	25.42	39.81	0.00	3,499.0	0.0	2016.63	1003.87	3,020.50
4	35.0	22.52	22.121	14.40	0.00	0.15	2.77	0.85	1.00	0.00	24.84	39.81	0.00	3,433.4	0.0	2106.34	1077.56	3,183.90
5	50.0	24.28	31.267	28.80	0.00	0.13	2.84	0.85	1.00	0.00	38.38	79.62	0.00	5,688.0	0.0	3596.68	2323.18	5,919.86
6	70.0	26.06	25.252	28.80	0.00	0.13	2.84	0.85	1.00	0.00	33.24	79.62	0.00	5,183.0	0.0	3351.88	2493.71	5,845.59
7	90.0	27.48	23.189	28.80	0.00	0.14	2.81	0.85	1.00	0.00	31.61	79.62	0.00	3,615.2	0.0	3322.42	2629.20	5,951.62
8	110.0	28.66	21.325	22.12	0.00	0.13	2.84	0.85	1.00	0.00	27.25	79.62	0.00	3,508.4	0.0	3018.73	2742.65	5,761.39
9	130.0	29.69	26.175	22.12	0.00	0.17	2.71	0.85	1.00	0.00	31.69	79.62	0.00	3,783.5	0.0	3472.68	2840.83	6,313.51
10	150.0	30.60	16.566	18.57	0.00	0.14	2.80	0.85	1.00	0.00	22.57	79.62	0.00	2,816.9	0.0	2634.79	2927.71	5,562.50
11	170.0	31.41	14.543	15.02	0.00	0.14	2.80	0.85	1.00	0.00	19.95	72.28	0.00	2,336.1	0.0	2385.48	2739.30	5,124.77
12	188.0	32.09	10.623	10.68	0.00	0.16	2.75	0.85	1.00	0.00	14.69	18.39	0.00	1,239.9	0.0	1761.97	755.91	2,517.88
														42,139.7	0.0	54,945.92		

Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

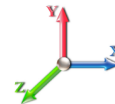
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 1.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	
			Linear Area (sqft)	Linear Area (sqft)															
1	5.0	4.62	24.312	39.93	21.98	0.23	2.49	1.00	1.00	1.66	47.50	53.61	27.60	10,491.	5756.2	465.30	300.80	766.10	
2	15.0	4.62	23.540	41.93	23.98	0.25	2.45	1.00	1.00	1.85	48.02	55.21	30.81	11,089.	6442.9	462.78	316.38	779.17	
3	25.0	5.14	22.832	39.06	24.66	0.24	2.46	1.00	1.00	1.95	45.61	56.02	32.42	11,239.	6574.4	490.56	362.46	853.01	
4	35.0	5.52	22.121	39.30	24.91	0.25	2.44	1.00	1.00	2.01	45.12	56.57	33.53	11,296.	6718.2	515.85	394.56	910.41	
5	50.0	5.95	31.267	76.31	47.51	0.23	2.49	1.00	1.00	2.08	75.61	114.36	69.50	18,294.	10710.3	951.76	877.06	1,828.82	
6	70.0	6.39	25.252	75.34	46.55	0.24	2.47	1.00	1.00	2.16	69.13	115.55	71.87	17,259.	10348.4	927.69	956.72	1,884.41	
7	90.0	6.73	23.189	73.92	45.12	0.25	2.42	1.00	1.00	2.21	66.51	116.47	73.70	15,165.	10345.6	922.99	1013.64	1,936.64	
8	110.0	7.02	21.325	65.57	43.45	0.26	2.42	1.00	1.00	2.26	59.79	117.21	75.20	14,623.	9945.4	863.11	1068.40	1,931.51	
9	130.0	7.28	26.175	73.01	50.89	0.33	2.21	1.00	1.00	2.29	70.68	117.85	76.46	16,079.	11035.0	967.89	1064.56	2,032.45	
10	150.0	7.50	16.566	66.07	47.49	0.32	2.24	1.00	1.00	2.33	56.60	118.40	77.57	13,379.	9623.5	808.17	1114.10	1,922.27	
11	170.0	7.70	14.543	59.09	44.07	0.34	2.19	1.00	1.00	2.36	50.77	108.40	73.04	11,851.	8736.1	727.75	1048.10	1,775.84	
12	188.0	7.86	10.623	49.63	38.94	0.42	2.02	1.00	1.00	2.38	42.68	33.47	21.42	6,184.5	4531.2	576.97	322.90	899.87	
														156,953.5	100767.3				17,520.50

Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

Wind Load Factor: 1.00

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 1.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	
1	5.0	4.62	24.312	39.93	21.98	0.23	2.49	0.80	1.00	1.66	42.64	53.61	27.60	10,491.	5756.2	417.67	300.80	718.48	
2	15.0	4.62	23.540	41.93	23.98	0.25	2.45	0.80	1.00	1.85	43.31	55.21	30.81	11,089.	6442.9	417.41	316.38	733.79	
3	25.0	5.14	22.832	39.06	24.66	0.24	2.46	0.80	1.00	1.95	41.04	56.02	32.42	11,239.	6574.4	441.44	362.46	803.90	
4	35.0	5.52	22.121	39.30	24.91	0.25	2.44	0.80	1.00	2.01	40.69	56.57	33.53	11,296.	6718.2	465.26	394.56	859.82	
5	50.0	5.95	31.267	76.31	47.51	0.23	2.49	0.80	1.00	2.08	69.36	114.36	69.50	18,294.	10710.3	873.04	877.06	1,750.10	
6	70.0	6.39	25.252	75.34	46.55	0.24	2.47	0.80	1.00	2.16	64.07	115.55	71.87	17,259.	10348.4	859.91	956.72	1,816.63	
7	90.0	6.73	23.189	73.92	45.12	0.25	2.42	0.80	1.00	2.21	61.87	116.47	73.70	15,165.	10345.6	858.63	1013.64	1,872.28	
8	110.0	7.02	21.325	65.57	43.45	0.26	2.42	0.80	1.00	2.26	55.52	117.21	75.20	14,623.	9945.4	801.54	1068.40	1,869.94	
9	130.0	7.28	26.175	73.01	50.89	0.33	2.21	0.80	1.00	2.29	65.45	117.85	76.46	16,079.	11035.0	896.20	1064.56	1,960.76	
10	150.0	7.50	16.566	66.07	47.49	0.32	2.24	0.80	1.00	2.33	53.28	118.40	77.57	13,379.	9623.5	760.86	1114.10	1,874.96	
11	170.0	7.70	14.543	59.09	44.07	0.34	2.19	0.80	1.00	2.36	47.86	108.40	73.04	11,851.	8736.1	686.06	1048.10	1,734.15	
12	188.0	7.86	10.623	49.63	38.94	0.42	2.02	0.80	1.00	2.38	40.55	33.47	21.42	6,184.5	4531.2	548.24	322.90	871.14	
														156,953.5	100767.3				16,865.96

Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

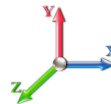
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

Wind Load Factor: 1.00

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 1.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat	Total Round	Ice Round	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	
			Area (sqft)	Area (sqft)	Area (sqft)														
1	5.0	4.62	24.312	39.93	21.98	0.23	2.49	0.85	1.00	1.66	43.86	53.61	27.60	10,491.	5756.2	429.58	300.80	730.38	
2	15.0	4.62	23.540	41.93	23.98	0.25	2.45	0.85	1.00	1.85	44.49	55.21	30.81	11,089.	6442.9	428.75	316.38	745.14	
3	25.0	5.14	22.832	39.06	24.66	0.24	2.46	0.85	1.00	1.95	42.18	56.02	32.42	11,239.	6574.4	453.72	362.46	816.18	
4	35.0	5.52	22.121	39.30	24.91	0.25	2.44	0.85	1.00	2.01	41.80	56.57	33.53	11,296.	6718.2	477.91	394.56	872.47	
5	50.0	5.95	31.267	76.31	47.51	0.23	2.49	0.85	1.00	2.08	70.92	114.36	69.50	18,294.	10710.3	892.72	877.06	1,769.78	
6	70.0	6.39	25.252	75.34	46.55	0.24	2.47	0.85	1.00	2.16	65.34	115.55	71.87	17,259.	10348.4	876.86	956.72	1,833.57	
7	90.0	6.73	23.189	73.92	45.12	0.25	2.42	0.85	1.00	2.21	63.03	116.47	73.70	15,165.	10345.6	874.72	1013.64	1,888.37	
8	110.0	7.02	21.325	65.57	43.45	0.26	2.42	0.85	1.00	2.26	56.59	117.21	75.20	14,623.	9945.4	816.93	1068.40	1,885.33	
9	130.0	7.28	26.175	73.01	50.89	0.33	2.21	0.85	1.00	2.29	66.76	117.85	76.46	16,079.	11035.0	914.12	1064.56	1,978.68	
10	150.0	7.50	16.566	66.07	47.49	0.32	2.24	0.85	1.00	2.33	54.11	118.40	77.57	13,379.	9623.5	772.68	1114.10	1,886.79	
11	170.0	7.70	14.543	59.09	44.07	0.34	2.19	0.85	1.00	2.36	48.59	108.40	73.04	11,851.	8736.1	696.48	1048.10	1,744.58	
12	188.0	7.86	10.623	49.63	38.94	0.42	2.02	0.85	1.00	2.38	41.08	33.47	21.42	6,184.5	4531.2	555.43	322.90	878.33	
														156,953.5	100767.3				17,029.59

Load Case: 1.0D + 1.0W Normal Wind

1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00

Wind Importance Factor: 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	6.66	24.312	17.95	0.00	0.15	2.76	1.00	1.00	0.00	33.06	39.81	0.00	3,945.9	0.0	515.61	199.11	714.72
2	15.0	6.66	23.540	17.95	0.00	0.16	2.75	1.00	1.00	0.00	32.30	39.81	0.00	3,872.3	0.0	501.90	199.11	701.01
3	25.0	7.40	22.832	14.40	0.00	0.15	2.78	1.00	1.00	0.00	30.33	39.81	0.00	3,887.8	0.0	530.77	221.42	752.19
4	35.0	7.95	22.121	14.40	0.00	0.15	2.77	1.00	1.00	0.00	29.53	39.81	0.00	3,814.9	0.0	552.36	237.67	790.03
5	50.0	8.57	31.267	28.80	0.00	0.13	2.84	1.00	1.00	0.00	45.72	79.62	0.00	6,320.0	0.0	945.12	512.42	1,457.54
6	70.0	9.20	25.252	28.80	0.00	0.13	2.84	1.00	1.00	0.00	39.47	79.62	0.00	5,758.9	0.0	877.76	550.03	1,427.79
7	90.0	9.70	23.189	28.80	0.00	0.14	2.81	1.00	1.00	0.00	37.30	79.62	0.00	4,016.9	0.0	864.72	579.91	1,444.64
8	110.0	10.12	21.325	22.12	0.00	0.13	2.84	1.00	1.00	0.00	33.23	79.62	0.00	3,898.2	0.0	811.97	604.94	1,416.91
9	130.0	10.48	26.175	22.12	0.00	0.17	2.71	1.00	1.00	0.00	38.15	79.62	0.00	4,203.8	0.0	921.95	626.59	1,548.55
10	150.0	10.80	16.566	18.57	0.00	0.14	2.80	1.00	1.00	0.00	27.03	79.62	0.00	3,129.9	0.0	695.98	645.76	1,341.74
11	170.0	11.09	14.543	15.02	0.00	0.14	2.80	1.00	1.00	0.00	23.06	72.28	0.00	2,595.7	0.0	608.26	604.20	1,212.46
12	188.0	11.32	10.623	10.68	0.00	0.16	2.75	1.00	1.00	0.00	16.69	18.39	0.00	1,377.7	0.0	441.76	166.73	608.49
														46,821.9	0.0	13,416.05		

Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

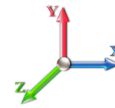
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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Load Case: 1.0D + 1.0W 60° Wind

1.0D + 1.0W 60 mph Wind at 60° From Face

Wind Load Factor: 1.00

Wind Importance Factor: 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	6.66	24.312	17.95	0.00	0.15	2.76	0.80	1.00	0.00	28.19	39.81	0.00	3,945.9	0.0	439.77	199.11	638.88
2	15.0	6.66	23.540	17.95	0.00	0.16	2.75	0.80	1.00	0.00	27.59	39.81	0.00	3,872.3	0.0	428.75	199.11	627.86
3	25.0	7.40	22.832	14.40	0.00	0.15	2.78	0.80	1.00	0.00	25.76	39.81	0.00	3,887.8	0.0	450.86	221.42	672.28
4	35.0	7.95	22.121	14.40	0.00	0.15	2.77	0.80	1.00	0.00	25.11	39.81	0.00	3,814.9	0.0	469.60	237.67	707.27
5	50.0	8.57	31.267	28.80	0.00	0.13	2.84	0.80	1.00	0.00	39.47	79.62	0.00	6,320.0	0.0	815.87	512.42	1,328.28
6	70.0	9.20	25.252	28.80	0.00	0.13	2.84	0.80	1.00	0.00	34.42	79.62	0.00	5,758.9	0.0	765.44	550.03	1,315.47
7	90.0	9.70	23.189	28.80	0.00	0.14	2.81	0.80	1.00	0.00	32.66	79.62	0.00	4,016.9	0.0	757.20	579.91	1,337.11
8	110.0	10.12	21.325	22.12	0.00	0.13	2.84	0.80	1.00	0.00	28.97	79.62	0.00	3,898.2	0.0	707.76	604.94	1,312.70
9	130.0	10.48	26.175	22.12	0.00	0.17	2.71	0.80	1.00	0.00	32.91	79.62	0.00	4,203.8	0.0	795.44	626.59	1,422.03
10	150.0	10.80	16.566	18.57	0.00	0.14	2.80	0.80	1.00	0.00	23.72	79.62	0.00	3,129.9	0.0	610.68	645.76	1,256.44
11	170.0	11.09	14.543	15.02	0.00	0.14	2.80	0.80	1.00	0.00	20.15	72.28	0.00	2,595.7	0.0	531.54	604.20	1,135.74
12	188.0	11.32	10.623	10.68	0.00	0.16	2.75	0.80	1.00	0.00	14.57	18.39	0.00	1,377.7	0.0	385.54	166.73	552.27
														46,821.9	0.0	12,306.33		

Load Case: 1.0D + 1.0W 90° Wind

1.0D + 1.0W 60 mph Wind at 90° From Face

Wind Load Factor: 1.00

Wind Importance Factor: 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00

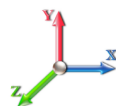
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	5.0	6.66	24.312	17.95	0.00	0.15	2.76	0.85	1.00	0.00	29.41	39.81	0.00	3,945.9	0.0	458.73	199.11	657.84
2	15.0	6.66	23.540	17.95	0.00	0.16	2.75	0.85	1.00	0.00	28.77	39.81	0.00	3,872.3	0.0	447.04	199.11	646.15
3	25.0	7.40	22.832	14.40	0.00	0.15	2.78	0.85	1.00	0.00	26.91	39.81	0.00	3,887.8	0.0	470.84	221.42	692.26
4	35.0	7.95	22.121	14.40	0.00	0.15	2.77	0.85	1.00	0.00	26.21	39.81	0.00	3,814.9	0.0	490.29	237.67	727.96
5	50.0	8.57	31.267	28.80	0.00	0.13	2.84	0.85	1.00	0.00	41.03	79.62	0.00	6,320.0	0.0	848.18	512.42	1,360.60
6	70.0	9.20	25.252	28.80	0.00	0.13	2.84	0.85	1.00	0.00	35.68	79.62	0.00	5,758.9	0.0	793.52	550.03	1,343.55
7	90.0	9.70	23.189	28.80	0.00	0.14	2.81	0.85	1.00	0.00	33.82	79.62	0.00	4,016.9	0.0	784.08	579.91	1,363.99
8	110.0	10.12	21.325	22.12	0.00	0.13	2.84	0.85	1.00	0.00	30.03	79.62	0.00	3,898.2	0.0	733.82	604.94	1,338.75
9	130.0	10.48	26.175	22.12	0.00	0.17	2.71	0.85	1.00	0.00	34.22	79.62	0.00	4,203.8	0.0	827.06	626.59	1,453.66
10	150.0	10.80	16.566	18.57	0.00	0.14	2.80	0.85	1.00	0.00	24.55	79.62	0.00	3,129.9	0.0	632.01	645.76	1,277.76
11	170.0	11.09	14.543	15.02	0.00	0.14	2.80	0.85	1.00	0.00	20.88	72.28	0.00	2,595.7	0.0	550.72	604.20	1,154.92
12	188.0	11.32	10.623	10.68	0.00	0.16	2.75	0.85	1.00	0.00	15.10	18.39	0.00	1,377.7	0.0	399.60	166.73	566.32
														46,821.9	0.0	12,583.76		

Force/Stress Compression Summary

Structure: CT00802-S-SBA
Site Name: Putnam Freight
Height: 196.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

7/27/2022

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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
						X	Y	Z					
1	10	PST - 10" DIA PIPE	-355.54	1.2D + 1.6W Normal Wind	10.02	50	50	50	16.38	50.00	525.10	67.7	Member X
2	20	PST - 10" DIA PIPE	-335.29	1.2D + 1.6W Normal Wind	10.02	50	50	50	16.38	50.00	525.10	63.9	Member X
3	30	PX - 8" DIA PIPE	-314.90	1.2D + 1.6W Normal Wind	10.02	50	50	50	20.88	50.00	556.18	56.6	Member X
4	40	PX - 8" DIA PIPE	-294.36	1.2D + 1.6W Normal Wind	10.02	50	50	50	20.88	50.00	556.18	52.9	Member X
5	60	PX - 8" DIA PIPE	-283.55	1.2D + 1.6W Normal Wind	10.02	100	100	100	41.77	50.00	505.44	56.1	Member X
6	80	PX - 8" DIA PIPE	-243.48	1.2D + 1.6W Normal Wind	10.02	100	100	100	41.77	50.00	505.44	48.2	Member X
7	100	PST - 8" DIA PIPE	-203.04	1.2D + 1.6W Normal Wind	10.02	100	100	100	40.88	50.00	334.51	60.7	Member X
8	120	PX - 6" DIA PIPE	-163.14	1.2D + 1.6W Normal Wind	10.02	100	100	100	54.89	50.00	303.27	53.8	Member X
9	140	PX - 6" DIA PIPE	-125.88	1.2D + 1.6W Normal Wind	6.68	100	100	100	36.59	50.00	342.75	36.7	Member X
10	160	PX - 5" DIA PIPE	-85.17	1.2D + 1.6W Normal Wind	6.68	100	100	100	43.55	50.00	239.35	35.6	Member X
11	180	PSP - 4.5 x 0.438	-44.27	1.2D + 1.6W Normal Wind	6.68	100	100	100	55.78	50.00	200.33	22.1	Member X
12	196	PX - 3-1/2" DIA PIPE	-9.37	1.2D + 1.0Di + 1.0Wi Normal	5.34	100	100	100	48.94	50.00	139.00	6.7	Member X

Splices

Top Splice								Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	10	1.2D + 1.6W Normal Wind	354.34	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	374.98	0.00			
2	20	1.2D + 1.6W Normal Wind	334.09	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	354.34	0.00			
3	30	1.2D + 1.6W Normal Wind	313.76	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	334.09	0.00		3/8 A325	6
4	40	1.2D + 1.6W Normal Wind	293.23	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	313.76	0.00		3/8 A325	6
5	60	1.2D + 1.6W Normal Wind	253.60	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	293.23	0.00		3/8 A325	6
6	80	1.2D + 1.6W Normal Wind	213.20	0.00	0.0	1 3/8	6	1.2D + 1.6W Normal Wind	253.60	0.00		3/8 A325	6
7	100	1.2D + 1.6W Normal Wind	173.02	0.00	0.0	1 1/4	6	1.2D + 1.6W Normal Wind	213.20	0.00		3/8 A325	6
8	120	1.2D + 1.6W Normal Wind	132.46	0.00	0.0	1 1/4	6	1.2D + 1.6W Normal Wind	173.02	0.00		1/4 A325	6
9	140	1.2D + 1.6W Normal Wind	91.73	0.00	0.0	1 1/4	4	1.2D + 1.6W Normal Wind	132.46	0.00		1/4 A325	6
10	160	1.2D + 1.6W Normal Wind	51.00	0.00	0.0	1 1/4	4	1.2D + 1.6W Normal Wind	91.73	0.00		1/4 A325	4
11	180	1.2D + 1.6W Normal Wind	13.04	0.00	0.0	1 A325	4	1.2D + 1.6W Normal Wind	51.00	0.00		1/4 A325	4
12	196	1.2D + 1.0Di + 1.0Wi 60° Wind	1.62	0.00	0.0			1.2D + 1.6W Normal Wind	13.04	0.00		1 A325	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
						X	Y	Z									
1	10	SAE - 4X4X0.375	-12.4	0.9D + 1.6W 90° Wind	13.00	100	100	100	167.95	36.00	22.91	2	1	24.86	52.20	54	Member Z
2	20	SAE - 4X4X0.375	-12.6	0.9D + 1.6W 90° Wind	12.50	100	100	100	163.27	36.00	24.24	2	1	24.86	52.20	52	Member Z
3	30	SAE - 4X4X0.375	-12.1	0.9D + 1.6W 90° Wind	12.00	100	100	100	158.59	36.00	25.69	2	1	24.86	52.20	49	Bolt Shear
4	40	SAE - 4X4X0.375	-11.8	0.9D + 1.6W 90° Wind	11.50	100	100	100	153.90	36.00	27.28	2	1	24.86	52.20	48	Bolt Shear
5	60										0.00	0	0				
6	80										0.00	0	0				
7	100										0.00	0	0				
8	120										0.00	0	0				
9	140										0.00	0	0				
10	160										0.00	0	0				
11	180										0.00	0	0				
12	196	SAE - 2X2X0.1875	-0.61	1.2D + 1.6W 60° Wind	7.40	100	100	100	225.38	36.00	3.16	1	1	12.43	9.79	19	Member Z

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
						X	Y	Z									

Force/Stress Compression Summary

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

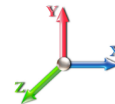
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X Y Z	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	10	SAE - 3.5X3.5X0.375	-16.6	1.2D + 1.6W 90° Wind	16.80	48 96 48	157.46	22.60	2	1	24.86	52.2	74	Member Y
2	20	SAE - 3.5X3.5X0.375	-17.4	1.2D + 1.6W 90° Wind	16.40	48 96 48	154.81	23.38	2	1	24.86	52.2	75	Member Y
3	30	SAE - 3.5X3.5X0.375	-17.0	1.2D + 1.6W 90° Wind	16.01	48 96 48	152.21	24.18	2	1	24.86	50.2	70	Member Y
4	40	SAE - 3.5X3.5X0.375	-16.7	1.2D + 1.6W 90° Wind	15.62	48 96 48	149.65	25.02	2	1	24.86	50.2	67	Bolt Shear
5	60	SAE - 4X4X0.375	-12.8	1.2D + 1.6W 90° Wind	24.62	48 48 48	179.99	19.94	1	1	17.89	21.5	72	Bolt Shear
6	80	SAE - 3.5X3.5X0.375	-11.9	1.2D + 1.6W 90° Wind	22.81	50 50 50	199.22	14.12	1	1	17.89	21.5	85	Member Z
7	100	SAE - 3.5X3.5X0.25	-11.1	1.2D + 1.6W 90° Wind	21.03	50 50 50	181.83	11.55	1	1	17.89	14.3	97	Member Z
8	120	SAE - 3.5X3.5X0.25	-10.4	1.2D + 1.6W 90° Wind	19.30	50 50 50	166.82	13.72	1	1	17.89	14.3	76	Member Z
9	140	SAE - 3.5X3.5X0.25	-8.68	1.2D + 1.6W 90° Wind	16.11	50 50 50	139.30	19.68	1	1	17.89	14.3	61	Bolt Bear
10	160	SAE - 2.5X2.5X0.25	-7.79	1.2D + 1.6W 90° Wind	14.32	50 50 50	174.93	8.79	1	1	12.43	14.7	89	Member Z
11	180	SAE - 2.5X2.5X0.1875	-7.24	1.2D + 1.6W 90° Wind	12.58	50 50 50	152.49	8.76	1	1	12.43	11.0	83	Member Z
12	196	SAE - 2X2X0.1875	-3.64	1.2D + 1.6W 90° Wind	10.23	50 50 50	155.85	6.60	1	1	12.43	11.0	55	Member Z

Force/Stress Tension Summary

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

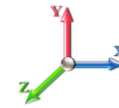
Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	10	PST - 10" DIA PIPE	298.78	0.9D + 1.6W 60° Wind	50	535.50	55.8	Member
2	20	PST - 10" DIA PIPE	282.29	0.9D + 1.6W 60° Wind	50	535.50	52.7	Member
3	30	PX - 8" DIA PIPE	266.05	0.9D + 1.6W 60° Wind	50	574.20	46.3	Member
4	40	PX - 8" DIA PIPE	249.60	0.9D + 1.6W 60° Wind	50	574.20	43.5	Member
5	60	PX - 8" DIA PIPE	241.05	0.9D + 1.6W 60° Wind	50	574.20	42.0	Member
6	80	PX - 8" DIA PIPE	207.85	0.9D + 1.6W 60° Wind	50	574.20	36.2	Member
7	100	PST - 8" DIA PIPE	173.84	0.9D + 1.6W 60° Wind	50	378.00	46.0	Member
8	120	PX - 6" DIA PIPE	138.92	0.9D + 1.6W 60° Wind	50	378.00	36.8	Member
9	140	PX - 6" DIA PIPE	106.22	0.9D + 1.6W 60° Wind	50	378.00	28.1	Member
10	160	PX - 5" DIA PIPE	70.25	0.9D + 1.6W 60° Wind	50	274.95	25.5	Member
11	180	PSP - 4.5 x 0.438	32.80	0.9D + 1.6W 60° Wind	50	251.51	13.0	Member
12	196	PX - 3-1/2" DIA PIPE	4.34	0.9D + 1.6W 60° Wind	50	165.60	2.6	Member

Splices

Sect	Top Elev	Top Splice						Bottom Splice					
		Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	10	0.9D + 1.6W 60° Wind	297.72	545.68	54.6	1 3/8	6	0.9D + 1.6W 60° Wind	315.7	0.00			
2	20	0.9D + 1.6W 60° Wind	281.24	545.68	51.5	1 3/8	6	0.9D + 1.6W 60° Wind	297.7	0.00			
3	30	0.9D + 1.6W 60° Wind	265.04	545.68	48.6	1 3/8	6	0.9D + 1.6W 60° Wind	281.2	545.68	51.5	1 3/8 A325	6
4	40	0.9D + 1.6W 60° Wind	248.55	545.68	45.5	1 3/8	6	0.9D + 1.6W 60° Wind	265.0	545.68	48.6	1 3/8 A325	6
5	60	0.9D + 1.6W 60° Wind	215.03	545.68	39.4	1 3/8	6	0.9D + 1.6W 60° Wind	248.5	545.68	45.5	1 3/8 A325	6
6	80	0.9D + 1.6W 60° Wind	181.27	545.68	33.2	1 3/8	6	0.9D + 1.6W 60° Wind	215.0	545.68	39.4	1 3/8 A325	6
7	100	0.9D + 1.6W 60° Wind	146.79	457.92	32.1	1 1/4	6	0.9D + 1.6W 60° Wind	181.2	545.68	33.2	1 3/8 A325	6
8	120	0.9D + 1.6W 60° Wind	111.13	457.92	24.3	1 1/4	6	0.9D + 1.6W 60° Wind	146.7	457.92	32.1	1 1/4 A325	6
9	140	0.9D + 1.6W 60° Wind	75.53	305.28	24.7	1 1/4	4	0.9D + 1.6W 60° Wind	111.1	457.92	24.3	1 1/4 A325	6
10	160	0.9D + 1.6W 60° Wind	38.63	305.28	12.7	1 1/4	4	0.9D + 1.6W 60° Wind	75.53	305.28	24.7	1 1/4 A325	4
11	180	0.9D + 1.6W 60° Wind	7.32	212.04	3.5	1 A325	4	0.9D + 1.6W 60° Wind	38.63	305.28	12.7	1 1/4 A325	4
12	196		0.00	0.00	0.0			0.9D + 1.6W 60° Wind	7.32	212.04	3.5	1 A325	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	10	SAE - 4X4X0.375	12.97	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	52.2	Bolt Shear
2	20	SAE - 4X4X0.375	13.18	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	53.0	Bolt Shear
3	30	SAE - 4X4X0.375	12.59	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	50.7	Bolt Shear
4	40	SAE - 4X4X0.375	11.91	1.2D + 1.6W 90° Wind	36	92.66	2	1	24.86	52.20	46.25	47.9	Bolt Shear
5	60	-			36	0.00	0	0					
6	80	-			36	0.00	0	0					
7	100	-			36	0.00	0	0					
8	120	-			36	0.00	0	0					
9	140	-			36	0.00	0	0					
10	160	-			36	0.00	0	0					
11	180	-			36	0.00	0	0					
12	196	SAE - 2X2X0.1875	0.56	0.9D + 1.6W Normal Wi	36	23.00	1	1	12.43	9.79	8.51	6.6	Blck Shear

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	10	SAE - 3.5X3.5X0.375	15.83	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	52.20	38.10	63.7	Bolt Shear

Force/Stress Tension Summary

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

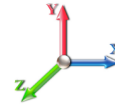
Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
2	20	SAE - 3.5X3.5X0.375	16.36	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	52.20	38.10	65.8	Bolt Shear
3	30	SAE - 3.5X3.5X0.375	15.93	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	50.24	37.34	64.1	Bolt Shear
4	40	SAE - 3.5X3.5X0.375	15.71	0.9D + 1.6W 90° Wind	36	71.73	2	1	24.86	50.24	37.34	63.2	Bolt Shear
5	60	SAE - 4X4X0.375	12.56	0.9D + 1.6W 90° Wind	36	82.60	1	1	17.89	21.53	24.93	70.2	Bolt Shear
6	80	SAE - 3.5X3.5X0.375	11.76	0.9D + 1.6W 90° Wind	36	70.20	1	1	17.89	21.53	24.93	65.8	Bolt Shear
7	100	SAE - 3.5X3.5X0.25	10.98	1.2D + 1.6W 90° Wind	36	48.00	1	1	17.89	14.35	16.62	76.5	Bolt Bear
8	120	SAE - 3.5X3.5X0.25	10.30	1.2D + 1.6W 90° Wind	36	48.00	1	1	17.89	14.35	16.62	71.8	Bolt Bear
9	140	SAE - 3.5X3.5X0.25	8.67	1.2D + 1.6W 90° Wind	36	48.00	1	1	17.89	14.35	16.62	60.4	Bolt Bear
10	160	SAE - 2.5X2.5X0.25	7.72	1.2D + 1.6W 90° Wind	36	32.71	1	1	12.43	14.79	13.22	62.1	Bolt Shear
11	180	SAE - 2.5X2.5X0.1875	7.25	1.2D + 1.6W 90° Wind	36	24.84	1	1	12.43	11.09	9.91	73.2	Blck Shear
12	196	SAE - 2X2X0.1875	3.57	0.9D + 1.6W 90° Wind	36	18.58	1	1	12.43	11.09	7.88	45.4	Blck Shear

Seismic Section Forces

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

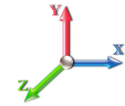
Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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Load Case: 1.2D + 1.0E

Dead Load Factor	1.20	Sds 0.183	Ss 0.1720	Fa 1.6000	Ke 0.0000
Seismic Load Factor	1.00	Sd1 0.100	S1 0.0630	Fv 2.4000	Kg 0.0000
Seismic Importance Factor	1.00	SA 0.183	R 3.0000	Vs 4.2344	f1 1.9764

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	5.00	3945.9	0.00	0.03	0.01	6.59
2	15.00	3872.3	0.01	0.06	0.03	15.72
3	25.00	3887.7	0.03	0.07	0.04	23.10
4	35.00	3814.9	0.06	0.07	0.04	30.16
5	50.00	6320.0	0.12	0.07	0.03	73.32
6	70.00	5758.8	0.24	0.06	0.02	104.03
7	90.00	4016.8	0.40	0.02	0.01	102.17
8	110.00	3898.1	0.60	-0.05	0.01	128.87
9	130.00	4203.8	0.83	-0.12	0.06	178.23
10	150.00	3129.8	1.11	-0.07	0.19	182.67
11	170.00	7938.1	1.42	0.33	0.45	704.05
12	188.00	6883.8	1.74	1.28	0.88	926.93

Load Case: 0.9D + 1.0E

Dead Load Factor	0.90	Sds 0.183	Ss 0.1720	Fa 1.6000	Ke 0.0000
Seismic Load Factor	1.00	Sd1 0.100	S1 0.0630	Fv 2.4000	Kg 0.0000
Seismic Importance Factor	1.00	SA 0.183	R 3.0000	Vs 4.2344	f1 1.9764

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	5.00	3945.9	0.00	0.03	0.01	6.59
2	15.00	3872.3	0.01	0.06	0.03	15.72
3	25.00	3887.7	0.03	0.07	0.04	23.10
4	35.00	3814.9	0.06	0.07	0.04	30.16
5	50.00	6320.0	0.12	0.07	0.03	73.32
6	70.00	5758.8	0.24	0.06	0.02	104.03
7	90.00	4016.8	0.40	0.02	0.01	102.17
8	110.00	3898.1	0.60	-0.05	0.01	128.87
9	130.00	4203.8	0.83	-0.12	0.06	178.23
10	150.00	3129.8	1.11	-0.07	0.19	182.67
11	170.00	7938.1	1.42	0.33	0.45	704.05
12	188.00	6883.8	1.74	1.28	0.88	926.93

Support Forces Summary

Structure: CT00802-S-SBA

Code: TIA-222-G

7/27/2022

Site Name: Putnam Freight

Exposure: C

Height: 196.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

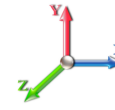
Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind	1	0.00	373.69	-42.63	
	1a	12.83	-152.24	-15.00	
	1b	-12.83	-152.24	-15.00	
1.2D + 1.6W 60° Wind	1	-5.86	188.75	-20.97	
	1a	-21.09	188.75	5.41	
	1b	-31.60	-308.30	-18.24	
1.2D + 1.6W 90° Wind	1	-7.02	23.07	-1.92	
	1a	-32.40	314.21	14.76	
	1b	-29.45	-268.08	-12.84	
0.9D + 1.6W Normal Wind	1	0.00	367.61	-42.15	
	1a	13.24	-157.86	-15.24	
	1b	-13.24	-157.86	-15.24	
0.9D + 1.6W 60° Wind	1	-5.87	182.84	-20.49	
	1a	-20.68	182.84	5.16	
	1b	-32.01	-313.78	-18.48	
0.9D + 1.6W 90° Wind	1	-7.03	17.30	-1.44	
	1a	-31.98	308.19	14.51	
	1b	-29.86	-273.58	-13.07	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	166.76	-16.22	
	1a	0.49	11.24	-2.40	
	1b	-0.49	11.24	-2.40	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-1.75	113.70	-10.10	
	1a	-9.63	113.70	3.54	
	1b	-6.27	-38.17	-3.62	
1.2D + 1.0Di + 1.0Wi 90° Wind	1	-2.05	63.08	-4.33	
	1a	-12.98	151.29	6.32	
	1b	-5.51	-25.13	-1.99	
1.2D + 1.0E	1	0.00	39.56	-2.09	
	1a	0.02	14.82	-0.18	
	1b	-0.02	14.82	-0.18	
0.9D + 1.0E	1	0.00	33.77	-1.61	
	1a	0.43	9.07	-0.42	
	1b	-0.43	9.07	-0.42	
1.0D + 1.0W Normal Wind	1	0.00	98.33	-10.86	
	1a	1.90	-20.33	-2.81	
	1b	-1.90	-20.33	-2.81	
1.0D + 1.0W 60° Wind	1	-1.35	56.66	-5.93	
	1a	-5.81	56.66	1.79	
	1b	-6.14	-55.64	-3.55	
1.0D + 1.0W 90° Wind	1	-1.60	19.22	-1.59	
	1a	-8.39	84.98	3.92	
	1b	-5.65	-46.53	-2.33	

Max Reactions

Leg			Overturning		
Max Uplift:	-313.78	(kips)	Moment:	8198.56	(ft-kips)
Max Down:	373.69	(kips)	Total Down:	69.20	(kips)
Max Shear:	42.63	(kips)	Total Shear:	72.64	(kips)

Analysis Summary

Structure: CT00802-S-SBA	Code: TIA-222-G	7/27/2022
Site Name: Putnam Freight	Exposure: C	
Height: 196.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II
		Page: 20



Max Reactions

Leg		Overturning	
Max Uplift:	-313.78 (kips)	Moment:	8198.56 (ft-kips)
Max Down:	373.69 (kips)	Total Down:	69.20 (kips)
Max Shear:	42.63 (kips)	Total Shear:	72.64 (kips)

Anchor Bolts

Bolt Size (in.): 1.50	Number Bolts: 8
Yield Strength (Ksi): 50.00	Tensile Strength (Ksi): 65.00
Detail Type: D	Length: 0.25

Interaction Ratio: 0.79

Max Usages

Max Leg: 67.7% (1.2D + 1.6W Normal Wind - Sect 1)
 Max Diag: 96.8% (1.2D + 1.6W 90° Wind - Sect 7)
 Max Horiz: 54.5% (0.9D + 1.6W 90° Wind - Sect 1)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	166.67	0.0493	-0.0013	0.0356
	173.33	0.0533	-0.0012	0.0357
	185.33	0.0608	-0.0010	0.0367
	196.00	0.0674	-0.0006	0.0357
0.9D + 1.6W 101 mph Wind at 60° From Face	166.67	0.8250	0.0178	0.5400
	173.33	0.8872	0.0154	0.5332
	185.33	0.9994	0.0120	0.5343
	196.00	1.0960	0.0075	0.5334
0.9D + 1.6W 101 mph Wind at 90° From Face	166.67	0.8349	-0.0211	0.5484
	173.33	0.8982	-0.0183	0.5368
	185.33	1.0118	-0.0146	0.5417
	196.00	1.1089	-0.0095	0.5451
0.9D + 1.6W 101 mph Wind at Normal To Face	166.67	0.8650	0.0192	0.5629
	173.33	0.9304	0.0168	0.5557
	185.33	1.0473	0.0136	0.5572
	196.00	1.1480	0.0093	0.5564
1.0D + 1.0W 60 mph Wind at 60° From Face	166.67	0.1856	0.0041	0.1208
	173.33	0.1997	0.0036	0.1195
	185.33	0.2248	0.0028	0.1195
	196.00	0.2465	0.0018	0.1192
1.0D + 1.0W 60 mph Wind at 90° From Face	166.67	0.1879	-0.0048	0.1229
	173.33	0.2021	-0.0042	0.1204
	185.33	0.2276	-0.0033	0.1214
	196.00	0.2493	-0.0022	0.1221

1.0D + 1.0W 60 mph Wind at Normal To Face	166.67	0.1947	-0.0043	0.1263
	173.33	0.2092	-0.0037	0.1245
	185.33	0.2354	-0.0030	0.1251
	196.00	0.2580	-0.0020	0.1250

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	166.67	0.2517	0.0055	0.1616
	173.33	0.2704	0.0048	0.1599
	185.33	0.3039	0.0038	0.1609
	196.00	0.3330	0.0024	0.1584

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	166.67	0.2528	-0.0064	0.1632
	173.33	0.2717	-0.0056	0.1601
	185.33	0.3053	-0.0044	0.1618
	196.00	0.3345	-0.0029	0.1618

1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	166.67	0.2562	0.0056	0.1655
	173.33	0.2754	0.0049	0.1627
	185.33	0.3096	0.0039	0.1639
	196.00	0.3391	0.0026	0.1638

1.2D + 1.0E - Normal To Face	166.67	0.0493	0.0013	0.0357
	173.33	0.0534	0.0012	0.0358
	185.33	0.0609	0.0010	0.0368
	196.00	0.0675	0.0006	0.0357

1.2D + 1.6W 101 mph Wind at 60° From Face	166.67	0.8260	0.0178	0.5408
	173.33	0.8883	0.0154	0.5340
	185.33	1.0007	0.0120	0.5350
	196.00	1.0974	0.0075	0.5340

1.2D + 1.6W 101 mph Wind at 90° From Face	166.67	0.8359	-0.0211	0.5492
	173.33	0.8994	-0.0184	0.5376
	185.33	1.0131	-0.0146	0.5425
	196.00	1.1104	-0.0095	0.5459

1.2D + 1.6W 101 mph Wind at Normal To Face	166.67	0.8661	0.0193	0.5638
	173.33	0.9316	0.0168	0.5566
	185.33	1.0487	0.0136	0.5582
	196.00	1.1495	0.0093	0.5574

	Pier Foundation For Self Supporting Tower			Date
				7/27/2022
	Customer Name:	SBA Communications Corp	EIA/TIA Standard:	TIA-222-G
	Site Name:		Structure Height (Ft.):	196
	Site Number:	CT00802-S-SBA	Engineer Name:	J. Tibbetts
	Engr. Number:	132046	Manager Login Req'd:	

Foundation Info Obtained from:

Drawings/Calculations

Acceptable overstress (%) 5.0%

Structure Type:

Self Supporting Tower

Analysis or Design?

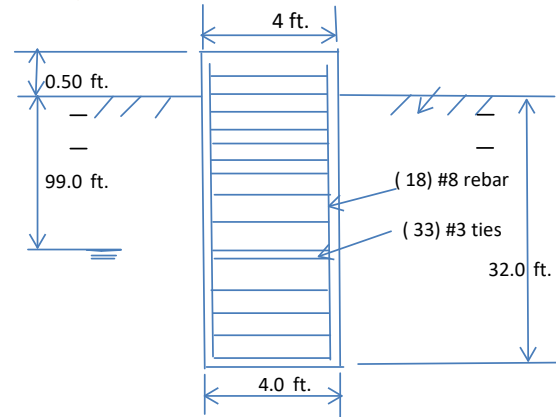
Analysis

Base Reactions (Factored):

Axial Load (Kips):	373.7	Shear Force (Kips):	42.6
Uplift Force (Kips):	313.8	Moment (Kips-ft):	0.0

Foundation Geometries:

Diameter of Pier (ft.):	4.0	Depth of Base B. G. S. :	32.0 ft.
Pier Height A. G. (ft.):	0.50		



SST Pier Foundation

Material Properties and Rebar Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000 ksi
Vertical bar yield (ksi):	60	Tie steel yield strength:	60 ksi
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	3
Qty. of Vertical Rebars:	18	Tie Spacing:	12.0 in.
Concrete Cover (in.):	3	Concrete unit weight:	150.0 pcf
Consider ties in concrete shear strength?	Yes		

Soil Design Parameters:

Water Table B.G.S. (ft):	99.0	Unit weight of water:	62.4 psf
Ratio of Uplift/Axial Skin Friction:	1.00	Pullout failure Angle:	30 (°)
Skin Frictions are to be obtained from:	Soil Report		

Sand

Depth of Layers (ft)		γ_{soil}	ϕ	Cohesion	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types					
Top	Bottom	(pcf)	(°)	(psf)								
0.0	2.0	115	0	0	0	0	Clay					
2.0	4.0	115	32	0	1500	0	Sand					
4.0	20.0	115	32	0	1500	0	Sand					
20.0	26.0	115	32	0	4000	40000	Sand					
26.0	32.0	135	36	0	4000	40000	Sand					
32.0	37.0											

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

	Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75
Total Dry Soil Volume from Conical Failure (cu. Ft.):	15147	Dry Soil Weight from Conical Failure:	1556	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	0	Buoyant Soil Weight from Conical Failure (Ki	0	Kips
Total Dry Concrete Volume (cu. Ft.):	408	Total Dry Concrete Weight:	61.26	Kips
Total Buoyant Concrete Volume (cu. Ft.):	0	Total Buoyant Concrete Weight:	0.00	Kips
Total Effective Concrete Weight (Kips):	61.3	Total Effective Soil Weight:	1556	Kips
Total Effective Vertical Load on Base (Kips):	394			

Check Soil Capacities:

Calculated Foundation Allowable Axial Capacity (Kips):	1053.0	>	Design Factored Axial Load (Kips):	394	Usage	0.37	OK!
Calculated Foundation Uplift Capacity (Kips):	761.99	>	Design Factored Uplift Load (Kips):	314		0.41	OK!

Check the capacities of Reinforcing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

Reinforcing Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.11			
Calculated Moment Capacity (Mn,Kips-Ft):	781	>	Design Factored Moment (Mu, K-Ft):	232.4	0.30	OK!
Calculated Shear Capacity (Kips):	121.3	>	Design Factored Shear (Kips):	42.6	0.35	OK!
Calculated Tension Capacity (Tn, Kips):	767.9	>	Design Factored Tension (Tu Kips):	313.8	0.41	OK!
Calculated Compression Capacity (Pn, Kips):	2381	>	Design Factored Axial Load (Pu Kips):	373.7	0.16	OK!
Moment & Tension Strength Combination:	0.30	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.008	Reinforcement Ratio is satisfied per ACI				

Reinforce Pier Foundation by Adding Concrete Block (Yes/No ?)

No